



Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

09-AMCP-0004

OCT 16 2008

Mr. N. Ceto, Program Manager
Office of Environmental Cleanup
Hanford Project Office
U.S. Environmental Protection Agency
309 Bradley Blvd., Suite 115
Richland, Washington 99352

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EDMC

Dear Mr. Ceto:

ENGINEERING EVALUATION/COST ANALYSIS FOR THE 200-MG-2 OPERABLE UNIT
WASTE SITES, DOE/RL-2008-45, DRAFT A

The purpose of this letter is to transmit the Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites, DOE/RL-2008-45, Draft A, to the U.S. Environmental Protection Agency for your approval. This document presents the results of a non-time-critical removal action engineering evaluation/cost analysis (EE/CA) that was conducted to evaluate removal action alternatives for the 200-MG-2 Operable Unit waste sites. This transmittal completes Hanford Federal Facility Agreement and Consent Order Milestone M-15-49B.

The 200-MG-2 waste sites include trenches, cribs, ditches, French drains, retention basins, injection/reverse wells, and unplanned release sites. The results of this EE/CA will be used to support waste site decision making for these waste sites and will be followed by an action memorandum for the 200-MG-2 Operable Unit.

If you have any questions, please contact me, or your staff may contact Matt McCormick, Assistant Manager for the Central Plateau, on (509) 373-9971.

Sincerely,

A handwritten signature in black ink that reads "David A. Brockman".

David A. Brockman
Manager

AMCP:FMR

Attachment

cc: See Page 2

Mr. N. Ceto
09-AMCP-0004

-2-

OCT 16 2008

cc w/attach:

G. Bohnee, NPT
L. Buck, Wanapum
C. E. Cameron, EPA
S. Harris, CTUIR
J. A. Hedges, Ecology
R. Jim, YN
S. L. Leckband, HAB
K. Niles, ODOE
J. B. Price, Ecology
Administrative Record
Environmental Portal

cc w/o attach:

R. E. Piippo, FHI
J. G. Vance, FFS

Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites

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



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

**Approved for Public Release,
Further Dissemination Unlimited**

Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites

Date Published
August 2008

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



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

J. D. Aardal
Release Approval

09/09/2008
Date

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EXECUTIVE SUMMARY

1

2 This document presents the results of a non-time-critical removal action engineering evaluation/
3 cost analysis (EE/CA) addressing disposition of contaminated soil and other materials from
4 waste sites contained in the Hanford Site 200-MG-2 Operable Unit (OU). This EE/CA was
5 prepared in accordance with the *Comprehensive Environmental Response, Compensation, and*
6 *Liability Act of 1980*¹ (CERCLA).

7 The 200-MG-2 OU includes 70 waste sites in the 200 East and 200 West Areas, hereafter
8 referred to as the “200 Areas.” The waste sites include french drains, injection/reverse wells,
9 trenches, cribs ditches, and retention basins with shallow contamination (generally less than
10 4.6 m [15 ft] deep). This OU also includes a few sites where chemical and radioactive
11 contaminants were released as the result of leaks or spills (i.e., unplanned release sites).
12 Because these sites are considered low-risk, little remedial investigation has been performed.
13 Thus, one of the aspects of these sites is the general absence of information about site
14 characteristics, including the nature and extent of contamination. The terms “contamination”
15 or “contaminant,” as used in this document, refer to the presence of contaminants of
16 potential concern that exist above preliminary removal cleanup levels, as described
17 throughout the EE/CA.

18 The U.S. Department of Energy has determined that the 200-MG-2 OU waste sites contain
19 the potential for release of CERCLA hazardous substances, and that a non-time-critical
20 removal action, pursuant to authority delegated under Executive Order 12580, *Superfund*
21 *Implementation*,² and Section 7.2.4 of Ecology et al., 1989b, *Hanford Federal Facility*
22 *Agreement and Consent Order Action Plan*,³ is warranted to mitigate the threat of release.

¹ *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, 42 USC 9601, et seq.

² Executive Order 12580, 1987, *Superfund Implementation*, Ronald Reagan, January 23.
<http://www.archives.gov/federal-register/executive-orders/1987.html>

³ 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. <http://www.hanford.gov/?page=117&parent=92>

1 Therefore, the purpose of this EE/CA is to evaluate removal action alternatives to mitigate
2 threats to human health and the environment posed by the contaminated soil and other materials
3 in the 200-MG-2 OU. This EE/CA evaluates four removal action alternatives for each site:

- 4 • No action (NA)
- 5 • Maintain existing soil cover/institutional controls/monitored natural attenuation
6 (MESC/IC/MNA)
- 7 • Confirmatory sampling/no action (CS/NA)
- 8 • Removal, treatment, and disposal (RTD).

9 NA assumes all short- and long-term survey and maintenance activities are terminated.

10 MESC/IC/MNA evaluates using natural attenuation processes to lower contaminant
11 concentrations, while relying on institutional controls of the area to prevent migration of the
12 contaminants and exposure to receptors. CS/NA assumes that the waste site does not presently
13 pose a threat to human health and the environment, and sampling and analysis will be conducted
14 to confirm this assumption. Finally, RTD includes removal and disposal of the soil and other
15 materials, with treatment as required for disposal.

16 After summarizing site characteristics, providing a site description, and establishing removal
17 action objectives, these alternatives were evaluated in terms of effectiveness, implementability,
18 and cost. Chapter 4.0 contains a general description of each of the four alternatives.

19 The preferred removal actions for the 200-MG-2 OU waste sites are based on the individual
20 waste site characteristics. The preferred actions include all the alternatives mentioned above
21 with the exception of the no-action alternative, which cannot be chosen for these waste sites
22 because of the absence of characterization data.

23 The preferred alternative for each waste site is recommended based on its overall ability to
24 protect human health and the environment and its effectiveness in maintaining protection for
25 both the short and the long term. These alternatives reduce the potential for further releases to
26 the environment; provide the best balance of protecting the health of the workers and the public;
27 protect environment; and provide an end state that is consistent with future cleanup actions and
28 commitments of Ecology et al., 1989a, *Hanford Federal Facility Agreement and Consent*

1 *Order.*⁴ Chapter 5.0 describes the basis for these recommendations, including a detailed analysis
 2 of how well each alternative meets the CERCLA removal action evaluation criteria.
 3 Chapter 6.0 provides the summary of preferred removal actions for all sites and contingency
 4 plans if the site preferred alternative is determined to be inappropriate during the removal action.
 5 Table ES-1 summarizes the present worth costs of the preferred removal actions across all waste
 6 sites. The 200-MG-2 OU preferred removal actions have a present worth cost of \$33,177,000.
 7 The type, size, and extent of hazardous substance contamination vary considerably across the
 8 200-MG-2 OU waste sites. Thus, it is not possible to prepare meaningful unit cost factors based
 9 on area or waste volume removed from the analysis in this OU.

Table ES-1. Summary of the 200-MG-2 Operable Unit Waste Site
 Preferred Removal Actions.

Preferred Alternative	Number of Waste Sites	Present Worth
NA	0	\$0
MESC/IC/MNA	1	\$494,000
CS/NA	38	\$7,049,000
RTD	31	\$25,634,000
Total	70	\$33,177,000

CS/NA = confirmatory sampling/no action.

MESC/IC/MNA = maintain existing soil cover/institutional controls/monitored natural attenuation.

NA = no action.

RTD = removal, treatment, and disposal.

10

11

⁴ 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. <http://www.hanford.gov/?page=91&parent=0>.

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7

PLATE

8 Plate 1. 200-MG-2 Operable Unit Sites..... (located in pocket at the end of this document)

9

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TERMS

1		
2	ARAR	applicable or relevant and appropriate requirement
3	bgs	below ground surface
4	CERCLA	<i>Comprehensive Environmental Response, Compensation, and</i>
5		<i>Liability Act of 1980</i>
6	CFR	<i>Code of Federal Regulations</i>
7	COPC	contaminant of potential concern
8	CS/NA	confirmatory sampling/no action
9	DOE	U.S. Department of Energy
10	Ecology	Washington State Department of Ecology
11	EE/CA	engineering evaluation/cost analysis
12	EPA	U.S. Environmental Protection Agency
13	ERDF	Environmental Restoration Disposal Facility
14	IC	institutional controls
15	MESC/IC/MNA	maintain existing soil cover/institutional controls/monitored
16		natural attenuation
17	NA	no action
18	NEPA	<i>National Environmental Policy Act of 1969</i>
19	NPL	"National Priorities List" (40 CFR 300, Appendix B)
20	OU	operable unit
21	PRCL	preliminary removal cleanup level
22	RAO	removal action objective
23	RAWP	removal action work plan
24	RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
25	RTD	removal, treatment, and disposal
26	SCA	soil contamination area
27	TBC	to be considered
28	Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
29		(Ecology et al., 1989a)
30	TMV	toxicity, mobility, and volume
31	UPR	unplanned release
32	URM	underground radioactive material
33	WAC	<i>Washington Administrative Code</i>
34		

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METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
<i>If you know</i>	<i>Multiply by</i>	<i>To get</i>	<i>If you know</i>	<i>Multiply by</i>	<i>To get</i>
Length			Length		
inches	25.40	millimeters	millimeters	0.0394	inches
inches	2.54	centimeters	centimeters	0.394	inches
feet	0.305	meters	meters	3.281	feet
yards	0.914	meters	meters	1.094	yards
miles (statute)	1.609	kilometers	kilometers	0.621	miles (statute)
Area			Area		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.0929	sq. meters	sq. meters	10.764	sq. feet
sq. yards	0.836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.591	sq. kilometers	sq. kilometers	0.386	sq. miles
acres	0.405	hectares	hectares	2.471	acres
Mass (weight)			Mass (weight)		
ounces (avoir)	28.349	grams	grams	0.0353	ounces (avoir)
pounds	0.453	kilograms	kilograms	2.205	pounds (avoir)
tons (short)	0.907	ton (metric)	ton (metric)	1.102	tons (short)
Volume			Volume		
teaspoons	5	milliliters	milliliters	0.034	ounces (U.S., liquid)
tablespoons	15	milliliters	liters	2.113	pints
ounces (U.S., liquid)	29.573	milliliters	liters	1.057	quarts (U.S., liquid)
cups	0.24	liters	liters	0.264	gallons (U.S., liquid)
pints	0.473	liters	cubic meters	35.315	cubic feet
quarts (U.S., liquid)	0.946	liters	cubic meters	1.308	cubic yards
gallons (U.S., liquid)	3.785	liters			
cubic feet	0.0283	cubic meters			
cubic yards	0.764	cubic meters			
Temperature			Temperature		
Fahrenheit	$(^{\circ}\text{F}-32)*5/9$	Centigrade	Centigrade	$(^{\circ}\text{C}*9/5)+32$	Fahrenheit
Radioactivity			Radioactivity		
picocurie	37	millibecquerel	millibecquerel	0.027	picocurie

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1.0 INTRODUCTION

2 This chapter first discusses the purpose and scope of this document. This discussion is followed
3 by sections that describe the document's organization, background to the 200-MG-2 Operable
4 Unit (OU) with a list of its sites, a regulatory overview, and the approach to OU removal actions.

5 1.1 PURPOSE AND SCOPE

6 This document presents the results of a *Comprehensive Environmental Response, Compensation,*
7 *and Liability Act of 1980* (CERCLA) non-time-critical removal action engineering
8 evaluation/cost analysis (EE/CA) that was conducted to evaluate removal action alternatives for
9 the 200-MG-2 OU waste sites. These waste sites are in both 200 East and 200 West Areas of the
10 Hanford Site, hereafter referred to as the "200 Areas" (Figure 1-11-1). Typically, an EE/CA
11 focuses on a single site or facility. In contrast, this EE/CA is being used to support removal
12 action decisions for a large number of waste sites.

13 Final remedial decisions for the 200-MG-2 OU have not been made. Some of the sites have been
14 characterized and found to contain CERCLA hazardous substances⁵ that pose a threat to human
15 health and the environment. Because most of the sites have not been characterized and may
16 contain hazardous substances, removal actions that include characterization are warranted before
17 final remedial decisions can be documented.

18 This EE/CA identifies the objectives of the removal actions⁶ and analyzes the removal action
19 alternatives in terms of cost, effectiveness, and implementability for the 200-MG-2 OU waste
20 sites. Figure 1-1 depicts the 200-MG-2 OU waste sites in the 200 Areas and Figures 1-21-2 and
21 1-3 show the sites located within the 200 East and 200 West Areas, respectively. A large scale
22 version of Figure 1-1 is provided in Plate 1 at the back of this EE/CA. The alternatives
23 considered provide a range of potential response actions that are appropriate to address site-
24 specific conditions.

25 The U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA)
26 will use this EE/CA report as the basis for selecting removal actions to mitigate potential risks to
27 human health and the environment. This EE/CA also will be presented to the public for review
28 and comment. An Action Memorandum, which will document and authorize implementation of
29 the removal action for each waste site, will be developed from this EE/CA. A removal action
30 work plan (RAWP) will be prepared to document the removal action decision(s), preliminary
31 removal cleanup levels (PRCL), and removal action methods.

32 The final remedial action selected for the 200-MG-2 OU waste sites will be submitted for public
33 review in a proposed plan and documented in a Record of Decision.

34

⁵ "Hazardous substances" are defined in 40 CFR 300.5, "Definitions," and include both radioactive and chemical substances.

⁶ The terms "remove" or "removal" mean the cleanup or removal of released hazardous substances from the environment, such actions as may be necessary taken in the event of the threat of release of hazardous substances into the environment, such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances, the disposal of removed material, or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release (40 CFR 300.5).

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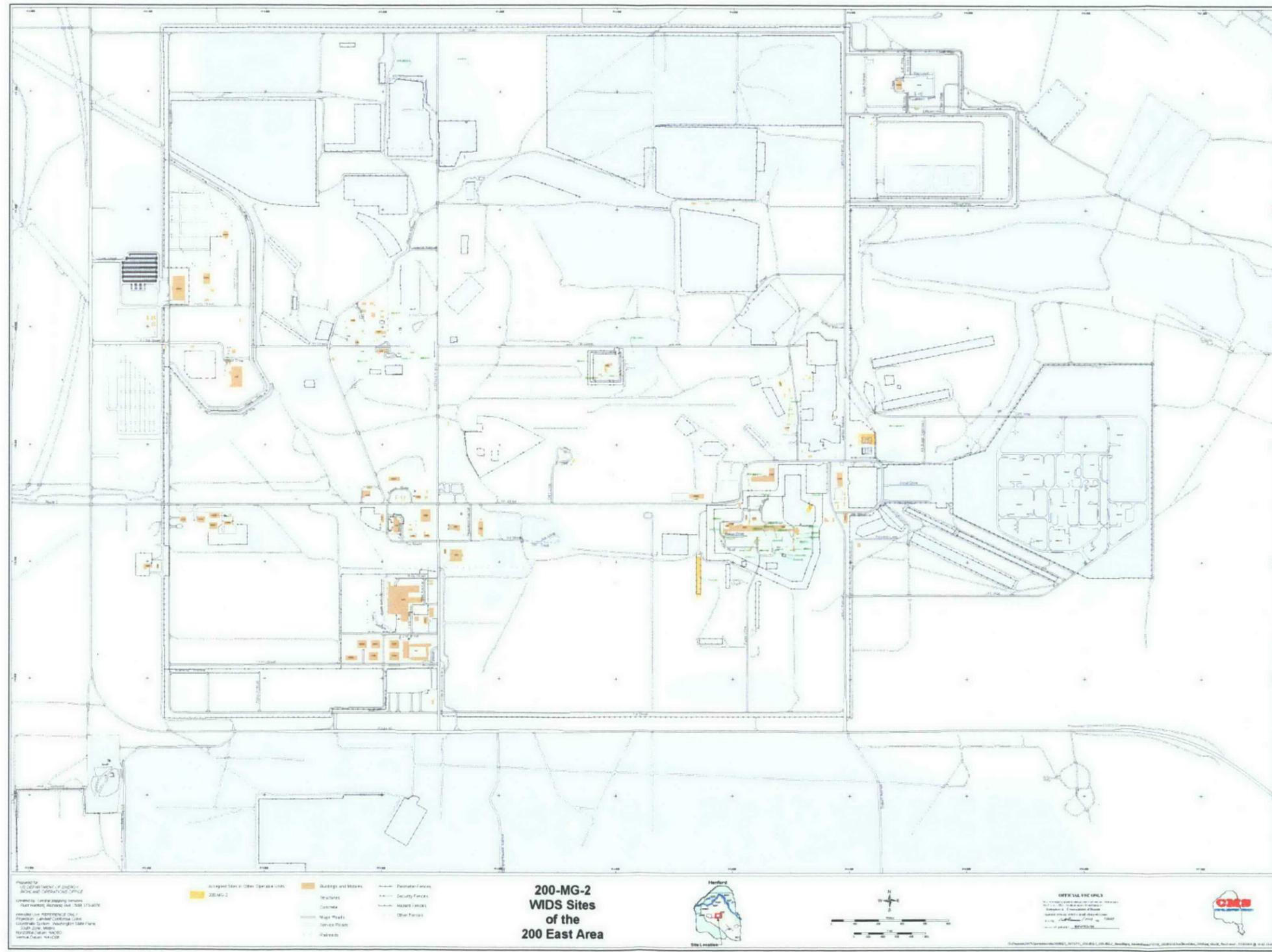
Figure 1-1. 200-MG-2 Operable Unit Waste Sites.



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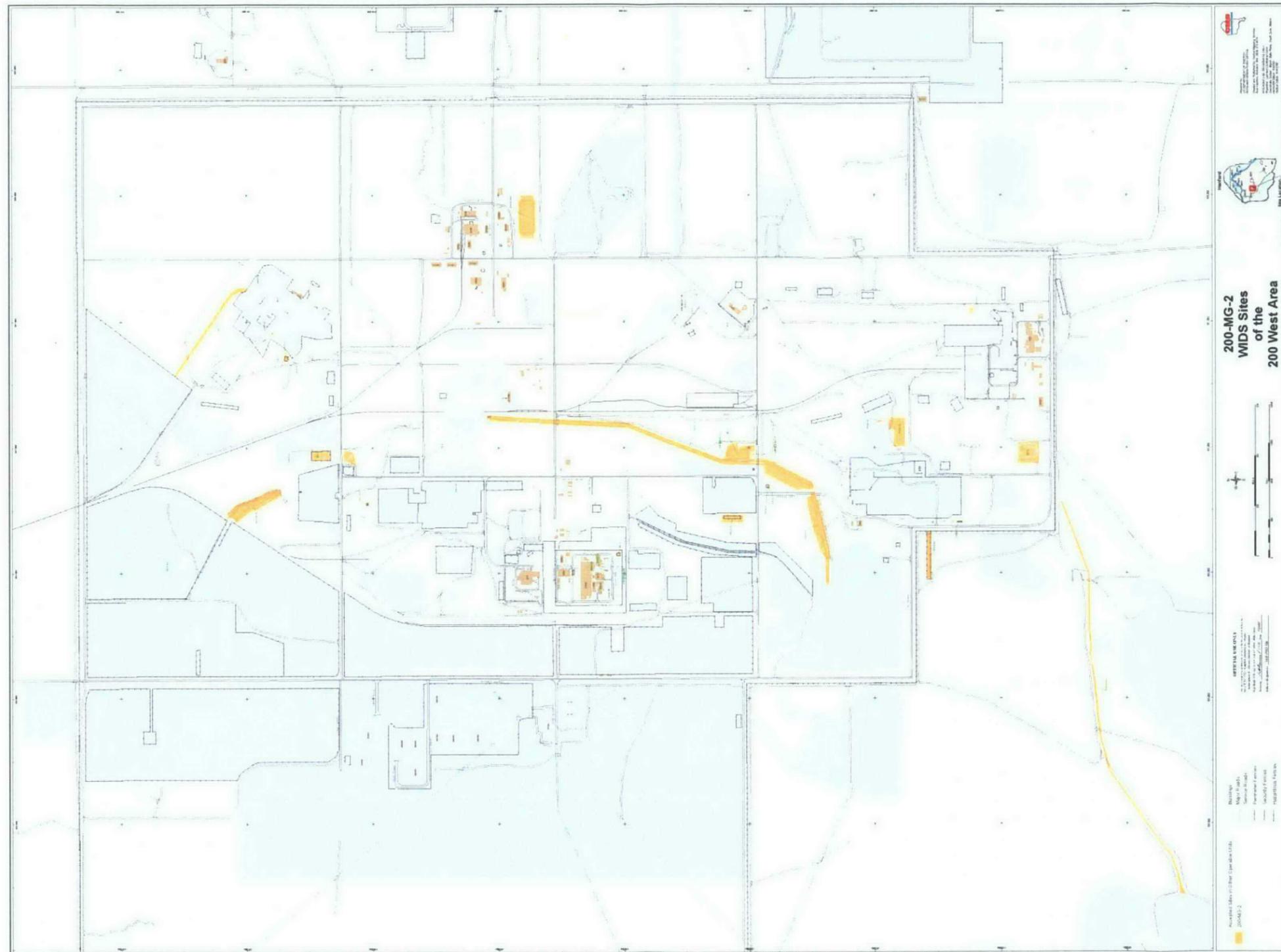
Figure 1-2. 200-MG-2 Operable Unit Waste Sites – 200 East Area.



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Figure 1-3. 200-MG-2 Operable Unit Waste Sites – 200 West Area.



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1.2 REPORT ORGANIZATION

This document is organized into seven chapters as indicated below.

- Chapter 1.0, Introduction. Provides an introduction, purpose, scope, background information on 200 Area characteristics, waste site history, and overall removal action approach.
- Chapter 2.0, Site Characterization. Provides an overview of the waste sites, the waste site profiles, the waste sources, the nature and extent of contamination, and risk evaluation.
- Chapter 3.0, Removal Action Objectives (RAO) and PRCLs. Provides the removal action scope and purpose, justification for the proposed action, and PRCLs.
- Chapter 4.0, Discussion of Alternatives. Provides a description of the alternatives.
- Chapter 5.0, Analysis of Alternatives. Provides the individual analysis of alternatives, comparative analysis of alternatives and preferred removal actions.
- Chapter 6.0, Conclusions and Recommended Alternatives. Provides the summary of preferred removal actions and the removal action contingency plans.
- Chapter 7.0, References.

In addition, three appendices support these analyses.

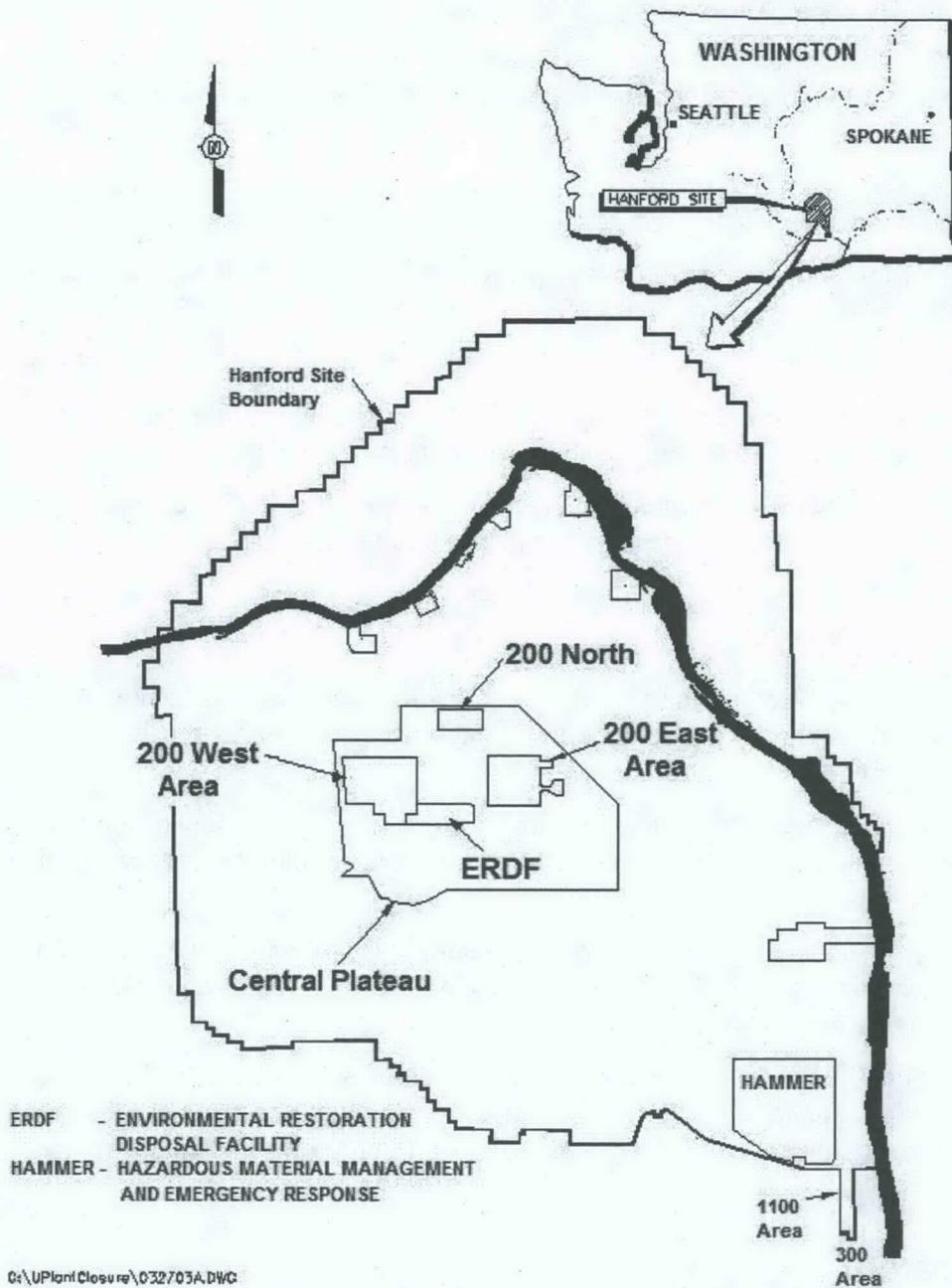
- Appendix A, Waste Site Summary. Includes brief summaries of waste sites and their characteristics with photos and schematics of each site. References for the information are included for each waste site.
- Appendix B, Waste Site Attributes. Provides a comparative overview of the waste site information in a tabular summary form that was used in developing the preferred site removal actions.
- Appendix C, Applicable or Relevant and Appropriate Requirements (ARAR). Includes description of the chemical-, location-, and action-specific ARARs and to-be-considered (TBC) advisories for the OU.

A separate document (SGW-38475, *Cost Estimate for the 200-MG-2 Operable Unit Engineering Evaluation/Cost Analysis Removal Actions*) includes cost estimates and summary tables of primary cost components for each site, with summaries of assumptions and waste site parameters.

1.3 BACKGROUND

The Hanford Site encompasses approximately 1,517 km² (586 mi²) in the Columbia River Basin of south-central Washington state (Figure 1-4). In 1989, the EPA placed the 100, 200, 300, and 1100 Areas of the Hanford Site on the National Priorities List (40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," Appendix B, "National Priorities List"). The 200 Area NPL site contains the 200 East and 200 West Areas, which include waste management facilities and inactive irradiated fuel-reprocessing facilities, and the 200 North Area (Figure 1-4), formerly used for interim storage and staging of irradiated fuel.

Figure 1-4. Location of the Hanford Site in Washington State.



1
2

1 The 200-MG-2 OU consists of 81 waste sites according to Appendix C of Ecology et al., 1989b,
2 *Hanford Federal Facility Agreement and Consent Order Action Plan* (Tri-Party Agreement
3 Action Plan). The list of sites in Appendix C has been updated, bringing the current total to
4 70 sites as a result of OU transfers and reclassification of accepted waste sites. Of the 81 sites
5 originally designated for the 200-MG-2 OU, 8 have been identified for transfers to other OUs
6 through Ecology et al., 1989a, *Hanford Federal Facility Agreement and Consent Order*
7 (Tri-Party Agreement) change requests, and 3 sites were identified for removal from
8 Appendix C. A waste-site tracking record (SGW-38577, *200-MG-1 and 200-MG-2 Operable*
9 *Units Waste Sites Tracking Record*) has been included in the Administrative Record to facilitate
10 assignment tracking of the 200-MG-2 OU waste sites.

11 The 200-MG-2 OU waste sites evaluated in this EE/CA are listed in Table 1-1. These waste sites
12 contain shallow contamination or contamination that can feasibly be removed with a non-time-
13 critical removal action. The DOE and EPA agreed that decision making is straight forward and
14 that supplemental data are not required before selecting a cleanup alternative. These sites are
15 likely candidates for at least one of the following removal actions described in this EE/CA:

- 16 • No action (NA)
- 17 • Maintain existing soil cover/institutional controls/monitored natural attenuation
18 (MESC/IC/MNA)
- 19 • Confirmatory sampling/no action (CS/NA)
- 20 • Removal, treatment, and disposal (RTD).

21 These alternatives are discussed further in Section 1.5.1 and in Chapter 4.0.

22 The waste sites include injection/reverse wells, french drains, trenches, cribs, ditches, and
23 retention basins. This OU also includes a few sites where chemical and radioactive contaminants
24 were released as the result of leaks or spills (i.e., unplanned release [UPR] sites). The
25 200-MG-2 OU waste sites generally have shallow, low-level radiological and/or chemical
26 contamination and small waste volumes. In this EE/CA, the word "contamination" means the
27 expected or known presence of at least one contaminant of potential concern (COPC), developed
28 in Section 0, at a concentration that is greater than its PRCL. The terms "contaminant" and
29 "COPC" are used interchangeably within this document.

30 Previous partial cleanup actions, including placement of clean soil interim stabilization covers,
31 have been implemented at some of the sites. However, because these sites are considered low
32 risk, little remedial investigation has been performed. Thus, one of the aspects of the 200-MG-2
33 OU sites is the general absence of information about site characteristics, including the nature and
34 extent of contamination.

35 All of the waste sites are located within the Core Area (previously identified as Core Zone
36 boundary).⁷ The borders of the Area around the 200 Areas are shown in Figure 1-1.

⁷ The application of the Core Zone boundary is defined in DOE/RL-2005-57, *Hanford Site End State Vision*.

Table 1-1. 200-MG-2 Operable Unit Waste Sites Evaluated in the Engineering Evaluation/Cost Analysis. (2 Pages)

Waste Site Code	Waste Site Type	Waste Site Code	Waste Site Type	Waste Site Code	Waste Site Type
200-E-4	French Drain	216-A-11	French Drain	216-T-12	Trench
200-E-25	French Drain	216-A-12	French Drain	216-T-13	Trench
200-E-55	French Drain	216-A-13	French Drain	216-T-29	French Drain
200-E-65	Injection/ Reverse Well	216-A-14	French Drain	216-T-31	French Drain
200-E-67	Injection/ Reverse Well	216-A-22	Crib	216-T-33	Crib
200-E-68	Injection/ Reverse Well	216-A-26	French Drain	216-T-4-1D	Ditch
200-E-70	Injection/ Reverse Well	216-A-26A	French Drain	216-T-4-2	Ditch
200-E-71	Injection/ Reverse Well	216-A-32	Crib	216-T-9	Trench
200-E-73	Injection/ Reverse Well	216-A-33	French Drain	216-U-3	French Drain
200-E-74	Injection/ Reverse Well	216-A-35	French Drain	216-U-7	French Drain
200-E-77	Injection/ Reverse Well	216-A-38-1	Crib	216-U-13	Trench
200-E-79	Injection/ Reverse Well	216-A-41	Crib	216-U-14	Ditch
200-E-84	Injection/ Reverse Well	216-B-13	French Drain	216-W-LWC	Crib
200-W-107	Injection/ Reverse Well	216-B-51	French Drain	216-Z-13	French Drain
200-W-108	Injection/ Reverse Well	216-C-4	Crib	216-Z-14	French Drain
200-W-109	Injection/ Reverse Well	216-S-12	Trench	216-Z-15	French Drain
200-W-111	Injection/ Reverse Well	216-S-16D	Ditch	2704-C-WS-1	French Drain
200-W-118	Injection/ Reverse Well	216-S-18	Trench	UPR-200-E-9	Unplanned Release
207-A-NORTH	Retention Basin	216-S-25	Crib	UPR-200-E-17	Unplanned Release
207-S	Retention Basin	216-SX-2	Crib	UPR-200-W-103	Unplanned Release
207-T	Retention Basin	216-T-1	Ditch	UPR-200-W-111	Unplanned Release
207-U	Retention Basin	216-T-10	Trench	UPR-200-W-112	Unplanned Release

Table 1-1. 200-MG-2 Operable Unit Waste Sites Evaluated in the Engineering Evaluation/Cost Analysis. (2 Pages)

Waste Site Code	Waste Site Type	Waste Site Code	Waste Site Type	Waste Site Code	Waste Site Type
207-Z	Retention Basin	216-T-11	Trench	UPR-200-W-138	Unplanned Release
209-E-WS-2	French Drain	--	--	--	--

1 1.4 REGULATORY OVERVIEW

2 This section contains an overview of the Hanford Site designation as an NPL site and of the
 3 manner in which CERCLA applies to these waste sites for the 200-MG-2 OU removal action.
 4 This section also summarizes regulatory and public involvement requirements.

5 The waste sites contained in the 200-MG-2 OU are all on the 200 Area NPL, one of three
 6 remaining NPL sites at the Hanford Site, and subject to cleanup action under CERCLA. These
 7 waste sites are identified in Appendix C of Ecology et al., 1989b, *Hanford Federal Facility*
 8 *Agreement and Consent Order Action Plan* (Tri-Party Agreement Action Plan), under
 9 200-MG-2 OU as waste sites potentially needing remedial action. The removal actions under
 10 this EE/CA being proposed for these waste sites will not interfere with the final remedial action
 11 decisions as required by 40 CFR 300.415(d), "Removal Action." The cleanup of these waste
 12 sites will consider both CERCLA remedial action and *Resource Conservation and Recovery Act*
 13 *of 1976* (RCRA) corrective action requirements and will be documented in a final Record of
 14 Decision. Activities undertaken for cleanup of these NPL sites are performed in accordance with
 15 the National Contingency Plan (40 CFR 300) and the Tri-Party Agreement.

16 1.4.1 Removal Action Authority

17 40 CFR 300.415(b)(1) and Tri-Party Agreement Action Plan, Section 7.2.4 state that when there
 18 is a threat to public health or welfare of the United States or to the environment, the lead agency
 19 may take any appropriate removal action to abate, prevent, minimize, stabilize, mitigate, or
 20 eliminate the release or the threat of release.

21 This EE/CA was prepared in accordance with CERCLA and 40 CFR 300.415 to satisfy
 22 environmental review requirements for non-time-critical removal actions (DOE/EH-143-9811,
 23 *Non-Time-Critical Removal Actions*). After the public has had an opportunity to comment on the
 24 alternatives and the recommended approach presented in this document, an Action Memorandum
 25 will be issued to authorize the removal action.

26 1.4.2 Regulatory Involvement

27 EPA is the lead regulatory agency for the 200-MG-2 OU. EPA involvement will be in
 28 accordance with the Tri-Party Agreement, to ensure that the selected removal action activity
 29 complies with ARARs, protection of human health and the environment is achieved, and the
 30 removal action is consistent with ongoing or subsequent related remedial actions. Accordingly,

1 EPA concurrence will be sought for the Action Memorandum that will be prepared after this
2 EE/CA process. The RAWP will be approved by the lead regulatory agency.

3 **1.4.3 Stakeholder Involvement**

4 Removal actions taken pursuant to this EE/CA will be conducted in compliance with
5 Ecology et al., 2002, *Hanford Site Tri-Party Agreement Public Involvement Community*
6 *Relations Plan*, and public participation requirements established in 40 CFR 300.415(n),
7 "Community Relations in Removal Actions," and any applicable DOE policies. This EE/CA
8 will undergo a 30-day public comment period. After the public comment period, a written
9 response to significant comments will be provided in accordance with 40 CFR 300.820(a),
10 "Administrative Record File for a Removal Action."

11 **1.5 APPROACH TO REMEDIATION**

12 The remediation approach to the 200-MG-2 OU has in part been determined by the following:

- 13 • Removal action alternatives consistent with the logic behind the creation of this OU
- 14 • Preference for RTD, whenever practicable
- 15 • Extensive use of the observational approach because of limited site information;
16 particularly for non-engineered structures (e.g., spills, UPRs, and windblown
17 contamination) to support rapid changes to the proposed removal action alternatives
- 18 • Procedure for easy addition of new sites to existing remedy (i.e., plug-in approach), as
19 well as assignment of sites to other OUs if the waste sites do not fit the 200-MG-2 OU
20 conceptual model or the removal action alternatives.

21 The 200-MG-2 OU site removal action approach builds on the experience and processes
22 obtained from DOE/RL-94-61, *100-KR-1 Operable Unit Focused Feasibility Study Report*,
23 Appendix N. The methods discussed below are used in this EE/CA and removal action
24 implementation, which is described in more detail in Chapter 6.0.

25 **1.5.1 Removal Action Alternatives**

26 Because the waste sites in this OU are shallow and simple removal efforts would effectively
27 remove the contaminant exposure pathway to human and environmental receptors, the range of
28 alternatives considered is limited. The 200-MG-2 OU removal action alternatives considered in
29 this EE/CA are consistent with the logic behind the creation of this OU, and include NA,
30 MESC/IC/MNA, CS/NA, and RTD. Sites determined to require other alternatives will be
31 identified for transfer to other OUs.

32 The applicability of the removal action alternatives is discussed below.

- 33 • NA. This alternative applies to sites that decision-makers have determined need no
34 further action.
- 35 • MESC/IC/MNA. This alternative may be appropriate for waste sites that contain an
36 existing soil cover and only short-lived radionuclides that do not present an immediate
37 endangerment to human health or the environment and that will attenuate to levels below
38 PRCLs within 150 years.

- 1 • CS/NA. This alternative may be used when empirical data indicate that RTD of the
2 waste site is not required. Confirmatory sampling data will be collected to confirm that
3 contamination is not present at levels above PRCLs, supporting the decision that no
4 action is required.
- 5 • RTD. In this alternative, contamination will be removed, including contamination that
6 may have migrated away from the original site, to levels below the established PRCLs.
7 The PRCLs will be established in the RAWP. Excavated waste will be treated if
8 necessary and disposed of at the Environmental Restoration Disposal Facility (ERDF).
9 RTD waste sites are typically shallow sites where the depth of contamination is not
10 expected to extend more than 4.6 m (15 ft) nominally below ground surface (bgs). This
11 will include removal of soils, debris and contaminated structures. The depth is not
12 restricted to 4.6 m (15 ft), but that depth will be used as a general guideline for this
13 category. Deeper excavation in certain cases may prove beneficial if it allows removal of
14 contaminants to levels below PRCLs.

15 1.5.2 Plug-in Approach

16 The waste site remedy selection is documented in the Action Memorandum. The “plug-in
17 approach” has been developed to analyze removal alternatives for groups of sites with similar
18 characteristics, designated as the site profile. The Action Memorandum will identify remedies
19 based on the site profiles. If it is determined that a new waste site(s) is sufficiently similar to, or
20 compatible with, a site group for which the alternatives have already been developed and
21 analyzed, then the site will “plug-in” to that group. Confirmatory sampling may be required to
22 determine whether a particular waste site fits the criteria for plug-in. The plug-in approach
23 eliminates the time and cost required to produce multiple, redundant site-specific EE/CAs
24 (DOE/EH-413-9903, *The Plug-In Approach: A Generic Strategy to Expediting Cleanup*).

25 1.5.3 Removal Action Flexibility

26 An RAWP will be used to document preferred removal alternatives for the 200-MG-2 OU waste
27 sites. However, because of the lack of characterization data and variability inherent in the
28 200-MG-2 OU waste site conditions, flexibility is necessary in the waste site remedy selection
29 process. If the preferred removal alternative for a site, developed in Chapter 5.0, is found to be
30 inappropriate during its implementation, then a different removal alternative that is more
31 appropriate to the site conditions will be chosen through consultation with the DOE, Richland
32 Operations Office and the lead regulatory agency. This approach allows alternative remedies to
33 be implemented to best achieve site remediation. The removal action decision-making approach
34 is presented in Section 6.2.

35 1.5.4 Observational Approach

36 The observational approach is a method of planning, designing, and implementing a removal
37 action that uses a limited amount of initial characterization data. Additional information
38 gathered during removal actions will be used to make “real-time” decisions in the field to guide
39 the direction and scope of removal actions, based on contingent planning. The observational
40 approach in removal actions provides the flexibility in the field necessary to adapt the removal
41 action to observed site conditions. Removal actions will proceed until it can be demonstrated

1 through field screening and verification sampling that the PRCLs and appropriate risk levels
2 have been met. This method of streamlining is faster and more cost-effective than traditional
3 approaches that require substantial site characterization and detailed planning before taking
4 removal actions.

5 **1.5.5 Prioritization**

6 The implementation of the preferred removal actions for the 200-MG-2 OU waste sites will be
7 prioritized in the RAWP. This prioritization may be based on several considerations, including
8 the following:

- 9 • Expected contamination depth
- 10 • Proximity of a waste site to other waste sites or structures
- 11 • Ease of access to the waste site
- 12 • Potential integration of waste site removal action with other nearby site remedial actions.

13

2.0 SITE CHARACTERIZATION

This chapter first provides a general background and site description for the 200 Areas of the Hanford Site, including the flora, fauna, climate, geology, and hydrogeology. This is followed by sections on the available waste information and the waste site attributes, which is a compilation of information for the waste sites in the 200-MG-2 OU, including waste site history, physical characteristics (e.g., lateral dimensions and depth) and site types (e.g., french drains, injection/reverse wells, cribs, trenches). The final two sections describe the sources, nature, and extent of contamination, as well as a streamlined risk evaluation.

2.1 BACKGROUND AND SITE DESCRIPTIONS

This section provides general background of the 200 Areas, the sites, flora and fauna, climate, and the geology and hydrogeology of the area.

2.1.1 General Description

The 200 Areas were the center of activity for processing plutonium at the Hanford Site starting in the mid-1940s. Five general plant process groupings exist in the 200 Areas, including fuel processing, plutonium isolation, uranium recovery, cesium/strontium recovery, and waste storage/treatment. Liquid wastes are considered the most significant type of discharge to the environment in terms of volume and numbers of constituents. Detailed information on the historical operations and waste generation mechanisms is provided in DOE/RL-2001-54, *Central Plateau Ecological Evaluation*. Waste site types in the 200-MG-2 OU are discussed in Section 2.3.

2.1.2 Flora and Fauna

The 200 Areas are a mature shrub-steppe ecosystem, dominated by sagebrush and Sandberg's bluegrass. The native shrub-steppe is interspersed with disturbed areas in which the primary vegetation is made up of annual grasses and forbs. Many sites in the 200 Area are covered with gravel or asphalt, or stabilized with non-native wheatgrass (DOE/RL-2001-54). Species of mammals common to the 200 Areas include coyotes, Great Basin pocket mice, northern pocket gophers, and deer mice. The most widely distributed bird species are meadowlarks, horned larks, and mourning doves. Gopher snakes and side-blotched lizards are the main reptiles inhabiting the 200 Area. The most common groups of terrestrial invertebrates in these areas are darkling beetles, grasshoppers, and ants. The Central Plateau Ecological Evaluation (DOE/RL-2001-54) presents a detailed account of the species of the 200 Areas.

2.1.3 Climate

The Hanford Site lies east of the Cascade Mountains and has a semiarid climate caused by the rain shadow effect of the mountains. Climatological data are monitored at the Hanford Meteorological Station and other locations throughout the Hanford Site. From 1945 through 2001, the recorded maximum temperature was 45 °C (113 °F), and the recorded minimum temperature was -30.6 °C (-23 °F) (PNNL-6415, *Hanford Site National Environmental Policy Act (NEPA) Characterization*). The two extremes occurred during August and February,

1 respectively. The monthly average temperature ranged from a low of -0.24°C (31.7°F) in
2 January to a high of 24.6°C (76.3°F) in July. The annual average relative humidity is 54 percent
3 (PNNL-6415).

4 Most precipitation occurs during late autumn and winter, with more than half of the annual
5 amount occurring from November through February (PNNL-6415). Normal annual precipitation
6 is 17.7 cm (6.98 in.). Because it typically receives less than 25.5 cm (10 in.) of precipitation a
7 year, the climate is considered to be semiarid (PNNL-6415).

8 The prevailing wind direction at the Hanford Monitoring Station is from the northwest during all
9 months of the year (PNNL-6415). Monthly average wind speeds are lowest during the winter
10 months and average about 3 m/s (6 to 7 mi/h). The highest average wind occurs during the
11 summer and is about 4 m/s (8 to 9 mi/h). The record wind gust was 35.7 m/s (80 mi/h) in 1972
12 (DOE/RL-2007-50, *Central Plateau Terrestrial Ecological Risk Assessment Report*).

13 2.1.4 Geology and Hydrogeology

14 The average depth from ground surface to groundwater beneath the 200 Areas ranges from 50 m
15 (164 ft) to greater than 100 m (328 ft). Additional details on the geology and hydrogeology
16 underlying the 200 Areas and the 200-MG-2 OU are not provided in this EE/CA because the OU
17 waste sites do not have the potential to impact groundwater or the deep vadose zone. In addition,
18 the geological and hydrological conditions that exist beneath the 200 Areas are well understood
19 and are described in a number of technical documents, some of which are included as references
20 to this EE/CA (WHC-SD-ER-TI-003, *Geology and Hydrology of the Hanford Site - A*
21 *Standardized Text for use in WHC Documents & Reports*; PNNL-14187, *Hanford Site*
22 *Groundwater Monitoring for Fiscal Year 2002*; PNNL-13641, *Uncertainty Analysis*
23 *Framework - Hanford Site-Wide Groundwater Flow and Transport Model*; PNNL-13116,
24 *Hanford Site Groundwater Monitoring for Fiscal Year 1999*; PNNL-6415, *Hanford Site*
25 *National Environmental Policy Act (NEPA) Characterization*; PNL-5506, *Hanford Site Water*
26 *Table Changes 1950 Through 1980, Data Observations and Evaluation*; and Lindsey, 1996, *The*
27 *Miocene to Pliocene Ringold Formation and Associated Deposits of the Ancestral Columbia*
28 *River System, South-Central Washington and North-Central Oregon*).

29 DOE, EPA and the Washington State Department of Ecology (Ecology) created the
30 200-MG-2 OU through Tri-Party Agreement Milestone M-015-06-02 and Tri-Party Agreement
31 Change Request C-06-02. The 200-MG-2 OU waste sites have shallow vadose zone (4.6 m [15
32 ft bgs]) contamination and are not considered a threat to groundwater quality. Sites with the
33 potential for groundwater impacts probably would not be considered Model Group 1 sites. If
34 confirmation sampling or the observational approach shows that a site is more than a shallow
35 contamination problem, the site will be reevaluated and other alternatives considered.

36 The radionuclide inventory for this conceptual model group does not include transuranic isotopes
37 at or near 100 nCi/g. Examples of 200-MG-2 waste sites are unplanned releases, shallow
38 releases or leaks, and contamination spread by burrowing wildlife.

39 2.2 AVAILABLE WASTE SITE INFORMATION

40 The *Waste Information Data System* database was the primary source of site information for the
41 200-MG-2 OU. Because the waste sites comprising the 200-MG-2 OU previously had been part

1 of other OUs, certain data-gathering activities and evaluations already had been completed in
2 conjunction with the prior OU activities for a few of the waste sites. Detailed waste site
3 information is presented in Appendices A and B.

- 4 • Appendix A contains an information brief for each waste site, including the site history,
5 its known or estimated dimensions and depth, and assumptions concerning potential
6 contaminants and their distribution. References for the information also are provided.
7 Engineering diagrams, if available, are included in each brief where a structure is a
8 component of the waste site. The briefs also contain current site photographs for many of
9 the sites. The preferred remedy and estimated cost for the remedy also is shown for each
10 waste site.
- 11 • Appendix B includes a large waste site summary table identifying primary attributes of
12 the waste sites, organized by waste site type. These attributes were used in selecting
13 preferred removal actions. This table permits a direct comparison of all similar waste
14 sites, including their physical features, waste release mechanisms, potential contaminant
15 types (i.e., radiological or nonradiological), and potential contaminant depth.

16 Characterization data that include laboratory analytical results are only available for waste sites
17 that were designated as "representative sites" in a previous OU. Only five waste sites in the
18 200-MG-2 OU were previously representative waste sites while assigned to the 200-MW-1 OU
19 (200-E-4 French Drain, 216-T-13 Trench, 216-T-33 Crib, and 216-U-3 French Drain) or the
20 200-CW-5 OU (216-U-14 Ditch) and have been characterized.

21 Little or no characterization data exist for the remainder of the waste sites addressed in this
22 EE/CA. The available information generally is limited to descriptions of the process operations
23 that may have resulted in the release of a radiological or hazardous constituent. Radiological
24 surveys and prior cleanup activities are described for some of the waste sites. Previous cleanup
25 actions include decontamination operations, removal of impacted soils or materials, and/or
26 covering the affected area with clean soil.

27 **2.3 WASTE SITE ATTRIBUTES**

28 The 200-MG-2 OU contains several different types of waste sites as shown in Table 2-1. Site
29 areas range from tens of square feet to acres in size. The majority of the waste sites are relatively
30 small. Generally, the small area waste sites are associated with an engineered structure
31 (e.g., french drain, injection/reverse well, crib) or an UPR of very limited extent. Larger area
32 sites include some retention basins and ditches. Some of the engineered structures that have
33 been in direct contact with a process waste stream (i.e., french drains, reverse wells, cribs, and
34 retention basins) potentially may be contaminated, and include materials such as concrete, steel
35 and wood.

Table 2-1. 200-MG-2 Operable Unit Waste Site Attributes. (4 Pages)

Waste Site Type	Number of Sites	Site Areas (ft ²)	Potential Contaminants	Potential Contaminant Intervals (depth bgs ft) [Number of sites in Interval]	Primary Contaminated Media	Secondary Contaminated Media	Waste Site Characteristics
<i>Waste sites associated with small volume liquid releases (potential contaminant depth – less than 6 ft)</i>							
Unplanned releases	3	Unknown for all sites	Radiological and nonradiological	0-3 [1]; 2-6 [1]; 0-6 [1]	Soil	None	Leaks and spills.
Total	3						
<i>Waste sites associated with small volume liquid releases (potential contaminant depth – less than 15 ft)</i>							
Retention basins	5	550 – 30,261	Radiological and nonradiological	0-8 [1]; 0-15 [2]; 0-15 (spotty) [1]; 7-15 [1]	Concrete	Soil	Concrete basins used to store contaminated effluent temporarily for sampling and analysis before discharge to ditches and ponds.
Unplanned releases	3	150 – 600	Radiological and nonradiological	0-15 [2]; 7-15 [1]	Soil	None or piping	Includes two trenches containing contaminated soil and a pipeline leak.
Total	8						

Table 2-1. 200-MG-2 Operable Unit Waste Site Attributes. (4 Pages)

Waste Site Type	Number of Sites	Site Areas (ft ²)	Potential Contaminants	Potential Contaminant Intervals (depth bgs ft) [Number of sites in Interval]	Primary Contaminated Media	Secondary Contaminated Media	Waste Site Characteristics
<i>Waste sites associated with larger volume waste stream discharges (potential contaminant depth – less than 15 ft)</i>							
Ditches	5	4,401 – 45,444	Primarily radiological	3-6 [1]; 10-15 [1]; 4-15 localized [3]	Soil	None	Includes one representative site from 200-CW-5 OU. Received cooling water waste streams. Contamination may be localized along ditches.
Cribs	3	100 – 2,281.6	Primarily radiological	7-15 [2]; 11-15 [1]	Soil	Piping	Includes one representative site from 200-MW-1 OU. Received condensate and decontamination wastes.
Total	8						

Table 2-1. 200-MG-2 Operable Unit Waste Site Attributes. (4 Pages)

Waste Site Type	Number of Sites	Site Areas (ft ²)	Potential Contaminants	Potential Contaminant Intervals (depth bgs ft) [Number of sites in Interval]	Primary Contaminated Media	Secondary Contaminated Media	Waste Site Characteristics
<i>Waste sites associated with small volume waste stream discharges from an engineered structure (potential contaminant depth – less than 15 ft deep)</i>							
French drains	7	2.5 – 91; one site has unknown area	Radiological or nonradiological	0-15 [2]; 9-10 [1]; 3-6 [1]; 12-15 [1]; 8-9 [1]; 13-15 [1]	Rock or gravel-filled conduit or concrete casing	Soil	Includes two representative sites from 200-MW-1 OU. Primarily received steam condensate.
Trenches	7	150 – 2,000	Radiological or nonradiological	0-15 [2]; 7-10 [2]; 10-11 [1]; 0-11 [1]; 10-15 [1]	Soil	None	Includes one representative site from 200-MW-1 OU. Generally received miscellaneous liquid effluents; consisting of decontamination waste; some received contaminated soil or sludge.
Injection/ reverse wells	15	3.1 – 12.6	Low potential for radiological or nonradiological contaminants	3-4 [4]; 4-5 [4]; unknown [7]	Rock or gravel-filled concrete casing	Soil	Generally received steam condensate; some received storm water.
Total	29						

Table 2-1. 200-MG-2 Operable Unit Waste Site Attributes. (4 Pages)

Waste Site Type	Number of Sites	Site Areas (ft ²)	Potential Contaminants	Potential Contaminant Intervals (depth bgs ft) [Number of sites in Interval]	Primary Contaminated Media	Secondary Contaminated Media	Waste Site Characteristics
<i>Waste sites associated with small volume waste stream discharges from an engineered structure (potential contaminant depth – greater than 15 ft deep)</i>							
Trench	1	14,000	Radiological and/or nonradiological	18-19 [1]	Soil	None	Site consists of two pits used to decontaminate equipment from the uranium recovery operation.
French drains	15	6.8 – 112	Radiological and/or nonradiological	3-18 [1]; 9-17 [2]; 0-20 [1]; 16-20 [3]; 17-25 [1]; 20-25 [1]; 20-30 [2]; 23-25 [1]; 27-28 [1]; 30-35 [1]; 30-40 [1]	Generally concrete or tile casing with gravel drainage material	Soil	Generally received steam condensate or floor and sink drainage.
Total	16						
<i>Waste sites associated with larger volume waste stream discharges (potential contaminant depth – greater than 15 ft)</i>							
Cribs	6	16 – 19,951	Primarily radiological	10-20 [1]; 12-20 [1]; 16-20 [1]; 16-25 [1]; 19-30 [1]; 37-38 [1]	Soil, crib fill material	Discharge piping	Received various waste streams including process wastes, steam condensate, laundry wastewater, equipment decontamination water, and floor drainage.
Total	6						

bgs = below ground surface.
 OU = operable unit.

2-7

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1 A few of the waste sites have previously had contaminated soil removed, and/or placement of a
2 0.3 to 0.6 m (1- to 2-ft) thick soil stabilization cover over the site. Soil stabilization covers are
3 used to prevent or minimize the uncontrolled spreading of contamination. Those waste sites with
4 a soil stabilization cover are noted in Appendices A and B. Approximately 40 percent of the
5 200-MG-2 OU waste sites have soil stabilization covers.

6 **2.4 SOURCES, NATURE, AND EXTENT OF** 7 **CONTAMINATION**

8 This section includes a summary of the information on the existing waste sites and the process
9 that was used to select the COPCs.

10 **2.4.1 Site Information**

11 There is little information on the depths of contamination of in the 200-MG-2 OU waste sites.
12 This information, however, is needed to estimate the removal action costs. To fill this data gap,
13 the contaminant depth for each site was estimated based on the following considerations.

- 14 • The known or estimated volume of a release. The volume of waste released is not known
15 with a high degree of certainty for many of the waste sites. For those waste sites where a
16 leak or spill occurred, the amount of material released generally was estimated to be
17 relatively small. For those waste sites involving the discharge of process waste streams,
18 such as cribs and ditches, the effluent volumes may have been large. Effluent discharge
19 volume data for engineered liquid disposal waste sites, if available, are summarized in
20 RPP-26744, *Hanford Soil Inventory Model, Rev. 1*). Larger volume releases may result
21 in deeper vertical migration into the soil column.
- 22 • Depth at the point of release. Waste sites in this OU are the result of either surface or
23 subsurface liquid discharges. Process waste streams, such as cooling water, were
24 discharged at the surface into ditches, trenches, and retention basins. Reverse wells,
25 cribs, and certain french drains were designed to discharge liquids into the subsurface and
26 also may have resulted in vertical contaminant extent deeper than 4.6 m (15 ft).
- 27 • Mobility of the potential contaminants associated with the release. Available information
28 concerning the process waste streams indicates that the primary contaminants released at
29 the waste sites in this OU have low to moderate mobility.

30 The estimated contaminant depths and potential contaminants at each waste site are presented in
31 Appendices A and B. A summary of this assessment and other site attributes also is provided in
32 Table 2-1. The waste sites in Table 2-1 were grouped into three potential depth categories: less
33 than 1.8 m (6 ft), less than 4.6 m (15 ft), and deeper than 4.6 m (15 ft). The conceptual
34 contaminant distribution model for the 200-MG-2 OU is shallow contamination with no potential
35 for impact to groundwater. Nevertheless, waste sites may be encountered during removal actions
36 that do not fit the conceptual model (i.e., sites with contamination greater than 4.6 m [15 ft]).
37 These sites will be dispositioned in accordance with the process described in Section 6.2.

38 The lateral extent of potential contamination for waste sites that received liquid discharges was
39 estimated by considering the portion of the site that was in direct contact with the liquid, yielding
40 contaminated soil volume estimates for the cost analyses.

2.4.2 Selection of Contaminants of Potential Concern

The 200-MG-2 OU waste sites consist of a variety of source types. The limited empirical data available on the 200-MG-2 OU waste sites is a hindrance to the development of a list of COPCs. Because these waste sites originate from many different waste-generating processes and release mechanisms, potential risk-driver contaminants were selected by a Central Plateau site-wide information query from the *Hanford Environmental Information System* database.

The query searched several different types of data held in the *Hanford Environmental Information System* database. The maximum detected concentrations were obtained for constituents in soil samples taken from wells, boreholes, and waste sites within the boundaries of the Central Plateau as shown in Figure 2-1.

Initially, 332 constituents were identified and the maximum detected value of each constituent was compared to human health and ecological screening values. Method C of Ecology's Ecology Cleanup Levels and Risk Calculation table and radiation soil preliminary cleanup levels (DOE/RL-2006-50, *200-UR-1 Unplanned Release Waste Group Operable Unit Sampling and Analysis Plan*, Table 3) were used for human health screening. WAC 173-340-900, "Tables," Table 749-3 and radiation biological concentration guides were used for ecological screening. The resulting COPC lists are provided in Tables 2-2 and 2-3.

To ensure an effective means for detecting and reporting constituents that may not be identified as COPCs, a "method-based" approach will be used for reporting analytical results. This approach will yield concentrations for the COPCs as well as other constituents included in the laboratory analytical method lists.

2.5 STREAMLINED RISK EVALUATION

An exposure pathway is the physical course that a COPC takes from the point of release to a receptor. The route of exposure is the means by which a COPC enters a receptor. For an exposure pathway to be complete, all of the following components must be present:

- Source
- Mechanism of chemical release and transport
- Environmental transport medium
- Exposure point
- Exposure route
- Receptor or exposed population.

In the absence of any one of these components, an exposure pathway is considered incomplete and, therefore, creates no risk or hazard. This section examines the potential site contaminant release mechanisms, potentially complete human-exposure pathways and receptors, potentially complete ecological exposure pathways, and the potential threats.

Figure 2-1. Boundary of Central Plateau Information Query.



2-10

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Table 2-2. Nonradionuclide Contaminants of Potential Concern

Contaminants of Potential Concern	
Antimony	Molybdenum
Aroclor-1254	Nickel
Aroclor-1260	Selenium
Arsenic	Thallium
Barium	Total petroleum hydrocarbons (diesel range)
Chromium	Total petroleum hydrocarbons (kerosene range)
Copper	Uranium
Lead	Vanadium
Mercury	Zinc

1

Table 2-3. Radionuclide Contaminants of Potential Concern

Contaminants of Potential Concern	
Americium-241	Plutonium-239/240
Cesium-137	Strontium-90
Europium-152	Uranium-233/234
Europium-154	Uranium-235
Europium-155	Uranium-238
Plutonium-238	--

2 2.5.1 Release Mechanisms

3 The primary release mechanisms for the 200-MG-2 OU waste sites include the following:

- 4 • Discharge of liquid effluent waste streams to cribs, injection/reverse wells, french drains,
5 trenches, ditches, and retention basins
- 6 • Unplanned release of liquid waste streams to shallow zone soils

7 As discussed in Section 2.1.4, the 200-MG-2 OU waste sites have contamination in the shallow
8 vadose zone and are not considered a threat to groundwater quality.

9 2.5.2 Potentially Complete Human Exposure 10 Pathways and Receptors

11 The future land use of the Central Plateau is described in DOE/EIS-0222-F, *Final Hanford*
12 *Comprehensive Land-Use Plan Environmental Impact Statement*. Based on DOE/EIS-0222-F
13 and the associated 64 FR 61615, "Record of Decision: Hanford Comprehensive Land-Use Plan

1 Environmental Impact Statement (HCP EIS),” the Central Plateau, which includes the 200 Areas,
2 land use is described as industrial-exclusive, which is defined as “preserving DOE control of the
3 continuing remediation activities and use of the existing compatible infrastructure required to
4 support activities such as dangerous waste, radioactive waste, and mixed waste treatment,
5 storage, and disposal facilities” (DOE/EIS-0222-F). All 200-MG-2 OU waste sites are located
6 within this industrial-exclusive boundary. The most plausible exposure pathways are considered
7 for characterizing human health risks. An industrial worker will be used to calculate PRCLs
8 inside the industrial-exclusive boundary.

9 The potential human health exposure pathways are:

- 10 • Inhalations of dust or particulates
- 11 • Ingestion of soil
- 12 • Dermal contact
- 13 • External radiation exposure

14 **2.5.3 Potentially Complete Ecological Exposure** 15 **Pathways**

16 The most plausible potential ecological exposure pathways for the 200-MG-2 OU waste sites
17 stem from direct contact with shallow zone soil that contains suitable habitat for terrestrial
18 wildlife.

19 Ecological PRCLs that are protective of terrestrial ecological receptors are being established for
20 use on 200 Areas waste sites. The ecological cleanup levels will be directly applicable to the
21 200-MG-2 OU waste sites.

22 **2.5.4 Potential Threats**

23 If action is delayed or not taken, waste site contaminants will continue to migrate in the
24 environment. Severe weather and vegetation growth can result in further environmental
25 contamination. This may cause a threat to worker health and the environment through ingestion
26 and inhalation of particles, and direct exposure, and to the public through inhalation of airborne
27 contaminants. Subsurface liquids may continue to migrate. Areas that have been cleaned up
28 may become recontaminated with the release of contaminants from these waste sites. The
29 potential for worker, public, and environmental exposures as well as removal costs increases
30 with continued distribution of contamination in the environment over time.

31 **2.6 RISK EVALUATION AND SITE** 32 **CONDITIONS THAT JUSTIFY A REMOVAL** 33 **ACTION**

34 The DOE has determined that the 200-MG-2 OU waste sites contain the potential for release of
35 CERCLA hazardous substances, and that a non-time-critical removal action, pursuant to
36 authority delegated under Executive Order 12580, *Superfund Implementation*, and the Tri-Party
37 Agreement Action Plan, Section 7.2.4, is warranted to mitigate the threat of release.

38
39

3.0 REMOVAL ACTION OBJECTIVES AND PRELIMINARY REMOVAL CLEANUP LEVELS

This chapter discusses the RAOs and PRCLs to be attained by the removal actions for the 200-MG-2 OU. The development of the RAOs and PRCLs identified in this EE/CA are consistent with preliminary CERCLA remedial investigation/feasibility study processes for the 200-MG-2 OU and for the other 200 Area OUs.

3.1 REMOVAL ACTION OBJECTIVES

RAOs provide a basis for evaluating specific removal alternatives to achieve compliance with potential ARARs (specified in Appendix C) and PRCLs, to the extent practicable. Based on previous remedial action objectives developed for the 200 Area OUs, the RAOs for this EE/CA are listed below.

- RAO 1. Prevent unacceptable risk to human health and ecological receptors from exposure to soils and/or debris contaminated with nonradiological constituents at concentrations above the appropriate land-use criteria.
- RAO 2. Prevent unacceptable risk to human health and ecological receptors from exposure to soils and/or debris contaminated with radiological constituents at concentrations above the appropriate land-use criteria.
- RAO 3. Prevent adverse impacts to cultural resources and threatened or endangered species, and minimize wildlife habitat disruption.

Achieving these RAOs can be accomplished by reducing concentrations (or activities) of contaminants to PRCLs or by eliminating potential exposure pathways/routes. The DOE will excavate to the depth of unimpacted soil for waste sites within the Core Area, to the extent practicable. This will initially be demonstrated using field instruments that detect beta- or gamma-ionizing radiation. The target excavation depth will be achieved when field radiological surveys show that residual radioactivity approximates non-impacted soil conditions. If this is judged not feasible for the site, DOE will, to the maximum extent practicable, complete the removal action in a manner consistent with the anticipated final remedial action by comparison of site COPC concentrations to PRCLs.

Verification sampling and analysis will be performed to assist in closing out the removal action at individual sites. Protection of human health and the environment is met when risks from residual contamination are within the CERCLA 10^{-6} to 10^{-4} excess lifetime cancer risk range or when the hazard index is less than 1.0 for noncarcinogenic effects (EPA, 1991, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, OSWER Directive 9355.0-30).

3.2 PRELIMINARY REMOVAL CLEANUP LEVELS

The conceptual site model in this EE/CA consists of sites with a shallow contamination profile that do not pose a risk to groundwater. PRCLs for the waste sites identified in this EE/CA will be developed and documented in the RAWP. These PRCLs will be based on attainment of acceptable levels of human health and ecological risk for waste sites within the Core Area to the

1 extent practicable. The PRCLs for waste sites inside the Core Area boundary are based on
2 industrial land-use and protection of wildlife. All the 200-MG-2 OU waste sites are in the Core
3 Area.

4 However, if sites are encountered with deeper contamination and are not transferred to another
5 OU, then groundwater PRCLs may be developed through site-specific modeling or other
6 methods (e.g., leachability testing). If DOE and EPA agrees that those cleanup levels apply to a
7 site and will result in residual contamination levels that do not pose an unacceptable threat to
8 groundwater for 1,000 years, then those levels will be adopted and documented in the RAWP.

9 Attainment of the PRCLs is intended to meet the RAOs identified in Section 3.1 and are
10 expected also to satisfy the remedial action objectives established in a final Record of Decision.

11

4.0 DISCUSSION OF ALTERNATIVES

A summary of each of the four removal action alternatives for the 200-MG-2 OU waste sites is provided below. The alternatives are discussed in general terms as they will be applied to the 200-MG-2 OU waste sites.

4.1 NO-ACTION ALTERNATIVE

The NA alternative is required by CERCLA as a baseline for comparison with other removal action alternatives. In the NA alternative, no legal restrictions, institutional controls (IC), or active measures are applied to the waste site. The NA alternative implies allowing the wastes to remain in the current configuration, thus being affected only by natural processes. No maintenance or other activities will be instituted or continued. Selecting the NA alternative will require that a waste site pose no unacceptable threat to human health or the environment.

4.2 MAINTAIN EXISTING SOIL COVER/INSTITUTIONAL CONTROLS/MONITORED NATURAL ATTENUATION ALTERNATIVE

Under the MESC/IC/MNA alternative, the existing soil cover on a waste site is maintained and/or augmented as needed to provide protection from intrusion by biological receptors, along with ICs (e.g., deed restrictions, excavation permits) and physical barriers (e.g., fencing) that will mitigate contaminant exposure. Appendices A and B identify waste sites that have soil covers (i.e., soil stabilization covers and clean overburden). With this alternative, radioactive contaminants remaining at the site are allowed to decay in place (i.e., to attenuate naturally), thereby reducing risk until PRCLs are met. This alternative will be considered for waste sites that meet the following conditions.

- A soil cover exists on the site.
- Contaminant concentrations will attenuate to below PRCLs within 150 years.
- Contaminants do not have a pathway to receptors within 150 years.
- Cost for this alternative is lower than the other alternatives and is still protective of human health and the environment.

DOE/RL-2001-41, *Sitewide Institutional Controls Plan for Hanford CERCLA Response Actions*, describes how the ICs are implemented and maintained and serves as a reference for the selection of ICs in the future. ICs generally include non-engineered restrictions on activities and access to land, groundwater, surface water, waste sites, waste-disposal areas, and other areas or media that contain hazardous substances. This is to minimize the potential for human exposure to the substances. Common types of ICs include procedural restrictions for access, warning notices, permits, easements, deed notifications, leases and contracts, and land-use controls. Waste sites having a thin soil cover may require more stringent ICs (e.g., physical barriers, biological monitoring, removal of deeply rooted plants, and control of deep-burrowing animals) to be implemented. The RAWP will specify soil cover thickness requirements. Water- and land-use restrictions also will be used, as necessary, to prevent exposure during the attenuation period.

1 Attenuation relies on natural processes to lower contaminant concentrations until cleanup levels
 2 are met. Monitored natural attenuation includes sampling and/or environmental monitoring,
 3 consistent with EPA/540/R-99/006, *Radiation Risk Assessment at CERCLA Sites: Q&A*,
 4 OSWER 9200.4-31P, to verify that contaminants are attenuating as expected and to ensure that
 5 contaminants remain isolated (e.g., will not be released to air or biota). Monitoring activities
 6 will include surface radiological surveys and/or subsurface radiological logging to verify that
 7 natural attenuation processes are effective. Collection of confirmatory samples and laboratory
 8 analysis is included in this alternative to confirm that the radiological contaminants at the site
 9 will attenuate and meet cleanup criteria within the 150-year timeframe. Sample design
 10 assumptions for cost estimating purposes are described (SGW-38475).

11 **4.3 CONFIRMATORY SAMPLING/NO-ACTION** 12 **ALTERNATIVE**

13 Under the CS/NA alternative, sampling and analysis will be conducted to confirm that COPCs
 14 are not present at concentrations above PRCLs. Radiological surveys will be included in the
 15 initial site investigation as appropriate for site conditions to support the selection of sampling
 16 locations. Direct radiological surveys without additional sampling and analysis also may be used
 17 for verifying that radiological contamination is below PRCLs for waste sites contaminated only
 18 with radionuclides for which the isotopic ratios have been established.

19 This alternative will be considered for waste sites that meet one or more of the following
 20 conditions.

- 21 • Prior cleanup activities have been performed, but insufficient data are currently available
 22 to close out the waste site.
- 23 • COPC concentrations are not expected to exceed PRCLs.
- 24 • The contamination status of the site is uncertain and a strong possibility exists that the
 25 site is not contaminated.

26 **4.4 REMOVAL, TREATMENT, AND DISPOSAL** 27 **ALTERNATIVE**

28 This alternative applies to waste sites that are expected to be contaminated above PRCLs.
 29 Removal activities will include excavation of contaminated soil and structures. This alternative
 30 will be considered for waste sites that meet one or more of the following conditions.

- 31 • Contaminant concentrations are known or expected to exceed PRCLs.
- 32 • Contaminants will not naturally attenuate within 150 years.
- 33 • Removal cost for this alternative is not prohibitive and provides a greater amount of risk
 34 reduction than other alternatives.

35 The cleanup of sites under the RTD alternative will be guided by the observational approach.
 36 The observational approach is a method of planning, designing, and implementing a removal
 37 action that relies on information (e.g., field instrument readings and/or field screening samples)
 38 collected during the removal to guide the direction and scope of the activity. Initial screening
 39 and sampling data are used for an ERDF profile, to assess the extent of contamination and to
 40 make real-time decisions in the field. Following some excavation, the extent of contamination

1 may be further assessed by additional screening and sampling. The extent of removal is then
2 adjusted based on those results. Targeted removals will be conducted under this alternative if
3 contamination is localized in only a portion of a waste site.

4 In this alternative, soils will be removed until the PRCLs are achieved, generally up to a depth of
5 4.6 m (15 ft). For human exposures via soil contact, a depth of 4.6 m (15 ft) is the point of
6 compliance under WAC 173-340-745(7), "Point of Compliance," as it represents a reasonable
7 estimate of the depth of soil that is normally excavated and distributed at the surface as a result
8 of development activities. Direct radiological surveys without additional sampling and analysis
9 may be used for verifying that radiological contamination is below PRCLs for waste sites
10 contaminated only with radionuclides for which the isotopic ratios have been established.

11 In some cases, excavation beyond 4.6 m (15 ft) may be required. These cases include waste sites
12 where removal of an engineered structure is required, or where verification sampling indicates
13 that deeper excavation is required to attain PRCLs. Structures and soil with contaminant
14 concentrations above the PRCLs will be removed using conventional techniques and will be
15 disposed of at ERDF or other approved disposal facility.

16 Pre-verification sampling will be performed to determine depth of contamination if unanticipated
17 contamination above the PRCLs is discovered at greater than 4.6 m (15 ft) bgs. The impacted
18 soils will be removed if sampling indicates that PRCLs can reasonably be achieved through
19 slightly deeper excavation. However, the waste site will be proposed for reassignment to another
20 OU and assessment of other response or removal actions if pre-verification sampling indicates
21 that slightly deeper excavation will not result in attainment of PRCLs. Sites also may be
22 proposed for OU reassignment if removal actions will interfere with remedial actions at
23 nearby sites. Decision inputs will include results of modeling (in accordance with
24 WAC 173-340-747(8) "Alternative Fate and Transport Models"), risk assessment, and regulatory
25 requirements. Criteria will be developed within the RAWP to indicate under which conditions
26 deeper excavation will be required. Exceptional conditions will require consultation with EPA.

27 Some OU waste sites containing structures are known to extend below 4.6 m (15 ft). The
28 removal action cost estimates were calculated recognizing the excavation that is expected.

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5.0 ANALYSIS OF ALTERNATIVES

1
2 CERCLA requires that non-time-critical removal action EE/CA alternatives be evaluated against
3 three criteria: effectiveness, implementability, and cost (EPA, 1993, *Guidance on Conducting*
4 *Non-Time Critical Removal Actions Under CERCLA*, OSWER Directive 9360.0-32). Each
5 removal action alternative is evaluated against the criteria shown in Table 5-1.

Table 5-1. Description of CERCLA Evaluation Criteria.

CERCLA Evaluation Criteria	Description of CERCLA Evaluation Criteria
Effectiveness	The ability to meet the removal objectives within the scope of the removal action and in terms of overall protection of human health and the environment.
Overall protection of human health and the environment	This criterion evaluates whether implementation of an alternative achieves adequate protection of risks to human health and the environment posed by the likely exposure pathways. Reducing the potential threat to acceptable levels is a CERCLA threshold requirement and is the primary objective of the removal action. The evaluation of this criterion is based on qualitative analysis and on assumptions regarding the contaminants present at the waste site.
Compliance with ARARs	Implementation actions for any selected alternative will be designed to comply with ARARs cited in this document, to the extent possible. ARARs are any appropriate standards, criteria, or limitations under any Federal environmental law or more stringent state requirement that must be either met or waived for any hazardous substance, pollutant, or contaminant that will remain on site during or after completion of a removal action. Each alternative is assessed for compliance against these ARARs.
Long-term effectiveness and permanence	The long-term effectiveness and permanence criterion addresses the risk after the removal action is completed. This criterion also refers to the ability of the removal action to maintain reliable long-term protection of human health and the environment after removal action objectives have been met.
Reduction of TMV through treatment	This criterion refers to an evaluation of the anticipated performance of treatment technologies that might be employed in a removal action. The criterion assesses whether a removal action alternative significantly and permanently reduces the TMV of a hazardous substance through treatment. Significant overall reduction can be achieved by destroying toxic contaminants or by reducing total mass, contaminant mobility, or total volume of contaminated media.
Short-term effectiveness	This criterion refers to potential adverse effects on human health and the environment during the removal action implementation phase(s). This criterion also evaluates the speed with which an alternative achieves protection.
Implementability	This criterion addresses the technical and administrative feasibility of implementing the removal action alternative and the availability of the required services and materials.
Cost	This criterion considers the cost of implementing a removal action alternative, including capital costs, operation and maintenance costs, and monitoring costs, to the extent that costs can be quantified. The cost evaluation also includes monitoring of any restoration or mitigation measures for natural, cultural, and historical resources.

ARAR = applicable or relevant and appropriate requirement.

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980.*

TMV = toxicity, mobility, and volume.

1 Specific information on contaminant concentrations is generally not available for the
2 200-MG-2 OU waste sites. In many cases, process knowledge concerning the characteristics of
3 the waste stream released, materials present, or historical radiological hand-held instrument
4 survey results provide the only indication as to whether the site may currently be contaminated.
5 Qualitative information suggests that COPC concentrations are below PRCLs for many of the
6 waste sites; therefore, site conditions are presumed in the absence of quantitative data.

7 Two base assumptions were considered in the alternatives analysis and are repeated as each
8 alternative is evaluated against the criteria in Sections 5.1 and 5.2. The first assumption is that
9 the waste site is assumed to be contaminated (i.e., at least one COPC concentration is greater
10 than its PRCL). The second assumption is that the COPC concentrations are all below PRCLs at
11 a given waste site. The preferred alternative was selected by matching the available site
12 information with the appropriate assumption and CERCLA evaluation criteria. Each of these
13 criteria is further explained in the following sections.

14 **5.1 EFFECTIVENESS**

15 The effectiveness criterion refers to the ability to meet the removal objectives outlined in
16 Chapter 3.0 in terms of overall protection of human health and the environment.

17 **5.1.1 Overall Protection of Human Health and the** 18 **Environment**

19 This criterion was used to evaluate whether implementation of an alternative achieves adequate
20 protection of risks to human health and the environment through the likely exposure pathways.
21 Reducing the potential threat to acceptable levels is a CERCLA threshold requirement and is the
22 primary objective of the removal action. The evaluation of this criterion was based on a
23 qualitative analysis and the current assumptions regarding the contamination status of the
24 200-MG-2 OU waste sites.

25 **NA.** The NA alternative was retained for detailed analysis as a baseline description of the effects
26 of taking no action as required by CERCLA regulations. This alternative cannot be considered
27 for the 200-MG-2 OU waste sites because of the absence of characterization data. Secondly,
28 assuming that COPC concentrations exist above their PRCLs, this alternative does not provide
29 acceptable levels of protection because exposure pathways would remain intact for Hanford Site
30 personnel, the local environment, and/or the public. However, this alternative is provided for
31 comparison to the other alternatives in the analysis even though it is not selected as a removal
32 action alternative.

33 **MESC/IC/MNA.** Under the MESC/IC/MNA alternative, contaminants would remain at the
34 200-MG-2 OU waste sites beneath the existing soil covers to prevent inadvertent human and
35 biological intrusion until contaminant concentrations reach acceptable levels. This alternative
36 relies on natural attenuation (i.e., radioactive decay for radionuclides) to decrease contaminant
37 concentrations to levels protective of human health and the environment. This alternative would
38 be protective if PRCLs can be achieved within 150 years. Maintenance and periodic monitoring
39 would be required for soil covers throughout the attenuation period. Confirmatory sampling is
40 required to determine that attenuation would be achieved within the 150-year timeframe, based
41 on half-lives of the radionuclides at the waste site.

1 CS/NA. The CS/NA alternative would protect human health and the environment if
2 confirmatory sampling and analysis shows contaminant levels below PRCLs and appropriate risk
3 levels are met. This alternative cannot be applied to waste sites when sampling and analysis
4 shows contaminant concentrations above PRCLs because additional actions would not be taken
5 and residual contaminants could lead to unacceptable exposures to human or ecological
6 receptors.

7 RTD. The RTD alternative is protective of long-term human health and the environment
8 because the contaminants are removed from the waste sites. However, this alternative has
9 greater potential to expose workers to contamination and industrial safety hazards than the other
10 alternatives.

11 **5.1.1.1 Contaminant Levels Exceed PRCLs**

12 The RTD alternative is most protective for the 200-MG-2 OU waste sites with contaminant
13 levels above PRCLs, because contaminants are removed and exposure pathways are eliminated.
14 The MESC/IC/MNA alternative is next most protective because exposure pathways are
15 controlled at sites where soil covers exist and contaminants naturally attenuate below PRCLs
16 within 150 years. The CS/NA alternative is not protective for sites where contaminants exceed
17 PRCLs, appropriate risk levels are not met, and because actions would not be taken to control
18 exposure pathways. The NA alternative is least protective of human health and the environment
19 because no action would be taken to confirm exposure risks or control exposure pathways.

20 **5.1.1.2 Contaminant Levels Below PRCLs**

21 Each alternative requires certain actions to determine that the site contaminants are below
22 PRCLs. The CS/NA alternative is most appropriate for 200-MG-2 OU waste sites that have
23 COPCs at levels below PRCLs, because no actions beyond sampling and analysis are needed
24 after the risks are determined. The MESC/IC/MNA alternative is protective, but unnecessary
25 because no contamination is present. Only sampling below the cover soil to confirm
26 contaminant levels would be required. The RTD alternative would be protective, but not
27 necessary because the site poses no risk to human health or the environment. The NA alternative
28 cannot demonstrate protectiveness in the absence of characterization data.

29 **5.1.2 Compliance with Applicable or Relevant and** 30 **Appropriate Requirements**

31 Implementation actions for any selected removal alternative will comply, to the extent
32 practicable, with ARARs. ARARs are environmental regulations that have been evaluated to
33 potentially be pertinent to the removal action. Response actions are required to comply with the
34 substantive aspects of ARARs, not with corresponding administrative requirements. That is,
35 permit applications and other administrative requirements, such as administrative reviews, and
36 reporting and recordkeeping requirements, are considered administrative for actions conducted
37 entirely onsite (40 CFR 300.400[e], "General") and therefore not required. The purpose of this
38 section is to identify the key ARARs proposed for the alternatives addressed in this EE/CA.
39 ARARs, which will be complied with during implementation of the selected removal action, will
40 be documented in the CERCLA Action Memorandum. The proposed ARARs are discussed
41 generally in the following sections and are documented in detail in Appendix C. In addition,
42 TBC information consists of nonpromulgated advisories or guidance issued by Federal or state
43 governments that are not binding legally and do not have the status of potential ARARs. As

1 appropriate, TBCs should be considered in determining the removal action necessary for
2 protection of human health and the environment.

3 **NA.** The NA alternative does not comply with ARARs because no actions would be taken to
4 comply with Federal or state requirements.

5 **MESC/IC/MNA.** The MESC/IC/MNA alternative complies with ARARs for sites that have an
6 existing soil cover and have contaminants that will naturally attenuate to levels below PRCLs
7 within 150 years, or sites with an existing soil cover and current contaminant levels that do not
8 exceed PRCLs because the appropriate risk levels would be met. The alternative does not
9 comply for sites with an existing soil cover where contaminants will not naturally attenuate to
10 levels below PRCLs within this timeframe.

11 **CS/NA.** The CS/NA alternative complies with ARARs for sites where confirmatory sampling
12 verifies that the appropriate risk levels have been met. Sites where confirmatory sampling shows
13 contaminant levels to be above PRCLs and appropriate risk levels have not been met, would not
14 comply because no action would be taken to meet Federal or state requirements.

15 **RTD.** The RTD alternative complies with ARARs for sites where contaminants exceed PRCLs
16 because contaminated soils and structures would be removed from the waste sites and
17 appropriate risk levels would be met. The alternative also would comply for sites where
18 contaminants are below PRCLs.

19 **5.1.2.1 Contaminant Levels Exceed PRCLs**

20 The RTD alternative would comply with ARARs because both radiological and nonradiological
21 contaminated soils would be removed from the waste sites. More potential ARARs would need
22 to be met with this alternative because of excavation, emission control, waste transportation, and
23 waste management action-specific requirements. The MESC/IC/MNA alternative also would
24 comply with ARARs at sites that have an existing soil cover and where contaminants would
25 naturally attenuate to levels below PRCLs within 150 years because the appropriate risk levels
26 would be met. This alternative does not comply with ARARs at sites where natural attenuation
27 is not sufficient to result in contaminant levels that are less than PRCLs within 150 years or
28 where soil covers do not currently exist. The CS/NA alternative does not comply with ARARs
29 for sites where contaminants exceed PRCLs because the appropriate risk levels would not be met
30 and no action would be taken to meet any Federal or state regulations. The NA alternative does
31 not comply with ARARs because no action would be taken to meet any Federal or state
32 regulations.

33 **5.1.2.2 Contaminant Levels Below PRCLs**

34 Each alternative requires certain actions to determine that the site contaminants are below
35 PRCLs. For the MESC/IC/MNA, CS/NA, and RTD alternatives, confirmatory sampling would
36 be used to demonstrate that appropriate risk levels have been met by attaining PRCLs. The NA
37 alternative does not comply with ARARs because no action would be taken to identify risk or
38 meet any Federal or state regulations.

39 **5.1.2.3 Waste Management Standards**

40 A variety of waste streams may be generated under the proposed removal action alternatives. It
41 is anticipated that most of the waste will designate as low-level, dangerous waste, or mixed
42 waste in a solid form and result from implementation of the RTD alternative. Radioactive waste

1 is governed under the authority of the *Atomic Energy Act of 1954*. The identification, storage,
2 treatment, and disposal of hazardous waste and the hazardous component of mixed waste are
3 governed by RCRA. The State of Washington, which implements RCRA requirements under
4 WAC 173-303, "Dangerous Waste Regulations," has been authorized by the EPA to implement
5 most elements of the RCRA program. The dangerous waste standards for generation and storage
6 will apply to the management of any dangerous or mixed waste generated at the 200-MG-2 OU
7 waste sites. Treatment standards for dangerous or mixed waste subject to RCRA land disposal
8 restrictions are specified in WAC 173-303-140, "Land Disposal Restrictions," which
9 incorporates 40 CFR 268, "Land Disposal Restrictions," by reference.

10 Waste that is designated as low-level waste that meets ERDF acceptance criteria (WCH-191,
11 *Environmental Restoration Disposal Facility Waste Acceptance Criteria*) is assumed to be
12 disposed at ERDF, which is engineered to meet appropriate performance standards. Alternate
13 potential disposal locations may be considered when the removal action occurs if a suitable and
14 cost-effective location is identified. Any potential alternate disposal location will be evaluated
15 for appropriate performance standards to ensure that it is adequately protective of human health
16 and the environment.

17 Waste designated as dangerous or mixed waste would be treated as appropriate to meet land
18 disposal restrictions and ERDF acceptance criteria and disposed at ERDF. ERDF is engineered
19 to meet minimum technical requirements for landfills under WAC 173-303-665, "Landfills."
20 Applicable packaging and pre-transportation requirements for dangerous or mixed waste
21 generated at a 200-MG-2 OU waste site would be identified and implemented before movement
22 of any waste.

23 It is anticipated that the MESC/IC/MNA, CS/NA, and RTD alternatives can be performed in
24 compliance with the waste management ARARs. Waste streams will be evaluated, designated,
25 and managed in compliance with the potential ARAR requirements. Before disposal, waste will
26 be managed in a protective manner to prevent releases to the environment or unnecessary
27 exposure to personnel.

28 **5.1.2.4 Standards Controlling Emissions to the Environment**

29 The proposed removal action alternatives have the potential to generate both radioactive and
30 nonradioactive airborne emissions. The RTD alternative would have the greatest potential for
31 generation of airborne emissions.

32 RCW 70.94, "Washington Clean Air Act," requires regulation of radioactive air pollutants. The
33 state implementing regulation WAC 173-480, "Ambient Air Quality Standards and Emission
34 Limits for Radionuclides," sets standards that are as stringent or more so than the Federal *Clean*
35 *Air Act of 1990* and Amendments, and under the Federal implementing regulation, 40 CFR 61,
36 Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon
37 from Department of Energy Facilities." EPA partial delegation of the 40 CFR 61 authority to the
38 State of Washington includes all substantive emissions monitoring, abatement, and reporting
39 aspects of the Federal regulation. The state standards protect the public by conservatively
40 establishing exposure standards applicable to even the maximally exposed public individual, be
41 that individual real or hypothetical. To that end, the standards address any member of the public,
42 at the point of maximum annual air concentration in an unrestricted area where any member of
43 the public may be. All combined radionuclide airborne emissions from the DOE Hanford Site
44 "facility" are not to exceed amounts that would cause an exposure to any member of the public

1 of greater than 10 mrem/yr effective dose equivalent. The state implementing regulation
2 WAC 246-247, "Radiation Protection – Air Emissions," which adopts the WAC 173-480
3 standards and the 40 CFR 61, Subpart H standard, requires verification of compliance with the
4 10 mrem/yr standard, and potentially would be applicable to the removal action.

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

9 The above state implementing regulations further address control of radioactive airborne
10 emissions where economically and technologically feasible (WAC 246-247-040 (3) and -040 (4),
11 "General Standards," and associated definitions). To address the substantive aspect of these
12 potential requirements, best or reasonably achieved control technology could be addressed by
13 ensuring that applicable emission control technologies (those successfully operated in similar
14 applications) would be used when economically and technologically feasible (i.e., based on
15 cost/benefit). If it is determined that there are substantive aspects of the requirement for control
16 of radioactive airborne emissions once ARARs are finalized, then controls will be administered
17 as appropriate using reasonable and effective methods.

18 The MESC/IC/MNA, CS/NA, and RTD alternatives are expected to comply with
19 these standards.

20 **5.1.3 Long-Term Effectiveness and Permanence**

21 The long-term effectiveness and permanence criterion refers to the magnitude of remaining risk
22 and the ability of a remedy to maintain reliable protection of human health and the environment
23 over time, after the removal action alternative has been completed and cleanup goals have been
24 met. The completion of the removal action alternative for MESC/IC/MNA is defined as the end
25 of the attenuation period (up to 150 years) and for RTD it is defined as the day the removal is
26 complete.

27 **NA.** The NA alternative was retained for detailed analysis as a baseline description of the effects
28 of taking no action as required by CERCLA regulations. This alternative cannot be considered
29 for the 200-MG-2 OU waste sites because of the absence of characterization data. Secondly, for
30 contaminated sites the NA alternative does not provide any measure of long-term effectiveness
31 and permanence because no actions would be taken to mitigate risks or maintain long-term
32 protection.

33 **MESC/IC/MNA.** The MESC/IC/MNA alternative achieves long-term effectiveness via natural
34 attenuation and ICs. This alternative does not provide protection for sites without existing soil
35 covers or where contaminants will not attenuate sufficiently to meet PRCLs within 150 years.

36 **CS/NA.** The CS/NA alternative would provide long-term effectiveness and permanence for sites
37 where confirmatory sampling shows contaminant levels do not exceed PRCLs. The alternative
38 would not be effective or provide permanent protection for human health and the environment at
39 sites where confirmatory sampling shows contaminant levels that exceed PRCLs.

40 **RTD.** The RTD alternative provides long-term effectiveness and permanent protection of
41 human health and the environment, because contaminants would be removed from the waste
42 sites and exposure pathways would no longer be present.

1 5.1.3.1 Contaminant Levels Exceed PRCLs

2 The RTD alternative provides the most effective, permanent, long-term protection for human
 3 health and the environment because contaminant removal eliminates exposure pathways. The
 4 MESC/IC/MNA alternative also would be protective for sites where confirmatory sampling
 5 shows contaminants will attenuate to less than PRCLs within 150 years and the existing soil
 6 cover can be maintained during this period. This alternative does not provide effective long-term
 7 protection for sites where PRCLs will be exceeded after 150 years, or where an existing soil
 8 cover is not present. The CS/NA alternative would not provide long-term effectiveness and
 9 permanence because waste site sampling would show PRCLs are exceeded. The NA alternative
 10 is not effective and permanent because no action is taken to identify or eliminate risk.

11 5.1.3.2 Contaminant Levels Below PRCLs

12 Each alternative requires certain actions to determine that the site contaminants are below
 13 PRCLs. The CS/NA alternative is effective and permanent in the long-term for 200-MG-2 OU
 14 waste sites that have contaminant levels that do not exceed PRCLs, because confirmatory
 15 sampling and analysis results provide data indicating no risk is present. The MESC/IC/MNA
 16 and RTD alternatives also would be effective, but unnecessary, because the waste site poses no
 17 unacceptable risk. The NA alternative cannot demonstrate protectiveness in the absence of
 18 characterization data.

19 5.1.4 Reduction of Toxicity, Mobility, or Volume 20 through Treatment

21 This criterion evaluates performance of anticipated treatment technologies in the removal action.
 22 It also assesses the potential reduction of toxicity, mobility, and volume (TMV) of a hazardous
 23 substance through treatment. Reduction characteristics include destruction of toxic
 24 contaminants, mass reduction, immobilization of contaminants, or reduction of the contaminated
 25 media volume.

26 This criterion focuses on the following factors for each alternative:

- 27 • Treatment processes used and the materials treated
- 28 • Recycling, reuse, and/or waste minimization used in a given treatment process
- 29 • Types and quantities of residuals that remain following treatment
- 30 • Possibility that further treatment actions may be needed for residuals
- 31 • Extent to which the alternative satisfies the statutory preference for treatment as a
 32 principal element.

33 **NA.** The NA alternative was retained for detailed analysis as a baseline description of the effects
 34 of taking no action as required by CERCLA regulations. This alternative cannot be considered
 35 for the 200-MG-2 OU waste sites because of the absence of characterization data. Secondly, the
 36 NA alternative does not provide reduction in TMV because no treatment is implemented.

37 **MESC/IC/MNA.** The MESC/IC/MNA alternative does not provide reduction in TMV because
 38 no treatment is implemented at the waste site. No credit is taken for attenuation as a treatment
 39 mechanism.

1 **CS/NA.** The CS/NA alternative does not provide reduction in TMV because no treatment is
2 implemented at the waste site.

3 **RTD.** The RTD alternative does not provide reduction in TMV because no treatment is
4 implemented at the waste site.

5 **5.1.4.1 Contaminant Levels Exceed PRCLs**

6 The NA, MESC/IC/MNA, CS/NA, and RTD alternatives do not provide reduction in TMV
7 because no treatment is implemented at the waste site.

8 **5.1.4.2 Contaminant Levels Below PRCLs**

9 Each alternative requires certain actions to determine that the site contaminants are below
10 PRCLs. The NA, MESC/IC/MNA, CS/NA, and RTD alternatives do not provide reduction in
11 TMV because no treatment is implemented at the waste site.

12 **5.1.5 Short-Term Effectiveness**

13 This criterion refers to potential adverse effects on human health and the environment during the
14 removal action implementation phase(s). The factors are considered for each alternative are
15 listed below.

- 16 • Health and safety of remediation workers and reliability of protective measures taken.
17 Specifically, this involves any risk resulting from implementation, such as fugitive dust,
18 transportation of hazardous materials, or air quality impacts from off-gas emissions.
- 19 • Physical, biological, and cultural impacts that might result from the construction and
20 implementation of the removal action, and whether the impacts can be controlled
21 or mitigated.
- 22 • The amount of time required to meet RAOs.

23 Short-term environmental impacts generally relate to the extent of physical disturbance of a site
24 and its associated habitat. Risks also can be associated with the potential disturbance of sensitive
25 species because of increased human activity in the area.

26 **NA.** The NA alternative was retained for detailed analysis as a baseline description of the effects
27 of taking no action as required by CERCLA regulations. This alternative cannot be considered
28 for the 200-MG-2 OU waste sites because of the absence of characterization data. Secondly, the
29 NA alternative does not apply for this criterion.

30 **MESC/IC/MNA.** The MESC/IC/MNA alternative would have no adverse impact to human
31 health and the environment for sites with an existing soil cover and contaminant levels that do
32 not exceed PRCLs. There is a potential for worker exposure during sampling, monitoring, or
33 maintenance activities over the attenuation period (up to 150 years) if the contaminant levels
34 exceed PRCLs. This alternative would prevent adverse impacts to cultural resources and/or
35 threatened or endangered species, and also would minimize disruption of habitat.

36 **CS/NA.** The CS/NA alternative would have negligible short-term impact to workers for sites
37 where confirmatory sampling shows contaminant levels do not exceed PRCLs. The alternative
38 would pose minimal risk to workers for sites where confirmatory sampling shows contaminant
39 levels exceed the PRCLs during the sampling process.

1 **RTD.** The RTD alternative could result in short-term risks to workers and the environment
2 during the implementation phase if contaminant levels exceed PRCLs. The excavation of
3 contaminated soil would inherently increase the potential for a release to the environment,
4 especially to the air. Adherence to appropriate environmental regulations and use of control
5 technologies would mitigate the potential for releases. Risk would be lower at sites where
6 contaminant levels are below PRCLs and only related to site industrial worker hazards and
7 impacts to the environment associated with site disturbances.

8 **5.1.5.1 Contaminant Levels Exceed PRCLs**

9 The RTD alternative has the greatest potential short-term impacts to human health and the
10 environment during implementation for 200-MG-2 OU waste sites where contaminant levels
11 exceed PRCLs. Potential worker and environmental impacts are associated with excavation,
12 fugitive dust, and transportation of contaminated material. The MESC/IC/MNA alternative
13 would have few adverse effects to human health and the environment for sites with an existing
14 soil cover because direct exposure pathways would be controlled. The CS/NA may have the
15 potential for a short-term impact (through exposure) on workers collecting samples. This
16 alternative would not involve any additional actions that would pose a risk to workers or the
17 environment. The NA alternative does not apply as discussed previously.

18 **5.1.5.2 Contaminant Levels Below PRCLs**

19 Each alternative requires certain actions to determine that the site contaminants are below
20 PRCLs. The CS/NA alternative would have minimal short-term impacts on human health and
21 the environment for waste sites where contaminant levels do not exceed PRCLs, because no
22 exposure pathways will be present and the site disturbance is minimal. The MESC/IC/MNA
23 alternative also would have minor impact to workers or the environment. The RTD alternative
24 would have more short-term risk to human health and the environment than the other alternatives
25 because excavation involves construction worker hazards and more disturbance of the site. The
26 NA alternative does not apply as discussed previously.

27 **5.2 IMPLEMENTABILITY**

28 This criterion addresses the technical and administrative feasibility of implementing the removal
29 action alternative and the availability of the required services and materials.

30 The following factors are considered for each alternative:

- 31 • Technical feasibility:
 - 32 – likelihood of technical difficulties in constructing and operating the alternative
 - 33 – likelihood of delays because of technical problems
 - 34 – uncertainties related to innovative technologies (e.g., failures).
- 35 • Administrative feasibility:
 - 36 – ability to coordinate activities with other offices and agencies
 - 37 – potential for regulatory constraints to develop (e.g., because of uncovering buried
 - 38 cultural resources or encountering endangered species).

1 • Availability of services and materials:

- 2 – availability of adequate onsite or offsite treatment storage capacity, and disposal
3 services, if necessary
- 4 – availability of necessary equipment, specialists, and provisions to ensure obtaining
5 any additional resources, if necessary.

6 **NA.** The NA alternative was retained for detailed analysis as a baseline description of the effects
7 of taking no action as required by CERCLA regulations. This alternative cannot be considered
8 for the 200-MG-2 OU waste sites because of the absence of characterization data. Secondly, the
9 NA alternative would not be feasible, because regulatory constraints would prevent its
10 implementation.

11 **MESC/IC/MNA.** The MESC/IC/MNA alternative is relatively easy to implement, but requires
12 a long-term commitment to monitoring and maintenance of the existing soil cover. The
13 alternative is technically straightforward and would be administratively and technically feasible
14 for sites with an existing soil cover and contaminant levels that would meet PRCLs within
15 150 years.

16 **CS/NA.** The CS/NA alternative is relatively easy to implement for all 200-MG-2 OU waste sites
17 because it is technically and administratively straightforward. The potential for failure or
18 development of new regulatory constraints would be low, because the only activity would be
19 sampling and analysis. The alternative may have technical challenges at sites that require special
20 sampling equipment (e.g., accessing potentially contaminated soils below thick concrete
21 retention basins or below building foundations).

22 **RTD.** The RTD alternative poses the greatest technical and administrative implementation
23 challenge because it requires the most planning, commitment of equipment and personnel, and
24 project coordination. Another important factor that may influence its feasibility is the available
25 treatment and disposal capacity at ERDF.

26 **5.2.1 Contaminant Levels Exceed PRCLs**

27 The CS/NA alternative would be easiest to implement where contamination levels exceed
28 PRCLs, because the only activity would be sampling and analysis, although this alternative
29 would not provide a reduction in the risk posed by a contaminated waste site. The
30 MESC/IC/MNA alternative will be more difficult to implement, because of the long-term nature
31 of the action. On-going administrative coordination would be required to ensure proper
32 maintenance, monitoring, and compliance. The RTD alternative would be the most difficult to
33 implement due to the requirements for planning, equipment and personnel requirements for
34 excavation and demolition activities, and worker safety. Sites with large waste removal volumes
35 could be impacted by disposal capacity at ERDF. The NA alternative is not applicable.

36 **5.2.2 Contaminant Levels Below PRCLs**

37 Each alternative requires certain actions to determine that the site contaminants are below
38 PRCLs. The CS/NA alternative would be easy to implement for waste sites where
39 contamination levels do not exceed PRCLs, because the only activity required would be
40 sampling and analysis. The MESC/IC/MNA alternative also would be easy to implement. Only
41 sampling and analysis would be performed to determine if COPCs would meet attenuation

1 requirements. The RTD alternative would require the greatest commitment of personnel,
2 equipment, and administrative coordination. The NA alternative is not applicable.

3 **5.3 COST**

4 This criterion considers the cost of implementing a removal action alternative, including capital
5 costs, operation and maintenance costs, and monitoring costs, to the extent that costs can be
6 quantified assuming that the site contaminants are above PRCLs. The cost evaluation also
7 includes monitoring of any restoration or mitigation measures for natural, cultural, and
8 historical resources. The costs provide a discriminator for deciding between similar protective
9 and implementable alternatives for a specific site. Therefore, the costs are not absolute costs, but
10 rather relational costs for the evaluation of the alternatives.

11 The cost reference document for this EE/CA (SGW-38475) presents the cost estimates in both
12 2008 nondiscounted and present worth terms. Only the present worth costs are used for
13 comparative purposes in the alternatives analysis. The target accuracy for the cost estimates is
14 -30 percent to +50 percent. The cost estimates were prepared from information available at the
15 time of this study. The actual cost of the project will depend on additional information gained
16 during the removal action phase. While the exact dollar estimates were prepared, present worth
17 estimates in this EE/CA have been rounded to the nearest thousand dollars.

18 The present worth cost for each applicable alternative is estimated for each waste site for
19 comparison between alternatives. The cost shown for a particular alternative only would be
20 applicable if the waste site met all the conditions for its use (Chapter 4.0). In some cases,
21 because of the specific characteristics of a waste site, an alternative and its associated costs
22 would not apply. For example, the cost for MESC/IC/MNA would not apply to waste sites
23 without an existing soil stabilization cover. The CS/NA alternative generally has the lowest cost
24 of the three alternatives that could be implemented (it is assumed that the NA alternative would
25 not be implemented). The RTD alternative is generally higher in cost than CS/NA. The
26 MESC/IC/MNA alternative typically costs more than other alternatives. However, the RTD
27 costs are highly dependent on site size and waste volume. Thus, RTD in some cases may be
28 more expensive than MESC/IC/MNA.

29 **5.4 APPLICATION OF ALTERNATIVE** 30 **SELECTION PROCESS**

31 A summary showing the application of the CERCLA evaluation criteria is presented in
32 Tables 5-2 and 5-3. The two base assumptions considered for each alternative are that
33 contaminant concentrations at the waste site exceed PRCLs and that contaminant concentrations
34 at the waste site do not exceed PRCLs.

35 The preferred alternative selection was based on the CERCLA evaluation criteria and the
36 decision logic shown in Figure 5-1. When comparing and selecting a preferred alternative,
37 present worth cost was used as the final factor in the analysis. Generally, if one alternative
38 offered a greater amount of protection than another for approximately the same cost of
39 implementation, the most protective alternative was selected. The MESC/IC/MNA has a limited
40 application (Section 4.2), so the cost comparison was focused on RTD and CS/NA for most
41 waste sites. As the cost difference increased between RTD and CS/NA, CS/NA became the
42 preferred alternative, particularly when the site was most likely below PRCLs.

Table 5-2. Comparison of CERCLA Evaluation Criteria to Removal Action Alternatives: Site COPCs Expected to Exceed PRCLs. (2 Pages)

CERCLA Evaluation Criteria	Summary of Comparison of CERCLA Evaluation Criteria Among Alternatives			
	NA	MESC/IC/MNA	CS/NA	RTD
Effectiveness				
Protective of human health and the environment See Section 5.1.1.1	<input checked="" type="checkbox"/> Not protective because no action taken to characterize risk or control exposure pathways.	<input type="checkbox"/> Protective for sites with an existing soil cover and COPCs would be below PRCLs within 150 years. Exposure pathways must be controlled until attenuation is complete. <input checked="" type="checkbox"/> Does not apply for waste sites without an existing soil cover and/or where COPCs would not be below PRCLs within 150 years.	<input checked="" type="checkbox"/> Not protective because no action taken to control exposure pathways.	<input type="checkbox"/> Most protective because COPCs are removed to levels below PRCLs.
Complies with ARARs See Section 5.1.2.1	<input checked="" type="checkbox"/> Cannot demonstrate compliance with ARARs in the absence of characterization data or removal actions	<input type="checkbox"/> Would comply for sites with existing soil cover and COPCs that would be below PRCLs within 150 years. <input checked="" type="checkbox"/> Does not apply for waste sites without an existing soil cover and/or where COPCs would not be below PRCLs within 150 years.	<input checked="" type="checkbox"/> Not compliant with ARARs because sampling data do not confirm the site poses no risks and because no action taken to meet Federal or state cleanup regulations.	<input type="checkbox"/> Would comply with ARARs. More potential ARARs need to be met with this alternative because of excavation, emission controls, and waste management requirements.
Long-term effectiveness and permanence See Section 5.1.3.1	<input checked="" type="checkbox"/> Does not apply. There are no characterization data and removal actions not taken.	<input type="checkbox"/> Effective and permanent for sites with existing soil cover and COPCs would be below PRCLs within 150 years. <input checked="" type="checkbox"/> Not effective or permanent for waste sites without an existing soil cover and/or where COPCs would not be below PRCLs within 150 years.	<input checked="" type="checkbox"/> No long-term effectiveness because protective measures are not taken to control exposure pathways.	<input type="checkbox"/> Effective and permanent because COPCs would be removed to levels below PRCLs at completion of the removal action.
Reduction of TMV through treatment See Section 5.1.4.1	<input checked="" type="checkbox"/> Does not reduce TMV because active treatment actions are not taken.	<input checked="" type="checkbox"/> Does not result in a reduction in TMV because active treatment actions are not taken. No credit is taken for attenuation as a treatment method.	<input checked="" type="checkbox"/> Does not result in a reduction in TMV because active treatment actions are not taken.	<input checked="" type="checkbox"/> Does not result in a reduction in TMV because active treatment actions are not taken at the waste site.
Short-term effectiveness See Section 5.1.5.1	<input checked="" type="checkbox"/> Does not apply. There are no characterization data and removal actions not taken.	<input type="checkbox"/> Minor potential impact to workers or environment during implementation. <input checked="" type="checkbox"/> Not applicable for sites without an existing soil cover and/or where COPCs would not be below PRCLs within 150 years.	<input type="checkbox"/> Minor potential impact to workers or environment during implementation.	<input type="checkbox"/> Greatest potential for impacts to workers and releases to the environment.

Table 5-2. Comparison of CERCLA Evaluation Criteria to Removal Action Alternatives: Site COPCs Expected to Exceed PRCLs. (2 Pages)

CERCLA Evaluation Criteria	Summary of Comparison of CERCLA Evaluation Criteria Among Alternatives			
	NA	MESC/IC/MNA	CS/NA	RTD
Implementability See Section 5.2.1	<input checked="" type="checkbox"/> Cannot achieve regulatory acceptability in the absence of characterization data	② Few actions required, but it involves long-term monitoring and maintenance. <input checked="" type="checkbox"/> Not applicable for sites without an existing soil cover and/or where COPCs would not be below PRCLs within 150 years.	① Easily implementable because only activity is sampling and analysis.	③ Technically and administratively the most difficult alternative to implement.
Cost See Section 5.3	Not applicable – No associated cost	Generally highest cost alternative.	Generally lowest cost alternative.	Generally intermediate cost alternative.

①②③ Circles indicate the criterion is met. The numbers within the circles designate the relative ranking in meeting the criterion among the alternatives. A ranking of #1 indicates all aspects of the criterion are best met by the alternative. Criteria of relatively equal ranking receive the same numeric value.

Does not meet the criterion.

ARAR = applicable or relevant and appropriate requirement.
 CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980.*
 COPC = contaminant of potential concern.
 CS/NA = confirmatory sampling/no action.

MESC/IC/MNA = maintain existing soil cover/institutional controls/monitored natural attenuation.
 NA = no action.
 PRCL = preliminary removal cleanup level.
 RTD = removal, treatment, and disposal.
 TMV = toxicity, mobility, and volume.

Table 5-3. Comparison of CERCLA Evaluation Criteria to Removal Action Alternatives: Site COPCs Expected Below PRCLs. (2 Pages)

CERCLA Evaluation Criteria	Summary of Comparison of CERCLA Evaluation Criteria Among Alternatives				
	NA	MESC/IC/MNA	CS/NA	RTD	
Effectiveness					
Protective of human health and the environment See Section 5.1.1.2	<input checked="" type="checkbox"/>	Cannot demonstrate protectiveness in the absence of characterization data	⊖ Not evaluated because COPCs are below PRCLs.	① Meets the criterion because data are gathered to confirm that the waste site poses no risk and no further action is needed.	⊖ Not evaluated because COPCs are below PRCLs.
Complies with ARARs See Section 5.1.2.2	<input checked="" type="checkbox"/>	Cannot demonstrate compliance with ARARs in the absence of characterization data	⊖ Not evaluated because COPCs are below PRCLs.	① Complies with ARARs because sampling data confirm the site poses no risks and meets Federal or state cleanup regulations.	⊖ Not evaluated because COPCs are below PRCLs.
Long-term effectiveness and permanence See Section 5.1.3.2	<input checked="" type="checkbox"/>	Does not apply. There are no characterization data and removal actions not taken.	⊖ Not evaluated because COPCs are below PRCLs.	① Meets the criterion. Sampling data verify no further actions are needed at the waste site.	⊖ Not evaluated because COPCs are below PRCLs.
Reduction of TMV through treatment See Section 5.1.4.2	<input checked="" type="checkbox"/>	Cannot demonstrate reduction of TMV without active treatment	⊖ Not evaluated because COPCs are below PRCLs.	⊖ Does not apply because COPCs are below PRCLs.	⊖ Not evaluated because COPCs are below PRCLs.
Short-term effectiveness See Section 5.1.5.2	<input checked="" type="checkbox"/>	Does not apply. There are no characterization data and removal actions not taken.	⊖ Not evaluated because COPCs are below PRCLs.	⊖ Does not apply. Removal actions not taken	⊖ Not evaluated because COPCs are below PRCLs.
Implementability See Section 5.2.2	<input checked="" type="checkbox"/>	Cannot achieve regulatory acceptability in the absence of characterization data	⊖ Not evaluated because COPCs are below PRCLs.	① Easily implementable since only activity is sampling and analysis.	⊖ Not evaluated because COPCs are below PRCLs.

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Table 5-3. Comparison of CERCLA Evaluation Criteria to Removal Action
 Alternatives: Site COPCs Expected Below PRCLs. (2 Pages)

CERCLA Evaluation Criteria	Summary of Comparison of CERCLA Evaluation Criteria Among Alternatives			
	NA	MESC/IC/MNA	CS/NA	RTD
Cost See Section 5.3	Does not apply. There are no characterization data and removal actions not taken.	Not evaluated because COPCs are below PRCLs.	Low cost alternative	Not evaluated because COPCs are below PRCLs.

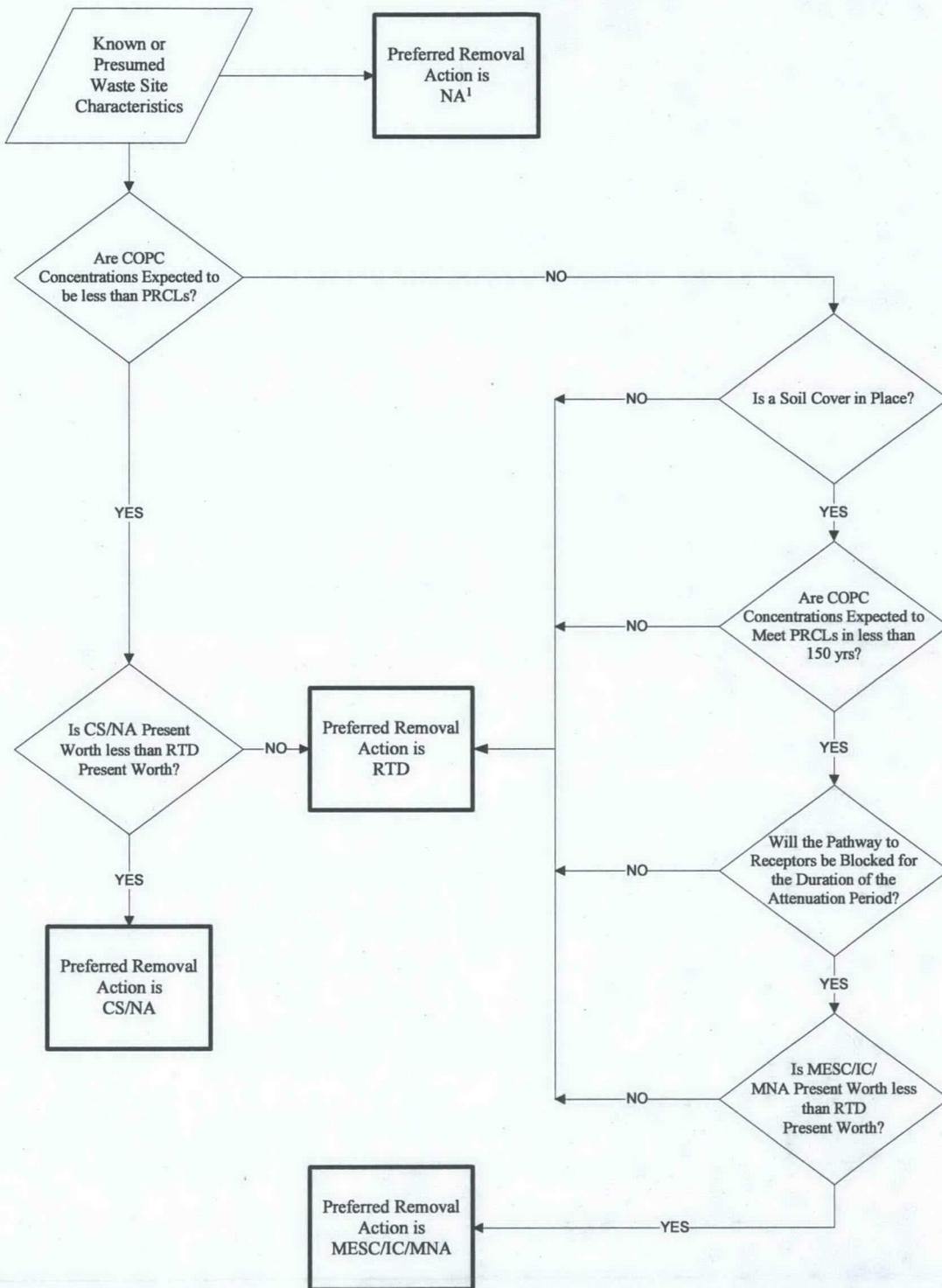
- Circles indicate the criterion is met. A ranking of #1 indicates all aspects of the criterion are best met by the alternative.
- ⊙ The circle with the diagonal bar indicates an alternative that was not evaluated because COPCs concentrations are expected to be below PRCLs.
- ☒ Does not meet the criterion.

ARAR = applicable or relevant and appropriate requirement.
 CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980.*
 COPC = contaminant of potential concern.
 CS/NA = confirmatory sampling/no action.

MESC/IC/MNA = maintain existing soil cover/institutional controls/monitored natural attenuation.
 NA = no action.
 PRCL = preliminary removal cleanup level.
 RTD = removal, treatment, and disposal.
 TMV = toxicity, mobility, and volume.

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Figure 5-1. Decision Logic Diagram.



¹ NA is included as a CERCLA requirement of the assessment, but is not the preferred removal action for any 200-MG-2 OU waste site.

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1 Removal action alternative selection involved review of available information for specific waste
2 site attributes as shown in Appendix B. The outcome of this evaluation for each waste site,
3 including removal action costs, is presented in Table 5-4.

4 Symbols were used in Tables 5-2, 5-3, and 5-4 to illustrate graphically whether or not the
5 alternatives met the CERCLA evaluation criteria. The symbols also relay the relative ranking of
6 each alternative against the criteria. The symbols in Tables 5-2 and 5-3 demonstrate the general
7 guidelines of how the alternatives ranked against each other for each criterion.

8 **5.5 NATIONAL ENVIRONMENTAL POLICY** 9 **ACT OF 1969**

10 In accordance with DOE *National Environmental Policy Act of 1969* (NEPA) policy,
11 DOE CERCLA documents are required to incorporate NEPA values (e.g., transportation,
12 cumulative, offsite, ecological, and socioeconomic impacts) to the extent practicable. For this
13 EE/CA, the NA alternative is excluded from the NEPA values evaluation because it failed to
14 meet the overall protection threshold criterion as documented in Section 5.1.1. None of the other
15 removal alternatives, MESC/IC/MNA, CS/NA, or RTD, would be expected to create any
16 significant transportation impacts. All waste transportation would occur on the Hanford Site,
17 primarily on roads where public access is restricted.

18 Cumulative impacts might occur in both the short term and long term because of the
19 interrelationships between the removal action and other 200 Areas activities, such as remediation
20 of waste sites and groundwater, deactivation, decontamination and decommissioning of
21 surrounding facilities, and operation of waste treatment or disposal facilities. For this action,
22 short-term cumulative impacts were considered in terms of both air quality and resource
23 allocation. With appropriate work controls, airborne releases from the 200-MG-2 OU waste sites
24 are expected to be minor under all of the removal action alternatives, so the contribution to
25 cumulative impacts on local and regional air quality would be minimal. With respect to resource
26 allocation, the MESC/IC/MNA, CS/NA, and RTD alternatives as well as other 200 Area
27 activities would require resources in terms of budget, materials, and/or disposal space. The RTD
28 alternative also would require a commitment of resources required for excavation of waste sites.

29 Initially, the contribution to cumulative impacts would be less for MESC/IC/MNA and CS/NA
30 and greater for RTD, which would require additional budget resources as well as some
31 disturbance to ecological resources. The disturbance to ecological resources would be
32 minimized during removal by performing mitigation in accordance with DOE/RL-96-88,
33 *Hanford Site Biological Resources Mitigation Strategy*.

34 In the long term, the overall cumulative effect of the removal action and other activities in the
35 200 Areas would be to enhance the protection of personnel, the public, and the environment,
36 which is consistent with the values expressed by EPA, Ecology, stakeholders, affected Native
37 American tribes, and the public. MESC/IC/MNA and CS/NA would contribute to this enhanced
38 protection, with CS/NA creating the greatest and most positive long-term effect.

39 Finally, none of the alternatives would be expected to adversely affect existing cultural resources
40 or to have any socioeconomic impacts.

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Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth				Alternative Analysis Outcome				
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative		
200-E-4	French Drain	☑	⊖	①	⊖	☑	⊖	①	⊖	☑	⊖	①	⊖	☑	⊖	①	⊖	☑	⊖	①	⊖	Note A	Note B	\$180,000	\$393,000		■	Available information indicates that this site is a dry well or french drain that is covered by a metal lid painted yellow. The french drain is connected to the 209-E Critical Mass Laboratory via an underground pipe (200-E-249-PL). Nonhazardous liquid waste in the form of steam condensate from the steam trap in the valve pit as well as the equipment room have been reported to have been dispositioned at this location. An auger hole was drilled and sampled 6.2 m (20.5 ft) into the center of the drain as part of the 200-MW-1 OU characterization project in 2004. Barium and copper exceeded wildlife screening values. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
200-E-25	French Drain	☑	☑	☑	①	☑	☑	②	☑	☑	☑	①	☑	☑	☑	☑	②	③	☑	☑	①	③	Note A	Note B	\$180,000	\$401,000	■	Available information indicates that this site is a dry well that is associated with the 272-BB Insulation Shop and the 200-E-209-PL Pipeline. The site is located 6 m (20 ft) north of the northeast corner of 272-BB Building. The site is not visible from the surface (2.7 m [9 ft] deep), but is marked with a sign. Materials that could have been flushed into an associated floor drain include asbestos, calcium silicate, fiberglass, silicate, Airball, and latex paint, organic chemicals, oil, and grease. The site is no longer in use and the sink and drain (which provided the conduit from the shop to the dry well) were removed and plugged with concrete. Based on the potential for asbestos and other insulation materials to be present, the RTD alternative is most protective of potential receptors and best meets other CERCLA criteria.
200-E-55	French Drain	☑	☑	☑	①	☑	☑	②	☑	☑	☑	①	☑	☑	☑	☑	②	③	☑	☑	①	③	Note A	Note B	\$180,000	\$424,000	■	Available information indicates this french drain is associated with the 291-B Sand Filter and the 200-E-214-PL Pipeline. The site is located east of the 291-B Sand Filter below grade and is marked with a single steel post. Potentially radioactive liquid waste in the form of condensate from the B Plant Canyon sand filter and rainwater that leaked through the sand filter roof was dispositioned to this site. In 1994, an auger hole and sample at 4.9 m (16 ft) bgs indicated contamination at a maximum of 20,000 dpm beta/gamma and 2,100 dpm alpha direct. The sand filter roof was sealed to eliminate this source to the drain in 1998. Based on the potential for radionuclide(s) to be present, the RTD alternative is most protective of potential receptors and best meets other CERCLA criteria.
200-E-65	Injection/ Reverse Well	☑	☑	☑	①	☑	☑	②	☑	☑	☑	①	☑	☑	☑	☑	②	③	☑	☑	①	③	Note A	Note B	\$168,000	\$152,000	■	Available information indicates this reverse well is associated with the PUREX facility and 200-E-107 Unplanned Release. The site is a drain with a metal flush mount and cover. The site is located within the 200-E-107 Unplanned Release posted boundaries. Waste site 200-E-107 was recently stabilized and down posted from a radiologically controlled area to a URM. Nonhazardous liquid waste in the form of steam condensate is reported to have been dispositioned at this location. The discharge was seasonal, and nonregulated chemicals were added to dechlorinate water, prevent scale, and control corrosion. RTD is cost-effective, protective, and best meets other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

- ①②③ Circles indicate the criterion is met. The numbers designate the relative ranking in meeting the criterion among the alternatives.
- ⊖ Indicates an alternative that was not evaluated because COPC concentrations are expected to be below PRCLs.
- ☑ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth			Alternative Analysis Outcome									
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative						
200-E-67	Injection/Reverse Well	☑	☑	☑	①	☑	☑	☑	②	☑	☑	☑	①	☑	☑	☑	☑	☑	☑	☑	②	③	☑	☑	①		③	Note A	Note B	\$122,000	\$134,000	■ Available information indicates this reverse well is associated with the 202-A-417 Catch Tank. The site is located adjacent to the south wall of the 202-A Building. The drain is inside a dome-shaped caisson surrounded by chain/posts and posted a CA. The caisson is inside the 200-E-103 Unplanned Release area, which was stabilized in 1999. The information does not suggest what the waste stream was, only that the source has been eliminated. There also is no indication as to how deep the site is. RTD is cost-effective and most protective due to the uncertainties of this site.
200-E-68	Injection/Reverse Well	☑	☑	☑	①	☑	☑	☑	②	☑	☑	☑	①	☑	☑	☑	☑	☑	☑	☑	②	③	☑	☑	①	③	Note A	Note B	\$168,000	\$152,000	■ Available information indicates this reverse well is associated with the 291-A Control House. The site is a drain with a metal cover. The site is located south of PUREX between the 291-A Stack exhaust and the 291-AB Stack Building inside a posted CA. Nonhazardous liquid waste in the form of steam condensate is reported to have been dispositioned at this location. The discharge was seasonal, and nonregulated chemicals were added to dechlorinate water, prevent scale, and control corrosion. RTD is cost-effective, protective, and best meets other CERCLA criteria.	
200-E-70	Injection/Reverse Well	☑	⊖	⊖	①	☑	⊖	⊖	①	☑	⊖	⊖	①	☑	⊖	⊖	☑	⊖	⊖	☑	⊖	②	③	☑	⊖	②	③	Note A	\$445,000	\$122,000	\$134,000	■ Available information indicates this reverse well is located within the 200-E-107 Unplanned Release area. The site is a drain with a metal cover; the metal cover has four holes through it. The site is located south of the 202-A Building. Nonhazardous liquid waste in the form of steam condensate is reported to have been dispositioned at this location. The discharge was seasonal, and nonregulated chemicals were added to dechlorinate water, prevent scale, and control corrosion. In 1998, a radiation survey detected 10,000 dpm beta/gamma on the steam pipes and in the gravel. The metal cover read >10,000 dpm. The radiological contamination on the cover is assumed to be from years of PUREX stack emissions. RTD is most protective and best meets other CERCLA criteria.
200-E-71	Injection/Reverse Well	☑	⊖	①	⊖	☑	⊖	①	⊖	☑	⊖	⊖	①	⊖	⊖	☑	⊖	⊖	☑	⊖	⊖	⊖	☑	⊖	①	⊖	Note A	Note B	\$122,000	\$134,000	■ Available information indicates this reverse well is a man-made hole in the ground (no drain structure was built). The site is located south of the 202-A Building, within the 200-E-103 Unplanned Release area. Nonhazardous liquid waste in the form of steam condensate is reported to have been dispositioned at this location. The discharge was seasonal, and nonregulated chemicals were added to dechlorinate water, prevent scale, and control corrosion. The source was eliminated when the 200-E Area Powerhouse shut down in 1997 and stopped producing steam. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.	

Ranking of Alternatives for Individual CERCLA Criteria:

- ①②③ Circles indicate the criterion is met. The numbers designate the relative ranking in meeting the criterion among the alternatives.
- ⊖ Indicates an alternative that was not evaluated because COPC concentrations are expected to be below PRCLs.
- ☑ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth				Alternative Analysis Outcome								
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative						
200-E-73	Injection/Reverse Well	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	○	○	☒	○	○	○	☒	○	①	○		Note A	Note B	\$122,000	\$134,000		■
200-E-74	Injection/Reverse Well	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	○	○	☒	○	○	○	☒	○	①	○	Note A	Note B	\$122,000	\$134,000		■	Available information indicates this reverse well is a drain with a rusty metal cover. It is approximately 0.9 m (3 ft) deep. The site is located southeast of the 202-A Building, within the 200-E-103 Unplanned Release area. The site was not covered with the 200-E-103 Unplanned Release stabilization material. Nonhazardous liquid waste in the form of steam condensate is reported to have been disposed at this location. The discharge was seasonal, and nonregulated chemicals were added to dechlorinate water, prevent scale, and control corrosion. The source was eliminated when the 200-E Area Powerhouse shut down in 1997 and stopped producing steam. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
200-E-77	Injection/Reverse Well	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	○	☒	○	②	③	☒	○	②	③	Note A	\$489,000	\$168,000	\$152,000		■	Available information indicates this reverse well is a concrete structure with a metal cover that is sitting slightly above grade and filled with rocks. The drain is approximately 0.9 m (3 ft) deep. The site is located on the northeast corner of the 202-A Building, within the 200-E-107 Unplanned Release area. Nonhazardous liquid waste in the form of steam condensate is reported to have been disposed at this location. The discharge was seasonal, and nonregulated chemicals were added to dechlorinate water, prevent scale, and control corrosion. The source was eliminated when the 200-E Area Powerhouse shut down in 1997 and stopped producing steam. RTD is cost-effective, protective, and best meets other CERCLA criteria.
200-E-79	Injection/Reverse Well	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	○	☒	○	②	③	☒	○	②	③	Note A	\$489,000	\$168,000	\$157,000		■	Available information indicates this reverse well is a concrete drain under a steam line with a metal cover. There is a rusty pipe leading to the drain. The drain is approximately 1.2 m (4 ft) deep. The site is located on the southeast corner of the PUREX Railroad Cut, within the 200-E-107 Unplanned Release area. Nonhazardous liquid waste in the form of steam condensate is reported to have been disposed at this location. The discharge was seasonal, and nonregulated chemicals were added to dechlorinate water, prevent scale, and control corrosion. The source was eliminated when the 200-E Area Powerhouse shut down in 1997 and stopped producing steam. RTD is cost-effective, protective, and best meets other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

- ①②③ Circles indicate the criterion is met. The numbers designate the relative ranking in meeting the criterion among the alternatives.
- Indicates an alternative that was not evaluated because COPC concentrations are expected to be below PRCLs.
- ☒ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth				Alternative Analysis Outcome				
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative		
200-E-84	Injection/Reverse Well	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	Note B	\$122,000	\$134,000		■	Available information indicates this reverse well is gravel filled and flush with a gravel surface with the exception of a small lip on one side. There is a steel pipe leading to the drain. The site is located on the west end of the 202-A Building. Nonhazardous liquid waste in the form of steam condensate is reported to have been disposed at this location. There also is potential for storm water runoff because the site is not covered. The steam condensate discharge was seasonal, and nonregulated chemicals were added to dechlorinate water, prevent scale, and control corrosion. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
200-W-107	Injection/Reverse Well	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	②	③	☒	○	②	③	Note A	\$445,000	\$122,000	\$134,000	■	Available information indicates this reverse well is a covered cement french drain that still may be active. The site is covered with a yellow metal cover with a slot on one side and is flush with the surrounding gravel covered ground. The site is located 1.8 m (6 ft) east of the back wall of the 222-U Building within the 200-W-136 Unplanned Release area. Nonhazardous liquid waste in the form of storm water runoff is reported to have been disposed at this location. The drain, however, is posted as a CA. The depth of the site is unknown. RTD is the most protective alternative and best meets other CERCLA criteria.
200-W-108	Injection/Reverse Well	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	②	③	☒	○	②	③	Note A	\$489,000	\$168,000	\$147,000	■	Available information indicates this reverse well is a covered cement french drain that still may be active. The site is covered with a yellow metal cover with a slot on one side and is flush with the surrounding gravel covered ground. The site is located on the northeast corner of the backside of the 222-U Building within the 200-W-136 area. Nonhazardous liquid waste in the form of storm water runoff is reported to have been disposed at this location. The depth of the site is approximately 1.2 m (4 ft). RTD is cost-effective, protective, and best meets other CERCLA criteria.
200-W-109	Injection/Reverse Well	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	②	③	☒	○	②	③	Note A	\$445,000	\$122,000	\$134,000	■	Available information indicates this reverse well is a covered cement french drain that still may be active. The site is covered with a yellow metal cover with a slot on one side and is flush with the surrounding sand-covered ground. The site is located on the east side of the backside of the 222-U Building within the 200-W-136 Unplanned Release area. Nonhazardous liquid waste in the form of storm water runoff is reported to have been disposed at this location. The depth of the site is unknown. RTD is the most protective alternative and best meets other CERCLA criteria.
200-W-111	Injection/Reverse Well	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	②	③	☒	○	②	③	Note A	\$445,000	\$122,000	\$134,000	■	Available information indicates this reverse well is a covered cement french drain that still may be active. The site is covered with a yellow metal cover with a slot on one side and is flush with the surrounding gravel-covered ground. The site is located on the southeast corner of the 222-U Building within the 200-W-136 Unplanned Release area. Nonhazardous liquid waste in the form of storm water runoff is reported to have been disposed at this location. The depth of the site is approximately 0.9 m (3 ft). Because of uncertainty concerning the composition of the storm water runoff in this area, RTD is the most protective alternative and best meets other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

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- ☒ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth			Alternative Analysis Outcome								
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative					
200-W-118	Injection/Reverse Well	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	Note A	Note B	\$122,000	\$134,000		■	Available information indicates this reverse well is an insulated pipe extending into a french drain. The site is located on the northeastern corner of the 224-U Facility fence line. Nonhazardous liquid waste in the form of steam condensate is reported to have been dispositioned at this location. The discharge was seasonal, and nonregulated chemicals were added to dechlorinate water, prevent scale, and control corrosion. The source was eliminated when the 200-E Area Powerhouse shut down in 1997 and stopped producing steam. The depth of the site is unknown. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.			
207-A NORTH	Retention Basin	☑	☑	☑	①	☑	☑	☑	②	☑	☑	☑	①	☑	☑	☑	☑	☑	☑	②	③	☑	☑	①	③	Note A	Note B	\$180,000	\$1,711,000	■	Available information indicates this retention basin consists of three concrete hypalon-lined basins surrounded with chain and posts. The site is located east of the 242-A Evaporator in the 200 East Area. The site is associated with the 242-A Evaporator, 216-A-25 Pond, 216-B-3 Pond, 200-E-234-PL Pipeline, and 200-E-235-PL Pipeline. Nonhazardous liquid waste in the form of steam condensate is reported to have been dispositioned at this location from the 242-A Evaporator since 1977. A polyurethane sealant was added to the basin walls in 1982. Before the installation of the hypalon liner, the basins had been posted as a CA. The basins were physically isolated and ceased to operate in 1999. The depth of the site is approximately 2.1 m (7 ft). RTD is the most protective alternative and best meets other CERCLA criteria.
207-S	Retention Basin	☑	②	☑	①	☑	②	☑	①	☑	②	☑	②	☑	○	○	○	☑	②	②	③	☑	②	①	③	Note A	\$494,000	\$318,000	\$1,227,000	■	Available information indicates this retention basin consists of a concrete basin that has been backfilled to grade with dirt. The site is posted as a URM. The site is located west of the 222-S Laboratory in the 200 West Area and is associated with the 202-S Facility, 216-S-17 Pond, UPR-200-W-13, UPR-200-W-15, UPR-200-W-95, and the 200-W-152-PL Pipeline. Nonhazardous liquid waste in the form of process cooling water and steam condensate is reported to have been dispositioned at this location, from the 202-S Facility. However, several coil leaks from the 202-S Facility caused contaminated effluent to be discharged to the basin, ultimately ceasing operations to the basin in 1954. The basin was then backfilled to grade. In 1975, gravel and herbicides were spread over the site to stop radioactive weed growth. The surface is potentially contaminated with radioactive biota. In 1991, a radiation survey detected 9,000 cpm beta/gamma at the site. The depth of the site is approximately 2 m (6.8 ft). MESC/IC/MNA is the preferred alternative because it is cost-effective, protective of human and ecological receptors, and meets other CERCLA criteria.
207-T	Retention Basin	☑	○	○	①	☑	○	○	①	☑	○	○	①	☑	○	○	○	☑	○	②	③	☑	○	②	③	Note A	\$598,000	\$429,000	\$2,617,000	■	Available information indicates this retention basin consists of a concrete structure divided into two sections. The basin has been backfilled with contaminated dirt and capped with 0.6 m (2 ft) of clean soil bringing the material to grade in 1996. The site is posted as a URM (down posted from an SCA). The site is located west of the 221-T Building in the 200 West Area. The site is associated with the 221-T Building, 224-T Building, 216-T-12 Trench, 200-W-53 Unplanned Release, 216-T-4-1 Ditch, 216-T-4-2 Ditch, 200-W-88-PL Pipeline, 200-W-165-PL Pipeline, 200-W-166-PL Pipeline, 200-W-167-PL Pipeline, and the 200-W-164-PL Pipeline. Radioactive and nonhazardous liquid waste in the form of cooling water effluent from the 221-T and 224-T Buildings and low-level radioactive waste from the T Plant process cooling and ventilation steam condensate is reported to have been dispositioned at this location. The depth of the site is approximately 2 m (6.5 ft). RTD is the most protective alternative and best meets other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

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- ☑ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth				Alternative Analysis Outcome									
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative							
207-U	Retention Basin	☑	○	○	①	☑	○	○	①	☑	○	○	①	☑	○	○	①	☑	○	○	①	☑	○	○	①		○	②	③	Note A	\$598,000	\$429,000	\$2,617,000
207-Z	Retention Basin	☑	○	○	①	☑	○	○	①	☑	○	○	①	☑	○	○	①	☑	○	○	①	☑	○	○	①	○	②	③	Note A	\$494,000	\$180,000	\$857,000	■ Available information indicates this retention basin consists of a concrete structure divided into two sections. The basins may have been filled with high-density grout. The site is located inside the Z Plant (Plutonium Finishing Plant) exclusion area fence. The site is associated with the 241-Z and 234-5Z Facilities and 200-W-209-PL Pipeline. Potentially contaminated liquid waste in the form of steam condensate and cooling water via the D-3 piping system is reported to have been dispositioned at this location. The depth of the site is approximately 3 m (10 ft). RTD is the most protective alternative and best meets other CERCLA criteria.
209-E-WS-2	French Drain	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	○	①	○	Note A	Note B	\$168,000	\$186,000	■ Available information indicates this french drain is a drain in a gravel area. The drain is painted yellow and has a metal cover. The site is located on the southeast corner of the 209-E Critical Mass Laboratory (Laboratory wing). Nonhazardous liquid waste in the form of condensate is reported to have been dispositioned at this location from the Critical Mass Laboratory high-efficiency particulate air filters and heat exchange systems. The depth of the site is approximately 2.5 m (8 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-A-11	French Drain	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	○	①	○	Note A	\$494,000	\$180,000	\$802,000	■ Available information indicates this french drain is in an excavation that is 10 ft in diameter and approximately 1.5 m (5 ft) deep. Both the drain and the excavation are filled with rock and backfilled over. The site is located near the southeast corner of the 202-A Building and is delineated by steel posts and chain, posted as URM. The drain received trap pit # 1 steam condensate and equipment leakage from the 202-A Building, which is estimated to have less than 50 Ci of beta contamination. The steam source has been eliminated, and the trap pit was sealed; therefore, waste should no longer be draining to the site. The depth of the site is approximately 9.1 m (30 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-A-12	French Drain	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	☑	○	①	○	○	①	○	Note A	\$494,000	\$180,000	\$571,000	■ Available information indicates this french drain is in an excavation that is 3 m (10 ft) in diameter and approximately 1.5 m (5 ft) deep. Both the drain and the excavation are filled with rock and backfilled over. The site is located in the center of the south side of the 202-A Building (22.9 m [75 ft] from the building). It is not marked and is not visible from the ground. The drain received trap pit # 3 drainage from the 202-A Building, which is estimated to have less than 50 Ci of beta contamination. The depth of the site is approximately 6 m (20 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

- ①②③ Circles indicate the criterion is met. The numbers designate the relative ranking in meeting the criterion among the alternatives.
- Indicates an alternative that was not evaluated because COPC concentrations are expected to be below PRCLs.
- ☑ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth			Alternative Analysis Outcome						
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative			
216-A-13	French Drain	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	\$494,000	\$180,000	\$564,000			■	Available information indicates this french drain is in an excavation that is filled with gravel. The site is located 6 m (20 ft) west and 6 m (20 ft) south of the southwest corner of the 202-A Building and is not marked or posted. It does have a metal cover that is visible from the ground. The drain received seal water from the air sampler vacuum pumps in the 202-A Building and is estimated to have less than 1 Ci of beta contamination. The depth of the site is approximately 6 m (20 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-A-14	French Drain	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	\$494,000	\$180,000	\$802,000		■	Available information indicates this french drain is composed of two reinforced-concrete pipes placed vertically end to end, in an excavation that is filled with gravel. The site is covered by a steel cover. The site is located south of the center of the 202-A Building and is not marked or posted or visible from the ground. The drain received steam condensate, storm water, and equipment leakage from the vacuum cleaner filter pit. The liquid waste is estimated to be less than 1 Ci in beta contamination. The site is also considered active due to storm water runoff that still may be dispositioned to the drain. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.	
216-A-22	Crib/French Drain	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	②	③	☒	○	②	③	Note A	\$494,000	\$180,000	\$544,000		■	Available information indicates this site is located along the north wall of the 203-A Building, north of PUREX. The site is covered in gravel and marked with a single AC-540 marker and URM signs. The crib received drainage from the 203-A Building truck load-out apron, the sump waste from the 203-A Building enclosure, and the heating coil condensate from the P-1 through P-4 UNH tanks. The waste is estimated at less than 1 Ci of beta contamination; however, the site also received uranium from some of the discharges. In 1991, a radiation survey detected 65,000 dpm beta/gamma at the site. No alpha contamination was detected. The depth of the site is approximately 4.9 m (16 ft). RTD is the most protective alternative and best meets other CERCLA criteria.
216-A-26	French Drain	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	Note B	\$180,000	\$429,000		■	Available information indicates this french drain is in an excavation. There are no visible surface features at this location. The site is located inside the PUREX security fence, south of the 291-A Control House. The site received floor drainage from the 291-A fan Control House. The liquid waste is estimated to be less than 1 Ci in beta contamination. The site ran from 1965 to 1991 and is associated with the 291-A Fan Control Building, the 216-A-26A French Drain, and the 200-E-270-PL Pipeline. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.	
216-A-26A	French Drain	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	Note B	\$180,000	\$429,000		■	Available information indicates this french drain is below grade. The site is located inside the PUREX security fence, south of the 291-A Control House. The drain received floor drainage from the 291-A Fan Control House. The liquid waste is estimated to have contained less than 1 Ci in beta contamination. The site was deactivated in 1965 and the waste stream was rerouted to the 216-A-26 French Drain. The site is associated with the 291-A Fan Control Building, the 216-A-26A French Drain, and the 200-E-270-PL Pipeline. The depth of the site is approximately 4.9 m (16 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.	

Ranking of Alternatives for Individual CERCLA Criteria:

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- Indicates an alternative that was not evaluated because COPC concentrations are expected to be below PRCLs.
- ☒ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth			Alternative Analysis Outcome				
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative	
216-A-32	Crib	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	Note A	\$494,000	\$180,000	\$789,000		■
216-A-33	French Drain	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	Note A	\$494,000	\$180,000	\$405,000	■	Available information indicates this french drain is inside the PUREX security fence south of the 202-A Building. Currently the 291-AE Filter Building sits on top of the french drain's location. Before the 291-AE Building was built on top of the drain, the drain had a carbon steel cover. The site is associated with the 291-A Fan House and the 200-E-269-PL Pipeline and received bearing coolant waste from the 291-A-1 Stack exhaust fans. The liquid waste is estimated to have contained less than 1 Ci in beta activity. The site was capped and removed from service in 1964. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-A-35	French Drain	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	Note A	Note B	\$180,000	\$453,000	■	Available information indicates this site is located 9.1 m (30 ft) south of the west end of the 202-A Building (south of the 216-A-13 French Drain). The drain is a raised cement structure painted yellow and surrounded by URM signs. The cover has a confined space posting. The drain received seal cooling water from the air sampler vacuum pumps in the 202-A Building. The liquid waste is estimated to contain less than 1 Ci in beta activity. The site replaced the 216-A-13 French Drain. The site was later deactivated and rerouted to the 216-A-29 Ditch. The site is associated with PUREX, the 216-A-13 French Drain, and the 200-E-272-PL Pipeline. The depth of the site is approximately 4.9 m (16 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-A-38-1	Crib	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	Note A	\$494,000	\$180,000	\$3,144,000	■	Available information indicates this crib is southwest of the 202-A Building, north of 1st Street, south of the PUREX security fence. The site is surrounded with steel posts/chain and URM signs. The crib was built to receive PUREX process condensate, but never was used. It is still a possibility though, that the site could have received waste potentially contaminated by a reduced vapor phase de-entrainment by accident. The depth of the site is approximately 11.2 m (37 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-A-41	Crib	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	Note A	\$494,000	\$180,000	\$430,000	■	Available information indicates this crib is northwest of the 296-A-13 Stack (north of the 244-AR Vault Facility). The site is no longer marked or posted. The crib received 296-A-13 Stack condensate drainage (the stack is connected to the 244-AR Vault), which is potentially acidic and is reported to have contained less than 1 Ci of beta activity. The crib was deactivated by removing the stack drainage pipe. Drainage was rerouted to the vessel vent seal pot system in the 244-AR Building. The depth of the site is approximately 2.1 m (7 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

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- ⊙ Indicates an alternative that was not evaluated because COPC concentrations are expected to be below PRCLs.
- ☒ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth			Alternative Analysis Outcome								
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative					
216-B-13	French Drain	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	○	○	☒	○	○	○	☒	○	①	○		Note A	\$494,000	\$180,000	\$488,000	■
216-B-51	French Drain	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	○	☒	○	②	③	☒	○	②	③	Note A	\$494,000	\$180,000	\$469,000	■	Available information indicates this french drain is located north of the B Tank Farm and northeast of the 216-B-8 Crib and Tile Field. The site is within a small area posted as URM. The drain is a concrete structure that extends 0.3 m (1 ft) above ground and 4.2 m (14 ft) below ground. A wooden cover with vent holes covers the structure. The site is posted with fixed CA signs. The site received process waste effluent drainage from the BC Crib pipeline, which carried high salt, neutral to basic scavenged tributyl phosphate waste via or from the BY Tank Farm to the BC Crib area and is estimated to contain less than 10 Ci beta activity. The site is associated with the 216-E-114-PL Pipeline, 200-E-221-PL Pipeline, and UPR-200-E-144. The site was used from 1956 to 1958. In 2006, a radiation survey detected 18,000 dpm/100 cm ² beta/gamma on the structure and wooden cover. The depth of the site is approximately 4.6 m (15 ft). RTD is the most protective alternative and best meets other CERCLA criteria.
216-C-4	Crib	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	○	○	☒	○	○	○	☒	○	①	○	Note A	\$494,000	\$180,000	\$585,000	■	Available information indicates this crib is located between the double security fences surrounding the 209-E Critical Mass Laboratory. The site is marked and posted with URM signs. The crib received contaminated organic waste from the 276-C Building. The site is associated with the 200-E-170-PL Pipeline. This crib was deactivated in 1965 and surface stabilized in 2000. The depth of the site is approximately 4.9 m (16 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-S-12	Trench	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	○	☒	○	②	③	☒	○	②	③	Note A	\$494,000	\$180,000	\$527,000	■	Available information indicates this trench is located northeast of the 202-S Building (north of the 291 Stack). The site is marked and posted with URM signs and cement marker posts/chain. The trench was used for liquid disposal of 291-S Stack flush water. The waste is estimated to contain approximately 5 Ci of beta emitters, and 2 to 3 Ci of gamma emitters (ruthenium and zirconium-niobium). The site is associated with the 291-S Stack. The trench was deactivated by removing the above-ground piping and backfilling the location. The depth of the site is approximately 3 m (10 ft). RTD is the most protective alternative and best meets other CERCLA criteria.
216-S-16D	Ditch	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	○	○	☒	○	○	○	☒	○	①	○	Note A	\$489,000	\$168,000	\$885,000	■	This site starts from the southwest corner of the 200 West Area perimeter fence and terminates at the eastern edge of the 216-S-16 Pond. The site is marked and posted with URM signs. The ditch was used for disposal of process cooling water and steam condensate from the REDOX facility from 1957 to 1967. In 1967, the site received condenser and vessel cooling water from concentrator boil-down operations in the 202-S Building. In 1973, the ditch was connected to the 216-U-9 Ditch, so 216-U-10 overflow could reach the 216-S-16 Pond. The site is associated with the REDOX facility, 216-S-16 Pond, 216-U-9 Ditch, and 200-W-155-PL Pipeline. The ditch has been backfilled and surface stabilized. The depth of the site is approximately 0.9 m (3 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

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- ☒ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth				Alternative Analysis Outcome							
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative					
216-S-18	Trench	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	○	○	☒	○	○	○	☒	○	①	○		Note A	\$494,000	\$180,000	\$644,000	■
216-S-25	Crib	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	○	○	☒	○	○	○	☒	○	①	○	Note A	Note B	\$180,000	\$2,888,000	■	Available information indicates this crib is located west of the SX Tank Farm outside the 200 West Area perimeter fence (south and east of the 216-U-10 Pond). The crib is marked and posted with URM signs. The crib received 242-S Evaporator process steam condensate until 1980. In 1984, the 200-W-159-PL Pipeline was tied into the crib. In 1985, the site received effluent from the 216-U-1 and -2 groundwater pump-and-treat activity. In 1995, the site received condensate from the 241-SX Sludge Cooler Steam Heater at approximately 15 to 30 L/h. The site is associated with the 242-S Evaporator and the 200-W-161-PL Pipeline. The depth of the site is approximately 3 m (10 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-SX-2	Crib	☒	☒	☒	①	☒	☒	☒	②	☒	☒	☒	①	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	①	③	Note A	Note B	\$180,000	\$519,000	■	Available information indicates this crib is located south of the 241-SX-701 Compressor House and west of the SX Tank Farm fence. The crib is marked with light posts/chain and URM signs. The crib received waste from and is connected to the 241-SX-701 Compressor House. In 2000, the crib's vent risers were sealed to prevent passive radioactive emissions. The site is associated with the 241-SX-701 Compressor House and the 200-W-162-PL Pipeline. The depth of the site is approximately 2 m (6.8 ft). Because of the potential for the presence of shallow radionuclides, RTD is the most protective alternative and best meets other CERCLA criteria.
216-T-1	Ditch	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	○	○	☒	○	○	○	☒	○	①	○	Note A	\$494,000	\$180,000	\$1,326,000	■	This ditch is located on the north side of the 221-T Building. The site is marked and posted with URM signs. The ditch received cooling water and steam condensate discharge from the 221-T and 271-T Buildings. It also received sodium hydroxide wash water waste solution from the Sodium-Air Water Reaction Emergency Air Cleaning Development-Hanford Engineering Development Laboratory. The site ran from 1956 to 1970. It was isolated permanently in 1995 by filling the manholes with concrete and cutting/capping the discharge pipes as well as backfilling and stabilizing the location. The site is associated with the 221-T Building and 200-W-180-PL Pipeline. The depth of the site is approximately 3 m (10 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-T-4-1D	Ditch	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	○	☒	○	○	○	☒	○	②	③	Note A	\$494,000	\$180,000	\$1,607,000	■	This ditch is located west of the 221-T Building and northwest of the T Tank Farm. It is marked and posted with URM signs. The ditch received T Plant cooling water and condensate waste via the 207-T Retention Basin. Total plutonium discharge to the site is estimated at 1.41 g. The site was contaminated to the maximum allowance by 1971 (20,000 cpm). The ditch was backfilled in 1972. The site ran from 1944 to 1972, and was surface stabilized in 1995. The site is associated with the 216-T-4A Pond, 216-T-4-2 Ditch, 207-T Retention Basin, and 200-W-164-PL Pipeline. The depth of the site is approximately 1.2 m (4 ft). RTD is the most protective alternative and best meets other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

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Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth			Alternative Analysis Outcome					
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative		
216-T-4-2	Ditch	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	②	③	Note A	\$494,000	\$180,000		\$2,784,000	■ This ditch is located north of the T Tank Farm. It is marked and posted with URM signs. The site is covered in grass. The ditch received steam condensate and condenser cooling water from 242-T Evaporator and nonradioactive wastewater from the 221-T Building air conditioning filter units and floor drains. Total plutonium discharged to the site is estimated at 1.41 g. The site replaced the 216-T-4-1 Ditch. The site was backfilled and surface stabilized in 1995. The site is associated with the 216-T-4B Pond, 207-T Retention Basin, and 200-W-164-PL Pipeline. The depth of the site is approximately 1.2 m (4 ft). RTD is the most protective alternative and best meets other CERCLA criteria.
216-T-9	Trench	☒	○	①	○	☒	○	①	○	☒	○	○	①	○	○	○	①	○	○	○	○	①	○	Note A	\$489,000	\$168,000	\$408,000	■ Available information indicates this trench is located west of the 221-T Building and southwest of the 216-T-33 Crib. The site is no longer marked or posted. The site originally was used for subsurface liquid disposal of vehicle decontamination waste for heavy equipment and other vehicles. Contaminated soil at the site was removed (maximum of 3,000 cpm) and taken to the 200 West Area Dry Waste Burial Ground, and the site was backfilled in 1954. The site is associated with the 216-T-10 and 216-T-11 Trenches. The depth of the site is approximately 0.6 m (2 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-T-10	Trench	☒	○	①	○	☒	○	①	○	☒	○	○	①	○	○	○	①	○	○	○	○	①	○	Note A	\$489,000	\$168,000	\$408,000	■ Available information indicates this trench is located west of the 221-T Building and southwest of the 216-T-33 Crib. The site is no longer marked or posted. The site originally was used for subsurface liquid disposal of vehicle decontamination waste for heavy equipment and other vehicles. Contaminated soil at the site was removed (maximum of 3,000 cpm) and taken to the 200 West Area Dry Waste Burial Ground, and the site was backfilled in 1954. The site is associated with the 216-T-9 and 216-T-11 Trenches. The depth of the site is approximately 2.1 m (7 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-T-11	Trench	☒	○	①	○	☒	○	①	○	☒	○	○	①	○	○	○	①	○	○	○	○	①	○	Note A	\$489,000	\$168,000	\$408,000	■ Available information indicates this trench is located west of the 221-T Building and southwest of the 216-T-33 Crib. The site is no longer marked or posted. The site originally was used for subsurface liquid disposal of vehicle decontamination waste for heavy equipment and other vehicles. Contaminated soil at the site was removed (maximum of 3,000 cpm) and taken to the 200 West Area Dry Waste Burial Ground, and the site was backfilled in 1954. The site is associated with the 216-T-10 and 216-T-11 Trenches. The depth of the site is approximately 2.1 m (7 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-T-12	Trench	☒	○	○	①	☒	○	○	①	☒	○	○	①	○	○	○	①	○	○	○	○	②	③	Note A	\$494,000	\$180,000	\$413,000	■ Available information indicates this trench is located near the northeast corner of the 207-T Retention Basin. The site is not marked or posted. The area around the 207-T Retention Basin has been backfilled and stabilized (including the spot where the trench should be located). The trench received sludge from the 207-T Retention Basin. The sludge at the time of burial (1954) has a radiation survey instrument-reading maximum of 15 mR/h. Surface readings at the time ranged between 2 and 5 mR/h. The trench was used only once before being backfilled. The depth of the site is approximately 2.5 m (8 ft). RTD is the most protective alternative and best meets other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

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- Indicates an alternative that was not evaluated because COPC concentrations are expected to be below PRCLs.
- ☒ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth				Alternative Analysis Outcome							
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative					
216-T-13	Trench	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	Note B	\$180,000	\$392,000	■	Available information indicates this trench is located on the north side of the TY Tank Farm, north of the perimeter fence. The site is not marked or posted. The site was used to clean contaminated vehicles with water or steam. Contaminated soil was removed in 1972 and taken to the 200 West Area Dry Waste Burial Ground. Two characterization test pits were dug at the site in 2005 with analytical results showing only low-level concentrations of a few organic constituents. The site has been associated with the 269-W Regulated Garage (currently demolished). The depth of the site is approximately 3 m (10 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-T-29	French Drain	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	Note B	\$168,000	\$670,000	■	Available information indicates this french drain is located adjacent to the north end of the 291-T Sand Filter and northeast of the 221-T Building. The drain is a part of the sand filter construction, and the sand filter is marked and posted as a CA. A vent riser protruding from the roof of the northwest corner of the sand filter is assumed to be the drain. The site received canyon air condensate from the 291-T Sand Filter, which may have contained up to 8,000 kg of nitric acid. The site is associated with the 200-W-45 (291-T Sand Filter). The site ran from 1949 to 1964. In 1964, the sand filter bypass was removed, which in turn deactivated the french drain. The depth of the site is approximately 0.9 m (3 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-T-31	French Drain	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	Note B	\$180,000	\$507,000	■	Available information indicates this french drain is located near the southeast corner of the TX Tank Farm, on the east side of the TX Tank Farm fence. The drain was exhumed in 1962; a single steel post and WIDS sign marks the approximate location of where the drain was. The site ran from 1954 to 1959. In 1959, the drain was abandoned due to contamination by steam condensate from a steam line blowout during efforts to unplug a waste line. The contaminated equipment and soil were removed and taken to the 200 West Area Dry Waste Burial Ground. The depth of the former site is approximately 8.2 (27 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-T-33	Crib	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	\$494,000	\$180,000	\$470,000	■	This crib is located west of the 221-T Canyon Building, and southwest of the 2706-T Building. It is marked with light posts/chain and URM signs. The crib received equipment decontamination waste from the 2706-T Decontamination Building. The site only ran for one month in 1963 and has been surface stabilized. The site is associated with the 2706-T Decontamination Building and the 200-W-173-PL Pipeline. The depth of the site is approximately 3.3 m (10.8 ft). A characterization borehole was drilled through the site in 2004 and showed low levels of Cs-137 (33.1 pCi/g) and Sr-90 (49 pCi/g) in the 3.9 to 4.7 m (13 to 15.5 ft) sampling interval. RTD is the most appropriate alternative and meets the other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

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- ☒ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth			Alternative Analysis Outcome								
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative					
216-U-3	French Drain	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	Note B	\$180,000	\$396,000		■	Available information indicates this french drain is located south of the U Tank Farm on the south side of 16th Street. The drain is marked with light steel posts/chain and posted with URM signs. The site received condensate from the steam condensers on the 241-U-104 and 241-U-110 Tanks, which held REDOX boiling waste. The french drain operated from 1954 to 1955. The site was deactivated in 1955 when the contents of the tanks were no longer boiling. Sometime before 1985, the site was backfilled. It was noticed that the backfill may have caved-in, so in 1985 the site and cave-in were backfilled again. The site is associated with 241-U-104 and 241-U-110 Tanks and the 200-W-169-PL Pipeline. The depth of the site is approximately 3.7 m (12 ft). A characterization borehole was drilled through the site in 2004, with analytical results showing only low concentrations of several organic constituents. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.			
216-U-7	French Drain	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	\$494,000	\$180,000	\$514,000	■	Available information indicates this french drain is located on the southeast side of the 221-U Building near Section 6. The drain is located in a larger area that has been stabilized and posted with URM signs. The site received liquid wastes from a counting box floor drain during the Uranium Recovery Program inside the 221-U Building. The waste contained nitrate and potentially UNH. The site ran from 1952 to 1957. The site was retired when the Uranium Recovery operations shut down. The site was deactivated by removing cell jumpers in the 221-U Building. The site was surface stabilized in 1998. The site is associated with UPR-200-W-162, UPR-200-W-138, and the 200-W-217-PL pipeline. The depth of the site is approximately 5.2 m (17 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.				
216-U-13	Trench	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	☒	○	①	○	Note A	\$494,000	\$180,000	\$1,061,000	■	Available information indicates this trench is located west of the U Tank Farm. The site is not marked or posted. The site was used as a decontamination pit from 1952 to 1956, using steam and water hoses to remove radioactive contaminants from vehicles, equipment, and pumps from the Uranium Recovery operations. Contaminated soil was removed in the past and taken to the 200 West Area Burial Grounds. The depth of the site is approximately 5.5 m (18 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.				
216-U-14	Ditch	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	②	③	☒	○	②	③	Note A	\$791,000	\$717,000	\$6,007,000	■	This ditch originates west of the 284-W Powerhouse and extends southward, terminating at the 216-U-10 Pond. The site received powerhouse wastewater; laundry wastewater; chemical sewer waste from the 221-U Building; and steam condensate and cooling water from the 221-U Building, 241-U-110 Condenser Tank, 224-U Building, and 242-S Evaporator. All effluent discharges were ceased by 1995. The site was backfilled and stabilized in stages between 1984 and 1995. The site is associated with the 284-W Powerhouse; 2723-W, 2724-W, 221-U, 224-U, and 271-U Buildings; 242-S Evaporator; 241-U-110 Tank; and 200-W-102-PL, 200-W-168-PL, 200-W-222-PL, and 200-W-223-PL Pipelines. In 1981, a soil sample was taken; results detected Cs-137, Sr-90, U-238, Co-60, Pu-239/240, and Tc-99. In 1997, a radiation survey was performed on tumbleweeds at the site. Contamination was detected at 4,000 to 10,000 dpm. The depth of the site is approximately 3 m (10 ft). RTD is the most protective alternative and best meets other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

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- ☒ Does not meet the criterion.
- Indicates the preferred alternative for the waste site.

Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth				Alternative Analysis Outcome							
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative					
216-W-LWC	Crib	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	⊙	⊙	☒	⊙	⊙	⊙	☒	⊙	①	⊙		Note A	\$1,373,000	\$751,000	\$20,200,000	■
216-Z-13	French Drain	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	⊙	⊙	☒	⊙	⊙	⊙	☒	⊙	①	⊙	Note A	\$494,000	\$180,000	\$415,000	■	Available information indicates this french drain is located northeast of the 291-Z Stack. The french drain is visible from the ground and is adjacent to a single cement marker post and metal plate labeled with the site name. The site received emergency condensate from the ET-8 Exhaust Fan Turbine and 291-Z Stack steam condensate and floor drainage. The effluent source has been isolated. The site is associated with the ET-8 Exhaust Fan Turbine, 291-Z Stack, and 200-W-214-PL Pipeline. The depth of the site is approximately 4.9 m (16 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-Z-14	French Drain	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	⊙	⊙	☒	⊙	⊙	⊙	☒	⊙	①	⊙	Note A	\$494,000	\$180,000	\$415,000	■	Available information indicates this french drain is located northwest of the 291-Z Stack. The top of the french drain has been paved over, but is adjacent to a single cement marker post and metal plate labeled with the site name. The site received emergency condensate from the ET-9 Exhaust Fan Turbine and 291-Z Stack steam condensate and floor drainage. The site is associated with the ET-9 Exhaust Fan Turbine, 291-Z Stack, and 200-W-215-PL Pipeline. The depth of the site is approximately 4.9 m (16 ft). CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
216-Z-15	French Drain	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	⊙	☒	⊙	②	③	☒	⊙	②	③	Note A	\$494,000	\$180,000	\$469,000	■	Available information indicates this french drain is located adjacent to the southeast corner of the 2731-Z Building and north of the 291-Z Ventilation Building. The drain is marked with a single concrete marker post and a sign that reads, "Buried Radioactivity – Do Not Excavate." The site received condensate drainage from the 291-Z Building's S-12 Evaporator cooler. The source was rerouted in 1997 and therefore eliminated for this site. The site is associated with the 291-Z Building and the 200-W-216-PL Pipeline. The depth of the site is approximately 7 m (23 ft). RTD is the preferred alternative and best meets CERCLA criteria.
2704-C-WS-1	French Drain	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	⊙	⊙	☒	⊙	⊙	⊙	☒	⊙	①	⊙	Note A	\$494,000	\$180,000	\$405,000	■	Available information indicates this french drain is located on the southwest corner of the 2704-C Building (demolished) in the 200 East Area. The drain is located within a larger gravel area that is posted as a URM. The drain is not visible from the ground surface. The site received steam condensate drainage from an unknown source. The site is associated with the 2704-C Building, 200-E-250-PL Pipeline, and the UPR-200-E-41 area. The depth of the site is unknown. CS/NA is the most appropriate alternative and meets the other CERCLA criteria.
UPR-200-E-17	Unplanned Release	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	⊙	☒	⊙	②	③	☒	⊙	②	③	Note A	\$489,000	\$168,000	\$192,000	■	Available information indicates this unplanned release affected the top of the 216-A-22 Crib, located north of PUREX, north of the 203-A Building, near the 216-A-28 French Drain. The release is not separately marked due to being inside the 203-A radiation zone from the 216-A-22 Crib. The release is described to be uranium (from UNH storage) contamination that was dispositioned to the ground surface due to the failed crib inlet at the 216-A-22 Crib. The site is associated with the 216-A-22 Crib and the 203-A Building. RTD is the most protective alternative and best meets other CERCLA criteria.

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Table 5-4. Assessment of Alternatives Using CERCLA Evaluation Criteria and Selection of the Preferred Removal Action Alternative for Each Waste Site. (16 Pages)

Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth			Alternative Analysis Outcome				
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative	
UPR-200-E-9	Unplanned Release	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	☒	⊙	①	⊙	Note A	\$494,000	\$180,000	\$394,000		■
UPR-200-W-103	Unplanned Release	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	⊙	☒	⊙	②	③	Note A	\$494,000	\$180,000	\$411,000	■	Available information indicates this unplanned release occurred within the Z Plant exclusion area 1.9 m (6 ft) south and 3.7 m (12 ft) west of the southwest corner of the 236-Z Building. The release is not visible from the ground surface. The release is described to have contained approximately 10 g of plutonium with gross alpha contamination greater than 6,000,000 dpm. The site of release was covered over with clean soil (contamination remains under cover). The site is associated with the 216-Z-18 Crib, 234-5 Building, and 236-Z Building. The depth of the site is approximately 2.1 (7 ft). RTD is the most protective alternative and best meets other CERCLA criteria.
UPR-200-W-111	Unplanned Release	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	⊙	☒	⊙	②	③	Note A	\$494,000	\$180,000	\$501,000	■	Available information indicates this unplanned release is located approximately 3 m (10 ft) from the concrete wall on the south side of the 207-U South Retention Basin. In 1997, the area was surface stabilized. The release is described to have been sludge from the 207-U South Retention Basin that was buried in a one-use-only trench adjacent to the retention basin. The contaminated soil then was covered with clean backfill. The site went from an SCA to a URM. The site is associated with the 207-U South Retention Basin. The depth of the site is approximately 3 m (10 ft). RTD is the most protective alternative and best meets other CERCLA criteria.
UPR-200-W-112	Unplanned Release	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	①	☒	⊙	⊙	⊙	☒	⊙	②	③	Note A	\$494,000	\$180,000	\$501,000	■	Available information indicates this unplanned release is located approximately 3 m (10 ft) from the concrete wall on the north side of the 207-U North Retention Basin. In 1997, the area was surface stabilized. The release is described to have been sludge from the 207-U North Retention Basin that was buried in a one-use-only trench on the north side of the retention basin. The contaminated soil then was covered with clean backfill. The site went from an SCA to a URM. The site is associated with the 207-U North Retention Basin. The depth of the site is approximately 3 m (10 ft). RTD is the most protective alternative and best meets other CERCLA criteria.

Ranking of Alternatives for Individual CERCLA Criteria:

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Waste Site Code	Site Type	Overall Protection			Compliance with ARARs			Long-Term Effectiveness			Reduction in TMV			Short-Term Effectiveness			Implementability			Present Worth				Alternative Analysis Outcome												
		No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	No Action	MESC/IC/MNA	CS/NA	RTD	Key Site Information and Rationale for Selected Alternative										
UPR-200-W-138	Unplanned Release	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	①	☒	○	○	②	③	☒	○	○	②	③	Note A	\$489,000	\$168,000	\$163,000					<p>■ Available information indicates this unplanned release is located on the northwest corner of the 221-U Building near the R-3 entrance within the UPR-200-W-162 area. The area where this release occurred has been surface stabilized and posted as a URM. The release is described as approximately 140 kg of UNH solution, containing 14 kg (30.9 lb) of uranium discharged to the ground through the 216-U-7 French Drain. In 1998, CAs on the east side of the 221-U Building were covered with clean backfill. The site is associated with the 221-U Building vessel vent blower pit, UPR-200-W-162, and the 216-U-7 French Drain. The depth of the site is unknown. RTD is the most protective alternative and best meets other CERCLA criteria.</p>

Note A: The No-Action Alternative was retained for detailed analysis as a baseline description of the effects of taking no action as required by CERCLA regulations. This alternative cannot be considered for the 200-MG-2 OU waste sites because of the absence of characterization data. Hence, there is no cost listed for this alternative.

Note B: No cost in the MESC/IC/MNA category indicates a site with no stabilization cover and no backfill according to WIDS. Sites that do not have a stabilization cover but have been backfilled may still be considered for MESC/IC/MNA.

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ARAR = applicable or relevant and appropriate requirement.

bgs = below ground surface.

CA = contaminated area.

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980.*

CS/NA = confirmatory sampling/no action.

cpm = counts per minute.

dpm = disintegrations per minute.

MESC/IC/MNA = maintain existing soil cover/institutional controls/monitored natural attenuation.

mR = milliroentgen.

OU = operable unit.

PUREX = Plutonium-Uranium Extraction Plant.

REDOX = Reduction-Oxidation Plant.

RTD = removal, treatment, and disposal.

SCA = soil contamination area.

TMV = toxicity, mobility, and volume.

UNH = uranyl nitrate hexahydrate.

UPR = unplanned release.

URM = underground radioactive material.

WIDS = *Waste Information Data System* database.

Ranking of Alternatives for Individual CERCLA Criteria:

①②③ Circles indicate the criterion is met. The numbers designate the relative ranking in meeting the criterion among the alternatives.

○ Indicates an alternative that was not evaluated because COPC concentrations are expected to be below PRCLs.

☒ Does not meet the criterion.

■ Indicates the preferred alternative for the waste site.

6.0 CONCLUSIONS AND RECOMMENDED ALTERNATIVES

Chapter 4.0 provided a description of the four alternative removal actions, and Chapter 5.0 analyzed each of the alternatives against the three CERCLA evaluation criteria for non-time-critical removal actions: effectiveness, implementability, and cost. This chapter provides a summary of the preferred removal actions and the path forward for implementing the removal actions for the 200-MG-2 OU waste sites.

6.1 SUMMARY OF PREFERRED REMOVAL ACTIONS

Table 6-1 summarizes the present worth costs of the preferred removal alternatives across all waste sites. The 200-MG-2 OU preferred removal actions have a present worth cost of \$33,177,000. The type, size, and extent of hazardous substance contamination vary considerably across the 200-MG-2 OU waste sites. Thus, it is not possible to prepare meaningful unit cost factors based on area or waste volume removed from the analysis in this OU.

Table 6-1. Summary of the 200-MG-2 Operable Unit Waste Site Preferred Removal Actions.

Preferred Alternative	Number of Waste Sites	Present Worth
NA	0	\$0
MESC/IC/MNA	1	\$494,000
CS/NA	38	\$7,049,000
RTD	31	\$25,634,000
Total	70	\$33,177,000

CS/NA = confirmatory sampling/no action.

MESC/IC/MNA = maintain existing soil cover/institutional controls/monitored natural attenuation.

NA = no action.

RTD = removal, treatment, and disposal.

The preferred removal action for each site is summarized in Tables 6-2, 6-3, and 6-4 for MESC/IC/MNA, CS/NA, and RTD, respectively. As discussed earlier, the NA alternative was not selected as the preferred alternative for any of the 200-MG-2 waste sites.

Table 6-2. Waste Sites with MESC/IC/MNA Preferred Removal Action Alternative.

Waste Site Code	Waste Site Type	Present Worth
207-S	Retention Basin	\$494,000

MESC/IC/MNA = maintain existing soil cover/institutional controls/monitored natural attenuation.

Table 6-3. Waste Sites with CS/NA Preferred Removal Action Alternative.

Waste Site Code	Waste Site Type	Present Worth	Waste Site Code	Waste Site Type	Present Worth
200-E-4	French Drain	\$180,000	216-C-4	Crib	\$180,000
200-E-71	Injection/ Reverse Well	\$122,000	216-S-16D	Ditch	\$168,000
200-E-73	Injection/ Reverse Well	\$122,000	216-S-18	Trench	\$180,000
200-E-74	Injection/ Reverse Well	\$122,000	216-S-25	Crib	\$180,000
200-E-84	Injection/ Reverse Well	\$122,000	216-T-1	Ditch	\$180,000
200-W-118	Injection/ Reverse Well	\$122,000	216-T-9	Trench	\$168,000
209-E-WS-2	French Drain	\$168,000	216-T-10	Trench	\$168,000
216-A-11	French Drain	\$180,000	216-T-11	Trench	\$168,000
216-A-12	French Drain	\$180,000	216-T-13	Trench	\$180,000
216-A-13	French Drain	\$180,000	216-T-29	French Drain	\$168,000
216-A-14	French Drain	\$180,000	216-T-31	French Drain	\$180,000
216-A-26	French Drain	\$180,000	216-U-3	French Drain	\$180,000
216-A-26A	French Drain	\$180,000	216-U-7	French Drain	\$180,000
216-A-32	Crib	\$180,000	216-U-13	Trench	\$180,000
216-A-33	French Drain	\$180,000	216-W-LWC	Crib	\$751,000
216-A-35	French Drain	\$180,000	216-Z-13	French Drain	\$180,000
216-A-38-1	Crib	\$180,000	216-Z-14	French Drain	\$180,000
216-A-41	Crib	\$180,000	2704-C-WS-1	French Drain	\$180,000
216-B-13	French Drain	\$180,000	UPR-200-E-9	Unplanned Release	\$180,000
Total Present Worth for CS/NA sites: \$7,049,000					

CS/NA = confirmatory sampling/no action.

Table 6-4. Waste Sites with RTD Preferred Removal Action Alternative.

Waste Site Code	Waste Site Type	Present Worth	Waste Site Code	Waste Site Type	Present Worth
200-E-25	French Drain	\$401,000	216-A-22	Crib/French Drain	\$544,000
200-E-55	French Drain	\$424,000	216-B-51	French Drain	\$469,000
200-E-65	Injection/ Reverse Well	\$152,000	216-S-12	Trench	\$527,000
200-E-67	Injection/ Reverse Well	\$134,000	216-SX-2	Crib	\$519,000
200-E-68	Injection/ Reverse Well	\$152,000	216-T-4-1D	Ditch	\$1,607,000
200-E-70	Injection/ Reverse Well	\$134,000	216-T-4-2	Ditch	\$2,784,000
200-E-77	Injection/ Reverse Well	\$152,000	216-T-12	Trench	\$413,000
200-E-79	Injection/ Reverse Well	\$157,000	216-T-33	Crib	\$470,000
200-W-107	Injection/ Reverse Well	\$134,000	216-U-14	Ditch	\$6,007,000
200-W-108	Injection/ Reverse Well	\$147,000	216-Z-15	French Drain	\$469,000
200-W-109	Injection/ Reverse Well	\$134,000	UPR-200-E-17	Unplanned Release	\$192,000
200-W-111	Injection/ Reverse Well	\$134,000	UPR-200-W-103	Unplanned Release	\$411,000
207-A NORTH	Retention Basin	\$1,711,000	UPR-200-W-111	Unplanned Release	\$501,000
207-T	Retention Basin	\$2,617,000	UPR-200-W-112	Unplanned Release	\$501,000
207-U	Retention Basin	\$2,617,000	UPR-200-W-138	Unplanned Release	\$163,000
Total Present Worth for RTD sites:		\$25,634,000			

RTD = removal, treatment, and disposal.

6.2 200-MG-2 OPERABLE UNIT PATH FORWARD

The path forward following public release of this EE/CA includes the following:

- Public review and comment. During this period, the public will have an opportunity to review this EE/CA, and comment on the analyses and preferred removal actions.
- Action Memorandum. An Action Memorandum will be prepared after the public review and comment period that provides a concise written record of the decisions for the OU waste sites and removal action alternatives. The Memorandum will describe the site

1 histories, current activities, and human health and environmental risks. It will outline the
2 proposed actions and costs, and documents the approval of the proposed action by the
3 DOE-Richland Operations Office and the lead regulatory agency. Tri-Party Agreement
4 Milestone M-015-49B-T01 makes the following commitment for the 200-MG-2 OU:

5 “A draft action memorandum for the 200-MG-2 OU will be submitted
6 with a proposed set of M-016 series of interim milestones to establish
7 specific schedules, adjusted to site priorities, to complete the remediation
8 field work by 2024. The proposed set of M-016 milestones will include a
9 process to reevaluate priorities annually.”

- 10 • RAWP. The RAWP will provide a description of the work to be done and applicable
11 PRCLs.
- 12 • Removal action implementation. The culmination of the regulatory and planning
13 documents is the field implementation of the removal actions, including verification that
14 PRCLs and RAOs have been achieved.

15 The path forward is graphically summarized in Figure 6-1. Removal actions at the 200-MG-2
16 OU waste sites may have a lower priority for cleanup than other Hanford OU waste sites because
17 they are expected to pose relatively little potential risk to human health and the environment.
18 Thus, the 200-MG-2 OU removal actions may be performed opportunistically or to complement
19 other ongoing cleanup actions. The 200-MG-2 OU RAWP will contain more schedule details
20 and will be submitted to DOE and EPA for review and approval.

21 Because characterization data do not exist for most of the 200-MG-2 waste sites, the
22 observational screening and excavation guidance activities may reveal different site conditions
23 than presently understood. This necessitates the ability to change the preferred alternative as
24 characterization data become available. Decision logic has been developed to describe how the
25 site removal action may shift from one alternative to another based on the assessment of
26 characterization data. This decision logic begins with the preferred waste site removal
27 alternative developed in Chapter 5.0, and is shown in Figure 6-2 for MESC/IC/MNA, Figure 6-3
28 for CS/NA, and Figure 6-4 for RTD.

29 The initial site screening or confirmatory sampling activities will be used to determine
30 compliance with the PRCLs and the potential need to consider other alternatives. For example,
31 contamination may be found to extend deeper than 4.6 m (15 ft) bgs before reaching the depth of
32 unimpacted soil at some sites. Because these sites are outside the expected conditions for a
33 200-MG-2 OU waste site, DOE will discuss the next steps (e.g., sampling to determine
34 contamination depth, or transfer site to another OU) with EPA. After the completion of the
35 waste site removal activity, site completion activities will be performed as specified in
36 the RAWP.

Figure 6-1. General Path Forward.

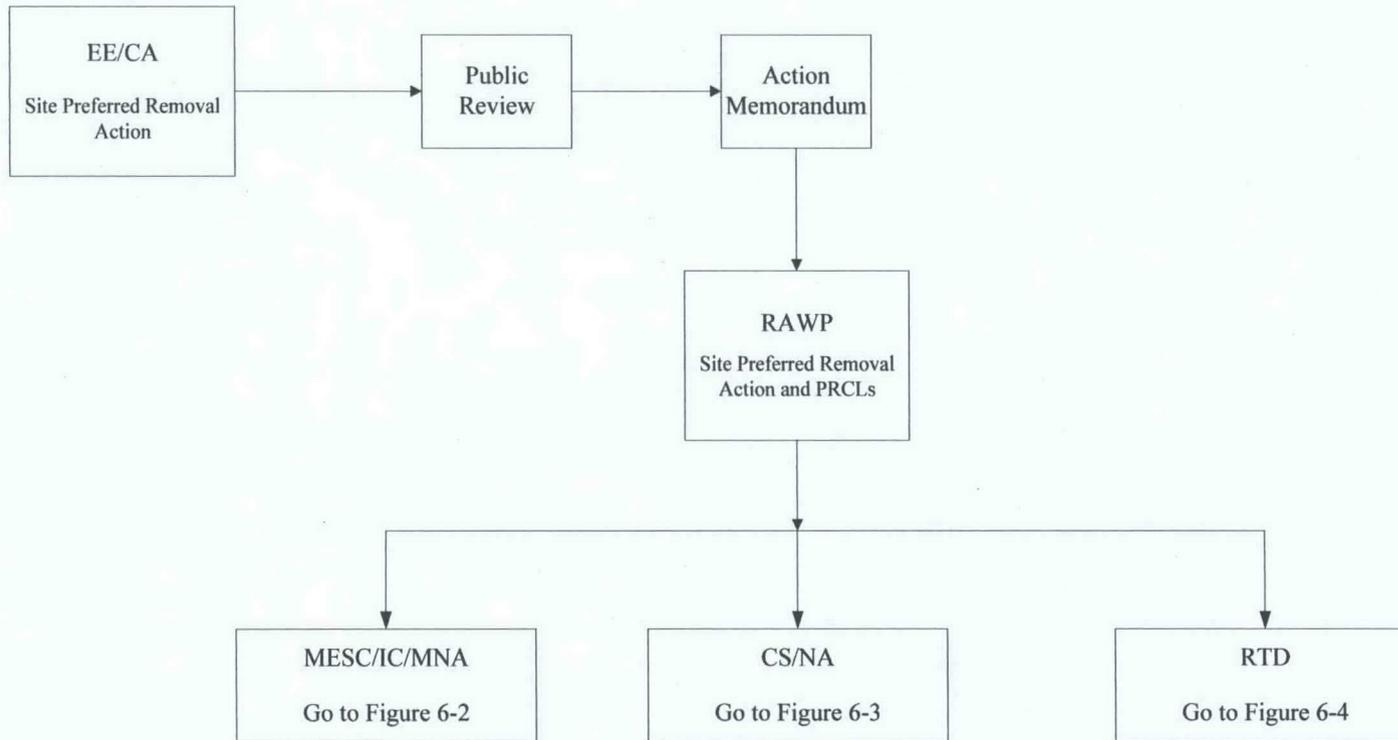
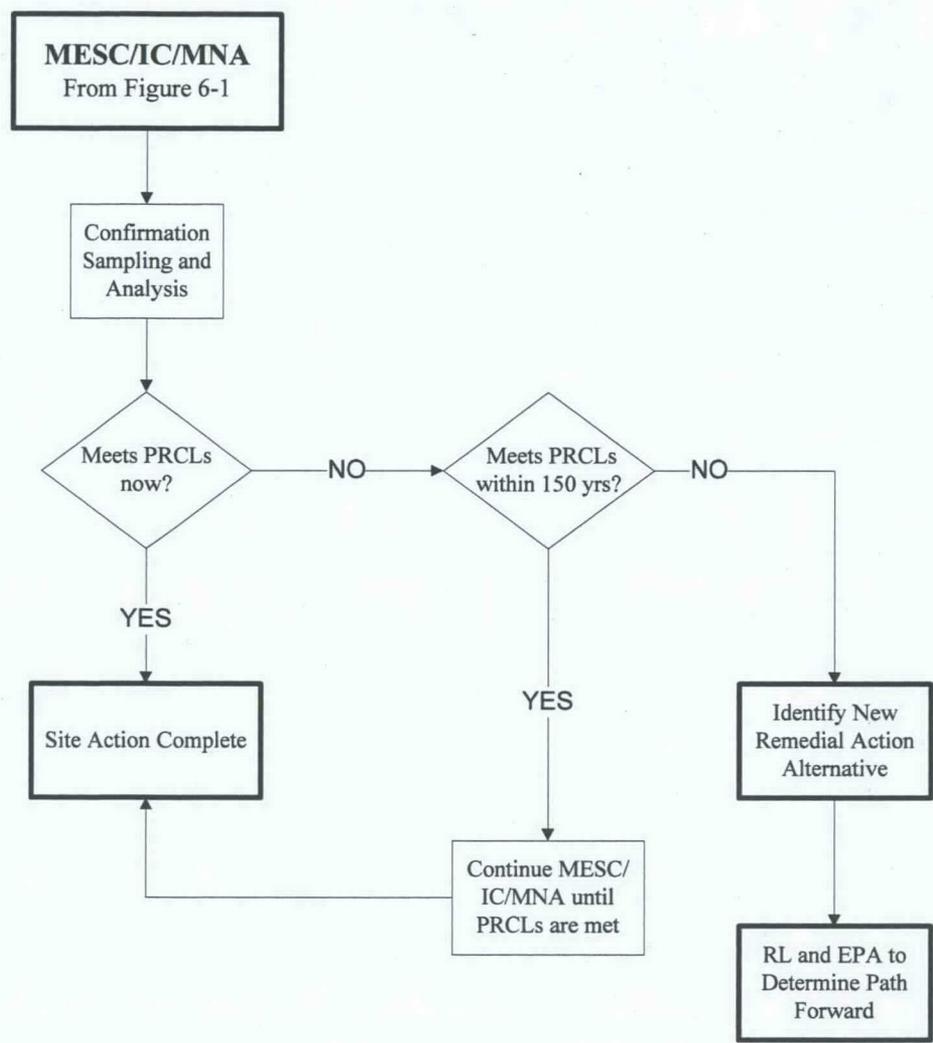
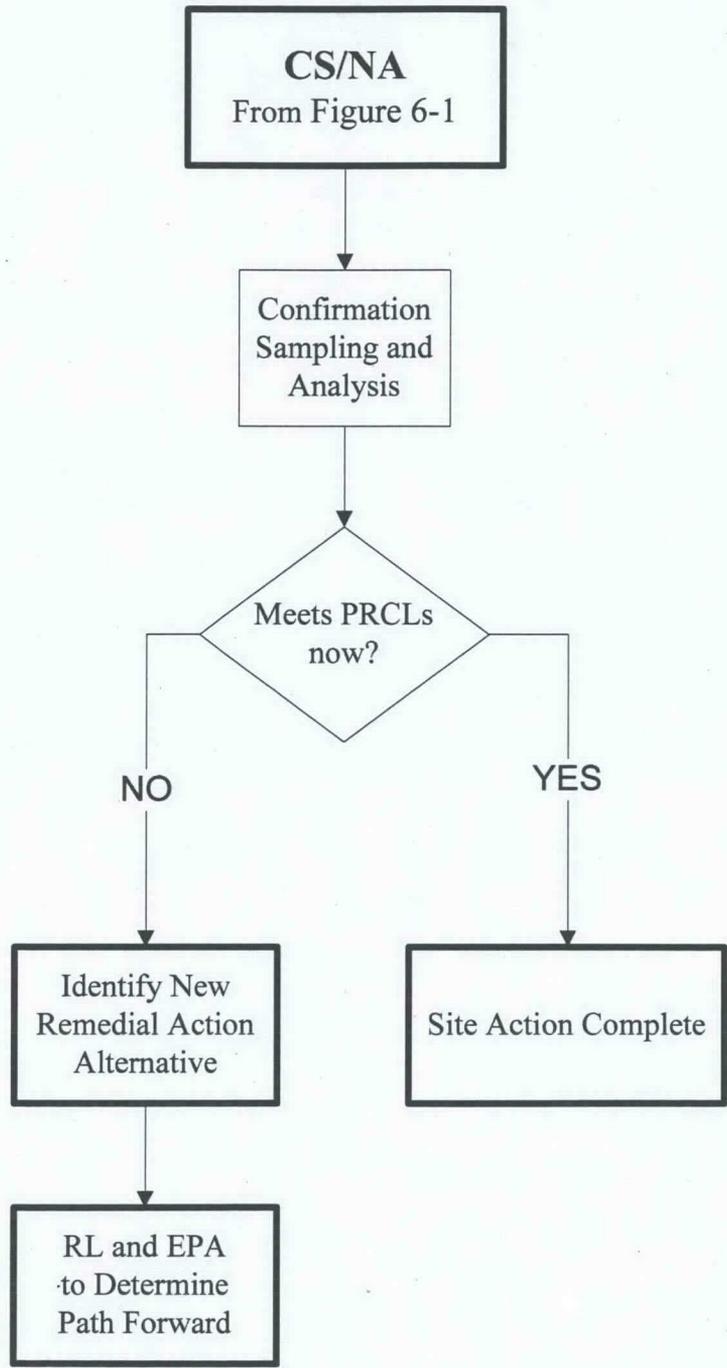


Figure 6-2. Removal Action Decision-Making Process for MESC/IC/MNA Alternative.



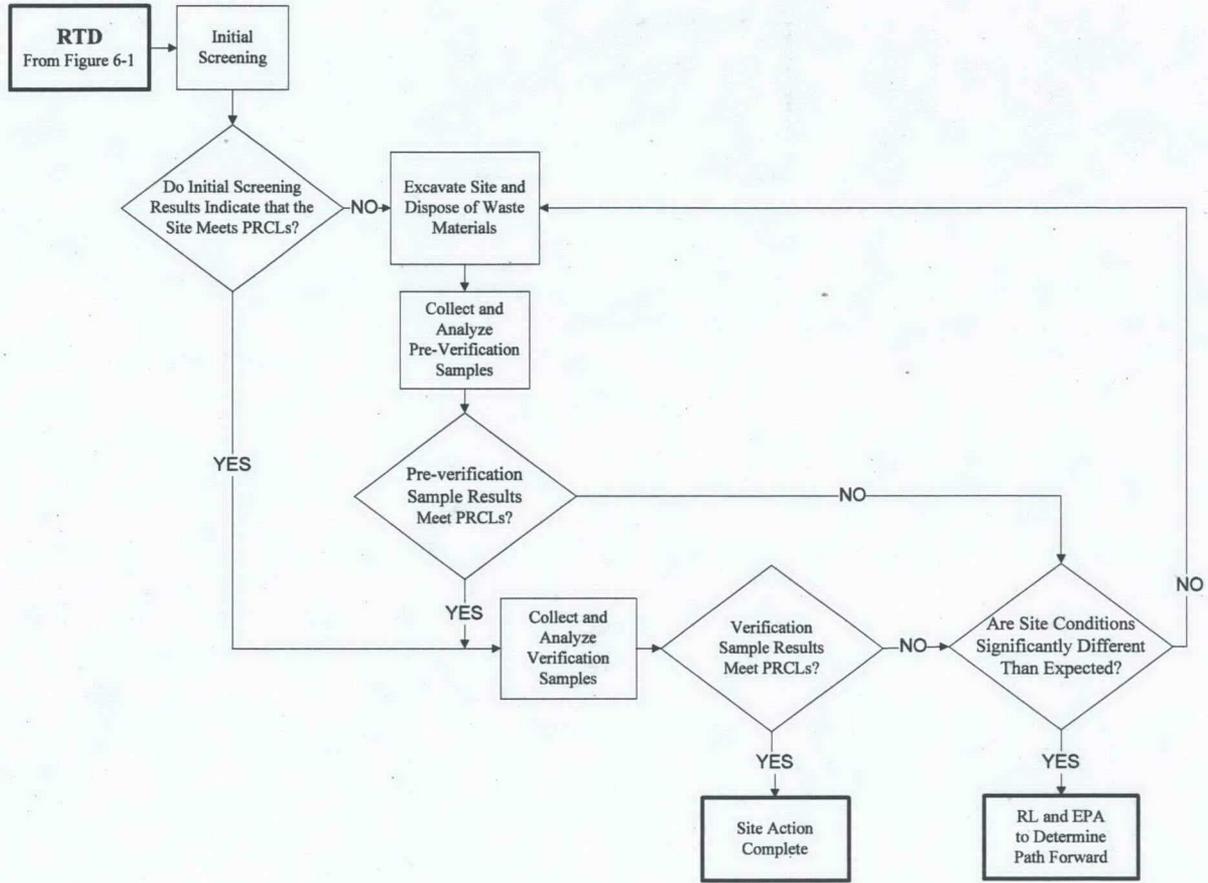
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Figure 6-3. Removal Action Decision-Making Process for CS/NA Alternative.



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Figure 6-4. Removal Action Decision-Making Process for RTD Alternative.



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APPENDIX A
WASTE SITE SUMMARY

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200-E-25

Site Name: 200-E-25, 272-BB French Drain, Insulation Shop French Drain, Miscellaneous Stream #659

Site Type: French Drain

Current OU: 200-MG-2

Facility: B Plant Area

Former OU: 200-MW-1

Waste Site Description:

The dry well is located approximately 6 m (20 ft) north of the northeast corner of the 272-BB Insulation Shop. The french drain structure is not visible from the surface, but its location is marked with an old sign, "Asbestos Waste Disposal Site - Do No Excavate", mounted on two support posts. Asbestos is regulated as a hazardous substance under CERCLA. A sign, "200-E-25", is attached to one of the support posts. Material used in the 272-BB Insulation Shop that possibly could have been flushed into the sink or floor drain includes: Calcium Silicate, Fiberglass, Silicate, "Airball" (an insulation cover material) and latex paint. Prior to 1988, it is possible that organic chemicals, oils and grease may have been introduced into the french drain. The building sink and floor drain were connected to the dry well via a 5.1 cm (2 in.), schedule 40, carbon steel pipe. A 0.4 m (1.5 ft) diameter, 36 in. tall grease trap with a removable cover is located on the east side of the 272-BB building. Percolating water around the french drain was noted in 1990 indicating a broken or plugged drain line from the insulation shop. The Facility Compliance group recommended all discharges from the building be discontinued as of September 1991. The installation of a replacement drainage system was proposed. However, due to complicated regulatory issues, it was decided to remove the sink from the building and plug the floor drain with concrete. The insulation shop no longer has any water supply or any other drains.

Related Site Structure: The site is associated with the 272-BB building and the 200-E-209-PL pipeline.

Site Posting: Old sign, Mounted on two support posts. The sign says "Asbestos Waste Disposal site- Do Not Excavate" Sign

Release Mechanism: Effluent from a sink and floor drain

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	2.7 m (9.0 ft)
Site Width:	0.6 m (2.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.3 m ² (3.1 ft ²)		

Potential Contaminants:

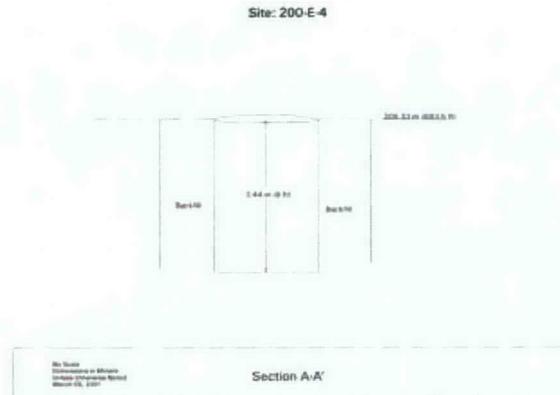
	Type	Constituents
Radiological	None	None
Nonradiological	X	Asbestos, Calcium Silicate, Fiberglass, Silicate, "Airball" (an insulation cover material), Latex paint, organic chemicals, oil and grease.

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 401,251

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

200-E-4

Site Name: 200-E-4, Critical Mass Laboratory Dry Well North, 209-E North Dry Well, Miscellaneous Stream #730
Site Type: French Drain
Current OU: 200-MG-2
Facility: Semi-Works Area
Former OU: 200-MW-1

Waste Site Description:

The site is located approximately 7.6 m (25 ft) north of the northwest corner of the 209-E Critical Mass Laboratory Service Building. The site is a 1.2 m (4 ft) diameter dry well, covered with a yellow metal cover. The waste was steam condensate from the steam trap in the valve pit plus steam condensate from the equipment room.

Related Site Structure: The site is connected to 209-E Critical Mass Lab via underground piping (see site code 200-E-249-PL).

Site Posting: Not Specified

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	3.4 m (11.0 ft)
Site Width:	1.2 m (4.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	1.2 m ² (12.5 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	X	Ba, Cu

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

200-E-65

No Image Available

Site Name: 200-E-65, 202A Building Steam Condensate, Miscellaneous Stream #466 Injection Well (R)
Site Type: Injection/Reverse Well **Facility:** Purex Area
Current OU: 200-MG-2 **Former OU:** 200-MW-1

Waste Site Description:

The site is located on the southeast corner of 202-A, east of railroad tunnel #1 (218-E-14), inside posted boundaries site code 200-E-107, that has been recently stabilized and downposted to an URM area. The site is a 1.2 m (4 ft) diameter concrete drain with a metal plate cover and is flush with the ground surface. On 10/15/98, the inside of the drain was dry. The site received non-contaminated steam condensate. However, the drain is located within an area that had been posted as a RCA (see site code 200-E-107). A radiation survey done in October 1998 did not detect any contamination. Stream #466 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams Report and placed on the INACTIVE list (Table 3) in April 1996. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion.

Related Site Structure: The site is associated with the PUREX facility and 200-E-107.

Site Posting: URM

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	1.2 m (4.0 ft)
Site Width:	1.2 m (4.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	1.1 m ² (12.6 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	Unknown	Unknown

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 151,839

References:

WIDS General Summary Report, DOE/RL-2001-65

200-E-67

No Image Available

Site Name: 200-E-67, 202A Building Steam Condensate, Miscellaneous Stream #494**Site Type:** Injection/Reverse Well**Facility:** Purex Area**Current OU:** 200-MG-2**Former OU:** 200-MW-1**Waste Site Description:**

The site is located adjacent to the south wall of 202-A. The drain is located inside a dome shaped caisson that is surrounded by post and chain and posted with CA signs. The dome is labeled 202-A-417. Approximately 3.7 acres of previously posted CA was stabilized in 1999 (WIDS 200-E-103). This site is within the stabilized area, but is separately posted as a CA. The source has been eliminated. The site was removed from the ACTIVE list (table 2) and placed on the INACTIVE list (Table 3 of the Inventory of Miscellaneous Streams Report) in 1996.

Related Site Structure: The site is associated with the 202-A-417 Catch tank.**Site Posting:** CA**Release Mechanism:** Drain**Release Type:** Liquid**Dimensions (estimated):****Site Length:** Irregular m (Irregular ft)**Site Depth:** Unknown m (Unknown ft)**Site Width:** Unknown m (Unknown ft)**Cover Thickness:** 0 m (0 ft)**Site Area:** Unknown m² (Unknown ft²)**Potential Contaminants:**

Potential Contaminants:		Constituents
	Type	
Radiological	X	Unknown
Nonradiological	Unknown	Unknown

Preferred Removal Action: RTD**Estimated Removal Action Present Worth:** 134,294**References:**

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

200-E-68

No Image Available

Site Name: 200-E-68, 291A Control House Steam Condensate, Miscellaneous Stream #59, Injection Well (L)

Site Type: Injection/Reverse Well

Facility: Purex Area

Current OU: 200-MG-2

Former OU: 200-MW-1

Waste Site Description:

The site, a 1.2 m (4 ft) diameter drain with a metal cover, is located south of PUREX, between the 291-A stack exhaust fans and the 292-AB stack building. It is on the southeast corner of 291-A building. It is located inside a CA, which surrounds the 291-A building and stack structures. Several disconnected, asbestos-covered steam lines hang above it. The site received non-contaminated steam condensate, but is located inside a posted CA. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam that was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion.

Related Site Structure: The site is associated with the 291-A control house.

Site Posting: Located within a large CA area.

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	Unknown m (Unknown ft)
Site Width:	1.2 m (4.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	1.2 m ² (12.6 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	Unknown	Unknown

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 151,839

References:

WIDS General Summary Report, DOE/RL-2001-65

200-E-70

No Image Available

Site Name: 200-E-70, Line #8801 Steam Condensate, Miscellaneous Stream #64, Injection Well (Q)

Site Type: Injection/Reverse Well

Facility: Purex Area

Current OU: 200-MG-2

Former OU: 200-MW-1

Waste Site Description:

The site is located south of 202A, on the east side of the railroad tunnel #1 (218-E-14). In 1998, the site was inside the PUREX SCA (200-E-107). The site is a 0.9 m (3 ft) diameter drain with four holes in the cover located 2.1 m (7 ft) east of the steam line. The drain is located inside a large Radiologically Controlled Area (site code 200-E-107). 200-E-107 had been a surface Soil Contamination Area. The drain received non-contaminated steam condensate. There are several open-ended, cut pipes. It is assumed these pipes once were connected to the drain cover. The cover is posted with Confined Space signs, but on 5/18/00, it was located inside a posted CA. However, the drain had been located within a large Soil Contamination Area (200-E-107). In 1998, 10,000 dpm beta/gamma were detected on the steam pipes and in the gravel using a hand held instrument. The metal cover on the drain read less than 10,000 dpm. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam that was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. W.M. Hayward stated that he believed the steam in this line was clean, so the contamination in this location is likely from the same sources as contributed to the rest of the surrounding CA, which are emissions from years of PUREX operations.

Related Site Structure: None

Site Posting: Confined Space signs, CA and "URM"

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length: None m (None ft)

Site Depth: Unknown m (Unknown ft)

Site Width: 0.9 m (3.0 ft)

Cover Thickness: 0.3-0.6 m (1-2 ft)

Site Area: 0.7 m² (7.0 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 134,294

References:

WIDS General Summary Report, DOE/RL-2001-65

200-E-71

No Image Available

Site Name: 200-E-71, Line #8801 Steam Condensate, Miscellaneous Stream #63, Injection Well (O)
Site Type: Injection/Reverse Well **Facility:** Purex Area
Current OU: 200-MG-2 **Former OU:** 200-MW-1

Waste Site Description:

The site is located south of 202-A, on the west side of the 218-E-14 Tunnel and adjacent to the southeast side of 216-A-11. The site is a man-made hole under the steam line. It is approximately 0.9 m (3 ft) deep and 0.61 m (2 ft) wide. The site received non-contaminated steam condensate. There is no drain structure. The drain was not covered with backfill material. The steam vented directly into the soil. However, it had been located inside a larger area that was posted as a SCA (see site code 200-E-103). Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam that was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. The effluent to this drain was eliminated when the 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. The source has been abandoned, but the lines have not been capped. Stream #56 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams Report and placed on the INACTIVE list (Table 3) in May 1998.

Related Site Structure: None
Site Posting: URM

Release Mechanism: Steam condensate
Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	0.9 m (3.0 ft)
Site Width:	0.6 m (2.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.3 m ² (3.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 121,529

References:

WIDS General Summary Report, DOE/RL-2001-65

200-E-73

No Image Available

Site Name: 200-E-73, Line #8801 Steam Condensate, Miscellaneous Stream #61, Injection Well (M)

Site Type: Injection/Reverse Well

Facility: Purex Area

Current OU: 200-MG-2

Former OU: 200-MW-1

Waste Site Description:

The site is located near the south wall of 202A, between 202A and the 291AH Ammonia Off-gas filter building, adjacent to the south side of 291-AD. The site is a 0.9 m (3 ft) diameter concrete structure with a rusty metal cover. The site received steam condensate from the 8801 steam line. The stream was moved from the ACTIVE list (Table 2) to the INACTIVE list (Table 3) of the Inventory of Miscellaneous Streams Report in 1996. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion.

Related Site Structure: The site is associated with 200-E-103.

Site Posting: CA

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	unknown m (unknown ft)
Site Width:	0.9 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.7 m ² (7.0 ft ²)		

Potential Contaminants:

		Type	Constituents
Radiological		None	None
Nonradiological		None	None

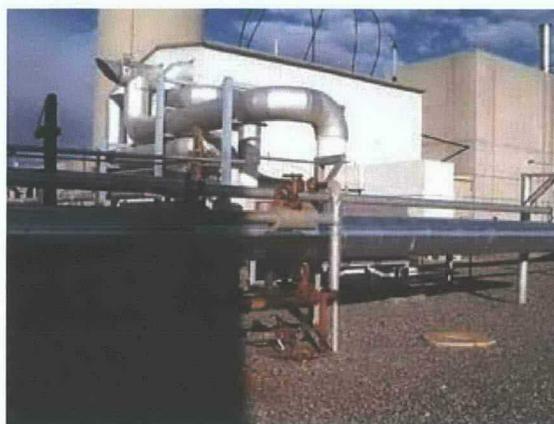
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 121,529

References:

WIDS General Summary Report, DOE/RL-2001-65

200-E-74



Site Name: 200-E-74, Line #8801 Steam Condensate, Miscellaneous Stream #62, Injection Well (N)
Site Type: Injection/Reverse Well
Current OU: 200-MG-2

Facility: Purex Area
Former OU: 200-MW-1

Waste Site Description:

The site is located southeast of 202A, on the west side of the 218-E-14 tunnel. The site is a 0.9 m (3 ft) diameter drain with a rusty metal cover. On October 15, 1998, the inside of the covered drain was inspected. The drain was dry, but rust stained. The site received non-contaminated steam condensate, but is located within an area that had been posted as a SCA (200-E-103). Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. The steam condensate to this drain was eliminated when the 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. Stream #62 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams Report and placed on the INACTIVE list (Table 3) in May 1998.

Related Site Structure: None

Site Posting: Located within a large CA area.

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	0.9 m (3.0 ft)
Site Width:	0.9 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.7 m ² (7.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 121,529

References:

WIDS General Summary Report, DOE/RL-2001-65

200-E-77

No Image Available

Site Name: 200-E-77, Line #8801 Steam Condensate, Miscellaneous Stream #65, Injection Well (S)
Site Type: Injection/Reverse Well
Current OU: 200-MG-2
Facility: Purex Area
Former OU: 200-MW-1

Waste Site Description:

The site is located on the northeast corner of 202-A. The site received non-contaminated steam condensate but is inside a posted CA (see 200-E-107). The site is a 1.2 m (4 ft) diameter concrete structure with a metal cover. The structure is slightly above grade and is filled with rocks. On 10/15/98, the inside of drain was dry. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. The effluent to this drain was eliminated when the 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. Stream #65 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams Report and placed on the INACTIVE list (Table 3) in May 1998.

Related Site Structure: None

Site Posting: URM, Located within a large CA area.

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	0.9 m (3.0 ft)
Site Width:	1.2 m (4.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	1.2 m ² (12.6 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 151,839

References:

WIDS General Summary Report, DOE/RL-2001-65

200-E-79

No Image Available

Site Name: 200-E-79, Line #8801 Steam Condensate, Miscellaneous Stream #66, Injection Well (T)**Site Type:** Injection/Reverse Well**Facility:** B Farm Area**Current OU:** 200-MG-2**Former OU:** 200-MW-1**Waste Site Description:**

The site is located on the southeast corner of the PUREX Railroad Cut inside a posted radiologically posted area known as 200-E-107. The site is a 0.9 m (3 ft) diameter concrete drain under a steam line with a metal cover. There is a rusty pipe going into the drain. On October 15, 1998, the inside of the drain was dry. Although the drain received non-contaminated steam condensate, it is located inside an area that had been a posted CA (200-E-107). Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. The 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. Stream #66 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams Report and placed on the INACTIVE list (Table 3) in May 1998.

Related Site Structure: None**Site Posting:** URM, Located within a large CA area.**Release Mechanism:** Steam condensate**Release Type:** Liquid**Dimensions (estimated):**

Site Length:	None m (None ft)	Site Depth:	1.2 m (4.0 ft)
Site Width:	0.9 m (3.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	0.7 m ² (7.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: RTD**Estimated Removal Action Present Worth:** 156,738

References:

WIDS General Summary Report, DOE/RL-2001-65

200-E-84

No Image Available

Site Name: 200-E-84, 202A Building Steam Condensate, Miscellaneous Stream #58, Injection Well (C)

Site Type: Injection/Reverse Well

Facility: Purex Area

Current OU: 200-MG-2

Former OU: 200-MW-1

Waste Site Description:

The drain is located on the west end of 202-A, under the filter banks inside a RBA. The site is a 0.9 m (3 ft) diameter, gravel-filled french drain that received steam condensate. The drain is flush with the surrounding gravel surface except for a small lip on one side. A steel drain pipe extends over the french drain. The drain was installed to receive steam condensate. The Inventory of Miscellaneous Streams Report states the steam source has been eliminated and that it is a gravel-filled french drain with no cover that has a potential to receive stormwater runoff. A site walkdown in 1998 determined the pipe above the drain is a pressure relief valve associated with the PUREX building steam system. The pressure relief valve was isolated during PUREX deactivation. The walkdown team believes the drain is not physically located such that it would collect stormwater runoff. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam that was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. During a site visit on October 15, 1998, Gary MacFarlan explained that the RBA was posted here because of a dose rate associated with the filter banks, not a contamination issue. Miscellaneous Stream #58 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Stream Report and placed on the INACTIVE list (Table 3) in 1996.

Related Site Structure: None

Site Posting: Located inside a large RB area

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	unknown m (unknown ft)
Site Width:	0.9 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.7 m ² (7.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 121,529

References:

WIDS General Summary Report, DOE/RL-2001-65

200-W-107

Site Name: 200-W-107, Miscellaneous Stream #685, 222-U Building Stormwater Runoff

Site Type: Injection/Reverse Well

Facility: U Plant Area

Current OU: 200-MG-2

Former OU: 200-MW-1

Waste Site Description:

The site is located six feet east of the back wall of the 222-U Building, just west of 216-U-4B within the gravel area known as 200-W-136. The site is a covered cement french drain which is considered to be active. The yellow metal cover has a slot on one side and is level with the surrounding gravel covered ground. No aboveground pipes were visible extending from the building to the drain. The drain lid is posted with a CA sign and a label stating "This is Not a Confined Space". Documentation states that the site received storm water runoff from the east side or backside of the 222-U Building. During the site walkdown, however, it was unclear how the drain received storm water because no pipes were observed extending from the building into the drain. Coordinates from DOE/RL-88-11 show the site further south than actually located during the site walkdown.

Related Site Structure: This site is associated with the 222-U Building.

Site Posting: URM "Not a confined space"

Release Mechanism: Stormwater runoff

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	unknown m (unknown ft)
Site Width:	0.8 m (2.5 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	0.5 m ² (4.9 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 134,294

References:

WIDS General Summary Report,

200-W-108

Site Name: 200-W-108, Miscellaneous Stream #687, 222-U Building Stormwater Runoff
Site Type: Injection/Reverse Well
Current OU: 200-MG-2
Facility: U Plant Area
Former OU: 200-MW-1

Waste Site Description:

The site is located on the northeast corner (back side) of the 222-U Building within the gravel area known as 200-W-136. The site is a covered cement french drain which is considered to be active. The yellow metal cover has a slot on one side and is level with the surrounding gravel covered ground. There are no postings on the yellow metal cover and no aboveground pipes were visible extending into the drain which is level with the surrounding gravel covered ground. The yellow drain lid was moved to the side, revealing a 0.76 m (2.5 ft) diameter dry culvert, approximately 1.2 m (4 ft) deep. No aboveground pipes are currently visible extending to the culvert. Coordinates from the DOE/RL-88-11 correspond with the diagram. No pipelines were visible leading to the french drain. Documentation states that the site received stormwater runoff from the east side or backside of the 222-U Building. During the site walkdown, however, it was unclear how the drain received stormwater because no pipes were observed extending from the building into the drain.

Related Site Structure: The drain is associated with the demolished 222-U building and the 200-W-136 remediation area.

Site Posting: URM "Not a confined space"

Release Mechanism: Stormwater runoff

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	1.2 m (4.0 ft)
Site Width:	0.8 m (2.5 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	0.5 m ² (4.9 ft ²)		

Potential Contaminants:

		Type	Constituents
Radiological		None	None
Nonradiological		None	None

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 147,431

References:

WIDS General Summary Report,

200-W-109

No Image Available

Site Name: 200-W-109, Miscellaneous Stream #521, 222-U Building Stormwater Runoff**Site Type:** Injection/Reverse Well**Facility:** U Plant Area**Current OU:** 200-MG-2**Former OU:** 200-MW-1**Waste Site Description:**

The site is located on the east side (backside) of the 222-U Building just southwest of the 200-W-108 site and within the gravel area known as 200-W-136. The site is a covered cement french drain which is considered to be active. The yellow metal cover has a slot on one side and is level with the surrounding gravel covered ground. There are no postings on the yellow metal cover and no aboveground pipes were visible extending to the drain. The drain is ground level and filled with sand. Documentation states that the site received stormwater runoff from the east side or backside of the 222-U Building. During the site walkdown, however, it was unclear how the drain could have received stormwater because no pipes were observed extending from the building into the drain and the drain is filled to the top with compacted sand.

Related Site Structure: This site is associated with the 222-U Building.**Site Posting:** URM "Not a confined space"**Release Mechanism:** Stormwater runoff**Release Type:** Liquid**Dimensions (estimated):**

Site Length:	None m (None ft)	Site Depth:	unknown m (unknown ft)
Site Width:	0.8 m (2.5 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	0.5 m ² (4.9 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: RTD**Estimated Removal Action Present Worth:** 134,294**References:**

WIDS General Summary Report,

200-W-111

Site Name: 200-W-111, Miscellaneous Stream #394, 222-U Building Stormwater Runoff

Site Type: Injection/Reverse Well

Current OU: 200-MG-2

Facility: U Plant Area

Former OU: 200-MW-1

Waste Site Description:

The site is located near the southeastern corner of the 222-U Building within the gravel area known as 200-W-136. The site is a covered french drain which is considered to be active. The yellow metal cover has a slot on one side and is level with the surrounding gravel covered ground. It is posted "Not a Confined Space". The cover is over a 0.61 m (2 ft) diameter VCP by 0.91 m (3 ft) deep drain structure. No underground piping was observed in the drain, nor aboveground pipes extending to the drain; however, a steel pipe was observed on the building. The pipe has been cutoff approximately 0.61 m (2 ft) from the ground. Documentation states that the site received stormwater runoff from the east side or backside of the 222-U Building. During the site walkdown, however, it was unclear how the drain received stormwater because no pipes were observed extending from the building into the drain. DOE/RL-88-11, Rev.2 states this miscellaneous stream received both stormwater and steam condensate. A steamline is visible in the background of the photograph, but does not connect to the covered drain.

Related Site Structure: The drain is associated with the 222-U Building.

Site Posting: URM "Not a confined space"

Release Mechanism: Stormwater runoff

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	0.9 m (3.0 ft)
Site Width:	0.6 m (2.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	0.3 m ² (3.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 134,294

References:

WIDS General Summary Report,

200-W-118

Site Name: 200-W-118, Miscellaneous Stream #141, Steam Condensate MSS-TRP-006

Site Type: Injection/Reverse Well

Current OU: 200-MG-2

Facility: U Plant Area

Former OU: 200-MW-1

Waste Site Description:

The site is located inside the northeastern corner of the 224-U facility fence, north of 16th Street and west of Beloit Ave. The site is a 0.025 m (1-in.) diameter insulated pipe extending into a 1.22 m (4 ft) diameter french drain structure. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. This was a seasonal discharge. The effluent to this drain was eliminated when the 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. The source has been abandoned, but the lines have not been capped. A field walkdown was done to compare locations and descriptions of Miscellaneous Stream sites (around 221-U, 224-U and 222-U) identified in the DOE/RL-88-11 document to the physical locations.

Related Site Structure: None

Site Posting: Not Specified

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	unknown m (unknown ft)
Site Width:	1.2 m (4.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	1.2 m ² (12.6 ft ²)		

Potential Contaminants:

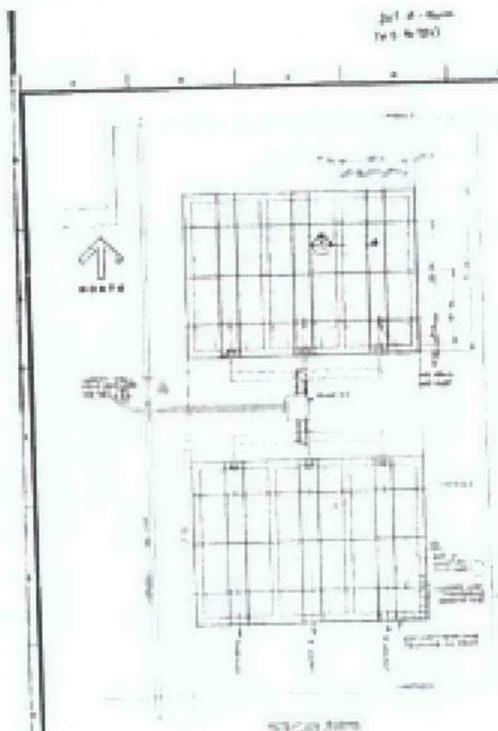
	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 121,529

References:

WIDS General Summary Report,

207-A-NORTH

Site Name: 207-A-NORTH, 207-A, 207-A Retention Basin, 207-A-NORTH Retention Basin, 207-A North
Site Type: Retention Basin
Current OU: 200-MG-2
Facility: 200 E Ponds Area
Former OU: 200-SC-1

Waste Site Description:

The 207-A-NORTH basins are located east of 242-A Evaporator building, adjacent to the 207-A-SOUTH basin. The 207-A North basins consist of three Hypalon-lined, concrete basins that are surrounded with posts and chain. There is no radiological posting on the north basins. The basins have been receiving steam condensate from the 242-A Evaporator since 1977. Effluent was originally sent to the 216-A-25 (Gable Pond) and later to the B Pond system. When the B-Ponds became inactive, effluent was diverted to TEDF. The basins were alternately filled, sampled, and emptied when meeting specifications. The basins discharged via pipeline to the 216-B-3C pond; this was discontinued in early 1997 and the basin effluent was diverted to the 200 Area TEDF. The 207-A North Basins were physically isolated and ceased to operate in November 1999.

Related Site Structure: The basins are associated with the 242-A Evaporator facility, 216-A-25 Pond and 216-B-3 Pond. The pipelines from 242-A Evaporator to the 207-A basins are site code 200-E-234-PL. The basin distribution lines are site code 200-E-235-PL.

Site Posting: None

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	16.8 m (55.0 ft)	Site Depth:	2.1 m (7.0 ft)
Site Width:	3.0 m (10.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	51.2 m ² (550.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

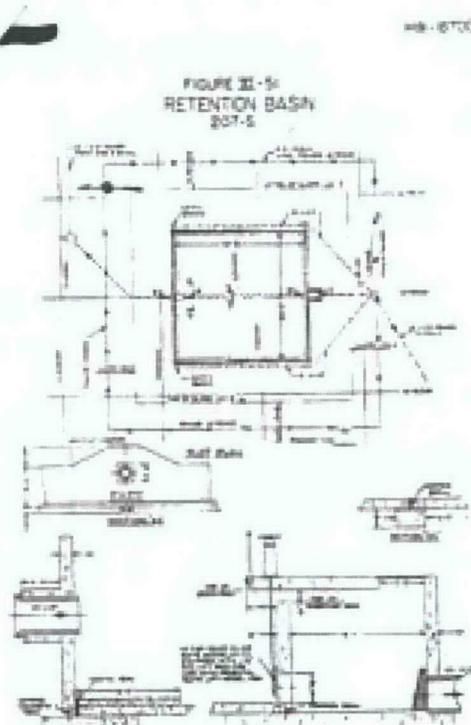
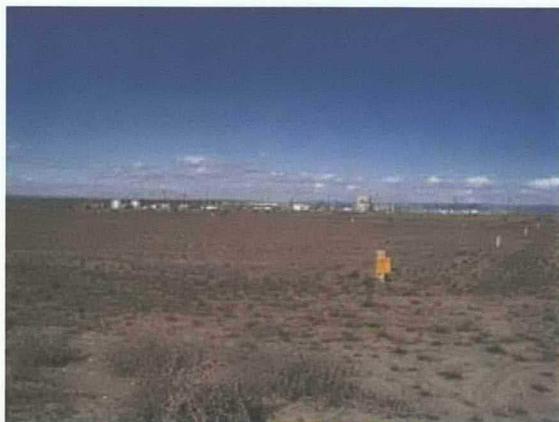
Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 1,710,839

References:

WIDS General Summary Report,

207-S



Site Name: 207-S, REDOX Retention Basin, 207-S Retention Basin

Site Type: Retention Basin

Current OU: 200-MG-2

Facility: 200 W Ponds Area

Former OU: 200-CW-2

Waste Site Description:

The site is located west of the 222-S Laboratory buildings, north of 10th Street, and is surrounded with concrete marker posts. It is currently posted with URM signs and the basin has been backfilled to grade with dirt. The site received process cooling water and steam condensate from the 202-S Building. The water was then discharged to the 216-S-17 Pond or the 216-S-16 Pond. Coil leaks inside the 202-S facility often caused contaminated effluent to be discharged to the retention basin. In April 1954, the 207-S Retention Basin was shut down following a 202-S coil leak that contaminated the basin above permissible limits and an effluent bypass was installed. The concrete floors and walls of the basin were grossly contaminated and subsequently filled with dirt to prevent contamination from spreading. The basin was a 39.6 m by 39.6 m (130 ft by 130 ft) concrete structure with a volume of $3.23\text{E}+06$ L ($8.53\text{E}+05$ gal). The walls are approximately 25 cm (10 in.) thick, and the floors are 20.3 cm (8 in.) thick. The system included approximately 610 m (2,000 ft) of 61-cm (24-in.) diameter vitrified clay pipe used to convey the waste water into and out of the unit. There is an overflow tank located in the center of the north end, just inside the basin wall, composed of 0.48-cm (3/16-in.) steel walls, 1.7 m (5.5 ft) high. The tank diameter was 6.1 m (20 ft). There is also an outlet weir structure adjacent to the south wall, outside the basin. In June 1975, the soil was treated with herbicides and covered with 23 cm (9 in) of gravel to stop radioactive weed growth. However, the vegetation later returned and the site became recontaminated.

Related Site Structure: The basin is associated with the 202-S facility, the 216-S-17 pond, UPR-200-W-13, UPR-200-W-15, UPR-200-W-95 and the 200-W-152-PL pipeline.

Site Posting: Concrete marker posts and URM signs.

Release Mechanism: Cooling water/Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	40.0 m (130.0 ft)	Site Depth:	2.1 m (6.8 ft)
Site Width:	40.0 m (130.0 ft)	Cover Thickness:	0.6 m (2 ft)
Site Area:	1600.0 m ² (16900.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	9000 cpm beta/gamma in September 1981.
Nonradiological	X	Unknown

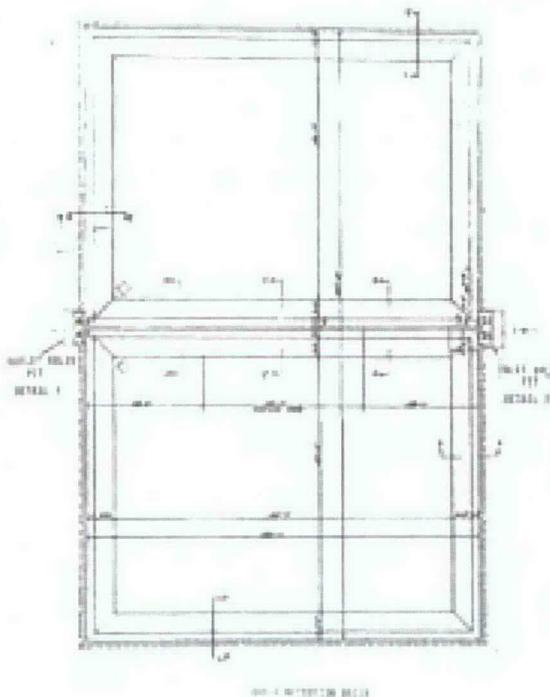
Preferred Removal Action: MESC/IC/MNA

Estimated Removal Action Present Worth: 493,691

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

207-T



Site Name: 207-T, T Plant Retention Basin, 207-T, 207-T Retention Basin

Site Type: Retention Basin

Current OU: 200-MG-2

Facility: T Farm Area

Former OU: 200-CW-4

Waste Site Description:

The site is located west of 221-T Building and north of 23rd Street. The retention basin was backfilled to grade with dirt in 1996. T Posts mark the corners of the basin and it is posted as an URM area. The basin received cooling water effluent from 221-T and 224-T and potentially low-level radioactive waste from T Plant process cooling and ventilation steam condensate, which was discharged to the 216-T-4-1 and 214-T-4-2 Ditches. From 11/44 to 1976, the site received process cooling water from process equipment jackets in 221-T and 224-T buildings and intermittently, 242-T Evaporator cooling water. After 1976, the site received intermittent flow from 221-T, 221-TA, and 224-T buildings. The effluent discharge was rerouted to the 200 Area TEDF in 1995. The unit was a concrete structure, divided into two sections, with a 3,800,000 L (1,000,000 gal) capacity. The bottom dimensions for each basin are 32.3 by 32.3 m (106 by 106 ft). There was an inlet structure on the east side and an outlet structure on the west side, adjacent to the outside walls of the basins. Two 40.6 cm (16 in.) diameter cast iron pipes connected to two-0.9 m (3 ft) sumps, one for each basin. Approximately 1830 m (6000 ft) of 61 cm (24 in.) diameter vitrified clay pipeline was used to convey waste water to and from the basin. H-2-3019 shows a black iron pipeline that exits the east side of the basin, traveling south, connecting to a pipeline that is associated with the 216-TY-201 flush tank. Periodically the sludge that accumulated on the bottoms of the basins was cleaned out. The sludge was placed in holes (one of these holes is documented as 216-T-12) located around the perimeter of the basin and covered with clean dirt. Additional holes were probably dug and filled with sludge, but not individually documented. Over the years this unit received potentially low-level radioactive waste from T-Plant process cooling and ventilation steam condensate. Also, unit received 1900L of 5% NaOH(aq) solution from T-Plant. On September 12, 1985, 1900 liters (500 gallons) of aqueous 5% sodium hydroxide solution containing 100 kilograms (219 pounds) of sodium hydroxide was released from T Plant to the basins and subsequently to 214-T-4-2 Ditch. At the time of the release, pH was 12.5. No cleanup actions were undertaken. After 6 hours of dilution by continued condensate discharge, the pH was 7.67

Related Site Structure: The basin is associated with 221-T, 224-T, 216-T-12, 200-W-53 and 216-T-4-1 and 216-T-4-2 Ditches. The inlet pipelines associated with this basin are WIDS site codes 200-W-88-PL, 200-W-165-PL, 200-W-166-PL and 200-W-167-PL. The outlet pipeline that leads to the 216-T-4 ditch is WIDS site code 200-W-164-PL.

Site Posting: URM

Release Mechanism: Process cooling water/steam condensate/contaminated soil

Release Type: Liquid

Dimensions (estimated):

Site Length:	75.0 m (246.0 ft)	Site Depth:	2.0 m (6.5 ft)
Site Width:	37.5 m (123.0 ft)	Cover Thickness:	0.6-0.9 m (2-3 ft)
Site Area:	2811.1 m ² (30261.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 2,616,681

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

207-U

No Image Available

No Image Available

Site Name: 207-U, 207-U Retention Basin**Site Type:** Retention Basin**Current OU:** 200-MG-2**Facility:** T Plant Area**Former OU:** 200-CW-5**Waste Site Description:**

The site is located inside 200 West Area, west of 221-U Building, north of 16th Street, and east of the 241-U Tank Farm. The unit is a plastic-lined concrete basin, posted as a CA, and divided into two equal halves, with a capacity of 3.785E+06 L (1E+06 gal). The bottom dimensions for each basin are 32 by 32 m (106 by 106 ft). The total overall dimensions at the top ledge is 75 by 38 m (246 by 123 ft), 2 m deep (6.5 ft). There is an inlet structure on the east and an outlet structure on the west side, on the outside of the basins. Each basin has a 0.9 by 0.9-m (3 by 3-ft) sump. There is also a sampler cabinet and a sample vault on the east side of the basins near the inlet structure. There are two unplanned release sites (UPR-200-W-111 and UPR-200-W-112) adjacent to the basin where sludge was removed and buried. These burial sites are located within 3.1 m (10 ft) of the basin on the north side and on the south side, near the western corners. An unused sampler cabinet is located on the east side of the basin, as well as a sample vault that is a confined space. Until 1972, the unit received steam condensate and cooling water from 224-U Building and chemical sewer waste from the 221-U Building. After 1972, the unit has received only cooling water from 224-U Building. The water was held in the basin, sampled, and then discharged to the 216-U-10 Pond via the 216-U-14 Ditch until the basin outlet was plugged in 1994. The outlet was plugged so that the basins would serve as an evaporation pond for the storm water it receives. The basin was temporarily replaced by 216-U-16 Crib (1984 through 1986) but was reactivated when 216-U-16 Crib was taken out of service. Presently, the basin is receiving storm water runoff from the 224-U building and grounds. The water is allowed to evaporate in the basin. During the Uranium Trioxide (UO₃) facility deactivation, the trench that runs between 224-UA and 224-U was tied into the 207-U retention basin pipeline to route the storm water buildup from the contaminated zones on the backside of the facility to the 207-U Basins for solar evaporation. The basin outlets have been isolated with concrete. The Hanford Operational Environmental Monitoring Program will continue to monitor the air and soil in the vicinity of the basins to meet NESHAP requirements for monitoring of diffuse and fugitive sources. Originally, the basin received chemical sewer waste and cooling water from the building; currently, it receives storm water runoff from building and grounds. It has two radioactive sludge barrier grounds on each side approximately 10m away. Occurrence Report 86-46 states that on August 6, 1986, 2365 L (625 gal) of recovered nitric acid, containing 39 kg (86 lbs) of uranium was discharged through the chemical sewer to the 207-U retention Basin. Prior to the discovery of the release, the outlet valves on the retention basin were open to the 216-U-14 Ditch. The acid released to the ditch was greatly diluted with the 300 gal/min flow of cooling water from the 224-U facility being processed through the chemical sewer system. The Hanford Site Waste Management Units Report (1987) reported different release values: it states that approximately 3,000 L (796 gal) of 50% reprocessed nitric acid was released to the basin and subsequently to 216-U-14 Ditch. The total release to the environment consisted of approximately 102,000 kg (225,000 lbs) of corrosive solution (pH less than 2.0) and 45.4 kg (100 lbs) of uranium.

Related Site Structure: There is an inlet structure on the east and an outlet structure on the west side, on the outside of the basins. Each basin has a 0.9 by 0.9-meter (3 by 3-foot) sump. There is also a sampler cabinet and a sample vault on the east side of the basins near the inlet structure. The chemical sewer pipeline that fed the basin is site code 200-W-192-PL. The outlet pipe to the 216-U-14 ditch is site code 200-W-222-PL.

Site Posting: CA

Release Mechanism: Chemical sewer waste/ cooling water/ stormwater runoff

Release Type: Liquid

Dimensions (estimated):

Site Length:	75.0 m (246.0 ft)	Site Depth:	2.0 m (6.5 ft)
Site Width:	37.5 m (123.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	2811.1 m ² (30261.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

Preferred Removal Action: RTD**Estimated Removal Action Present Worth: 2,616,681****References:**

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

207-Z

No Image Available

Site Name: 207-Z, 207-Z Retention Basin, 241-Z Retention Basin, 241-Z-RB**Site Type:** Retention Basin**Facility:** PFP Area**Current OU:** 200-MG-2**Former OU:** 200-SC-1**Waste Site Description:**

The concrete basins are located inside the Z Plant Exclusion Area fence, south of 236-Z building, and have been filled with high density grout. The site had been a concrete basin structure divided into two halves. The two sides were separated by a 0.3-m (1 ft) thick concrete wall. Each basin contained a sump with a sump pump. A 1.8-m (6 ft) high chain link fence surrounded the basin. The site received potentially contaminated waste. Steam condensate and cooling water, via the D-3 piping system, was sent to this holding facility then released to the 216-Z-1 and 216-Z-11 Ditches. Document HNF-30654 used historical operations records to determine an approximate volume of 152,000 L (40,000 gal) that could have leaked from the 241-Z basins. The 207-Z Retention Basin has sometimes been confused with the 216-Z-21 Seepage Pond; they are two separate waste sites. The 216-Z-21 Seepage Pond is located east of the Z Plant Exclusion Area, adjacent to Camden Ave. The 207-Z Retention Basin is inside the PFP fence.

Related Site Structure: The retention basin is associated with the 241-Z and 234-5Z facilities. Pipelines associated with the basin are discussed in site code 200-W-209-PL.

Site Posting: Not Specified**Release Mechanism:** Steam condensate/ cooling water**Release Type:** Liquid**Dimensions (estimated):**

Site Length:	15.2 m (50.0 ft)	Site Depth:	3.1 m (10.0 ft)
Site Width:	12.2 m (40.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	185.8 m ² (2000.2 ft ²)		

Potential Contaminants:

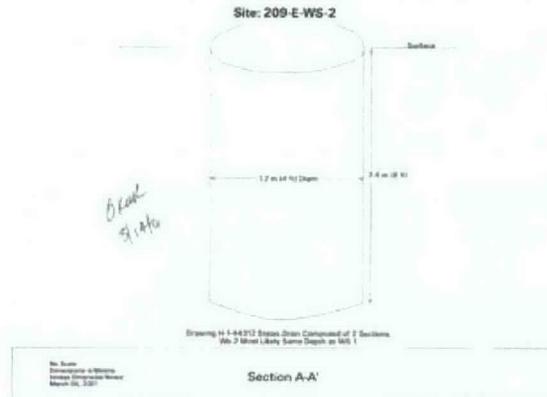
	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

Preferred Removal Action: RTD**Estimated Removal Action Present Worth:** 856,926

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

209-E-WS-2



Site Name: 209-E-WS-2, Critical Mass Lab French Drain

Site Type: French Drain

Current OU: 200-MG-2

Facility: Semi-Works Area

Former OU: 200-MW-1

Waste Site Description:

The unit is located at the southeast corner of the Critical Mass Laboratory (laboratory wing). The drain is a 1.2 m (4 ft) diameter drain in a gravel area southeast of the building. The unit is a french drain that received condensate from the Critical Mass Lab HEPA filters and heat exchange system. It is painted with yellow paint and has a metal cover. The waste at the unit includes steam condensate through a collapsed rusted pipe from the Heat Exchanger located in Room 11 of 209-E and a stainless steel pipe from the clean side of the HEPA filters.

Related Site Structure: The site is associated with the 209-E Critical Mass Laboratory. The pipelines to the french drain are described in site code 200-E-247-PL.

Site Posting: Not Specified

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	2.4 m (8.0 ft)
Site Width:	1.2 m (4.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	1.1 m ² (12.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

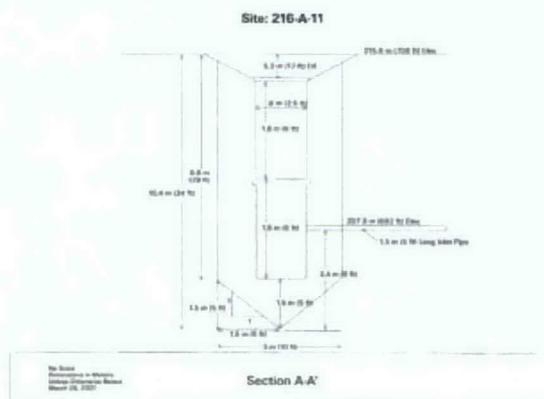
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 167,966

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-11



Site Name: 216-A-11 French Drain, Miscellaneous Stream #465

Site Type: French Drain

Current OU: 200-MG-2

Facility: Purex Area

Former OU: 200-MW-1

Waste Site Description:

The site is located near the southeast corner of the 202-A Building, south of Trap Pit #1 and is inside a small area delineated by steel posts and chain, posted as a URM area. A 0.76 m (2.5 ft) diameter, circular metal cover is visible. One concrete AC-540 marker identifies the site. The unit is composed of two reinforced concrete pipes placed vertically end to end. The excavation is 3.0 m (10 ft) in diameter and extends to a depth of 1.5 m (5 ft) below the bottom. Both the drain and the excavation are filled with 8-cm (3-in.) rock to the top and are backfilled over. The site received the Trap Pit #1 drainage from the 202-A Building. The waste was low in salt and was neutral to basic. The site contains less than 50 Ci total beta activity. A sump in the bottom of Trap Pit #1 collected steam condensate and equipment leakage that drained into 216-A-11. RHO-CD-673 (Maxfield) states the start date was 1956; PNL-6456 (Stenner) states the start date was 1955. The steam source has been eliminated from the PUREX Facility. The Trap Pit #1 has been sealed to eliminate any rain water entering the structure.

Related Site Structure: The site is associated with the PUREX Trap Pit #1 and pipeline 200-E-266-PL.

Site Posting: URM

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	9.1 m (30.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 50 curries of beta activity in October 1988. Site received approximately 100,000L of mixed liquid waste.
Nonradiological	Unknown	Unknown

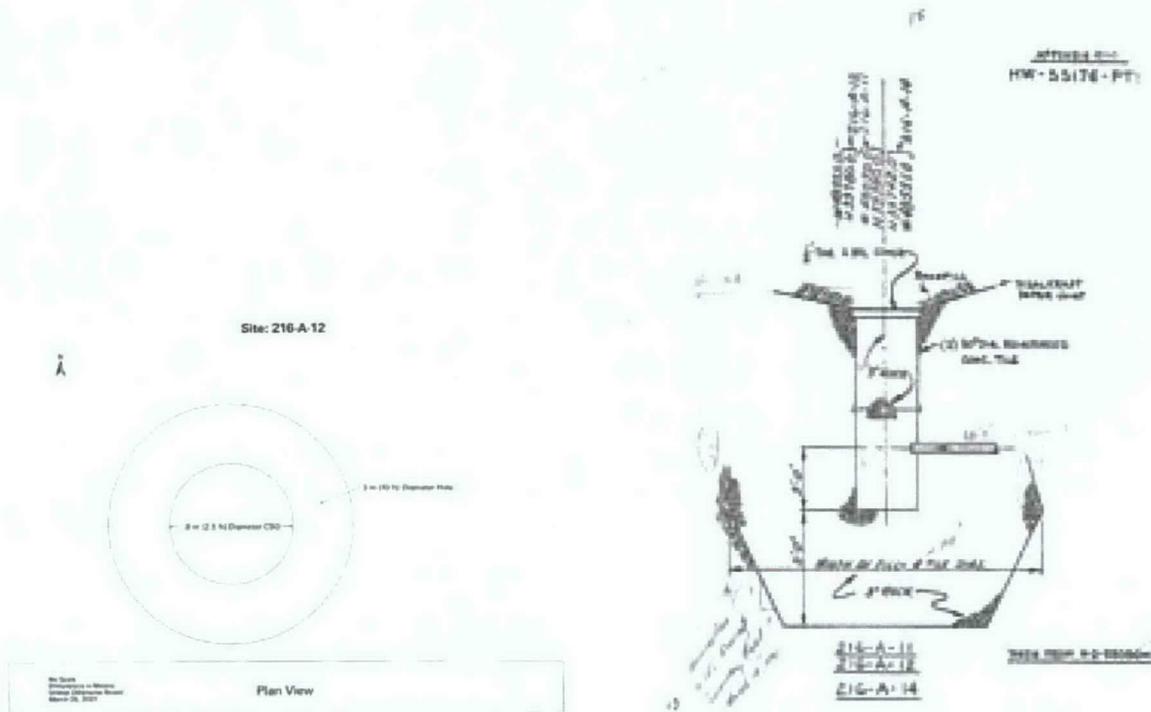
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-12



Site Name: 216-A-12, Miscellaneous Stream #463
Site Type: French Drain
Current OU: 200-MG-2

Facility: Purex Area
Former OU: 200-MW-1

Waste Site Description:

The site is located at the center of the south side of the 202-A Building, approximately 23 m (75 ft) from the building. The site is not marked or posted and cannot be visually located. The Historical Summary of Inventory of Hanford Radioactively Contaminated Waste Disposal Facilities (1974) states that drain is located under a minor construction change house. The Inventory of Miscellaneous Streams Report stated this drain was active due to the possibility of rain water entering the pit. There are no visible surface features for this drain. The wall of the trap pit includes a "French Drain" label. The unit is composed of two reinforced concrete tile pipes placed vertically end to end. The excavation is 3.0 m (10 ft) in diameter and extends 1.5 m (5 ft) below the bottom. Both the drain and the excavation are filled with gravel to the top of the unit and backfilled over. The site received the Steam Trap Pit #3 drainage from the 202-A Building. The waste was low in salt and was neutral to basic. The site contains less than 50 Ci total beta activity. It is possible that more than one Trap Pit drained to this french drain.

Related Site Structure: The site is associated with PUREX Trap #3 and pipeline 200-E-267-PL.

Site Posting: None

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	6.0 m (20.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

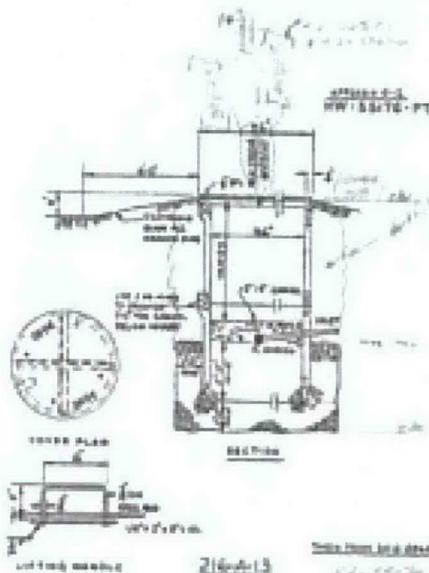
Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 50 curries of beta activity in October 1988. Site received approximately 100,000L of mixed liquid waste.
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA**Estimated Removal Action Present Worth:** 179,554**References:**

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-13



Site Name: 216-A-13, 216-A-13 French Drain, Miscellaneous Stream #460

Site Type: French Drain

Current OU: 200-MG-2

Facility: Purex Area

Former OU: 200-MW-1

Waste Site Description:

The site is located approximately 6 m (20 ft) west and 6 m (20 ft) south of the southwest corner of the 202-A Building and is not marked or posted. A 1.2 m (45 in.) diameter metal cover is visible over the drain. The drain is constructed of two lengths of concrete pipe placed vertically end to end. The unit is filled to a depth of 0.9 m (3 ft) with 5 to 8 cm (2 to 3 in.) of rock. This unit has a bed of gravel around the lower section of pipe extending a minimum of 0.3 m (1 ft) away from the pipe in all directions. The site received the seal water from the air sampler vacuum pumps in the 202-A Building. The waste is low in salt, neutral to basic, and contains less than 1 Ci total beta activity. The 1993 PUREX AAMS Report lists the total volume released as 100,000 L (30,000 gal), but does not give the reference for this discrepancy from the original Stenner report. It is assumed that the original number is correct, and the AAMS report added an extra "0" in error. The pipeline to the 216-A-13 french drain was cut and capped in 1962. The effluent was diverted to the 216-A-35 french drain.

Related Site Structure: The site is associated with PUREX, the 216-A-35 French Drain and pipeline 200-E-273-PL.

Site Posting: None

Release Mechanism: Seal water

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	6.0 m (20.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

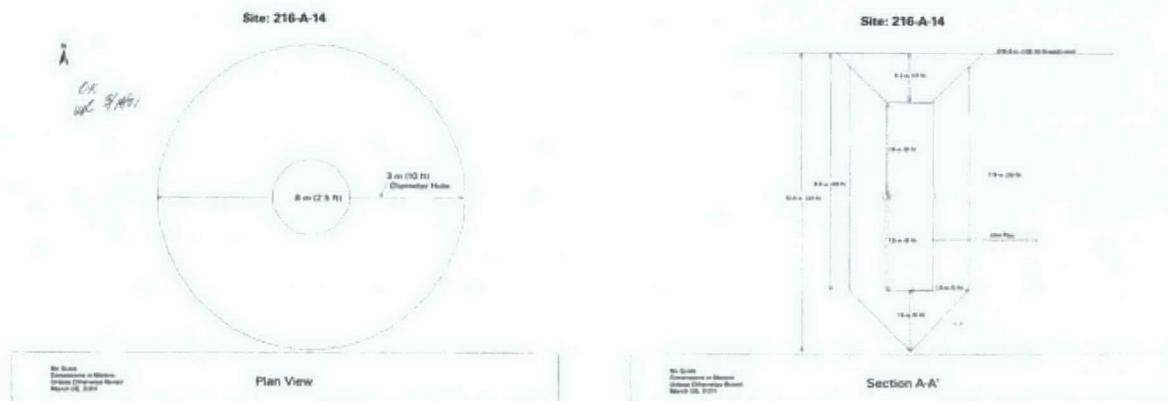
Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 1 curie of beta activity total in October 1988. Site received approximately 10,000L of mixed liquid waste.
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA**Estimated Removal Action Present Worth:** 179,554**References:**

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-14



Site Name: 216-A-14, French Drain - Vacuum Cleaner Filter Pit, Miscellaneous Stream #462

Site Type: French Drain

Current OU: 200-MG-2

Facility: Purex Area

Former OU: 200-MW-1

Waste Site Description:

The site is located south of the center of the 202-A Building, 5.5 m (18 ft) east of the Filter Pit. The drain is not marked or posted and there are no visible surface features it. The Vacuum Cleaner Filter Pit is a concrete box with approximately 0.6 m (2 ft) above grade. The sump is inside the pit and drains through an underground pipe to the buried french drain. The drain is composed of two reinforced concrete pipes placed vertically end to end. The excavation is 3.0 m (10 ft) in diameter and extends to a depth of 1.5 m (5 ft) below the bottom. Both the drain and the excavation are filled with 8-cm (3-in.) rock to the top and backfilled over. The filter pit access is labeled Contamination Area, Radiation Area, Airborne Contamination and Confined Space. A 10 cm (4 in.) M23b-UD inlet pipe, approximately 1.5 m (5 ft) long, extends horizontally into the unit, 7.9 m (26 ft) below grade. The site has a 1.3 cm (0.5 in.) thick steel cover. The site received the vacuum cleaner filter and blower pit drainage from the 202-A Building. The waste was low in salt, neutral to basic, and contains less than 1 Ci total beta activity. A sump in the bottom of Filter Pit collected steam condensate, storm water and equipment leakage that drained to 216-A-14. The Inventory of Miscellaneous Streams Report stated the french drain was considered active due to the possibility of storm water entering the structure. Storm water disposal to engineered structures will be managed under a permit issued by Ecology in 1999.

Related Site Structure: The site is associated with the Vacuum Cleaner Filter Pit and pipeline 200-E-268-PL.

Site Posting: None

Release Mechanism: Seal water

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	9.0 m (30.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 1 curie of beta activity total in October 1988. Site received approximately 1,000L of mixed liquid waste.
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

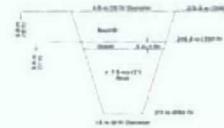
References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-22



Site: 216-A-22



Site Name: 216-A-22, 216-A-22 French Drain, 216-A-22 Crib

Site Type: Crib

Current OU: 200-MG-2

Facility: Purex Area

Former OU: 200-MW-1

Waste Site Description:

The site is located along the north wall of the 203-A Building, north of PUREX. The crib is marked with a single cement AC-540 marker and URM signs. The site received the drainage from the 203-A Building truck loadout apron, the sump waste from the 203-A Building enclosure, and the heating coil condensate from the P-1 through P-4 UNH tanks. The waste is low in salt, neutral to basic, and contains less than 1 Ci total beta activity. The site received some uranium from the discharges. In 1961, a release from a UNH truck spilled 1335 pounds of uranium on the truck apron. Some of this drained into the 216-A-22 crib. The 203-A tank farm was used for storage and shipping of UNH product and concentration of UNH waste. It consisted of 460,000 L (100,000 gal) stainless steel tanks for UNH storage and three smaller nitric acid tanks. Two 10-cm (4-in.) effluent pipes are associated with the french drain. One pipe entered the crib 0.5 m (1.5 ft) above original grade. This pipe is no longer visible as it was covered over to stabilize contamination. The pipe from the truck loadout apron enters the site horizontally, 2.4 m (8 ft) below grade. The excavation is 4.9 m (16 ft) in diameter at grade and 1.8 m (6 ft) in diameter at the bottom, with a side slope of 3:1 (V:H). Approximately 3 m (10 ft) of gravel fills the excavation bottom, and the site is backfilled. The drainage from the 203-A Building to the site was redirected to the 216-A-28 French Drain in December 1958. However, drainage from the truck loadout apron was not diverted at that time (see H-2-54818 and Lundgren, 1970). The actual stop date of discharges to crib is not clear. The site cannot be visually located as it was covered over with clean soil after the UPR-200-E-17 release. Some documents list the start date for 216-A-22 as March 1956. Other documents say it had a startup date of November 1955. UPR-200-E-17 is described as yellow, uranium contaminated soil on the 216-A-22 Crib. No date is provided for this event, but it was documented in a 1959 report.

Related Site Structure: The site is associated with the 203-A facility and UPR-200-E-17. The pipeline associated with this drain is site code 200-E-159-PL.

Site Posting: URM

Release Mechanism: Contaminated effluent discharge

Release Type: Liquid

Dimensions (estimated):

Site Length:	3.0 m (10.0 ft)	Site Depth:	3.0 m (16.0 ft)
Site Width:	5.0 m (16.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	15.0 m ² (160.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	65,000 dpm beta/gamma, no alpha in 1991.
Nonradiological	X	Uranium

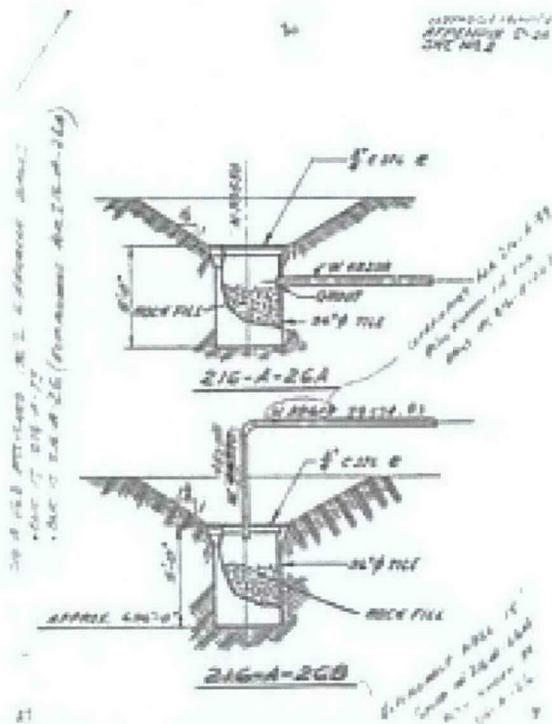
Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 543,844

References:

WIDS General Summary Report, DOE/RL-2000-60, DOE/RL-2005-62

216-A-26



No Image Available

Site Name: 216-A-26, 216-A-26 French Drain, 216-A-26B, Miscellaneous Stream #464

Site Type: French Drain

Facility: Purex Area

Current OU: 200-MG-2

Former OU: 200-MW-1

Waste Site Description:

The site is located inside the PUREX security fence, south of the 291-A Control House and approximately 4.57 m (15 ft) south of 216-A-26A French Drain. There are no visible surface features for this drain. The unit is composed of three clay pipe (each 5 feet long) segments buried vertically. Some references state the clay pipe diameter is 3 feet and some state the diameter is 4 feet. The site received the floor drainage from the 291-A Fan Control House. The waste was low in salt, neutral to basic, and contains less than 1 Ci of total beta activity. The quantity of discharge is unknown. This french drain was installed to replace the 216-A-26A french drain. Both drains received effluent from floor drains inside the 291-A Fan House. 216-A-26 was removed from service in 1991. This french drain was installed in 1965 to replace the 216-A-26A french drain. The numbering of the french drains in this area has caused some confusion. The alias "216-A-26B" was used for two different french drains. It is an alias for this french drain (216-A-26, located south of 291-A) and also an alias for the 216-A-33 French Drain (located west of 291-A). The 291-AE Building was built over top of the 216-A-33 French Drain and no longer appears on drawing revisions. In documents and on drawings older than 1965, reference to 216-A-26B would be indicating the drain also known as 216-A-33. The effluent source to this french drain was two floor drains located inside the 291-A Fan Control Building. The floor drains were plugged by filling with epoxy during the Purex deactivation.

Related Site Structure: This site is associated with the 291-A Fan Control Building, the 216-A-26A french drain and pipeline 200-E-270-PL.

Site Posting: Not Specified

Release Mechanism: Floor drainage

Release Type: Liquid

Dimensions (estimated):

Site Length: None m (None ft) **Site Depth:** 5.0 m (16.0 ft)
Site Width: 1.0 m (3.0 ft) **Cover Thickness:** 0 m (0 ft)
Site Area: 0.8 m² (7.1 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 1 curie total beta activity, quantity unknown in April 1979.
Nonradiological	Unknown	Unknown

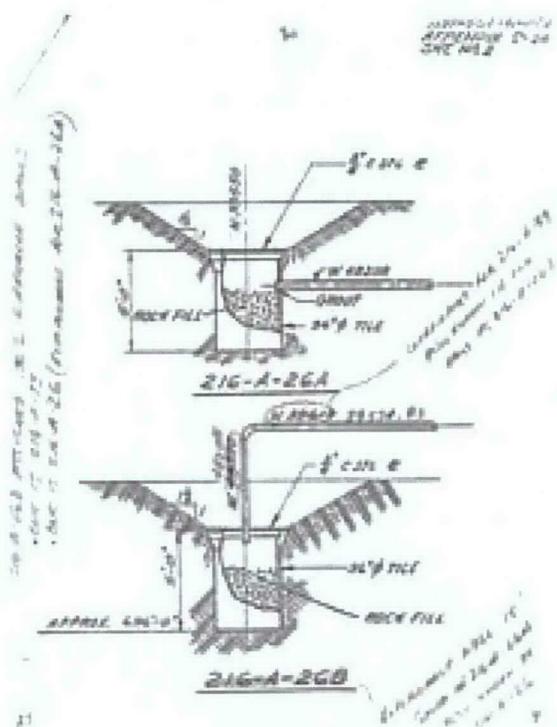
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-26A



No Image Available

Site Name: 216-A-26A, 216-A-25 Crib, 216-A-26 French Drain, 291-A French Drain
Site Type: French Drain **Facility:** Purex Area
Current OU: 200-MG-2 **Former OU:** 200-MW-1

Waste Site Description:

The french drain is located inside the PUREX security fence, south of the 291-A Building. There are no surface features for this drain. The unit is composed of three sections of clay pipe each 1.5 m (5 ft) long, placed vertically end to end below grade. Some references state the pipe diameter was 0.9 m (3 ft) and other references state the diameter as 1.2 m (4 ft). The site received the floor drainage from the 291-A Fan Control Room. The waste is low in salt, neutral to basic, and contains less than 1 Ci total beta activity. In 1965, the site was deactivated by removing the encasement and rerouting the effluent piping to the new 216-A-26 French Drain encasement, located 4.6 m (15 ft) south. Due to an unusual site numbering issue, the original french drain is known as 216-A-26A and the replacement french drain is numbered 216-A-26. The alias "216-A-26B" was assigned to two different french drains: 216-A 26 and 216-A-33 (located west of 291-A). Encasement was removed in July 1965 and the effluent was diverted to a new french drain (216-A-26, sometimes called 216-A-26B), located 4.6 m (15 ft) south of this encasement.

Related Site Structure: The site is associated with the 291-A stack, fan house, the 216-A-26 French Drain and pipeline 200-E-270-PL.

Site Posting: Not Specified

Release Mechanism: Floor drainage

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	5.0 m (16.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

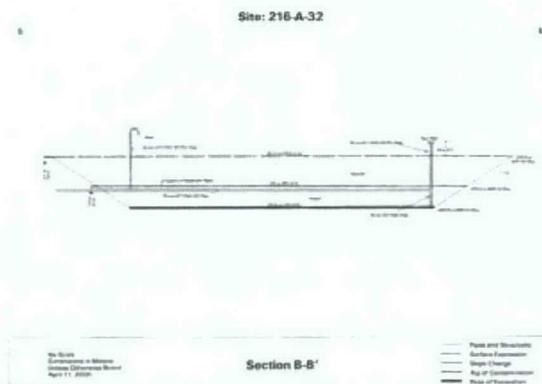
Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 1 curie total beta activity in April 1979, 1,000 L
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA**Estimated Removal Action Present Worth:** 179,554**References:**

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-32



Site Name: 216-A-32, 216-A-32 Crib
Site Type: Crib
Current OU: 200-MG-2

Facility: Purex Area
Former OU: 200-MW-1

Waste Site Description:

The crib is located northeast of 202-A, inside the PUREX exclusion fence. The site is currently surrounded with cement posts with URM signs. There had been an inner area marked with steel posts, chains and Surface Contamination signs. The site received the 202-A canyon crane maintenance facility floor, sink, and shower drainage. The site contains less than 1 Ci total beta activity. In a letter (Walsar 1966), Isochem Corporation indicates the intent to dispose of 24,600 L (6,500 gal) of approximately 50% Soltrol (a brand of purified kerosene) diluent in this crib. BHI-00178 (1995) reports that investigators were unable to verify if the proposed disposal took place. Perforated vitrified clay pipe was placed horizontally on the fill 1.5 m (5 ft) above the bottom of the excavation. Two layers of Sisalkraft paper separate the crib gravel from the overlying earthen backfill. The start date was January 1959. PNL-6456 states the end date was 1972. [Dimensions provided are bottom dimensions].

Related Site Structure: The site is associated with 202-A and the 200-E-107 stabilized area. The pipeline associated with this crib is site code 200-E-194-PL.

Site Posting: URM, SCA

Release Mechanism: Floor, sink and shower drainage

Release Type: Liquid

Dimensions (estimated):

Site Length:	21.3 m (70.0 ft)	Site Depth:	3.6 m (12.0 ft)
Site Width:	2.4 m (8.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	52.0 m ² (560.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 1 curie total beta activity in October 1988.
Nonradiological	X	Unknown

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-33



Site Name: 216-A-33, 216-A-33 Dry Well, 216-A-26B
Site Type: French Drain
Current OU: 200-MG-2

Facility: Purex Area
Former OU: 200-MW-1

Waste Site Description:

The site is located inside the PUREX security fence, south of 202-A, and southwest of the 291-A stack. The 291-AE Filter Building has been built over top of the site where this drain was located. The stainless steel (M21-UD) inlet pipe entered the unit 1.5 m (5 ft) below grade. The french drain had a carbon steel cover. The site received the bearing coolant waste from the 291-A-1 Stack electrical exhaust fans. The waste is low in salt, neutral to basic, and contains less than 1 Ci of total beta activity. Project B-295A constructed the 291-AE Building over the area where this drain was located. The inlet piping was capped and the drain was removed from service in 1964 because water was no longer used as a coolant for electrical fans. The site was deactivated by capping the effluent pipeline to the unit on the south side of the 291-A Fan Plenum. The alias "216-A-26B" was used for two different french drains: the 216-A-33 French Drain and 216-A-26, located adjacent to 291-A. Prior to 1965, the number 216-A-26B was an alias for the 216-A-33 French Drain. The 291-AE Building was built over top of the 216-A-33 French Drain and no longer appears on drawing revisions. This has caused confusion in some documentation related to these french drains.

Related Site Structure: The french drain is associated with the 291-A Fan House and pipeline 200-E-269-PL.

Site Posting: Not Specified

Release Mechanism: Bearing coolant waste

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	4.0 m (13.0 ft)
Site Width:	2.0 m (7.0 ft)	Cover Thickness:	Building m (Building ft)
Site Area:	3.1 m ² (38.5 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 1 curie total beta activity October 1988.
Nonradiological	Unknown	Unknown

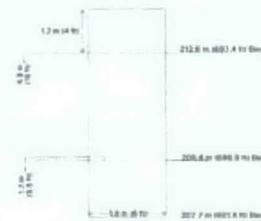
Preferred Removal Action: CS/NA
Estimated Removal Action Present Worth: 179,554

References:
WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-35



Site: 216-A-35



Site Name: 216-A-35 French Drain, 216-A-35 Dry Well
Site Type: French Drain
Current OU: 200-MG-2

Facility: Purex Area
Former OU: 200-MW-1

Waste Site Description:

The site is located approximately 9 m (30 ft) south of the west end of the 202-A PUREX Building, south of the 216-A-13 French Drain. The drain is a raised cement structure, painted yellow and surrounded with URM signs. The top cover is marked Confined Space. The site received the seal cooling water from the air sampler vacuum pumps in the 202-A Building. The waste is low in salt, neutral to basic, and contains less than 1 Ci of total beta activity. The site is a french drain that was a replacement for the 216-A-13 French Drain. The inlet pipe enters the french drain 3.2 m (10.5 ft) below grade. Disposal to the site was terminated when the effluent flow rate exceeded the infiltration capacity of the soil. The site was deactivated by capping the effluent pipeline to the unit and rerouting the effluent to the 216-A-29 Ditch via the 202-A Chemical Sewer.

Related Site Structure: The site is associated with PUREX, the 216-A-13 French Drain and pipeline 200-E-272-PL.
Site Posting: URM and Confined Space

Release Mechanism: Seal water
Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	5.0 m (16.0 ft)
Site Width:	2.0 m (7.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	3.1 m ² (38.5 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 1 curie total beta activity in October 1988.
Nonradiological	X	Unknown

Preferred Removal Action: CS/NA
Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-38-1

No Image Available

Site Name: 216-A-38-1, 216-A-38 Crib (See Subsites)**Site Type:** Crib**Current OU:** 200-MG-2**Facility:** Purex Area**Former OU:** 200-MW-1**Waste Site Description:**

The crib is located southwest of 202-A Building north of 1st Street, south of the PUREX security fence. The crib is surrounded by light posts and a chain. It is posted with URM signs. There are no concrete AC-540 markers or signs to label the site. Although the crib was built to receive PUREX effluent, it was never used. The crib was built to replace the 216-A-10 crib, but had not been activated when plans for modifying the PUREX head end process were begun. The planned building addition would have been constructed immediately adjacent to the crib. For this reason, the crib was activated. The site is identified in the project proposal (Project IAP-606) as the PUREX Process Condensate Crib - 216-A-38. It was intended to receive the PUREX process condensate waste that was being discharged to the 216-A-10 Crib. The 216-A-10 was showing signs of strontium-90 saturation. The replacement crib was required for continued disposal for the disposal of large volumes [1,040,000 to 1,230,000 L (275,000 to 325,000 gal/day)] of condensate waste. There was a potential for this process condensate to become grossly contaminated as a result of reduced vapor phase de-entrainment or foaming in the concentrator. The location for the 216-A-38-1 Crib was chosen to shorten piping runs and take advantage of the high percolation rate [76 to 95 L (20-25 gal)] per day per square foot. The existing 216-A-10 crib could not be depended upon for continued disposal of process condensate. It had been in operation since June 1961 (five years), and had received about 1,800 million L (475 million gal) of condensate which contained about 115,000 Ci of beta activity (as of June 1966). Strontium-90 had been verified to be in the groundwater under the crib. There is a 15-cm (6-in) perforated stainless steel distribution pipe (from PUREX and running the length of the crib) reducing to 10-cm (4-in.) perforated pipe placed at 10 m (33 ft) below grade. This pipe was isolated with the installation of a blind flange in 1989. There is 1.5 m (5 ft) of gravel in the excavation with a membrane barrier between the gravel and the backfill. The excavation was backfilled with excavated material. The side slopes of the excavation were cut at 1:1. The crib was posted as an URM area in 1980, due to the fact that underground piping had been installed that connected the crib to the PUREX process. No surface contamination has ever been identified during routine surveillance and no stabilization activities have occurred at this crib. The crib proposal document was issued by ISO-CHEM in 1966, but the actual construction date has not been determined. A 216-A-38 Crib specification document was issued in February, 1967 (HWS-7724). This site was considered for reclassification, but has been temporarily withdrawn because the URM posting has not been removed, and because of concerns expressed by management that samples were never collected to prove no effluent ever reached the crib through the underground piping. Documents would be insufficient. It is possible that if the site was connected to a facility, it may have received waste even though the facility managers were not aware of it. The piping had been installed nine years before it was physically isolated.

Related Site Structure: The site is associated with the 216-A-10 crib. The pipeline to the 216-A-38-1 crib is site

code 200-E-240-PL. There are two radiological test wells (one at each end of the crib).

Site Posting: URM

Release Mechanism: Reported as never used

Release Type: None / Unknown

Dimensions (estimated):

Site Length: 159.0 m (522.0 ft)

Site Depth: 11.3 m (37.0 ft)

Site Width: 5.0 m (16.0 ft)

Cover Thickness: 0.3-0.6 m (1-2 ft)

Site Area: 795.0 m² (8352.0 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	Unknown	Unknown
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-A-41



Site Name: 216-A-41, Crib, 291-AR Stack Drain, 296-A-13 Stack Drain

Site Type: Crib

Current OU: 200-MG-2

Facility: Purex Area

Former OU: 200-MW-1

Waste Site Description:

The crib is located northwest of the 296-A-13 stack, west of Buffalo Ave. and north of the 244-AR Vault facility. The site is a small crib that is no longer marked or posted and is 1.8 m (6 ft) below grade. The area where the crib is assumed to be located is covered with gravel. The site received the 296-A-13 Stack condensate drainage. The stack is connected to the 291-AR Filter Building. According to RHO-CD-673, the waste was potentially slightly acidic and contained less than 1 Ci total beta activity. Potential contaminants of concern (Stenner) may be tritium, cobalt-60, strontium-90, and cesium-137. The bottom of the crib (elevation: 207 m [678.5 ft]) is filled with 0.5 m (1.5 ft) of 3.8 to 25.4-cm (1.5 to 10-in.) rock, then 20.3 cm (8 in.) of 1.9 to 3.8-cm (0.75 to 1.5-in.) gravel, and several cm of 1.9-cm (0.75-in.) gravel. This material is covered by a layer of 20 mm polyethylene and 10.2 cm (4 in) of sand (elevation: 208 m [681.0 ft]). The site was then backfilled with soil to a ground elevation of 209 m (684.0 ft) (with the crown at 212 m [696.0 ft]). The side slope is 1:1. A 10.2-cm (4-in.) vitrified clay pipe enters the crib (from the 296-A-13 Stack) at elevation 208 m (681.0 ft) and connects to the crib dispersion structure, constructed of 20.3 by 20.3 by 40.6-cm (8 by 8 by 16-in.) bond beam concrete blocks placed end-to-end. The pipeline from the stack (296-A-13) to the crib is approximately (15 ft) long and extends northwest (30 degrees west of true north) from the stack. The site is not marked in the field. The mapped center point location of the site is based on drawing coordinates from H-2-61975, "216-A-41 Crib, Plan and Profile". Drawing H-2-44501, "Area Map-200 East, A Plant Facilities", shows the crib at the same location.

Related Site Structure: The crib is associated with the 296-A-13 Stack (291-AR Filter Building Stack) (WIDS Site 296-A-13) and the 291-AR Filter Building. The Filter Building is related to the 244-AR Vault Canyon. The pipeline to the crib is 200-E-276-PL.

Site Posting: None

Release Mechanism: Stack condensate

Release Type: Liquid

Dimensions (estimated):

Site Length: 3.0 m (10.0 ft)

Site Width: 3.0 m (10.0 ft)

Site Area: 9.3 m² (100.0 ft²)

Site Depth: 2.0 m (7.0 ft)

Cover Thickness: 0.3-0.6 m (1-2 ft)

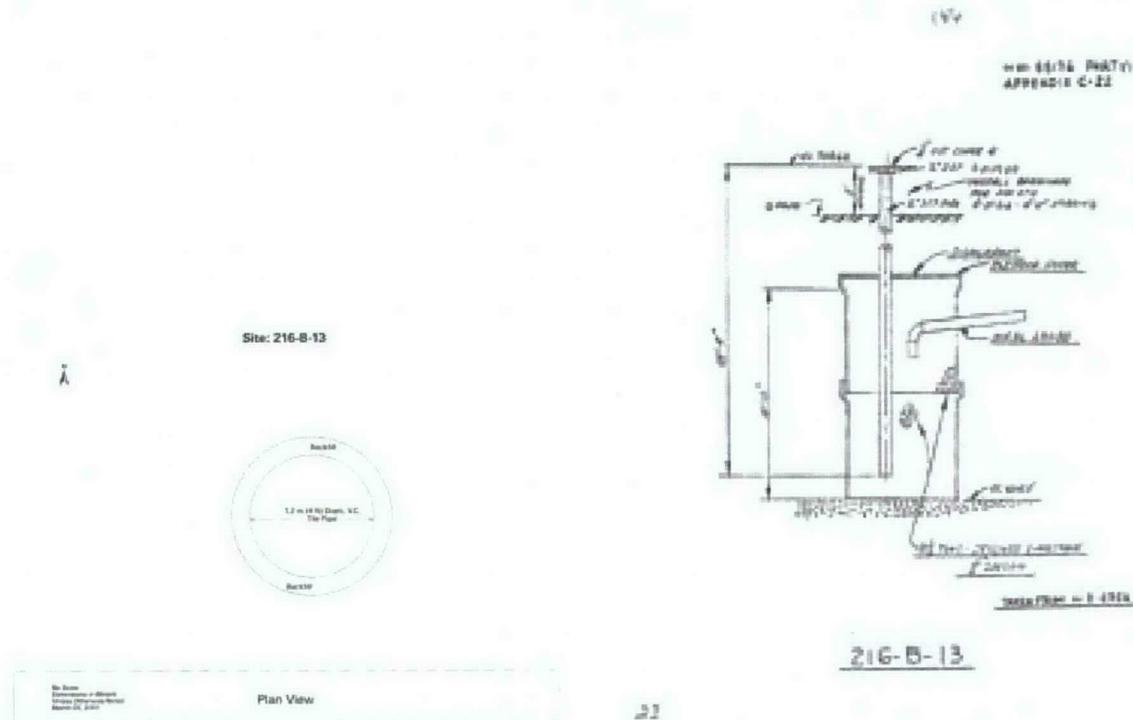
Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 1 curie total beta activity. Tritium, cobalt-60, strontium-90, and cesium-137 in April 1979.
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA**Estimated Removal Action Present Worth:** 179,554**References:**

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-B-13



Site Name: 216-B-13, 216-B-13 French Drain, 291-B Crib, 216-B-B, 216-B-13 Crib

Site Type: French Drain

Facility: B Plant Area

Current OU: 200-MG-2

Former OU: 200-MW-1

Waste Site Description:

The french drain is located south of 221-B and northeast of the 291-B-1 Stack. A single, concrete AC-540 marker is the only site identifier. There is a URM sign attached to the concrete post. The site received the 291-B-1 Stack drainage. In 6/76, the stack drainage was rerouted to a catch tank, jetted to the wind tunnel, drained to a sump, and then pumped to a cell drainage sample tank. The waste is low in salt and is neutral to basic. The unit operated from August 1947 to June 1976. The french drain is constructed of two 1.22 m (4 ft) diameter by 1.53 m (5 ft) long tile pipes, stacked vertically and filled with crushed limestone. The unit has a plywood cover, located 2.44 m (8 ft) below grade. Two and a half tons (2,270 kg) of limestone were used as a base and to fill the tile pipes. The bottom of the drain is 5.5 m (18 ft) below ground surface.

Related Site Structure: The french drain is associated with the 291-B stack. The pipeline that fed the french drain is site code 200-E-243-PL.

Site Posting: URM, Surface contamination, Cave in potential.

Release Mechanism: Stack condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	6.0 m (20.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	200cpm Beta/Gamma in a 1985 rad survey.
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-B-51

No Image Available

No Image Available

Site Name: 216-B-51, 216-BY-9 Crib**Site Type:** French Drain**Current OU:** 200-MG-2**Facility:** B Farm Area**Former OU:** 200-TW-1**Waste Site Description:**

The french drain is south of 12 Street, east of Baltimore Ave, north of the 241-B Tank Farm, and northeast of the 216-B-8 Crib and Tile Field. The site is a small URM area measuring approximately 3 m by 3 m (10 ft by 10 ft). The concrete drain structure extends approximately 0.3 m (1 ft) above the ground surface and 4.2 m (4.3?) (14 ft) below ground. The structure is approximately 1.5 m (5 ft) in diameter with a wooden lid cover with vent holes. The structure is also posted with Fixed CA signs. The site received drainage from the BC Crib pipeline which carried high salt, neutral to basic scavenged tributyl phosphate waste via or from 241-BY tank farm to the BC Crib area. The site contains less than 10 Ci total beta. The french drain (active from January 1956 to January 1958) received drainage from the pipeline that transferred tri-butyl phosphate waste from the 241-BY Tank Farm to the BC Cribs and Trenches. The pipe is filled with 4 m (13 ft) of gravel.

Related Site Structure: The french drain is associated with 216-E-114-PL, 200-E-221-PL and UPR-200-E-144.**Site Posting:** URM, Fixed Contamination Area sign**Release Mechanism:** Process waste effluent**Release Type:** Liquid**Dimensions (estimated):**

Site Length:	None m (None ft)	Site Depth:	4.6 m (15.0 ft)
Site Width:	1.5 m (5.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	1.8 m ² (19.6 ft ²)		

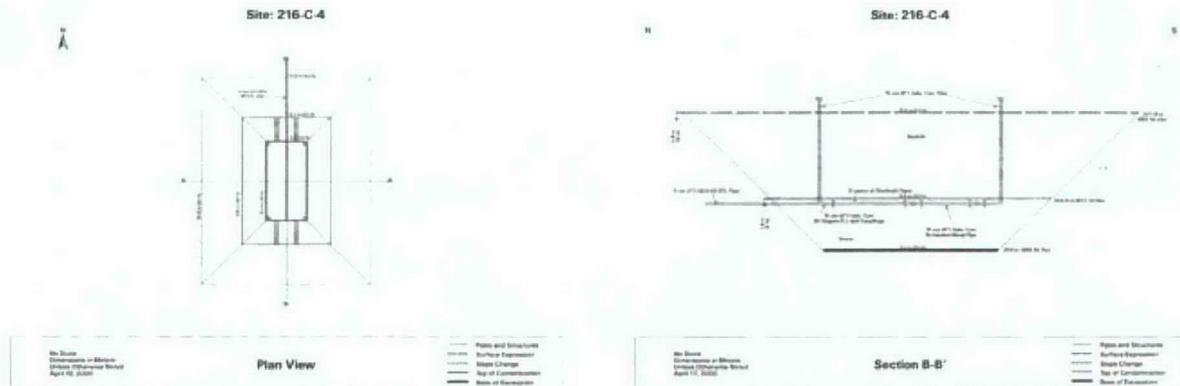
Potential Contaminants:

	Type	Constituents
Radiological	X	Less than 10 curries total beta/ gamma in March 1993. Maximim direct reading of 18,000 dpm /100 cm2 beta/gamma was found on concrete structure and wood cover from rad survey in April 2006.
Nonradiological	X	Tri- butyl phosphate

Preferred Removal Action: RTD**Estimated Removal Action Present Worth:** 469,235**References:**

WIDS General Summary Report, DOE/RL-2000-38, DOE/RL-2003-64, DOE/RL-2002-42

216-C-4



Site Name: 216-C-4, 216-C-4 Crib

Site Type: Crib

Current OU: 200-MG-2

Facility: Semi-Works Area

Former OU: 200-PW-3

Waste Site Description:

The crib is located south of 7th Street in the Hot Semiworks area, in between the double security fences surrounding the 209-E Critical Mass Laboratory. It is marked and posted with URM signs. An access area has been cut through the 209-E security fence. The site received contaminated organic waste from the 276-C Building that was low in salt and is neutral to basic. The unit is constructed of a 15-cm (6-in.) diameter galvanized, corrugated, perforated piping placed horizontally at 3.5 m (11.5 ft) below grade. Two 6.1 m (20 ft) lengths are placed perpendicularly to the inlet pipe, forming an H pattern. The side slope is 1:1. The site contains 1.8 m (6 ft) of gravel fill [74 m³ (2,600 ft³)] and has been backfilled. The waste release point is 1.5 m (5 ft) from the site bottom. The crib bottom is 4.8 m (16 ft) below ground surface and measures 3 m (10 ft) by 6 m (20 ft).

Related Site Structure: The pipeline associated with this crib is site code 200-E-170-PL.

Site Posting: URM

Release Mechanism: Contaminated effluent

Release Type: Liquid

Dimensions (estimated):

Site Length:	6.1 m (20.0 ft)	Site Depth:	5.0 m (16.0 ft)
Site Width:	3.0 m (10.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	18.6 m ² (200.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	170,000 L of organic waste

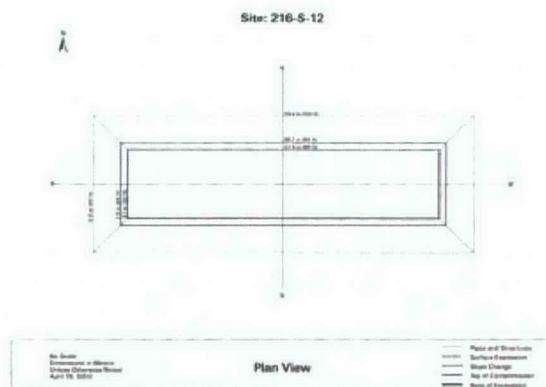
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-01, DOE/RL-2006-51

216-S-12



Site Name: 216-S-12, UPR-200-W-30, 291-S Stack Wash Sump, REDOX Stack Flush Trench

Site Type: Trench

Current OU: 200-MG-2

Facility: Redox Area

Former OU: 200-MW-1

Waste Site Description:

The site is located northeast of the 202-S (REDOX) facility, north of the 291-S Stack and consists of one, single-use liquid waste disposal trench. The site is surrounded with cement marker posts and chain, posted with URM signs. It is labeled 216-S-12. This site was used for liquid disposal of 291-S Stack flush water. In July 1954, the 291-S (REDOX) stack was flushed and approximately 68,100 L (18,000 gal) of flush water was drained into this trench. The water contained ammonium nitrate (600 kg). The material contained an estimated 5 Ci of beta particle emitters and 2-3 Ci of gamma particle emitters that were predominantly ruthenium and zirconium-niobium. Potential contaminants of concern include cobalt-60, cesium-137, strontium-90, plutonium-239/240, and uranium-238. It was fed with an overground pipeline.

Related Site Structure: The site is associated with the 291-S Stack.

Site Posting: URM

Release Mechanism: Flush water

Release Type: Liquid

Dimensions (estimated):

Site Length: 27.4 m (90.0 ft)

Site Width: 6.1 m (20.0 ft)

Site Area: 167.2 m² (1800.2 ft²)

Site Depth: 3.0 m (10.0 ft)

Cover Thickness: 0 m (0 ft)

Potential Contaminants:

	Type	Constituents
Radiological	X	5 curies of beta particle emitters and 2-3 curies of gamma emitters, that were predominantly ruthenium and zirconium-niobium. Cobalt-60, Strontium-90, cesium-137, plutonium 239/240, uranium 238 in May 1987. 600 kg Ammonium nitrate
Nonradiological	X	

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 526,908

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-S-16D



Site: 216-S-16D



Site Name: 216-S-16D, 202-S Swamp (New) and Ditch, 202-S Swamp #1, REDOX Pond #2, 216-S-24 Ditch

Site Type: Ditch

Current OU: 200-MG-2

Facility: 200 W Ponds Area

Former OU: 200-CW-2

Waste Site Description:

The open ditch began 835 m (2736 ft) southwest of the southwest corner of the 200 West Area perimeter fence, terminating at the eastern edge of the 216-S-16 Pond. The site is a ditch that connected the 202-S Building to the 216-S-16 Pond. The side slope of the open ditch was 2:1. It is posted with URM signs. January 1957 is considered the most accurate start date for this site which received process cooling water and steam condensate from 202-S Building (REDOX) until June 1967. After the REDOX was put on standby in July 1967, the site received condenser and vessel cooling water from concentrator boil-down operations in the 202-S Building. In 1973, the 216-U-9 ditch was connected to the 216-S-16 ditch to allow the 216-U-10 pond overflow to reach the 216-S-16 pond. Prior to reaching the open ditch, the effluent was transported via an underground, 60 cm (24 in.) vitrified clay pipeline.

Related Site Structure: The site is associate with the REDOX facility, the 216-S-16 Pond, and the 216-U-9 Ditch. The pipeline to the 216-S-16 ditch is discussed in site code 200-W-155-PL.

Site Posting: URM

Release Mechanism: Contaminated effluent

Release Type: Liquid

Dimensions (estimated):

Site Length:	518.2 m (1700.1 ft)	Site Depth:	0.9 m (3.0 ft)
Site Width:	1.2 m (4.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	631.7 m ² (6800.7 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 167,966

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

216-S-18



Site Name: 216-S-18, 241-SX Steam Cleaning Pit, 216-S-14 Steam Cleaning Pit

Site Type: Trench

Current OU: 200-MG-2

Facility: S/U Farm Area

Former OU: 200-MW-1

Waste Site Description:

The site is located north of 13th Street, east of 241-S Tank Farms, and southwest of 216-S-9 Crib. The site consists of one backfilled trench. It is posted with light weight chain and URM signs. This site was originally used in 1954 as a steam cleaning pit for contaminated equipment. According to RHO-CD-673 (Maxfield, 1979), the trench was excavated in October 1972. In 1972, the site was backfilled and released from radiation zone status. The contaminated material was taken to a 200 West Area burial ground. In 1995 and 1997, the open trench was used to consolidate nearby surface soil contamination. During the stabilization of UPR-200-W-165 and UPR-200-W-114 in 1995, contamination specks were found in the shallow trench excavation. The area was posted as a radiation area. The source of the contamination is assumed to be contamination specks from the operation of the 241-S Tank Farms. In 1997, a small area of contaminated soil remaining from UPR-200-W-114 was pushed into the 216-S-18 Trench depression. The 216-S-18 Trench area was then covered with clean dirt and posted as a URM area. The contaminated soil was covered with 1.8 m (6 ft) of clean dirt to bring the site up to grade.

Related Site Structure: The site is associated with UPR-200-W-114.

Site Posting: URM

Release Mechanism: Steam condensate/contaminated soil

Release Type: Solid and Liquid

Dimensions (estimated):

Site Length:	38.0 m (125.0 ft)	Site Depth:	2.0 m (6.6 ft)
Site Width:	4.6 m (16.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	174.8 m ² (2000.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	Unknown	Unknown

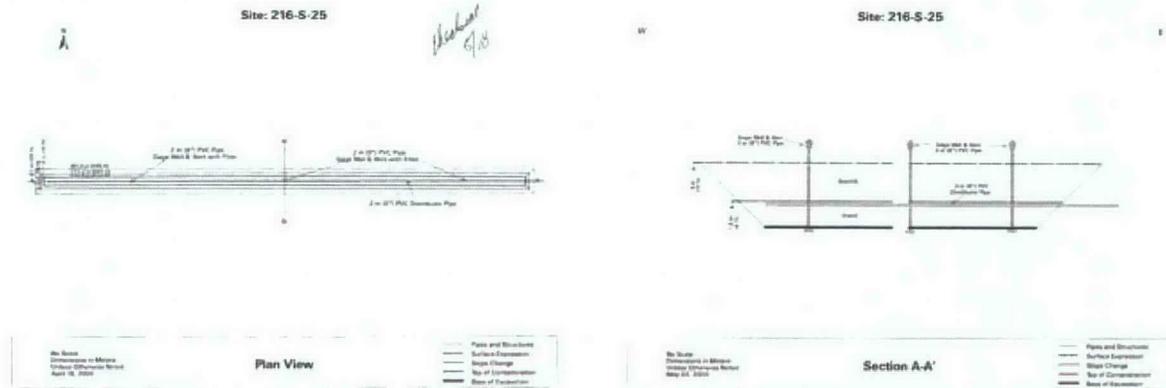
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-S-25



Site Name: 216-S-25, 216-S-25 Crib

Site Type: Crib

Current OU: 200-MG-2

Facility: 200 W Ponds Area

Former OU: 200-SC-1

Waste Site Description:

The crib is located south of 13th Street and west of the 241-SX Tank Farm, outside the 200 West perimeter fence, south and east of 216-U-10 Pond. The site is marked with AC-540 markers and posted with URM signs. A distribution pipe is located 2.1 m (7 ft) below grade. The site contains approximately 1160 m³ (41,000 ft³) of gravel. Three gage wells and vent systems made of 20 cm (8 in.) SCH 40 PVC with a 15 cm (6 in.) SCH 40 PVC perforated distribution pipe. Until 11/80, the site received the 242-S Evaporator process steam condensate. Since 11/80, the 242-S Evaporator has been in standby mode. In 1985, this crib received the effluent from the 216-U-1 & 2 groundwater pump and treat effort. The 241-SX Sludge Cooler Steam Heater was shut off in 1992 due to leaking tubes. A new steam heater unit was installed in 1993 and scheduled to start up in 1995. It was to operate for five months (through winter and early spring) producing approximately 15 to 30 L (4-8 gal) of condensate per hour that would be discharged to the 216-S-25 crib. The crib received effluent from the 242-S Evaporator building via a 10 cm (4 in.) diameter underground pipeline (site code 200-W-161-PL). In 1984, the pipeline from 241-SX-402 (site code 200-W-159-PL) was tied into the 216-S-25 crib pipeline.

Related Site Structure: The crib is associated with the 242-S Evaporator building. The pipeline associated with this crib is site code 200-W-161-PL.

Site Posting: URM

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	175.3 m (575.0 ft)	Site Depth:	3.1 m (10.0 ft)
Site Width:	3.0 m (10.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	534.2 m ² (5750.6 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	Unknown	Unknown
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA
Estimated Removal Action Present Worth: 179,554

References:
WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

216-SX-2



Site Name: 216-SX-2, 216-SX-2 Crib

Site Type: Crib

Current OU: 200-MG-2

Facility: S/U Farm Area

Former OU: 200-MW-1

Waste Site Description:

The crib is located on the east side of Cooper Ave. adjacent to the 241-SX tank Farm. It is approximately 7.6 m (25 ft) south of the 241-SX-701 Compressor house and 23 m (75 ft) west of the 241-SX Tank Farm fence. The crib is currently surrounded by light post and chain and posted with URM signs. It is labeled "216-SX-2" on three sides with old style black and white signs. It is a gravel filled crib topped with a subsurface layer of Sisalkraft paper. The crib received waste from and is connected to the 241-SX-701 Compressor House. A comment was added to H-2-39952 in September 1965, stating the crib had been abandoned because it had ceased to percolate.

Related Site Structure: The crib is associated with the 241-SX-701 Compressor House. The pipeline associated with this crib is site code 200-W-162-PL.

Site Posting: URM

Release Mechanism: Compressor house waste

Release Type: Liquid

Dimensions (estimated):

Site Length: 22.9 m (75.3 ft)

Site Depth: 2.1 m (6.8 ft)

Site Width: 9.2 m (30.3 ft)

Cover Thickness: 0 m (0 ft)

Site Area: 210.7 m² (2281.6 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	Unknown	Unknown

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 519,083

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-T-1



Site Name: 216-T-1, 221-T Ditch, 221-T Trench, 216-T-1 Trench

Site Type: Ditch

Current OU: 200-MG-2

Facility: T Plant Area

Former OU: 200-CW-4

Waste Site Description:

The ditch is located on the north side of 221-T Building, west of Beloit Avenue. The ditch was permanently isolated by filling the manholes with concrete and cutting and capping the discharge pipes and was backfilled and stabilized in April 1995 by Tank Farm Operations. It is currently marked and posted with URM signs and the site is now inactive. The ditch received cooling water and steam condensate discharge from 221-T and 271-T. From 1944 until 6/56, the site received miscellaneous waste from pilot plant experimental work, intermittent decontamination waste, and waste from the head end of the 221-T Building. From 6/56 to 1/64 the ditch was inactive due to the production operations at T Plant being shut down. From 1/64 to 6/70, the site received cooling water from the blowdown vessel in the 271-T Building and miscellaneous waste from PNL head end operations in the 221-T Building. After 6/70, the site received condensate from steam-heated radiators at the head end of 221-T Building. During standdown of PNL operations, the discharge of 271-T and other 221-T head end waste was discontinued. The site also received sodium hydroxide wash water waste solution (less than 1,000 gal/month [3,800 L/month]) from the Sodium-Air-Water Reaction Emergency Air Cleaning Development-HEDL. This waste water was nonradioactive and generally wet only the bottom of the unit to approximately 150 ft (46 m) from the outfall.

Related Site Structure: The ditch was associated with the 221-T facility operations. The pipeline associated with the ditch is 200-W-180-PL.

Site Posting: URM

Release Mechanism: Steam condensate/ cooling water

Release Type: Liquid

Dimensions (estimated):

Site Length:	447.0 m (1467.0 ft)	Site Depth:	3.1 m (10.0 ft)
Site Width:	0.9 m (3.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	408.7 m ² (4401.2 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA

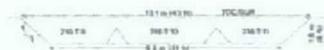
Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

216-T-10

Site: 216-T-9, 10, 11



No Image Available

**Site Name:** 216-T-10, Decontamination Trenches, Equipment Decontamination Area**Site Type:** Trench**Facility:** T Plant Area**Current OU:** 200-MG-2**Former OU:** 200-MW-1**Waste Site Description:**

This site is located west of the 221-T Building and southwest of the 216-T-33 Crib and consists of a backfilled trench. The site is no longer marked or posted. No radionuclide or chemical contamination has been documented for this site according to DOE/RL-91-61. However, ARH-2757 states that all contamination (maximum 3000 cpm) was buried in the 200 West Dry Waste Burial Ground. Although no cleaning agents are listed, the possibility of hazardous chemical contamination exists. This site was used for subsurface liquid disposal of heavy equipment and vehicle decontamination waste. The site operated from June 1951 to March 1954. Maxfield (1979) states the site operated from June 1951 to March 1957, but this ending date is believed to be in error. In 1954, the unit was backfilled. The vehicle decontamination operations were transferred to the 269-W garage facility that discharged waste to the 216-T-13 trench.

Related Site Structure: The site is associated with trenches 216-T-9 and 216-T-11.**Site Posting:** None**Release Mechanism:** Vehicle decontamination waste**Release Type:** Liquid**Dimensions (estimated):**

Site Length:	15.2 m (50.0 ft)	Site Depth:	2.0 m (7.0 ft)
Site Width:	3.0 m (10.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	46.5 m ² (500.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	Unknown
Nonradiological	Unknown	Unknown

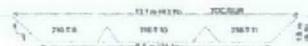
Preferred Removal Action: CS/NA**Estimated Removal Action Present Worth:** 167,966

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-T-11

Site: 216-T-9, 10, 11



No Image Available

**Site Name:** 216-T-11, Decontamination Trenches, Equipment Decontamination Area**Site Type:** Trench**Facility:** T Plant Area**Current OU:** 200-MG-2**Former OU:** 200-MW-1**Waste Site Description:**

This site is located west of 221-T and southwest of the 216-T-33 Crib. This site consists of a backfilled trench. The site is no longer marked or posted. The site received heavy equipment and vehicle decontamination waste. No radionuclide or chemical contamination has been documented for this site according to DOE/RL-91-61. However, ARH-2757 states that all contamination (maximum 3000 cpm) was buried in the 200 West Dry Waste Burial Ground. Although no cleaning agents are listed, the possibility of hazardous chemical contamination exists. This site was used for subsurface liquid disposal of heavy equipment and vehicle decontamination waste. The unit operated from June 1951 to March 1954. Maxfield (1979) states the site operated from June 1951 to March 1957, but this end date is believed to be in error. In 1954, the unit was backfilled, and decontamination operations were transferred to the 269-W garage facility that discharged to the 216-T-13 trench.

Related Site Structure: The site is associated with the 216-T-9 and 216-T-10 trenches..**Site Posting:** None**Release Mechanism:** Vehicle decontamination waste**Release Type:** Liquid**Dimensions (estimated):**

Site Length:	15.2 m (50.0 ft)	Site Depth:	2.0 m (7.0 ft)
Site Width:	3.0 m (10.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	46.5 m ² (500.0 ft ²)		

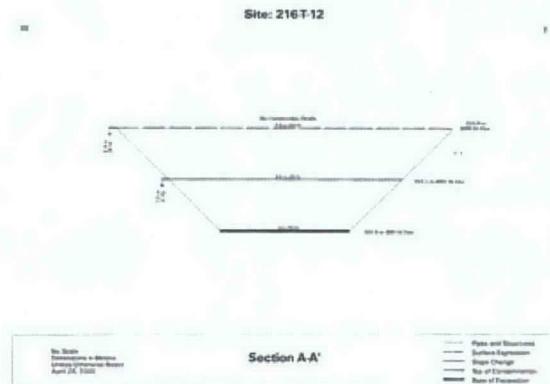
Potential Contaminants:

	Type	Constituents
Radiological	None	Unknown
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA**Estimated Removal Action Present Worth:** 167,966

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-T-12

Site Name: 216-T-12, 207-T Sludge Grave, 207-T Sludge Pit, 216-T-11

Site Type: Trench

Facility: T Farm Area

Current OU: 200-MG-2

Former OU: 200-CW-4

Waste Site Description:

This site is located at the northeast corner of the 207-T Retention Basin. There is no visible evidence of this waste site. The area around the 207-T Retention Basin, including the northeast corner where this pit was located, has been stabilized with clean backfill material and posted with URM signs. The sludge pit is not separately marked. The site received contaminated sludge from the 207-T Retention Basin. The waste is low in salt and is neutral to basic. The site was a small trench that was dug November 1954 with a backhoe at the northeast corner of the 207-T Retention Basin. Sludge dredged from the 207-T Retention Basin was put into the trench and covered. A maximum of 15 mR/hr was detected on the sludge at the time of the burial (1954). The majority of the surface readings taken were in the range of 2 to 5 mR/hr. The pit was used only once. The site was backfilled when dredging operations were complete.

Related Site Structure: The associated structure is the 207-T Retention Basin.

Site Posting: URM

Release Mechanism: Contaminated sludge

Release Type: Solid and Liquid

Dimensions (estimated):

Site Length:	4.6 m (15.0 ft)	Site Depth:	2.4 m (8.0 ft)
Site Width:	3.1 m (10.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	14.3 m ² (150.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Up to 0.015 rad/hour in 1954.
Nonradiological	Unknown	Unknown

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 413,027

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

216-T-13



Site Name: 216-T-13, 269-W Regulated Garage, 269-W Decontamination Pit or Trench, 216-T-12, 269-W Regulated Garage Decontamination Pit

Site Type: Trench

Current OU: 200-MG-2

Facility: T Farm Area

Former OU: 200-MW-1

Waste Site Description:

This site is located on the north side of the 241-TY Farm, north of the tank farm perimeter fence. The site has been shown at two locations on different maps. Drawing H-2-1495 (originally made in 1952) shows the location of the trench adjacent to the 269-W garage and northwest of the 241-TY Tank Farm, while a later drawing (H-2-32526, 1967 Rev 3) shows the trench due north of the 241-TY Tank Farm. The mapped location in HGIS is due north of the Tank Farm as of December 2001. The site consisted of a single open trench located west of the 269-W Regulated Garage (now demolished). Currently, there is a concrete ramp covered with 0.6 m (2 ft) of gravel that is visible near the site of the garage. The trench is no longer marked or posted. This site was used to clean contaminated vehicles. A Tip Rack was located in the bottom of the open trench. Vehicles were driven into the trench and onto the rack. The vehicles were then sprayed with water or steam to remove the contamination. The decontamination was often required prior to vehicles being serviced at the 269-W Garage. The site received vehicle decontamination liquid waste. The inventory prior to the removal of 3.06 m³ (4 yds³) of soil was estimated through 1972 as follows. ARH-2757, part 3 states the volume was 0.98E+05 L; <0.100E+00 g - plutonium; 0.840E+02 Ci - beta; 0.100E00 Ci - strontium-90; 0.400E+02 Ci - ruthenium-106; 0.100E+00 Ci - cesium-137; < 0.100E+00 Ci - cobalt-60; <0.500E-01 kg - uranium. ARH-1608 states the volume was 0.026E+06 Liters; <0.100E+00 g - plutonium; 60 Ci - beta; 1.00E+00 Ci - strontium-90; 40 Ci - ruthenium-106; 1.00E+00 Ci - cesium-137; < 0.100E+00 Ci - cobalt-60; <.1 lbs of uranium. Readings up to 1,500 cpm were measured in the excavated soil. Although no cleaning agents are listed, the possibility of hazardous chemical contamination exists. The site operated from June 1954 to June 1964. The site was deactivated when all vehicle decontamination operations were transferred to the 2706-T Building (also known as 2706-W). In 1964, the pit was deactivated by backfilling with soil. Although a dirt unloading ramp is located in the vicinity of this trench, the ramp was used to unload equipment and is not associated with the decontamination activities at 216-T-13. The trench is shown at different locations on two drawings. Drawing H-2-1495 (created in 1952) shows the trench adjacent to the southwest side of the 269-W garage. A conversation with a retired 200 West Area employee indicates the location north of the 241-TY Tank Farm is the correct location. Ground Penetrating Radar and Electromagnetic Induction scans done in December 2001 were not able to define the covered trench location. The older drawing, H-2-1495, appears to have depicted the 269-W garage further north of the location where the building foundations that are still visible. The shape of the building was also inverted on this drawing. Conversions to Washington State Plane coordinates for the trench shown on H-2-1495 distort the site location with respect to the known cement building foundations.

Related Site Structure: The site was associated with activities at the 269-W Regulated Garage, but the garage was not physically connected to the vehicle decontamination trench.

Site Posting: None

Release Mechanism: Vehicle decontamination waste

Release Type: Liquid

Dimensions (estimated):

Site Length: 6.1 m (20.0 ft)

Site Depth: 3.0 m (10.0 ft)

Site Width: 6.1 m (20.0 ft)

Cover Thickness: 0 m (0 ft)

Site Area: 37.2 m² (400.0 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

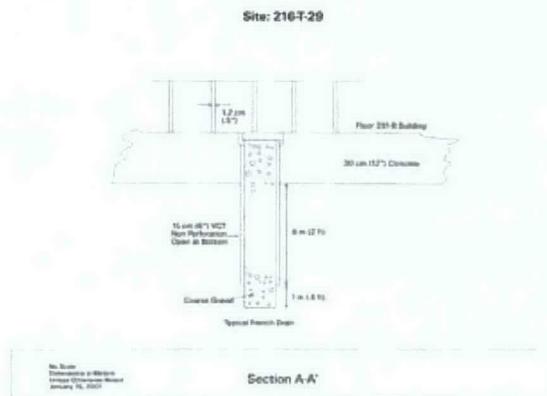
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-T-29



Site Name: 216-T-29, 291-T Sand Filter Sewer, 216-T-29 French Drain

Site Type: French Drain

Current OU: 200-MG-2

Facility: T Plant Area

Former OU: 200-MW-1

Waste Site Description:

The 291-T Sand Filter is located northeast of the 221-T building. The french drain is located adjacent to the north end of the 291-T Sand Filter and northeast of the 221-T Building. The 216-T-29 French Drain is part of the sand filter construction and is assumed to be located beneath the northwest corner of the sand filter structure. The sand filter is marked and posted as a CA. This site received canyon air condensate from the 291-T Sand Filter. There is a vent riser protruding through the roof of the northwest corner of the sand filter. This is assumed to be the location of the drain. The site waste was moisture condensed from canyon air and included 8000 kg of nitric acid. In the 1950s, silver reactor filters, made of fiberglass soaked in silver nitrate, were added to the stack ducts. The filters reacted with the radioiodine to form silver iodide. The T, B and U Plants were all constructed alike. A drawing (H-2-1378) for the B Plant Sand Filter (Site code 200-E-30) shows the drain for that sand filter to be located adjacent to the center of the east end of the B Plant Sand Filter, but not underneath the sand filter structure. Since the T Plant and B Plant construction plans were so similar, it may be possible that the T Plant Sand Filter drain is actually located adjacent to the center of the north end of the sand filter structure. The 1987 Hanford Site Waste Management Units Report site description states "This site consists of sixty french drains, 6 inch diameter, 3 foot 5 inches long, filled with coarse gravel, placed 13 feet 7 inches below the top of the structure. The sand filter is a concrete structure 100 X 48 X 14 ft, 7 in high which contains concrete blocks arranged in rows to form lateral ducts, with drains spaced throughout." This document description indicates the sand filter structure and the 216-T-29 french drain are the same structure. However, the 200 Area Waste Site Handbook (RHO-CD-673) describes the facility (sand filter) as "Sixty 6 inch diameter vitrified soil pipes in an area 100 X 48 ft. The 291-T sand filter inlet trenches drain to a single french drain pipe extending into the ground at the north corner of the sand filter. Any moisture condensed from the canyon air on the filter bed will escape to the ground at this location. The amount and activity are both very low." This description indicates a separate, single french drain beneath the sand filter structure. The site operated from March 1949 to March 1964. In 1964 the sand filter bypass water seal was removed, deactivating the french drain. The sand filter was deactivated because new air filters were installed in each cell of the 221-T Building. The sand filter bypass water seal was removed, allowing the 221-T Building exhaust air to flow directly to the 291-T-1 Stack.

Related Site Structure: The associated structure is 200-W-45 (291-T Sand Filter).

Site Posting: CA

Release Mechanism: Moisture condensate

Release Type: Liquid

Dimensions (estimated):

Site Length: None m (None ft) **Site Depth:** 1.0 m (3.0 ft)
Site Width: 0.2 m (0.7 ft) **Cover Thickness:** 0 m (0 ft)
Site Area: 0.0 m² (0.4 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	8000 Kg of nitric acid, silver iodide

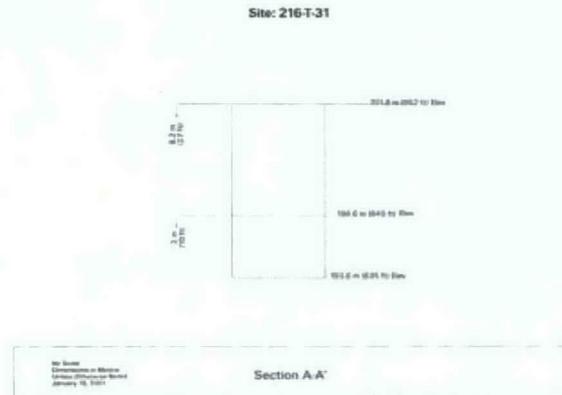
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 167,966

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-T-31



Site Name: 216-T-31, 216-T-31 French Drain

Site Type: French Drain

Current OU: 200-MG-2

Facility: T Farm Area

Former OU: 200-MW-1

Waste Site Description:

This site was located west of Camden Ave., near the southeast corner of the 241-TX Farm, on the east side of 241-TX Tank Farm fence. The site consisted of a 0.9 m (3 ft) diameter french drain. The drain was exhumed and left unmarked. A post with the WIDS Site code 216-T-31 now marks the approximate location of where the french drain had been. The unit was in operation in 1954 and abandoned in 1959 after it was contaminated by steam condensate from a steam line blowout during efforts to unplug a waste line (October 1959). A new steam line was installed in 1959 and a new steam condensate drain was made to replace the contaminated drain. The Hanford Site Waste Management Units Report (Cramer, 1987), RHO-CD-673 (Maxfield, 1979), ARH-2155 (Lundgren, 1971), and DOE/RL-91-61 contain conflicting information about this site. They differ on when it operated, and when it became contaminated.

Related Site Structure: None

Site Posting: Not Specified

Release Mechanism: Leak/ spill

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	8.2 m (27.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

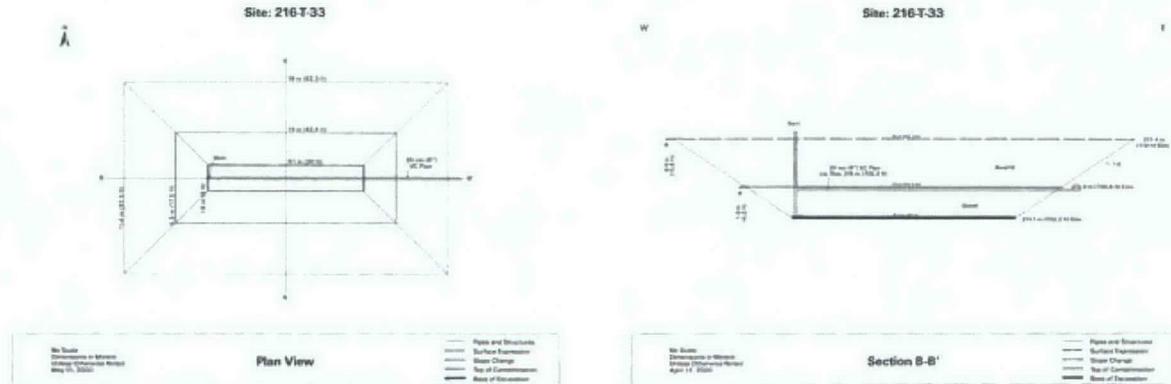
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-T-33



Site Name: 216-T-33, 216-T-33 Crib
Site Type: Crib
Current OU: 200-MG-2

Facility: T Plant Area
Former OU: 200-MW-1

Waste Site Description:

This unit is located west of 221-T Canyon Building and southwest of 2706-T. The site is surrounded with light metal posts and chain, posted with URM signs, and consists of a rectangular crib with perforated vitreous clay inlet pipe set into a gravel layer. A layer of plastic sheeting, clean sand, and backfill are above the pipe. The site received equipment decontamination waste from the 2706-T Building. The waste is low in salt, neutral to basic, and contains sodium hydroxide. The total effluent discharged to the crib is questionable, due to the fact that the discharge line plugged shortly after the crib became active. This site provided subsurface liquid disposal for the 2706-T Building. After the line plugged, the 2706-T waste was routed to the 216-T-28 crib, via the 241-T-112 tank. The site was only active from January to February 1963, when the line to the unit plugged. There is some question as to the amount of liquid that actually reached the unit. Operating management believed the line to the unit retained all of the waste. Sections of the tile line were removed and the building effluent was rerouted to the 216-T-28 Crib via the 241-T-112 Tank in the 241-T Tank Farm. The top dimensions are 12.2 m (40 ft) by 6.1 m (20 ft).

Related Site Structure: The site is associated with the 2706-T Decontamination Building. The pipeline associated with this crib is 200-W-173-PL.

Site Posting: URM

Release Mechanism: Equipment decontamination waste

Release Type: Liquid

Dimensions (estimated):

Site Length:	9.1 m (30.0 ft)	Site Depth:	3.3 m (10.8 ft)
Site Width:	2.0 m (7.0 ft)	Cover Thickness:	2.1 m (7 ft)
Site Area:	18.3 m ² (210.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Cs-137, Sr-90
Nonradiological	None	None

Preferred Removal Action: CS/NA
Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-T-4-1D

Site Name: 216-T-4-1D, 216-T-4 Ditch, 216-T-4 Swamp
Site Type: Ditch
Current OU: 200-MG-2

Facility: T Farm Area
Former OU: 200-CW-4

Waste Site Description:

The site was located north of 23rd Street, west of the 221-T Building and northwest of the 241-T Tank Farm. The original ditch is not currently visible. The ditch was replaced by the 216-T-4-2 Ditch in 1972. The first 15 m (50 ft) of the original (216-T-4-1D) ditch was reused in the replacement ditch construction. The ditch received T Plant cooling water and condensate waste via the 207-T Retention Basin. The 216-T-4-1 Ditch was surface stabilized along with the 216-T-4-2 replacement ditch in 1995. The area is posted as a URM. From 1944 to September 1951 and July 1955 to August 1956, the site received process cooling water from the 221-T and 224-T Buildings via the 207-T Retention Basin and steam condensate from 221-T Building. From September 1951 to July 1955, the site received the above listed streams plus condenser cooling water and steam condensate from 242-T Evaporator. From August 1956 to June 1957, the site received steam condensate from 221-T. From June 1957 to July 1964, the site was on standby. From July 1964 to December 1965, the site received decontamination waste from 2706-T. From December 1965 to November 1970, the site received the above listed streams plus condenser cooling water from 242-T Building. After November 1970, the site received condenser cooling water from 242-T Building. The total plutonium is 1.41 g (3.1E-3 lbs) according to Hanford Defense Waste Environmental Impact Statement data. By 1971, the unit had become contaminated to a maximum of 20,000 cpm at the bottom and was badly overgrown with aquatic plants, shrubs, and small willow trees. It was an attractive nuisance for area waterfowl. The berm from the new 216-T-4-2 Ditch was used to cover this unit in 1972. The radionuclide inventory is included in the 216-T-4A Pond inventory. The start date was November 1944 and the end date was May 1972.

Related Site Structure: The ditch is associated with the 216-T-4A Pond and the 216-T-4-2 Ditch. The pipeline from 207-T that fed the ditch is site code 200-W-164-PL.

Site Posting: URM

Release Mechanism: Steam condensate/ cooling water

Release Type: Liquid

Dimensions (estimated):

Site Length:	259.1 m (850.0 ft)	Site Depth:	1.2 m (4.0 ft)
Site Width:	2.4 m (8.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	631.7 m ² (6800.7 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Plutonium
Nonradiological	X	Unknown

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 1,606,700

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

Preferred Removal Action: RTD

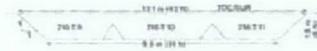
Estimated Removal Action Present Worth: 2,784,112

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

216-T-9

Site: 216-T-9, 10, 11



No Image Available

**Site Name:** 216-T-9, Decontamination Trenches, Equipment Decontamination Area**Site Type:** Trench**Current OU:** 200-MG-2**Facility:** T Plant Area**Former OU:** 200-MW-1**Waste Site Description:**

This site is located west of the 221-T Building and southwest of the 216-T-33 Crib and consists of a backfilled trench. The site is no longer marked or posted. This site was used for subsurface liquid disposal of vehicle decontamination waste from heavy equipment and other vehicles. No radionuclide or chemical contamination has been documented for this site according to DOE/RL-91-61. However, ARH-2757 states that all contamination (maximum 3000 cpm) was buried in the 200 West Dry Waste Burial Ground. Although no cleaning agents are listed, the possibility of hazardous chemical contamination exists. The site operated from February 1951 to March 1954. Maxfield (RHO-CD-673) states the site operated from July 1965 to January 1969; however, these dates are believed to be in error based on other reference material. The unit was backfilled in 1954. Decontamination operations were transferred to the 269-W garage facility that discharged to the 216-T-13 trench.

Related Site Structure: The site is associated with trenches 216-T-10 and 216-T-11.**Site Posting:** None**Release Mechanism:** Vehicle decontamination waste**Release Type:** Liquid**Dimensions (estimated):**

Site Length:	15.2 m (50.0 ft)	Site Depth:	2.0 m (7.0 ft)
Site Width:	3.0 m (10.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	46.5 m ² (500.0 ft ²)		

Potential Contaminants:

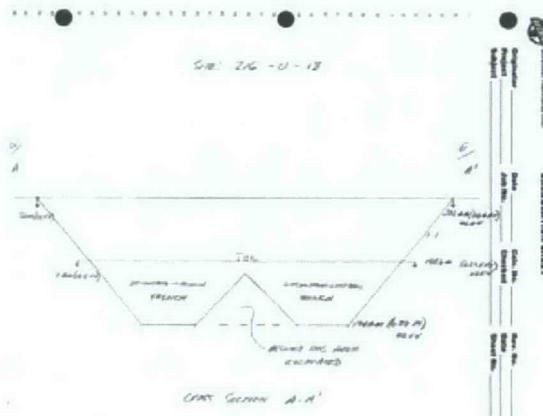
	Type	Constituents
Radiological	None	None
Nonradiological	Unknown	Unknown

Preferred Removal Action: CS/NA**Estimated Removal Action Present Worth:** 167,966

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-U-13



Site Name: 216-U-13, 216-U-13 Cribs, 216-U-13, Vehicle Steam Cleaning Pit

Site Type: Trench

Current OU: 200-MG-2

Facility: S/U Farm Area

Former OU: 200-MW-1

Waste Site Description:

This site was located west of the 241-U Tank Farm and consisted of two trenches of equal dimensions that are no longer marked or posted. Some debris is visible in the area. The area is not level; many deep gullies are located in the area. The site operated as a decontamination pit from March 1952 to March 1956, using steam and water hoses to remove radioactive contaminants from vehicles, equipment and pumps from the Uranium Recovery operation - mainly to decontaminate trucks and cranes bearing low levels of radioactive contamination. The trenches were sloped so that vehicles could be driven down to the decontamination station at the bottom. The site waste may include traces of detergent and nitric acid. 216-U-13 was two trenches of equal size (dimensions provided are for total of the two trenches). Several large pumps used in the Uranium Recovery process were also cleaned here, but the residue was scraped and taken to the 200 West Burial Grounds as were contaminated soils in the bottom of the pits. The trenches were backfilled and the site was deactivated because the decontamination operations were transferred to the 269-W garage equipment decontamination waste pit (216-T-13). In 1981 and 1982 the area west of the new tank farm fence was surveyed to determine the radiological conditions. A radiation survey of the site was performed on 9/24/81 and, except for two spots, all ground surface and vegetation at the trench site was less than background. In 1981, a chain link fence was installed around the 241-U Tank Farm and the fence excluded the 216-U-13 trenches. On August 10 and 11, 1982 the trenches were excavated to allow for sub-surface radiation surveys. The results enabled the two trenches to be released from radiological controls.

Related Site Structure: None

Site Posting: None

Release Mechanism: Vehicle decontamination waste

Release Type: Liquid

Dimensions (estimated):

Site Length: 61.0 m (200.0 ft)

Site Depth: 5.5 m (18.0 ft)

Site Width: 21.3 m (70.0 ft)

Cover Thickness: 0 m (0 ft)

Site Area: 1299.3 m² (14000.0 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	None

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-U-14

No Image Available

No Image Available

Site Name: 216-U-14, 216-U-14 Ditch, Laundry Ditch**Site Type:** Ditch**Current OU:** 200-MG-2**Facility:** T Plant Area**Former OU:** 200-CW-5**Waste Site Description:**

The ditch originated west of the 284-W Powerhouse, west of Bridgeport Avenue and extended southward, terminating at the 216-U-10 Pond. The 216-U-14 ditch was excavated in 1944 and was the original effluent route to the 216-U-10 Pond. It received 284-W Powerhouse waste water, laundry waste water (until 1981) via 200-W-102 Pipeline, chemical sewer waste from 221-U, and steam condensate and cooling water from 221-U, 241-U-110 condenser tank, 224-U and the 242-S Evaporator. The 221-U and 224-U effluent entered the ditch after passing through the 207-U Retention Basin. Near the head end of the ditch, a 0.6 m (2 ft) diameter pipe allowed 284-W Powerhouse and laundry effluent to flow under 19th Street and connect to the main portion of the ditch. The ditch also had a 1.22 m (4 ft) diameter culvert that allowed effluent to flow under 16th Street to the portion of the ditch located north of the 242-S Evaporator and also flowed under Cooper Ave. to terminate at 216-U-10 Pond. The 200 West Area Powerhouse Pond was constructed over the location of the head end of the 216-U-14 Ditch after that section was deactivated. The depth varied slightly along the length of the ditch. The 216-U-16 crib was built in 1984 to accept 224-U effluent that had previously been discharged to the ditch. However, the 216-U-16 crib failed in 1985 when a pooling of waste on an underground caliche layer caused a lateral movement of the liquid that eventually reached groundwater by seeping around a well casing. Some 224-U effluent was diverted back to the 216-U-14 Ditch until November 1994, when the outlet pipe to the 207-U Retention Basin was permanently isolated and filled with concrete. The portion of the ditch located west of Cooper Ave. received effluent from the 242-S Evaporator and remained active until April 1995. Discharge from the 242-S Evaporator was eliminated in 1995 ending all discharges to this unit. A variety of wastewater releases have occurred over 50 years. Occurrence Report 86-46 states that on August 6, 1986, 2365 L (625 gal) of recovered nitric acid, containing 39 kg (86 lbs) of uranium was discharged through the chemical sewer to the 207-U retention Basin. Prior to the discovery of the release, the outlet valves on the retention basin were open to the 216-U-14 Ditch. The acid released to the ditch was greatly diluted with the 1140 L (300 gal) per minute flow of cooling water from the 224-U facility being processed through the chemical sewer system. The outlet valves from the retention basin were closed shortly after the discovery of the release and the remainder of the acid release was contained in the retention basin. The effluent in the retention basin was neutralized with 270 kg (600 lbs) of sodium carbonate. The Hanford Site Waste Management Units Report (1987) reported different release values. It stated approximately 3000 L (796 gal) of 50% reprocessed nitric acid was released to the unit. The total release to the environment consisted of approximately 101,250 kg (225,000 lbs) of corrosive solution (pH less than 2.0) and 45.4 kg (100 lbs) of uranium. Sediment, soil and vegetation samples were collected to characterize the 216-U-14 Ditch several times. In 1981, contamination levels found in sediment at the head end of the ditch, to a depth of 175 cm (70 in), were above background levels for all radionuclides analyzed. The average concentration for all depths was 76.6 pCi/g cesium-137, 113.4 pCi/g per gram cobalt-60, 101.6 pCi/g strontium-90, and 89.1 pCi/g plutonium 239/240. The highest concentrations of cobalt-60 were found in the head end of the ditch. The highest concentration of cesium-137 was found near where the ditch entered U-Pond. Core samples were collected in 1987 to determine the effects of the accidental nitric acid and uranium release that occurred in 1986. A maximum of 185 pCi/g of uranium was found at a depth of 15 to 30 cm (6 to 12 in). Test pits were excavated in the ditch in 1992 to support the Groundwater Impact Assessment for the 216-U-14 Ditch. The test pits were located in the portion of the ditch west of Cooper Ave and east of the 216-U-10 pond. Data indicated the contaminants were concentrated within a few feet of the bottom of the ditch.

Related Site Structure: The ditch is associated with the 284-W Powerhouse, 2723-W (old laundry facility), 2724-W (new laundry facility), 221-U, 224-U, 271-U the 242-S Evaporator building and the 241-U-110 tank. The 200 West Area Powerhouse Pond was constructed over the location of the head end of the 216-U-14 Ditch. The pipeline from 2724-W is 200-W-102-PL. A pipeline from 241-U tank farm to the 216-U-14 ditch is site code 200-W-168-PL. The

outlet pipe from 207-U is site code 200-W-222-PL. The effluent discharge pipe from 242-S Evaporator to the 216-U-14 ditch is site code 200-W-223-PL.

Site Posting: URM

Release Mechanism: Multiple miscellaneous effluent releases

Release Type: Liquid

Dimensions (estimated):

Site Length: 1731.3 m (5680.3 ft)

Site Depth: 3.1 m (10.0 ft)

Site Width: 2.4 m (8.0 ft)

Cover Thickness: minimum 0.61 m (minimum 2.0 ft)

Site Area: 4221.5 m² (45444.4 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	X	Radiological survey showed collected tumble-weeds with 4000 to 10,000 dpm in 1997. 1981 sampling detected Cs-137, Sr-90, U-238, Co-60, Pu-239/240. (Tn and Tc-99)
Nonradiological	X	Unknown

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 6,006,623

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

216-U-3



Site Name: 216-U-3, 216-U-11, 216-U-3 French Drain

Site Type: French Drain

Current OU: 200-MG-2

Facility: S/U Farm Area

Former OU: 200-MW-1

Waste Site Description:

This site is located south of the 241-U Tank Farm on the south side of 16th Street and consists of a french drain with light steel posts and chain with URM signs. The drain is a 3.6 m (12 ft) deep, 1.8 m (6 ft) diameter, rock-filled excavation with sloping sides and a 10 cm (4 in) diameter vent riser. This 216-U-3 crib received condensate from the steam condensers on the 241-U-104 and 241-U-110 tanks. The 241-U-104 and 241-U-110 tanks held REDOX boiling waste. The site waste contains nitrate. The closed loop cooling water for the condensers was discharged to the 216-U-14 ditch. Most reference documents mention this site receiving waste from 241-U-110, but drawing H-2-44004 also shows the 241-U-104 tank having a condenser that is attached to the same pipeline as the 241-U-110 tank. This site operated from May 1954 to August 1955. The site was deactivated by valving out the condenser piping, when the tank contents were no longer boiling. Although the drain was a gravel filled excavation, a large cave-in depression was noticed at this site in 1985. It is assumed that a subsurface wash out had occurred. An area of contaminated soil, located adjacent to the 216-U-3 site, was surface stabilized in 1998 (See 200-W-67). The site had a 1.8 m (6 ft) bottom diameter and a 1:1 side slope. The surface diameter of the excavation was 5.5 m (18 ft).

Related Site Structure: The french drain is associated with the 241-U-104, 241-U-110 Tanks and the 200-W-169-PL pipeline.

Site Posting: URM

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	3.7 m (12.0 ft)
Site Width:	1.8 m (6.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	2.5 m ² (28.3 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	X	Hg, Se

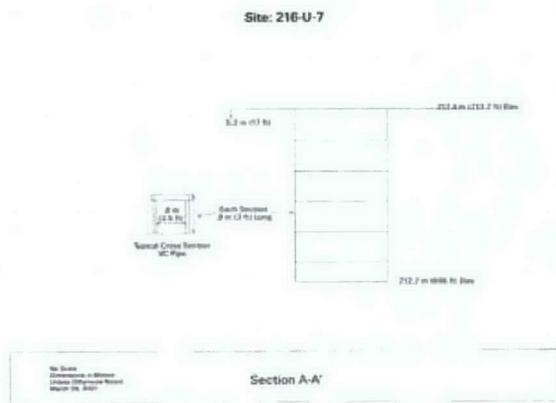
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-U-7



Site Name: 216-U-7, 221-U Counting Box French Drain, 221-U Vessel Vent Blower Pit French Drain
Site Type: French Drain
Current OU: 200-MG-2
Facility: U Plant Area
Former OU: 200-MW-1

Waste Site Description:

This site is located on the southeast side of the 221-U Building near Section 6. It is northwest of the 241-UX-154 Diversion Box. The french drain is within a larger area that has been stabilized and posted with URM signs. This drain is constructed of a concrete pipe set vertically into the ground. Gravel fills 1.1 m (3.5 ft) of the pipe. The site received liquid wastes from a counting box floor drain during the metal recovery program. The site waste contains nitrate. Due to UPR-200-W-138, it is assumed that 13 kg (30 lbs) of uranium in UNH solution were also introduced to the soil through the 216-U-7 French Drain. However, the release associated with UPR-200-W-138 may be associated with a different french drain. The release information is vague. It is possible the event effected the 216-U-7 French Drain if sufficient liquid volume was released to the surface to flow southward and reach the 216-U-7 French Drain location. The site operated from March 1952 to June 1957 and was retired when the Uranium Recovery operations in the 221-U Building were shut down. The site was deactivated by removing the cell jumpers in the 221-U Building. Drawing H-2-44511, Sheet 68 correctly identifies the location of 216-U-7 French Drain near 221-U Section 6. This drawing shows 216-U-7 attached to a structure marked "Blower Pit". Other, more detailed U Plant drawings H-2-43078 and H-2-43039 show the "Blower Pit" to be located further north, near 221-U Section 3. These drawings describe the structure near section 6 adjacent to 216-U-7 as a "Counting Box".

Related Site Structure: The site is associated with the 221-U Building, UPR-200-W-162 and UPR-200-W-138. The pipeline from the counting box to the french drain is site code 200-W-217-PL.

Site Posting: URM

Release Mechanism: Contaminated effluent

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	5.2 m (17.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	13 Kg of Uranium in UNH solution
Nonradiological	Unknown	Unknown

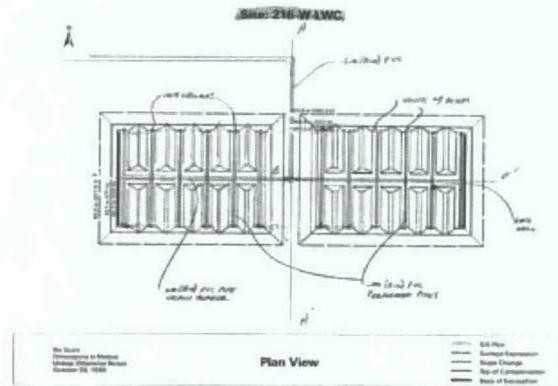
Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-W-LWC



Site Name: 216-W-LWC, 216-W-LC, Laundry Waste Crib, 216-W-LWC Crib, 216-W-1

Site Type: Crib

Current OU: 200-MG-2

Facility: T Plant Area

Former OU: 200-CW-5

Waste Site Description:

The site is located east of Beloit Ave., south of 20th Street, is surrounded by a single URM posted area, and consists of two independent crib structures (drain fields) and associated underground pipelines connecting to the 200-W-64 laundry facilities. Each crib bottom dimension is 47 m (150 ft by 40.5 m (133 ft). Each structure consists of a 20 cm (9-in.) P.V.C. central distribution pipe running east-west, 4.3 m (14 ft) below grade, from which six 10 cm (4-in) P.V.C. perforated drain lines extend the length of the unit of both sides 47 m (150 ft). The drain lines run parallel to each other, 7.0 m (23 ft) apart. Beneath each lies a 1.5-m (5-ft) deep rock-filled trench, giving the bottom a serrated appearance. A 2.1 m (7-ft) layer of gravel fill 4,243 m³ (5,546 yd) was backfilled over to grade. The side slope is 1.5:1. The site received all the process wastewater (averaging 2,615,435 L per month) from the contaminated laundry facility (2724-W/WA) and mask cleaning station (MO-412), starting September 7, 1981 and ending September 1994. The waste included radioactive residue from the contaminated laundry and detergents. Bleach and flame retardant chemicals were added to some of the wash and rinse cycles. From 1981 to 1983, some waste oils from a nearby fabrication shop, entered the waste stream through manhole B. The site became inactive in January 1994 when operations were initiated at an offsite contracted laundry facility. TPA M-17-34 required elimination of all discharge to the Crib by January 1995. By 1981, approximately three million pounds of laundry was processed per year in 600 pound capacity washing machines and 400 pound capacity dryers. An average of 2,615,435 L (691,000 gal) of waste water was discharged to the new crib each month. The serrated-type bottom design allowed the effluent to first infiltrate the soil column at the unit bottom. Solids were entrained at the rock bed/soil column interface in the bottom and began to accumulate, gradually reducing the infiltration rate. When the infiltrate capacity of the field unit bottom was reduced to less than the effluent discharge rate, pooling occurred at which point new, unused side walls became available for infiltration. Solids in the effluent settled to the bottom, leaving a clarified effluent to infiltrate the side walls. After six months of operation, the crib began backing up into the supply piping. In 1983, the distribution lateral was found to be 50% plugged with a gelatinous sludge. It was discovered that waste oils from the nearby fabrication shops were entering the crib waste stream through Manhole B, which subsequently was blocked with concrete to prevent anymore waste oil from entering the crib. The plugged piping was cleaned out enabling the crib to operate normally. Prior to discharging to the crib, laundry effluent was discharged via 200-W-102 (Pipeline from Laundry/Powerhouse) to the 216-U-14 Ditch.

Related Site Structure: The crib received effluent from the 2724-W, 2724-WA, 2724-WB Laundry facilities, MO-412 Mask Cleaning facility and the 2723-W Old Laundry. The pipeline to the Laundry Waste Crib is site code 200-W-221-PL.

Site Posting: URM

Release Mechanism: Contaminated effluent

Release Type: Liquid

Dimensions (estimated):

Site Length: 47.0 m (150.0 ft)

Site Depth: 5.8 m (19.1 ft)

Site Width: 40.5 m (133.0 ft)

Cover Thickness: 0 m (0 ft)

Site Area: 1905.3 m² (19951.0 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 750,839

References:

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

216-Z-13**No Image Available****No Image Available****Site Name:** 216-Z-13, 234-5 Dry Well #1, 216-Z-13 Dry Well, Miscellaneous Stream #261, 216-Z-13 A and B**Site Type:** French Drain**Facility:** PFP Area**Current OU:** 200-MG-2**Former OU:** 200-MW-1**Waste Site Description:**

The french drain is located northeast of the 291-Z stack and consists of two drain systems. The visible french drain is actually the upper portion of a two-part drain system. It receives condensate from the steam turbine exhaust stack. The lower french drain is constructed of two tile culverts placed end-to-end, and backfilled beneath 9 ft (2.7 m) of gravel and is located approximately 6 m (20 ft) south of the drain marked on the surface. The covered top of the upper french drain is visible on the surface, adjacent to a single cement marker post with a metal plate labeled 216-Z-13 (also seen in 1985 photograph 122440-250cn). The effluent source has been isolated. This french drain received emergency condensate from the turbine of the ET-8 exhaust fan, and 291-Z building steam condensate and floor drainage. Due to the french drain's location, low levels of vadose zone contamination are assumed. Two pipes discharged to the lower french drain, but the miscellaneous stream (#261) to the drain has been eliminated. The culvert is filled with cobbles. Due to the common nature of the discharge to the upper and lower drain systems, there is a potential for historical documentation related to the drains to be confusing.

Related Site Structure: This french drain is associated with include two effluent discharge pipes, the ET-8 exhaust fan turbine, and the 291-Z Building. The pipeline to the french drain is 200-W-214-PL.

Site Posting: None**Release Mechanism:** Steam condensate**Release Type:** Liquid**Dimensions (estimated):**

Site Length:	None m (None ft)	Site Depth:	5.0 m (16.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	None	None
Nonradiological	None	none

Preferred Removal Action: CS/NA**Estimated Removal Action Present Worth:** 179,554**References:**

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-Z-14

No Image Available

No Image Available

Site Name: 216-Z-14, 234-5 Dry Well #2, 216-Z-14 Dry Well, Miscellaneous Stream #262, 216-Z-14 A and B**Site Type:** French Drain**Facility:** PFP Area**Current OU:** 200-MG-2**Former OU:** 200-MW-1**Waste Site Description:**

The french drain is located northwest of the 291-Z Stack. The site consists of two drain systems. The upper drain is marked with a single cement marker post, but the top of the drain has been paved over. The lower drain system is not visible from the surface. It is located approximately 6 m (20 ft) southeast of the cement marker post. The lower french drain is constructed of two tile culverts placed end to end, and backfilled beneath 9 ft (2.7 m) of gravel. Two pipes discharge to the french drain. The culvert is filled with cobble. The french drain receives emergency condensate and steam condensate from the turbine of the ET-9 exhaust fan along with 291-Z building steam condensate and floor drainage. Due to the french drain's location, low levels of vadose zone contamination are assumed. The lower french drain receives steam condensate from the turbine of the ET-9 exhaust fan and 291-Z floor drainage. The condensate discharged to the upper drain system has been disconnected and now discharges to the ground. Due to the common nature of the discharge to the upper and lower drain systems, there is a potential for historical documentation related to the drains to be confusing. The site is miscellaneous stream number 262 in the some revisions of Inventory of Miscellaneous Streams report (DOE/RL-95-82) and 263 in other revisions. The site is also addressed in the Miscellaneous Streams Best Management Practices Report, as a b stream (a stream discharging in a surface contaminated area). However, in 2001, no posted SCA existed. Based on process history, the drains received non contaminated effluent.

Related Site Structure: The lower french drain is associated with two effluent discharge pipes, the ET-9 exhaust fan turbine, and the 291-Z Building. The pipeline to the french drain is 200-W-215-PL.

Site Posting: Not Specified

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	5.0 m (16.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

216-Z-15



Site Name: 216-Z-15, 234-5 Dry Well #3, 216-Z-15 Dry Well, Miscellaneous Stream #263

Site Type: French Drain

Current OU: 200-MG-2

Facility: PFP Area

Former OU: 200-MW-1

Waste Site Description:

The unit is adjacent to the southeast corner of the 2731-Z Building and north of the 291-Z Ventilation Building. The 216-Z-15 Dry Well is an inactive, below grade french drain. The site is marked with a single concrete marker post that reads "Buried Radioactivity - Do Not Excavate." The marker post is believed to be located directly above the drain structure. The unit is composed of two sections of vitrified clay pipe in a vertical configuration. There is one inlet pipe. The pipe is filled with cobbles and the upper end is covered with a wood plank. That source was eliminated in May 1997. Low levels of contamination are assumed, due to the possibility of accidents or unusual events in nearby areas. The french drain used to receive condensate drainage from the 291-Z building S-12 Evaporator Cooler, but that source has been re-routed to the 291-Z Sump, which is batch discharged to the PFP Low Level Waste Treatment Facility. The 216-Z-15 French Drain has been inactive and its discharge source has been eliminated since May 1997. The drain is listed as number 263 in some revisions of the Inventory of Miscellaneous Streams report (DOE/RL-95-82) and number 262 in other revisions.

Related Site Structure: The french drain is associated with the 291-Z building. The pipeline to the french drain is 200-W-216-PL.

Site Posting: 'Buried Radioactivity - Do Not Excavate.'

Release Mechanism: Process condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	None m (None ft)	Site Depth:	7.0 m (23.0 ft)
Site Width:	1.0 m (3.0 ft)	Cover Thickness:	0 m (0 ft)
Site Area:	0.8 m ² (7.1 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

Preferred Removal Action: RTD
Estimated Removal Action Present Worth: 469,410

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

2704-C-WS-1

No Image Available

No Image Available

Site Name: 2704-C-WS-1, 2704-C French Drain, Gatehouse French Drain**Site Type:** French Drain**Current OU:** 200-MG-2**Facility:** Semi-Works Area**Former OU:** 200-MW-1**Waste Site Description:**

This site is located in 200 East, at the southwest corner of the site of the 2704-C Building (demolished in 1998). The area where the french drain was located is now within a larger gravel area that is posted URM. The drain is no longer visible at the location described. The drain could be covered with gravel or by the two dumpsters located in the area. A 1991 site visit reported the drain cover was painted yellow and posted with a tri-foil, indicating radioactive contamination. However, in 1993, the site was described as having no radiological posting or markings. Currently (1999), the former location of 2704-C building is located within a larger posted URM area and surrounded with a post and chain fence. There is a possibility that this site is the same site as that identified in HW-22955 as a quench tank. The description follows. Steam condensate drained to a quench tank at the southwest corner of the building (2704C). Sanitary waste drains through a 10.2 cm (4 in) cast iron line running beneath the floor slab from the toilet room to a point 1.5 m (5 ft) west of the building where it connects to a 10.2 cm (4 in) tile drain. The overflow from the quench tank also flows into this tile drain which runs to the sanitary waste disposal field. The sanitary waste disposal field is part of the 2607-E7 Septic System. (Drawings H-2-4033, H-2-4012, and H-2-4013 identify a quench tank. Drawing H-2-77665 identifies a french drain). The 2704-C building was originally built in 1949 to support the Hot Semiworks operations. It was a one story wooden structure, on a cement slab foundation, that contained the security office (Gate House), a lunch room and a toilet. Building steam condensate drained to a quench tank located at the southwest corner of the building. During the 1980s, 2704C housed the 200 East Tank Farms Health Physics (HPT) Offices. Prior to demolition by BHI, the building was designated a contaminated facility. Although the drain received building steam condensate, periodically the drain was labeled with radioactive postings.

Related Site Structure: The site was related to the 2704-C, Office and Gate House. The pipeline associated with this french drain is site code 200-E-250-PL. The Hot Semiworks surface stabilized area is known as 200-E-41. The demolished 2704-C building and drain are adjacent to the Hot Semiworks stabilized area.

Site Posting: Located within a large URM area.

Release Mechanism: Steam condensate

Release Type: Liquid

Dimensions (estimated):

Site Length:	Irregular m (Irregular ft)	Site Depth:	Unknown m (Unknown ft)
Site Width:	Irregular m (Irregular ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	Unknown m ² (Unknown ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

Preferred Removal Action: CS/NA

Estimated Removal Action Present Worth: 179,554

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

UPR-200-E-17

No Image Available

No Image Available

Site Name: UPR-200-E-17, Overflow at 216-A-22, UN-200-E-17**Site Type:** Unplanned Release**Facility:** Purex Area**Current OU:** 200-MG-2**Former OU:** 200-MW-1**Waste Site Description:**

The release effected the ground on top of the 216-A-22 Crib, located north of PUREX, north of the 203-A facility, near the 216-A-28 French Drain. The 216-A-22 crib is marked with a single cement post and posted with URM signs. The unplanned release is not separately marked or posted. The release cannot be visually identified. The release consisted of uranium (from UNH storage) contamination on the ground surface from the failed 216-A-22 Crib inlet. The 203-A tank farm was used for storage and shipping of UNH product and concentration of UNH waste. It consisted of 460,000 L (100,000 gal) stainless steel tanks for UNH storage and three smaller nitric acid tanks. HW-60807, issued in 1959, stated that the covered release area was not separately posted because it was located within the 203-A stack radiation zone. This statement was copied into many later documents. Site visits and conversations with previous PUREX workers cannot identify a stack at the 203-A tank farm. It is believed that author of HW-60807 intended to state the spill was located within the 203-A tank radiation zone.

Related Site Structure: The site is associated with 216-A-22 and 203-A.**Site Posting:** URM**Release Mechanism:** Leak/ spill**Release Type:** Liquid**Dimensions (estimated):****Site Length:** Irregular m (Irregular ft)**Site Depth:** Unknown m (Unknown ft)**Site Width:** Irregular m (Irregular ft)**Cover Thickness:** 0.3-0.6 m (1-2 ft)**Site Area:** Unknown m² (Unknown ft²)**Potential Contaminants:**

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	460,000 L Uranyl nitrate hexahydrate

Preferred Removal Action: RTD**Estimated Removal Action Present Worth:** 191,646**References:**

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

UPR-200-E-9

No Image Available

No Image Available

Site Name: UPR-200-E-9, Liquid Overflow at 216-BY-201, UN-200-E-9**Site Type:** Unplanned Release**Facility:** B Farm Area**Current OU:** 200-MG-2**Former OU:** 200-TW-1**Waste Site Description:**

The location of this unplanned liquid release is adjacent to the 216-BY-201 Flush Tank, north of the 241-BY Tank Farm. A large area of surface contamination north of 241-BY Tank Farm was later named UPR-200-E-89. The site has been surface stabilized with gravel and is posted as an URM area. The 216-BY-201 Flush Tank leaked supernatant waste from the tributyl phosphate (TBP) process to the ground. The 216-BY-201 flush tank received tributyl phosphate waste via the 241-BY tank farm and then released it to the 216-B-43 through 49 cribs. The 216-B-50 crib did not receive tri-butyl phosphate waste.

Related Site Structure: UPR-200-E-9 is associated with 216-BY-201 and the 216-B-43 through 50 cribs.**Site Posting:** URM**Release Mechanism:** Leak/ Spill**Release Type:** Liquid**Dimensions (estimated):****Site Length:** Irregular m (Irregular ft)**Site Depth:** Unknown m (Unknown ft)**Site Width:** Irregular m (Irregular ft)**Cover Thickness:** 3.7 m (12 ft)**Site Area:** Unknown m² (Unknown ft²)**Potential Contaminants:**

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Supernatant waste from the tributyl phosphate (TBP). 41,600 L tributyl phosphate process waste (before clean up)

Preferred Removal Action: CS/NA**Estimated Removal Action Present Worth:** 179,554**References:**

WIDS General Summary Report, DOE/RL-2000-38, DOE/RL-2003-64, DOE/RL-2002-42

UPR-200-W-103

No Image Available

Site Name: UPR-200-W-103, 216-Z-18 Line Break, UN-216-W-13, UN-200-W-103, Pipe Line Leak

Site Type: Unplanned Release

Facility: PFP Area

Current OU: 200-MG-2

Former OU: 200-PW-1

Waste Site Description:

UPR-200-W-103 occurred within the Z Plant exclusion area, approximately 1.8 m (6 ft) south and 3.7 m (12 ft) west of the southwest corner of the 236-Z Building in the 200 West Area. The release site is posted with URM warning signs. Contamination still remains under the clean soil. A WIDS number sign has been placed inside the URM to mark the approximate release location. The release contained approximately 10 g of plutonium with gross alpha contamination greater than 6,000,000 dpm.

Related Site Structure: UPR-200-W-103 is associated with the 216-Z-18 Crib line, the 234-5 Building, and the 236-Z Building.

Site Posting: URM

Release Mechanism: Pipeline release

Release Type: Liquid

Dimensions (estimated):

Site Length: 8.0 m (25.0 ft)

Site Depth: 2.1 m (7.0 ft)

Site Width: 2.0 m (6.0 ft)

Cover Thickness: 0 m (0 ft)

Site Area: 16.0 m² (150.0 ft²)

Potential Contaminants:

	Type	Constituents
Radiological	X	10 g of plutonium with gross alpha contamination in April 1979. greater than 6,000,000 dpm.
Nonradiological	Unknown	Unknown

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 411,226

References:

WIDS General Summary Report, DOE/RL-2001-01, DOE/RL-2006-51

UPR-200-W-111

No Image Available

No Image Available

Site Name: UPR-200-W-111, Sludge Trench at 207-U, UN-216-W-21**Site Type:** Unplanned Release**Facility:** T Plant Area**Current OU:** 200-MG-2**Former OU:** 200-CW-5**Waste Site Description:**

The site, a trench, is approximately 3 m (10 ft) from the concrete wall on the south side of the 207-U South Retention Basin in the 200 West Area. The site had been posted with "Surface Contamination" signs. In 1997, contaminated soil in the vicinity of the 207-U Retention Basin was scraped and consolidated around the basin perimeter. The contaminated soil was covered with clean backfill. The radiological posting was changed to "Underground Radioactive Material." Approximately 21 m³ (27 yds³) of sludge from the 207-U South Retention Basin was buried adjacent to the Retention Basin. Until 1972, the retention basins received steam condensate and cooling water from the 224-U Building and chemical sewer waste from the 221-U Building. The exact date of this basin scraping is not known. It is assumed to have been a one time use trench dug in the 1960's. The trench was given a "UPR" designation, even though the sludge removal was a planned activity.

Related Site Structure: UPR-200-W-111 was associated with the 207-U South Retention Basin.**Site Posting:** SCA, URM**Release Mechanism:** Dumping Area**Release Type:** Solid**Dimensions (estimated):**

Site Length:	12.2 m (40.0 ft)	Site Depth:	3.1 m (10.0 ft)
Site Width:	4.6 m (15.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	56.1 m ² (600.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

Preferred Removal Action: RTD**Estimated Removal Action Present Worth:** 500,709**References:**

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

UPR-200-W-112

No Image Available

No Image Available

Site Name: UPR-200-W-112, Sludge Trench at 207-U, UN-216-W-22**Site Type:** Unplanned Release**Facility:** T Plant Area**Current OU:** 200-MG-2**Former OU:** 200-CW-5**Waste Site Description:**

The site is approximately 3 m (10 ft) from the concrete wall on the north side of the 207-U North Retention Basin in the 200 West Area. The site had been posted with "Surface Contamination" warning signs. In 1997, the contaminated area in the vicinity of the 207-U Retention Basin was scraped and consolidated. The area was covered with clean soil and the radiological posting was changed to URM. Approximately 21 cubic m³ (27 yds³) of sludge from the 207-U North Retention Basin was buried adjacent to the north side of the Retention Basin. Until 1972, the retention basins received steam condensate and cooling water from the 224-U Building and chemical sewer waste from the 221-U Building. Sludge was scraped from the bottom of the north 207-U Retention Basin and placed in a narrow trench adjacent to the north basin wall. The sludge was covered with 1.2 m (4 ft) of clean soil. The exact date of this basin scraping is not known. It is assumed to be a one time use trench, dug in the 1960's. The trench was given a "UPR" designation, even though the sludge removal was a planned activity.

Related Site Structure: UPR-200-W-112 was associated with the 207-U North Retention Basin.**Site Posting:** SCA, URM**Release Mechanism:** Dumping Area**Release Type:** Solid**Dimensions (estimated):**

Site Length:	12.2 m (40.0 ft)	Site Depth:	3.1 m (10.0 ft)
Site Width:	4.6 m (15.0 ft)	Cover Thickness:	0.3-0.6 m (1-2 ft)
Site Area:	56.1 m ² (600.0 ft ²)		

Potential Contaminants:

	Type	Constituents
Radiological	X	Unknown
Nonradiological	X	Unknown

Preferred Removal Action: RTD**Estimated Removal Action Present Worth:** 500,709**References:**

WIDS General Summary Report, DOE/RL-99-66, DOE/RL-2004-24, DOE/RL-2003-11

UPR-200-W-138

No Image Available

No Image Available

Site Name: UPR-200-W-138, 221-U Vessel Vent Blower Pit French Drain, UN-216-W-11, UN-200-W-138, UN-200-W-22, UPR-200-W-22

Site Type: Unplanned Release

Facility: U Plant Area

Current OU: 200-MG-2

Former OU: 200-MW-1

Waste Site Description:

UPR-200-W-138 occurred at the northwest corner of the 221-U Building, near the R-3 entrance. It is located inside the larger, surface stabilized area, UPR-200-W-162. The site was described as the ground near the R-3 entrance to the 221-U Building. The area has been surface stabilized and posted with URM signs. The Unplanned Release is not separately marked or posted. An estimated 140 kg (300 lbs) of UNH solution, containing 14 kg (30 lbs) of uranium, was released to the ground through the french drain. The information for this release is vague: some documentation indicates the french drain involved was the 216-U-7, but drawing reviews indicate the blower pit is located north of 216-U-7. The blower pit drained to the 241-WR vault. If the event involved surface liquid being released, it is possible it flowed southward and could have effected the 216-U-7 drain. Uranyl nitrate hexahydrate (UNH) solution overflowed into the 221-U Building Vessel Vent Blower Pit, then onto the ground through the french drain. Confusion exists in documentation concerning the location of the UPR-200-W-138 release. RHO-CD-673 describes the location as being near door R-3 of the 221-U building. It also mentions 216-U-7 as a past designation. However, 216-U-7 is located near door R-6 of the 221-U building. Detailed drawings indicate that the 216-U-7 french drain is connected to the 221-U counting box, and the blower pit floor drain is connected to the 241-WR Vault. (See Drawings: H-2-40887, H-2-43078 and H-2-44511, sheet 67). If this is the case, then the ground surface may not have been contaminated through the 216-U-7 french drain. It may be best to resolve this confusion through interviews with knowledgeable personnel. Until the issue is resolved, it should be assumed that 136 kg (300 lbs) of uranium nitrate hexahydrate solution were introduced to the soil through the 216-U-7 french drain.

Related Site Structure: UPR-200-W-138 was associated with the 221-U Building Vessel Vent Blower Pit and the larger surface stabilized area UPR-200-W-162. It may also be associated with the 216-U-7 french drain.

Site Posting: Located within a larger URM stabilized area.

Release Mechanism: Contaminated effluent

Release Type: Liquid

Dimensions (estimated):

Site Length: Irregular m (Irregular ft)

Site Depth: Unknown m (Unknown ft)

Site Width: Irregular m (Irregular ft)

Cover Thickness: 0.3-0.6 m (1-2 ft)

Site Area: Unknown m² (Unknown ft²)

Potential Contaminants:

	Type	Constituents
Radiological	X	140 kg of uranium nitrate hexahydrate solution; 14 kg of uranium
Nonradiological	X	Nitrate

Preferred Removal Action: RTD

Estimated Removal Action Present Worth: 163,452

References:

WIDS General Summary Report, DOE/RL-2001-65, DOE/RL-2005-62

A2.0 REFERENCES

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- 2 *Group Operable Unit*, Draft B, U.S. Department of Energy, Richland Operations Office,
- 3 Richland, Washington.
- 4 DOE/RL-2006-51, 2006, *Remedial Investigation Report for the Plutonium/Organic-Rich Process*
- 5 *Condensate/Process Waste Group Operable Unit: Includes the 200-PW-1, 200-PW-3,*
- 6 *and 200-PW-6 Operable Units*, Draft A, U.S. Department of Energy, Richland
- 7 Operations Office, Richland, Washington.
- 8 WIDS, 2007, Waste Information Data System General Summary Report.

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APPENDIX B
WASTE SITE ATTRIBUTES

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APPENDIX B
WASTE SITE ATTRIBUTES

B1.0 INTRODUCTION

Appendix B was used to consider the attributes of the site to determine the preferred removal action alternative. Table B-1 is organized by site type thus enabling a row by row comparison by waste site type of much of the same information as contained in Appendix A. Table B-1 is a listing of the waste site 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
- waste site description
- related sites/structure
- 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.

B2.0 REFERENCE

WIDS, 2007, *Waste Information Data System General Summary Report*, Hanford Site database.

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Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
216-A-22	Inactive	Crib	216-A-22, 216-A-22 French Drain, 216-A-22 Crib	PUREX Area	The site is located along the north wall of the 203-A Building, north of PUREX. The crib is marked with a single cement AC-540 marker and URM signs. The site received the drainage from the 203-A Building truck load out apron, the sump waste from the 203-A Building enclosure, and the heating coil condensate from the P-1 through P-4 UNH tanks. The waste is low in salt, neutral to basic, and contains less than 1 Ci total beta activity. The site received some uranium from the discharges. In 1961, a release from a UNH truck spilled 1335 pounds of uranium on the truck apron. Some of this drained into the 216-A-22 crib. The 203-A tank farm was used for storage and shipping of UNH product and concentration of UNH waste. It consisted of 460,000 L (100,000 gal) stainless steel tanks for UNH storage and three smaller nitric acid tanks. Two 10-cm (4-in.) effluent pipes are associated with the french drain. One pipe entered the crib 0.5 m (1.5 ft) above original grade. This pipe is no longer visible as it was covered over to stabilize contamination. The pipe from the truck load out apron enters the site horizontally, 2.4 m (8 ft) below grade. The excavation is 4.9 m (16 ft) in diameter at grade and 1.8 m (6 ft) in diameter at the bottom, with a side slope of 3:1 (V:H). Approximately 3 m (10 ft) of gravel fills the excavation bottom, and the site is backfilled. The drainage from the 203-A Building to the site was redirected to the 216-A-28 French Drain in December 1958. However, drainage from the truck load out apron was not diverted at that time (see H-2-54818 and Lundgren, 1970). The actual stop date of discharges to crib is not clear. The site cannot be visually located as it was covered over with clean soil after the UPR-200-E-17 release. Some documents list the start date for 216-A-22 as March 1956. Other documents say it had a startup date of November 1955. UPR-200-E-17 is described as yellow, uranium contaminated soil on the 216-A-22 Crib. No date is provided for this event, but it was documented in a 1959 report.	Crib	Y	Y	1-2	160.0	10.0	16.0	16.0	16-25	Covered with gravel and posted URM.	Contaminated effluent discharge	Liquid	65,000 dpm beta/gamma, no alpha in 1991.	Uranium

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Waste Site Attributes. (40 Pages)

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216-A-32	Inactive	Crib	216-A-32, 216-A-32 Crib	PUREX Area	The crib is located northeast of 202-A, inside the PUREX exclusion fence. The site is currently surrounded with cement posts with URM signs. There had been an inner area marked with steel posts, chains and Surface Contamination signs. The site received the 202-A canyon crane maintenance facility floor, sink, and shower drainage. The site contains less than 1 Ci total beta activity. In a letter (Walsar 1966), Isochem Corporation indicates the intent to dispose of 24,600 L (6,500 gal) of approximately 50% Soltrol (a brand of purified kerosene) diluent in this crib. BHI-00178 (1995) reports that investigators were unable to verify if the proposed disposal took place. Perforated vitrified clay pipe was placed horizontally on the fill 1.5 m (5 ft) above the bottom of the excavation. Two layers of Sisalkraft paper separate the crib gravel from the overlying earthen backfill. The start date was January 1959. PNL-6456 states the end date was 1972. [Dimensions provided are bottom dimensions].	Crib	Y	Y	1-2	560.1	70.0	8.0	12.0	12-20	In Summer 2001, the large CA on the east side of PUREX (200-E-107) was surface stabilized and down posted to URM. The 216-A-32 crib was located within this larger CA and was surface stabilized as part of this project.	Floor, sink and shower drainage	Liquid	Less than 1 curie total beta activity in October 1988.	Unk.
216-A-38-1	Inactive	Crib	216-A-38-1, 216-A-38 Crib (See Subsites)	PUREX Area	The crib is located southwest of 202-A Building north of 1st Street, south of the PUREX security fence. The crib is surrounded by light posts and a chain. It is posted with URM signs. There are no concrete AC-540 markers or signs to label the site. Although the crib was built to receive PUREX effluent, it was never used. The crib was built to replace the 216-A-10 crib, but had not been activated when plans for modifying the PUREX head end process were begun. The planned building addition would have been constructed immediately adjacent to the crib. For this reason, the crib was activated. The site is identified in the project proposal (Project IAP-606) as the PUREX Process Condensate Crib - 216-A-38. It was intended to receive the PUREX process condensate waste that was being discharged to the 216-A-10 Crib. The 216-A-10 was showing signs of strontium-90 saturation. The replacement crib was required for continued disposal for the disposal of large volumes [1,040,000 to 1,230,000 L (275,000 to 325,000 gal/day)] of condensate waste. There was a potential for this process condensate to become grossly contaminated as a result of reduced vapor phase de-entrainment or foaming in the concentrator. The location for the 216-A-38-1 Crib was chosen to shorten piping runs and take advantage of the high percolation rate [76 to 95 L (20-25 gal)] per day per square foot. The existing 216-A-10 crib could not be depended upon for continued disposal of process condensate. It had been in operation since June 1961 (five years), and had received about 1,800 million L (475 million gal) of condensate which contained about 115,000 Ci of beta activity (as of June 1966). Strontium-90 had been verified to be in the	Crib	Y	Y	1-2	8352.0	522.0	16.0	37.0	37-38	In 1989, the pipelines from PUREX to this crib were isolated, this work was verified in 1994 and 1995 by R. E. Rasmussen, who provided the original work authorizations, Engineering Change Notice (with drawings of original valves and installed blank flanges), and photographs as documentation. This crib was surface stabilized due to possible cross contamination from surrounding areas. The PUREX Technical Baseline Report states that the crib was surface stabilized due to cross contamination from surrounding areas. A memo, written in 1992, contradicts the statement in the Technical Baseline Report and indicates no stabilization activities have occurred at this crib.	Reported as never used	None / Unknown	Unk.	Unk.

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)	
					groundwater under the crib. There is a 15-cm (6-in) perforated stainless steel distribution pipe (from PUREX and running the length of the crib) reducing to 10-cm (4-in.) perforated pipe placed at 10 m (33 ft) below grade. This pipe was isolated with the installation of a blind flange in 1989. There is 1.5 m (5 ft) of gravel in the excavation with a membrane barrier between the gravel and the backfill. The excavation was backfilled with excavated material. The side slopes of the excavation were cut at 1:1. The crib was posted as an URM area in 1980, due to the fact that underground piping had been installed that connected the crib to the PUREX process. No surface contamination has ever been identified during routine surveillance and no stabilization activities have occurred at this crib. The crib proposal document was issued by ISOCEM in 1966, but the actual construction date has not been determined. A 216-A-38 Crib specification document was issued in February, 1967 (HWS-7724). This site was considered for reclassification, but has been temporarily withdrawn because the URM posting has not been removed, and because of concerns expressed by management that samples were never collected to prove no effluent ever reached the crib through the underground piping. Documents would be insufficient. It is possible that if the site was connected to a facility, it may have received waste even though the facility managers were not aware of it. The piping had been installed nine years before it was physically isolated.															
216-A-41	Inactive	Crib	216-A-41, Crib, 291-AR Stack Drain, 296-A-13 Stack Drain	PUREX Area	The crib is located northwest of the 296-A-13 stack, west of Buffalo Ave. and north of the 244-AR Vault facility. The site is a small crib that is no longer marked or posted and is 1.8 m (6 ft) below grade. The area where the crib is assumed to be located is covered with gravel. The site received the 296-A-13 Stack condensate drainage. The stack is connected to the 291-AR Filter Building. According to RHO-CD-673, the waste was potentially slightly acidic and contained less than 1 Ci total beta activity. Potential contaminants of concern (Stenner) may be tritium, cobalt-60, strontium-90, and cesium-137. The bottom of the crib (elevation: 207 m [678.5 ft]) is filled with 0.5 m (1.5 ft) of 3.8 to 25.4-cm (1.5 to 10-in.) rock, then 20.3 cm (8 in.) of 1.9 to 3.8-cm (0.75 to 1.5-in.) gravel, and several cm of 1.9-cm (0.75-in.) gravel. This material is covered by a layer of 20 mm polyethylene and 10.2 cm (4 in) of sand (elevation: 208 m [681.0 ft]). The site was then backfilled with soil to a ground elevation of 209 m (684.0 ft) (with the crown at 212 m [696.0 ft]). The side slope is 1:1. A 10.2-cm (4-in.) vitrified clay pipe enters the crib (from the 296-A-13 Stack) at elevation 208 m (681.0 ft) and connects to the crib dispersion structure, constructed of 20.3	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, cobalt-60, strontium-90, and cesium-137 in April 1979.	Unk.	

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
					by 40.6-cm (8 by 8 by 16-in.) bond beam concrete blocks placed end-to-end. The pipeline from the stack (296-A-13) to the crib is approximately (15 ft) long and extends northwest (30 degrees west of true north) from the stack. The site is not marked in the field. The mapped center point location of the site is based on drawing coordinates from H-2-61975, "216-A-41 Crib, Plan and Profile." Drawing H-2-44501, "Area Map-200 East, A Plant Facilities," shows the crib at the same location.														
216-C-4	Inactive	Crib	216-C-4, 216-C-4 Crib	Semi-Works Area	The crib is located south of 7th Street in the Hot Semiworks area, in between the double security fences surrounding the 209-E Critical Mass Laboratory. It is marked and posted with URM signs. An access area has been cut through the 209-E security fence. The site received contaminated organic waste from the 276-C Building that was low in salt and is neutral to basic. The unit is constructed of a 15-cm (6-in.) diameter galvanized, corrugated, perforated piping placed horizontally at 3.5 m (11.5 ft) below grade. Two 6.1 m (20 ft) lengths are placed perpendicularly to the inlet pipe, forming an H pattern. The side slope is 1:1. The site contains 1.8 m (6 ft) of gravel fill [74 m ³ (2,600 ft ³)] and has been backfilled. The waste release point is 1.5 m (5 ft) from the site bottom. The crib bottom is 4.8 m (16 ft) below ground surface and measures 3 m (10 ft) by 6 m (20 ft).	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 Crib 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 ureabor herbicide at the rate of 450 kg/hectare (500 lbs/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

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
216-S-25	Inactive	Crib	216-S-25, 216-S-25 Crib	200 W Ponds Area	The crib is located south of 13th Street and west of the 241-SX Tank Farm, outside the 200 West perimeter fence, south and east of 216-U-10 Pond. The site is marked with AC-540 markers and posted with URM signs. A distribution pipe is located 2.1 m (7 ft) below grade. The site contains approximately 1160 m ³ (41,000 ft ³) of gravel. Three gage wells and vent systems made of 20 cm (8 in.) SCH 40 PVC with a 15 cm (6 in.) SCH 40 PVC perforated distribution pipe. Until 11/80, the site received the 242-S Evaporator process steam condensate. Since 11/80, the 242-S Evaporator has been in standby mode. In 1985, this crib received the effluent from the 216-U-1 & 2 groundwater pump and treat effort. The 241-SX Sludge Cooler Steam Heater was shut off in 1992 due to leaking tubes. A new steam heater unit was installed in 1993 and scheduled to start up in 1995. It was to operate for five months (through winter and early spring) producing approximately 15 to 30 L (4-8 gal) of condensate per hour that would be discharged to the 216-S-25 crib. The crib received effluent from the 242-S Evaporator building via a 10 cm (4 in.) diameter underground pipeline (site code 200-W-161-PL). In 1984, the pipeline from 241-SX-402 (site code 200-W-159-PL) was tied into the 216-S-25 crib pipeline.	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	The crib is located on the east side of Cooper Ave. adjacent to the 241-SX tank Farm. It is approximately 7.6 m (25 ft) south of the 241-SX-701 Compressor house and 23 m (75 ft) west of the 241-SX Tank Farm fence. The crib is currently surrounded by light post and chain and posted with URM signs. It is labeled "216-SX-2" on three sides with old style black and white signs. It is a gravel filled crib topped with a subsurface layer of Sisalkraft paper. The crib received waste from and is connected to the 241-SX-701 Compressor House. A comment was added to H-2-39952 in September 1965, stating the crib had been abandoned because it had ceased to percolate.	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.

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

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216-T-33	Inactive	Crib	216-T-33, 216-T-33 Crib	T Plant Area	This unit is located west of 221-T Canyon Building and southwest of 2706-T. The site is surrounded with light metal posts and chain, posted with URM signs, and consists of a rectangular crib with perforated vitreous clay inlet pipe set into a gravel layer. A layer of plastic sheeting, clean sand, and backfill are above the pipe. The site received equipment decontamination waste from the 2706-T Building. The waste is low in salt, neutral to basic, and contains sodium hydroxide. The total effluent discharged to the crib is questionable, due to the fact that the discharge line plugged shortly after the crib became active. This site provided subsurface liquid disposal for the 2706-T Building. After the line plugged, the 2706-T waste was routed to the 216-T-28 crib, via the 241-T-112 tank. The site was only active from January to February 1963, when the line to the unit plugged. There is some question as to the amount of liquid that actually reached the unit. Operating management believed the line to the unit retained all of the waste. Sections of the tile line were removed and the building effluent was rerouted to the 216-T-28 Crib via the 241-T-112 Tank in the 241-T Tank Farm. The top dimensions are 12.2 m (40 ft) by 6.1 m (20 ft).	Crib	Y	N	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-W-LWC	Inactive	Crib	216-W-LWC, 216-W-LC, Laundry Waste Crib, 216-W-LWC Crib, 216-W-1	T Plant Area	The site is located east of Beloit Ave., south of 20th Street, is surrounded by a single URM posted area, and consists of two independent crib structures (drain fields) and associated underground pipelines connecting to the 200-W-64 laundry facilities. Each crib bottom dimension is 47 m (150 ft) by 40.5 m (133 ft). Each structure consists of a 20 cm (9-in.) P.V.C. central distribution pipe running east-west, 4.3 m (14 ft) below grade, from which six 10 cm (4-in) P.V.C. perforated drain lines extend the length of the unit of both sides 47 m (150 ft). The drain lines run parallel to each other, 7.0 m (23 ft) apart. Beneath each lies a 1.5-m (5-ft) deep rock-filled trench, giving the bottom a serrated appearance. A 2.1 m (7-ft) layer of gravel fill 4,243 m ³ (5,546 yd ³) was backfilled over to grade. The side slope is 1.5:1. The site received all the process wastewater (averaging 2,615,435 L per month) from the contaminated laundry facility (2724-W/WA) and mask cleaning station (MO-412), starting September 7, 1981 and ending September 1994. The waste included radioactive residue from the contaminated laundry and detergents. Bleach and flame retardant chemicals were added to some of the wash and rinse cycles. From 1981 to 1983, some waste oils from a nearby fabrication shop, entered the waste stream through manhole B. The site became inactive in January 1994 when operations were initiated at an offsite contracted laundry facility. TPA M-17-34 required elimination of all discharge to the	Crib	Y	N	0	19951.0	150.0	133.0	19.1	19-30	Backfilled and surface stabilized.	Contaminated effluent	Liquid	Unk.	Unk.

Table B-1. 200-MG-2 Operable Unit
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					Crib by January 1995. By 1981, approximately three million pounds of laundry was processed per year in 600 pound capacity washing machines and 400 pound capacity dryers. An average of 2,615,435 L (691,000 gal) of waste water was discharged to the new crib each month. The serrated-type bottom design allowed the effluent to first infiltrate the soil column at the unit bottom. Solids were entrained at the rock bed/soil column interface in the bottom and began to accumulate, gradually reducing the infiltration rate. When the infiltrate capacity of the field unit bottom was reduced to less than the effluent discharge rate, pooling occurred at which point new, unused side walls became available for infiltration. Solids in the effluent settled to the bottom, leaving a clarified effluent to infiltrate the side walls. After six months of operation, the crib began backing up into the supply piping. In 1983, the distribution lateral was found to be 50% plugged with a gelatinous sludge. It was discovered that waste oils from the nearby fabrication shops were entering the crib waste stream through Manhole B, which subsequently was blocked with concrete to prevent anymore waste oil from entering the crib. The plugged piping was cleaned out enabling the crib to operate normally. Prior to discharging to the crib, laundry effluent was discharged via 200-W-102 (Pipeline from Laundry/Powerhouse) to the 216-U-14 Ditch.																
216-S-16D	Inactive	Ditch	216-S-16D, 202-S Swamp (New) and Ditch, 202-S Swamp #1, REDOX Pond #2, 216-S-24 Ditch	200 W Ponds Area	The open ditch began 835 m (2736 ft) southwest of the southwest corner of the 200 West Area perimeter fence, terminating at the eastern edge of the 216-S-16 Pond. The site is a ditch that connected the 202-S Building to the 216-S-16 Pond. The side slope of the open ditch was 2:1. It is posted with URM signs. January 1957 is considered the most accurate start date for this site which received process cooling water and steam condensate from 202-S Building (REDOX) until June 1967. After the REDOX was put on standby in July 1967, the site received condenser and vessel cooling water from concentrator boil-down operations in the 202-S Building. In 1973, the 216-U-9 ditch was connected to the 216-S-16 ditch to allow the 216-U-10 pond overflow to reach the 216-S-16 pond. Prior to reaching the open ditch, the effluent was transported via an underground, 60 cm (24 in.) vitrified clay pipeline.	Ditch	Y	Y	1-2	6800.7	1700.1	4.0	3.0	3-6	The ditch has been backfilled and surface stabilized.	Contaminated effluent	Liquid	Unk.	Unk.		

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
216-T-1	Inactive	Ditch	216-T-1, 221-T Ditch, 221-T Trench, 216-T-1 Trench	T Plant Area	The ditch is located on the north side of 221-T Building, west of Beloit Avenue. The ditch was permanently isolated by filling the manholes with concrete and cutting and capping the discharge pipes and was backfilled and stabilized in April 1995 by Tank Farm Operations. It is currently marked and posted with URM signs and the site is now inactive. The ditch received cooling water and steam condensate discharge from 221-T and 271-T. From 1944 until 6/56, the site received miscellaneous waste from pilot plant experimental work, intermittent decontamination waste, and waste from the head end of the 221-T Building. From 6/56 to 1/64 the ditch was inactive due to the production operations at T Plant being shut down. From 1/64 to 6/70, the site received cooling water from the blowdown vessel in the 271-T Building and miscellaneous waste from PNL head end operations in the 221-T Building. After 6/70, the site received condensate from steam-heated radiators at the head end of 221-T Building. During standdown of PNL operations, the discharge of 271-T and other 221-T head end waste was discontinued. The site also received sodium hydroxide wash water waste solution (less than 1,000 gal/month [3,800 L/month]) from the Sodium-Air-Water Reaction Emergency Air Cleaning Development-HEDL. This waste water was nonradioactive and generally wet only the bottom of the unit to approximately 150 ft (46 m) from the outfall.	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	The site was located north of 23rd Street, west of the 221-T Building and northwest of the 241-T Tank Farm. The original ditch is not currently visible. The ditch was replaced by the 216-T-4-2 Ditch in 1972. The first 15 m (50 ft) of the original (216-T-4-1D) ditch was reused in the replacement ditch construction. The ditch received T Plant cooling water and condensate waste via the 207-T Retention Basin. The 216-T-4-1 Ditch was surface stabilized along with the 216-T-4-2 replacement ditch in 1995. The area is posted as a URM. From 1944 to September 1951 and July 1955 to August 1956, the site received process cooling water from the 221-T and 224-T Buildings via the 207-T Retention Basin and steam condensate from 221-T Building. From September 1951 to July 1955, the site received the above listed streams plus condenser cooling water and steam condensate from 242-T Evaporator. From August 1956 to June 1957, the site received steam condensate from 221-T. From June 1957 to July 1964, the site was on standby. From July 1964 to December 1965, the site received decontamination waste from 2706-T. From December 1965 to November 1970, the site received the above listed streams plus condenser cooling water from	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.

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
					242-T Building. After November 1970, the site received condenser cooling water from 242-T Building. The total plutonium is 1.41 g (3.1E-3 lbs) according to Hanford Defense Waste Environmental Impact Statement data. By 1971, the unit had become contaminated to a maximum of 20,000 cpm at the bottom and was badly overgrown with aquatic plants, shrubs, and small willow trees. It was an attractive nuisance for area waterfowl. The berm from the new 216-T-4-2 Ditch was used to cover this unit in 1972. The radionuclide inventory is included in the 216-T-4A Pond inventory. The start date was November 1944 and the end date was May 1972.														
216-T-4-2	Inactive	Ditch	216-T-4-2, 216-T-4-2 Ditch	WM Area	The site is located north of 23rd Street and north of the 241-T Tank Farm. The first 15 m (50 ft) from the fallout (head of unit) was part of the original 216-T-4-1 Ditch. At that point, it made a 90-degree turn to the north, paralleling the old 216-T-4-1 Ditch where it went through a culvert under the railroad tracks and continued to the 216-T-4B Pond. The ditch has been backfilled and surface stabilized. It is currently marked and posted with URM signs. It has a grass cover. The site received steam condensate and condenser cooling water from the 242-T Evaporator and nonradioactive wastewater from 221-T air conditioning filter units and floor drains. Total Pu is 1.41 g (3.1E-3 lb) for this unit according to the Hanford Defense Waste Environmental Impact Statement data. This unit was dug as a replacement for the 216-T-4-1 Ditch in May 1972. The first 15 m (50 ft) of the new ditch is common with the original ditch. It received T Plant cooling water and condensate waste via the 207-T Retention Basin. A 1978 radiological survey found the first 15 m (50 ft) to be contaminated, but the remainder of the ditch was not radiologically contaminated. The ditch was constructed with riprap at head end. A 76 cm (30 in) diameter, 12-gauge corrugated galvanized inlet pipe was located 0.9 m (3 ft) below grade. The width provided is a bottom dimension.	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.

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216-U-14	Inactive	Ditch	216-U-14, 216-U-14 Ditch, Laundry Ditch	T Plant Area	The ditch originated west of the 284-W Powerhouse, west of Bridgeport Avenue and extended southward, terminating at the 216-U-10 Pond. The 216-U-14 ditch was excavated in 1944 and was the original effluent route to the 216-U-10 Pond. It received 284-W Powerhouse waste water, laundry waste water (until 1981) via 200-W-102 Pipeline, chemical sewer waste from 221-U, and steam condensate and cooling water from 221-U, 241-U-110 condenser tank, 224-U and the 242-S Evaporator. The 221-U and 224-U effluent entered the ditch after passing through the 207-U Retention Basin. Near the head end of the ditch, a 0.6 m (2 ft) diameter pipe allowed 284-W Powerhouse and laundry effluent to flow under 19th Street and connect to the main portion of the ditch. The ditch also had a 1.22 m (4 ft) diameter culvert that allowed effluent to flow under 16th Street to the portion of the ditch located north of the 242-S Evaporator and also flowed under Cooper Ave. to terminate at 216-U-10 Pond. The 200 West Area Powerhouse Pond was constructed over the location of the head end of the 216-U-14 Ditch after that section was deactivated. The depth varied slightly along the length of the ditch. The 216-U-16 crib was built in 1984 to accept 224-U effluent that had previously been discharged to the ditch. However, the 216-U-16 crib failed in 1985 when a pooling of waste on an underground caliche layer caused a lateral movement of the liquid that eventually reached groundwater by seeping around a well casing. Some 224-U effluent was diverted back to the 216-U-14 Ditch until November 1994, when the outlet pipe to the 207-U Retention Basin was permanently isolated and filled with concrete. The portion of the ditch located west of Cooper Ave. received effluent from the 242-S Evaporator and remained active until April 1995. Discharge from the 242-S Evaporator was eliminated in 1995 ending all discharges to this unit. A variety of wastewater releases have occurred over 50 years. Occurrence Report 86-46 states that on August 6, 1986, 2365 L (625 gal) of recovered nitric acid, containing 39 kg (86 lbs) of uranium was discharged through the chemical sewer to the 207-U retention Basin. Prior to the discovery of the release, the outlet valves on the retention basin were open to the 216-U-14 Ditch. The acid released to the ditch was greatly diluted with the 1140 L (300 gal) per minute flow of cooling water from the 224-U facility being processed through the chemical sewer system. The outlet valves from the retention basin were closed shortly after the discovery of the release and the remainder of the acid release was contained in the retention basin. The effluent in the retention basin was neutralized with 270 kg (600 lbs) of sodium carbonate. The Hanford Site Waste Management Units Report	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 1994. 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	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. (Tn and Tc-99)	Unk.

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					(1987) reported different release values. It stated approximately 3000 L (796 gal) of 50% reprocessed nitric acid was released to the unit. The total release to the environment consisted of approximately 101,250 kg (225,000 lbs) of corrosive solution (pH less than 2.0) and 45.4 kg (100 lbs) of uranium. Sediment, soil and vegetation samples were collected to characterize the 216-U-14 Ditch several times. In 1981, contamination levels found in sediment at the head end of the ditch, to a depth of 175 cm (70 in), were above background levels for all radionuclides analyzed. The average concentration for all depths was 76.6 pCi/g cesium-137, 113.4 pCi/g per gram cobalt-60, 101.6 pCi/g strontium-90, and 89.1 pCi/g plutonium 239/240. The highest concentrations of cobalt-60 were found in the head end of the ditch. The highest concentration of cesium-137 was found near where the ditch entered U- Pond. Core samples were collected in 1987 to determine the effects of the accidental nitric acid and uranium release that occurred in 1986. A maximum of 185 pCi/g of uranium was found at a depth of 15 to 30 cm (6 to 12 in). Test pits were excavated in the ditch in 1992 to support the Groundwater Impact Assessment for the 216-U-14 Ditch. The test pits were located in the portion of the ditch west of Cooper Ave and east of the 216-U-10 pond. Data indicated the contaminants were concentrated within a few feet of the bottom of the ditch.											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.				
200-E-25	Inactive	French Drain	200-E-25, 272-BB French Drain, Insulation Shop French Drain, Miscellaneous Stream #659	B Plant Area	The dry well is located approximately 6 m (20 ft) north of the northeast corner of the 272-BB Insulation Shop. The french drain structure is not visible from the surface, but its location is marked with an old sign, "Asbestos Waste Disposal Site - Do No Excavate," mounted on two support posts. Asbestos is regulated as a hazardous substance under CERCLA. A sign, "200-E-25," is attached to one of the support posts. Material used in the 272-BB Insulation Shop that possibly could have been flushed into the sink or floor drain includes: Calcium Silicate, Fiberglass, Silicate, "Airball" (an insulation cover material) and latex paint. Prior to 1988, it is possible that organic chemicals, oils and grease may have been introduced into the french drain. The building sink and floor drain were connected to the dry well via a 5.1 cm (2 in.), schedule 40, carbon steel pipe. A 0.4 m (1.5 ft) diameter, 36 in. tall grease trap with a removable cover is located on the east side of the 272-BB building. Percolating water around the french drain was noted in 1990 indicating a broken or plugged drain line from the insulation shop. The Facility Compliance group recommended all discharges from the building be discontinued as of September 1991. The installation of a replacement drainage system was proposed. However,	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.	

Table B-1. 200-MG-2 Operable Unit
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					due to complicated regulatory issues, it was decided to remove the sink from the building and plug the floor drain with concrete. The insulation shop no longer has any water supply or any other drains.														
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	The site is located approximately 7.6 m (25 ft) north of the northwest corner of the 209-E Critical Mass Laboratory Service Building. The site is a 1.2 m (4 ft) diameter dry well, covered with a yellow metal cover. The waste was steam condensate from the steam trap in the valve pit plus steam condensate from the equipment room.	French Drain	N	N	0	12.5	None	4.0	11.0	0-15	One auger hole was drilled 6.25 m through the french drain.	Steam condensate	Liquid	None	Ba, Cu
200-E-55	Inactive	French Drain	200-E-55, Effluent Drain East of 291-B Sand Filter, Miscellaneous Stream #322	B Plant Area	The french drain is located 3.6 m (12 ft) east of the east end of the 291-B Sand Filter (WIDS Site Code 200-E-30), below grade. There are no visual surface features for this drain; it has been marked with a single steel post. It consists of a hole 1.83 m (6 ft) in diameter, 0.9 m (3 ft) deep backfilled with gravel. The drain received condensate from the B-Plant canyon sand filter and rain water that leaked through the sand filter roof. An auger drill sample of the sand filter french drain was collected in September 1994. A spilt spoon sample was collected at 4.8 m (16 ft) below ground surface. Maximum contamination levels in the soil read 20,000 dpm beta/gamma and 2100 dpm alpha with hand held instruments.	French Drain	N	N	0	28.3	None	6.0	3.0	3-18	Sand filter roof was sealed in Sep. 1998, to eliminate all possible water sources to this drain.	Condensate/rain water leak	Liquid	20,000 dpm beta/gamma 2,100 dpm alpha detected in September 1994.	Unk.

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209-E-WS-2	Inactive	French Drain	209-E-WS-2, Critical Mass Lab French Drain	Semi-Works Area	The unit is located at the southeast corner of the Critical Mass Laboratory (laboratory wing). The drain is a 1.2 m (4 ft) diameter drain in a gravel area southeast of the building. The unit is a french drain that received condensate from the Critical Mass Lab HEPA filters and heat exchange system. It is painted with yellow paint and has a metal cover. The waste at the unit includes steam condensate through a collapsed rusted pipe from the Heat Exchanger located in Room 11 of 209-E and a stainless steel pipe from the clean side of the HEPA filters.	French Drain	N	N	0	12.1	None	4.0	8.0	8-9	None	Steam condensate	Liquid	None	None
216-A-11	Inactive	French Drain	216-A-11 French Drain, Miscellaneous Stream #465	PUREX Area	The site is located near the southeast corner of the 202-A Building, south of Trap Pit #1 and is inside a small area delineated by steel posts and chain, posted as a URM area. A 0.76 m (2.5 ft) diameter, circular metal cover is visible. One concrete AC-540 marker identifies the site. The unit is composed of two reinforced concrete pipes placed vertically end to end. The excavation is 3.0 m (10 ft) in diameter and extends to a depth of 1.5 m (5 ft) below the bottom. Both the drain and the excavation are filled with 8-cm (3-in.) rock to the top and are backfilled over. The site received the Trap Pit #1 drainage from the 202-A Building. The waste was low in salt and was neutral to basic. The site contains less than 50 Ci total beta activity. A sump in the bottom of Trap Pit #1 collected steam condensate and equipment leakage that drained into 216-A-11. RHO-CD-673 (Maxfield) states the start date was 1956; PNL-6456 (Stenner) states the start date was 1955. The steam source has been eliminated from the PUREX Facility. The Trap Pit #1 has been sealed to eliminate any rain water entering the structure.	French Drain	Y, .08 m	N	0	7.1	None	3.0	30.0	30-40	The steam source has been eliminated from the PUREX Facility. The Trap Pit #1 has been sealed to eliminate any rain water entering the structure. Drain and excavation filled with 0.08m of rock to the top and are backfilled over. Also has a circular metal cover.	Steam condensate	Liquid	Less than 50 curries of beta activity in October 1988. Site received approximately 100,000L of mixed liquid waste.	Unk.

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216-A-12	Inactive	French Drain	216-A-12, Miscellaneous Stream #463	PUREX Area	The site is located at the center of the south side of the 202-A Building, approximately 23 m (75 ft) from the building. The site is not marked or posted and cannot be visually located. The Historical Summary of Inventory of Hanford Radioactively Contaminated Waste Disposal Facilities (1974) states that drain is located under a minor construction change house. The Inventory of Miscellaneous Streams Report stated this drain was active due to the possibility of rain water entering the pit. There are no visible surface features for this drain. The wall of the trap pit includes a "French Drain" label. The unit is composed of two reinforced concrete tile pipes placed vertically end to end. The excavation is 3.0 m (10 ft) in diameter and extends 1.5 m (5 ft) below the bottom. Both the drain and the excavation are filled with gravel to the top of the unit and backfilled over. The site received the Steam Trap Pit #3 drainage from the 202-A Building. The waste was low in salt and was neutral to basic. The site contains less than 50 Ci total beta activity. It is possible that more than one Trap Pit drained to this french drain.	French Drain	Y, 1-2 ft	N	0	7.1	None	3.0	20.0	20-30	Steam source eliminated and Trap Pit #3 has been sealed to prevent any rain water from entering the pit. Site is filled with gravel to the top and backfilled over.	Steam condensate	Liquid	Less than 50 curies of beta activity in October 1988. Site received approximately 100,000L of mixed liquid waste.	Unk.
216-A-13	Inactive	French Drain	216-A-13, 216-A-13 French Drain, Miscellaneous Stream #460	PUREX Area	The site is located approximately 6 m (20 ft) west and 6 m (20 ft) south of the southwest corner of the 202-A Building and is not marked or posted. A 1.2 m (45 in.) diameter metal cover is visible over the drain. The drain is constructed of two lengths of concrete pipe placed vertically end to end. The unit is filled to a depth of 0.9 m (3 ft) with 5 to 8 cm (2 to 3 in.) of rock. This unit has a bed of gravel around the lower section of pipe extending a minimum of 0.3 m (1 ft) away from the pipe in all directions. The site received the seal water from the air sampler vacuum pumps in the 202-A Building. The waste is low in salt, neutral to basic, and contains less than 1 Ci total beta activity. The 1993 PUREX AAMS Report lists the total volume released as 100,000 L (30,000 gal), but does not give the reference for this discrepancy from the original Stenner report. It is assumed that the original number is correct, and the AAMS report added an extra "0" in error. The pipeline to the 216-A-13 french drain was cut and capped in 1962. The effluent was diverted to the 216-A-35 french drain.	French Drain	Y	N	0	7.1	None	3.0	20.0	20-30	The pipeline to the 216-A-13 french drain was cut and capped in 1962. The effluent was diverted to the 216-A-35 french drain. Backfilled with gravel/rock to top.	Seal water	Liquid	Less than 1 curie of beta activity total in October 1988. Site received approximately 10,000L of mixed liquid waste.	Unk.
216-A-14	Inactive	French Drain	216-A-14, French Drain - Vacuum Cleaner Filter Pit, Miscellaneous Stream #462	PUREX Area	The site is located south of the center of the 202-A Building, 5.5 m (18 ft) east of the Filter Pit. The drain is not marked or posted and there are no visible surface features it. The Vacuum Cleaner Filter Pit is a concrete box with approximately 0.6 m (2 ft) above grade. The sump is inside the pit and drains through an underground pipe to the buried french drain. The drain is composed of two reinforced concrete pipes placed	French Drain	Y	N	0	7.1	None	3.0	30.0	30-35	None	Seal water	Liquid	Less than 1 curie of beta activity total in October 1988. Site received approximately 1,000L of mixed liquid	Unk.

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					vertically end to end. The excavation is 3.0 m (10 ft) in diameter and extends to a depth of 1.5 m (5 ft) below the bottom. Both the drain and the excavation are filled with 8-cm (3-in.) rock to the top and backfilled over. The filter pit access is labeled Contamination Area, Radiation Area, Airborne Contamination and Confined Space. A 10 cm (4 in.) M23b-UD inlet pipe, approximately 1.5 m (5 ft) long, extends horizontally into the unit, 7.9 m (26 ft) below grade. The site has a 1.3 cm (0.5 in.) thick steel cover. The site received the vacuum cleaner filter and blower pit drainage from the 202-A Building. The waste was low in salt, neutral to basic, and contains less than 1 Ci total beta activity. A sump in the bottom of Filter Pit collected steam condensate, storm water and equipment leakage that drained to 216-A-14. The Inventory of Miscellaneous Streams Report stated the french drain was considered active due to the possibility of storm water entering the structure. Storm water disposal to engineered structures will be managed under a permit issued by Ecology in 1999.														waste.	
216-A-26	Inactive	French Drain	216-A-26, 216-A-26 French Drain, 216-A-26B, Miscellaneous Stream #464	PUREX Area	The site is located inside the PUREX security fence, south of the 291-A Control House and approximately 4.57 m (15 ft) south of 216-A-26A French Drain. There are no visible surface features for this drain. The unit is composed of three clay pipe (each 5 feet long) segments buried vertically. Some references state the clay pipe diameter is 3 feet and some state the diameter is 4 feet. The site received the floor drainage from the 291-A Fan Control House. The waste was low in salt, neutral to basic, and contains less than 1 Ci of total beta activity. The quantity of discharge is unknown. This french drain was installed to replace the 216-A-26A french drain. Both drains received effluent from floor drains inside the 291-A Fan House. 216-A-26 was removed from service in 1991. This french drain was installed in 1965 to replace the 216-A-26A french drain. The numbering of the french drains in this area has caused some confusion. The alias "216-A-26B" was used for two different french drains. It is an alias for this french drain (216-A-26, located south of 291-A) and also an alias for the 216-A-33 French Drain (located west of 291-A). The 291-AE Building was built over top of the 216-A-33 French Drain and no longer appears on drawing revisions. In documents and on drawings older than 1965, reference to 216-A-26B would be indicating the drain also known as 216-A-33. The effluent source to this french drain was two floor drains located inside the 291-A Fan Control Building. The floor drains were plugged by filling with epoxy during the PUREX deactivation.	French Drain	N	N	0	7.1	None	3.0	16.0	16-20	Floor drains were plugged by filling with the epoxy during the PUREX deactivation.	Floor drainage	Liquid	Less than 1 curie total beta activity, quantity unknown in April 1979.	Unk.	

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216-A-26A	Inactive	French Drain	216-A-26A, 216-A-25 Crib, 216-A-26 French Drain, 291-A French Drain	PUREX Area	The french drain is located inside the PUREX security fence, south of the 291-A Building. There are no surface features for this drain. The unit is composed of three sections of clay pipe each 1.5 m (5 ft) long, placed vertically end to end below grade. Some references state the pipe diameter was 0.9 m (3 ft) and other references state the diameter as 1.2 m (4 ft). The site received the floor drainage from the 291-A Fan Control Room. The waste is low in salt, neutral to basic, and contains less than 1 Ci total beta activity. In 1965, the site was deactivated by removing the encasement and rerouting the effluent piping to the new 216-A-26 French Drain encasement, located 4.6 m (15 ft) south. Due to an unusual site numbering issue, the original french drain is known as 216-A-26A and the replacement french drain is numbered 216-A-26. The alias "216-A-26B" was assigned to two different french drains: 216-A-26 and 216-A-33 (located west of 291-A). Encasement was removed in July 1965 and the effluent was diverted to a new french drain (216-A-26, sometimes called 216-A-26B), located 4.6 m (15 ft) south of this encasement.	French Drain	N	N	0	7.1	None	3.0	16.0	16-20	In 1965, the site was deactivated by removing the encasement and rerouting the effluent piping to another drain.	Floor drainage	Liquid	Less than 1 curie total beta activity in April 1979, 1,000 L	Unk.
216-A-33	Inactive	French Drain	216-A-33, 216-A-33 Dry Well, 216-A-26B	PUREX Area	The site is located inside the PUREX security fence, south of 202-A, and southwest of the 291-A stack. The 291-AE Filter Building has been built over top of the site where this drain was located. The stainless steel (M21-UD) inlet pipe entered the unit 1.5 m (5 ft) below grade. The french drain had a carbon steel cover. The site received the bearing coolant waste from the 291-A-1 Stack electrical exhaust fans. The waste is low in salt, neutral to basic, and contains less than 1 Ci of total beta activity. Project B-295A constructed the 291-AE Building over the area where this drain was located. The inlet piping was capped and the drain was removed from service in 1964 because water was no longer used as a coolant for electrical fans. The site was deactivated by capping the effluent pipeline to the unit on the south side of the 291-A Fan Plenum. The alias "216-A-26B" was used for two different french drains: the 216-A-33 French Drain and 216-A-26, located adjacent to 291-A. Prior to 1965, the number 216-A-26B was an alias for the 216-A-33 French Drain. The 291-AE Building was built over top of the 216-A-33 French Drain and no longer appears on drawing revisions. This has caused confusion in some documentation related to these french drains.	French Drain	N	Y	Building	38.5	None	7.0	13.0	13-15	French drain had a carbon steel cover, before they built 291-AE Filter building over it.	Bearing coolant waste	Liquid	Less than 1 curie total beta activity October 1988.	Unk.
216-A-35	Inactive	French Drain	216-A-35 French Drain, 216-A-35 Dry Well	PUREX Area	The site is located approximately 9 m (30 ft) south of the west end of the 202-A PUREX Building, south of the 216-A-13 French Drain. The drain is a raised cement structure, painted yellow and surrounded with URM	French Drain	N	N	0	38.5	None	7.0	16.0	16-20	Site was deactivated by capping the effluent pipeline to the unit and rerouting the effluent to	Seal water	Liquid	Less than 1 curie total beta activity in October 1988.	Unk.

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Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)	
					signs. The top cover is marked Confined Space. The site received the seal cooling water from the air sampler vacuum pumps in the 202-A Building. The waste is low in salt, neutral to basic, and contains less than 1 Ci of total beta activity. The site is a french drain that was a replacement for the 216-A-13 French Drain. The inlet pipe enters the french drain 3.2 m (10.5 ft) below grade. Disposal to the site was terminated when the effluent flow rate exceeded the infiltration capacity of the soil. The site was deactivated by capping the effluent pipeline to the unit and rerouting the effluent to the 216-A-29 Ditch via the 202-A Chemical Sewer.											another ditch.				
216-B-13	Inactive	French Drain	216-B-13, 216-B-13 French Drain, 291-B Crib, 216-B-B, 216-B-13 Crib	B Plant Area	The french drain is located south of 221-B and northeast of the 291-B-1 Stack. A single, concrete AC-540 marker is the only site identifier. There is a URM sign attached to the concrete post. The site received the 291-B-1 Stack drainage. In 6/76, the stack drainage was rerouted to a catch tank, jetted to the wind tunnel, drained to a sump, and then pumped to a cell drainage sample tank. The waste is low in salt and is neutral to basic. The unit operated from August 1947 to June 1976. The french drain is constructed of two 1.22 m (4 ft) diameter by 1.53 m (5 ft) long tile pipes, stacked vertically and filled with crushed limestone. The unit has a plywood cover, located 2.44 m (8 ft) below grade. Two and a half tons (2,270 kg) of limestone were used as a base and to fill the tile pipes. The bottom of the drain is 5.5 m (18 ft) below ground surface.	French Drain	N	Y	1-2	7.1	None	3.0	20.0	20-25	Welded shut in 1974, drain riser was cut off below grade and capped.	Stack condensate	Liquid	200cpm Beta/Gamma in a 1985 rad survey.	Unk.	
216-B-51	Inactive	French Drain	216-B-51, 216-BY-9 Crib	B Farm Area	The french drain is south of 12 Street, east of Baltimore Ave, north of the 241-B Tank Farm, and northeast of the 216-B-8 Crib and Tile Field. The site is a small URM area measuring approximately 3 m by 3 m (10 ft by 10 ft). The concrete drain structure extends approximately 0.3 m (1 ft) above the ground surface and 4.2 m (4.3?) (14 ft) below ground. The structure is approximately 1.5 m (5 ft) in diameter with a wooden lid cover with vent holes. The structure is also posted with Fixed CA signs. The site received drainage from the BC Crib pipeline which carried high salt, neutral to basic scavenged tributyl phosphate waste via or from 241-BY tank farm to the BC Crib area. The site contains less than 10 Ci total beta. The french drain (active from January 1956 to January 1958) received drainage from the pipeline that transferred tri-butyl phosphate waste from the 241-BY Tank Farm to the BC Cribs and Trenches. The pipe is filled with 4 m (13 ft) of gravel.	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	

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
216-T-29	Inactive	French Drain	216-T-29, 291-T Sand Filter Sewer, 216-T-29 French Drain	T Plant Area	The 291-T Sand Filter is located northeast of the 221-T building. The french drain is located adjacent to the north end of the 291-T Sand Filter and northeast of the 221-T Building. The 216-T-29 French Drain is part of the sand filter construction and is assumed to be located beneath the northwest corner of the sand filter structure. The sand filter is marked and posted as a CA. This site received canyon air condensate from the 291-T Sand Filter. There is a vent riser protruding through the roof of the northwest corner of the sand filter. This is assumed to be the location of the drain. The site waste was moisture condensed from canyon air and included 8000 kg of nitric acid. In the 1950s, silver reactor filters, made of fiberglass soaked in silver nitrate, were added to the stack ducts. The filters reacted with the radioiodine to form silver iodide. The T, B and U Plants were all constructed alike. A drawing (H-2-1378) for the B Plant Sand Filter (Site code 200-E-30) shows the drain for that sand filter to be located adjacent to the center of the east end of the B Plant Sand Filter, but not underneath the sand filter structure. Since the T Plant and B Plant construction plans were so similar, it may be possible that the T Plant Sand Filter drain is actually located adjacent to the center of the north end of the sand filter structure. The 1987 Hanford Site Waste Management Units Report site description states "This site consists of sixty french drains, 6 inch diameter, 3 foot 5 inches long, filled with coarse gravel, placed 13 feet 7 inches below the top of the structure. The sand filter is a concrete structure 100 X 48 X 14 ft, 7 in high which contains concrete blocks arranged in rows to form lateral ducts, with drains spaced throughout." This document description indicates the sand filter structure and the 216-T-29 french drain are the same structure. However, the 200 Area Waste Site Handbook (RHO-CD-673) describes the facility (sand filter) as "Sixty 6 inch diameter vitrified soil pipes in an area 100 X 48 ft. The 291-T sand filter inlet trenches drain to a single french drain pipe extending into the ground at the north corner of the sand filter. Any moisture condensed from the canyon air on the filter bed will escape to the ground at this location. The amount and activity are both very low." This description indicates a separate, single french drain beneath the sand filter structure. The site operated from March 1949 to March 1964. In 1964 the sand filter bypass water seal was removed, deactivating the french drain. The sand filter was deactivated because new air filters were installed in each cell of the 221-T Building. The sand filter bypass water seal was removed, allowing the 221-T Building exhaust air to flow directly to the 291-T-1 Stack.	French Drain	N	N	0	0.4	None	0.7	3.0	3-6	In 1964 the sand filter bypass water seal was removed, deactivating the french drain. The sand filter bypass water seal was removed.	Moisture condensate	Liquid	Unk.	8000 Kg of nitric acid, silver iodide

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

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216-T-31	Inactive	French Drain	216-T-31, 216-T-31 French Drain	T Farm Area	This site was located west of Camden Ave., near the southeast corner of the 241-TX Farm, on the east side of 241-TX Tank Farm fence. The site consisted of a 0.9 m (3 ft) diameter french drain. The drain was exhumed and left unmarked. A post with the WIDS Site code 216-T-31 now marks the approximate location of where the french drain had been. The unit was in operation in 1954 and abandoned in 1959 after it was contaminated by steam condensate from a steam line blowout during efforts to unplug a waste line (October 1959). A new steam line was installed in 1959 and a new steam condensate drain was made to replace the contaminated drain. The Hanford Site Waste Management Units Report (Cramer, 1987), RHO-CD-673 (Maxfield, 1979), ARH-2155 (Lundgren, 1971), and DOE/RL-91-61 contain conflicting information about this site. They differ on when it operated, and when it became contaminated.	French Drain	N	N	0	7.1	None	3.0	27.0	27-28	The french drain was exhumed in 1962. The contaminated, culvert, gravel and soil were removed and buried in the 200 West Area Dry Burial Ground. The site was released from radiation zone status in February 1962.	Leak/ spill	Liquid	None	None
216-U-3	Active	French Drain	216-U-3, 216-U-11, 216-U-3 French Drain	S/U Farm Area	This site is located south of the 241-U Tank Farm on the south side of 16th Street and consists of a french drain with light steel posts and chain with URM signs. The drain is a 3.6 m (12 ft) deep, 1.8 m (6 ft) diameter, rock-filled excavation with sloping sides and a 10 cm (4 in) diameter vent riser. This 216-U-3 crib received condensate from the steam condensers on the 241-U-104 and 241-U-110 tanks. The 241-U-104 and 241-U-110 tanks held REDOX boiling waste. The site waste contains nitrate. The closed loop cooling water for the condensers was discharged to the 216-U-14 ditch. Most reference documents mention this site receiving waste from 241-U-110, but drawing H-2-44004 also shows the 241-U-104 tank having a condenser that is attached to the same pipeline as the 241-U-110 tank. This site operated from May 1954 to August 1955. The site was deactivated by valving out the condenser piping, when the tank contents were no longer boiling. Although the drain was a gravel filled excavation, a large cave-in depression was noticed at this site in 1985. It is assumed that a subsurface wash out had occurred. An area of contaminated soil, located adjacent to the 216-U-3 site, was surface stabilized in 1998 (See 200-W-67). The site had a 1.8 m (6 ft) bottom diameter and a 1:1 side slope. The surface diameter of the excavation was 5.5 m (18 ft).	French Drain	N	N	0	28.3	None	6.0	12.0	12-15	Crib was valved out. Before 1985 it was backfilled, but then the cave in was noticed. Cave-in was backfilled later. 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. The 1985 cave-in was backfilled, 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-U-7	Inactive	French Drain	216-U-7, 221-U Counting Box French Drain, 221-U Vessel Vent Blower Pit French Drain	U Plant Area	This site is located on the southeast side of the 221-U Building near Section 6. It is northwest of the 241-UX-154 Diversion Box. The french drain is within a larger area that has been stabilized and posted with URM signs. This drain is constructed of a concrete pipe set vertically into the ground. Gravel fills 1.1 m (3.5 ft) of	French Drain	N	Y	1-2	7.1	None	3.0	17.0	17-25	Surface stabilized in 1998. In 1998, the contaminated areas on the east side of the 221-U building were surface stabilized with material from the 200	Contaminated effluent	Liquid	13 Kg of Uranium in UNH solution	Unk.

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)	
					the pipe. The site received liquid wastes from a counting box floor drain during the metal recovery program. The site waste contains nitrate. Due to UPR-200-W-138, it is assumed that 13 kg (30 lbs) of uranium in UNH solution were also introduced to the soil through the 216-U-7 French Drain. However, the release associated with UPR-200-W-138 may be associated with a different french drain. The release information is vague. It is possible the event effected the 216-U-7 French Drain if sufficient liquid volume was released to the surface to flow southward and reach the 216-U-7 French Drain location. The site operated from March 1952 to June 1957 and was retired when the Uranium Recovery operations in the 221-U Building were shut down. The site was deactivated by removing the cell jumpers in the 221-U Building. Drawing H-2-44511, Sheet 68 correctly identifies the location of 216-U-7 French Drain near 221-U Section 6. This drawing shows 216-U-7 attached to a structure marked "Blower Pit." Other, more detailed U Plant drawings H-2-43078 and H-2-43039 show the "Blower Pit" to be located further north, near 221-U Section 3. These drawings describe the structure near section 6 adjacent to 216-U-7 as a "Counting Box."											Area Ash Pit. The area was reposted to URM. (see UPR-200-W-138 and UPR-200-W-162)				
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	The french drain is located northeast of the 291-Z stack and consists of two drain systems. The visible french drain is actually the upper portion of a two-part drain system. It receives condensate from the steam turbine exhaust stack. The lower french drain is constructed of two tile culverts placed end-to-end, and backfilled beneath 9 ft (2.7 m) of gravel and is located approximately 6 m (20 ft) south of the drain marked on the surface. The covered top of the upper french drain is visible on the surface, adjacent to a single cement marker post with a metal plate labeled 216-Z-13 (also seen in 1985 photograph 122440-250cn). The effluent source has been isolated. This french drain received emergency condensate from the turbine of the ET-8 exhaust fan, and 291-Z building steam condensate and floor drainage. Due to the french drain's location, low levels of vadose zone contamination are assumed. Two pipes discharged to the lower french drain, but the miscellaneous stream (#261) to the drain has been eliminated. The culvert is filled with cobbles. Due to the common nature of the discharge to the upper and lower drain systems, there is a potential for historical documentation related to the drains to be confusing.	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,	PFP Area	The french drain is located northwest of the 291-Z Stack. The site consists of two drain systems. The upper drain is marked with a single cement marker post, but the top of the drain has been paved over. The lower	French Drain	Y	N	0	7.1	None	3.0	16.0	9-17	None	Steam condensate	Liquid	Unk.	Unk.	

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)	
			Miscellaneous Stream #262, 216-Z-14 A and B		drain system is not visible from the surface. It is located approximately 6 m (20 ft) southeast of the cement marker post. The lower french drain is constructed of two tile culverts placed end to end, and backfilled beneath 9 ft (2.7 m) of gravel. Two pipes discharge to the french drain. The culvert is filled with cobble. The french drain receives emergency condensate and steam condensate from the turbine of the ET-9 exhaust fan along with 291-Z building steam condensate and floor drainage. Due to the french drain's location, low levels of vadose zone contamination are assumed. The lower french drain receives steam condensate from the turbine of the ET-9 exhaust fan and 291-Z floor drainage. The condensate discharged to the upper drain system has been disconnected and now discharges to the ground. Due to the common nature of the discharge to the upper and lower drain systems, there is a potential for historical documentation related to the drains to be confusing. The site is miscellaneous stream number 262 in the some revisions of Inventory of Miscellaneous Streams report (DOE/RL-95-82) and 263 in other revisions. The site is also addressed in the Miscellaneous Streams Best Management Practices Report, as a b stream (a stream discharging in a surface contaminated area). However, in 2001, no posted SCA existed. Based on process history, the drains received non contaminated effluent.															
216-Z-15	Inactive	French Drain	216-Z-15, 234-5 Dry Well #3, 216-Z-15 Dry Well, Miscellaneous Stream #263	PPF Area	The unit is adjacent to the southeast corner of the 2731-Z Building and north of the 291-Z Ventilation Building. The 216-Z-15 Dry Well is an inactive, below grade french drain. The site is marked with a single concrete marker post that reads "Buried Radioactivity - Do Not Excavate." The marker post is believed to be located directly above the drain structure. The unit is composed of two sections of vitrified clay pipe in a vertical configuration. There is one inlet pipe. The pipe is filled with cobbles and the upper end is covered with a wood plank. That source was eliminated in May 1997. Low levels of contamination are assumed, due to the possibility of accidents or unusual events in nearby areas. The french drain used to receive condensate drainage from the 291-Z building S-12 Evaporator Cooler, but that source has been re-routed to the 291-Z Sump, which is batch discharged to the PFP Low Level Waste Treatment Facility. The 216-Z-15 French Drain has been inactive and its discharge source has been eliminated since May 1997. The drain is listed as number 263 in some revisions of the Inventory of Miscellaneous Streams report (DOE/RL-95-82) and number 262 in other revisions.	French Drain	Y	N	0	7.1	None	3.0	23.0	23-25	None	Process condensate	Liquid	Unk.	Unk.	

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
2704-C-WS-1	Inactive	French Drain	2704-C-WS-1, 2704-C French Drain, Gatehouse French Drain	Semi-Works Area	This site is located in 200 East, at the southwest corner of the site of the 2704-C Building (demolished in 1998). The area where the french drain was located is now within a larger gravel area that is posted URM. The drain is no longer visible at the location described. The drain could be covered with gravel or by the two dumpsters located in the area. A 1991 site visit reported the drain cover was painted yellow and posted with a tri-foil, indicating radioactive contamination. However, in 1993, the site was described as having no radiological posting or markings. Currently (1999), the former location of 2704-C building is located within a larger posted URM area and surrounded with a post and chain fence. There is a possibility that this site is the same site as that identified in HW-22955 as a quench tank. The description follows. Steam condensate drained to a quench tank at the southwest corner of the building (2704C). Sanitary waste drains through a 10.2 cm (4 in) cast iron line running beneath the floor slab from the toilet room to a point 1.5 m (5 ft) west of the building where it connects to a 10.2 cm (4 in) tile drain. The overflow from the quench tank also flows into this tile drain which runs to the sanitary waste disposal field. The sanitary waste disposal field is part of the 2607-E7 Septic System. (Drawings H-2-4033, H-2-4012, and H-2-4013 identify a quench tank. Drawing H-2-77665 identifies a french drain). The 2704-C building was originally built in 1949 to support the Hot Semiworks operations. It was a one story wooden structure, on a cement slab foundation, that contained the security office (Gate House), a lunch room and a toilet. Building steam condensate drained to a quench tank located at the southwest corner of the building. During the 1980s, 2704C housed the 200 East Tank Farms Health Physics (HPT) Offices. Prior to demolition by BHI, the building was designated a contaminated facility. Although the drain received building steam condensate, periodically the drain was labeled with radioactive postings.	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.
200-E-65	Inactive	Injection/Reverse Well	200-E-65, 202A Building Steam Condensate, Miscellaneous Stream #466 Injection Well (R)	PUREX Area	The site is located on the southeast corner of 202-A, east of railroad tunnel #1 (218-E-14), inside posted boundaries site code 200-E-107, that has been recently stabilized and downposted to an URM area. The site is a 1.2 m (4 ft) diameter concrete drain with a metal plate cover and is flush with the ground surface. On 10/15/98, the inside of the drain was dry. The site received non-contaminated steam condensate. However, the drain is located within an area that had been posted as a RCA (see site code 200-E-107). A radiation survey done in October 1998 did not detect any contamination. Stream #466 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams	Injection/Reverse Well	N	N	0	12.6	None	4.0	4.0	4-5	None	Steam condensate	Liquid	None	Unk.

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
					Report and placed on the INACTIVE list (Table 3) in April 1996. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion.														
200-E-67	Inactive	Injection/Reverse Well	200-E-67, 202A Building Steam Condensate, Miscellaneous Stream #494	PUREX Area	The site is located adjacent to the south wall of 202-A. The drain is located inside a dome shaped caisson that is surrounded by post and chain and posted with CA signs. The dome is labeled 202-A-417. Approximately 3.7 acres of previously posted CA was stabilized in 1999 (WIDS 200-E-103). This site is within the stabilized area, but is separately posted as a CA. The source has been eliminated. The site was removed from the ACTIVE list (table 2) and placed on the INACTIVE list (Table 3 of the Inventory of Miscellaneous Streams Report) in 1996.	Injection/Reverse Well	N	N	0	Unk,	Irr.	Unk.	Unk.	Unk.	None	Drain	Liquid	Unk.	Unk.
200-E-68	Inactive	Injection/Reverse Well	200-E-68, 291A Control House Steam Condensate, Miscellaneous Stream #59, Injection Well (L)	PUREX Area	The site, a 1.2 m (4 ft) diameter drain with a metal cover, is located south of PUREX, between the 291-A stack exhaust fans and the 292-AB stack building. It is on the southeast corner of 291-A building. It is located inside a CA, which surrounds the 291-A building and stack structures. Several disconnected, asbestos-covered steam lines hang above it. The site received non-contaminated steam condensate, but is located inside a posted CA. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam that was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion.	Injection/Reverse Well	N	N	0	Unk,	None	4.0	Unk.	4-5	None	Steam condensate	Liquid	None	Unk.
200-E-70	Inactive	Injection/Reverse Well	200-E-70, Line #8801 Steam Condensate, Miscellaneous Stream #64, Injection Well (Q)	PUREX Area	The site is located south of 202A, on the east side of the railroad tunnel #1 (218-E-14). In 1998, the site was inside the PUREX SCA (200-E-107). The site is a 0.9 m (3 ft) diameter drain with four holes in the cover located 2.1 m (7 ft) east of the steam line. The drain is located inside a large Radiologically Controlled Area (site code 200-E-107). 200-E-107 had been a surface Soil Contamination Area. The drain received non-contaminated steam condensate. There are several	Injection/Reverse Well	N	Y	1-2	Unk,	None	3.0	Unk.	Unk.	The area was stabilized and downposted to an URM area in 2001.	Steam condensate	Liquid	None	None

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)	
					open-ended, cut pipes. It is assumed these pipes once were connected to the drain cover. The cover is posted with Confined Space signs, but on 5/18/00, it was located inside a posted CA. However, the drain had been located within a large Soil Contamination Area (200-E-107). In 1998, 10,000 dpm beta/gamma were detected on the steam pipes and in the gravel using a hand held instrument. The metal cover on the drain read less than 10,000 dpm. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam that was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. W.M. Hayward stated that he believed the steam in this line was clean, so the contamination in this location is likely from the same sources as contributed to the rest of the surrounding CA, which are emissions from years of PUREX operations.															
200-E-71	Inactive	Injection/Reverse Well	200-E-71, Line #8801 Steam Condensate, Miscellaneous Stream #63, Injection Well (O)	PUREX Area	The site is located south of 202-A, on the west side of the 218-E-14 Tunnel and adjacent to the southeast side of 216-A-11. The site is a man-made hole under the steam line. It is approximately 0.9 m (3 ft) deep and 0.61 m (2 ft) wide. The site received non-contaminated steam condensate. There is no drain structure. The drain was not covered with backfill material. The steam vented directly into the soil. However, it had been located inside a larger area that was posted as a SCA (see site code 200-E-103). Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam that was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. The effluent to this drain was eliminated when the 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. The source has been abandoned, but the lines have not been capped. Stream #56 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams Report and placed on the INACTIVE list (Table 3) in May 1998.	Injection/Reverse Well	N	N	0	Unk,	None	2.0	3.0	3-4	Approximately 3.7 acres of previously posted CA was stabilized in 1999 (WIDS 200-E-103). This site is within the stabilized area, and is now posted within the larger URM Area. The hole that the steam line vented to was not backfilled during the stabilization activity. There are no visual changes from the last site walkdown.	Steam condensate	Liquid	None	None	

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
200-E-73	Inactive	Injection/Reverse Well	200-E-73, Line #8801 Steam Condensate, Miscellaneous Stream #61, Injection Well (M)	PUREX Area	The site is located near the south wall of 202A, between 202A and the 291AH Ammonia Off-gas filter building, adjacent to the south side of 291-AD. The site is a 0.9 m (3 ft) diameter concrete structure with a rusty metal cover. The site received steam condensate from the 8801 steam line. The stream was moved from the ACTIVE list (Table 2) to the INACTIVE list (Table 3) of the Inventory of Miscellaneous Streams Report in 1996. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion.	Injection/Reverse Well	N	N	0	Unk,	None	3.0	Unk.	Unk.	This surrounding area was surface stabilized in 1999.	Steam condensate	Liquid	None	None
200-E-74	Inactive	Injection/Reverse Well	200-E-74, Line #8801 Steam Condensate, Miscellaneous Stream #62, Injection Well (N)	PUREX Area	The site is located southeast of 202A, on the west side of the 218-E-14 tunnel. The site is a 0.9 m (3 ft) diameter drain with a rusty metal cover. On October 15, 1998, the inside of the covered drain was inspected. The drain was dry, but rust stained. The site received non-contaminated steam condensate, but is located within an area that had been posted as a SCA (200-E-103). Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. The steam condensate to this drain was eliminated when the 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. Stream #62 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams Report and placed on the INACTIVE list (Table 3) in May 1998.	Injection/Reverse Well	N	N	0	Unk,	None	3.0	3.0	3-4	Approximately 3.7 acres of previously posted Contamination Area was stabilized in 1999 (WIDS 200-E-103). This site is within the area that was stabilized. The drain was not covered with backfill material.	Steam condensate	Liquid	None	None
200-E-77	Inactive	Injection/Reverse Well	200-E-77, Line #8801 Steam Condensate, Miscellaneous Stream #65, Injection Well (S)	PUREX Area	The site is located on the northeast corner of 202-A. The site received non-contaminated steam condensate but is inside a posted CA (see 200-E-107). The site is a 1.2 m (4 ft) diameter concrete structure with a metal cover. The structure is slightly above grade and is filled with rocks. On 10/15/98, the inside of drain was dry. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals	Injection/Reverse Well	N	Y	1-2	Unk,	None	4.0	3.0	3-4	Surface stabilized along with a large contaminated area that it was in (2001).	Steam condensate	Liquid	None	None

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
					(calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. The effluent to this drain was eliminated when the 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. Stream #65 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams Report and placed on the INACTIVE list (Table 3) in May 1998.														
200-E-79	Inactive	Injection/Reverse Well	200-E-79, Line #8801 Steam Condensate, Miscellaneous Stream #66, Injection Well (T)	B Farm Area	The site is located on the southeast corner of the PUREX Railroad Cut inside a posted radiologically posted area known as 200-E-107. The site is a 0.9 m (3 ft) diameter concrete drain under a steam line with a metal cover. There is a rusty pipe going into the drain. On October 15, 1998, the inside of the drain was dry. Although the drain received non-contaminated steam condensate, it is located inside and area that had been a posted CA (200-E-107). Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. The 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. Stream #66 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Streams Report and placed on the INACTIVE list (Table 3) in May 1998.	Injection/Reverse Well	N	Y	1-2	Unk,	None	3.0	4.0	4-5	Surface stabilized along with a large contaminated area that it was in (2001)	Steam condensate	Liquid	None	None

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200-E-84	Inactive	Injection/Reverse Well	200-E-84, 202A Building Steam Condensate, Miscellaneous Stream #58, Injection Well (C)	PUREX Area	The drain is located on the west end of 202-A, under the filter banks inside a RBA. The site is a 0.9 m (3 ft) diameter, gravel-filled french drain that received steam condensate. The drain is flush with the surrounding gravel surface except for a small lip on one side. A steel drain pipe extends over the french drain. The drain was installed to receive steam condensate. The Inventory of Miscellaneous Streams Report states the steam source has been eliminated and that it is a gravel-filled french drain with no cover that has a potential to receive stormwater runoff. A site walkdown in 1998 determined the pipe above the drain is a pressure relief valve associated with the PUREX building steam system. The pressure relief valve was isolated during PUREX deactivation. The walkdown team believes the drain is not physically located such that it would collect stormwater runoff. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam that was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, this was a seasonal discharge. Non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. During a site visit on October 15, 1998, Gary MacFarlan explained that the RBA was posted here because of a dose rate associated with the filter banks, not a contamination issue. Miscellaneous Stream #58 was eliminated from the ACTIVE list (Table 2) of the Miscellaneous Stream Report and placed on the INACTIVE list (Table 3) in 1996.	Injection/Reverse Well	N	N	0	Unk,	None	3.0	Unk.	Unk.	Unk.	Pressure relief valve was isolated during PUREX deactivation.	Steam condensate	Liquid	None	None
200-W-107	Inactive	Injection/Reverse Well	200-W-107, Miscellaneous Stream #685, 222-U Building Stormwater Runoff	U Plant Area	The site is located six feet east of the back wall of the 222-U Building, just west of 216-U-4B within the gravel area known as 200-W-136. The site is a covered cement french drain which is considered to be active. The yellow metal cover has a slot on one side and is level with the surrounding gravel covered ground. No aboveground pipes were visible extending from the building to the drain. The drain lid is posted with a CA sign and a label stating "This is Not a Confined Space." Documentation states that the site received storm water runoff from the east side or backside of the 222-U Building. During the site walkdown, however, it was unclear how the drain received storm water because no pipes were observed extending from the building into the drain. Coordinates from DOE/RL-88-11 show the site further south than actually located during the site walkdown.	Injection/Reverse Well	N	Y	1-2	Unk,	None	2.5	Unk.	Unk.	None	Stormwater runoff	Liquid	None	None	

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200-W-108	Inactive	Injection/Reverse Well	200-W-108, Miscellaneous Stream #687, 222-U Building Stormwater Runoff	U Plant Area	The site is located on the northeast corner (back side) of the 222-U Building within the gravel area known as 200-W-136. The site is a covered cement french drain which is considered to be active. The yellow metal cover has a slot on one side and is level with the surrounding gravel covered ground. There are no postings on the yellow metal cover and no aboveground pipes were visible extending into the drain which is level with the surrounding gravel covered ground. The yellow drain lid was moved to the side, revealing a 0.76 m (2.5 ft) diameter dry culvert, approximately 1.2 m (4 ft) deep. No aboveground pipes are currently visible extending to the culvert. Coordinates from the DOE/RL-88-11 correspond with the diagram. No pipelines were visible leading to the french drain. Documentation states that the site received stormwater runoff from the east side or backside of the 222-U Building. During the site walkdown, however, it was unclear how the drain received stormwater because no pipes were observed extending from the building into the drain.	Injection/Reverse Well	N	Y	1-2	Unk,	None	2.5	4.0	4-5	None	Stormwater runoff	Liquid	None	None
200-W-109	Inactive	Injection/Reverse Well	200-W-109, Miscellaneous Stream #521, 222-U Building Stormwater Runoff	U Plant Area	The site is located on the east side (backside) of the 222-U Building just southwest of the 200-W-108 site and within the gravel area known as 200-W-136. The site is a covered cement french drain which is considered to be active. The yellow metal cover has a slot on one side and is level with the surrounding gravel covered ground. There are no postings on the yellow metal cover and no aboveground pipes were visible extending to the drain. The drain is ground level and filled with sand. Documentation states that the site received stormwater runoff from the east side or backside of the 222-U Building. During the site walkdown, however, it was unclear how the drain could have received stormwater because no pipes were observed extending from the building into the drain and the drain is filled to the top with compacted sand.	Injection/Reverse Well	Y	Y	1-2	Unk,	None	2.5	Unk.	Unk.	The site is filled to ground level with packed sand.	Stormwater runoff	Liquid	None	None
200-W-111	Inactive	Injection/Reverse Well	200-W-111, Miscellaneous Stream #394, 222-U Building Stormwater Runoff	U Plant Area	The site is located near the southeastern corner of the 222-U Building within the gravel area known as 200-W-136. The site is a covered french drain which is considered to be active. The yellow metal cover has a slot on one side and is level with the surrounding gravel covered ground. It is posted "Not a Confined Space." The cover is over a 0.61 m (2 ft) diameter VCP by 0.91 m (3 ft) deep drain structure. No underground piping was observed in the drain, nor aboveground pipes extending to the drain; however, a steel pipe was observed on the building. The pipe has been cutoff approximately 0.61 m (2 ft) from the ground. Documentation states that the site received stormwater runoff from the east side or backside of the 222-U	Injection/Reverse Well	N	Y	1-2	Unk,	None	2.0	3.0	3-4	When the 222-U building was demolished in 2005, the metal french drain lids were removed. The french drains were filled with sand to within 7.6 to 10 centimeters (3 to 4 inches) of the top of the drains. Crushed rock was added around the drain structures. The entire area was covered with clean gravel and posted as an Underground Radioactive	Stormwater runoff	Liquid	None	None

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Waste Site Attributes. (40 Pages)

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					Building. During the site walkdown, however, it was unclear how the drain received stormwater because no pipes were observed extending from the building into the drain. DOE/RL-88-11, Rev.2 states this miscellaneous stream received both stormwater and steam condensate. A steamline is visible in the background of the photograph, but does not connect to the covered drain.										Material Area (see 200-W-136).				
200-W-118	Inactive	Injection/Reverse Well	200-W-118, Miscellaneous Stream #141, Steam Condensate MSS-TRP-006	U Plant Area	The site is located inside the northeastern corner of the 224-U facility fence, north of 16th Street and west of Beloit Ave. The site is a 0.025 m (1-in.) diameter insulated pipe extending into a 1.22 m (4 ft) diameter french drain structure. Steam was produced from sanitary water that had been sent through a water softener system to remove minerals (calcium and magnesium). The treated water was introduced into boilers to produce steam. This steam was superheated before distribution to facilities for heating and process use. Disposal sites received steam condensate from the steam distribution lines. When used for heating purposes, non-regulated chemicals were added to dechlorinate the water, prevent scale, and control corrosion. This was a seasonal discharge. The effluent to this drain was eliminated when the 200 East Area Powerhouse shut down (December 1997) and stopped producing steam. The source has been abandoned, but the lines have not been capped. A field walkdown was done to compare locations and descriptions of Miscellaneous Stream sites (around 221-U, 224-U and 222-U) identified in the DOE/RL-88-11 document to the physical locations.	Injection/Reverse Well	N	N	0	Unk,	None	4.0	Unk.	Unk.	None	Steam condensate	Liquid	None	None
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	The 207-A-NORTH basins are located east of 242-A Evaporator building, adjacent to the 207-A-SOUTH basin. The 207-A North basins consist of three Hypalon-lined, concrete basins that are surrounded with posts and chain. There is no radiological posting on the north basins. The basins have been receiving steam condensate from the 242-A Evaporator since 1977. Effluent was originally sent to the 216-A-25 (Gable Pond) and later to the B Pond system. When the B-Ponds became inactive, effluent was diverted to TEDF. The basins were alternately filled, sampled, and emptied when meeting specifications. The basins discharged via pipeline to the 216-B-3C pond; this was discontinued in early 1997 and the basin effluent was diverted to the 200 Area TEDF. The 207-A North Basins were physically isolated and ceased to operate in November 1999.	Retention Basin	N	N	0	Unk,	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.

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207-S	Inactive	Retention Basin	207-S, REDOX Retention Basin, 207-S Retention Basin	200 W Ponds Area	The site is located west of the 222-S Laboratory buildings, north of 10th Street, and is surrounded with concrete marker posts. It is currently posted with URM signs and the basin has been backfilled to grade with dirt. The site received process cooling water and steam condensate from the 202-S Building. The water was then discharged to the 216-S-17 Pond or the 216-S-16 Pond. Coil leaks inside the 202-S facility often caused contaminated effluent to be discharged to the retention basin. In April 1954, the 207-S Retention Basin was shut down following a 202-S coil leak that contaminated the basin above permissible limits and an effluent bypass was installed. The concrete floors and walls of the basin were grossly contaminated and subsequently filled with dirt to prevent contamination from spreading. The basin was a 39.6 m by 39.6 m (130 ft by 130 ft) concrete structure with a volume of 3.23E+06 L (8.53E+05 gal). The walls are approximately 25 cm (10 in.) thick, and the floors are 20.3 cm (8 in.) thick. The system included approximately 610 m (2,000 ft) of 61-cm (24-in.) diameter vitrified clay pipe used to convey the waste water into and out of the unit. There is an overflow tank located in the center of the north end, just inside the basin wall, composed of 0.48-cm (3/16-in.) steel walls, 1.7 m (5.5 ft) high. The tank diameter was 6.1 m (20 ft). There is also an outlet weir structure adjacent to the south wall, outside the basin. In June 1975, the soil was treated with herbicides and covered with 23 cm (9 in) of gravel to stop radioactive weed growth. However, the vegetation later returned and the site became recontaminated.	Retention Basin	Y	Y	2	Unk,	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.
207-T	Active	Retention Basin	207-T, T Plant Retention Basin, 207-T, 207-T Retention Basin	T Farm Area	The site is located west of 221-T Building and north of 23rd Street. The retention basin was backfilled to grade with dirt in 1996. T Posts mark the corners of the basin and it is posted as an URM area. The basin received cooling water effluent from 221-T and 224-T and potentially low-level radioactive waste from T Plant process cooling and ventilation steam condensate, which was discharged to the 216-T-4-1 and 214-T-4-2 Ditches. From 11/44 to 1976, the site received process cooling water from process equipment jackets in 221-T and 224-T buildings and intermittently, 242-T Evaporator cooling water. After 1976, the site received intermittent flow from 221-T, 221-TA, and 224-T buildings. The effluent discharge was rerouted to the 200 Area TEDF in 1995. The unit was a concrete structure, divided into two sections, with a 3,800,000 L (1,000,000 gal) capacity. The bottom dimensions for each basin are 32.3 by 32.3 m (106 by 106 ft). There was an inlet structure on the east side and an outlet structure on the west side, adjacent to the outside walls of the basins.	Retention Basin	Y	Y	2-3	Unk,	246.0	123.0	6.5	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 0.46m - 1.07m of clean dirt. In 1996, the basin was backfilled with contaminated soil from adjacent areas and capped with 2 feet of clean dirt. An area north of the 207-T basin was originally designated as UPR-200-W-166 (alias UN-216-W-31). The contaminated soil was scraped and placed on top of the 216-T-14 through 216-T-17	Process cooling water/steam condensate/contaminated soil	Liquid	Unk.	Unk.

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					Two 40.6 cm (16 in.) diameter cast iron pipes connected to two-0.9 m (3 ft) sumps, one for each basin. Approximately 1830 m (6000 ft) of 61 cm (24 in.) diameter vitrified clay pipeline was used to convey waste water to and from the basin. H-2-3019 shows a black iron pipeline that exits the east side of the basin, traveling south, connecting to a pipeline that is associated with the 216-TY-201 flush tank. Periodically the sludge that accumulated on the bottoms of the basins was cleaned out. The sludge was placed in holes (one of these holes is documented as 216-T-12) located around the perimeter of the basin and covered with clean dirt. Additional holes were probably dug and filled with sludge, but not individually documented. Over the years this unit received potentially low-level radioactive waste from T-Plant process cooling and ventilation steam condensate. Also, unit received 1900L of 5% NaOH(aq) solution from T-Plant. On September 12, 1985, 1900 liters (500 gallons) of aqueous 5% sodium hydroxide solution containing 100 kilograms (219 pounds) of sodium hydroxide was released from T Plant to the basins and subsequently to 214-T-4-2 Ditch. At the time of the release, pH was 12.5. No cleanup actions were undertaken. After 6 hours of dilution by continued condensate discharge, the pH was 7.67												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-166. The contaminated soil east of the 207-T Basins was scraped and placed inside the basins as fill material in 1996. To distinguish between the area remediated in 1992 and the contamination placed into the 207-T Basin in 1996, 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-166), was completed in May 1996. Three to eighteen inches of the contaminated soil was scraped from 200-W-53 (UPR-200-W-166) and deposited in the bottom of the basin. The basin was then capped with eighteen to twenty four inches of clean dirt. The area was downposted from a SCA to URM.				
207-U	Inactive	Retention Basin	207-U, 207-U Retention Basin	T Plant Area	The site is located inside 200 West Area, west of 221-U Building, north of 16th Street, and east of the 241-U Tank Farm. The unit is a plastic-lined concrete basin, posted as a CA, and divided into two equal halves, with a capacity of 3.785E+06 L (1E+06 gal). The bottom dimensions for each basin are 32 by 32 m (106 by 106 ft). The total overall dimensions at the top ledge is 75 by 38 m (246 by 123 ft), 2 m deep (6.5 ft). There is an inlet structure on the east and an outlet structure on the west side, on the outside of the basins. Each basin has a 0.9 by 0.9-m (3 by 3-ft) sump. There is also a sampler cabinet and a sample vault on the east side of the basins	Retention Basin	N	Y	1-2	Unk.	246.0	123.0	6.5	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	Chemical sewer waste/ cooling water/ stormwater runoff	Liquid	Unk.	Unk.		

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					<p>near the inlet structure. There are two unplanned release sites (UPR-200-W-111 and UPR-200-W-112) adjacent to the basin where sludge was removed and buried. These burial sites are located within 3.1 m (10 ft) of the basin on the north side and on the south side, near the western corners. An unused sampler cabinet is located on the east side of the basin, as well as a sample vault that is a confined space. Until 1972, the unit received steam condensate and cooling water from 224-U Building and chemical sewer waste from the 221-U Building. After 1972, the unit has received only cooling water from 224-U Building. The water was held in the basin, sampled, and then discharged to the 216-U-10 Pond via the 216-U-14 Ditch until the basin outlet was plugged in 1994. The outlet was plugged so that the basins would serve as an evaporation pond for the storm water it receives. The basin was temporarily replaced by 216-U-16 Crib (1984 through 1986) but was reactivated when 216-U-16 Crib was taken out of service. Presently, the basin is receiving storm water runoff from the 224-U building and grounds. The water is allowed to evaporate in the basin. During the Uranium Trioxide (UO₃) facility deactivation, the trench that runs between 224-UA and 224-U was tied into the 207-U retention basin pipeline to route the storm water buildup from the contaminated zones on the backside of the facility to the 207-U Basins for solar evaporation. The basin outlets have been isolated with concrete. The Hanford Operational Environmental Monitoring Program will continue to monitor the air and soil in the vicinity of the basins to meet NESHAP requirements for monitoring of diffuse and fugitive sources. Originally, the basin received chemical sewer waste and cooling water from the building; currently, it receives storm water runoff from building and grounds. It has two radioactive sludge barrier grounds on each side approximately 10m away. Occurrence Report 86-46 states that on August 6, 1986, 2365 L (625 gal) of recovered nitric acid, containing 39 kg (86 lbs) of uranium was discharged through the chemical sewer to the 207-U retention Basin. Prior to the discovery of the release, the outlet valves on the retention basin were open to the 216-U-14 Ditch. The acid released to the ditch was greatly diluted with the 300 gal/min flow of cooling water from the 224-U facility being processed through the chemical sewer system. The Hanford Site Waste Management Units Report (1987) reported different release values: it states that approximately 3,000 L (796 gal) of 50% reprocessed nitric acid was released to the basin and subsequently to 216-U-14 Ditch. The total release to the environment consisted of approximately 102,000 kg (225,000 lbs) of corrosive solution (pH less than 2.0) and 45.4 kg (100 lbs) of uranium.</p>												<p>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 reposed as an 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.</p>				

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Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
207-Z	Inactive	Retention Basin	207-Z, 207-Z Retention Basin, 241-Z Retention Basin, 241-Z-RB	PPF Area	The concrete basins are located inside the Z Plant Exclusion Area fence, south of 236-Z building, and have been filled with high density grout. The site had been a concrete basin structure divided into two halves. The two sides were separated by a 0.3-m (1 ft) thick concrete wall. Each basin contained a sump with a sump pump. A 1.8-m (6 ft) high chain link fence surrounded the basin. The site received potentially contaminated waste. Steam condensate and cooling water, via the D-3 piping system, was sent to this holding facility then released to the 216-Z-1 and 216-Z-11 Ditches. Document HNF-30654 used historical operations records to determine an approximate volume of 152,000 L (40,000 gal) that could have leaked from the 241-Z basins. The 207-Z Retention Basin has sometimes been confused with the 216-Z-21 Seepage Pond; they are two separate waste sites. The 216-Z-21 Seepage Pond is located east of the Z Plant Exclusion Area, adjacent to Camden Ave. The 207-Z Retention Basin is inside the PPF fence.	Retention Basin	Y	N	0	Unk,	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	The site is located northeast of the 202-S (REDOX) facility, north of the 291-S Stack and consists of one, single-use liquid waste disposal trench. The site is surrounded with cement marker posts and chain, posted with URM signs. It is labeled 216-S-12. This site was used for liquid disposal of 291-S Stack flush water. In July 1954, the 291-S (REDOX) stack was flushed and approximately 68,100 L (18,000 gal) of flush water was drained into this trench. The water contained ammonium nitrate (600 kg). The material contained an estimated 5 Ci of beta particle emitters and 2-3 Ci of gamma particle emitters that were predominantly ruthenium and zirconium-niobium. Potential contaminants of concern include cobalt-60, cesium-137, strontium-90, plutonium-239/240, and uranium-238. It was fed with an overground pipeline.	Trench	Y	N	0	Unk,	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. Cobalt-60, Strontium-90, cesium-137, plutonium 239/240, uranium 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	The site is located north of 13th Street, east of 241-S Tank Farms, and southwest of 216-S-9 Crib. The site consists of one backfilled trench. It is posted with light weight chain and URM signs. This site was originally used in 1954 as a steam cleaning pit for contaminated equipment. According to RHO-CD-673 (Maxfield, 1979), the trench was excavated in October 1972. In 1972, the site was backfilled and released from radiation zone status. The contaminated material was taken to a 200 West Area burial ground. In 1995 and 1997, the open trench was used to consolidate nearby surface soil contamination. During the stabilization of UPR-200-W-165 and UPR-200-W-114 in 1995, contamination	Trench	Y	Y	1-2	Unk,	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.

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
					specks were found in the shallow trench excavation. The area was posted as a radiation area. The source of the contamination is assumed to be contamination specks from the operation of the 241-S Tank Farms. In 1997, a small area of contaminated soil remaining from UPR-200-W-114 was pushed into the 216-S-18 Trench depression. The 216-S-18 Trench area was then covered with clean dirt and posted as a URM area. The contaminated soil was covered with 1.8 m (6 ft) of clean dirt to bring the site up to grade.														
216-T-10	Inactive	Trench	216-T-10, Decontamination Trenches, Equipment Decontamination Area	T Plant Area	This site is located west of the 221-T Building and southwest of the 216-T-33 Crib and consists of a backfilled trench. The site is no longer marked or posted. No radionuclide or chemical contamination has been documented for this site according to DOE/RL-91-61. However, ARH-2757 states that all contamination (maximum 3000 cpm) was buried in the 200 West Dry Waste Burial Ground. Although no cleaning agents are listed, the possibility of hazardous chemical contamination exists. This site was used for subsurface liquid disposal of heavy equipment and vehicle decontamination waste. The site operated from June 1951 to March 1954. Maxfield (1979) states the site operated from June 1951 to March 1957, but this ending date is believed to be in error. In 1954, the unit was backfilled. The vehicle decontamination operations were transferred to the 269-W garage facility that discharged waste to the 216-T-13 trench.	Trench	Y	N	0	Unk,	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 counts per minute) 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	This site is located west of 221-T and southwest of the 216-T-33 Crib. This site consists of a backfilled trench. The site is no longer marked or posted. The site received heavy equipment and vehicle decontamination waste. No radionuclide or chemical contamination has been documented for this site according to DOE/RL-91-61. However, ARH-2757 states that all contamination (maximum 3000 cpm) was buried in the 200 West Dry Waste Burial Ground. Although no cleaning agents are listed, the possibility of hazardous chemical contamination exists. This site was used for subsurface liquid disposal of heavy equipment and vehicle decontamination waste. The unit operated from June 1951 to March 1954. Maxfield (1979) states the site operated from June 1951 to March 1957, but this end date is believed to be in error. In 1954, the unit was backfilled, and decontamination operations were transferred to the 269-W garage facility that discharged to the 216-T-13 trench.	Trench	Y	N	0	Unk,	50.0	10.0	7.0	7-10	In May 1972, the site was exhumed. All contamination (maximum 3000 counts per minute) 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.

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
216-T-12	Inactive	Trench	216-T-12, 207-T Sludge Grave, 207-T Sludge Pit, 216-T-11	T Farm Area	This site is located at the northeast corner of the 207-T Retention Basin. There is no visible evidence of this waste site. The area around the 207-T Retention Basin, including the northeast corner where this pit was located, has been stabilized with clean backfill material and posted with URM signs. The sludge pit is not separately marked. The site received contaminated sludge from the 207-T Retention Basin. The waste is low in salt and is neutral to basic. The site was a small trench that was dug November 1954 with a backhoe at the northeast corner of the 207-T Retention Basin. Sludge dredged from the 207-T Retention Basin was put into the trench and covered. A maximum of 15 mR/hr was detected on the sludge at the time of the burial (1954). The majority of the surface readings taken were in the range of 2 to 5 mR/hr. The pit was used only once. The site was backfilled when dredging operations were complete.	Trench	Y	N	0	Unk,	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 Liquid	Up to 0.015 rad/hour 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	This site is located on the north side of the 241-TY Farm, north of the tank farm perimeter fence. The site has been shown at two locations on different maps. Drawing H-2-1495 (originally made in 1952) shows the location of the trench adjacent to the 269-W garage and northwest of the 241-TY Tank Farm, while a later drawing (H-2-32526, 1967 Rev 3) shows the trench due north of the 241-TY Tank Farm. The mapped location in HGIS is due north of the Tank Farm as of December 2001. The site consisted of a single open trench located west of the 269-W Regulated Garage (now demolished). Currently, there is a concrete ramp covered with 0.6 m (2 ft) of gravel that is visible near the site of the garage. The trench is no longer marked or posted. This site was used to clean contaminated vehicles. A Tip Rack was located in the bottom of the open trench. Vehicles were driven into the trench and onto the rack. The vehicles were then sprayed with water or steam to remove the contamination. The decontamination was often required prior to vehicles being serviced at the 269-W Garage. The site received vehicle decontamination liquid waste. The inventory prior to the removal of 3.06 m ³ (4 yds ³) of soil was estimated through 1972 as follows. ARH-2757, part 3 states the volume was 0.98E+05 L; <0.100E+00 g - plutonium; 0.840E+02 Ci - beta; 0.100E00 Ci - strontium-90; 0.400E+02 Ci - ruthenium-106; 0.100E+00 Ci - cesium-137; < 0.100E+00 Ci - cobalt-60; <0.500E-01 kg - uranium. ARH-1608 states the volume was 0.026E+06 Liters; <0.100E+00 g - plutonium; 60 Ci - beta; 1.00E+00 Ci - strontium-90; 40 Ci - ruthenium-106; 1.00E+00 Ci - cesium-137; < 0.100E+00 Ci - cobalt-60; <.1 lbs of uranium. Readings up to 1,500 cpm were measured in the excavated soil.	Trench	N	N	0	Unk,	20.0	20.0	10.0	10-11	The site was radioactive, but was excavated in April 1972. Approximately 3.06 m ³ (4 yds 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 feet in April 2005.	Vehicle decontamination waste	Liquid	None	None

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)	
					Although no cleaning agents are listed, the possibility of hazardous chemical contamination exists. The site operated from June 1954 to June 1964. The site was deactivated when all vehicle decontamination operations were transferred to the 2706-T Building (also known as 2706-W). In 1964, the pit was deactivated by backfilling with soil. Although a dirt unloading ramp is located in the vicinity of this trench, the ramp was used to unload equipment and is not associated with the decontamination activities at 216-T-13. The trench is shown at different locations on two drawings. Drawing H-2-1495 (created in 1952) shows the trench adjacent to the southwest side of the 269-W garage. A conversation with a retired 200 West Area employee indicates the location north of the 241-TY Tank Farm is the correct location. Ground Penetrating Radar and Electromagnetic Induction scans done in December 2001 were not able to define the covered trench location. The older drawing, H-2-1495, appears to have depicted the 269-W garage further north of the location where the building foundations that are still visible. The shape of the building was also inverted on this drawing. Conversions to Washington State Plane coordinates for the trench shown on H-2-1495 distort the site location with respect to the known cement building foundations.															
216-T-9	Inactive	Trench	216-T-9, Decontamination Trenches, Equipment Decontamination Area	T Plant Area	This site is located west of the 221-T Building and southwest of the 216-T-33 Crib and consists of a backfilled trench. The site is no longer marked or posted. This site was used for subsurface liquid disposal of vehicle decontamination waste from heavy equipment and other vehicles. No radionuclide or chemical contamination has been documented for this site according to DOE/RL-91-61. However, ARH-2757 states that all contamination (maximum 3000 cpm) was buried in the 200 West Dry Waste Burial Ground. Although no cleaning agents are listed, the possibility of hazardous chemical contamination exists. The site operated from February 1951 to March 1954. Maxfield (RHO-CD-673) states the site operated from July 1965 to January 1969; however, these dates are believed to be in error based on other reference material. The unit was backfilled in 1954. Decontamination operations were transferred to the 269-W garage facility that discharged to the 216-T-13 trench.	Trench	Y	N	0	Unk,	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.	
216-U-13	Inactive	Trench	216-U-13, 216-U-13 Crib, 216-U-13, Vehicle Steam Cleaning Pit	S/U Farm Area	This site was located west of the 241-U Tank Farm and consisted of two trenches of equal dimensions that are no longer marked or posted. Some debris is visible in the area. The area is not level; many deep gullies are located in the area. The site operated as a decontamination pit from March 1952 to March 1956, using steam and water hoses to remove radioactive	Trench	Y	N	0	Unk,	200.0	70.0	18.0	18-19	Contaminated soil in the bottom of the pits was removed and then backfilled. When the pits were deactivated in 1956, contaminated soil in the bottom of the pits was	Vehicle decontamination waste	Liquid	None	None	

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)	
					contaminants from vehicles, equipment and pumps from the Uranium Recovery operation - mainly to decontaminate trucks and cranes bearing low levels of radioactive contamination. The trenches were sloped so that vehicles could be driven down to the decontamination station at the bottom. The site waste may include traces of detergent and nitric acid. 216-U-13 was two trenches of equal size (dimensions provided are for total of the two trenches). Several large pumps used in the Uranium Recovery process were also cleaned here, but the residue was scraped and taken to the 200 West Burial Grounds as were contaminated soils in the bottom of the pits. The trenches were backfilled and the site was deactivated because the decontamination operations were transferred to the 269-W garage equipment decontamination waste pit (216-T-13). In 1981 and 1982 the area west of the new tank farm fence was surveyed to determine the radiological conditions. A radiation survey of the site was performed on 9/24/81 and, except for two spots, all ground surface and vegetation at the trench site was less than background. In 1981, a chain link fence was installed around the 241-U Tank Farm and the fence excluded the 216-U-13 trenches. On August 10 and 11, 1982 the trenches were excavated to allow for sub-surface radiation surveys. The results enabled the two trenches to be released from radiological controls.											removed and taken to a dry waste burial ground. The steam cleaning equipment was removed in the 1960's and the pits were backfilled. In August 1982, six holes, measuring approximately 1.2 m (4 ft) wide and 1.8 m (6 ft) deep, were dug around the perimeter of the trenches and two trenches 9 m (30 ft) long and 4.6 m (15 ft) deep were dug across the two vehicle decontamination pits to determine the subsurface radiological conditions. Radiation Survey 82-1170 states that three soil samples were collected in each trench. The 216-U-13 was found to be free of surface and subsurface radiological contamination. The area was released from radiological control in 1982.				
UPR-200-E-17	Inactive	Unplanned Release	UPR-200-E-17, Overflow at 216-A-22, UN-200-E-17	PUREX Area	The release effected the ground on top of the 216-A-22 Crib, located north of PUREX, north of the 203-A facility, near the 216-A-28 French Drain. The 216-A-22 crib is marked with a single cement post and posted with URM signs. The unplanned release is not separately marked or posted. The release cannot be visually identified. The release consisted of uranium (from UNH storage) contamination on the ground surface from the failed 216-A-22 Crib inlet. The 203-A tank farm was used for storage and shipping of UNH product and concentration of UNH waste. It consisted of 460,000 L (100,000 gal) stainless steel tanks for UNH storage and three smaller nitric acid tanks. HW-60807, issued in 1959, stated that the covered release area was not separately posted because it was located within the 203-A stack radiation zone. This statement was copied into many later documents. Site visits and conversations with previous PUREX workers cannot identify a stack at the 203-A tank farm. It is believed that author of HW-60807 intended to state the spill was located within the 203-A tank radiation zone.	Crib	N	Y	1-2	Unk.	Irr.	Irr.	Unk.	2-6	In 1959, the area was covered with dirt. It was not separately marked because it was located within the 203-A chained radiation zone.	Leak/ spill	Liquid	Unk.	460,000 L Uranyl nitrate hexahydrate	

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

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UPR-200-E-9	Inactive	Unplanned Release	UPR-200-E-9, Liquid Overflow at 216-BY-201, UN-200-E-9	B Farm Area	The location of this unplanned liquid release is adjacent to the 216-BY-201 Flush Tank, north of the 241-BY Tank Farm. A large area of surface contamination north of 241-BY Tank Farm was later named UPR-200-E-89. The site has been surface stabilized with gravel and is posted as an URM area. The 216-BY-201 Flush Tank leaked supernatant waste from the tributyl phosphate (TBP) process to the ground. The 216-BY-201 flush tank received tri-butyl phosphate waste via the 241-BY tank farm and then released it to the 216-B-43 through 49 cribs. The 216-B-50 crib did not receive tri-butyl phosphate waste.	Outlying Area	N	Y	12	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 (TBP). 41,600 L tributyl phosphate process waste (before clean up)
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	UPR-200-W-103 occurred within the Z Plant exclusion area, approximately 1.8 m (6 ft) south and 3.7 m (12 ft) west of the southwest corner of the 236-Z Building in the 200 West Area. The release site is posted with URM warning signs. Contamination still remains under the clean soil. A WIDS number sign has been placed inside the URM to mark the approximate release location. The release contained approximately 10 g of plutonium with gross alpha contamination greater than 6,000,000 dpm.	Outlying Area	Y	N	0	Unk,	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-gallon 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 2.1m depth, after it was backfilled. Contaminated soil still remains.	Pipeline release	Liquid	10 g of plutonium with gross alpha contamination in April 1979. greater than 6,000,000 dpm.	Unk.

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Waste Site Description	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 Const. (Rad)	Potential Const. (Nonrad)
UPR-200-W-111	Inactive	Unplanned Release	UPR-200-W-111, Sludge Trench at 207-U, UN-216-W-21	T Plant Area	The site, a trench, is approximately 3 m (10 ft) from the concrete wall on the south side of the 207-U South Retention Basin in the 200 West Area. The site had been posted with "Surface Contamination" signs. In 1997, contaminated soil in the vicinity of the 207-U Retention Basin was scraped and consolidated around the basin perimeter. The contaminated soil was covered with clean backfill. The radiological posting was changed to "Underground Radioactive Material." Approximately 21 m ³ (27 yds ³) of sludge from the 207-U South Retention Basin was buried adjacent to the Retention Basin. Until 1972, the retention basins received steam condensate and cooling water from the 224-U Building and chemical sewer waste from the 221-U Building. The exact date of this basin scraping is not known. It is assumed to have been a one time use trench dug in the 1960's. The trench was given a "UPR" designation, even though the sludge removal was a planned activity.	Trench	N	Y	1-2	Unk,	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	The site is approximately 3 m (10 ft) from the concrete wall on the north side of the 207-U North Retention Basin in the 200 West Area. The site had been posted with "Surface Contamination" warning signs. In 1997, the contaminated area in the vicinity of the 207-U Retention Basin was scraped and consolidated. The area was covered with clean soil and the radiological posting was changed to URM. Approximately 21 cubic m ³ (27 yds ³) of sludge from the 207-U North Retention Basin was buried adjacent to the north side of the Retention Basin. Until 1972, the retention basins received steam condensate and cooling water from the 224-U Building and chemical sewer waste from the 221-U Building. Sludge was scraped from the bottom of the north 207-U Retention Basin and placed in a narrow trench adjacent to the north basin wall. The sludge was covered with 1.2 m (4 ft) of clean soil. The exact date of this basin scraping is not known. It is assumed to be a one time use trench, dug in the 1960's. The trench was given a "UPR" designation, even though the sludge removal was a planned activity.	Retention Basin	N	Y	1-2	Unk,	40.0	15.0	10.0	0-15	The site was surface stabilized in 1997.	Dumping Area	Solid	Unk.	Unk.

Table B-1. 200-MG-2 Operable Unit
Waste Site Attributes. (40 Pages)

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UPR-200-W-138	Inactive	Unplanned Release	UPR-200-W-138, 221-U Vessel Vent Blower Pit French Drain, UN-216-W-11, UN-200-W-138, UN-200-W-22, UPR-200-W-22	U Plant Area	UPR-200-W-138 occurred at the northwest corner of the 221-U Building, near the R-3 entrance. It is located inside the larger, surface stabilized area, UPR-200-W-162. The site was described as the ground near the R-3 entrance to the 221-U Building. The area has been surface stabilized and posted with URM signs. The Unplanned Release is not separately marked or posted. An estimated 140 kg (300 lbs) of UNH solution, containing 14 kg (30 lbs) of uranium, was released to the ground through the french drain. The information for this release is vague: some documentation indicates the french drain involved was the 216-U-7, but drawing reviews indicate the blower pit is located north of 216-U-7. The blower pit drained to the 241-WR vault. If the event involved surface liquid being released, it is possible it flowed southward and could have effected the 216-U-7 drain. Uranyl nitrate hexahydrate (UNH) solution overflowed into the 221-U Building Vessel Vent Blower Pit, then onto the ground through the french drain. Confusion exists in documentation concerning the location of the UPR-200-W-138 release. RHO-CD-673 describes the location as being near door R-3 of the 221-U building. It also mentions 216-U-7 as a past designation. However, 216-U-7 is located near door R-6 of the 221-U building. Detailed drawings indicate that the 216-U-7 french drain is connected to the 221-U counting box, and the blower pit floor drain is connected to the 241-WR Vault. (See Drawings: H-2-40887, H-2-43078 and H-2-44511, sheet 67). If this is the case, then the ground surface may not have been contaminated through the 216-U-7 french drain. It may be best to resolve this confusion through interviews with knowledgeable personnel. Until the issue is resolved, it should be assumed that 136 kg (300 lbs) of uranium nitrate hexahydrate solution were introduced to the soil through the 216-U-7 french drain.	Outlying Area	N	Y	1-2	Unk,	Irr.	Irr.	Unk.	0-6	The site has been surface stabilized. In 1998, the contaminated areas on the east side of 221-U were covered with clean backfill material (see UPR-200-W-162). The area was reposted as "Underground Radioactive Material." The area around the 241-UX-154 Diversion Box was not covered with backfill material.	Contaminated effluent	Liquid	140 kg of uranium nitrate hexahydrate solution; 14 kg of uranium	Nitrate

Const. = constituents.
 Cont. = contaminant.
 cpm = counts per minute.
 dpm = disintegrations per minute.
 GEA = gamma energy analysis.
 HEPA = high-efficiency particulate air.
 Irr. = irregular.
 PVC = polyvinyl chloride.

mR = milliroentgen.
 PCBs = polychlorinated biphenyls.
 ppb = parts per billion.
 psi = pounds per square inch.
 PUREX = Plutonium-Uranium Extraction Plant.
 Rad = Radioactive.
 RARA = Radiation Area Remedial Action.
 RCRA = *Resource Conservation and Recovery Act of 1976*.

RR = railroad.
 SCA = soil contamination area.
 SSW = Strontium Semi-Works.
 TSD = treatment, storage or disposal (unit).
 UNH = uranyl nitrate hexahydrate.
 Unk. = unknown.
 URM = underground radioactive material.
 VCP = vitrified clay pipe.
 WIDS = *Waste Information Data System* database.

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APPENDIX C
POTENTIAL APPLICABLE OR RELEVANT
AND APPROPRIATE REQUIREMENTS

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TERMS

ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CFR	<i>Code of Federal Regulations</i>
ERDF	Environmental Restoration Disposal Facility
OU	operable unit
PCB	polychlorinated biphenyl
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
T-BACT	toxics – best available control technology
TBC	to be considered
TSCA	<i>Toxic Substances Control Act of 1976</i>
WAC	<i>Washington Administrative Code</i>

APPENDIX C

POTENTIAL APPLICABLE OR RELEVANT
AND APPROPRIATE REQUIREMENTSC1.0 IDENTIFICATION OF POTENTIAL APPLICABLE OR
RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE
200-MG-2 OPERABLE UNIT

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

C1.1 COMPLIANCE WITH APPLICABLE OR
RELEVANT AND APPROPRIATE
REQUIREMENTS

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 would have to comply by law if the same action was being undertaken apart from CERCLA authority. All jurisdictional prerequisites of the requirement must be met in order for the requirement to be applicable. A requirement that is relevant and appropriate may “miss” on one or more jurisdictional prerequisites for applicability but still make sense at the site, given the circumstances of the site and release.

Response actions 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 any selected alternative will be designed to comply with the ARARs cited in this section to the extent practicable. 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 is to identify the key ARARs for the proposed alternatives addressed in this engineering evaluation/cost analysis. ARARs, which will be complied with during implementation of the selected removal action, will be documented in the CERCLA Action Memorandum. To-be-considered information consists of nonpromulgated advisories or guidance issued by Federal or state governments that are not binding legally and do not have the status of potential ARARs. As appropriate, to-be-considered information should be considered while determining the removal action necessary for protection of human health and the environment.

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

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

12 Potential Federal and state ARARs are presented in Tables C-1 and C-2, respectively. The
13 chemical-specific ARARs likely to be the most relevant removal action of the 200-MG-2 OU are
14 elements of the Washington State regulations that implement WAC 173-340, "Model Toxics
15 Control Act -- Cleanup," specifically associated with developing risk-based concentrations for
16 cleanup (WAC 173-340-745, "Soil Cleanup Standards for Industrial Properties"). The
17 requirements of WAC 173-340-745 help establish soil cleanup standards for nonradioactive
18 contaminants at waste sites. The state air emission standards are likely to be important in
19 identifying air emission limits and control requirements for any removal actions that produce air
20 emissions. *Resource Conservation and Recovery Act of 1976 (RCRA)* land-disposal restrictions
21 will be important standards during the management of wastes generated during removal actions.

22 C1.2 WASTE MANAGEMENT STANDARDS

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

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

31 The identification, storage, treatment, and disposal of hazardous waste and the hazardous
32 component of mixed waste are governed by RCRA. The State of Washington, which
33 implements RCRA requirements under WAC 173-303, "Dangerous Waste Regulations," has
34 been authorized to implement most elements of the RCRA program. The dangerous waste
35 standards for generation and storage would apply to the management of any dangerous or mixed
36 waste generated at the 200-MG-2 OU waste sites. Treatment standards for dangerous or mixed
37 waste subject to RCRA land disposal restrictions are specified in WAC 173-303-140, "Land
38 Disposal Restrictions," which incorporates 40 CFR 268, "Land Disposal Restrictions,"
39 by reference.

40 The management and disposal of PCB wastes are governed by the *Toxic Substances Control Act*
41 *of 1976 (TSCA)*, and regulations at 40 CFR 761, "Polychlorinated Biphenyls (PCBs)
42 Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions." The TSCA

1 regulations contain specific provisions for PCB waste, including PCB waste that contains a
2 radioactive component. PCBs also are considered underlying hazardous constituents under
3 RCRA and thus could be subject to WAC 173-303 and 40 CFR 268 requirements.

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

9 Waste that is designated as low-level waste that meets Environmental Restoration Disposal
10 Facility (ERDF) acceptance criteria is assumed to be disposed at ERDF, which is engineered to
11 meet appropriate performance standards. Alternate potential disposal locations may be
12 considered when the removal action occurs if a suitable and cost-effective location is identified.
13 Any potential alternate disposal location will be evaluated for appropriate performance standards
14 to ensure that it is adequately protective of human health and the environment.

15 Waste designated as dangerous or mixed waste would be treated as appropriate to meet land
16 disposal restrictions and ERDF acceptance criteria, and disposed at ERDF. ERDF is engineered
17 to meet minimum technical requirements for landfills under WAC 173-303-665, "Landfills."
18 Applicable packaging and pre-transportation requirements for dangerous or mixed waste
19 generated at the 200-MG-2 OU waste sites would be identified and implemented before
20 movement of any waste.

21 Some of the aqueous waste designated as low-level waste, dangerous, or mixed waste would be
22 transported to the Effluent Treatment Facility for treatment and disposal. The Effluent
23 Treatment Facility is a RCRA-permitted facility authorized to treat aqueous waste streams
24 generated on the Hanford Site and dispose of these streams at a designated state-approved land
25 disposal facility in accordance with applicable requirements.

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

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

32 CERCLA Section 104(d)(4) states that where two or more noncontiguous facilities are
33 reasonably related on the basis of geography, or on the basis of the threat or potential threat to
34 the public health or welfare or the environment, the facilities can be treated as one for purposes
35 of CERCLA response actions. Consistent with this, the 200-MG-2 OU waste sites and ERDF
36 would be considered to be onsite for purposes of Section 104 of CERCLA, and waste may be
37 transferred between the facilities without requiring a permit.

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

1 C1.3 STANDARDS CONTROLLING EMISSIONS 2 TO THE ENVIRONMENT

3 The proposed removal action alternatives have the potential to generate both radioactive and
4 toxic/criteria airborne emissions.

5 C1.3.1 Radiological Air Emissions

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

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

30 The above state implementing regulations further address control of radioactive airborne
31 emissions where economically and technologically feasible (WAC 246-247-040[3] and -040[4],
32 "General Standards," and associated definitions). To address the substantive aspect of these
33 potential requirements, best or reasonably achieved control technology could be addressed by
34 ensuring that applicable emission control technologies (those successfully operated in similar
35 applications) would be used when economically and technologically feasible (i.e., based on
36 cost/benefit). If it is determined that there are substantive aspects of the requirement for control
37 of radioactive airborne emissions once ARARs are finalized, then controls will be administered
38 as appropriate using the best methods from among those that are reasonable and effective.

39 C1.3.2 Criteria/Toxic Air Emissions

40 Under WAC 173-400, "General Regulations for Air Pollution Sources," and WAC 173-460,
41 "Controls for New Sources of Toxic Air Pollutants," requirements are established for the
42 regulation of emissions of criteria/toxic air pollutants. The primary nonradioactive emissions

1 resulting from this removal action will be fugitive particulate matter. In accordance with
2 WAC 173-400-040, "General Standards for Maximum Emissions," reasonable precautions must
3 be taken to (1) prevent the release of air contaminants associated with fugitive emissions
4 resulting from excavation, materials handling, or other operations; and (2) prevent fugitive dust
5 from becoming airborne from fugitive sources of emissions. The use of treatment technologies
6 that would result in emissions of toxic air pollutants that would be subject to the substantive
7 applicable requirements of WAC 173-460 are not anticipated to be a part of this removal action.
8 Treatment of some waste encountered during the removal action may be required to meet ERDF
9 waste acceptance criteria. In most cases, the type of treatment anticipated would consist of
10 solidification/stabilization techniques such as macroencapsulation or grouting, and
11 WAC 173-460 would not be considered an ARAR. If more aggressive treatment is required that
12 would result in the emission of regulated air pollutants, the substantive requirements of
13 WAC 173-400-113(2), "Requirements for New Sources in Attainment or Unclassifiable Areas,"
14 and WAC 173-460-060, "Control Technology Requirements," would be evaluated to determine
15 applicability.

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

20

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

	ARAR or TBC	Requirement	Rationale for Use
<i>National Archaeological and Historic Preservation Act of 1976</i> , 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 potentially applicable to actions that might disturb these sites. This requirement is location-specific.
<i>National Historic Preservation Act of 1966</i> , 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 potentially applicable to actions that might disturb these types of sites. This requirement is location-specific.
<i>Native American Graves Protection and Repatriation Act</i> , 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 potentially applicable if remains and sacred objects are found during removal action and will require Native American Tribal consultation in the event of discovery. This requirement is location-specific.
<i>Endangered Species Act of 1973</i> , 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 potentially applicable if threatened or endangered species are identified in areas where removal actions will occur. This requirement is location-specific.
"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)	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 ≥ 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.

ARAR = applicable or relevant and appropriate requirement.
CFR = Code of Federal Regulations.
MCL = maximum contaminant level.

OU = operable unit.
TBC = to-be-considered.

Table C-2. Identification of Potential State Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action. (6 Pages)

ARAR Citation	ARAR or TBC	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	ARAR	Identifies those materials that are and are not solid waste.	Substantive requirements of these regulations are potentially 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 potentially would be subject to the procedures for identifying solid waste to ensure proper management. This 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 potentially applicable to materials encountered during the removal action. Specifically, solid waste generated for removal from the CERCLA site during this removal action potentially would be subject to the dangerous waste designation procedures to ensure proper management. This requirement is action-specific.
"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 potentially applicable to removal actions in the 200-MG-2 OU, should wastes identified in WAC 173-303-071 be encountered. This 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 potentially applicable to materials encountered during the removal action. Specifically, the substantive standards for management of special waste are potentially applicable to the interim management of certain waste that will be generated during the removal action. This 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 potentially applicable to materials encountered during the removal action. Specifically, the substantive standards for management of universal waste are potentially applicable to the interim management of certain waste that will be generated during the removal action. This requirement is action-specific.

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Table C-2. Identification of Potential State Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action. (6 Pages)

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
<p>“Land Disposal Restrictions and Prohibitions,” WAC 173-303-140(4)</p>	ARAR	<p>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).</p>	<p>The substantive requirements of this regulation are potentially 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 potentially 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 potentially would be subject to all applicable laws and regulations. This requirement is action-specific.</p>
<p>“Requirements for Generators of Dangerous Waste,” WAC 173-303-170</p>	ARAR	<p>Establishes the requirements for dangerous waste generators.</p>	<p>Substantive requirements of these regulations are potentially applicable to materials encountered during the removal action. Specifically, the substantive standards for management of dangerous and/or mixed waste are potentially applicable to the interim management of certain waste that will be generated during the removal action. For purposes of this removal action, WAC 173-303-170(3) includes the substantive provisions of WAC 173-303-200 by reference. WAC 173-303-200 further includes certain substantive standards from WAC 173-303-630 and -640 by reference. This requirement is action-specific.</p>
<p>“Model Toxics Control Act – Cleanup,” WAC 173-340 (as amended, February 2007)</p>			
<p>“Soil Cleanup Standards for Industrial Properties,” WAC 173-340-745(5)(b) “Terrestrial Ecological Evaluation Procedures,” WAC 173-340-7490 “Tables,” WAC 173-340-900, Table 749-3</p>	ARAR	<p>Establishes the process and methods used to evaluate risk and to develop cleanup standards for soil and other environmental media.</p>	<p>The substantive requirements of the specified subsections are relevant and appropriate to developing cleanup standards for the selected removal action for the 200-MG-2 Operable Unit. This is a chemical-specific requirement.</p>

Table C-2. Identification of Potential State Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action. (6 Pages)

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
“General Regulations for Air Pollution Sources,” WAC 173-400 and WAC 173-460			
<p>“Washington Clean Air Act,” RCW 70.94 and State Government – Executive,” “Department of Ecology,” RCW 43.21A</p> <p>“General Regulations for Air Pollution – Sources,” WAC 173-400</p> <p>Specific subsection: WAC 173-400-040</p>	ARAR	<p>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.</p>	<p>Substantive requirements of the general standards for control of fugitive emissions are potentially applicable to removal actions at the site due to the generation of fugitive dust that occurs during excavation or other types of construction activities. These requirements are action-specific.</p>
<p>Specific subsections: WAC 173-400-050, “Emission Standards for Combustion and Incineration Units” WAC 173-400-060, “Emission Standards for General Process Units” WAC 173-400-070, “Emission Standards for Certain Source Categories” WAC 173-400-075, “Emission Standards for Sources Emitting Hazardous Air Pollutants”</p>	ARAR	<p>Requires specifically identified types of emission sources to meet additional 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.</p>	<p>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. These requirements are action-specific.</p>
<p>Specific subsection: WAC 173-400-113</p>	ARAR	<p>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 resulting from new or modified sources of regulated criteria and toxic air emissions. Emissions are to be minimized through application of best available control technology.</p>	<p>Substantive requirements of this regulation potentially 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. This requirement is action-specific.</p>

Table C-2. Identification of Potential State Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action. (6 Pages)

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
<p>“Controls for New Sources of Toxic Air Pollutants,” WAC 173-460</p> <p>Specific subsections: WAC 173-460-030 WAC 173-460-060 WAC 173-460-070 WAC 173-460-080 WAC 173-460-150 WAC 173-460-160</p>	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 potentially would be 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. These requirements are action-specific.
“Asbestos,” Benton Clean Air Agency, Regulation 1, Article 8			
<p>Section 8.02, “CFR Adoption by Reference”; Section 8.03, “General Requirements”</p>	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. This requirement is action-specific.
“Radiation Protection – Air Emissions,” WAC 246-247			
<p>“Radiation Protection -- Air Emissions,” WAC 246-247-035(1)(a)(ii)</p>	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 potentially 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 potentially apply. This is a risk-based standard for the purposes of protecting human health and the environment. This requirement is action-specific.
<p>“Radiation Protection -- Air Emissions” “Standards,” WAC 246-247-040(3) WAC 246-247-040(4)</p>	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 potentially 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 exists to ensure compliance with emission standards. These requirements are action-specific.

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Table C-2. Identification of Potential State Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action. (6 Pages)

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
<p>"Monitoring, Testing, and Quality Assurance," WAC 246-247-075(1) and – (2) and –(4)</p>	<p>ARAR</p>	<p>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 so as 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.</p> <p>Emissions from nonpoint and fugitive sources of airborne radioactive material shall be measured.</p> <p>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.</p>	<p>Substantive requirements of this standard are potentially 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 exists to ensure compliance with emission standards. These requirements are action-specific.</p>
<p>"Monitoring, Testing, and Quality Assurance," WAC 246-247-075(3)</p>	<p>ARAR</p>	<p>Methods to implement periodic confirmatory monitoring for minor sources may include estimating the emissions or other methods as approved by the lead agency.</p>	<p>Fugitive and diffuse emissions from the demolition and excavation and related activities potentially will require periodic confirmatory measurements to verify low emissions. This requirement is action-specific.</p>
<p>"Monitoring, Testing, and Quality Assurance," WAC 246-247-075(8)</p>	<p>ARAR</p>	<p>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.</p>	<p>Fugitive and diffuse emissions of airborne radioactive material due to demolition and excavation and related activities potentially will require measurement. This requirement is action-specific.</p>

Table C-2. Identification of Potential State Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action. (6 Pages)

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
“General Standards,” WAC 246-247-040(4) and “General Standards for Maximum Permissible Emissions,” WAC 173-480-050(1)	ARAR	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 due to demolition and excavation and related activities potentially will require efforts to minimize those emissions. This requirement is action-specific.
“Emission Monitoring and Compliance Procedures,” WAC 173-480-070-(2)	ARAR	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 resulting from demolition and excavation and related activities potentially will require assessment and reporting. This requirement is action-specific.
TBC pursuant to relevant waste acceptance criteria			
<i>Environmental Restoration Disposal Facility Waste Acceptance Criteria, WCH-191</i>	TBC	Establishes waste acceptance criteria for the Environmental Restoration Disposal Facility.	Waste destined for management at the Environmental Restoration Disposal Facility must meet acceptance criteria to ensure proper disposal.

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.*

TBC = to be considered.

WAC = *Washington Administrative Code.*

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C2.0 REFERENCES

- 2 40 CFR 61, "National Emission Standards for Hazardous Air Pollutants," Title 40, *Code of*
3 *Federal Regulations*, Part 61.
- 4 • 40 CFR 61, Subpart H, "National Emission Standards for Emissions of Radionuclides
5 Other than Radon from Department of Energy Facilities."
6 • 40 CFR 61, Subpart M, "National Emission Standards for Asbestos."
- 7 40 CFR 63, "National Emission Standards for Hazardous Air Pollutants for Source Categories,"
8 Title 40, *Code of Federal Regulations*, Part 63.
- 9 40 CFR 268, "Land Disposal Restrictions," Title 40, *Code of Federal Regulations*, Part 268.
- 10 40 CFR 300.400, "Permit Requirements, Title 40, *Code of Federal Regulations*, Part 300.400.
- 11 40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in
12 Commerce, and Use Prohibitions," Title 40, *Code of Federal Regulations*, Part 761.
- 13 • 40 CFR 761.50(b), "Applicability," "PCB Waste."
14 • 40 CFR 761.50(c), "Applicability," "Storage for Disposal."
- 15 *Atomic Energy Act of 1954*, 42 USC 2011, et seq.
- 16 *Benton Clean Air Authority*, 2005, Regulation 1, Article 8, Benton County, Washington.
- 17 *Clean Air Act of 1990*, 42 USC 7401, et seq., Pub. L. 101-549.
- 18 *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*,
19 42 USC 9601, et seq.
- 20 *Endangered Species Act of 1973*, 16 USC 1531, et seq.
- 21 *National Archaeological and Historic Preservation Act of 1976*, 16 USC 469aa-mm, et seq.
- 22 *National Historic Preservation Act of 1966*, 16 USC 470, et seq.
- 23 *Native American Graves Protection and Repatriation Act*, 25 USC 3001, et seq.
- 24 RCW 43.21A, "State Government – Executive," "Department of Ecology," Title 43,
25 Chapter 21A, *Revised Code of Washington*, as amended, Washington State, Olympia,
26 Washington.
- 27 RCW 70.94, "Public Health and Safety," "Washington Clean Air Act," Title 70, Chapter 94,
28 *Revised Code of Washington*, as amended, Washington State, Olympia, Washington.
- 29 *Resource Conservation and Recovery Act of 1976*, 42 USC 6901, et seq.
- 30 *Toxic Substances Control Act of 1976*, 15 USC 2601, et seq.
- 31 WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended,
32 Washington State Department of Ecology, Olympia, Washington.
- 33 • 173-303-016, "Identifying Solid Waste."
34 • 173-303-017, "Recycling Processes Involving Solid Waste."
35 • 173-303-040, "Definitions."
36 • 173-303-050, "Department of Ecology Cleanup Authority."

- 1 • 173-303-070(3), "Designation of Dangerous Waste," "Designation Procedures."
- 2 • 173-303-071, "Excluded Categories of Waste."
- 3 • 173-303-073, "Conditional Exclusion of Special Wastes."
- 4 • 173-303-077, "Requirements for Universal Waste."
- 5 • 173-303-120, "Recycled, Reclaimed, and Recovered Wastes."
- 6 • 173-303-140, "Land Disposal Restrictions."
- 7 • 173-303-140(4), "Land Disposal Restrictions and Prohibitions."
- 8 • 173-303-170, "Requirements for Generators of Dangerous Waste."
- 9 • 173-303-200, "Accumulating Dangerous Waste On-Site."
- 10 • 173-303-573, "Standards for Universal Waste Management."
- 11 • 173-303-630, "Closure and Post-Closure," "Use and Management of Containers."
- 12 • 173-303-640, "Tank Systems."
- 13 • 173-303-665, "Landfills."
- 14 • 173-303-960, "Special Powers and Authorities of the Department."
- 15 WAC 173-340, "Model Toxics Control Act -- Cleanup," *Washington Administrative Code*,
- 16 as amended, Washington State Department of Ecology, Olympia, Washington.
- 17 • 173-340-745, "Soil Cleanup Standards for Industrial Properties."
- 18 • 173-340-745(5)(b), "Standard Method C Industrial Soil Cleanup Levels."
- 19 • 173-340-900, "Tables."
- 20 • 173-340-7490, "Terrestrial Ecological Evaluation Procedures."
- 21 WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative*
- 22 *Code*, as amended, Washington State Department of Ecology, Olympia, Washington.
- 23 • 173-400-040, "General Standards for Maximum Emissions."
- 24 • 173-400-050, "Emission Standards for Combustion and Incineration Units."
- 25 • 173-400-060, "Emission Standards for General Process Units."
- 26 • 173-400-070, "Emission Standards for Certain Source Categories."
- 27 • 173-400-075, "Emission Standards for Sources Emitting Hazardous Air Pollutants."
- 28 • 173-400-113, "Requirements for New Sources in Attainment or Unclassifiable Areas."
- 29 WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," *Washington Administrative*
- 30 *Code*, as amended, Washington State Department of Ecology, Olympia, Washington.
- 31 • 173-460-030, "Requirements, Applicability and Exemptions."
- 32 • 173-460-060, "Control Technology Requirements."
- 33 • 173-460-070, "Ambient Impact Requirement."
- 34 • 173-460-080, "Demonstrating Ambient Impact Compliance."
- 35 • 173-460-150, "Class A Toxic Air Pollutants."
- 36 • 173-460-160, "Class B Toxic Air Pollutants."
- 37 WAC 173-480, "Ambient Air Quality Standards and Emission Limits for Radionuclides,"
- 38 *Washington Administrative Code*, as amended, Washington State Department of Ecology,
- 39 Olympia, Washington.
- 40 • 246-247-030(15), "Definitions."
- 41 • 173-480-050, "Standards."
- 42 • 173-480-070, "Emission Monitoring and Compliance Procedures."

1 WAC 246-247, "Department of Health," "Radiation Protection - Air Emissions," *Washington*
2 *Administrative Code*, as amended, Washington State Department of Health, Olympia,
3 Washington.

- 4 • 246-247-040, "General Standards."
- 5 • 246-247-075, "Monitoring, Testing, and Quality Assurance."

6 WCH-191, 2008, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*,
7 Rev. 0, Washington Closure Hanford, Richland, Washington.

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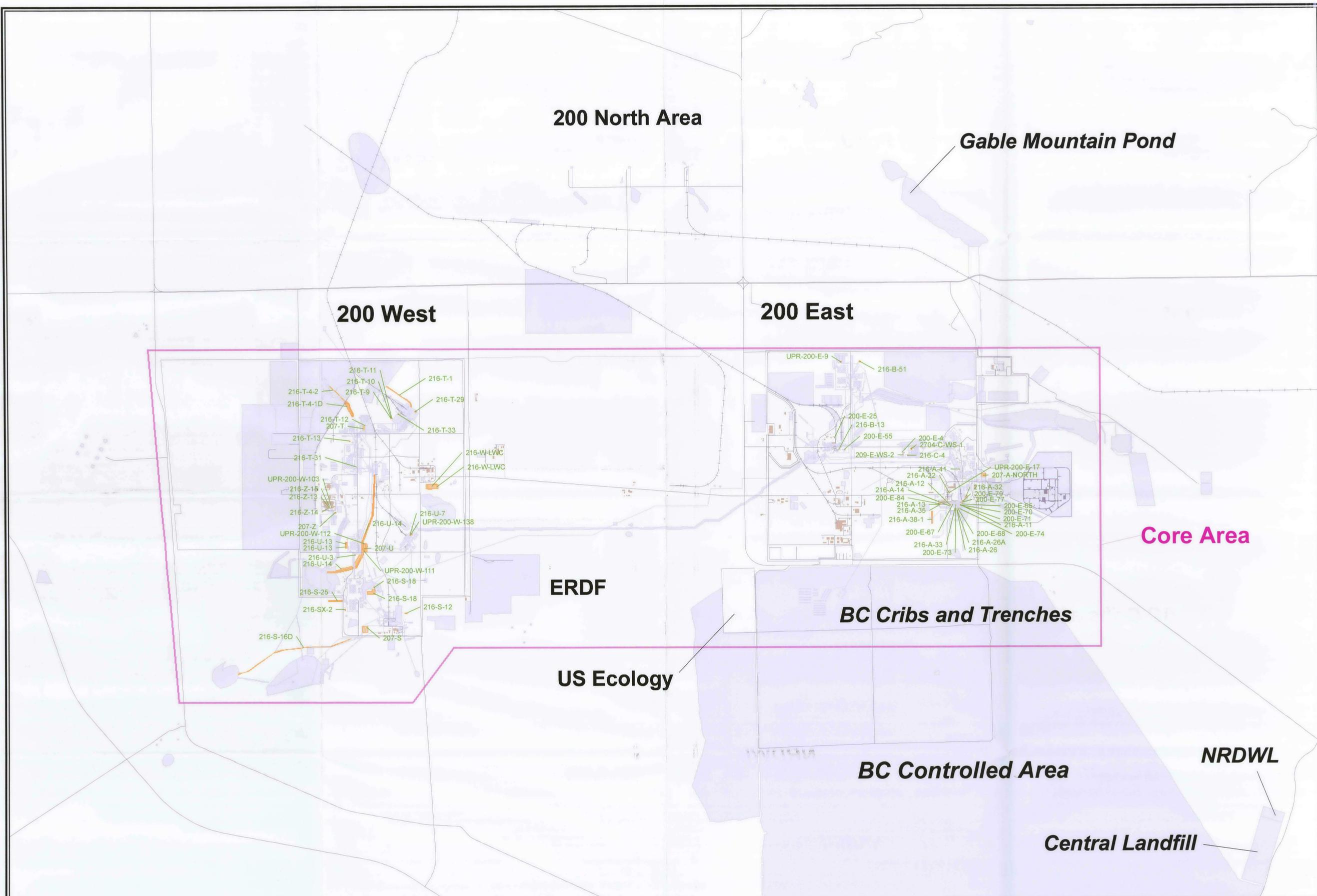
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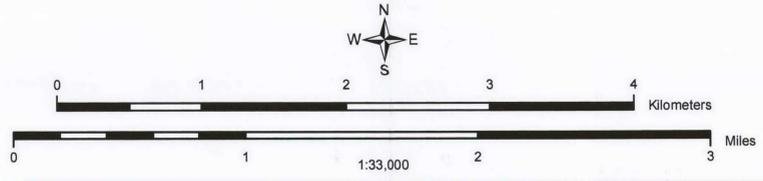
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200-MG-2 WIDS Sites

- 200-MG-2
- Accepted Sites in Other Operable Units
- Central Plateau Risk Framework Core Zone



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