

Meeting Minutes Transmittal - Approved

Unit Managers' Meeting
 200 West Area Ash Pit Demolition Site Closure Plan
 2440 Stevens Center Place, Room 1600
 Richland, Washington

Meeting Held September 27, 1995
 From 8:00 to 9:00 a.m.

The undersigned indicate by their signatures that these meeting minutes reflect the actual occurrences of the above dated Unit Managers Meeting.

Ellen M. Mattlin Date: 1/30/96
 Ellen M. Mattlin, Unit Manager, RL

NOT PRESENT

Date: _____
 Daniel L. Duncan, RCRA Program Manager, EPA Region 10

Fenggang Ma Date: 2/6/96
 Fenggang Ma, Unit Manager, Washington State Department of Ecology

200 West Area Ash Pit Demolition Site Closure Plan, WHC Concurrence

Fred A. Ruck III Date: 1/30/96
 Fred A. Ruck III, Contractor Representative, WHC

Purpose: Discuss Permitting Process

Meeting Minutes are attached. The minutes are comprised of the following:
 Attachment 1 - Agenda
 Attachment 2 - Summary of Discussion and Commitments/Agreements
 Attachment 3 - Attendance List
 Attachment 4 - Action Items
 Attachment 5 - Draft Data Evaluation Report for 200 West Area Ash Pit Demolition Site Clean Closure.



Attachment 1

Unit Managers' Meeting
200 West Area Ash Pit Demolition Site Closure Plan
2440 Stevens Center Place, Room 1600
Richland, Washington

Meeting Held September 27, 1995
From 8:00 to 9:00 a.m.

Agenda

1. Approval of Past UMM Minutes
2. Status Action Items
3. Status Closure Activities
 - Revision
 - Data Evaluation
4. New Business
 - Open Discussion
5. Set Next Meeting Date

Attachment 2

Unit Managers' Meeting
200 West Area Ash Pit Demolition Site Closure Plan
2440 Stevens Center Place, Room 1600
Richland, Washington

Meeting Held September 27, 1995
From 8:00 to 9:00 a.m.

Summary of Discussion and Commitments/Agreements

1. Approval of Past UMM Minutes

August 15, 1995, Unit Managers' Meeting Minutes was reviewed and signed by the Unit Managers.

2. Status Action Items:

-No Action Items

3. Status Closure Activities:

-Status Data Evaluation Report

WHC (D. M. Korematsu-Olund) handed Ecology a draft copy of the 200 West Area Ash Pit Demolition Site (Ash Pit) data evaluation report (see Attachment 5). WHC (D. M. Korematsu-Olund) stated that it is anticipated that the final copy of the evaluation report will be transmitted to Ecology within the next two weeks.

Note: All attendees have received a final copy of Ash Pit Data Evaluation Report, therefore those attending this meeting will not receive an Attachment 5.

-PE certification

WHC (F. A. Ruck) stated that Closure Certification for the 218 E-8 Borrow Pit Demolition Site, Ash Pit and the Hanford Patrol Academy Demolition Site, has been transmitted to Ecology on September 22, 1995. RL (E. M. Mattlin) stated that RL would need an official letter back from Ecology stated that they have accepted the closure certifications. Ecology (F. Ma) stated that a response would be forthcoming and that Ecology would also notify EPA to amend their database, recording the status of the units as closed.

4. New business:

-Open discussion
No new business.

5. Set new meeting date:

Last official Unit Managers' Meeting for Ash Pit. No future meetings are scheduled.

Attachment 4

Unit Managers' Meeting
200 West Area Ash Pit Demolition Site Closure Plan
2440 Stevens Center Place, Room 1600
Richland, Washington

Meeting Held September 27, 1995
From 8:00 to 9:00 a.m.

Action Items

Action Item #

Description

9-27-95:1

No Action Items

Attachment 5

Unit Managers' Meeting
200 West Area Ash Pit Demolition Site Closure Plan
2440 Stevens Center Place, Room 1600
Richland, Washington

Meeting Held September 27, 1995
From 8:00 to 9:00 a.m.

Draft Data Evaluation Report
for
200 West Area Ash Pit Demolition Site Clean Closure

Data Evaluation Report for 200 West Area Ash Pit Demolition Site Clean Closure

DRAFT

Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management



Westinghouse
Hanford Company Richland, Washington

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

Approved for Public Release

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) RCRA Unit Closures	4. Related EDT No.: NA
5. Proj./Prog./Dept./Div.: 01821	6. Cog. Engr.: D. M. Korematsu-Olund	7. Purchase Order No.: NA
8. Originator Remarks: This report summarizes the sampling activities and the analytical results obtained during soil characterization at the 200 West Area Ash Pit Demolition Site.		9. Equip./Component No.: NA
11. Receiver Remarks:		10. System/Bldg./Facility: NA
		12. Major Assm. Dwg. No.: NA
		13. Permit/Permit Application No.: NA
		14. Required Response Date: NA

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-EN-TI-305	0/1	0	Data Evaluation Report for 200 West Area Ash Pit Demolition Site Clean Closure	NA	2	1	

16. KEY					
Approval Designator (F)		Reason for Transmittal (G)		Disposition (H) & (I)	
E, S, O, D or N/A (see WHC-CM-3-5, Sec. 12.7)		1. Approval	4. Review	1. Approved	4. Reviewed no/comment
		2. Release	5. Post-Review	2. Approved w/comment	5. Reviewed w/comment
		3. Information	6. Dist. (Receipt Acknow. Required)	3. Disapproved w/comment	6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G)	(H)	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1	Cog. Eng. D.M. Korematsu-Olund	<i>D.M. Korematsu-Olund</i>	10/2/95	H6-23	06TI (2)			A3-36	3	
1	1	Cog. Mgr. F.A. Ruck III	<i>F.A. Ruck III</i>	10/2/95	H6-23	Central Files			A3-98 ±B-04	3	
		QA									
		Safety									
		Env.									

18. D.M. Korematsu-Olund <i>D.M. Korematsu-Olund</i> Signature of EDT Originator	19. D.M. Korematsu-Olund <i>D.M. Korematsu-Olund</i> Authorized Representative for Receiving Organization	20. F.A. Ruck III <i>F.A. Ruck III</i> Cognizant Manager	21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
--	---	--	---

RELEASE AUTHORIZATION

Document Number: WHC-SD-EN-TI-305, Rev. 0

Document Title: Data Evaluation Report for 200 West Area Ash Pit
Demolition Site Clean Closure

Release Date: October 2, 1995

This document was reviewed following the
procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:



T.L. Ontiveros

October 2, 1995

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SUPPORTING DOCUMENT

1. Total Pages ³⁶ 26²

2. Title

Data Evaluation Report for 200 West Area Ash Pit Demolition Site Clean Closure.

3. Number

WHC-SD-EN-TI-305

4. Rev No.

0

5. Key Words

Data Evaluation, 200 West Area Ash Pit, Demolition Site, RCRA Closure

6. Author

Name: D. M. Korematsu-Olund

D.M. Korematsu-Olund
Signature

Organization/Charge code 01821/A5GG1

7. Abstract

This report summarizes the sampling activities undertaken and the analytical results obtained in a soil sampling and analyses study performed for the 200 West Area Ash Pit Demolition Site (Ash Pit Demolition Site). The Ash Pit Demolition Site is identified as a Resource Conservation and Recovery Act (RCRA) treatment unit that will be closed in accordance with the applicable laws and regulations.

No constituents of concern were found in concentrations indicting contamination of the soil by Ash Pit Demolition Site activities.

8. RELEASE STAMP

OFFICIAL RELEASE
BY WHC
DATE 10/2/95
Sta. 37 38

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1 DATA EVALUATION REPORT FOR 200 WEST AREA ASH PIT
2 DEMOLITION SITE CLEAN CLOSURE
3
4

5 1.0 INTRODUCTION
6
7

8 1.1 PURPOSE AND SCOPE
9

10 The purpose of this report is to describe the soil sampling performed at
11 the 200 West Area Ash Pit Demolition Site (Ash Pit Demolition Site), to
12 present the analytical results of these verification samples, and to compare
13 the results to clean closure criteria.
14

15 The scope of this report is the evaluation of the analyte concentrations
16 for the eleven soil samples that represent the unit soils. This report does
17 not describe analytical methodology, nor does it provide raw analytical data
18 or the sampling validation report. A description of the sampling plan is
19 presented in the *200 West Ash Pit Demolition Site Closure Plan* (DOE-RL 1994a).
20 The sampling plan was discussed and agreed to by all parties during the Data
21 Quality Objectives (DQO) meeting held May 24, 1994. All analytical data were
22 validated according to *Data Validation Procedures for Chemical Analysis*
23 (WHC 1993). The laboratory data package and data validation report have been
24 transmitted to the Washington State Department of Ecology (Ecology), which is
25 the regulatory lead for closure of this unit (DOE-RL 1994c).
26

27 The Ash Pit Demolition Site is a *Resource Conservation and Recovery Act*
28 *of 1976* (RCRA) treatment unit located in the 200 West Area of the Hanford
29 Site. Two demolition events occurred at the Ash Pit Demolition Site:
30 the first in November 1984 and the second in June 1986. These demolition
31 events are considered a form of thermal treatment for discarded explosive
32 chemical products. Because it will no longer be used for this thermal
33 treatment, the unit is being closed. Soil sampling, for the purpose of clean
34 closure of the Ash Pit Demolition Site, occurred in July 1994 in accordance
35 with the Ash Pit Demolition Site Closure Plan, Revision I (DOE-RL 1994a).
36
37

38 1.2 SUMMARY OF RESULTS
39

40 To meet the criteria for clean closure of the Ash Pit Demolition Site,
41 analytical results must verify that the concentrations of all detonation
42 activity residues are at or below action levels. Action levels are defined as
43 levels above the Hanford Site soil background threshold levels identified in
44 *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*
45 (DOE-RL 1994b) and/or the "Model Toxics Control Act (MTCA) Cleanup Regulation"
46 (*Washington Administrative Code* [WAC] 173-340) Method B residential levels.
47 No constituents of concern were found in concentrations indicating
48 contamination of the soil at the Ash Pit Demolition Site (i.e., concentrations
49 above action levels).
50

51 Regulator acceptance of the findings presented in this report will
52 qualify the treatment unit for clean closure in accordance with
53 WAC 173-303-610, "Dangerous Waste Regulations," without further sampling, soil
54 removal, and/or decontamination.
55

1 1.3 TREATMENT UNIT INFORMATION

2
3 The Ash Pit Demolition Site closure area is located in the eastern
4 portion of the 200 West Area, as shown in Figure 1. The closure area occupies
5 an area 20 feet (6 meters) by 20 feet (6 meters) square. It is located within
6 a multi-use borrow pit area, as shown in Figure 2. The entire multi-use
7 borrow pit area is approximately 600 feet (180 meters) by 800 feet
8 (244 meters) in size with a gravelly, sparsely vegetated landscape.
9

10 There were only two demolition activities at the Ash Pit Demolition Site:
11 November 1984 and June 1986. Discarded explosive chemical products
12 (DOE-RL 1994a) were placed in a shallow depression, 6 to 12 inches (15 to
13 30 centimeters) deep, which was dug expressly for the demolition activity.
14 The discarded explosive chemical products were detonated in their original
15 metal and glass containers. Conventional explosives (i.e., nitroglycerin,
16 dynamite, and detonating cord) were placed around and on top of the chemical
17 containers. After the detonation event, the area was inspected to confirm
18 that no intact chemicals or containers remained.
19

20 21 22 2.0 SAMPLING

23
24
25 Soil sampling was performed on July 12, 1994. Sampling activities were
26 performed as specified in the sampling and analysis plan (SAP) provided in the
27 Ash Pit Demolition Site closure plan (DOE-RL 1994a). Eleven samples were
28 collected (10 samples and 1 collocated duplicate). Two blank samples were
29 included during sampling: a trip blank and an equipment blank. The trip
30 blank is used to test for contamination due to sample handling. The equipment
31 blank is used to determine whether decontamination of sampling equipment is
32 adequate.
33

34 35 2.1 SAMPLE LOCATIONS

36
37 The sample locations and the intervals are shown in Figure 3. The eleven
38 soil samples were taken within a 7.5-foot (2.3-meter) radius centered around
39 the blasting pit. Before sampling, the blasting pit was reconstructed by
40 removing wind-blown sand to create a 2-foot (61-centimeter) deep, 3-foot
41 (91-centimeter) diameter hole (original diameter 1.5 feet [46 centimeters]).
42 Sample intervals within the reconstructed crater (Figure 3, shaded area) were
43 based on the configuration of the reconstructed crater. All eleven sample
44 locations were authoritatively selected to ensure comprehensive coverage in
45 the inner radius of the pit and to account for the effects of prevailing wind
46 patterns on the pit. The collocated duplicate sample was taken at the center
47 of the crater at an interval of 0 to 6 inches (0 to 15 centimeters).
48

49 2.2 SAMPLE COLLECTION

50
51 The eleven samples required by the closure plan were assigned Hanford
52 Environmental Information System (HEIS [WHC 1990]) numbers BOCBNO, BOCBM9,
53 and BOC950 through BOC960 (Figure 3). The trip blank sample was
54 numbered BOCBNO and the equipment blank sample was numbered BOCBM9.
55

1 Engineering support personnel used hand tools (i.e., stainless steel
2 spoon and bowl) to obtain the soil samples in accordance with information
3 provided in Figure 3. Sampling depth ranged from 0 to 18 inches (0 to
4 46 centimeters). Samples were collected for offsite laboratory analyses
5 per SW-846 as requested on the Sample Analysis Form 94-329 (Figure 4).
6 The sampling equipment was decontaminated in the 1706 KE Laboratory in
7 accordance with Environmental Investigation Instruction 5.5, "Laboratory
8 Cleaning of RCRA/CERCLA Sampling Equipment" (WHC 1988). A complete set of
9 decontaminated equipment was provided for each sample. All sampling equipment
10 was later returned to the 1706 KE Laboratory for decontamination.
11

12 Because samples going offsite are required to show a certificate of
13 nondangerous radioactivity, additional aliquots were taken for total activity
14 readings. These aliquots were transported to the 222-S Laboratory on the
15 following day, July 13, 1994. The evaluation of the total activity results
16 allowed release of the samples for offsite transfer on July 14, 1994. All
17 samples were packaged, handled, and shipped in accordance with Westinghouse
18 Hanford Company (WHC) Environmental Investigations Instructions (WHC 1988).
19 All samples were cooled to 4 °Celsius during storage and transported to the
20 offsite laboratory. Samples are listed in Table 1.
21
22

23 2.3 QUALITY CONTROL SAMPLES 24

25 Figure 3 summarizes sample identification, location, and quality control
26 (QC) designation.
27

28 Sample Number BOC952, and a collocated duplicate (BOC953), were taken
29 from the center of the crater at an interval of 0 to 6 inches (0 to
30 15 centimeters). Duplicate samples are collected as close as possible to the
31 same point in space and time; however, they are stored in separate containers
32 and analyzed independently. Duplicate samples are used to estimate the
33 precision of the sampling process.
34

35 Trip blanks are used when samples are taken for volatile organics
36 analysis (VOA). The trip blank for this study consisted of clean sand that
37 was placed in a sample bottle in an uncontaminated area. The trip blank was
38 subjected to the same handling as the routine samples and was analyzed to
39 determine if contamination originated from the sample container or
40 transportation and storage procedures. The trip blank was submitted to the
41 analytical laboratory with the routine samples.
42

43 Equipment blanks consist of clean sand poured over or through the
44 sampling device after decontamination; these blanks are collected in a sample
45 bottle and transported to the laboratory for analysis. Equipment blanks test
46 for residual contamination from inadequate decontamination of the sampling
47 equipment at the 1706 KE Facility. One equipment blank was collected after
48 the sampling event was completed.
49
50
51

3.0 PERFORMANCE STANDARDS

The performance standards, or action levels, for soils are defined in the *200 West Area Ash Pit Demolition Site Closure Plan* (DOE-RL 1994a), Chapter 6, Section 6.1. To meet action levels for clean closure, analytical results must verify that potentially dangerous waste constituents treated at the unit are not present in concentrations above these levels. Action levels are defined as levels above the Hanford Site soil background threshold levels identified in *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes* (DOE-RL 1994b) and MTCA (WAC 173-340) Method B levels. If analyses determine that concentrations are above both guidelines, a phase two investigation would be developed. Additional information on the Hanford Site Background threshold levels is provided in Section 3.1 and is listed in Tables 2 and 3. Information on MTCA Method B health-based levels is provided in Section 3.2 and calculations are described in MTCA, Method B (WAC 173-340-740[3][a][iii]). In this report, the analytical results have been evaluated and compared with the action levels to verify that the concentration of all detonation activity residues is at or below action levels.

3.1 BACKGROUND LEVELS

The background action levels used in this report are based on a sitewide approach to determining background levels and were developed as an alternative to local unit-based background determinations at the Hanford Site (DOE-RL 1994b). Using local background for each RCRA treatment, storage, and/or disposal unit can lead to different definitions of contamination and different assessments of remediation goals and risk for various RCRA units. The Hanford Site Background approach is based on the premise that: (1) the waste management units are located on or in a common sequence of vadose zone sediments, and (2) the basic characteristics that control the chemical composition of these sediments are similar throughout the Hanford Site. The range of natural soil compositions is used to establish a single set of soil background data. Use of the Hanford Site Background for environmental restoration at the Hanford Site is technically preferable to the use of the unit-based background because the former more accurately represents the natural variability in soil composition and also provides a more consistent and efficient basis for evaluating contamination in soils.

The Hanford Site Background threshold levels are summarized in Tables 2 and 3. The background threshold is the concentration level defining the upper limit of the background population. Background thresholds are based on a tolerance interval approach. The calculated threshold levels depend on the confidence interval and percentile used in the calculation. The WAC 173-340-708(11)(d) specifies a tolerance coefficient of 95 percent and a coverage of 95 percent. The Hanford Site Background threshold levels are based on this 95/95 confidence interval. Statistical calculations are described in the source document (DOE-RL 1994b).

3.2 HEALTH-BASED LEVELS

The health-based action levels used in this report are based on calculations from the equations, risk levels, and exposure assumptions found

1 in the MTCA Method B. For noncarcinogens, the principal variable is the
2 reference dose. The reference dose, as defined in the Environmental
3 Protection Agency's (EPA) *Integrated Risk Information System* (IRIS) database
4 (EPA 1995), is an estimate of a daily exposure to the human population that
5 likely is to be without an appreciable risk of deleterious effects during a
6 lifetime. For carcinogens, the cancer slope factor is the basis for
7 determining human health effects; it is a measurement of the risk per unit
8 dose. The reference dose and the cancer slope factor are chemical-specific
9 and are obtained from IRIS. If not available in IRIS, secondary sources for
10 these toxicity values include the Ecology Cleanup Levels and Risk Calculation
11 database (Ecology 1995) and EPA Health Effects Assessment Summary Tables
12 (EPA 1994).

16 4.0 LABORATORY ANALYSES

19 All samples were sent to IT-Quanterra Laboratory in Knoxville, Tennessee,
20 for analysis. All samples were submitted for VOAs, semi-VOAs, detonation
21 residues, ICP metals, anions, and total nitrogen (Figure 4).

23 Table 1 lists the analytical methods for Ash Pit Demolition Site soils.
24 Each analyte group, except nitroexplosives and VOAs, has a concentration
25 comparison table that lists and identifies chemical concentrations
26 (see Tables 2, 3, and 4). All known nitroexplosives data were reported as
27 undetected. All volatile organic compounds (VOC) were reported as undetected
28 except for the equipment blank (BOCBM9) in which only trichloroethene, at
29 2 parts per billion, was estimated. No further evaluation will be presented
30 for these undetected analytes.

32 All analytical data were validated according to *Data Validation*
33 *Procedures for Chemical Analysis* (WHC 1993) (refer to Section 5.0).

36 4.1 ORGANIC ANALYSES

38 Samples were submitted for VOA and semi-VOA, including standard target
39 analytes and Appendix IX compounds, using gas chromatography/mass spectroscopy
40 (GS/MS), which is based on EPA SW-846 Methods 8240 and 8270. Any unidentified
41 compounds were subjected to a computer-generated library search and mass
42 spectral interpretation. Those unidentified analytes that generally correlate
43 with known compound spectra are listed as tentatively identified compounds
44 (TIC). The VOA was performed using purge and trap with capillary column
45 GC/MS. Matrix spike and matrix duplicate samples were analyzed for
46 Sample BOC950 and met all method-specified QC limits.

48 The semi-VOA was performed by direct injection of sample extract on a
49 capillary column GC/MS. The samples did not contain any Appendix IX
50 compounds. A matrix spike and a matrix spike duplicate were analyzed for
51 Sample BOC950. The matrix spike and matrix spike duplicate passed all QC
52 criteria with the exception of 2,4-dinitrotoluene in the matrix spike
53 duplicate, which was one percentage point above the criterion. However, the
54 laboratory control sample did meet all QC criteria. Because two of the QC

1 criteria were met and the third was only one percentage point above the
2 criterion, this discrepancy is not considered significant enough to have
3 effected the usefulness of the analytical data.

4 5 6 4.2 INORGANIC ANALYSES 7

8 Samples were analyzed for the following anions: fluoride, chloride,
9 phosphate, sulfate, nitrate, and nitrite. The EPA Method 300 (EPA 1993) was
10 used to determine the fluoride, chloride, phosphate, and sulfate
11 concentrations. The EPA Method 353.2 (EPA 1993) was used to determine the
12 nitrate/nitrite concentrations. It should be noted that EPA Method 300
13 reports values for nitrate and nitrite and these are included in the
14 validation data package (DOE-RL 1994c). However, for the purpose of this
15 report and as agreed to during the DQO process, only the results from
16 Method 353.2 will be evaluated in the report.

17
18 Metals were analyzed using cold vapor atomic absorption (CVAA)
19 spectroscopy for mercury; graphite furnace atomic absorption (GFAA)
20 spectroscopy for arsenic, lead, selenium, and thallium; and for the remaining
21 metals, inductively coupled plasma (ICP) spectroscopy. All QC was acceptable.
22 A matrix spike and a matrix spike duplicate were prepared for Sample
23 Number BOC950. Spike recovery was within acceptance limits for all parameters
24 except antimony, arsenic, copper, manganese and zinc. Poor spike recovery for
25 these analytes was attributed to sample nonhomogeneity and matrix
26 interference. Duplicate relative percent difference (RPD) (i.e., precision)
27 results were within acceptance limits for all parameters except for chromium,
28 zinc, and titanium, which exhibited slight variations due to sample
29 nonhomogeneity.

30 31 32 33 5.0 DATA VALIDATION 34 35

36 Data validation was performed by Golder Associates Inc., in accordance
37 with Level D as defined in *Data Validation Procedures for Chemical Analysis*
38 (WHC 1993). Level D validation includes evaluation and qualification of
39 results based on analytical holding times, method blank results, matrix spikes
40 and matrix spike duplicates, surrogate recoveries, and analytical method
41 blanks.

42
43 The criteria and limits for the validation procedures are listed in the
44 source document. Results of the data validators' review of the QC applied in
45 this sampling event were transmitted to the regulators with the validated data
46 packages (DOE-RL 1994c).

47
48 The data validation procedure establishes the following qualifiers and
49 definitions to describe the associated data:

- 50
51 U Indicates the compound or analyte was analyzed for and not detected
52 in the sample.
53

- 1 UJ Indicates the compound or analyte was analyzed for and not detected
 2 in the sample. Because of a QC deficiency identified during data
 3 validation, the associated quantitation limit is an estimate. These
 4 data are useable for decision-making purposes.
 5
- 6 J Indicates the compound or analyte was analyzed for and detected.
 7 The associated concentration is an estimate but is usable for
 8 decision-making purposes.
 9
- 10 JN Indicates a TIC that has been determined to be valid in terms of
 11 identification and quantitation.
 12
- 13 UR Indicates the compound or analyte was analyzed for and not detected
 14 in the sample. As a result of a major QC deficiency identified
 15 during data validation, the associated data have been qualified as
 16 unusable for decision-making purposes.
 17
- 18 R Indicates the compound or analyte was analyzed for and detected.
 19 As a result of a major QC deficiency identified during data
 20 validation, the concentration reported has been qualified as
 21 unusable. The associated data should be considered unusable for
 22 decision-making purposes.
 23
- 24 DJ Indicates the compound or analyte was analyzed at a secondary
 25 dilution factor, value estimated.
 26
- 27 B For organic data, indicates that the analyte was detected in both
 28 the sample and the associated blank. For inorganic data, indicates
 29 that the analyte concentration is less than the contract required
 30 detection limit, but greater than the instrument detection limit.
 31
- 32 BJ For organic data, indicates that the analyte was detected in both
 33 the sample and the associated blank. Because of a QC deficiency
 34 identified during data validation, the associated data have been
 35 qualified as estimated. For inorganic data, indicates that
 36 constituent was analyzed for and detected at a concentration less
 37 than the contract required detection limit but greater than the
 38 instrument detection limit. Because of a QC deficiency identified
 39 during data validation, the associated data have been qualified as
 40 estimated.
 41

42 TICs are reported for guidance only and are deemed as estimated and
 43 presumptive (WHC 1993). The true identity of the compound may be different
 44 than the tentative identity reported.
 45

46 Some discrepancies were noted in the validation of the laboratory data
 47 resulting in some of the data being qualified. The qualifiers are listed in
 48 Tables 2, 3, and 4.
 49

50 Holding times were exceeded for several samples as noted below. However,
 51 this is a result of applying holding times established for water samples to
 52 soil samples.
 53

1 The following qualifiers were applied to the data as described and
 2 required in the data validation guidelines (WHC 1993):
 3

- 4 • For the VOA, methylene chloride, acetone, and toluene were detected
 5 in the laboratory blank. This resulted in some data being qualified
 6 as nondetect (U). Also, the holding times for Samples BOC950,
 7 BOC951, BOC954, BOC957, and BOC958 were exceeded by two days and
 8 qualified as estimated (J) or undetected (UJ).
 9
- 10 • For semi-VOA, the spike recovery of 2,4-dinitrotoluene was below the
 11 control limit and the affected results were qualified as estimated
 12 (J) or undetected (UJ).
 13
- 14 • For anions, the holding times for some phosphate results were
 15 exceeded and the affected results were qualified as estimated (J) or
 16 rejected (R).
 17
- 18 • For nitrate/nitrite, the matrix spike recovery was below the control
 19 limit and the affected results were qualified as estimated (J).
 20
- 21 • For metals, the matrix spike recoveries for antimony, arsenic,
 22 copper, manganese and zinc were below the control limit and the
 23 affected results were qualified as estimated (BJ)/(J) or
 24 undetected (UJ).
 25
- 26 • Copper was reported in the laboratory blank at negative
 27 concentrations. This resulted in some data being qualified as
 28 estimated (J) or nondetect (UJ).
 29
- 30 • Aluminum, arsenic, calcium, and zinc were reported in the laboratory
 31 blank for the equipment blank (BOCBM9). This resulted in some data
 32 for this sample being qualified as nondetect (U).
 33
- 34 • For copper, the ICP serial dilution exceeded 10 percent. This
 35 resulted in all data being qualified as estimated (J).
 36
- 37 • For selenium, the matrix spike recovery was below the control limit
 38 and the affected results were qualified as undetected (UJ).
 39
- 40 • The method of standard additions (MSA) was required for arsenic
 41 analysis of Samples BOC952 and BOC953 but was not performed;
 42 therefore, associated results were qualified as estimated (J).
 43
- 44 • The correlation coefficient of the lead MSA analysis for
 45 Samples BOC954 and BOC957 was below the control limit; therefore,
 46 associated results were qualified as estimated (J).
 47

48 Additional information on the above noted laboratory discrepancies can be
 49 found in the data validation packages (DOE-RL 1994c).
 50
 51
 52

6.0 DATA EVALUATION

1
2
3
4 The closure plan proposed comparing concentrations of constituents of
5 concern to health-based action levels. For a given constituent, analytical
6 results below the detection limit are not considered to signify contamination.
7 Therefore, the samples are considered clean with respect to that analyte.
8 The health-based action levels are based on MTCA Method B or Hanford Site
9 Background threshold levels for soil, whichever is less stringent. For a
10 given constituent, analytical results at or below the health-based levels will
11 be considered clean with respect to that analyte. Any analyte found in
12 concentrations greater than the health-based level will require further
13 evaluation.
14

6.1 ORGANICS

15
16
17
18 No VOCs were reported in the analytical sample results for unit soils.
19 However, in the equipment blank (BOCBM9), results were nondetect for all
20 components except trichloroethene at 2.00 parts per billion. There will be no
21 further discussion on VOC, because the VOC was found in the equipment blank
22 only; all site sample results showed no VOC present.
23

24 For the semi-VOA, all results were below action levels except for one
25 sample (BOC954). This one sample was high in Polynuclear Aromatic
26 Hydrocarbons (PAHs) concentration and was the only sample to register high
27 PAHs. A second DQO meeting was convened to discuss the results of this
28 sample. The results of this DQO and the subsequent resampling and analysis
29 are discussed in Chapter 7.0 of this report. The conclusion of these
30 additional activities has determined that Sample BOC954 to be anomalous.
31 Therefore, the results of this sample are being dismissed from determination
32 of contamination.
33

34 As discussed below for the semi-VOA, all compounds were either below the
35 health-based action levels or have been identified as common laboratory
36 contaminants.
37

38 Phthalate compounds were identified in all soil samples but not in the
39 equipment blank. According to data validation guidelines, these are common
40 laboratory contaminants when detected in concentrations less than 4,000 parts
41 per billion in soil samples. Because all values were below this limit, all
42 phthalate compounds are being dismissed as attributable to laboratory
43 contamination.
44

45 There are no Hanford Site Background threshold levels, MTCA, Method B
46 levels, or practical quantitative limits (PQL) for TICs found in these
47 samples. TICs are a qualitative measure of whether or not a compound is
48 detected; the result is estimated. The true identity of the compound may be
49 different than what is reported. The TICs found in this study are not
50 EPA-listed hazardous substances (40 CFR 261) nor are they WAC dangerous waste
51 constituents having a waste designation level (WAC 173-303). No toxicity
52 (oral reference dose) information or carcinogenicity (cancer potency factor)
53 information is available from the EPA. Because the TICs have no established

1 action levels or relationship to dangerous waste regulations and are present
2 at such low concentration levels, the TICs are considered to be of no concern
3 to the closure of the RCRA unit.

4
5 TICs identified as 1,4-dimethyl-cyclohexane, hexadecanoic acid, and
6 2-methoxy-2-propoxy propane were found in the equipment blank in low
7 concentrations and are being attributed to, and dismissed as, contamination.

8
9 In Sample Number BOC951, one TIC was identified as octacosane estimated
10 at 91 parts per billion. Octacosane is a long, single-chain hydrocarbon
11 categorized as a wax bi-product. Because it is not subject to the dangerous
12 waste regulations, it is of no concern.

13
14 A TIC identified as octadecane was detected in Sample Number BOC960
15 estimated at 150 parts per billion. Because it is not subject to the
16 dangerous waste regulations, octadecane is of no concern.

17
18 A TIC identified as naphtho(1,2,3,4-def)chrysene was detected in Sample
19 Number BOC955 estimated at 430 parts per billion. Because it is not subject
20 to the dangerous waste regulations, naphtho(1,2,3,4-def)chrysene is of no
21 concern.

22 23 24 6.2 INORGANICS

25
26 No nitroexplosives compounds were detected in the soil sample.

27
28 The anion analyses are summarized in Table 3. Phosphate and nitrate-
29 nitrite results that were qualified with a 'J' indicate that the data are
30 estimated but considered usable for decision-making purposes. Anion analyses
31 reported above the laboratory instrumentation detection limits were compared
32 to MTCA, Method B, and/or Hanford Site Background threshold levels
33 (DOE-RL 1994b). Fluoride, chloride, phosphate, sulfate, and nitrite-nitrate
34 concentrations were all found to be below action levels indicating no
35 contamination present in unit soils. Note that chloride, sulfate, and
36 nitrate-nitrite were detected in the equipment blank indicating that the
37 likely source was from the sampling equipment.

38
39 The inorganic data for metals are summarized in Table 4. Some analytical
40 data were qualified with a 'J' indicating that the data are estimated but
41 considered usable for decision-making purposes. Some sample analytes were
42 detected in the equipment blank which indicates that the source was from the
43 sampling equipment (see Table 4). Metals analyses reported above the
44 laboratory instrumentation detection limits were compared to MTCA, Method B
45 and/or Hanford Site Background threshold levels (DOE-RL 1994b). All
46 constituents in unit soils were below action levels indicating no
47 contamination present.

7.0 PHASE II RESAMPLING AND REANALYSIS

The closure plan states that any analyte found in concentrations greater than the health-based level will require further evaluation. As a consequence of finding one sample with a high PAH concentration, a second DQO meeting was held to discuss details surrounding the sample's analytical results, as well as to determine further possible action. Laboratory documentation stated that during extraction of the original soil subsample taken from Sample BOC954, the extract showed characteristics not shown by any of the other samples; it was a dark, oily residue. Because of the appearance of the extract and the high levels of PAH concentration found in the sample, it was agreed by all parties that the sample should be retested by taking a new subsample from the original sample and reanalyzing it. It was known by all parties that the reanalysis would occur beyond the holding times for semi-VOA. However, because the initially reported concentration of PAHs were so high, it was recognized that if the original PAH results were accurate, then PAH residues would be found during the reanalyses. In addition to having the original sample (BOC954) reanalyzed, a limited amount of resampling of the Ash Pit Demolition Site was agreed to by all parties.

7.1 RESAMPLING AND ANALYSIS

A Phase II investigation involved additional sampling at the Ash Pit Demolition Site and was supported by the U.S. Department of Energy, Richland Operations Office (RL), Ecology, and WHC. As previously noted, this sampling was performed to provide additional information about the Ash Pit Demolition Site because a suspect sample result was found during the Phase I sampling. High concentrations of PAH were reported in a sample from the center of the sampling boundary at a depth of 31 to 46 centimeters (12 to 18 inches).

For the resampling, eight soil samples were taken from specific locations within a 180-centimeter (6-foot) radius circle centered at the blasting pit and two additional remote soil samples were taken randomly outside the sampling boundary (see Figure 5). Ecology took three split samples for separate analyses (see Figure 5). The two remote samples were taken for information only and were not in direct support of this Phase II investigation. Samples collected for chemical analysis were analyzed for semi-VOA using SW-846, Method 8270, at the Environmental Analytical Laboratory (EAL). The objective of the work was to verify that the concentrations of semi-VOA were below action levels. If the sampling analytical results from this activity were below action levels, then the original suspect sample (BOC954) data was an anomaly. Ecology sent their split samples to a separate contract laboratory. Agreement was made to accept either EAL data or Ecology data.

7.2 RESULTS OF THE RESAMPLING AND REANALYSIS

Sample BOC954 data from the Phase I sampling event is listed in Figure 5a. Reanalysis data performed by IT-Quanterra using a subsample from the remaining Sample BOC954 showed that no PAHs were present and no semi-VOC

1 were detected (see Figure 5b). Phase II analytical results from the EAL found
 2 that no PAHs were present and no semi-VOA were detected. The analytical
 3 results from Ecology split samples demonstrated that the location was clean
 4 with respect to RCRA contamination (Ecology et al. 1995).

5
6
7
8 **8.0 CONCLUSIONS**
9

10
11 The sampling and analysis activities identified few analyte
12 concentrations above detection. No volatile organic compounds or
13 nitroexplosives were detected in the soil samples. For analytes for which
14 MTCA, Method B, and Hanford Site Background threshold levels were available,
15 all analytes were below action levels. The units from Sample BOC954 were
16 dismissed as anomalies. Of the semi-VOCs for which no action levels were
17 available, all were TICs. All semi-VOC detections were TICs. These analytes
18 were of no concern to the closure of the unit for any one of the following
19 reasons:

- 20
21 • Low concentrations
22
23 • Attributed to common laboratory contaminants
24
25 • Found in equipment blank
26
27 • Constituents were not hazardous substances or dangerous waste
28 constituents.
29

30 Concentrations of anions and metals are below health-based action levels,
31 indicating no inorganic contamination is present at the Ash Pit Demolition
32 Site.
33

34 In summary, the analytical results for the Ash Pit Demolition Site soils
35 verify that the concentration of all detonation activity residues are below
36 action levels. No constituents of concern were found in concentrations
37 indicating contamination of the soil at the Ash Pit Demolition Site (i.e.,
38 concentrations above action levels). Consequently, under the provisions of
39 WAC 173-303-610, this RCRA unit qualifies for clean closure.

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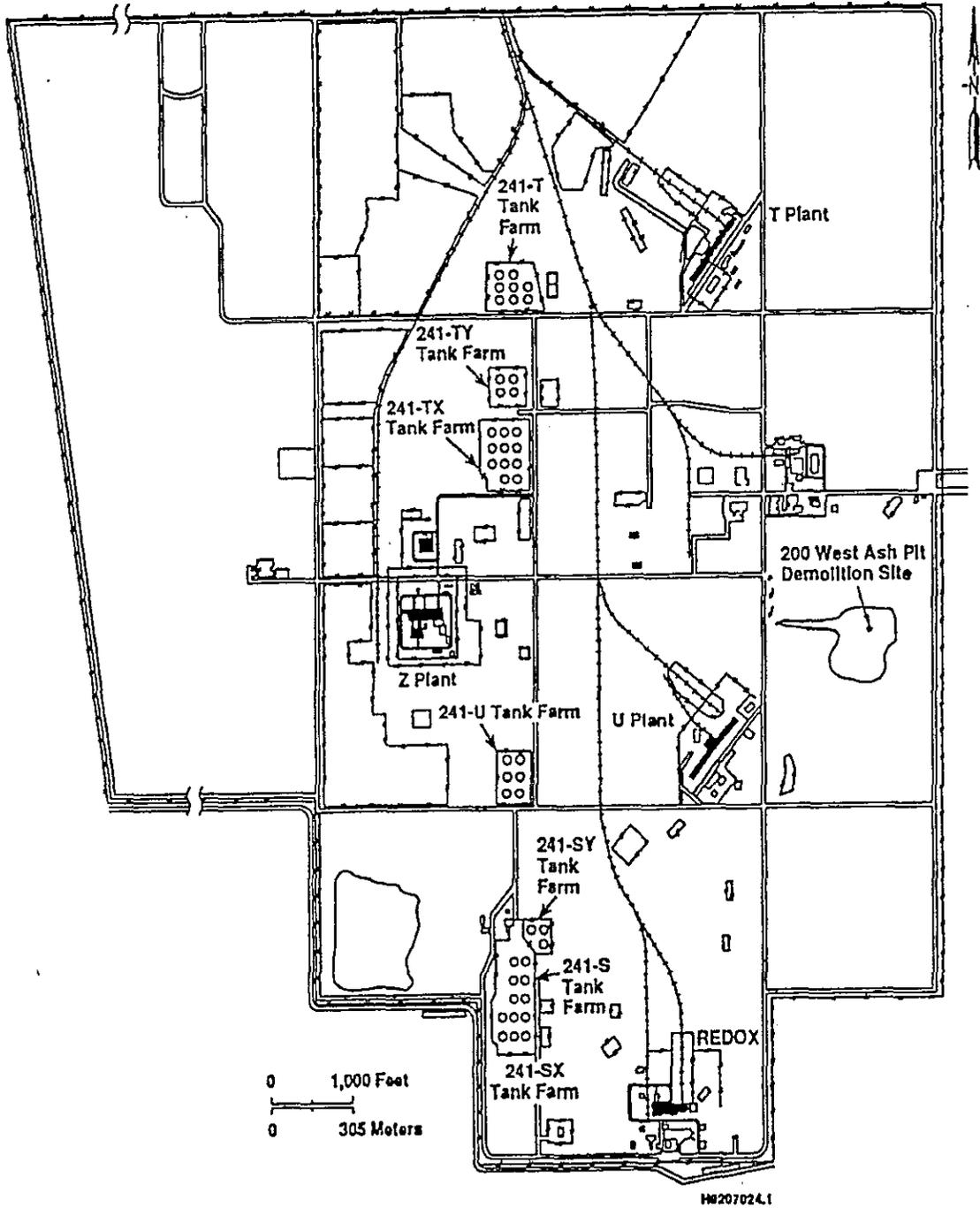
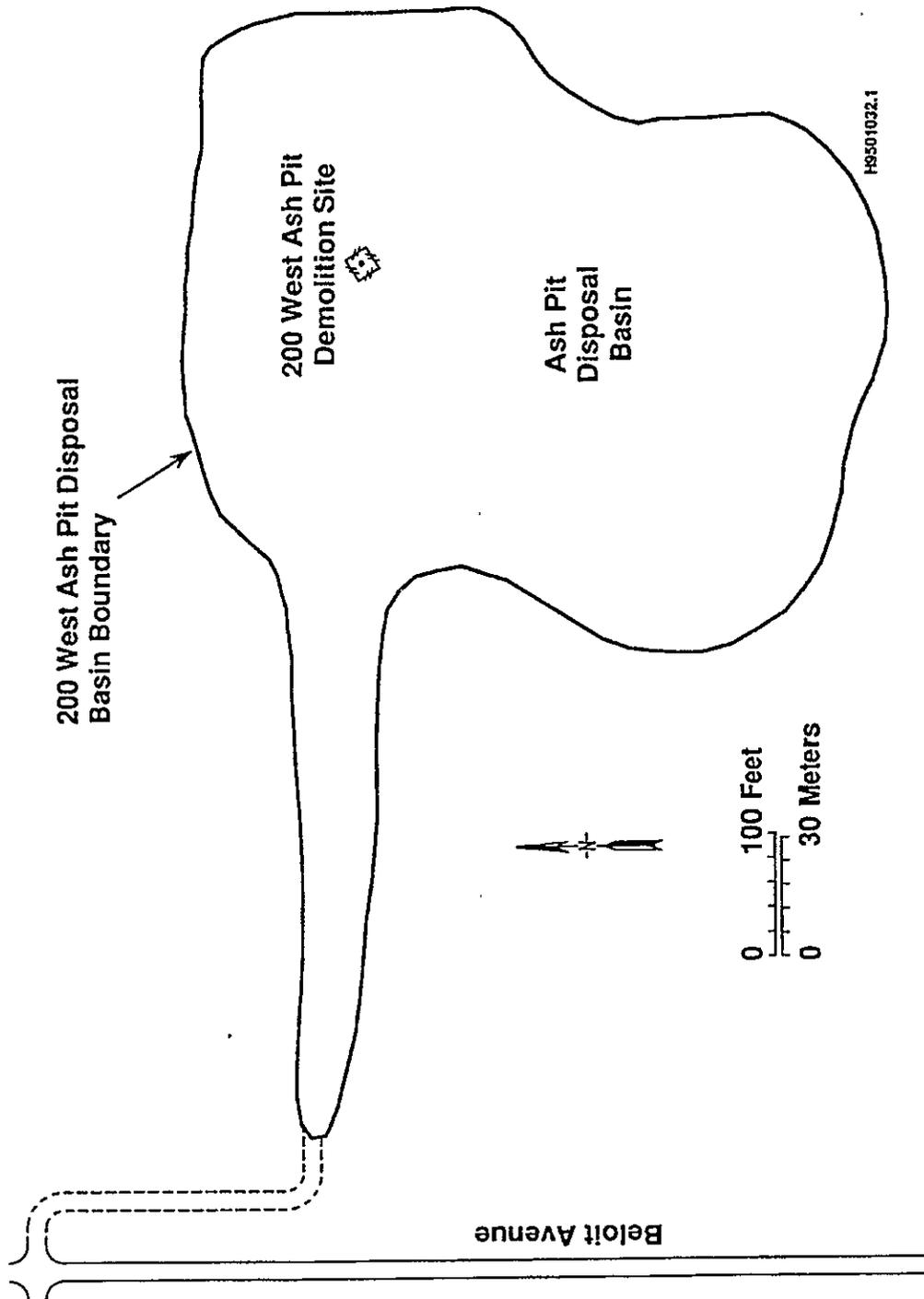


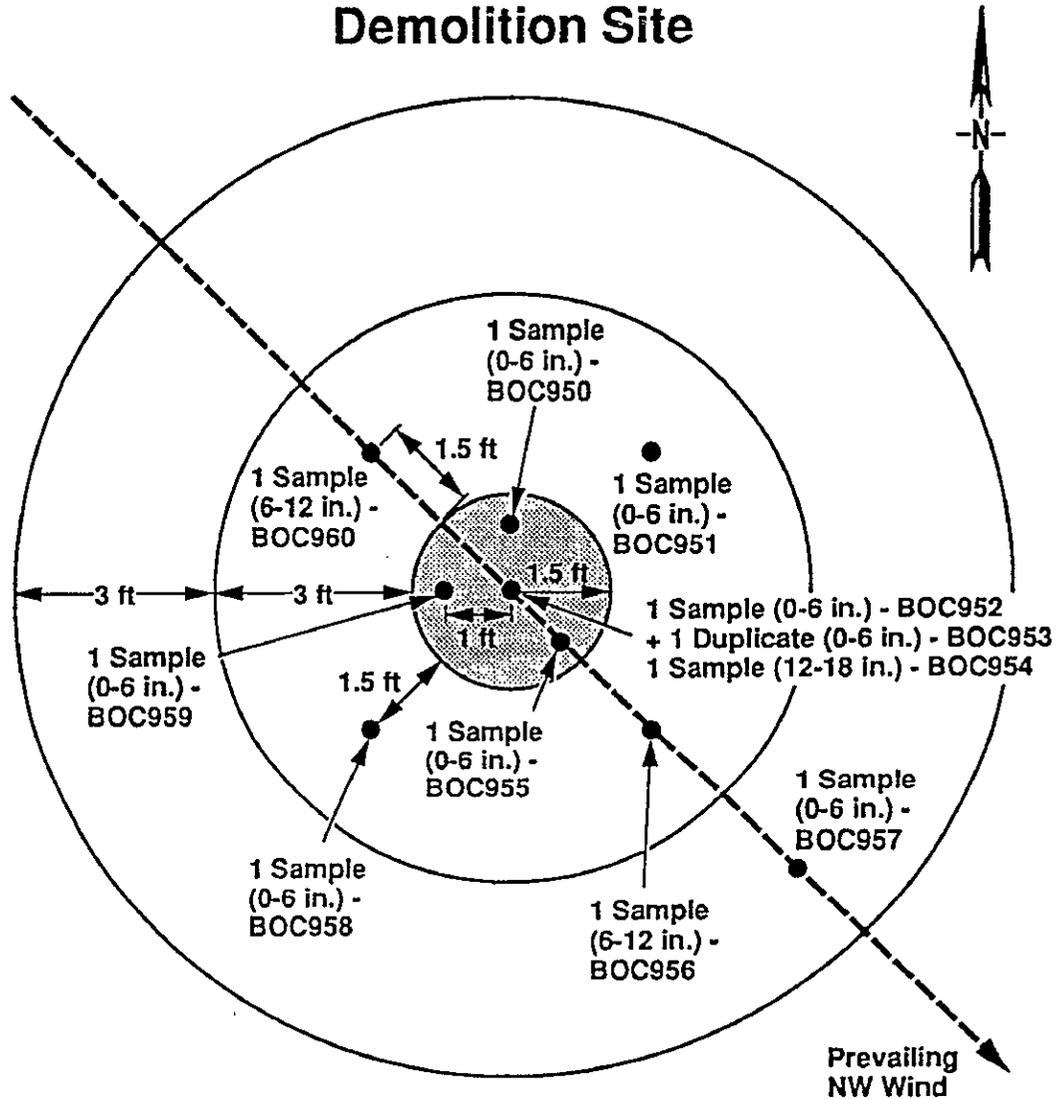
Figure 1. 200 West Area.



1

Figure 2. Layout of Ash Pit Demolition Site Closure Area.

200-West Area Ash Pit Demolition Site



Field QC Samples

- BOC953 - 1 Duplicate (Located at Center 0-6 in.)
- BOCBM9 - 1 Equipment Blank (Clean Silica Sand)
- BOCBN0 - 1 Trip Blank (Clean Silica Sand)



H9405002.1b

1 Figure 3. Ash Pit Demolition Site Closure Area, Sampling Locations,
2 and Sample Intervals.

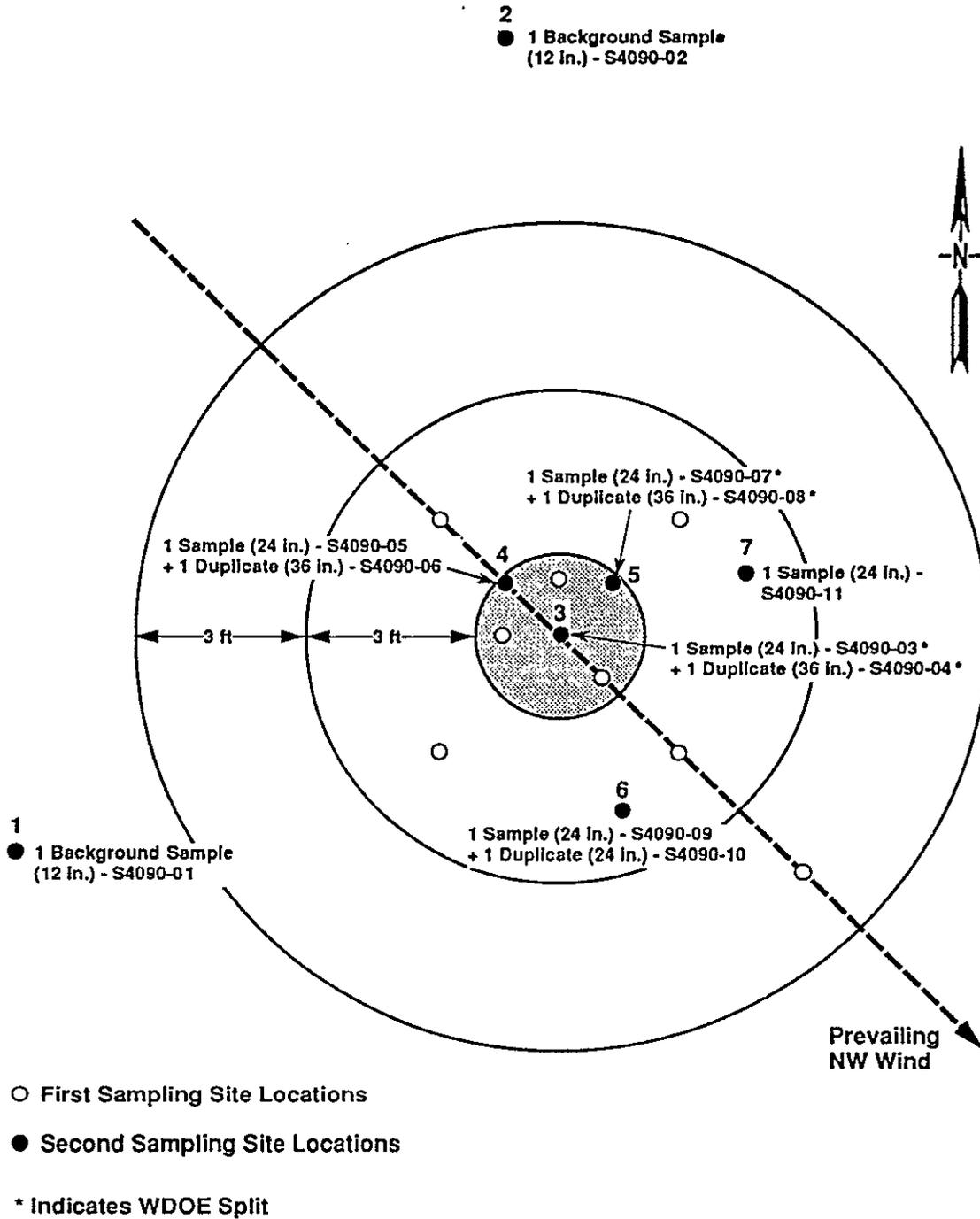
OFFICE OF SAMPLE MANAGEMENT FIELD SAMPLING REQUIREMENTS				94-329 SAF Number
Requirements are for IT				
REV 0				06/27/94
PARAMETER/ ANALYSIS	ANALYTICAL METHODS	CONTAINER ¹ / VOLUME	PRESERVATION	HOLDING TIME
1. VOA	8240 Appendix IX	Gs* 125 mL	Cool 4°C	7 Days
2. Semi-VOA	8270 Appendix IX	aG 125 mL	Cool 4°C	14 Days ³
3. Detonation Residue	8330	aG 125 mL	Cool 4°C	14 Days ³
4. Anions - F, Cl, SO ₄ - PO ₄ , NO ₄ , NO ₃	EPA 300.0	G 125 mL	Cool 4°C	28 Days 48 Hours
5. NO ₂ - NO ₃	EPA 353.1	P/G 125 mL	Cool 4°C	28 Days
6. ICP Metals AA Metals - Arsenic - Lead - Selenium - Mercury	6010 7060 7421 7740 7471	G 125 mL	Cool 4°C	6 Months 6 Months 6 Months 28 Days
7. Activity Scan (IT)	Lab Specific	G/P 40 mL	Cool 4°C	ASAP
8. Rod Screen (222-S)	Lab Specific	G/P small vial (at least 1 g)	None	ASAP

¹ Container Types:

P = Plastic (Polyethylene)
 G = Glass
 Gs = Glass w/septum cap
 GW* = Glass/wide mouth jar
 Gs = Glass w/septum cap--
 No head space in container

PW = Plastic (Polyethylene)/wide mouth jar
 PP = Polypropylene
 aG = Amber Glass
 T = Fluorocarbon Resins
 aGs* = Amber Glass w/septum cap
 aGs = Amber Glass w/septum cap
 No head space in container

² 7 Days for Extraction, 40 Days for Analysis³ 14 Days for Extraction, 40 Days for Analysis



H9509027.1a

1
2

Figure 5. Ash Pit Demolition Site Closure Area, Phase II Resampling Locations.

F5

Table 1. Routine and Quality Control Samples.

Sample number	Constituent Analysis ^a	Analytical Method
BOC950	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 ^b EPA ^c 300.0, 353
BOC951	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOC952	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOC953 Duplicate	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOC954	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOC955	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOC956	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOC957	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOC958	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOC959	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOC960	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOCBM9 Equipment Blank	VOA, Semi-VOA, Detonation residue, ICP Metals, Anions, TN	SW-846:8240, 8270, 8330, 6010 EPA 300.0, 353
BOCBNO Trip Blank	VOA	SW-846:8240

^a = Sample locations and analytical requirements are in Figures 3 and 4.

^b = EPA 1986.

^c = EPA 1993.

TN = nitrate-nitrite.

NOTE: All samples submitted to IT-Quanterra, Knoxville,¹Tenn.

951003.0826

Table 2. Ash Pit Demolition Site, Analytical Results for Soils, Semi-Volatile Organics Compounds.
(sheet 1 of 2)

Sample number	Name of Constituent	CAS ^a	Qualifiers	Concentration mg/kg	MTCA Method B ₂ Cleanup Level ^b mg/kg	Hanford Site Soil Background 95/95 threshold mg/kg	Hanford Site Background Maximum Conc. mg/kg
6	Di-N-Butylphthalate	84-74-2	J	.13	8,000.00	NA	NA
	TIC: Hexadecanoic Acid	57-10-3	JN	1.10	NA		
	2-methoxy-2-propoxy propane	53951-40-4	JN	.14	NA		
7	Di-N-Butylphthalate	84-74-2	J	.057	8,000.00	NA	NA
	Bis(2-ethylhexyl)phthalate	117-81-7	BJ	.051	71.00		
	TIC: 1,4-Dimethyl-Cyclohexane	2207-04-7	JN	.071	NA		
	2,6,-Dimethyl-Heptadecane	54105-67-8	JN	.13	NA		
	Hexadecanoic Acid	57-10-3	JN	.37	NA		
	Octacosane	630-02-4	JN	.091	NA		
8	Di-N-Butylphthalate	84-74-2	J	.53	8,000.00	NA	NA
	Bis(2-ethylhexyl)phthalate	117-81-7	BJ	.04	71.00		
	TIC: 1,4-Dimethyl-Cyclohexane	2207-04-7	JN	.12	NA		
	2-methoxy-2-propoxy propane	53951-40-4	BJN	1.20	NA		
	Octacosane	630-02-4	JN	.068	NA		
9	Di-N-Butylphthalate	84-74-2	J	.12	8,000.00	NA	NA
10	(Duplicate of BOC952)						
	TIC: 1,4-Dimethyl-Cyclohexane	2207-04-7	JN	.12	NA		
	Hexadecanoic Acid	57-10-3	BJN	.11	NA		
	2-methoxy-2-propoxy propane	53951-40-4	JN	1.80	NA		
12	Di-N-Butylphthalate	84-74-2	J	.065	8,000.00	NA	NA
	TIC: 1,4-Dimethyl-Cyclohexane	2207-04-7	JN	.094	NA		
	Naphtho(1,2,3,4-DEF)Chrysene	192-65-4	JN	.43	NA		
	2-methoxy-2-propoxy propane	53951-40-4	JN	.63	NA		
13	Di-N-Butylphthalate	84-74-2	J	.09	8,000.00	NA	NA
	Fluoranthene	206-44-0	J	.042	3,200.00		
	Pyrene	129-00-0	J	.036	2,400.00		
	TIC: 1,4-Dimethyl-Cyclohexane	2207-04-7	JN	.081			
	Hexadecanoic Acid	57-10-3	JN	.071			
14	Di-N-Butylphthalate	84-74-2	J	.034	8,000.00	NA	NA
	TIC: 1,4-Dimethyl-Cyclohexane	2207-04-7	JN	.093	NA		
15	Di-N-Butylphthalate	84-74-2	J	.067	8,000.00	NA	NA
	Bis(2-ethylhexyl)phthalate	117-81-7	BJ	.039	71.00		
	TIC: 1,4-Dimethyl-Cyclohexane	2207-04-7	JN	.074	NA		
	Hexadecanoic Acid	57-10-3	JN	.088	NA		

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Table 3. Ash Pit Demolition Site, Analytical Results for Soil, Anions. (sheet 1 of 2)

Sample number	Name of Constituent	Qualifiers	Concentration mg/kg	HTCA Method B Cleanup Levels ^a mg/kg	Hanford Site Soil Background 95/95 threshold ^b mg/kg	Hanford Site Soil Background Maximum Conc. ^b mg/kg
BOC950	Fluoride Chloride Phosphate Sulfate Nitrate+Nitrite	- - - - J	1.20 0.70 3.60 4.00 0.89	4800.0 NA NA NA 130000+8000=138000	13.00 783.0 12.70 931.0 208.0*	73.30 1480.0 225.0 12600.0 906.0*
BOC951	Fluoride Chloride Phosphate Sulfate Nitrate+Nitrite	- - J - J	0.80 4.90 7.90 21.00 5.20	4800.0 NA NA NA 130000+8000=138000	13.00 783.0 12.70 931.0 208.0*	73.30 1480.0 225.0 12600.0 906.0*
BOC952	Fluoride Chloride Phosphate Sulfate Nitrate+Nitrite	- - J - J	0.80 0.40 2.00 2.20 0.65	4800.0 NA NA NA 130000+8000=138000	13.00 783.0 12.70 931.0 208.0*	73.30 1480.0 225.0 12600.0 906.0*
BOC953 (Duplicate of BOC952)	Fluoride Chloride Phosphate Sulfate Nitrate+Nitrite	- - J - J	0.60 0.60 1.90 2.10 0.84	4800.0 NA NA NA 130000+8000=138000	13.00 783.0 12.70 931.0 208.0*	73.30 1480.0 225.0 12600.0 906.0*
BOC954	Fluoride Chloride Phosphate Sulfate Nitrate+Nitrite	- - J - J	0.80 0.80 3.10 4.50 1.30	4800.0 NA NA NA 130000+8000=138000	13.00 783.0 12.70 931.0 208.0*	73.30 1480.0 225.0 12600.0 906.0*
BOC955	Fluoride Chloride Phosphate Sulfate Nitrate+Nitrite	- - J - J	0.50 0.70 3.90 3.00 1.00	4800.0 NA NA NA 130000+8000=138000	13.00 783.0 12.70 931.0 208.0*	73.30 1480.0 225.0 12600.0 906.0*
BOC956	Fluoride Chloride Phosphate Sulfate Nitrate+Nitrite	- - J - J	0.80 1.00 2.90 4.20 1.10	4800.0 NA NA NA 130000+8000=138000	13.00 783.0 12.70 931.0 208.0*	73.30 1480.0 225.0 12600.0 906.0*
BOC957	Fluoride Chloride Phosphate Sulfate Nitrate+Nitrite	- - J - J	0.50 3.20 2.30 8.60 2.00	4800.0 NA NA NA 130000+8000=138000	13.00 783.0 12.70 931.0 208.0*	73.30 1480.0 225.0 12600.0 906.0*
BOC958	Fluoride Chloride Phosphate Sulfate Nitrate+Nitrite	- - J - J	0.50 0.90 3.10 5.60 2.00	4800.0 NA NA NA 130000+8000=138000	13.00 783.0 12.70 931.0 208.0*	73.30 1480.0 225.0 12600.0 906.0*

Table 3. Ash Pit Demolition Site, Analytical Results for Soil, Anions. (sheet 2 of 2)

Sample number	Name of Constituent	Qualifiers	Concentration mg/kg	MTCA Method B Cleanup Levels ^a mg/kg	Hanford Site Soil Background 95/95 threshold ^b mg/kg	Hanford Site Soil Background Maximum Conc. ^b mg/kg
1 BOC959	Fluoride	-	0.80	4800.0	13.00	73.30
	Phosphate	J	1.30	NA	12.70	225.0
	Sulfate	-	2.00	NA	931.0	12600.0
	Nitrate+Nitrite	J	0.84	130000+8000=138000	208.0*	906.0*
2 BOC960	Fluoride	-	1.70	4800.0	13.00	73.30
	Chloride	-	1.90	NA	783.0	1480.0
	Phosphate	J	4.50	NA	12.70	225.0
	Sulfate	-	20.00	NA	931.0	12600.0
	Nitrate+Nitrite	J	2.00	130000+8000=138000	208.0*	906.0*
3 4 5 BOCBM9 equip blank	Chloride	-	2.40	NA	783.0	1480.0
	Sulfate	-	3.30	NA	931.0	12600.0
	Nitrate+Nitrite	J	1.00	130000+8000=138000	208.0*	906.0*

^a = Calculation found in Model Toxics Control Act (173-340-740).

^b = DOE/RL, 1994b, Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes, DOE/RL-92-24, Rev. 2.

J = Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, by the laboratory because it is below the method detection limit.

mg/kg = milligram/kilogram (parts per million).

* = Nitrate concentration values only.

NA = not available.

Note: MTCA, Method B, use the lowest of the two cleanup levels, cancer or noncancer-based, for implementation in closure plans.

Table 4. Ash Pit Demolition Site, Analytical Results for Soils, Metals. (sheet 1 of 6)

Sample number	Name of Constituent	Qualifiers	Concentration mg/kg	MTCA Method B Cleanup Levels ^a mg/kg	Hanford Site Soil Background 95/95 threshold ^b mg/kg	Hanford Site Soil Background Maximum Conc. ^b mg/kg
BOC950	Aluminum	-	6,890.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	2.10	60.00	9.00	27.70
	Barium	-	81.80	5,600.00	175.00	480.00
	Beryllium	B	.24	400.00	1.80	10.00
	Cadmium	-	1.40	80.00	NC	11.00
	Calcium	-	9,440.00	NA	24,600.00	105,000.02
	Chromium	-	13.00	100.00 ^c	28.00	320.00
	Cobalt	B	3.60	4800.00	19.00	110.00
	Copper	J	35.80	3000.00	30.00	61.00
	Iron	-	19,100.00	NA	38,200.00	68,100.00
	Lead	-	18.30	250.00 ^c	14.90	74.10
	Magnesium	-	5,080.00	NA	9,160.00	32,300.00
	Manganese	J	315.00	11,000.00	583.00	1,110.00
	Mercury	-	.18	240.00	1.30	3.80
	Nickel	-	13.80	1600.00	25.00	200.00
	Potassium	-	1,080.00	NA	3,090.00	7,900.00
	Sodium	B	270.00	NA	1,390.00	6,060.00
	Vanadium	-	30.30	560.00	107.00	140.00
	Zinc	J	121.00	24,000.00	79.00	366.00
Titanium	-	919.00	NA	3,180.00	3,180.00	
BOC951	Aluminum	-	7,170.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	2.20	60.00	9.00	27.70
	Barium	-	94.90	5,600.00	175.00	480.00
	Beryllium	B	.34	400.00	1.80	10.00
	Calcium	-	8,470.00	NA	24,600.00	105,000.02
	Chromium	-	8.60	100.00 ^c	28.00	320.00
	Cobalt	B	6.10	4800.00	19.00	110.00
	Copper	J	24.20	3000.00	30.00	61.00
	Iron	-	2,2600.00	NA	38,200.00	68,100.00
	Lead	-	17.50	250.00 ^c	14.90	74.10
	Magnesium	-	5,080.00	NA	9,160.00	32,300.00
	Manganese	J	361.00	11,000.00	583.00	1,110.00
	Nickel	-	9.70	1600.00	25.00	200.00
	Potassium	-	2,530.00	NA	3,090.00	7,900.00
	Sodium	B	252.00	NA	1,390.00	6,060.00
	Vanadium	-	39.80	560.00	107.00	140.00
	Zinc	J	119.00	24,000.00	79.00	366.00
	Titanium	-	1,470.00	NA	3,180.00	3,180.00

Table 4. Ash Pit Demolition Site, Analytical Results for Soils, Metals. (sheet 2 of 6)

Sample number	Name of Constituent	Qualifiers	Concentration mg/kg	MTCA Method B Cleanup Levels ^a mg/kg	Hanford Site Soil Background 95/95 threshold ^b mg/kg	Hanford Site Soil Background Maximum Conc. ^b mg/kg
BOC952	Aluminum	-	6,940.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	2.10	60.00	9.00	27.70
	Barium	-	58.20	5,600.00	175.00	480.00
	Beryllium	B	0.23	400.00	1.80	10.00
	Calcium	-	10,800.00	NA	24,600.00	105,000.02
	Chromium	-	10.20	100.00 ^C	28.00	320.00
	Cobalt	B	3.10	4800.00	19.00	110.00
	Copper	J	12.90	3000.00	30.00	61.00
	Iron	-	19,100.00	NA	38,200.00	68,100.00
	Lead	-	5.30	250.00 ^C	14.90	74.10
	Magnesium	-	5,480.00	NA	9,160.00	32,300.00
	Manganese	J	314.00	11,000.00	583.00	1,110.00
	Nickel	-	12.10	1600.00	25.00	200.00
	Potassium	B	921.00	NA	3,090.00	7,900.00
	Sodium	B	232.00	NA	1,390.00	6,060.00
	Vanadium	-	33.00	560.00	107.00	140.00
	Zinc	J	48.70	24,000.00	79.00	366.00
	Titanium	-	965.00	NA	3,180.00	3,180.00
BOC953 (Duplicate to BOC952)	Aluminum	-	4,450.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	2.40	60.00	9.00	27.70
	Barium	B	37.60	5,600.00	175.00	480.00
	Calcium	-	7,900.00	NA	24,600.00	105,000.02
	Chromium	-	6.40	100.00 ^C	28.00	320.00
	Copper	J	6.70	3000.00	30.00	61.00
	Iron	-	12,400.00	NA	38,200.00	68,100.00
	Lead	-	4.60	250.00 ^C	14.90	74.10
	Magnesium	-	3,720.00	NA	9,160.00	32,300.00
	Manganese	J	207.00	11,000.00	583.00	1,110.00
	Nickel	B	5.60	1600.00	25.00	200.00
	Potassium	B	671.00	NA	3,090.00	7,900.00
	Sodium	B	141.00	NA	1,390.00	6,060.00
	Vanadium	-	19.70	560.00	107.00	140.00
	Zinc	J	31.00	24,000.00	79.00	366.00
	Titanium	-	678.00	NA	3,180.00	3,180.00

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T4.2

C334

Table 4. Ash Pit Demolition Site, Analytical Results for Soils, Metals. (sheet 3 of 6)

Sample number	Name of Constituent	Qualifiers	Concentration mg/kg	MTCA Method B Cleanup Levels ^a mg/kg	Hanford Site Soil Background 95/95 threshold ^b mg/kg	Hanford Site Soil Background Maximum Conc. ^b mg/kg
BOC954	Aluminum	-	5,530.00	80,000.00	15,100.00	28,800.00
	Arsenic	BJ	1.80	60.00	9.00	27.70
	Barium	-	66.20	5,600.00	175.00	480.00
	Beryllium	B	0.23	400.00	1.80	10.00
	Calcium	-	10,200.00	NA	24,600.00	105,000.02
	Chromium	-	8.00	100.00 ^C	28.00	320.00
	Cobalt	B	3.70	4800.00	19.00	110.00
	Copper	J	9.70	3000.00	30.00	61.00
	Iron	-	15,900.00	NA	38,200.00	68,100.00
	Lead	J	5.10	250.00 ^C	14.90	74.10
	Magnesium	-	4,270.00	NA	9,160.00	32,300.00
	Manganese	J	277.00	11,000.00	583.00	1,110.00
	Nickel	B	6.50	1600.00	25.00	200.00
	Potassium	B	1,020.00	NA	3,090.00	7,900.00
	Sodium	B	163.00	NA	1,390.00	6,060.00
	Vanadium	-	25.40	560.00	107.00	140.00
	Zinc	J	36.30	24,000.00	79.00	366.00
	Titanium	-	800.00	NA	3,180.00	3,180.00
BOC955	Aluminum	-	6,670.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	2.60	60.00	9.00	27.70
	Barium	-	70.90	5,600.00	175.00	480.00
	Beryllium	B	0.25	400.00	1.80	10.00
	Calcium	-	8,110.00	NA	24,600.00	105,000.02
	Chromium	-	9.40	100.00 ^C	28.00	320.00
	Cobalt	B	4.10	4800.00	19.00	110.00
	Copper	J	15.50	3000.00	30.00	61.00
	Iron	-	18,300.00	NA	38,200.00	68,100.00
	Lead	-	5.10	250.00 ^C	14.90	74.10
	Magnesium	-	4,990.00	NA	9,160.00	32,300.00
	Manganese	J	274.00	11,000.00	583.00	1,110.00
	Mercury	-	0.11	240.00	1.30	3.80
	Nickel	-	10.80	1600.00	25.00	200.00
	Potassium	-	1,130.00	NA	3,090.00	7,900.00
	Sodium	B	239.00	NA	1,390.00	6,060.00
	Vanadium	-	28.00	560.00	107.00	140.00
	Zinc	J	48.80	24,000.00	79.00	366.00
Titanium	-	925.00	NA	3,180.00	3,180.00	

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T4.3

2

Table 4. Ash Pit Demolition Site, Analytical Results for Soils, Metals. (sheet 4 of 6)

Sample number	Name of Constituent	Qualifiers	Concentration mg/kg	MTCB Method B Cleanup Levels ^a mg/kg	Hanford Site Soil Background 95/95 threshold ^b mg/kg	Hanford Site Soil Background Maximum Conc. ^b mg/kg
80C956	Aluminum	-	7,060.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	2.3	60.00	9.00	27.70
	Barium	-	84.10	5,600.00	175.00	480.00
	Beryllium	B	0.24	400.00	1.80	10.00
	Calcium	-	9,950.00	NA	24,600.00	105,000.02
	Chromium	-	15.00	100.00 ^C	28.00	320.00
	Cobalt	B	3.90	4800.00	19.00	110.00
	Copper	J	18.80	3000.00	30.00	61.00
	Iron	-	18,500.00	NA	38,200.00	68,100.00
	Lead	-	21.20	250.00 ^C	14.90	74.10
	Magnesium	-	4,810.00	NA	9,160.00	32,300.00
	Manganese	J	305.00	11,000.00	583.00	1,110.00
	Mercury	-	0.76	240.00	1.30	3.80
	Nickel	-	12.10	1600.00	25.00	200.00
	Potassium	-	1,210.00	NA	3,090.00	7,900.00
	Silver	-	2.20	400.00	2.10	14.60
	Sodium	B	282.00	NA	1,390.00	6,060.00
	Vanadium	-	30.00	560.00	107.00	140.00
	Zinc	J	112.00	24,000.00	79.00	366.00
	Titanium	-	1,010.00	NA	3,180.00	3,180.00
80C957	Aluminum	-	6,750.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	2.40	60.00	9.00	27.70
	Barium	-	89.10	5,600.00	175.00	480.00
	Calcium	-	8,500.00	NA	24,600.00	105,000.02
	Chromium	-	6.90	100.00 ^C	28.00	320.00
	Cobalt	B	6.70	4800.00	19.00	110.00
	Copper	J	17.50	3000.00	30.00	61.00
	Iron	-	26,400.00	NA	38,200.00	68,100.00
	Lead	J	6.70	250.00 ^C	14.90	74.10
	Magnesium	-	5,320.00	NA	9,160.00	32,300.00
	Manganese	J	374.00	11,000.00	583.00	1,110.00
	Nickel	-	10.80	1600.00	25.00	200.00
	Potassium	-	1,470.00	NA	3,090.00	7,900.00
	Sodium	B	223.00	NA	1,390.00	6,060.00
	Vanadium	-	51.10	560.00	107.00	140.00
	Zinc	J	49.50	24,000.00	79.00	366.00
	Titanium	-	1,910.00	NA	3,180.00	3,180.00

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T4.4

2

Table 4. Ash Pit Demolition Site, Analytical Results for Soils, Metals. (sheet 5 of 6)

Sample number	Name of Constituent	Qualifiers	Concentration mg/kg	MTCA Method B Cleanup Levels ^a mg/kg	Hanford Site Soil Background 95/95 threshold ^b mg/kg	Hanford Site Soil Background Maximum Conc. ^b mg/kg
1 BOC958	Aluminum	-	6,240.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	2.20	60.00	9.00	27.70
	Barium	-	84.40	5,600.00	175.00	480.00
	Calcium	-	8,500.00	NA	24,600.00	105,000.02
	Chromium	-	8.00	100.00 ^c	28.00	320.00
	Cobalt	B	3.10	4800.00	19.00	110.00
	Copper	J	16.90	3000.00	30.00	61.00
	Iron	-	18,100.00	NA	38,200.00	68,100.00
	Lead	-	11.60	250.00 ^c	14.90	74.10
	Magnesium	-	4,650.00	NA	9,160.00	32,300.00
	Manganese	J	329.00	11,000.00	583.00	1,110.00
	Nickel	-	9.70	1600.00	25.00	200.00
	Potassium	-	1,520.00	NA	3,090.00	7,900.00
	Sodium	B	190.00	NA	1,390.00	6,060.00
	Vanadium	-	27.90	560.00	107.00	140.00
	Zinc	J	60.80	24,000.00	79.00	366.00
	Titanium	-	1,020.00	NA	3,180.00	3,180.00
2 T4.5 BOC959	Aluminum	-	5,290.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	3.30	60.00	9.00	27.70
	Barium	-	51.70	5,600.00	175.00	480.00
	Calcium	-	8,760.00	NA	24,600.00	105,000.02
	Chromium	-	8.00	100.00 ^c	28.00	320.00
	Cobalt	B	3.20	4800.00	19.00	110.00
	Copper	J	5.60	3000.00	30.00	61.00
	Iron	-	16,100.00	NA	38,200.00	68,100.00
	Lead	-	4.20	250.00 ^c	14.90	74.10
	Magnesium	-	4,580.00	NA	9,160.00	32,300.00
	Manganese	J	227.00	11,000.00	583.00	1,110.00
	Nickel	B	7.30	1600.00	25.00	200.00
	Potassium	B	940.00	NA	3,090.00	7,900.00
	Sodium	B	157.00	NA	1,390.00	6,060.00
	Vanadium	-	25.20	560.00	107.00	140.00
	Zinc	J	31.40	24,000.00	79.00	366.00
	Titanium	-	801.00	NA	3,180.00	3,180.00

Table 4. Ash Pit Demolition Site, Analytical Results for Soils, Metals. (sheet 6 of 6)

Sample number	Name of Constituent	Qualifiers	Concentration mg/kg	MTCA Method B Cleanup Levels ^a mg/kg	Hanford Site Soil Background 95/95 threshold ^b mg/kg	Hanford Site Soil Background Maximum Conc. ^b mg/kg
BOC960	Aluminum	-	7,030.00	80,000.00	15,100.00	28,800.00
	Arsenic	J	2.60	60.00	9.00	27.70
	Barium	-	99.50	5,600.00	175.00	480.00
	Beryllium	B	0.26	400.00	1.80	10.00
	Calcium	-	8,410.00	NA	24,600.00	105,000.02
	Chromium	-	24.00	100.00 ^c	28.00	320.00
	Cobalt	B	4.70	4800.00	19.00	110.00
	Copper	J	27.80	3000.00	30.00	61.00
	Iron	-	19,700.00	NA	38,200.00	68,100.00
	Lead	-	36.40	250.00 ^c	14.90	74.10
	Magnesium	-	4,910.00	NA	9,160.00	32,300.00
	Manganese	J	286.00	11,000.00	583.00	1,110.00
	Mercury	-	0.62	240.00	1.30	3.80
	Nickel	-	18.30	1600.00	25.00	200.00
	Potassium	-	1,340.00	NA	3,090.00	7,900.00
	Silver	B	1.70	400.00	2.10	14.60
	Sodium	B	370.00	NA	1,390.00	6,060.00
	Vanadium	-	33.00	560.00	107.00	140.00
Zinc	J	155.00	24,000.00	79.00	366.00	
Titanium	-	1,100.00	NA	3,180.00	3,180.00	
BOCBM9 equip blank	Iron	-	104.00	NA	38,200.00	68,100.00
	Sodium	B	24.40	NA	1,390.00	6,060.00
	Titanium	-	1.40	NA	3,180.00	3,180.00

^a = Calculation found in Model Toxics Control Act (173-340-740).

^b = DOE/RL, 1994b, Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes, DOE/RL-92-24, Rev. 2.

^c = MTCA, Method A Cleanup Level, when MTCA, Method B levels not available.

J = Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, by the laboratory because it is below the method detection limit.

B = Indicates the constituents was analyzed for and detected in the associated laboratory blank.

mg/kg = milligram/kilogram (parts per million).

* = Nitrate concentration values only.

NA = not available.

NC = not calculated.

Note: MTCA, Method B, use the lowest of the two cleanup levels, cancer or noncancer-based, for implementation in closure plans.

951003.0826

Table 5a. Ash Pit Demolition Site, Analytical Results for Phase I Analysis of Soil Sample BOC954, Semi-Volatile Organics Compounds. (sheet 1 of 1)

Sample number	Name of Constituent	CAS ^a	Qualifiers	Concentration mg/kg	MTCA Method B Cleanup Level ^b mg/kg	Hanford Site Soil Background 95/95 threshold mg/kg	Hanford Site Background Maximum Conc. mg/kg	
6 BOC954DL	Naphthalene	91-20-3	DJ	4.3	320.00	NA	NA	
	Acenaphthene	83-32-9	DJ	6.9	4,800.00			
	Dibenzofuran	132-64-9	DJ	4.3				
	Fluorene	86-73-7	DJ	7.5	3,200.00			
	Phenanthrene	85-01-8	D	81.0	0.14 ^c			
	Anthracene	120-12-7	DJ	12.0	24,000.00			
	Fluoranthene	206-44-0	D	87.0	3,200.00			
	Pyrene	129-00-0	D	66.0	2,400.00			
	Benzo(A)Anthracene	56-55-3	D	28.0	0.14 ^c			
	Chrysene	218-01-9	D	34.0	0.14 ^c			
	Benzo(B)Fluoranthene	205-99-2	D	22.0	0.14 ^c			
	Benzo(K)Fluoranthene	207-08-9	D	24.0	0.14 ^c			
	Benzo(A)Pyrene	50-32-8	D	25.0	0.14			
	Indeno(1,2,3-cd)Pyrene	193-39-5	DJ	16.0	0.14 ^c			
	Benzo(G,H,I)Perylene	191-24-2	D	18.0	0.14 ^c			
	TIC:							
	9,10-Anthracenedione	84-65-1	JN	JN	NA			
11H-Benzo(A)Fluorene	238-84-6	JN	JN	NA				
Benzo(B)Naphtho(2,1-D)thiophene	239-35-0	JN	JN	NA				
Benzo(C)Phenathrene	195-19-7	JN	JN	NA				
Benzo(J)Fluoranthene	205-82-3	JN	JN	NA				

a = Chemical Abstract Services.

b = Calculation found in Model Toxics Control Act (173-340-740).

c = Calculation based on slope factor for benzo(A)pyrene for carcinogenic risk.

J = Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, by the laboratory because it is below the method detection limit.

JN = Tentatively identified compounds (TICs) were reported in the samples and deemed estimated and presumptive.

DJ = Indicates that the compound was analyzed at a secondary dilution factor; value is estimated.

mg/kg = milligram/kilogram (parts per million).

NA = not available.

Note: MTCA, Method B, use the lowest of the two cleanup levels, cancer or noncancer-based, for implementation in closure plans.

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7000-KN776-7800-21223242526

MHC-SD-EN-TI-305, Rev. 0

951003.0826

Table 5b. Ash Pit Demolition Site, Analytical Results for Phase II Reanalysis of Soil Sample BOC954, Semi-Volatile Organics Compounds. (sheet 1 of 1)

Sample number	Name of Constituent	CAS ^a	Qualifiers	Concentration mg/kg	MTCA Method B Cleanup Level ^b mg/kg	Hanford Site Soil Background 95/95 threshold mg/kg	Hanford Site Background Maximum Conc. mg/kg
BOC954DL	Naphthalene	91-20-3	U	NA	320.00	NA	NA
	Acenaphthene	83-32-9	U	NA	4,800.00		
	Dibenzofuran	132-64-9	U	NA			
	Fluorene	86-73-7	U	NA	3,200.00		
	Phenanthrene	85-01-8	U	NA	0.14 ^c		
	Anthracene	120-12-7	U	NA	24,000.00		
	Fluoranthene	206-44-0	U	NA	3,200.00		
	Pyrene	129-00-0	U	NA	2,400.00		
	Benzo(A)Anthracene	56-55-3	U	NA	0.14 ^c		
	Chrysene	218-01-9	U	NA	0.14 ^c		
	Benzo(B)Fluoranthene	205-99-2	U	NA	0.14 ^c		
	Benzo(K)Fluoranthene	207-08-9	U	NA	0.14 ^c		
	Benzo(A)Pyrene	50-32-8	U	NA	0.14		
	Indeno(1,2,3-cd)Pyrene	193-39-5	U	NA	0.14 ^c		
	Benzo(G,H,I)Perylene	191-24-2	U	NA	0.14 ^c		
	TIC:						
	9,10-Anthracenedione	84-65-1	U	NA	NA		
11H-Benzo(A)Fluorene	238-84-6	U	NA	NA			
Benzo(B)Naphtho(2,1-D)thiophene	239-35-0	U	NA	NA			
Benzo(C)Phenathrene	195-19-7	U	NA	NA			
Benzo(J)Fluoranthene	205-82-3	U	NA	NA			

^a = Chemical Abstract Services.

^b = Calculation found in Model Toxics Control Act (173-340-740).

^c = Calculation based on slope factor for benzo(A)pyrene for carcinogenic risk.

J = Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, by the laboratory because it is below the method detection limit.

U = Indicates that the compound was analyzed for and not detected.

mg/kg = milligram/kilogram (parts per million).

NA = not available.

Note: MTCA, Method B, use the lowest of the two cleanup levels, cancer or noncancer-based, for implementation in closure plans.

TSB.1

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