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

August 5, 2009

CERTIFIED MAIL

Mr. Ryan Jarvis
Heart of America Northwest
1314 N.E. 56th Street Suite 100
Seattle, Washington 98105

Dear Mr. Jarvis:

FREEDOM OF INFORMATION ACT REQUEST (FOI 2009-0054)

This letter is a partial response to your letters dated June 22, 2009, and July 15, 2009. In response to item 1, enclosed is a copy of a letter dated November 6, 2008, from the State of Washington Department of Ecology, and a copy of a U.S. Department of Energy (DOE) letter dated July 25, 1997, (DOE Letter 97-EAP-577), see Attachment I. Both of these documents are also responsive to items 4e, 4h, 6a, 6b, 9a and 9b or your requests.

In response to item 4f, enclosed are copies of the Regulatory Agency Inspection Database Summary Reports, see Attachment II. In response to 4g, enclosed are the Emergency Planning and Community Right-To-Know Act reports from 2001 through 2008, see Attachment III. In response to item 4h, enclosed is a copy of HNF-EP-0063, see Attachment IV.

In response to item 6c, enclosed are copies of DOE Letters 95-PCA-294, 95-PCA-353, 96-EAP-343, Document HNF-5841, and a letter from the State of Washington dated March 6, 1997, entitled, "Approval of Low-Level Burial Ground (LLBG) Part A, Revision 9," see Attachment V. In response to 6d, 6e, and 7c, please see our response to item 6c. In response to 7 a, please find documents as Attachment VI. In response to 7b, please see our response to 6c.

We continue to search and review documents responsive to your request. As you may know, the FOIA provides that an agency respond to requests within twenty working days. However, the FOIA permits an agency to extend the time limit to respond to a request in certain circumstances. These circumstances include the need to collect records from other locations, review large number of records, and consult with other offices. Due to the large amount of information requested, additional time will be needed to review the documents. We will notify you when our search and review is complete.

If you have any questions regarding your request, please contact me at our address above or on (509) 376-6288.

Sincerely,

Dorothy Riehle
Freedom of Information Act Officer
Office of Communications
and External Affairs

OCE:DCR

Attachments

ATTACHMENT I

0802709
CC Recd: 11/12/2008

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
3100 Port of Benton Blvd • Richland, WA 99354 • (509) 372-7950

November 6, 2008

Mr. David A. Brockman, Manager
Richland Operations Office
United States Department of Energy
P.O. Box 550, MSIN: A7-50
Richland, Washington 99352

Ms. Shirley J. Olinger, Manager
Office of River Protection
United States Department of Energy
P.O. Box 450, MSIN: H6-60
Richland, Washington 99352

Mr. Paul T. Day, Manager
Environmental Protection
Washington River Protection Solutions, LLC
P.O. Box 850, MSIN: R1-51
Richland, Washington 99352

Mr. Charles G. Spencer, President
Washington Closure Hanford, LLC
2620 Fermi Avenue, MSIN: H4-24
Richland, Washington 99354

Ms. Jennifer L. Nuzum, Director
Environmental Protection
Fluor Hanford, Inc.
P.O. Box 1000, MSIN: H8-12
Richland, Washington 99352

Mr. William S. Elkins, Project Director
Bechtel National, Inc.
2435 Stevens Center Place, MSIN: H4-02
Richland, Washington 99354

Mr. Roby D. Enge, Director
Environment, Safety, Health and Quality
Pacific Northwest National Laboratory
P.O. Box 999, MSIN: K1-38
Richland, Washington 99352

Mr. Moussa N. Jaraysi, Vice President
Environmental Programs
CH2M HILL Plateau Remediation Company
P.O. Box 1500, MSIN: H6-03
Richland, Washington 99352

Re: United States Department of Energy Letter, dated October 9, 2008, *Class 1 Modifications to the Hanford Facility Resource Conservation and Recovery Act Permit (Quarter Ending September 30, 2008)*

Dear Ladies and Gentlemen:

The Department of Ecology reviewed the referenced quarterly Class 1 and Class 1 prime modifications. You will find the results of that review on the following page. Enclosed are modification notification forms indicating the changes.

ENCLOSURE I

Quarterly Modifications

Part III, Operating Unit 2, PUREX Storage Tunnels

Page 2 of 5:	Hanford Facility RCRA Permit III.2	Approved
Page 3 of 5:	Chapter 7.0, § 7.2	Approved
Page 4 of 5:	Chapter 7.0, § 7.3	Approved
Page 5 of 5:	Chapter 7.0, § 7.4	Approved

Part III, Operating Unit 5, 325 HWTUs

Page 2 of 4:	Hanford Facility RCRA Permit III.5	Approved
Page 3 of 4:	Addendum A, Part A Form, Section XIV, Line 427	Approved
Page 4 of 4:	Addendum J, Contingency Plan	Approved

Part III, Operating Unit 10, WTP

24590-HLW-PCN-ENV-06-019	Approved
24590-HLW-PCN-ENV-08-001	Approved
24590-HLW-PCN-ENV-08-002	Approved
24590-LAW-PCN-ENV-06-008	Approved
24590-PTF-PCN-ENV-07-013	Approved
24590-PTF-PCN-ENV-07-015	Approved
24590-PTF-PCN-ENV-08-003	Approved
24590-PTF-PCN-ENV-08-016	Approved
24590-WTP-PCN-ENV-05-013	Approved
24590-WTP-PCN-ENV-05-015	Approved
24590-WTP-PCN-ENV-06-008	Approved
24590-WTP-PCN-ENV-06-009	Approved
24590-WTP-PCN-ENV-08-002	Approved

Part III, Operating Unit 15, 331-C Storage Unit

Page 2 of 3:	Hanford Facility RCRA Permit, III.15	Approved
Page 3 of 3:	Addendum A, Part A Form, § XIV, Line 50	Approved

Part III, Operating Unit 16, 400 Area WMU

Page 2 of 3:	Hanford Facility RCRA Permit, III.16	Approved
Page 3 of 3:	Addendum E, § E.4.3	Approved

Part VI, Closure Unit 10, 224-T Transuranic Waste Storage and Assay Facility

Page 2 of 10:	Hanford Facility RCRA Permit V.10	Approved
Page 3 of 10:	Closure Plan, § 1.0	Approved
Page 4 of 10:	Closure Plan, § 1.1	Approved
Page 5 of 10:	Closure Plan, § 1.2	Approved
Page 6 of 10:	Closure Plan, § 2.0, § 2.1, § 2.2, and § 2.3	Approved
Page 7 of 10:	Closure Plan, § 3.0	Approved
Page 8 of 10:	Closure Plan, § 3.2, § 3.2.1, § 3.2.2, § 3.2.3, and § 3.2.4	Approved
Page 9 of 10:	Closure Plan, § 3.3	Approved
Page 10 of 10:	Closure Plan, § 3.5	Approved

ENCLOSURE 3

Part A Forms transferring to the Plateau Remediation Contractor.
CH2M HILL Plateau Remediation Company

1706-KE, Addendum A, Part A Form, Closure Unit 16	Approved
207-A South Retention Basin, Addendum A, Part A Form, Closure Unit 9	Approved
216-A-10 Crib, Addendum A, Part A Form, Closure Unit 26	Approved
216-A-29 Ditch, Addendum A, Part A Form, Closure Unit 11	Approved
216-A-36B Crib, Addendum A, Part A Form, Closure Unit 12	Approved
216-A-37-1 Crib, Addendum A, Part A Form, Closure Unit 13	Approved
216-B-3 Main Pond, Addendum A, Part A Form, Closure Unit 22	Approved
216-B-63 Trench, Addendum A, Part A Form, Closure Unit 21	Approved
216-S-10 Pond and Ditch, Addendum A, Part A Form, Closure Unit 14	Approved
224-T TRUSAF, Addendum A, Part A Form, Closure Unit 10	Approved
241-CX Tank System, Addendum A, Part A Form, Closure Unit 15	Approved
400 Area WMU, Addendum A, Part A Form, Operating Unit 16	Approved
600 Area PS&TF, Addendum A, Part A Form, Closure Unit 8	Approved
B Plant Complex, Addendum A, Part A Form, Closure Unit 24	Approved
Central Waste Complex, Addendum A, Part A Form, Operating Unit 6	Approved
Hexone, Addendum A, Part A Form, Closure Unit 19	Approved
Integrated Disposal Facility, Addendum A, Part A Form, Operating Unit 11	Approved
LERF/200 ETF, Addendum A, Part A Form, Operating Unit 3	Approved
LLBG (1 & 2), Addendum A, Part A Form, OP/CL Units 17, 18	Approved
NRDWL, Addendum A, Part A Form, Closure Unit 20	Approved
PUREX Plant, Addendum A, Part A Form, Closure Unit 25	Approved
PUREX Storage Tunnels, Addendum A, Part A Form, Operating Unit 2	Approved
T Plant Complex, Addendum A, Part A Form, Operating Unit 9	Approved
WESF, Addendum A, Part A Form, Operating Unit 14	Approved
WRAP, Addendum A, Part A Form, Operating Unit 7	Approved

ENCLOSURE 4

Part A Forms transferring to the Hanford Tank Farms Operations Contractor.
Washington River Protection Solutions, LLC

222-S DMWU, Addendum A, Part A Form, Operating Unit 8	Approved
242-A Evaporator, Addendum A, Part A Form, Operating Unit 4	Approved
DST System/204-AR WUS, Addendum A, Part A Form, Operating Unit 12	Approved
IHLW (CSB), Addendum A, Part A Form, Inactive Operating Unit 13	Approved
SST, Addendum A, Part A Form, Closure Unit 4	Approved

ENCLOSURE 5

Part A Forms held by the United States Department of Energy pending transfer to the appropriate contractor.

183-H SEB, Addendum A, Part A Form, Post-Closure Unit 2	Approved
300 A Process Trenches, Addendum A, Part A Form, Post-Closure Unit 1	Approved

If you have any questions, please contact me at 509-372-7894.

Sincerely,

Greta P. Davis

Greta P. Davis
RCRA Permitting Coordinator
Nuclear Waste Program

pll

Enclosures (54)

cc w/enc:

Tony McKarns, USDOE
Woody Russell, USDOE
Wade Woolery, USDOE
Tony Miskho, FH
Suzette Thompson, FH
Stuart Harris, CTUIR
Gabriel Bohnee, NPT
Russell Jim, YN
Susan Leckband, HAB
Ken Niles, ODOE
Administrative Record: HSWP
Environmental Portal
HF OR Gen. File

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Dangerous Waste Permit Application Part A Form

Date Received	Reviewed by:	Date: 0 9 2 2 2 0 0 8
Month Day Year	Approved by:	Date: 0 9 2 2 2 0 0 8
0 9 1 9 2 0 0 8		

I. This form is submitted to: (place an "X" in the appropriate box)

☐	Request modification to a final status permit (commonly called a "Part B" permit)
☒	Request a change under interim status
☐	Apply for a final status permit. This includes the application for the initial final status permit for a site or for a permit renewal (i.e., a new permit to replace an expiring permit).
☐	Establish interim status because of the wastes newly regulated on: (Date)
	List waste codes:

II. EPA/State ID Number

W A 7 8 9 0 0 0 8 9 6 7

III. Name of Facility

US Department of Energy – Hanford Facility

IV. Facility Location (Physical address not P.O. Box or Route Number)

A. Street

825 Jadwin

City or Town	State	ZIP Code
Richland	WA	99352

County Code (if known)	County Name
0 0 5	Benton

B. Land Type	C. Geographic Location Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	D. Facility Existence Date Month Day Year
F	Refer to TOPO Map (Section XV.)		0 3 0 2 1 9 4 3

V. Facility Mailing Address

Street or P.O. Box

P.O. Box 550

City or Town	State	ZIP Code
Richland	WA	99352

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Dangerous Waste Permit Application Part A Form

Date Received	Reviewed by:	Date: 0 9 2 2 2 0 0 8
Month Day Year	Approved by:	Date: 0 9 2 2 2 0 0 8
0 9 1 9 2 0 0 8		

I. This form is submitted to: (place an "X" in the appropriate box)

☐	Request modification to a final status permit (commonly called a "Part B" permit)
☒	Request a change under interim status
☐	Apply for a final status permit. This includes the application for the initial final status permit for a site or for a permit renewal (i.e., a new permit to replace an expiring permit).
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825 Jadwin

City or Town	State	ZIP Code
Richland	WA	99352

County Code (if known)	County Name
0 0 5	Benton

B. Land Type	C. Geographic Location Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	D. Facility Existence Date Month Day Year
F	Refer to TOPO Map (Section XV.)		0 3 0 2 1 9 4 3

V. Facility Mailing Address

Street or P.O. Box		
P.O. Box 550		
City or Town	**State**	**ZIP Code**
Richland	WA	99352

VI. Facility contact (Person to be contacted regarding waste activities at facility)		
Name (last)	(first)	
Brockman	David	
Job Title	Phone Number (area code and number)	
Manager	(509) 376-7395	
Contact Address		
Street or P.O. Box		
P.O. Box 550		
City or Town	State	ZIP Code
Richland	WA	99352

VII. Facility Operator Information		
A. Name		Phone Number
Department of Energy Owner/Operator CH2M HILL Plateau Remediation Company Co-Operator for the Low-Level Burial Grounds*		(509) 376-7395 (509) 376-0556*
Street or P.O. Box		
P.O. Box 550 P.O. Box 1600 *		
City or Town	State	ZIP Code
Richland	WA	99352
B. Operator Type	F	
C. Does the name in VII.A reflect a proposed change in operator?	☐ Yes ☒ No	Co-Operator* change
If yes, provide the scheduled date for the change:	Month 1 0	Day 0 1	Year 2 0 0 8
D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.	☐ Yes ☒ No	

VIII. Facility Owner Information		
A. Name	Phone Number (area code and number)	
David A. Brockman, Operator/Facility-Property Owner	(509) 376-7395	
Street or P.O. Box		
P.O. Box 550		
City or Town	State	ZIP Code
Richland	WA	99352
B. Owner Type	F	
C. Does the name in VIII.A reflect a proposed change in owner?	☐ Yes ☒ No	
If yes, provide the scheduled date for the change:	Month	Day	Year

IX. NAICS Codes (5/6 digit codes)													
A. First							B. Second						
5	6	2	2	1		Waste Treatment & Disposal	9	2	4	1	1	0	Administration of Air & Water Resource & Solid Waste Management Programs
C. Third							D. Fourth						
5	4	1	7	1		Research & Development in the Physical, Engineering, & Life Sciences							

X. Other Environmental Permits (see instructions)

Permit Type	B. Permit Number													C. Description
E		A	I	R		0	6	-	1	0	1	9		WAC 246-247, NOC Rad Air
E		A	I	R		0	6	-	1	0	2	3		WAC 246-247, NOC Rad Air
E		A	I	R		0	6	-	1	0	5	4		WAC 246-247, NOC Rad Air
E		D	E	0	0	N	W	P	-	0	0	2		WAC 173-400 Non Rad Air

XI. Nature of Business (provide a brief description that includes both dangerous waste and non-dangerous waste areas and activities)

D81

The Low-Level Burial Grounds (LLBG) began waste management operations in January of 1960. The LLBG comprise a landfill disposal unit (D81) and cover a total area of approximately 225 hectares (556 acres). The landfill is divided into eight burial grounds. Six burial grounds are located in the 200 West Area and two in the 200 East Area, as depicted on the attached drawings. The LLBG consist of lined and unlined trenches of various sizes and depths. All mixed waste disposed will meet land disposal restriction requirements. The lined trenches have a double-liner leachate collection and removal system.

The process design capacity for mixed waste in the LLBG is 1,740,000 cubic meters (2,275,920 cubic yards) of which 1,500,000 cubic meters (1,962,000 cubic yards) are dedicated solely for the disposal of U.S. Navy defueled reactor compartments. Additional design capacity has been included to facilitate future lined trench construction. All future mixed waste trenches, designed and constructed to comply with all applicable regulations, will be added to the LLBG through the Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit modification process.

S01

The greater-than-90-day container storage capability in mixed waste trenches 31 and 34 of the 218-W-5 Burial Ground provides a location to store various sized containers of mixed waste in a RCRA-compliant manner other than the Central Waste Complex. In general, mixed waste will meet land disposal restriction (LDR) requirements before being placed in the trenches for storage. However, there will be other mixed waste containers that will be stored within the trenches before treatment to meet LDR. The placement of these containers in trenches 31 and 34 eliminates the need to construct a mixed waste storage/treatment pad. The process design capacity for storage of containers is estimated to be 10,000 cubic meters (13,080 cubic yards).

T04

Treatment to meet the LDR requirements will be performed within the mixed low-level waste (MLLW) trenches 31 and 34 of the 218-W-5 Burial Ground. The treatment capability consists of the use of immobilization technologies for mixed waste debris as listed under 40 CFR 268.45, Table 1, Alternative Treatment Standards for Hazardous Debris and MACRO in 40 CFR 268.42. In addition, the mixed waste containers will meet the 90 percent full container requirements following treatment. Treatment would be limited to those technologies that can be employed in/on containerized mixed waste. The process design capacity for treatment is estimated to be 100 cubic meters (131 cubic yards) per day.

EXAMPLE FOR COMPLETING ITEMS XII and XIII (shown in lines numbered X-1, X-2, and X-3 below): A facility has two storage tanks that hold 1200 gallons and 400 gallons respectively. There is also treatment in tanks at 20 gallons/hr. Finally, a one-quarter acre area that is two meters deep will undergo *in situ vitrification*.

Section XII. Process Codes and Design Capacities								Section XIII. Other Process Codes								
Line Number		A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	Line Number		A. Process Codes (enter code)			B Process Design Capacity		C. Process Total Number of Units	D. Process Description
					1. Amount	2. Unit of Measure (enter code)							1. Amount	2. Unit of Measure (enter code)		
X	1	S	0	2	1,600	G	002	X	1	T	0	4	700	C	001	In situ vitrification
X	2	T	0	3	20	E	001									
X	3	T	0	4	700	C	001									
	1	D	8	1	1,740,000	C	002		1							
	2	S	0	1	10,000	C	002		2							
	3	T	0	4	100	C	002		3							
	4								4							
	5								5							
	6								6							
	7								7							
	8							1	8							
	9							1	9							
1	0							1	0							
1	1							1	1							
1	2							1	2							
1	3							1	3							
1	4							1	4							
1	5							1	5							
1	6							1	6							
1	7							1	7							
1	8							1	8							
1	9							1	9							
2	0							2	0							
2	1							2	1							
2	2							2	2							
2	3							2	3							
2	4							2	4							
2	5							2	5							

XIV. Description of Dangerous Wastes

Example for completing this section: A facility will receive three non-listed wastes, then store and treat them on-site. Two wastes are corrosive only, with the facility receiving and storing the wastes in containers. There will be about 200 pounds per year of each of these two wastes, which will be neutralized in a tank. The other waste is corrosive and ignitable and will be neutralized then blended into hazardous waste fuel. There will be about 100 pounds per year of that waste, which will be received in bulk and put into tanks.

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Processes									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
X 1	D	0	0	2	400	P	S	0	1	T	0	1				
X 2	D	0	0	1	100	P	S	0	2	T	0	1				
X 3	D	0	0	2												Included with above
1	D	0	0	1	160,000,000	K	D	8	1							Includes Debris
2	D	0	0	2		K	D	8	1							Includes Debris
3	D	0	0	3		K	D	8	1							Includes Debris
4	D	0	0	4		K	D	8	1							Includes Debris
5	D	0	0	5		K	D	8	1							Includes Debris
6	D	0	0	6		K	D	8	1							Includes Debris
7	D	0	0	7		K	D	8	1							Includes Debris
8	D	0	0	8		K	D	8	1							Includes Debris
9	D	0	0	9		K	D	8	1							Includes Debris
10	D	0	1	0		K	D	8	1							Includes Debris
11	D	0	1	1		K	D	8	1							Includes Debris
12	D	0	1	2		K	D	8	1							Includes Debris
13	D	0	1	3		K	D	8	1							Includes Debris
14	D	0	1	4		K	D	8	1							Includes Debris
15	D	0	1	5		K	D	8	1							Includes Debris
16	D	0	1	6		K	D	8	1							Includes Debris
17	D	0	1	7		K	D	8	1							Includes Debris
18	D	0	1	8		K	D	8	1							Includes Debris
19	D	0	1	9		K	D	8	1							Includes Debris
20	D	0	2	0		K	D	8	1							Includes Debris
21	D	0	2	1		K	D	8	1							Includes Debris
22	D	0	2	2		K	D	8	1							Includes Debris
23	D	0	2	3		K	D	8	1							Includes Debris
24	D	0	2	4		K	D	8	1							Includes Debris
25	D	0	2	5		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
26	D	0	2	6		K	D	8	1							Includes Debris
27	D	0	2	7		K	D	8	1							Includes Debris
28	D	0	2	8		K	D	8	1							Includes Debris
29	D	0	2	9		K	D	8	1							Includes Debris
30	D	0	3	0		K	D	8	1							Includes Debris
31	D	0	3	1		K	D	8	1							Includes Debris
32	D	0	3	2		K	D	8	1							Includes Debris
33	D	0	3	3		K	D	8	1							Includes Debris
34	D	0	3	4		K	D	8	1							Includes Debris
35	D	0	3	5		K	D	8	1							Includes Debris
36	D	0	3	6		K	D	8	1							Includes Debris
37	D	0	3	7		K	D	8	1							Includes Debris
38	D	0	3	8		K	D	8	1							Includes Debris
39	D	0	3	9		K	D	8	1							Includes Debris
40	D	0	4	0		K	D	8	1							Includes Debris
41	D	0	4	1		K	D	8	1							Includes Debris
42	D	0	4	2		K	D	8	1							Includes Debris
43	D	0	4	3		K	D	8	1							Includes Debris
44	W	P	0	1		K	D	8	1							Includes Debris
45	W	P	0	2		K	D	8	1							Includes Debris
46	W	P	0	3		K	D	8	1							Includes Debris
47	W	P	C	B		K	D	8	1							Includes Debris
48	W	S	C	2		K	D	8	1							Includes Debris
49	W	T	0	1		K	D	8	1							Includes Debris
50	W	T	0	2		K	D	8	1							Includes Debris
51	F	0	0	1		K	D	8	1							Includes Debris
52	F	0	0	2		K	D	8	1							Includes Debris
53	F	0	0	3		K	D	8	1							Includes Debris
54	F	0	0	4		K	D	8	1							Includes Debris
55	F	0	0	5		K	D	8	1							Includes Debris
56	F	0	0	6		K	D	8	1							Includes Debris
57	F	0	0	7		K	D	8	1							Includes Debris
58	F	0	0	8		K	D	8	1							Includes Debris
59	F	0	0	9		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
60	F	0	1	0		K	D	8	1							Includes Debris
61	F	0	1	1		K	D	8	1							Includes Debris
62	F	0	1	2		K	D	8	1							Includes Debris
63	F	0	1	9		K	D	8	1							Includes Debris
64	F	0	2	8		K	D	8	1							Includes Debris
65	F	0	3	9		K	D	8	1							Includes Debris
66	U	0	0	1		K	D	8	1							Includes Debris
67	U	0	0	2		K	D	8	1							Includes Debris
68	U	0	0	3		K	D	8	1							Includes Debris
69	U	0	0	4		K	D	8	1							Includes Debris
70	U	0	0	5		K	D	8	1							Includes Debris
71	U	0	0	6		K	D	8	1							Includes Debris
72	U	0	0	7		K	D	8	1							Includes Debris
73	U	0	0	8		K	D	8	1							Includes Debris
74	U	0	0	9		K	D	8	1							Includes Debris
75	U	0	1	0		K	D	8	1							Includes Debris
76	U	0	1	1		K	D	8	1							Includes Debris
77	U	0	1	2		K	D	8	1							Includes Debris
78	U	0	1	4		K	D	8	1							Includes Debris
79	U	0	1	5		K	D	8	1							Includes Debris
80	U	0	1	6		K	D	8	1							Includes Debris
81	U	0	1	7		K	D	8	1							Includes Debris
82	U	0	1	8		K	D	8	1							Includes Debris
83	U	0	1	9		K	D	8	1							Includes Debris
84	U	0	2	0		K	D	8	1							Includes Debris
85	U	0	2	1		K	D	8	1							Includes Debris
86	U	0	2	2		K	D	8	1							Includes Debris
87	U	0	2	3		K	D	8	1							Includes Debris
88	U	0	2	4		K	D	8	1							Includes Debris
89	U	0	2	5		K	D	8	1							Includes Debris
90	U	0	2	6		K	D	8	1							Includes Debris
91	U	0	2	7		K	D	8	1							Includes Debris
92	U	0	2	8		K	D	8	1							Includes Debris
93	U	0	2	9		K	D	8	1							Includes Debris
94	U	0	3	0		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
95	U	0	3	1		K	D	8	1							Includes Debris
96	U	0	3	2		K	D	8	1							Includes Debris
97	U	0	3	3		K	D	8	1							Includes Debris
98	U	0	3	4		K	D	8	1							Includes Debris
99	U	0	3	5		K	D	8	1							Includes Debris
100	U	0	3	6		K	D	8	1							Includes Debris
101	U	0	3	7		K	D	8	1							Includes Debris
102	U	0	3	8		K	D	8	1							Includes Debris
103	U	0	3	9		K	D	8	1							Includes Debris
104	U	0	4	1		K	D	8	1							Includes Debris
105	U	0	4	2		K	D	8	1							Includes Debris
106	U	0	4	3		K	D	8	1							Includes Debris
107	U	0	4	4		K	D	8	1							Includes Debris
108	U	0	4	5		K	D	8	1							Includes Debris
109	U	0	4	6		K	D	8	1							Includes Debris
110	U	0	4	7		K	D	8	1							Includes Debris
111	U	0	4	8		K	D	8	1							Includes Debris
112	U	0	4	9		K	D	8	1							Includes Debris
113	U	0	5	0		K	D	8	1							Includes Debris
114	U	0	5	1		K	D	8	1							Includes Debris
115	U	0	5	2		K	D	8	1							Includes Debris
116	U	0	5	3		K	D	8	1							Includes Debris
117	U	0	5	5		K	D	8	1							Includes Debris
118	U	0	5	6		K	D	8	1							Includes Debris
119	U	0	5	7		K	D	8	1							Includes Debris
120	U	0	5	8		K	D	8	1							Includes Debris
121	U	0	5	9		K	D	8	1							Includes Debris
122	U	0	6	0		K	D	8	1							Includes Debris
123	U	0	6	1		K	D	8	1							Includes Debris
124	U	0	6	2		K	D	8	1							Includes Debris
125	U	0	6	3		K	D	8	1							Includes Debris
126	U	0	6	4		K	D	8	1							Includes Debris
127	U	0	6	6		K	D	8	1							Includes Debris
128	U	0	6	7		K	D	8	1							Includes Debris
129	U	0	6	8		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
130	U	0	6	9		K	D	8	1							Includes Debris
131	U	0	7	0		K	D	8	1							Includes Debris
132	U	0	7	1		K	D	8	1							Includes Debris
133	U	0	7	2		K	D	8	1							Includes Debris
134	U	0	7	3		K	D	8	1							Includes Debris
135	U	0	7	4		K	D	8	1							Includes Debris
136	U	0	7	5		K	D	8	1							Includes Debris
137	U	0	7	6		K	D	8	1							Includes Debris
138	U	0	7	7		K	D	8	1							Includes Debris
139	U	0	7	8		K	D	8	1							Includes Debris
140	U	0	7	9		K	D	8	1							Includes Debris
141	U	0	8	0		K	D	8	1							Includes Debris
142	U	0	8	1		K	D	8	1							Includes Debris
143	U	0	8	2		K	D	8	1							Includes Debris
144	U	0	8	3		K	D	8	1							Includes Debris
145	U	0	8	4		K	D	8	1							Includes Debris
146	U	0	8	5		K	D	8	1							Includes Debris
147	U	0	8	6		K	D	8	1							Includes Debris
148	U	0	8	7		K	D	8	1							Includes Debris
149	U	0	8	8		K	D	8	1							Includes Debris
150	U	0	8	9		K	D	8	1							Includes Debris
151	U	0	9	0		K	D	8	1							Includes Debris
152	U	0	9	1		K	D	8	1							Includes Debris
153	U	0	9	2		K	D	8	1							Includes Debris
154	U	0	9	3		K	D	8	1							Includes Debris
155	U	0	9	4		K	D	8	1							Includes Debris
156	U	0	9	5		K	D	8	1							Includes Debris
157	U	0	9	6		K	D	8	1							Includes Debris
158	U	0	9	7		K	D	8	1							Includes Debris
159	U	0	9	8		K	D	8	1							Includes Debris
160	U	0	9	9		K	D	8	1							Includes Debris
161	U	1	0	1		K	D	8	1							Includes Debris
162	U	1	0	2		K	D	8	1							Includes Debris
163	U	1	0	3		K	D	8	1							Includes Debris
164	U	1	0	5		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
165	U	1	0	6		K	D	8	1							Includes Debris
166	U	1	0	7		K	D	8	1							Includes Debris
167	U	1	0	8		K	D	8	1							Includes Debris
168	U	1	0	9		K	D	8	1							Includes Debris
169	U	1	1	0		K	D	8	1							Includes Debris
170	U	1	1	1		K	D	8	1							Includes Debris
171	U	1	1	2		K	D	8	1							Includes Debris
172	U	1	1	3		K	D	8	1							Includes Debris
173	U	1	1	4		K	D	8	1							Includes Debris
174	U	1	1	5		K	D	8	1							Includes Debris
175	U	1	1	6		K	D	8	1							Includes Debris
176	U	1	1	7		K	D	8	1							Includes Debris
177	U	1	1	8		K	D	8	1							Includes Debris
178	U	1	1	9		K	D	8	1							Includes Debris
179	U	1	2	0		K	D	8	1							Includes Debris
180	U	1	2	1		K	D	8	1							Includes Debris
181	U	1	2	2		K	D	8	1							Includes Debris
182	U	1	2	3		K	D	8	1							Includes Debris
183	U	1	2	4		K	D	8	1							Includes Debris
184	U	1	2	5		K	D	8	1							Includes Debris
185	U	1	2	6		K	D	8	1							Includes Debris
186	U	1	2	7		K	D	8	1							Includes Debris
187	U	1	2	8		K	D	8	1							Includes Debris
188	U	1	2	9		K	D	8	1							Includes Debris
189	U	1	3	0		K	D	8	1							Includes Debris
190	U	1	3	1		K	D	8	1							Includes Debris
191	U	1	3	2		K	D	8	1							Includes Debris
192	U	1	3	3		K	D	8	1							Includes Debris
193	U	1	3	4		K	D	8	1							Includes Debris
194	U	1	3	5		K	D	8	1							Includes Debris
195	U	1	3	6		K	D	8	1							Includes Debris
196	U	1	3	7		K	D	8	1							Includes Debris
197	U	1	3	8		K	D	8	1							Includes Debris
198	U	1	4	0		K	D	8	1							Includes Debris
199	U	1	4	1		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
200	U	1	4	2		K	D	8	1							Includes Debris
201	U	1	4	3		K	D	8	1							Includes Debris
202	U	1	4	4		K	D	8	1							Includes Debris
203	U	1	4	5		K	D	8	1							Includes Debris
204	U	1	4	6		K	D	8	1							Includes Debris
205	U	1	4	7		K	D	8	1							Includes Debris
206	U	1	4	8		K	D	8	1							Includes Debris
207	U	1	4	9		K	D	8	1							Includes Debris
208	U	1	5	0		K	D	8	1							Includes Debris
209	U	1	5	1		K	D	8	1							Includes Debris
210	U	1	5	2		K	D	8	1							Includes Debris
211	U	1	5	3		K	D	8	1							Includes Debris
212	U	1	5	4		K	D	8	1							Includes Debris
213	U	1	5	5		K	D	8	1							Includes Debris
214	U	1	5	6		K	D	8	1							Includes Debris
215	U	1	5	7		K	D	8	1							Includes Debris
216	U	1	5	8		K	D	8	1							Includes Debris
217	U	1	5	9		K	D	8	1							Includes Debris
218	U	1	6	0		K	D	8	1							Includes Debris
219	U	1	6	1		K	D	8	1							Includes Debris
220	U	1	6	2		K	D	8	1							Includes Debris
221	U	1	6	3		K	D	8	1							Includes Debris
222	U	1	6	4		K	D	8	1							Includes Debris
223	U	1	6	5		K	D	8	1							Includes Debris
224	U	1	6	6		K	D	8	1							Includes Debris
225	U	1	6	7		K	D	8	1							Includes Debris
226	U	1	6	8		K	D	8	1							Includes Debris
227	U	1	6	9		K	D	8	1							Includes Debris
228	U	1	7	0		K	D	8	1							Includes Debris
229	U	1	7	1		K	D	8	1							Includes Debris
230	U	1	7	2		K	D	8	1							Includes Debris
231	U	1	7	3		K	D	8	1							Includes Debris
232	U	1	7	4		K	D	8	1							Includes Debris
233	U	1	7	6		K	D	8	1							Includes Debris
234	U	1	7	7		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
235	U	1	7	8		K	D	8	1							Includes Debris
236	U	1	7	9		K	D	8	1							Includes Debris
237	U	1	8	0		K	D	8	1							Includes Debris
238	U	1	8	1		K	D	8	1							Includes Debris
239	U	1	8	2		K	D	8	1							Includes Debris
240	U	1	8	3		K	D	8	1							Includes Debris
241	U	1	8	4		K	D	8	1							Includes Debris
242	U	1	8	5		K	D	8	1							Includes Debris
243	U	1	8	6		K	D	8	1							Includes Debris
244	U	1	8	7		K	D	8	1							Includes Debris
245	U	1	8	8		K	D	8	1							Includes Debris
246	U	1	8	9		K	D	8	1							Includes Debris
247	U	1	9	0		K	D	8	1							Includes Debris
248	U	1	9	1		K	D	8	1							Includes Debris
249	U	1	9	2		K	D	8	1							Includes Debris
250	U	1	9	3		K	D	8	1							Includes Debris
251	U	1	9	4		K	D	8	1							Includes Debris
252	U	1	9	6		K	D	8	1							Includes Debris
253	U	1	9	7		K	D	8	1							Includes Debris
254	U	2	0	0		K	D	8	1							Includes Debris
255	U	2	0	1		K	D	8	1							Includes Debris
256	U	2	0	2		K	D	8	1							Includes Debris
257	U	2	0	3		K	D	8	1							Includes Debris
258	U	2	0	4		K	D	8	1							Includes Debris
259	U	2	0	5		K	D	8	1							Includes Debris
260	U	2	0	6		K	D	8	1							Includes Debris
261	U	2	0	7		K	D	8	1							Includes Debris
262	U	2	0	8		K	D	8	1							Includes Debris
263	U	2	0	9		K	D	8	1							Includes Debris
264	U	2	1	0		K	D	8	1							Includes Debris
265	U	2	1	1		K	D	8	1							Includes Debris
266	U	2	1	3		K	D	8	1							Includes Debris
267	U	2	1	4		K	D	8	1							Includes Debris
268	U	2	1	5		K	D	8	1							Includes Debris
269	U	2	1	6		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
270	U	2	1	7		K	D	8	1							Includes Debris
271	U	2	1	8		K	D	8	1							Includes Debris
272	U	2	1	9		K	D	8	1							Includes Debris
273	U	2	2	0		K	D	8	1							Includes Debris
274	U	2	2	1		K	D	8	1							Includes Debris
275	U	2	2	2		K	D	8	1							Includes Debris
276	U	2	2	3		K	D	8	1							Includes Debris
277	U	2	2	5		K	D	8	1							Includes Debris
278	U	2	2	6		K	D	8	1							Includes Debris
279	U	2	2	7		K	D	8	1							Includes Debris
280	U	2	2	8		K	D	8	1							Includes Debris
281	U	2	3	1		K	D	8	1							Includes Debris
282	U	2	3	2		K	D	8	1							Includes Debris
283	U	2	3	3		K	D	8	1							Includes Debris
284	U	2	3	4		K	D	8	1							Includes Debris
285	U	2	3	5		K	D	8	1							Includes Debris
286	U	2	3	6		K	D	8	1							Includes Debris
287	U	2	3	7		K	D	8	1							Includes Debris
288	U	2	3	8		K	D	8	1							Includes Debris
289	U	2	3	9		K	D	8	1							Includes Debris
290	U	2	4	0		K	D	8	1							Includes Debris
291	U	2	4	3		K	D	8	1							Includes Debris
292	U	2	4	4		K	D	8	1							Includes Debris
293	U	2	4	6		K	D	8	1							Includes Debris
294	U	2	4	7		K	D	8	1							Includes Debris
295	U	2	4	8		K	D	8	1							Includes Debris
296	U	2	4	9		K	D	8	1							Includes Debris
297	U	2	7	1		K	D	8	1							Includes Debris
298	U	2	7	8		K	D	8	1							Includes Debris
299	U	2	7	9		K	D	8	1							Includes Debris
300	U	2	8	0		K	D	8	1							Includes Debris
301	U	3	2	8		K	D	8	1							Includes Debris
302	U	3	5	3		K	D	8	1							Includes Debris
303	U	3	5	9		K	D	8	1							Includes Debris
304	U	3	6	4		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
305	U	3	6	7		K	D	8	1							Includes Debris
306	U	3	7	2		K	D	8	1							Includes Debris
307	U	3	7	3		K	D	8	1							Includes Debris
308	U	3	7	5		K	D	8	1							Includes Debris
309	U	3	8	7		K	D	8	1							Includes Debris
310	U	3	8	9		K	D	8	1							Includes Debris
311	U	3	9	4		K	D	8	1							Includes Debris
312	U	3	9	5		K	D	8	1							Includes Debris
313	U	4	0	1		K	D	8	1							Includes Debris
314	U	4	0	2		K	D	8	1							Includes Debris
315	U	4	0	3		K	D	8	1							Includes Debris
316	U	4	0	4		K	D	8	1							Includes Debris
317	U	4	0	7		K	D	8	1							Includes Debris
318	U	4	0	9		K	D	8	1							Includes Debris
319	U	4	1	0		K	D	8	1							Includes Debris
320	U	4	1	1		K	D	8	1							Includes Debris
321	P	0	0	1		K	D	8	1							Includes Debris
322	P	0	0	2		K	D	8	1							Includes Debris
323	P	0	0	3		K	D	8	1							Includes Debris
324	P	0	0	4		K	D	8	1							Includes Debris
325	P	0	0	5		K	D	8	1							Includes Debris
326	P	0	0	6		K	D	8	1							Includes Debris
327	P	0	0	8		K	D	8	1							Includes Debris
328	P	0	0	9		K	D	8	1							Includes Debris
329	P	0	1	0		K	D	8	1							Includes Debris
330	P	0	1	1		K	D	8	1							Includes Debris
331	P	0	1	2		K	D	8	1							Includes Debris
332	P	0	1	3		K	D	8	1							Includes Debris
333	P	0	1	4		K	D	8	1							Includes Debris
334	P	0	1	5		K	D	8	1							Includes Debris
335	P	0	1	6		K	D	8	1							Includes Debris
336	P	0	1	7		K	D	8	1							Includes Debris
337	P	0	1	8		K	D	8	1							Includes Debris
338	P	0	2	0		K	D	8	1							Includes Debris
339	P	0	2	1		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
340	P	0	2	2		K	D	8	1							Includes Debris
341	P	0	2	3		K	D	8	1							Includes Debris
342	P	0	2	4		K	D	8	1							Includes Debris
343	P	0	2	6		K	D	8	1							Includes Debris
344	P	0	2	7		K	D	8	1							Includes Debris
345	P	0	2	8		K	D	8	1							Includes Debris
346	P	0	2	9		K	D	8	1							Includes Debris
347	P	0	3	0		K	D	8	1							Includes Debris
348	P	0	3	1		K	D	8	1							Includes Debris
349	P	0	3	3		K	D	8	1							Includes Debris
350	P	0	3	4		K	D	8	1							Includes Debris
351	P	0	3	6		K	D	8	1							Includes Debris
352	P	0	3	7		K	D	8	1							Includes Debris
353	P	0	3	8		K	D	8	1							Includes Debris
354	P	0	3	9		K	D	8	1							Includes Debris
355	P	0	4	0		K	D	8	1							Includes Debris
356	P	0	4	1		K	D	8	1							Includes Debris
357	P	0	4	2		K	D	8	1							Includes Debris
358	P	0	4	3		K	D	8	1							Includes Debris
359	P	0	4	4		K	D	8	1							Includes Debris
360	P	0	4	5		K	D	8	1							Includes Debris
361	P	0	4	6		K	D	8	1							Includes Debris
362	P	0	4	7		K	D	8	1							Includes Debris
363	P	0	4	8		K	D	8	1							Includes Debris
364	P	0	4	9		K	D	8	1							Includes Debris
365	P	0	5	0		K	D	8	1							Includes Debris
366	P	0	5	1		K	D	8	1							Includes Debris
367	P	0	5	4		K	D	8	1							Includes Debris
368	P	0	5	6		K	D	8	1							Includes Debris
369	P	0	5	7		K	D	8	1							Includes Debris
370	P	0	5	8		K	D	8	1							Includes Debris
371	P	0	5	9		K	D	8	1							Includes Debris
372	P	0	6	0		K	D	8	1							Includes Debris
373	P	0	6	2		K	D	8	1							Includes Debris
374	P	0	6	3		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
375	P	0	6	4		K	D	8	1							Includes Debris
376	P	0	6	5		K	D	8	1							Includes Debris
377	P	0	6	6		K	D	8	1							Includes Debris
378	P	0	6	7		K	D	8	1							Includes Debris
379	P	0	6	8		K	D	8	1							Includes Debris
380	P	0	6	9		K	D	8	1							Includes Debris
381	P	0	7	0		K	D	8	1							Includes Debris
382	P	0	7	1		K	D	8	1							Includes Debris
383	P	0	7	2		K	D	8	1							Includes Debris
384	P	0	7	3		K	D	8	1							Includes Debris
385	P	0	7	4		K	D	8	1							Includes Debris
386	P	0	7	5		K	D	8	1							Includes Debris
387	P	0	7	6		K	D	8	1							Includes Debris
388	P	0	7	7		K	D	8	1							Includes Debris
389	P	0	7	8		K	D	8	1							Includes Debris
390	P	0	8	1		K	D	8	1							Includes Debris
391	P	0	8	2		K	D	8	1							Includes Debris
392	P	0	8	4		K	D	8	1							Includes Debris
393	P	0	8	5		K	D	8	1							Includes Debris
394	P	0	8	7		K	D	8	1							Includes Debris
395	P	0	8	8		K	D	8	1							Includes Debris
396	P	0	8	9		K	D	8	1							Includes Debris
397	P	0	9	2		K	D	8	1							Includes Debris
398	P	0	9	3		K	D	8	1							Includes Debris
399	P	0	9	4		K	D	8	1							Includes Debris
400	P	0	9	5		K	D	8	1							Includes Debris
401	P	0	9	6		K	D	8	1							Includes Debris
402	P	0	9	7		K	D	8	1							Includes Debris
403	P	0	9	8		K	D	8	1							Includes Debris
404	P	0	9	9		K	D	8	1							Includes Debris
405	P	1	0	1		K	D	8	1							Includes Debris
406	P	1	0	2		K	D	8	1							Includes Debris
407	P	1	0	3		K	D	8	1							Includes Debris
408	P	1	0	4		K	D	8	1							Includes Debris
409	P	1	0	5		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
410	P	1	0	6		K	D	8	1							Includes Debris
411	P	1	0	8		K	D	8	1							Includes Debris
412	P	1	0	9		K	D	8	1							Includes Debris
413	P	1	1	0		K	D	8	1							Includes Debris
414	P	1	1	1		K	D	8	1							Includes Debris
415	P	1	1	2		K	D	8	1							Includes Debris
416	P	1	1	3		K	D	8	1							Includes Debris
417	P	1	1	4		K	D	8	1							Includes Debris
418	P	1	1	5		K	D	8	1							Includes Debris
419	P	1	1	6		K	D	8	1							Includes Debris
420	P	1	1	8		K	D	8	1							Includes Debris
421	P	1	1	9		K	D	8	1							Includes Debris
422	P	1	2	0		K	D	8	1							Includes Debris
423	P	1	2	1		K	D	8	1							Includes Debris
424	P	1	2	2		K	D	8	1							Includes Debris
425	P	1	2	3		K	D	8	1							Includes Debris
426	P	1	2	7		K	D	8	1							Includes Debris
427	P	1	2	8		K	D	8	1							Includes Debris
428	P	1	8	5		K	D	8	1							Includes Debris
429	P	1	8	8		K	D	8	1							Includes Debris
430	P	1	8	9		K	D	8	1							Includes Debris
431	P	1	9	0		K	D	8	1							Includes Debris
432	P	1	9	1		K	D	8	1							Includes Debris
433	P	1	9	2		K	D	8	1							Includes Debris
434	P	1	9	4		K	D	8	1							Includes Debris
435	P	1	9	6		K	D	8	1							Includes Debris
436	P	1	9	7		K	D	8	1							Includes Debris
437	P	1	9	8		K	D	8	1							Includes Debris
438	P	1	9	9		K	D	8	1							Includes Debris
439	P	2	0	1		K	D	8	1							Includes Debris
440	P	2	0	2		K	D	8	1							Includes Debris
441	P	2	0	3		K	D	8	1							Includes Debris
442	P	2	0	4		K	D	8	1							Includes Debris
443	P	2	0	5		K	D	8	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
444	D	0	0	4	10,000,000	K	S	0	1	T	0	4				Includes Debris
445	D	0	0	5		K	S	0	1	T	0	4				Includes Debris
446	D	0	0	6		K	S	0	1	T	0	4				Includes Debris
447	D	0	0	7		K	S	0	1	T	0	4				Includes Debris
448	D	0	0	8		K	S	0	1	T	0	4				Includes Debris
449	D	0	0	9		K	S	0	1	T	0	4				Includes Debris
450	D	0	1	0		K	S	0	1	T	0	4				Includes Debris
451	D	0	1	1		K	S	0	1	T	0	4				Includes Debris
452	D	0	1	2		K	S	0	1	T	0	4				Includes Debris
453	D	0	1	3		K	S	0	1	T	0	4				Includes Debris
454	D	0	1	4		K	S	0	1	T	0	4				Includes Debris
455	D	0	1	5		K	S	0	1	T	0	4				Includes Debris
456	D	0	1	6		K	S	0	1	T	0	4				Includes Debris
457	D	0	1	7		K	S	0	1	T	0	4				Includes Debris
458	D	0	1	8		K	S	0	1	T	0	4				Includes Debris
459	D	0	1	9		K	S	0	1	T	0	4				Includes Debris
460	D	0	2	0		K	S	0	1	T	0	4				Includes Debris
461	D	0	2	1		K	S	0	1	T	0	4				Includes Debris
462	D	0	2	2		K	S	0	1	T	0	4				Includes Debris
463	D	0	2	3		K	S	0	1	T	0	4				Includes Debris
464	D	0	2	4		K	S	0	1	T	0	4				Includes Debris
465	D	0	2	5		K	S	0	1	T	0	4				Includes Debris
466	D	0	2	6		K	S	0	1	T	0	4				Includes Debris
467	D	0	2	7		K	S	0	1	T	0	4				Includes Debris
468	D	0	2	8		K	S	0	1	T	0	4				Includes Debris
469	D	0	2	9		K	S	0	1	T	0	4				Includes Debris
470	D	0	3	0		K	S	0	1	T	0	4				Includes Debris
471	D	0	3	1		K	S	0	1	T	0	4				Includes Debris
472	D	0	3	2		K	S	0	1	T	0	4				Includes Debris
473	D	0	3	3		K	S	0	1	T	0	4				Includes Debris
474	D	0	3	4		K	S	0	1	T	0	4				Includes Debris
475	D	0	3	5		K	S	0	1	T	0	4				Includes Debris
476	D	0	3	6		K	S	0	1	T	0	4				Includes Debris
477	D	0	3	7		K	S	0	1	T	0	4				Includes Debris
478	D	0	3	8		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
479	D	0	3	9		K	S	0	1	T	0	4				Includes Debris
480	D	0	4	0		K	S	0	1	T	0	4				Includes Debris
481	D	0	4	1		K	S	0	1	T	0	4				Includes Debris
482	D	0	4	2		K	S	0	1	T	0	4				Includes Debris
483	D	0	4	3		K	S	0	1	T	0	4				Includes Debris
484	W	P	0	1		K	S	0	1	T	0	4				Includes Debris
485	W	P	0	2		K	S	0	1	T	0	4				Includes Debris
486	W	P	0	3		K	S	0	1	T	0	4				Includes Debris
487	W	P	C	B		K	S	0	1	T	0	4				Includes Debris
488	W	S	C	2		K	S	0	1	T	0	4				Includes Debris
489	W	T	0	1		K	S	0	1	T	0	4				Includes Debris
490	W	T	0	2		K	S	0	1	T	0	4				Includes Debris
491	F	0	0	1		K	S	0	1	T	0	4				Includes Debris
492	F	0	0	2		K	S	0	1	T	0	4				Includes Debris
493	F	0	0	3		K	S	0	1	T	0	4				Includes Debris
494	F	0	0	4		K	S	0	1	T	0	4				Includes Debris
495	F	0	0	5		K	S	0	1	T	0	4				Includes Debris
496	F	0	0	6		K	S	0	1	T	0	4				Includes Debris
497	F	0	0	7		K	S	0	1	T	0	4				Includes Debris
498	F	0	0	8		K	S	0	1	T	0	4				Includes Debris
499	F	0	0	9		K	S	0	1	T	0	4				Includes Debris
500	F	0	1	0		K	S	0	1	T	0	4				Includes Debris
501	F	0	1	1		K	S	0	1	T	0	4				Includes Debris
502	F	0	1	2		K	S	0	1	T	0	4				Includes Debris
503	F	0	1	9		K	S	0	1	T	0	4				Includes Debris
504	F	0	2	8		K	S	0	1	T	0	4				Includes Debris
505	U	0	0	1		K	S	0	1	T	0	4				Includes Debris
506	U	0	0	2		K	S	0	1	T	0	4				Includes Debris
507	U	0	0	3		K	S	0	1	T	0	4				Includes Debris
508	U	0	0	4		K	S	0	1	T	0	4				Includes Debris
509	U	0	0	5		K	S	0	1	T	0	4				Includes Debris
510	U	0	0	6		K	S	0	1	T	0	4				Includes Debris
511	U	0	0	7		K	S	0	1	T	0	4				Includes Debris
512	U	0	0	8		K	S	0	1	T	0	4				Includes Debris
513	U	0	0	9		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
514	U	0	1	0		K	S	0	1	T	0	4				Includes Debris
515	U	0	1	1		K	S	0	1	T	0	4				Includes Debris
516	U	0	1	2		K	S	0	1	T	0	4				Includes Debris
517	U	0	1	4		K	S	0	1	T	0	4				Includes Debris
518	U	0	1	5		K	S	0	1	T	0	4				Includes Debris
519	U	0	1	6		K	S	0	1	T	0	4				Includes Debris
520	U	0	1	7		K	S	0	1	T	0	4				Includes Debris
521	U	0	1	8		K	S	0	1	T	0	4				Includes Debris
522	U	0	1	9		K	S	0	1	T	0	4				Includes Debris
523	U	0	2	0		K	S	0	1	T	0	4				Includes Debris
524	U	0	2	1		K	S	0	1	T	0	4				Includes Debris
525	U	0	2	2		K	S	0	1	T	0	4				Includes Debris
526	U	0	2	3		K	S	0	1	T	0	4				Includes Debris
527	U	0	2	4		K	S	0	1	T	0	4				Includes Debris
528	U	0	2	5		K	S	0	1	T	0	4				Includes Debris
529	U	0	2	6		K	S	0	1	T	0	4				Includes Debris
530	U	0	2	7		K	S	0	1	T	0	4				Includes Debris
531	U	0	2	8		K	S	0	1	T	0	4				Includes Debris
532	U	0	2	9		K	S	0	1	T	0	4				Includes Debris
533	U	0	3	0		K	S	0	1	T	0	4				Includes Debris
534	U	0	3	1		K	S	0	1	T	0	4				Includes Debris
535	U	0	3	2		K	S	0	1	T	0	4				Includes Debris
536	U	0	3	3		K	S	0	1	T	0	4				Includes Debris
537	U	0	3	4		K	S	0	1	T	0	4				Includes Debris
538	U	0	3	5		K	S	0	1	T	0	4				Includes Debris
539	U	0	3	6		K	S	0	1	T	0	4				Includes Debris
540	U	0	3	7		K	S	0	1	T	0	4				Includes Debris
541	U	0	3	8		K	S	0	1	T	0	4				Includes Debris
542	U	0	3	9		K	S	0	1	T	0	4				Includes Debris
543	U	0	4	1		K	S	0	1	T	0	4				Includes Debris
544	U	0	4	2		K	S	0	1	T	0	4				Includes Debris
545	U	0	4	3		K	S	0	1	T	0	4				Includes Debris
546	U	0	4	4		K	S	0	1	T	0	4				Includes Debris
547	U	0	4	5		K	S	0	1	T	0	4				Includes Debris
548	U	0	4	6		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
549	U	0	4	7		K	S	0	1	T	0	4				Includes Debris
550	U	0	4	8		K	S	0	1	T	0	4				Includes Debris
551	U	0	4	9		K	S	0	1	T	0	4				Includes Debris
552	U	0	5	0		K	S	0	1	T	0	4				Includes Debris
553	U	0	5	1		K	S	0	1	T	0	4				Includes Debris
554	U	0	5	2		K	S	0	1	T	0	4				Includes Debris
555	U	0	5	3		K	S	0	1	T	0	4				Includes Debris
556	U	0	5	5		K	S	0	1	T	0	4				Includes Debris
557	U	0	5	6		K	S	0	1	T	0	4				Includes Debris
558	U	0	5	7		K	S	0	1	T	0	4				Includes Debris
559	U	0	5	8		K	S	0	1	T	0	4				Includes Debris
560	U	0	5	9		K	S	0	1	T	0	4				Includes Debris
561	U	0	6	0		K	S	0	1	T	0	4				Includes Debris
562	U	0	6	1		K	S	0	1	T	0	4				Includes Debris
563	U	0	6	2		K	S	0	1	T	0	4				Includes Debris
564	U	0	6	3		K	S	0	1	T	0	4				Includes Debris
565	U	0	6	4		K	S	0	1	T	0	4				Includes Debris
566	U	0	6	6		K	S	0	1	T	0	4				Includes Debris
567	U	0	6	7		K	S	0	1	T	0	4				Includes Debris
568	U	0	6	8		K	S	0	1	T	0	4				Includes Debris
569	U	0	6	9		K	S	0	1	T	0	4				Includes Debris
570	U	0	7	0		K	S	0	1	T	0	4				Includes Debris
571	U	0	7	1		K	S	0	1	T	0	4				Includes Debris
572	U	0	7	2		K	S	0	1	T	0	4				Includes Debris
573	U	0	7	3		K	S	0	1	T	0	4				Includes Debris
574	U	0	7	4		K	S	0	1	T	0	4				Includes Debris
575	U	0	7	5		K	S	0	1	T	0	4				Includes Debris
576	U	0	7	6		K	S	0	1	T	0	4				Includes Debris
577	U	0	7	7		K	S	0	1	T	0	4				Includes Debris
578	U	0	7	8		K	S	0	1	T	0	4				Includes Debris
579	U	0	7	9		K	S	0	1	T	0	4				Includes Debris
580	U	0	8	0		K	S	0	1	T	0	4				Includes Debris
581	U	0	8	1		K	S	0	1	T	0	4				Includes Debris
582	U	0	8	2		K	S	0	1	T	0	4				Includes Debris
583	U	0	8	3		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
584	U	0	8	4		K	S	0	1	T	0	4				Includes Debris
585	U	0	8	5		K	S	0	1	T	0	4				Includes Debris
586	U	0	8	6		K	S	0	1	T	0	4				Includes Debris
587	U	0	8	7		K	S	0	1	T	0	4				Includes Debris
588	U	0	8	8		K	S	0	1	T	0	4				Includes Debris
589	U	0	8	9		K	S	0	1	T	0	4				Includes Debris
590	U	0	9	0		K	S	0	1	T	0	4				Includes Debris
591	U	0	9	1		K	S	0	1	T	0	4				Includes Debris
592	U	0	9	2		K	S	0	1	T	0	4				Includes Debris
593	U	0	9	3		K	S	0	1	T	0	4				Includes Debris
594	U	0	9	4		K	S	0	1	T	0	4				Includes Debris
595	U	0	9	5		K	S	0	1	T	0	4				Includes Debris
596	U	0	9	6		K	S	0	1	T	0	4				Includes Debris
597	U	0	9	7		K	S	0	1	T	0	4				Includes Debris
598	U	0	9	8		K	S	0	1	T	0	4				Includes Debris
599	U	0	9	9		K	S	0	1	T	0	4				Includes Debris
600	U	1	0	1		K	S	0	1	T	0	4				Includes Debris
601	U	1	0	2		K	S	0	1	T	0	4				Includes Debris
602	U	1	0	3		K	S	0	1	T	0	4				Includes Debris
603	U	1	0	5		K	S	0	1	T	0	4				Includes Debris
604	U	1	0	6		K	S	0	1	T	0	4				Includes Debris
605	U	1	0	7		K	S	0	1	T	0	4				Includes Debris
606	U	1	0	8		K	S	0	1	T	0	4				Includes Debris
607	U	1	0	9		K	S	0	1	T	0	4				Includes Debris
608	U	1	1	0		K	S	0	1	T	0	4				Includes Debris
609	U	1	1	1		K	S	0	1	T	0	4				Includes Debris
610	U	1	1	2		K	S	0	1	T	0	4				Includes Debris
611	U	1	1	3		K	S	0	1	T	0	4				Includes Debris
612	U	1	1	4		K	S	0	1	T	0	4				Includes Debris
613	U	1	1	5		K	S	0	1	T	0	4				Includes Debris
614	U	1	1	6		K	S	0	1	T	0	4				Includes Debris
615	U	1	1	7		K	S	0	1	T	0	4				Includes Debris
616	U	1	1	8		K	S	0	1	T	0	4				Includes Debris
617	U	1	1	9		K	S	0	1	T	0	4				Includes Debris
618	U	1	2	0		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
619	U	1	2	1		K	S	0	1	T	0	4				Includes Debris
620	U	1	2	2		K	S	0	1	T	0	4				Includes Debris
621	U	1	2	3		K	S	0	1	T	0	4				Includes Debris
622	U	1	2	4		K	S	0	1	T	0	4				Includes Debris
623	U	1	2	5		K	S	0	1	T	0	4				Includes Debris
624	U	1	2	6		K	S	0	1	T	0	4				Includes Debris
625	U	1	2	7		K	S	0	1	T	0	4				Includes Debris
626	U	1	2	8		K	S	0	1	T	0	4				Includes Debris
627	U	1	2	9		K	S	0	1	T	0	4				Includes Debris
628	U	1	3	0		K	S	0	1	T	0	4				Includes Debris
629	U	1	3	1		K	S	0	1	T	0	4				Includes Debris
630	U	1	3	2		K	S	0	1	T	0	4				Includes Debris
631	U	1	3	3		K	S	0	1	T	0	4				Includes Debris
632	U	1	3	4		K	S	0	1	T	0	4				Includes Debris
633	U	1	3	5		K	S	0	1	T	0	4				Includes Debris
634	U	1	3	6		K	S	0	1	T	0	4				Includes Debris
635	U	1	3	7		K	S	0	1	T	0	4				Includes Debris
636	U	1	3	8		K	S	0	1	T	0	4				Includes Debris
637	U	1	4	0		K	S	0	1	T	0	4				Includes Debris
638	U	1	4	1		K	S	0	1	T	0	4				Includes Debris
639	U	1	4	2		K	S	0	1	T	0	4				Includes Debris
640	U	1	4	3		K	S	0	1	T	0	4				Includes Debris
641	U	1	4	4		K	S	0	1	T	0	4				Includes Debris
642	U	1	4	5		K	S	0	1	T	0	4				Includes Debris
643	U	1	4	6		K	S	0	1	T	0	4				Includes Debris
644	U	1	4	7		K	S	0	1	T	0	4				Includes Debris
645	U	1	4	8		K	S	0	1	T	0	4				Includes Debris
646	U	1	4	9		K	S	0	1	T	0	4				Includes Debris
647	U	1	5	0		K	S	0	1	T	0	4				Includes Debris
648	U	1	5	1		K	S	0	1	T	0	4				Includes Debris
649	U	1	5	2		K	S	0	1	T	0	4				Includes Debris
650	U	1	5	3		K	S	0	1	T	0	4				Includes Debris
651	U	1	5	4		K	S	0	1	T	0	4				Includes Debris
652	U	1	5	5		K	S	0	1	T	0	4				Includes Debris
653	U	1	5	6		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
654	U	1	5	7		K	S	0	1	T	0	4				Includes Debris
655	U	1	5	8		K	S	0	1	T	0	4				Includes Debris
656	U	1	5	9		K	S	0	1	T	0	4				Includes Debris
657	U	1	6	0		K	S	0	1	T	0	4				Includes Debris
658	U	1	6	1		K	S	0	1	T	0	4				Includes Debris
659	U	1	6	2		K	S	0	1	T	0	4				Includes Debris
660	U	1	6	3		K	S	0	1	T	0	4				Includes Debris
661	U	1	6	4		K	S	0	1	T	0	4				Includes Debris
662	U	1	6	5		K	S	0	1	T	0	4				Includes Debris
663	U	1	6	6		K	S	0	1	T	0	4				Includes Debris
664	U	1	6	7		K	S	0	1	T	0	4				Includes Debris
665	U	1	6	8		K	S	0	1	T	0	4				Includes Debris
666	U	1	6	9		K	S	0	1	T	0	4				Includes Debris
667	U	1	7	0		K	S	0	1	T	0	4				Includes Debris
668	U	1	7	1		K	S	0	1	T	0	4				Includes Debris
669	U	1	7	2		K	S	0	1	T	0	4				Includes Debris
670	U	1	7	3		K	S	0	1	T	0	4				Includes Debris
671	U	1	7	4		K	S	0	1	T	0	4				Includes Debris
672	U	1	7	6		K	S	0	1	T	0	4				Includes Debris
673	U	1	7	7		K	S	0	1	T	0	4				Includes Debris
674	U	1	7	8		K	S	0	1	T	0	4				Includes Debris
675	U	1	7	9		K	S	0	1	T	0	4				Includes Debris
676	U	1	8	0		K	S	0	1	T	0	4				Includes Debris
677	U	1	8	1		K	S	0	1	T	0	4				Includes Debris
678	U	1	8	2		K	S	0	1	T	0	4				Includes Debris
679	U	1	8	3		K	S	0	1	T	0	4				Includes Debris
680	U	1	8	4		K	S	0	1	T	0	4				Includes Debris
681	U	1	8	5		K	S	0	1	T	0	4				Includes Debris
682	U	1	8	6		K	S	0	1	T	0	4				Includes Debris
683	U	1	8	7		K	S	0	1	T	0	4				Includes Debris
684	U	1	8	8		K	S	0	1	T	0	4				Includes Debris
685	U	1	8	9		K	S	0	1	T	0	4				Includes Debris
686	U	1	9	0		K	S	0	1	T	0	4				Includes Debris
687	U	1	9	1		K	S	0	1	T	0	4				Includes Debris
688	U	1	9	2		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
689	U	1	9	3		K	S	0	1	T	0	4				Includes Debris
690	U	1	9	4		K	S	0	1	T	0	4				Includes Debris
691	U	1	9	6		K	S	0	1	T	0	4				Includes Debris
692	U	1	9	7		K	S	0	1	T	0	4				Includes Debris
693	U	2	0	0		K	S	0	1	T	0	4				Includes Debris
694	U	2	0	1		K	S	0	1	T	0	4				Includes Debris
695	U	2	0	2		K	S	0	1	T	0	4				Includes Debris
696	U	2	0	3		K	S	0	1	T	0	4				Includes Debris
697	U	2	0	4		K	S	0	1	T	0	4				Includes Debris
698	U	2	0	5		K	S	0	1	T	0	4				Includes Debris
699	U	2	0	6		K	S	0	1	T	0	4				Includes Debris
700	U	2	0	7		K	S	0	1	T	0	4				Includes Debris
701	U	2	0	8		K	S	0	1	T	0	4				Includes Debris
702	U	2	0	9		K	S	0	1	T	0	4				Includes Debris
703	U	2	1	0		K	S	0	1	T	0	4				Includes Debris
704	U	2	1	1		K	S	0	1	T	0	4				Includes Debris
705	U	2	1	3		K	S	0	1	T	0	4				Includes Debris
706	U	2	1	4		K	S	0	1	T	0	4				Includes Debris
707	U	2	1	5		K	S	0	1	T	0	4				Includes Debris
708	U	2	1	6		K	S	0	1	T	0	4				Includes Debris
709	U	2	1	7		K	S	0	1	T	0	4				Includes Debris
710	U	2	1	8		K	S	0	1	T	0	4				Includes Debris
711	U	2	1	9		K	S	0	1	T	0	4				Includes Debris
712	U	2	2	0		K	S	0	1	T	0	4				Includes Debris
713	U	2	2	1		K	S	0	1	T	0	4				Includes Debris
714	U	2	2	2		K	S	0	1	T	0	4				Includes Debris
715	U	2	2	3		K	S	0	1	T	0	4				Includes Debris
716	U	2	2	5		K	S	0	1	T	0	4				Includes Debris
717	U	2	2	6		K	S	0	1	T	0	4				Includes Debris
718	U	2	2	7		K	S	0	1	T	0	4				Includes Debris
719	U	2	2	8		K	S	0	1	T	0	4				Includes Debris
720	U	2	3	1		K	S	0	1	T	0	4				Includes Debris
721	U	2	3	2		K	S	0	1	T	0	4				Includes Debris
722	U	2	3	3		K	S	0	1	T	0	4				Includes Debris
723	U	2	3	4		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
724	U	2	3	5		K	S	0	1	T	0	4				Includes Debris
725	U	2	3	6		K	S	0	1	T	0	4				Includes Debris
726	U	2	3	7		K	S	0	1	T	0	4				Includes Debris
727	U	2	3	8		K	S	0	1	T	0	4				Includes Debris
728	U	2	3	9		K	S	0	1	T	0	4				Includes Debris
729	U	2	4	0		K	S	0	1	T	0	4				Includes Debris
730	U	2	4	3		K	S	0	1	T	0	4				Includes Debris
731	U	2	4	4		K	S	0	1	T	0	4				Includes Debris
732	U	2	4	6		K	S	0	1	T	0	4				Includes Debris
733	U	2	4	7		K	S	0	1	T	0	4				Includes Debris
734	U	2	4	8		K	S	0	1	T	0	4				Includes Debris
735	U	2	4	9		K	S	0	1	T	0	4				Includes Debris
736	U	2	7	1		K	S	0	1	T	0	4				Includes Debris
737	U	2	7	8		K	S	0	1	T	0	4				Includes Debris
738	U	2	7	9		K	S	0	1	T	0	4				Includes Debris
739	U	2	8	0		K	S	0	1	T	0	4				Includes Debris
740	U	3	2	8		K	S	0	1	T	0	4				Includes Debris
741	U	3	5	3		K	S	0	1	T	0	4				Includes Debris
742	U	3	5	9		K	S	0	1	T	0	4				Includes Debris
743	U	3	6	4		K	S	0	1	T	0	4				Includes Debris
744	U	3	6	7		K	S	0	1	T	0	4				Includes Debris
745	U	3	7	2		K	S	0	1	T	0	4				Includes Debris
746	U	3	7	3		K	S	0	1	T	0	4				Includes Debris
747	U	3	7	5		K	S	0	1	T	0	4				Includes Debris
748	U	3	8	1		K	S	0	1	T	0	4				Includes Debris
749	U	3	8	2		K	S	0	1	T	0	4				Includes Debris
750	U	3	8	3		K	S	0	1	T	0	4				Includes Debris
751	U	3	8	4		K	S	0	1	T	0	4				Includes Debris
752	U	3	8	5		K	S	0	1	T	0	4				Includes Debris
753	U	3	8	6		K	S	0	1	T	0	4				Includes Debris
754	U	3	8	7		K	S	0	1	T	0	4				Includes Debris
755	U	3	8	9		K	S	0	1	T	0	4				Includes Debris
756	U	3	9	4		K	S	0	1	T	0	4				Includes Debris
757	U	3	9	5		K	S	0	1	T	0	4				Includes Debris
758	U	4	0	1		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
759	U	4	0	2		K	S	0	1	T	0	4				Includes Debris
760	U	4	0	3		K	S	0	1	T	0	4				Includes Debris
761	U	4	0	4		K	S	0	1	T	0	4				Includes Debris
762	U	4	0	7		K	S	0	1	T	0	4				Includes Debris
763	U	4	0	9		K	S	0	1	T	0	4				Includes Debris
764	U	4	1	0		K	S	0	1	T	0	4				Includes Debris
765	U	4	1	1		K	S	0	1	T	0	4				Includes Debris
766	P	0	0	1		K	S	0	1	T	0	4				Includes Debris
767	P	0	0	2		K	S	0	1	T	0	4				Includes Debris
768	P	0	0	3		K	S	0	1	T	0	4				Includes Debris
769	P	0	0	4		K	S	0	1	T	0	4				Includes Debris
770	P	0	0	5		K	S	0	1	T	0	4				Includes Debris
771	P	0	0	6		K	S	0	1	T	0	4				Includes Debris
772	P	0	0	7		K	S	0	1	T	0	4				Includes Debris
773	P	0	0	8		K	S	0	1	T	0	4				Includes Debris
774	P	0	0	9		K	S	0	1	T	0	4				Includes Debris
775	P	0	1	0		K	S	0	1	T	0	4				Includes Debris
776	P	0	1	1		K	S	0	1	T	0	4				Includes Debris
777	P	0	1	2		K	S	0	1	T	0	4				Includes Debris
778	P	0	1	3		K	S	0	1	T	0	4				Includes Debris
779	P	0	1	4		K	S	0	1	T	0	4				Includes Debris
780	P	0	1	5		K	S	0	1	T	0	4				Includes Debris
781	P	0	1	6		K	S	0	1	T	0	4				Includes Debris
782	P	0	1	7		K	S	0	1	T	0	4				Includes Debris
783	P	0	1	8		K	S	0	1	T	0	4				Includes Debris
784	P	0	2	0		K	S	0	1	T	0	4				Includes Debris
785	P	0	2	1		K	S	0	1	T	0	4				Includes Debris
786	P	0	2	2		K	S	0	1	T	0	4				Includes Debris
787	P	0	2	3		K	S	0	1	T	0	4				Includes Debris
788	P	0	2	4		K	S	0	1	T	0	4				Includes Debris
789	P	0	2	6		K	S	0	1	T	0	4				Includes Debris
790	P	0	2	7		K	S	0	1	T	0	4				Includes Debris
791	P	0	2	8		K	S	0	1	T	0	4				Includes Debris
792	P	0	2	9		K	S	0	1	T	0	4				Includes Debris
793	P	0	3	0		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
794	P	0	3	1		K	S	0	1	T	0	4				Includes Debris
795	P	0	3	3		K	S	0	1	T	0	4				Includes Debris
796	P	0	3	4		K	S	0	1	T	0	4				Includes Debris
797	P	0	3	6		K	S	0	1	T	0	4				Includes Debris
798	P	0	3	7		K	S	0	1	T	0	4				Includes Debris
799	P	0	3	8		K	S	0	1	T	0	4				Includes Debris
800	P	0	3	9		K	S	0	1	T	0	4				Includes Debris
801	P	0	4	0		K	S	0	1	T	0	4				Includes Debris
802	P	0	4	1		K	S	0	1	T	0	4				Includes Debris
803	P	0	4	2		K	S	0	1	T	0	4				Includes Debris
804	P	0	4	3		K	S	0	1	T	0	4				Includes Debris
805	P	0	4	4		K	S	0	1	T	0	4				Includes Debris
806	P	0	4	5		K	S	0	1	T	0	4				Includes Debris
807	P	0	4	6		K	S	0	1	T	0	4				Includes Debris
808	P	0	4	7		K	S	0	1	T	0	4				Includes Debris
809	P	0	4	8		K	S	0	1	T	0	4				Includes Debris
810	P	0	4	9		K	S	0	1	T	0	4				Includes Debris
811	P	0	5	0		K	S	0	1	T	0	4				Includes Debris
812	P	0	5	1		K	S	0	1	T	0	4				Includes Debris
813	P	0	5	4		K	S	0	1	T	0	4				Includes Debris
814	P	0	5	6		K	S	0	1	T	0	4				Includes Debris
815	P	0	5	7		K	S	0	1	T	0	4				Includes Debris
816	P	0	5	8		K	S	0	1	T	0	4				Includes Debris
817	P	0	5	9		K	S	0	1	T	0	4				Includes Debris
818	P	0	6	0		K	S	0	1	T	0	4				Includes Debris
819	P	0	6	2		K	S	0	1	T	0	4				Includes Debris
820	P	0	6	3		K	S	0	1	T	0	4				Includes Debris
821	P	0	6	4		K	S	0	1	T	0	4				Includes Debris
822	P	0	6	5		K	S	0	1	T	0	4				Includes Debris
823	P	0	6	6		K	S	0	1	T	0	4				Includes Debris
824	P	0	6	7		K	S	0	1	T	0	4				Includes Debris
825	P	0	6	8		K	S	0	1	T	0	4				Includes Debris
826	P	0	6	9		K	S	0	1	T	0	4				Includes Debris
827	P	0	7	0		K	S	0	1	T	0	4				Includes Debris
828	P	0	7	1		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
829	P	0	7	2		K	S	0	1	T	0	4				Includes Debris
830	P	0	7	3		K	S	0	1	T	0	4				Includes Debris
831	P	0	7	4		K	S	0	1	T	0	4				Includes Debris
832	P	0	7	5		K	S	0	1	T	0	4				Includes Debris
833	P	0	7	6		K	S	0	1	T	0	4				Includes Debris
834	P	0	7	7		K	S	0	1	T	0	4				Includes Debris
835	P	0	7	8		K	S	0	1	T	0	4				Includes Debris
836	P	0	8	1		K	S	0	1	T	0	4				Includes Debris
837	P	0	8	2		K	S	0	1	T	0	4				Includes Debris
838	P	0	8	4		K	S	0	1	T	0	4				Includes Debris
839	P	0	8	5		K	S	0	1	T	0	4				Includes Debris
840	P	0	8	7		K	S	0	1	T	0	4				Includes Debris
841	P	0	8	8		K	S	0	1	T	0	4				Includes Debris
842	P	0	8	9		K	S	0	1	T	0	4				Includes Debris
843	P	0	9	2		K	S	0	1	T	0	4				Includes Debris
844	P	0	9	3		K	S	0	1	T	0	4				Includes Debris
845	P	0	9	4		K	S	0	1	T	0	4				Includes Debris
846	P	0	9	5		K	S	0	1	T	0	4				Includes Debris
847	P	0	9	6		K	S	0	1	T	0	4				Includes Debris
848	P	0	9	7		K	S	0	1	T	0	4				Includes Debris
849	P	0	9	8		K	S	0	1	T	0	4				Includes Debris
850	P	0	9	9		K	S	0	1	T	0	4				Includes Debris
851	P	1	0	1		K	S	0	1	T	0	4				Includes Debris
852	P	1	0	2		K	S	0	1	T	0	4				Includes Debris
853	P	1	0	3		K	S	0	1	T	0	4				Includes Debris
854	P	1	0	4		K	S	0	1	T	0	4				Includes Debris
855	P	1	0	5		K	S	0	1	T	0	4				Includes Debris
856	P	1	0	6		K	S	0	1	T	0	4				Includes Debris
857	P	1	0	8		K	S	0	1	T	0	4				Includes Debris
858	P	1	0	9		K	S	0	1	T	0	4				Includes Debris
859	P	1	1	0		K	S	0	1	T	0	4				Includes Debris
860	P	1	1	1		K	S	0	1	T	0	4				Includes Debris
861	P	1	1	2		K	S	0	1	T	0	4				Includes Debris
862	P	1	1	3		K	S	0	1	T	0	4				Includes Debris
863	P	1	1	4		K	S	0	1	T	0	4				Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
							(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
864	P	1	1	5		K	S	0	1	T	0	4				Includes Debris
865	P	1	1	6		K	S	0	1	T	0	4				Includes Debris
866	P	1	1	8		K	S	0	1	T	0	4				Includes Debris
867	P	1	1	9		K	S	0	1	T	0	4				Includes Debris
868	P	1	2	0		K	S	0	1	T	0	4				Includes Debris
869	P	1	2	1		K	S	0	1	T	0	4				Includes Debris
870	P	1	2	2		K	S	0	1	T	0	4				Includes Debris
871	P	1	2	3		K	S	0	1	T	0	4				Includes Debris
872	P	1	2	7		K	S	0	1	T	0	4				Includes Debris
873	P	1	2	8		K	S	0	1	T	0	4				Includes Debris
874	P	1	8	5		K	S	0	1	T	0	4				Includes Debris
875	P	1	8	8		K	S	0	1	T	0	4				Includes Debris
876	P	1	8	9		K	S	0	1	T	0	4				Includes Debris
877	P	1	9	0		K	S	0	1	T	0	4				Includes Debris
878	P	1	9	1		K	S	0	1	T	0	4				Includes Debris
879	P	1	9	2		K	S	0	1	T	0	4				Includes Debris
880	P	1	9	4		K	S	0	1	T	0	4				Includes Debris
881	P	1	9	6		K	S	0	1	T	0	4				Includes Debris
882	P	1	9	7		K	S	0	1	T	0	4				Includes Debris
883	P	1	9	8		K	S	0	1	T	0	4				Includes Debris
884	P	1	9	9		K	S	0	1	T	0	4				Includes Debris
885	P	2	0	1		K	S	0	1	T	0	4				Includes Debris
886	P	2	0	2		K	S	0	1	T	0	4				Includes Debris
887	P	2	0	3		K	S	0	1	T	0	4				Includes Debris
888	P	2	0	4		K	S	0	1	T	0	4				Includes Debris
889	P	2	0	5		K	S	0	1	T	0	4				Includes Debris
890																
891																
892																
893																
894																
895																
896																
897																

XV. Map

Attach to this application a topographic map of the area extending to at least one (1) mile beyond property boundaries. The map must show the outline of the facility; the location of each of its existing and proposed intake and discharge structures; each of its dangerous waste treatment, storage, recycling, or disposal units; and each well where fluids are injected underground. Include all springs, rivers, and other surface water bodies in this map area, plus drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary. The instructions provide additional information on meeting these requirements.

Topographic map is located in the Ecology Library

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (refer to Instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, recycling, and disposal areas; and sites of future storage, treatment, recycling, or disposal areas (refer to Instructions for more detail).

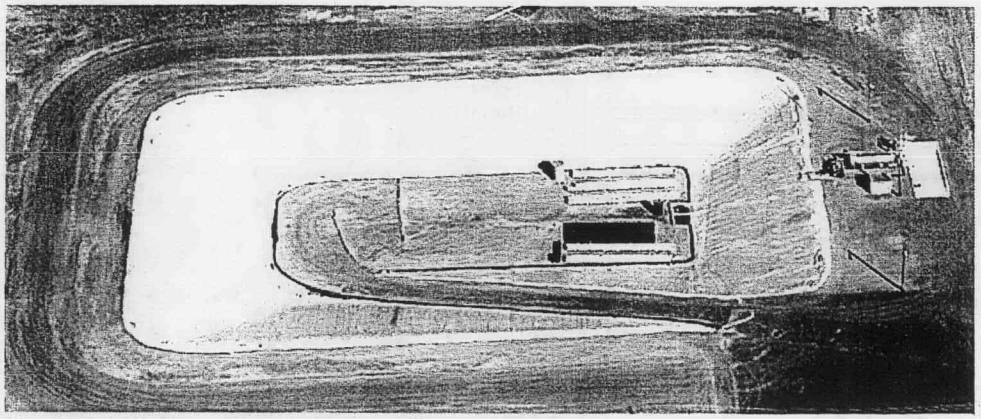
XVIII. Certifications

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Operator Name and Official Title (type or print) David A. Brockman, Manager U.S. Department of Energy Richland Operations Office	**Signature** Doug A. Shoop for	**Date Signed** 9/19/08
Co-Operator* Name and Official Title (type or print) John G. Lehew, III President and Chief Executive Officer CH2M HILL Plateau Remediation Company	**Signature**	**Date Signed** 9/2/08
Co-Operator – Address and Telephone Number* P.O. Box 1600 Richland, WA 99352 (509) 376-0556		
Facility-Property Owner Name and Official Title (type or print) David A. Brockman, Manager U.S. Department of Energy Richland Operations Office	**Signature** Doug A. Shoop for	**Date Signed** 9/19/08

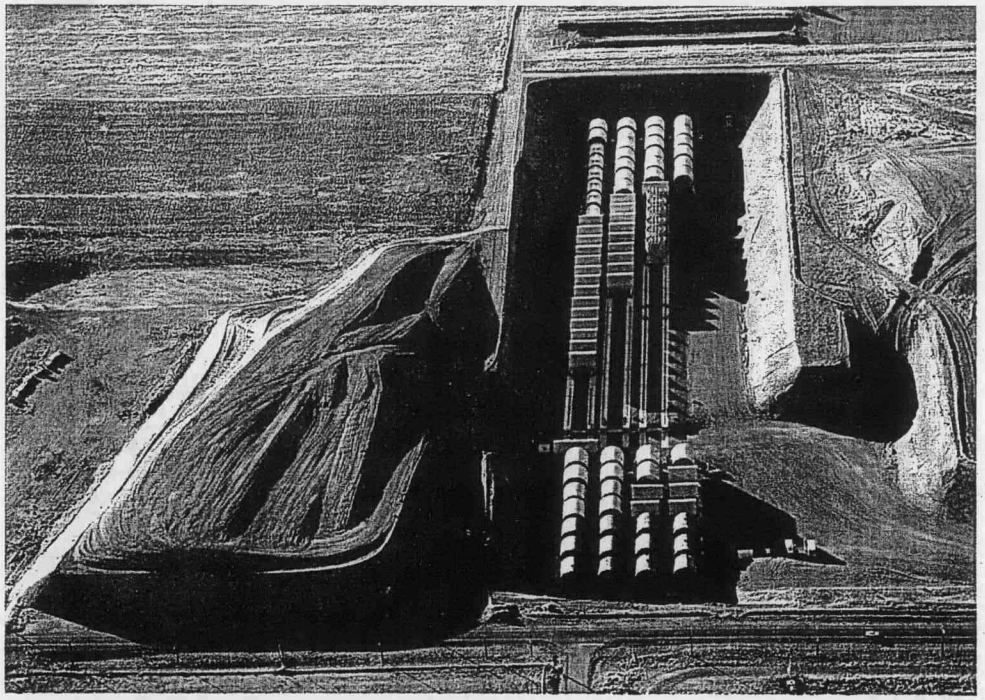
Comments

In Section VII. Facility Operator Information, there is no change to DOE as the Facility Owner/Operator; only a change in Co-Operator*. The change in Co-Operator* will be effective October 1, 2008.



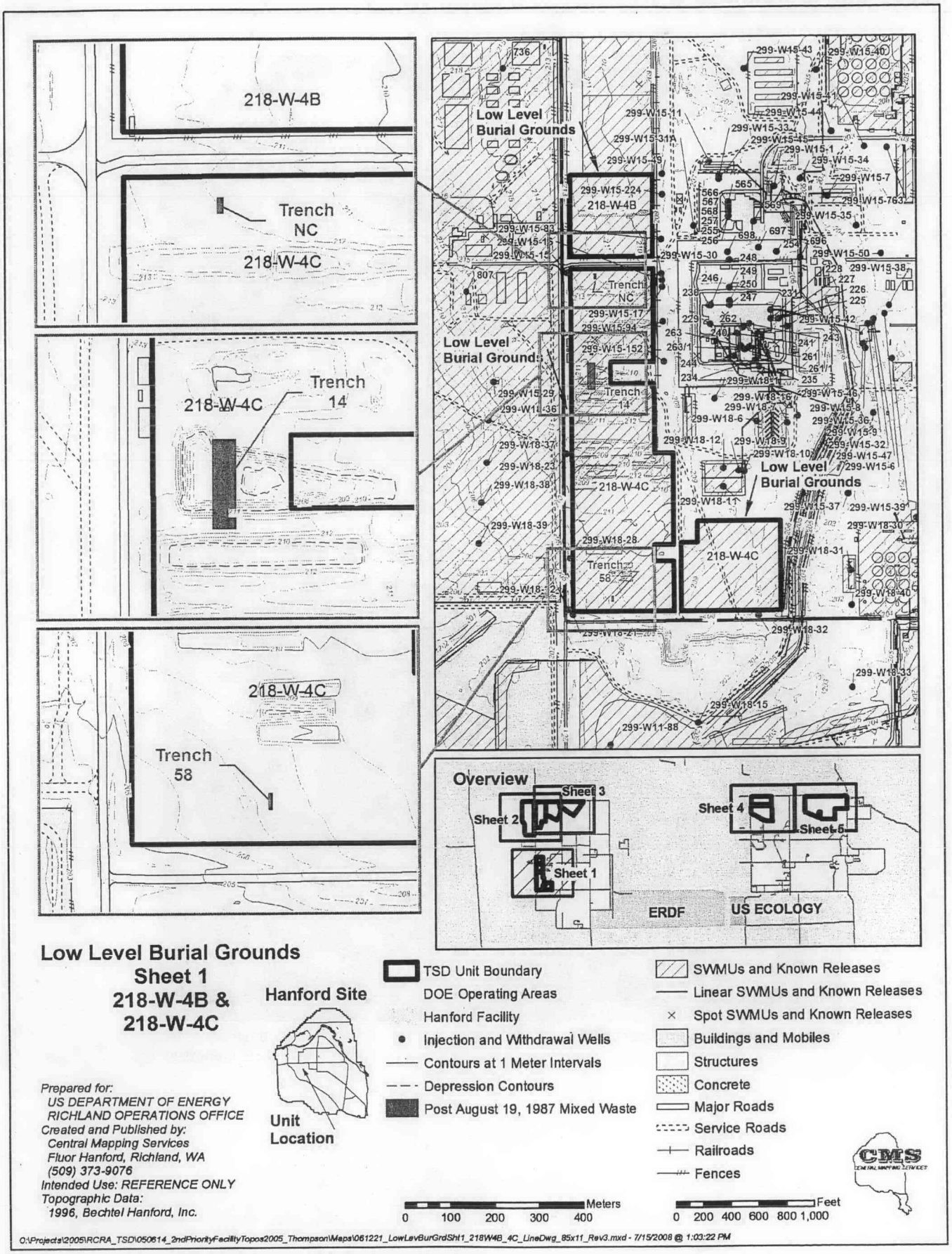
Lined Mixed Waste Trench, 218-W-5/200 West Area

98030102-22CN
Photo Taken 1998



Reactor Compartment, Trench 94

99110141-03CN
Photo Taken 1999


218-W-4B
Trench NC
218-W-4C
218-W-4C
Trench 14
218-W-4C
Trench 58
Low Level Burial Grounds
Low Level Burial Grounds
Low Level Burial Grounds
Trench NC
Trench 14
Trench 58
218-W-4B
218-W-4C
218-W-4C
Overview
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
ERDF
US ECOLOGY
Low Level Burial Grounds
Sheet 1
218-W-4B &
218-W-4C
Hanford Site
Unit Location
TSD Unit Boundary
DOE Operating Areas
Hanford Facility
Injection and Withdrawal Wells
Contours at 1 Meter Intervals
Depression Contours
Post August 19, 1987 Mixed Waste
SWMUs and Known Releases
Linear SWMUs and Known Releases
Spot SWMUs and Known Releases
Buildings and Mobiles
Structures
Concrete
Major Roads
Service Roads
Railroads
Fences
Meters
0 100 200 300 400
Feet
0 200 400 600 800 1,000
Prepared for:
US DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
Created and Published by:
Central Mapping Services
Fluor Hanford, Richland, WA
(509) 373-9076
Intended Use: REFERENCE ONLY
Topographic Data:
1996, Bechtel Hanford, Inc.
CMS
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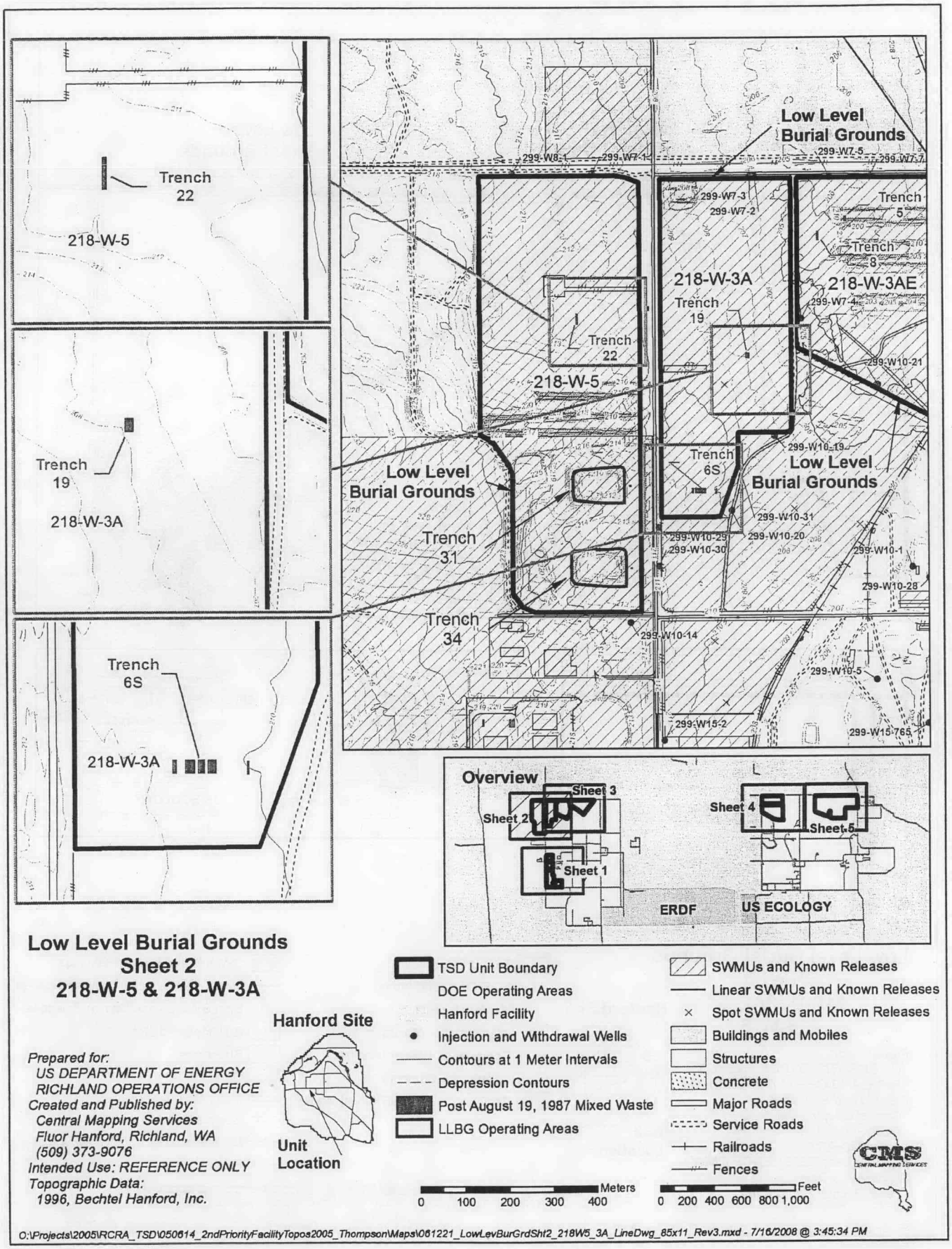
Trench 22
218-W-5
Trench 19
218-W-3A
Trench 6S
218-W-3A
Low Level Burial Grounds
Trench 22
218-W-5
218-W-3A
Trench 19
218-W-3AE
Trench 5
Trench 8
Trench 6S
Low Level Burial Grounds
Low Level Burial Grounds
Trench 31
Trench 34
299-W8-1
299-W7-1
299-W7-5
299-W7-7
299-W7-3
299-W7-2
299-W7-4
299-W10-21
299-W10-19
299-W10-31
299-W10-29
299-W10-30
299-W10-20
299-W10-1
299-W10-28
299-W10-14
299-W10-5
299-W15-2
299-W15-765
Overview
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
ERDF
US ECOLOGY
Low Level Burial Grounds
Sheet 2
218-W-5 & 218-W-3A
Hanford Site
Unit Location
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TSD Unit Boundary
DOE Operating Areas
Hanford Facility
Injection and Withdrawal Wells
Contours at 1 Meter Intervals
Depression Contours
Post August 19, 1987 Mixed Waste
LLBG Operating Areas
SWMUs and Known Releases
Linear SWMUs and Known Releases
Spot SWMUs and Known Releases
Buildings and Mobiles
Structures
Concrete
Major Roads
Service Roads
Railroads
Fences
Meters
0 100 200 300 400
Feet
0 200 400 600 800 1,000
CMS
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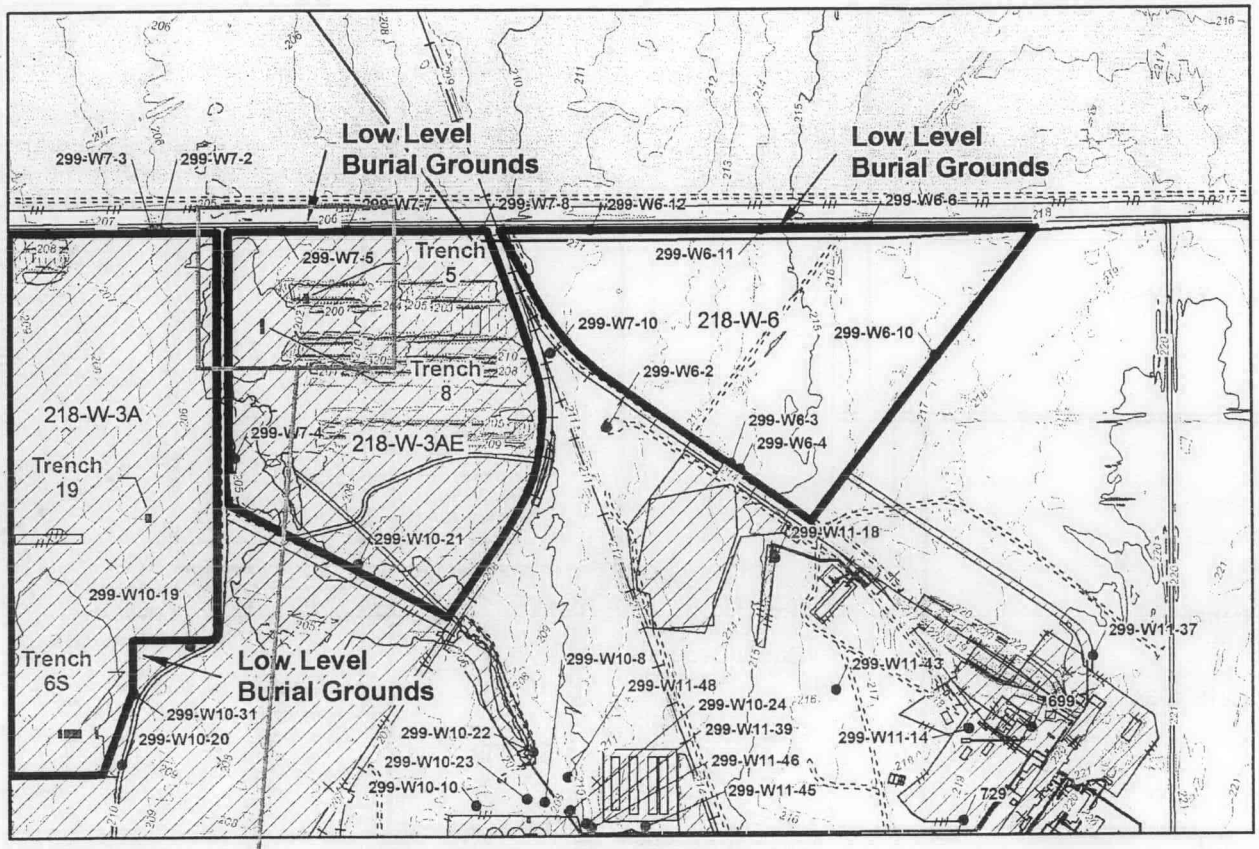

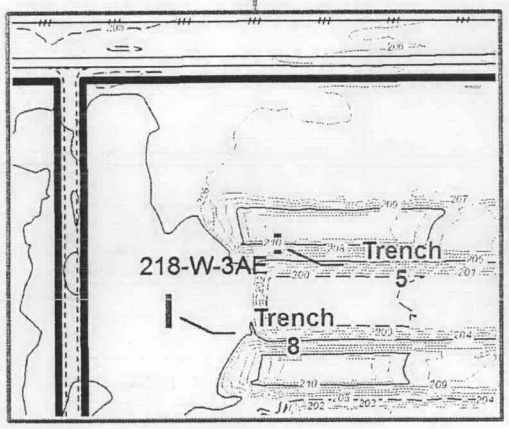

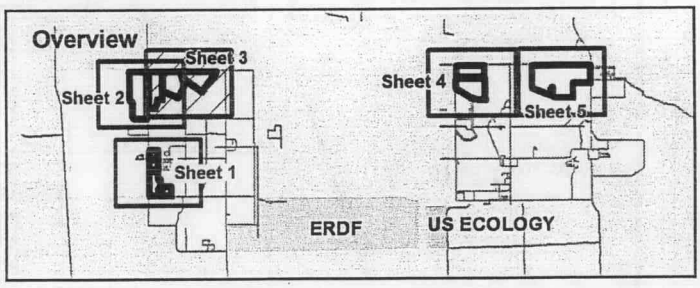

Low Level Burial Grounds
Sheet 3
218-W-3AE &
218-W-6

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Topographic Data:
1996, Bechtel Hanford, Inc.

Hanford Site

Unit Location

- TSD Unit Boundary
- DOE Operating Areas
- Hanford Facility
- Injection and Withdrawal Wells
- Contours at 1 Meter Intervals
- Depression Contours
- Post August 19, 1987 Mixed Waste
- SWMUs and Known Releases
- Linear SWMUs and Known Releases
- Spot SWMUs and Known Releases
- Buildings and Mobiles
- Structures
- Concrete
- Major Roads
- Service Roads
- Railroads
- Fences

Meters: 0 100 200 300 400

Feet: 0 200 400 600 800 1,000

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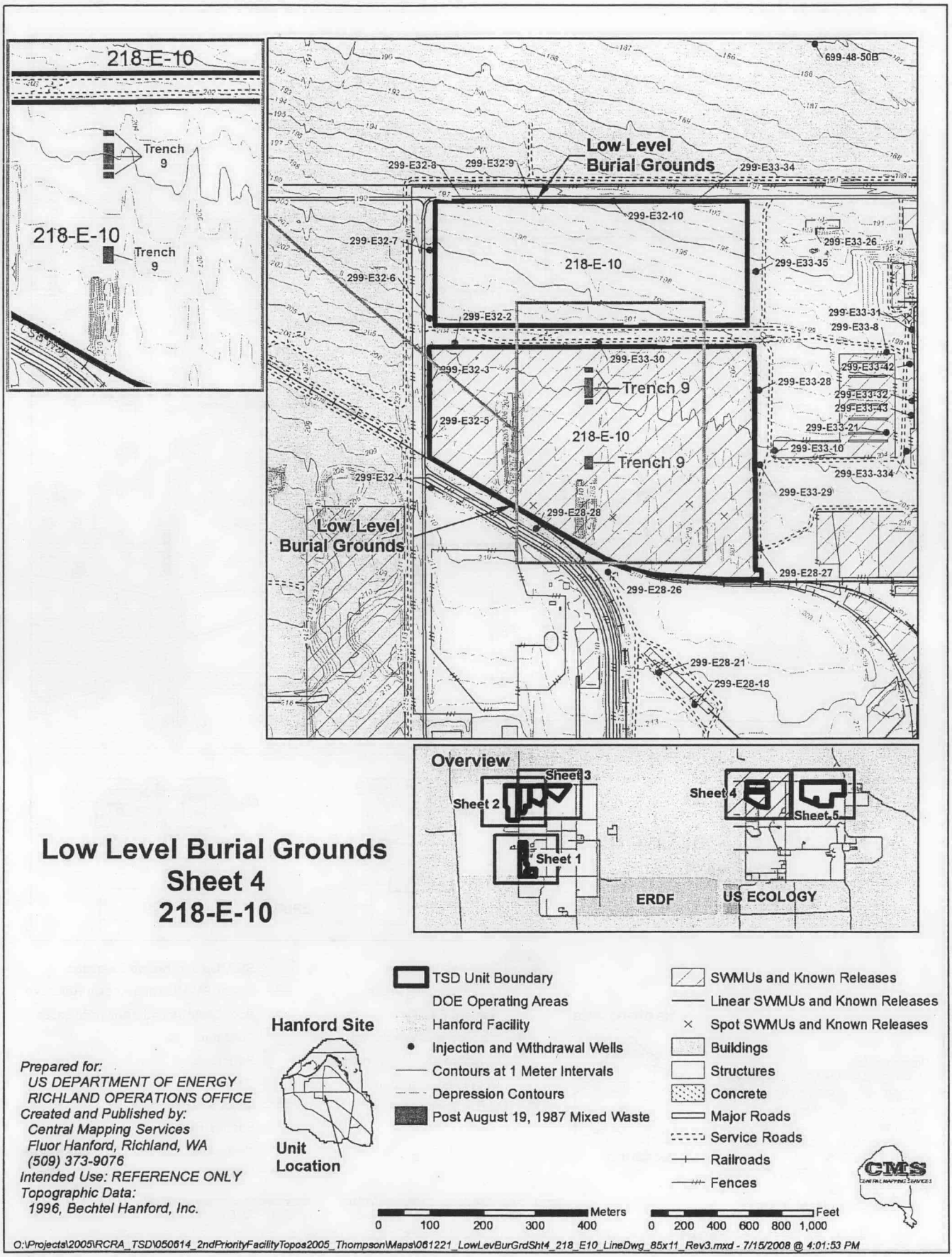
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218-E-10
Trench 9
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699-48-50B
299-E32-8
299-E32-9
299-E33-34
299-E32-10
299-E32-7
299-E32-6
218-E-10
299-E33-26
299-E33-35
299-E32-2
299-E33-31
299-E33-8
299-E33-30
299-E32-3
Trench 9
299-E33-42
299-E33-28
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299-E33-43
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218-E-10
299-E33-21
299-E33-10
Trench 9
299-E32-4
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299-E33-29
299-E28-28
Low Level Burial Grounds
299-E28-27
299-E28-26
299-E28-21
299-E28-18
Overview
Sheet 3
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Sheet 4
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US ECOLOGY
Low Level Burial Grounds
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218-E-10
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1996, Bechtel Hanford, Inc.
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Feet
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CMS
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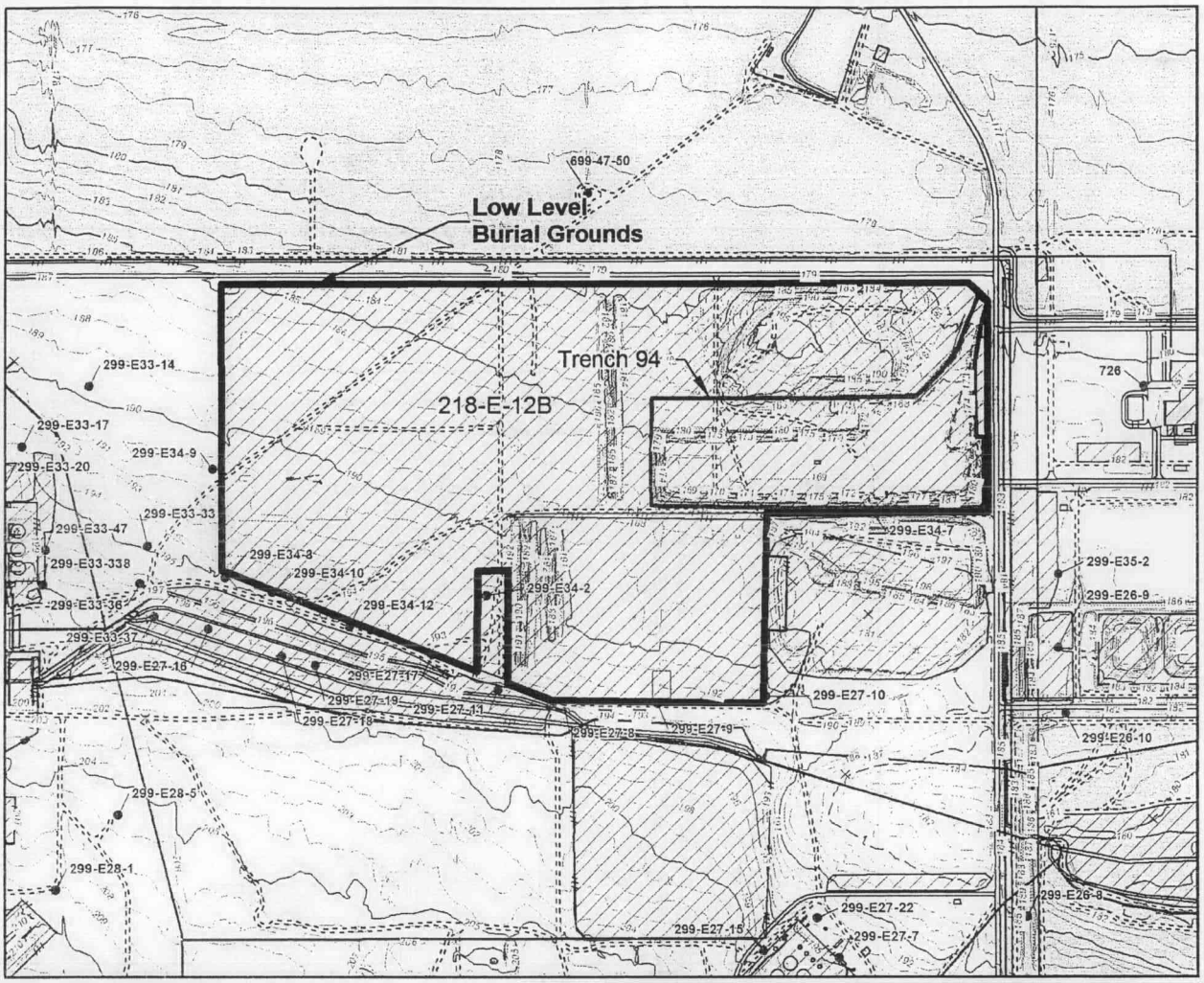

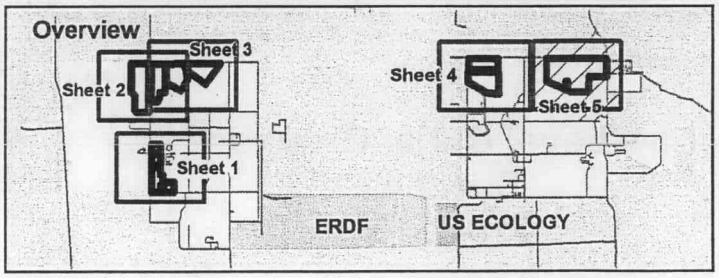

Low Level Burial Grounds
Sheet 5
218-E-12B

Hanford Site

Unit Location

- TSD Unit Boundary
- DOE Operating Areas
- Hanford Facility
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- Contours at 1 Meter Intervals
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- Railroads
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Meters: 0 100 200 300 400

Feet: 0 200 400 600 800 1,000

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

97-EAP-577

JUL 25 1997

Mr. Moses N. Jaraysi
Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
1315 West Fourth Avenue
Kennewick, Washington 99336-6018

Dear Mr. Jaraysi:

CERTIFICATION OF HANFORD FACILITY DANGEROUS WASTE PART A AND PART B PERMIT APPLICATION DOCUMENTATION, LOW-LEVEL BURIAL GROUNDS (WA7890008967) (TSD: D-2-9)

Enclosed is the Hanford Facility Dangerous Waste Permit Application documentation (Part A, Form 3, Revision 10, and Part B, Revision 1), for the Low-Level Burial Grounds (LLBG). The LLBG Part A, Form 3, and Part B have been revised for incorporation into the Hanford Facility Resource Conservation and Recovery Act Permit during Modification C. Also enclosed is a list of changes that have been made to the LLBG permit application documentation since the last draft was given to the State of Washington Department of Ecology on June 17, 1997.

If you have any questions, please contact Tony McKarns, U.S. Department of Energy, Richland Operations Office, on 376-9333.

Sincerely,

James E. Rasmussen

James E. Rasmussen, Director
Environmental Assurance, Permits,
and Policy Division
DOE Richland Operations Office

EAP:ACM

S. M. Price for

William D. Adair, Director
Environmental Protection
Responsible Party for
Fluor Daniel Hanford, Inc.

Enclosures:
1. LLBG Part A, Form 3, Revision 10
2. LLBG Part B, Revision 1

cc w/encls:
R. Jim, YIN
D. Powaukee, NPT
J. Wilkinson, CTUIR

cc w/o encls:
W. Adair, FDH
D. Saueressig, WMH

INFORMATION RELEASE REQUEST
LIMITED DISTRIBUTION DOCUMENT CHANGE/REVISION
(Short Form No. 2)

1. Base Document ID Number: DOE/RL-88-20

2. Base Document Title:

Hanford Facility Dangerous Waste Permit Application, Low-Level Burial Grounds

3. Change/Revision Number: Revision 1

4. Change/Revision Date: 07/97

5. Unclassified Category:* UC - N/A

6. Budget & Reporting Code:* B&R - N/A

7. Type of Limited-Use Info in Base Document:** N/A

I verify this change/revision to the base document indicated above:

- Complies with the provisions of WHC-CM-3-4
- Contains no classified references
- Does not change the intent or meaning of the base document
- And, the base document itself contains limited-use information or references Applied Technology information.

8. Responsible Manager: R. H. Engelmann

MSIN: H6-26 Telephone Number: 376-7485

R. H. Engelmann (Signature) 7-25-97 (Date)

9. Information Release Administration Specialist:**

Chris Willingham (Signature) 8-12-97 (Date)

*Required only for full revisions transmitted to OSTI.
**Required only for full revisions.

A-6001-401.2 (07/94)

14.0 PART B CERTIFICATION [K]

The following certification, required by WAC 173-303-810(13), for all applications and reports submitted to Ecology is hereby included:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy,
Richland Operations Office

Date 7/25/97

Co-operator*
H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford, Inc.

Date 7/24/97

* Fluor Daniel Hanford, Inc. is responsible for information presented in Chapters 1.0 through 4.0 and 6.0 through 15.0, including the associated appendices.

14.0 PART B CERTIFICATION [K]

The following certification, required by WAC 173-303-810(13), for all applications and reports submitted to Ecology is hereby included:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy,
Richland Operations Office

Date 7/25/97

Co-operator*
W. J. Madia, Director
Pacific Northwest National Laboratory

Date 24 July 1997

* Pacific Northwest National Laboratory is responsible for information presented in Chapter 5.0, including any associated appendices.

DOE/RL-88-20
Revision 1
UC-630

Hanford Facility Dangerous Waste Permit Application, Low-Level Burial Grounds

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Department of Energy
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Approved for Public Release

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HANFORD FACILITY DANGEROUS WASTE PERMIT APPLICATION, LOW-LEVEL BURIAL GROUNDS

FOREWORD

The *Hanford Facility Dangerous Waste Permit Application* is considered to be a single application organized into a General Information Portion (document number DOE/RL-91-28) and a Unit-Specific Portion. The scope of the Unit-Specific Portion is limited to Part B permit application documentation submitted for individual, 'operating' treatment, storage, and/or disposal units, such as the Low-Level Burial Grounds (this document, DOE/RL-88-20).

Both the General Information and Unit-Specific portions of the *Hanford Facility Dangerous Waste Permit Application* address the content of the Part B permit application guidance prepared by the Washington State Department of Ecology (Ecology 1987 and 1996) and the U.S. Environmental Protection Agency (40 Code of Federal Regulations 270), with additional information needs defined by the *Hazardous and Solid Waste Amendments* and revisions of Washington Administrative Code 173-303. For ease of reference, the Washington State Department of Ecology alpha-numeric section identifiers from the permit application guidance documentation (Ecology 1996) follow, in brackets, the chapter headings and subheadings. A checklist indicating where information is contained in the Low-Level Burial Grounds permit application documentation, in relation to the Washington State Department of Ecology guidance, is located in the Contents Section.

Documentation contained in the General Information Portion is broader in nature and could be used by multiple treatment, storage, and/or disposal units (e.g., the glossary provided in the General Information Portion). Wherever appropriate, the Low-Level Burial Grounds permit application documentation makes cross-reference to the General Information Portion, rather than duplicating text.

Information provided in this Low-Level Burial Grounds permit application documentation is current as of June 1997.

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METRIC CONVERSION CHART

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76456	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Force			**Force**		
pounds per square inch	6.895	kilopascals	kilopascals	1.4504×10^{-4}	pounds per square inch

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

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Application Checklist

Complete this checklist by providing the facility name and indicating where the listed material has been placed in the application. This is particularly important when the application does not closely follow the outline of the checklist and guidance.

Include the completed checklist with the Dangerous Waste Permit application.

Facility name Low-Level Burial Grounds

Date Application Received _____

State of Washington Part B Permit Application Review Checklist for Treatment, Storage, and Disposal Facilities			
		Technically Adequate?	Location in Application
A.	**Part A Form**		Chapter 1.0
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B-2	Topographic Map		2.2
B-2a	General Requirements		2.2
B-2b	Additional Requirements for Land Disposal Facilities		2.2
B-3	Seismic Consideration	Not Applicable	Not Applicable
B-4	Traffic Information		2.4
C.	**Waste Analysis**		Chapter 3.0
C-1	Chemical, Biological and Physical Analyses		3.1
C-1a	Waste In Piles	Not Applicable	Not Applicable
C-1b	Landfilled Wastes		3.2
C-1c	Wastes Incinerated and Wastes Used in Performance Tests	Not Applicable	Not Applicable

	Technically Adequate?	Location in Application
C-2 Waste Analysis Plan		3.3 and Appendix 3A
C-2a Detailed Chemical, Physical, and/or Biological Analysis		Appendix 3A
C-2a(1) Parameters and Rationale		
C-2a(2) Analytical Methods		
C-2a(3) Generator-Supplied Analyses		
C-2b Additional Requirements for Wastes Generated Off-site		
C-2b(1) Parameters and Rationale to Confirm Identity of Off-site Waste		
C-2b(2) Analytical Methods to Confirm Identity of Off-site Waste		
C-2b(3) Representative Sampling of Incoming Off-site Wastes		
C-2c Methods for Collecting Samples for Detailed and Confirming Analyses		
C-2d Frequency of Analyses		
C-3 Manifest System		
C-3a Procedures for Receiving Shipments		
C-3b Response to Significant Discrepancies		
C-3c Provisions for Non-acceptance of Shipment		
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		Technically Adequate?	Location in Application
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D-1f(1)	Management of Certain Reactive Wastes in Containers	Not Applicable	Not Applicable

		Technically Adequate?	Location in Application
D-1f(2)	Management of Ignitable and Certain Other Reactive Wastes in Containers	Not Applicable	Not Applicable
D-1f(3)	Design of Areas to Manage Incompatible Wastes	Not Applicable	Not Applicable
D-2	Tank Systems	Not Applicable	Not Applicable
D-2a	Design, Installation and Assessment of Tanks Systems	Not Applicable	Not Applicable
D-2a(1)	Design Requirements	Not Applicable	Not Applicable
D-2a(2)	Integrity Assessments	Not Applicable	Not Applicable
D-2a(3)	Additional Requirements for Existing Tanks	Not Applicable	Not Applicable
D-2a(4)	Additional Requirements for New Tanks	Not Applicable	Not Applicable
D-2a(5)	Additional Requirements for New On-ground or Underground Tanks	Not Applicable	Not Applicable
D-2b	Secondary Containment and Release Detection for Tank Systems	Not Applicable	Not Applicable
D-2b(1)	Requirements for All Tank Systems	Not Applicable	Not Applicable
D-2b(2)	Additional Requirements for Specific Types of Systems	Not Applicable	Not Applicable
D-2b(2)(a)	Vault Systems	Not Applicable	Not Applicable
D-2b(2)(b)	Double-walled Tanks	Not Applicable	Not Applicable
D-2b(2)(c)	Ancillary Equipment	Not Applicable	Not Applicable
D-2c	Variances from Secondary Containment Requirements	Not Applicable	Not Applicable
D-2d	Tank Management Practices	Not Applicable	Not Applicable

		Technically Adequate?	Location in Application
D-2e	Labels or Signs	Not Applicable	Not Applicable
D-2f	Air Emissions	Not Applicable	Not Applicable
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D-4	Surface Impoundments	Not Applicable	Not Applicable
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D-6b(3)	Exemption From Groundwater Protection Requirements Based on Design and Operation	Not Applicable	Not Applicable
D-6b(3)(a)	Double-lined Landfill	Not Applicable	Not Applicable
D-6b(3)(b)	Response to Liquids in Leak Detection System	Not Applicable	Not Applicable
D-6c	Liner System, General Items		4.5.3
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		Technically Adequate?	Location in Application
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		Technically Adequate?	Location in Application
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		Technically Adequate?	Location in Application
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D-6j(2)	Containers Holding Free Liquids	Not Applicable	Not Applicable
D-6j(3)	Restriction to Small Containers	Not Applicable	Not Applicable
D-6j(4)	Labpacks	Not Applicable	Not Applicable
D-6j(4)(a)	Inside Containers	Not Applicable	Not Applicable
D-6j(4)(b)	Overpack	Not Applicable	Not Applicable
D-6j(4)(c)	Absorbent Material	Not Applicable	Not Applicable
D-6j(4)(d)	Incompatible Wastes	Not Applicable	Not Applicable
D-6j(4)(e)	Reactive Wastes	Not Applicable	Not Applicable
D-6k	Containerized Wastes		4.5.11
D-61	Special Waste Management Plan for Landfills Containing Wastes FO20, F021, F022, F023, F026, and F027	Not Applicable	Not Applicable
D-61(1)	Wastes Description	Not Applicable	Not Applicable
D-61(2)	Soil Description	Not Applicable	Not Applicable
D-61(3)	Mobilizing Properties	Not Applicable	Not Applicable
D-61(4)	Additional Management Techniques	Not Applicable	Not Applicable

		Technically Adequate?	Location in Application
D-6m	Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes in Landfills	Not Applicable	Not Applicable
D-6m(1)	Management of Ignitable or Reactive Wastes Placed in Landfills	Not Applicable	Not Applicable
D-6m(2)	Management of Incompatible Wastes Placed in Landfills	Not Applicable	Not Applicable
D-7	Land Treatment	Not Applicable	Not Applicable
D-8	Air Emissions Control		4.6
D-8a	Process Vents	Not Applicable	Not Applicable
D-8a(1)	Applicability of Subpart AA Standards	Not Applicable	Not Applicable
D-8a(1)(a)	Process Vents Subject to Subpart AA Standards	Not Applicable	Not Applicable
D-8a(1)(b)	Process Vents Not Subject to Subpart AA Standards	Not Applicable	Not Applicable
D-8a(1)(c)	Re-evaluating Applicability of Subpart AA Standards	Not Applicable	Not Applicable
D-8a(2)	Process Vents - Demonstrating Compliance	Not Applicable	Not Applicable
D-8a(2)(a)	The Basis for Meeting Limits/Reductions	Not Applicable	Not Applicable
D-8a(2)(b)	Demonstrating Compliance via Selected Method	Not Applicable	Not Applicable
D-8a(2)(c)	Design Information and Operating Parameters for Closed Vent Systems and Control Devices	Not Applicable	Not Applicable
D-8a(2)(d)	Re-evaluating Compliance with Subpart AA Standards	Not Applicable	Not Applicable
D-8b	Equipment Leaks	Not Applicable	Not Applicable

		Technically Adequate?	Location in Application
D-8b(1)	Applicability of Subpart BB Standards	Not Applicable	Not Applicable
D-8b(1)(a)	Equipment Subject to Subpart BB	Not Applicable	Not Applicable
D-8b(1)(b)	Re-evaluating Applicability of Subpart BB Standards	Not Applicable	Not Applicable
D-8b(2)	Equipment Leaks - Demonstrating Compliance	Not Applicable	Not Applicable
D-8b(2)(a)	Procedures for Identifying Equipment Location and Method of Compliance, Marking Equipment, and Ensuring Records are Up-to-date	Not Applicable	Not Applicable
D-8b(2)(b)	Demonstrating Compliance with D-8b(1)(a) and (2)(a) Procedures	Not Applicable	Not Applicable
D-8b(2)(c)	Closed Vent Systems or Control Devices: Showing Compliance with Emission Reduction Standards	Not Applicable	Not Applicable
D-8c	Tanks and Containers	Not Applicable	Not Applicable
D-8c(1)	Applicability of Subpart CC Standards	Not Applicable	Not Applicable
D-8c(2)	Tank Systems and Container Areas - Demonstrating Compliance	Not Applicable	Not Applicable
D-9	Waste Minimization		Chapter 10.0
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E.	**Releases from Solid Waste Management Units**		Chapter 2.0
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		Technically Adequate?	Location in Application
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F-2d	Specific Process or Waste Type Inspection Requirements		6.2.3
F-2d(1)	Container Inspections		6.2.3.1
F-2d(2)	Tank System Inspections and Corrective Actions	Not Applicable	Not Applicable
F-2d(2)(a)	Tank System Inspections	Not Applicable	Not Applicable
F-2d(2)(b)	Tank Systems - Corrective Actions	Not Applicable	Not Applicable
F-2d(3)	Storage of Ignitable or Reactive Wastes	Not Applicable	Not Applicable
F-2d(4)	Air Emissions Control and Detection - Inspections, Monitoring, and Corrective Actions	Not Applicable	Not Applicable

		Technically Adequate?	Location in Application
F-2d(4)(a)	Process Vents	Not Applicable	Not Applicable
F-2d(4)(b)	Equipment Leaks	Not Applicable	Not Applicable
F-2d(4)(c)	Tanks and Containers	Not Applicable	Not Applicable
F-2d(5)	Waste Pile Inspection	Not Applicable	Not Applicable
F-2d(6)	Surface Impoundment Inspection	Not Applicable	Not Applicable
F-2d(7)	Incinerator Inspection	Not Applicable	Not Applicable
F-2d(8)	Landfill Inspection		6.2.3.2
F-2d(8)(a)	Run-on and Run-off Control System		6.2.3.2.1
F-2d(8)(b)	+Leak Detection Systems		6.2.3.2.2
F-2d(8)(c)	Wind Dispersal Control System		6.2.3.2.3
F-2d(8)(d)	Leachate Collection and Removal System		6.2.3.2.4
F-2d(9)	Land Treatment Facility Inspection	Not Applicable	Not Applicable
F-3	Preparedness and Prevention Requirements		6.3
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F-5a	Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste		6.5.1
F-5b	Precautions for Handling Ignitable or Reactive Waste and Mixing Incompatible Wastes		6.5.2

		Technically Adequate?	Location in Application
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G-5	Emergency Equipment		Appendix 7A
G-6	Coordination Agreements		Appendix 7A
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G-8	Required Reports, Recordkeeping, and Certifications		Appendix 7A
G-8(1)	General Requirements		Appendix 7A
G-8(2)	Requirements for Tank Systems	Not Applicable	Not Applicable

		Technically Adequate?	Location in Application
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H-2	Outline of Training Program		Appendix 8A
H-3	Implementation of Training Program		Appendix 8A
I.	**Closure and Financial Assurance**		Chapter 11.0
I-1	Closure Plan/Financial Assurance for Closure		11.1
I-1a	Closure Performance Standard		11.2
I-1b	Closure Activities		11.3
I-1b(1)	Maximum Extent of Operation		11.4
I-1b(2)	Removing Dangerous Wastes		11.5
I-1b(3)	Decontaminating Structures, Equipment, and Soil		11.6
I-1b(4)	Sampling and Analysis to Identify Extent of Decontamination/ Removal and to Verify Achievement of Closure Standard	Not Applicable	Not Applicable
I-1b(4)(a)	Sampling to Determine Extent of Contamination	Not Applicable	Not Applicable
1-1b(4)(b)	Sampling to Confirm Decontamination of Structures and Soils	Not Applicable	Not Applicable
I-1b(5)	Other Activities	Not Applicable	Not Applicable
I-1c	Maximum Waste Inventory	Not Applicable	Not Applicable
I-1d	Closure of Waste Piles, Surface Impoundments, Incinerators, Land Treatment, and Miscellaneous Units	Not Applicable	Not Applicable
I-1e	Closure of Landfill Units		11.7

		Technically Adequate?	Location in Application
I-1e(1)	Disposal Impoundments	Not Applicable	Not Applicable
I-1e(1)(a)	Elimination of Liquids	Not Applicable	Not Applicable
I-1e(1)(b)	Waste Stabilization	Not Applicable	Not Applicable
I-1e(2)	Cover Design		11.7.1
I-1e(3)	Minimization of Liquid Migration	Not Applicable	Not Applicable
I-1e(4)	Maintenance Needs		11.7.1
I-1e(5)	Drainage and Erosion		11.7.1
I-1e(6)	Settlement and Subsidence		11.7.1
I-1e(7)	Cover permeability		11.7.1
I-1e(8)	Freeze/Thaw Effects		11.7.1
I-1f	Schedule for Closure		11.8
I-1g	Extension for Closure Time		11.9
I-1h	Closure Cost Estimate	Not Applicable	Not Applicable
I-1i	Financial Assurance Mechanism for Closure	Not Applicable	Not Applicable
I-2	Notice in Deed of Already Closed Disposal Units	Not Applicable	Not Applicable
I-3	Post-Closure Plan		11.10
I-4	Liability Requirements	Not Applicable	Not Applicable
I-4a	Coverage for Sudden Accidental Occurrences	Not Applicable	Not Applicable
I-4b	Coverage for Nonsudden Accidental Occurrences	Not Applicable	Not Applicable
I-4c	Request for Variance	Not Applicable	Not Applicable

	Technically Adequate?	Location in Application
J. Other Federal and State Laws		Chapter 13.0
K. Part B Certification		Chapter 14.0

CONTENTS

1.0 PART A [A] 1-1

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1.0 PART A [A]

The following is a chronology of the regulatory history of the Low-Level Burial Grounds (LLBG).

- The *RCRA Part B Permit Application Low-Level Burial Grounds and Retrievable Storage*, submitted November 6, 1985 included a Part A, Form 3, that identified the LLBG and the retrievable storage units.

- The LLBG, operating under interim status, were classified as landfills (D81) and the retrievable storage units were classified as container storage (S01). Reserved areas were included for future disposal. The following locations were included in the 1985 submittal:

  - LLBG: 218-W-2A, 218-W-3AE, 218-E-10, 218-W-5, 218-W-4C, 218-W-3A, 218-E-12B, 218-C-9.
  - Reserved: 218-W-6, 218-E-10B.
  - Retrievable Storage Units: 218-W-4C, 218-W-3A.

  Individual trench locations within these burial grounds were not identified.

- On August 15, 1987, Revision 1 of the Part A, Form 3, was issued to incorporate comments received from the Washington State Department of Ecology (Ecology). The 1985 Part A was divided into two Part A, Form 3's, that consisted of the 'LLBG' and the 'retrievable storage units,' without designating specific locations for the burial grounds.

- In November 1987, the two Part A, Form 3's, were revised (Revision 2) to incorporate the required signature process in which the U.S. Department of Energy, Richland Operations Office signed as owner/operator and Westinghouse Hanford Company signed as co-operator. The retrievable storage units also were reclassified as landfills (D81) at the request of the U.S. Environmental Protection Agency. Specific burial grounds were named only for the retrievable storage units.

- On May 19, 1988, the two Part A, Form 3's, were combined into one and issued as Revision 3. Revision 3 of the Part A consisted of LLBG, retrievable storage units, and a future radioactive mixed waste disposal facility. Revision 3 included graphic representations of the trenches and identified the following LLBG:

200 West Area	200 East Area
218-W-3A	218-E-10
218-W-3AE	218-E-12B.
218-W-4B	
218-W-4C	
218-W-5	
218-W-6	

The LLBG Part A, Form 3, (Revision 3) had the following changes:

Deleted: 218-W-2A, 218-E-10B, and 218-C-9
Added: 218-W-4B.

The 218-W-2A and 218-C-9 Burial Grounds were deleted, as it was determined that mixed waste was not disposed in these sites [*Consent Agreement and Compliance Order* between Ecology and the U.S. Department of Energy, October 1, 1986 (Ecology 1986)]. The 218-E-10B Burial Ground was deleted because the area was designated for another use before any waste disposal occurred. The 218-W-4B Burial Ground was added because dangerous waste is contained in caisson alpha 4.

- Revision 4 of the Part A, Form 3, was submitted to Ecology on October 18, 1989, and had the following changes.

  - The 'date operation began' was changed from 1944 to 1960 to reflect the earliest date that the oldest burial ground (216-E-10) began receiving waste.

  - Waste numbers F020, F021, F022, F023, F026, and F027 were deleted as these waste types are not put into the LLBG.

  - Following the addition of the decommissioned Shippingport reactor pressure vessel and the U.S. Navy defueled reactor compartments, the estimated annual quantity of waste for waste code D008 was increased from 100,000 pounds to 18,000,000 pounds and for waste code WT01 from 800,000 to 18,800,000 pounds.

  - The burial ground number within the caption of a photograph of a "Typical Radioactive Retrievable Storage Facility--Liquid Organics" was changed from the "218-W-46/200 W Area" to the "218-W-4C/200 W Area."

  - The President of Westinghouse Hanford Company was changed from William M. Jacobi to John E. Nolan.

- Revision 5 of the Part A, Form 3, submitted to Ecology on October 20, 1989, had the following change.

  - The estimated annual quantity of waste for waste code D008 was reduced from 18,000,000 pounds to 2,000,000 pounds. Based on discussions and correspondence among the U.S. Navy, the U.S. Environmental Protection Agency, and Ecology, the quantity of lead (16,000,000 pounds) in defueled reactor compartments was considered shielding and was designated as WT01, a state-only waste. In addition, no extraction procedure toxicity testing had been performed on reactor compartments; therefore, the defueled reactor compartments were manifested by the U.S. Navy as WT01 only.

- Revision 6 of the Part A, Form 3, submitted to Ecology on August 16, 1990, had the following changes.

  - Estimated annual quantity of waste for dangerous waste number D008 (lead) was increased from "2,000,000" pounds to "18,000,000" pounds. This increase accounted for lead shielding contained in defueled reactor compartments.

  - The description of dangerous wastes (Section IV.E.) was changed to include a description of the metallic lead shielding contained in defueled reactor compartments disposed in trench 94.

- Revision 7 of the Part A, Form 3, submitted to Ecology on November 4, 1994, had the following changes.

  - Dangerous waste number F039 (multi-source leachate) was added to reflect leachate generation from the startup of trench 31.

  - Dangerous waste number P035, P079, U231, U241, U242, and WC01 were removed per the revised Washington Administrative Code (WAC) 173-303.

  - Section III.C. "Processes" was changed to reflect current operations at the LLBG.

  - The President of WHC was changed from Roger C. Nichols to A. LaMar Trego.

- Revision 8 of the Part A, Form 3, was submitted to Ecology on September 30, 1996, in support of the Project Hanford Management Contract change to Fluor Daniel Hanford, Inc. In addition, the Part A, Form 3, was revised to reflect the date that Ecology was given authorization to regulate the dangerous waste portion of mixed waste as identified in 52 Federal Register 35556. A new design capacity was identified based on waste forecasts with no lateral expansion of the various burial ground boundaries. Dangerous waste numbers WC02, U175, and P025 were removed per WAC 173-303. The estimated annual quantity of waste was consolidated into one number, "160,000,000" kilograms for all dangerous waste numbers. Sections III.C, IV.E., photographs and graphics were updated to reflect current operations.

- Revision 9 of the Part A, Form 3, submitted to Ecology on March 4, 1997, had the following changes.

  - Comments from Ecology on Revision 8, of the Part A, Form 3, were incorporated.

  - The Part A, Form 3, was revised to reflect the date of regulation of the dangerous waste component of mixed waste as August 19, 1987.

  - Process code S01 (storage container) was added with a total process design capacity of 10,000,000 liters. The greater-than-90-day

container storage is within the lined mixed waste disposal trenches 31 and 34 of the 218-W-5 Burial Ground.

- Dangerous waste numbers D004 through D043, all "U" and "P," and F001 through F005, and F028 were added under process code S01.

- Sections III.C and IV.E of the Part A, Form 3, were revised to include a discussion on process code S01.

- Graphics were updated to reflect current operations and the August 19, 1987 date of regulation of the dangerous waste component of mixed waste.

• Revision 10 of the Part A, Form 3, included in this permit application documentation, had the following changes.

- Updated text in Section IV.E. to account for dangerous waste numbers D001 through D003 being listed for disposal (D81) in Section IV.A.

- Hanford Site Coordinate System points corrected on 218-E-12B Burial Ground Site Plan.

- Call out for mixed fission product caissons corrected on 218-W-4B Burial Ground Site Plan.

- Updated trenches filled with low-level waste on 218-W-4C Burial Ground Site Plan. Following a record search on post-August 19, 1987 mixed waste, the eastern portion of trench 58 was determined not to contain regulated mixed waste.

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 character/inch).

FORM 3

DANGEROUS WASTE PERMIT APPLICATION

1. EPA/STATE I.D. NUMBER: W A 7 8 9 0 0 0 8 9 6 7

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED *(mo., day, & yr.)*	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

MO. 0 3 | DAY 2 2 | YR. 4 3 * FOR EXISTING FACILITIES, PROVIDE THE DATE *(mo., day, & yr.)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

* The date construction of the Hanford Facility commenced.

☐ 2. NEW FACILITY *(Complete item below)*

MO. | DAY | YR. FOR NEW FACILITIES, PROVIDE THE DATE, *(mo., day, & yr)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Section I above)*

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT

☒ 2. FACILITY HAS A FINAL PERMIT

III. PROCESSES - CODES AND CAPACITIES

A. PROCESS CODE - Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the *(Section III-C)*.

B. PROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process.

1. AMOUNT - Enter the amount.

2. UNIT OF MEASURE - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D82	*ACRES OR HECTARES*
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING SECTION III *(shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons.* The facility also has an incinerator that can burn up to 20 gallons per hour.

LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	B. 2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	B. 2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	D 8 1	174	F		7				
2	S 0 1	10,000,000	L		8				
3					9				
4					10				

Continued from the front.

PROCESSES (continued)

SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

Refer to the following page.

IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER - Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER - Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.

2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.

3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2			T 0 3 D 8 0	*included with above*

FORM 3 DANGEROUS WASTE PERMIT APPLICATION
U.S. ENVIRONMENTAL PROTECTION AGENCY/STATE IDENTIFICATION NUMBER WA7890008967

Section III.C., Description of Process Codes listed in Section III.a.

D81

The Low-Level Burial Grounds (LLBG) began waste management operations in January of 1960. The LLBG comprise a landfill disposal unit (D81) and cover a total area of approximately 225 hectares (556 acres). The landfill is divided into eight burial grounds. Six burial grounds are located in the 200 West Area and two in the 200 East Area, as depicted on the attached drawings. The LLBG consist of lined and unlined trenches of various sizes and depths. All mixed waste destined for disposal in lined trenches will meet land disposal restriction requirements. The lined trenches consist of a double-liner leachate collection and removal system.

The process design capacity for mixed waste in the LLBG is 174 hectare-meters (2,275,819 cubic yards) of which 150 hectare-meters (1,961,913 cubic yards) is dedicated solely for the disposal of reactor compartment disposal packages.

S01

The greater-than-90-day container storage capability in mixed waste Trenches 31 and 34 of Burial Ground 218-W-5 provides a location to store various size containers of treated mixed waste in a Resource Conservation and Recovery Act (RCRA) compliant manner other than the Central Waste Complex. The placement of these containers in Trenches 31 and 34 eliminates the need to construct a mixed waste storage pad. This capability also reduces the need to transfer this waste prior to disposal. The process design capacity for storage of containers is estimated to be 10,000,000 liters (2,641,700 gallons).

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

NUMBER *(entered from page 1)*

W	A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	D001	160,000,000	K	D81	Disposal
2	through				
3	D043				
4	WT01				
5	WT02				
6	WP01				
7	WP02				
8	WP03				
9	F001				
10	through				
11	F005				
12	F028				
13	F039				
14	W001				
15	U001				
16	through				
17	U012				
18	U014				
19	through				
20	U039				
21	U041				
22	through				
23	U053				
24	U055				
25	through				
26	U064				

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

NUMBER *(entered from page 1)*

A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	U066		K	D81	Disposal (Continued)
2	through				
3	U099				
4	U101				
5	through				
6	U103				
7	U105				
8	through				
9	U174				
10	U176				
11	through				
12	U194				
13	U196				
14	U197				
15	U200				
16	through				
17	U223				
18	U225				
19	through				
20	U228				
21	U232				
22	through				
23	U240				
24	U243				
25	through				
26	U249				

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

NUMBER *(entered from page 1)*

	A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	U328		K	D81	Disposal (Continued)
2	U353				
3	U359				
4	P001				
5	through				
6	P018				
7	P020				
8	through				
9	P024				
[illegible]	P026				
11	through				
12	P031				
13	P033				
14	P034				
15	P036				
16	through				
17	P051				
18	P054				
19	P056				
20	through				
21	P060				
22	P062				
23	through				
[illegible]	078				
25	P081				
26	P082				

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

NUMBER *(entered from page 1)*

A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	P084		K	D81	Disposal (Continued)
2	P085				
3	P087				
4	through				
5	P089				
6	P092				
7	through				
8	P099				
9	P101				
	through				
11	P116				
12	P118				
13	through				
14	P123				Included With Above
15	D004	10,000,000	K	S01	Storage-Container
16	through				
17	D043				
18	WT01				
19	WT02				
20	WP01				
21	WP02				
22	WP03				
23	W001				
	F001				
25	through				
26	F005				

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

NUMBER *(entered from page 1)*

H	A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	F028		K	S01	Storage-Container (Continued)
2	U001				
3	through				
4	U012				
5	U014				
6	through				
7	U039				
8	U041				
9	through				
10	U053				
11	U055				
12	through				
13	U064				
14	U066				
15	through				
16	U099				
17	U101				
18	through				
19	U103				
20	U105				
21	through				
22	U174				
23	U176				
24	through				
25	U194				
26	U196				

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

NUMBER *(entered from page 1)*

W	A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	U197		K	S01	Storage-Container (Continued)
2	U200				
3	through				
4	U223				
5	U225				
6	through				
7	U228				
8	U232				
9	through				
10	U240				
11	U243				
12	through				
13	U249				
14	U328				
15	U353				
16	U359				
17	P001				
18	through				
19	P018				
20	P020				
21	through				
22	P024				
23	P026				
24	through				
25	P031				
26	P033				

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

NUMBER *(entered from page 1)*

A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	P034		K	S01	Storage-Container (Continued)
2	P036				
3	through				
4	P051				
5	P054				
6	P056				
7	through				
8	P060				
9	P062				
10	through				
11	P078				
12	P081				
13	P082				
14	P084				
15	P085				
16	P087				
17	through				
18	P089				
19	P092				
20	through				
21	P099				
22	P101				
23	through				
	116				
25					
26					

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

NUMBER *(entered from page 1)*

	A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	P118		K	S01				Storage-Container (Continued)
2	through		↓	↓				↓
3	P123		↓	↓				Included With Above
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

CONTINUE ON REVERSE

Continued from the front.

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

The mixed waste disposed in the LLBG will consist of toxicity characteristic waste (D001 through D043), state-only waste (WT01, WT02, WP01, WP02, WP03, and W001), and listed waste from nonspecific sources (F001 through F005 and F039). Current LLBG operations do not allow for storage or disposal of ignitable, reactive, and incompatible waste in trenches 31 and 34 of the 218-W-5 Burial Ground. Currently there is no mechanism in place to treat collected leachate with listed waste numbers other than F001 through F005. However, regulatorily acceptable alternatives for leachate management will allow for the disposal of other listed waste that include all "U," "P," and other "F" dangerous waste numbers. The reactor compartments in the 218-E-12B Burial Ground contain shielding constructed of metallic lead (state-only D008). Mixed waste could consist of up to 25 percent debris; however, this estimate could fluctuate as waste management needs dictate.

The mixed waste stored in the LLBG will consist of toxicity characteristic waste (D004 through D043), state-only waste (WT01, WT02, WP01, WP02, WP03, and W001), and listed waste from nonspecific sources (F001 through F005 and F028). Other waste that may be stored at the LLBG include all "U" and "P" dangerous waste numbers.

V. FACILITY DRAWING Refer to attached drawing(s).

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS Refer to attached photograph(s).

All existing facilities must include photographs *(aerial or ground-level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION This information is provided on the attached drawing(s) and photograph(s).

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
John D. Wagoner, Manager U.S. Department of Energy Richland Operations Office	for	7/25/97

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

 CONTINUE ON PAGE 5

X. OPERATOR CERTIFICATION

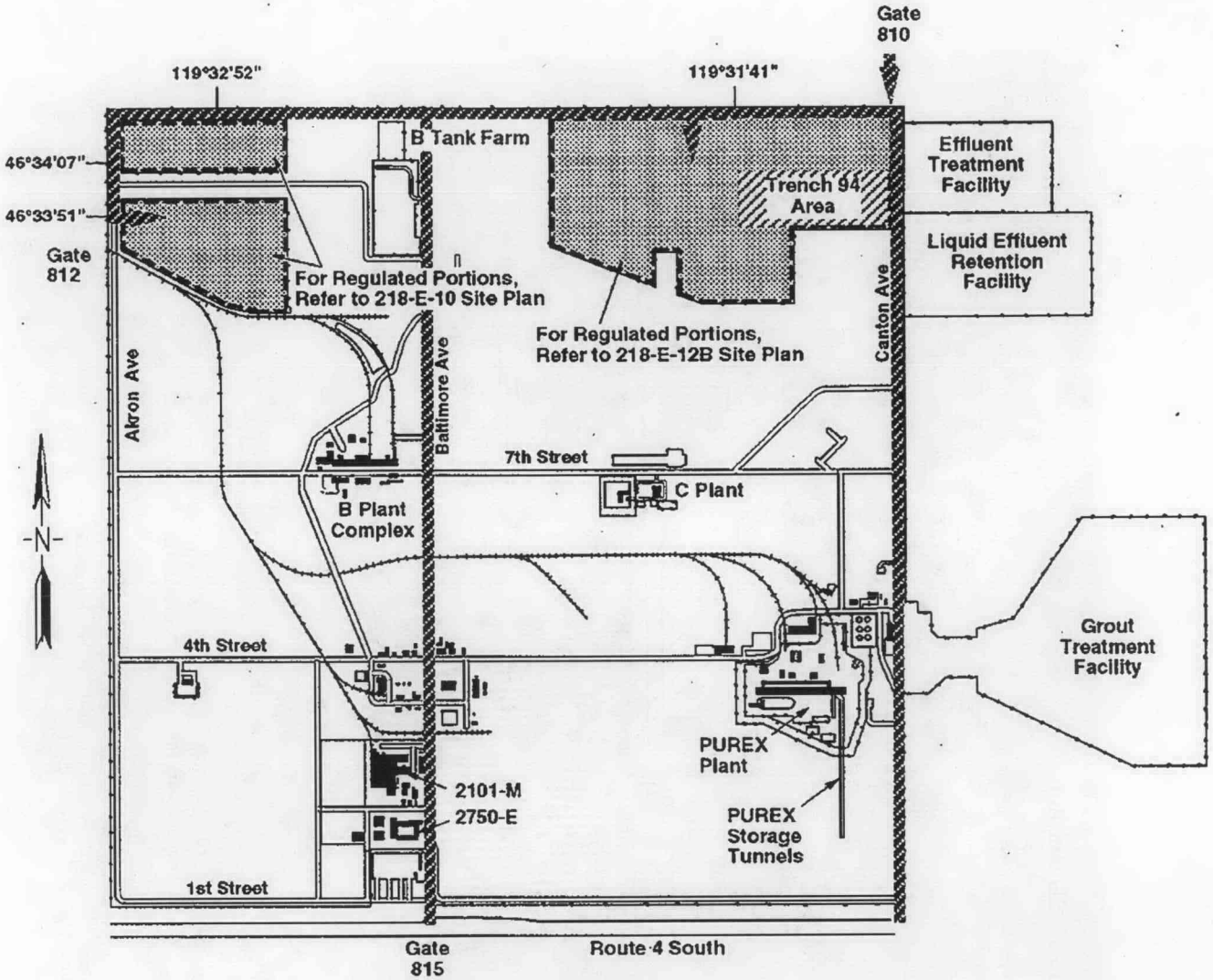
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

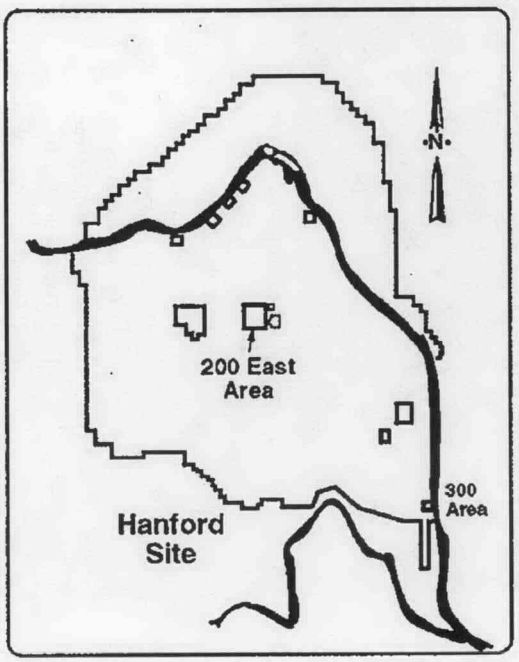
Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date 7/25/97

Co-operator
H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford, Inc.

Date July 11, 1997





0 1525 3050 ft
0 465 930 m

Regulated Burial Grounds

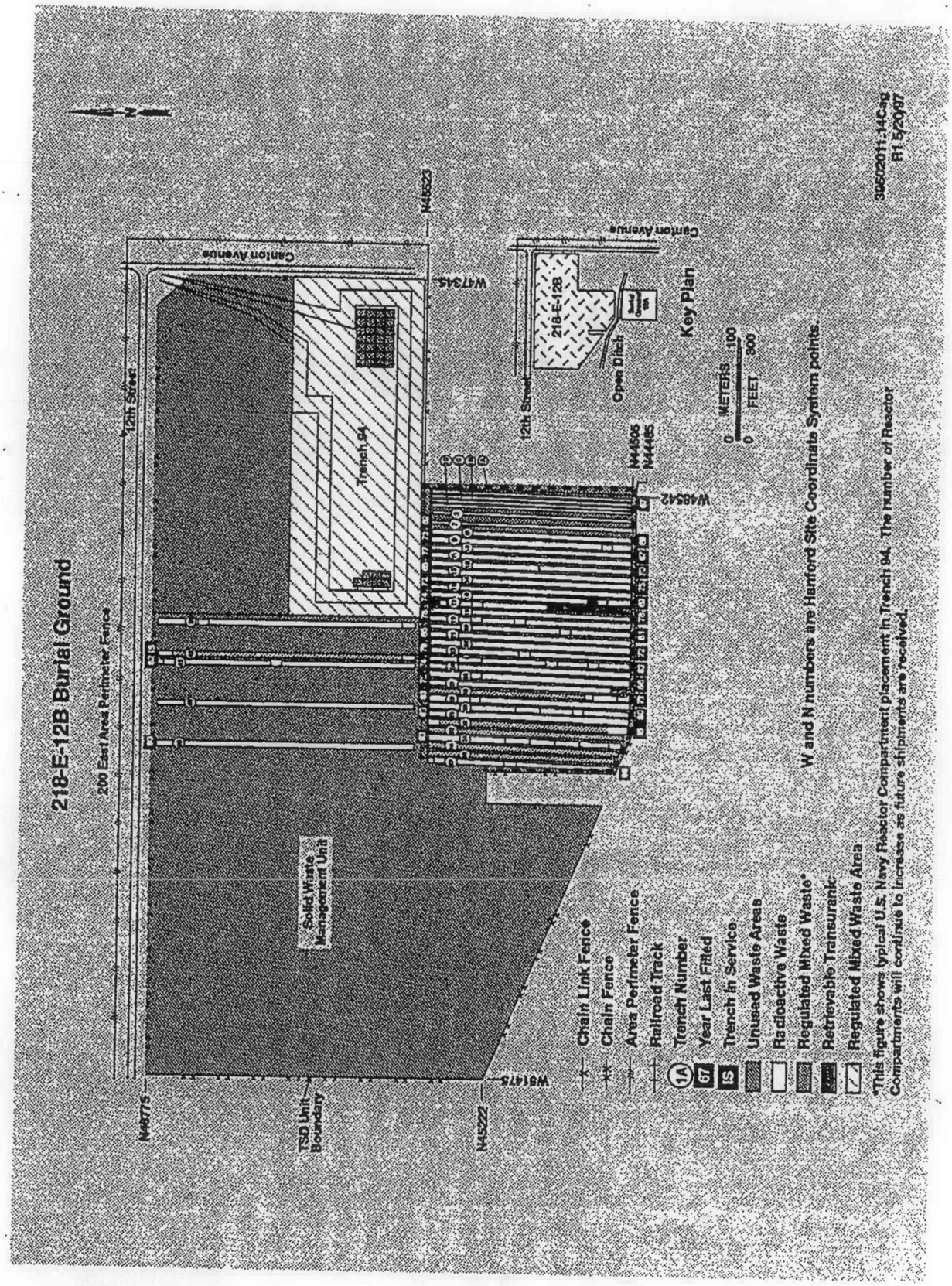
SWMU (Solid Waste Management Unit)

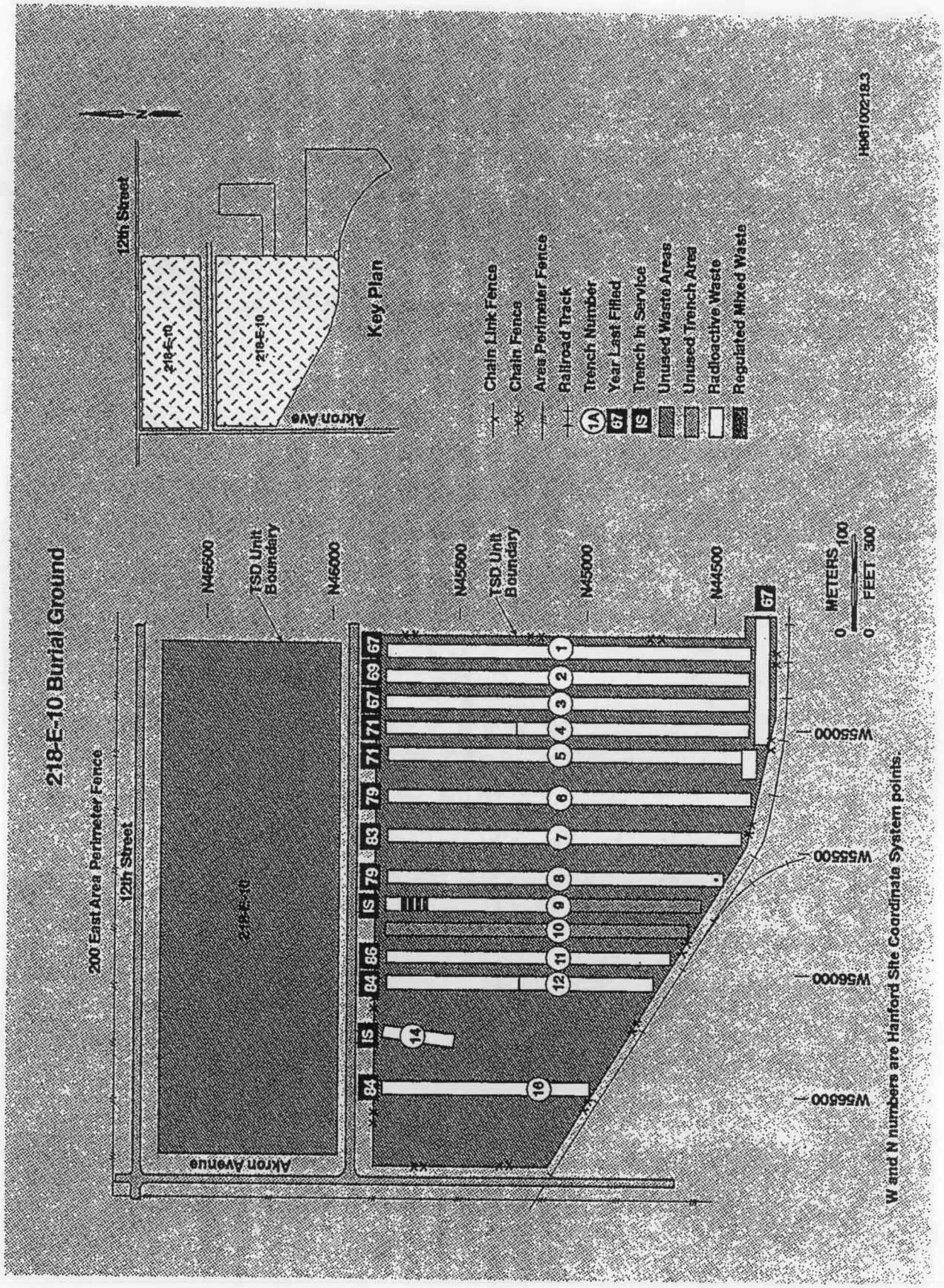
Waste Routes

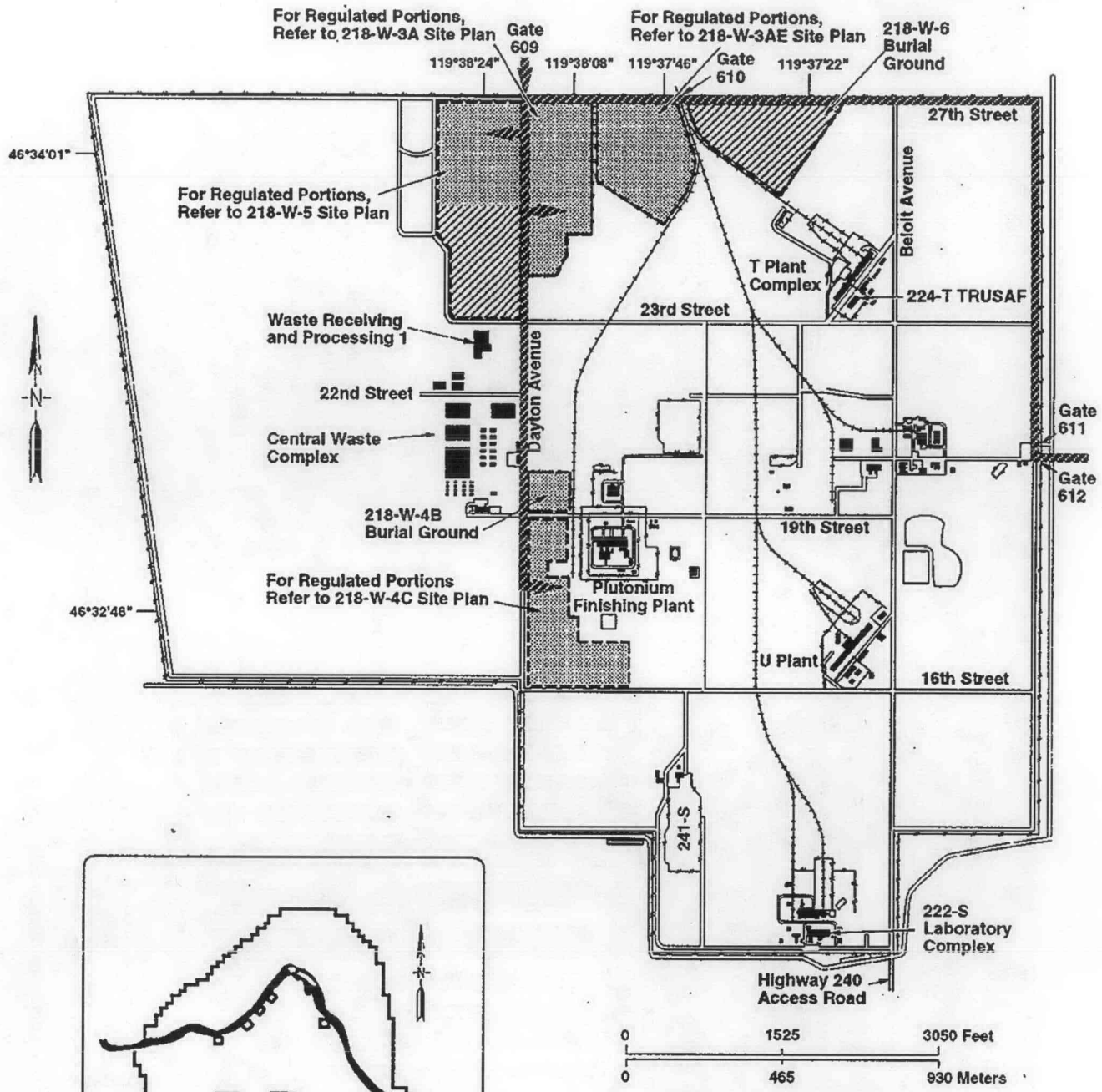
Note: TSD Unit boundaries are defined by dashed lines.

200 East Area Low-Level Burial Grounds

39407118.4

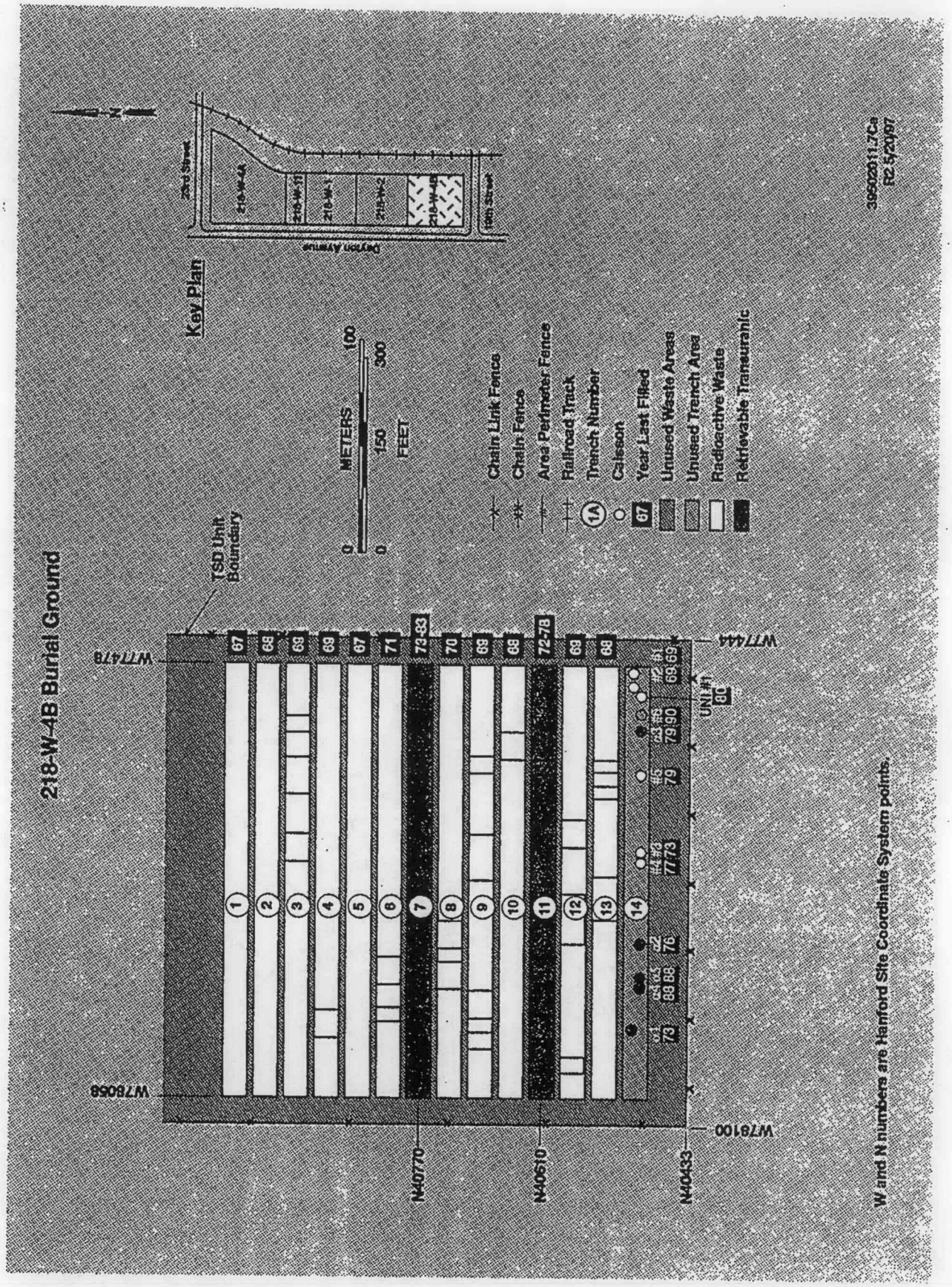

218-E-12B Burial Ground
200 East Area Perimeter Fence
12th Street
Carlton Avenue
Trench 94
Solid Waste Management Unit
TSD Unit Boundary
N48775
N45222
W47343
W48542
W51475
N45523
N44505
N44485
218-E-12B
Open Ditch
Key Plan
0 METERS 100
0 FEET 300
W and N numbers are Hanford Site Coordinate System points.
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench in Service
Unused Waste Areas
Radioactive Waste
Regulated Mixed Waste*
Retrievable Transuranic
Regulated Mixed Waste Area
*This figure shows typical U.S. Navy Reactor Compartment placement in Trench 94. The number of Reactor Compartments will continue to increase as future shipments are received.
306/2011:14Cag
B1 5/20/97

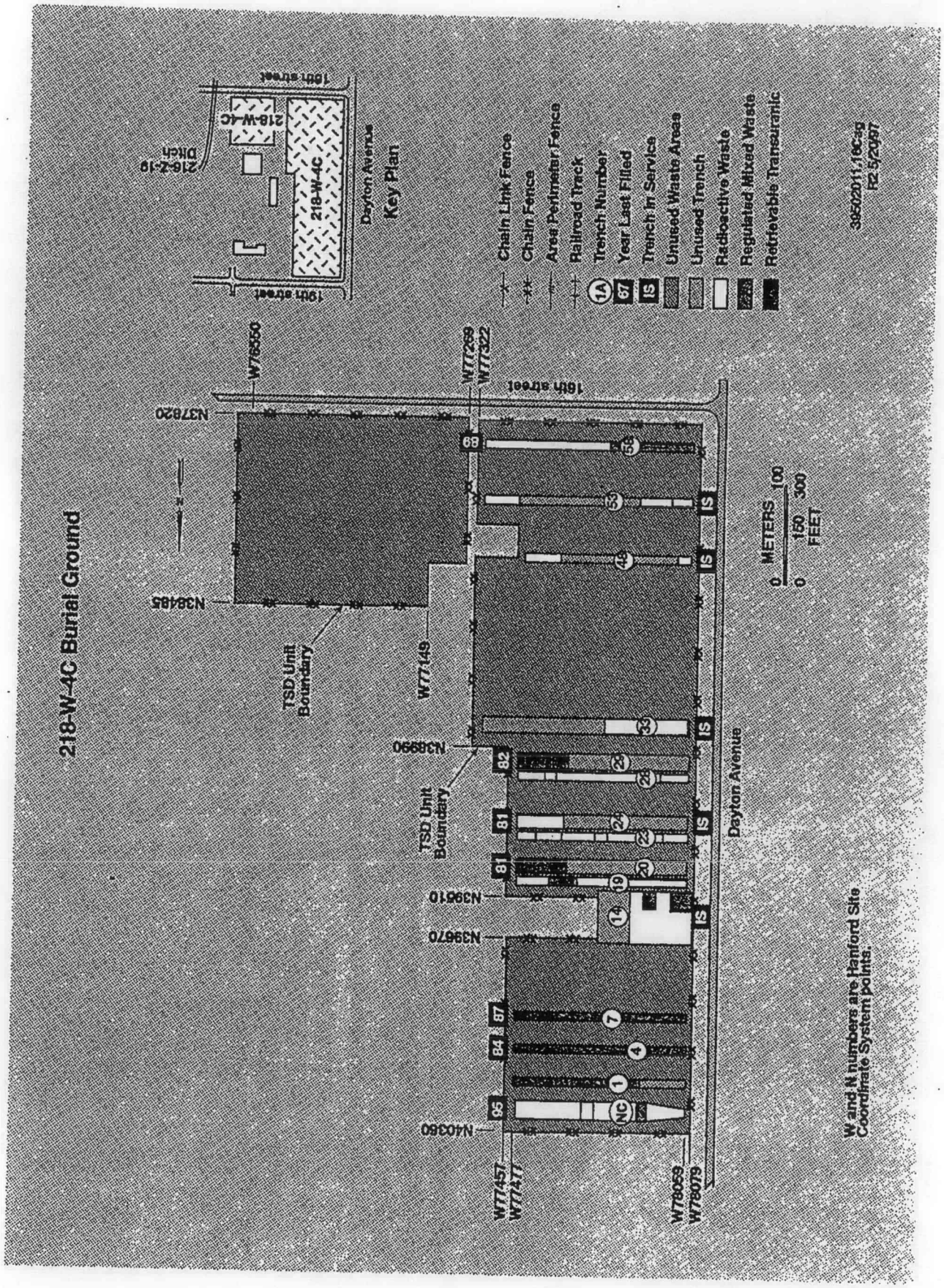

218-E-10 Burial Ground
200 East Area Perimeter Fence
12th Street
Akron Avenue
218-E-10
N46500
N46000
N45500
N45000
N44500
TSD Unit Boundary
W55000
W55500
W56000
W56500
Key Plan
218-E-10
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench In Service
Unused Waste Areas
Unused Trench Area
Radioactive Waste
Regulated Mixed Waste
METERS 0 100
FEET 0 300
W and N numbers are Hanford Site Coordinate System points.
H961002183

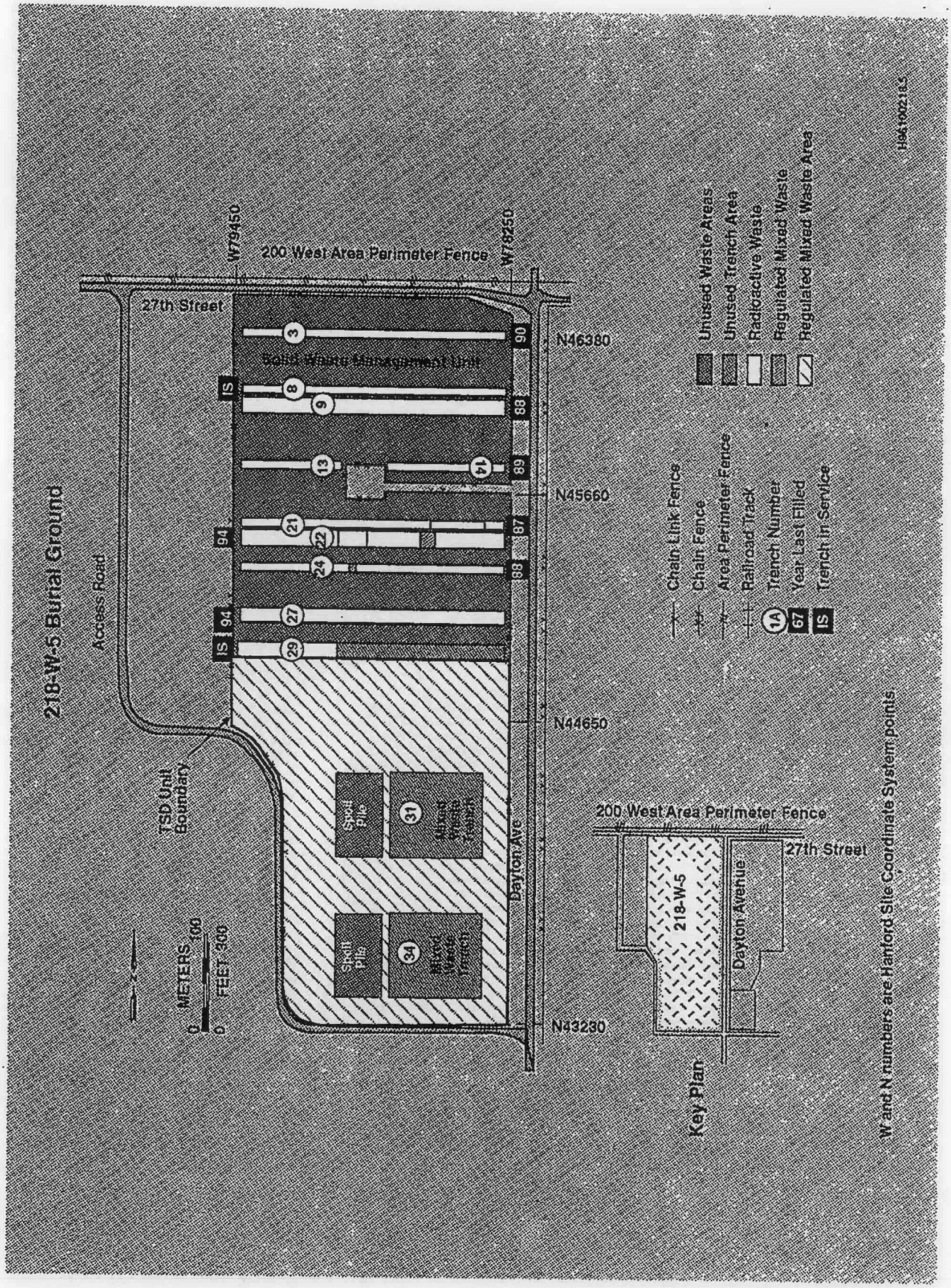


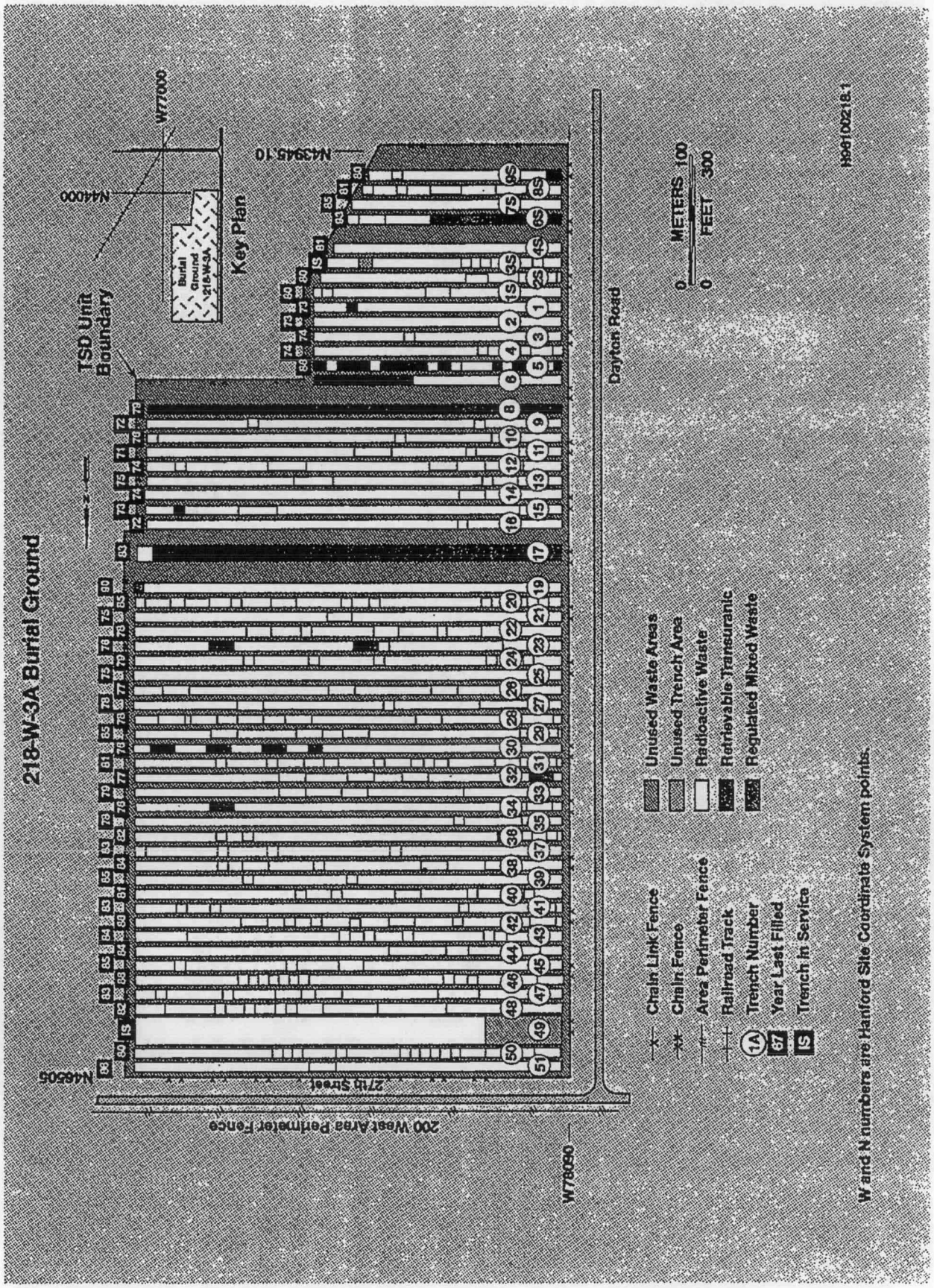
200 West Area Low-Level Burial Grounds

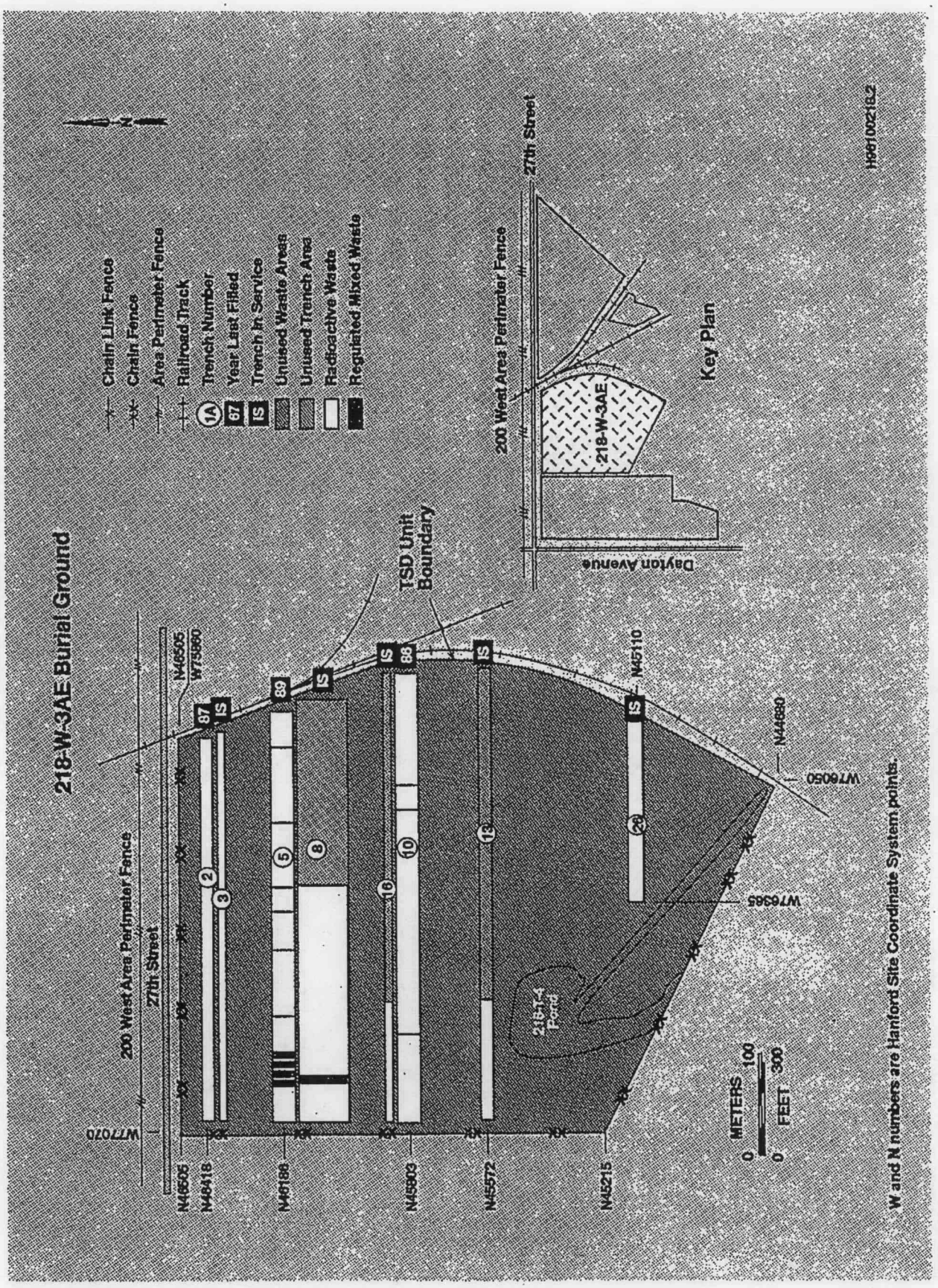
H9408030.1

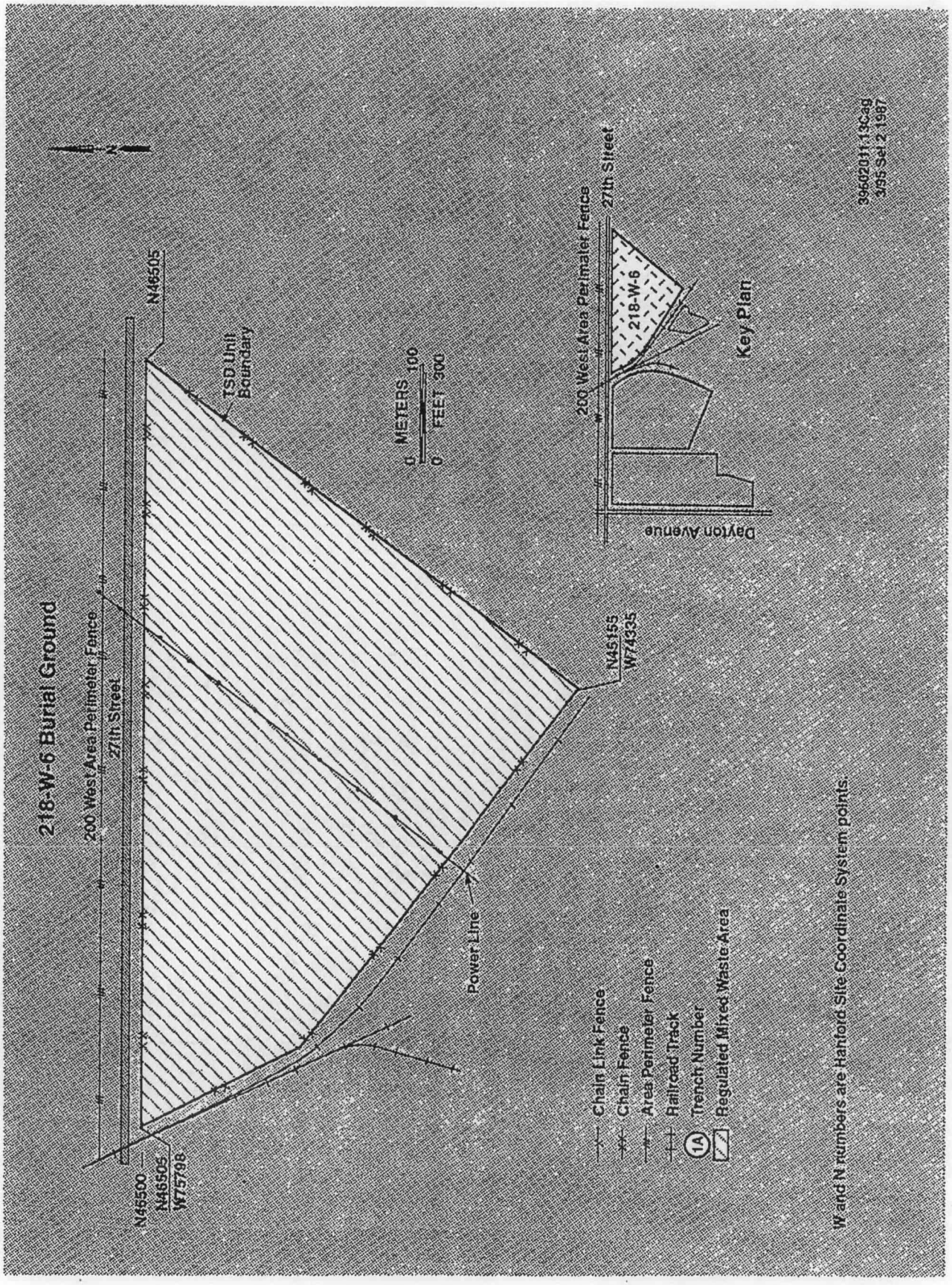

218-W-4B Burial Ground
TSD Unit Boundary
Key Plan
Dryden Avenue
25th Street
16th Street
218-W-4A
218-W-1
218-W-2
218-W-4B
N
METERS
0
50
100
FEET
0
150
300
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Caisson
Year Last Filled
Unused Waste Areas
Unused Trench Area
Radioactive Waste
Retrievable Transuranic
W78058
W77478
W77444
W78100
N40770
N40610
N40433
UNI #1
80
W and N numbers are Hanford Site Coordinate System points.
39502311.7Ca
R2 5/20/97


218-W-4C Burial Ground
Key Plan
218-W-4C
218-Z-19 Ditch
16th Street
19th Street
Dayton Avenue
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench In Service
Unused Waste Areas
Unused Trench
Radioactive Waste
Regulated Mixed Waste
Retrievable Transuranic
3950201 1.16cag
R2 5/2/97
W76550
W77269
W77322
N37820
N38485
N38990
N39610
N39670
N40360
W77457
W77411
W76059
W76079
TSD Unit Boundary
W77149
IS
NC
METERS 0 100
FEET 0 150 300
W and N numbers are Hanford Site Coordinate System points.

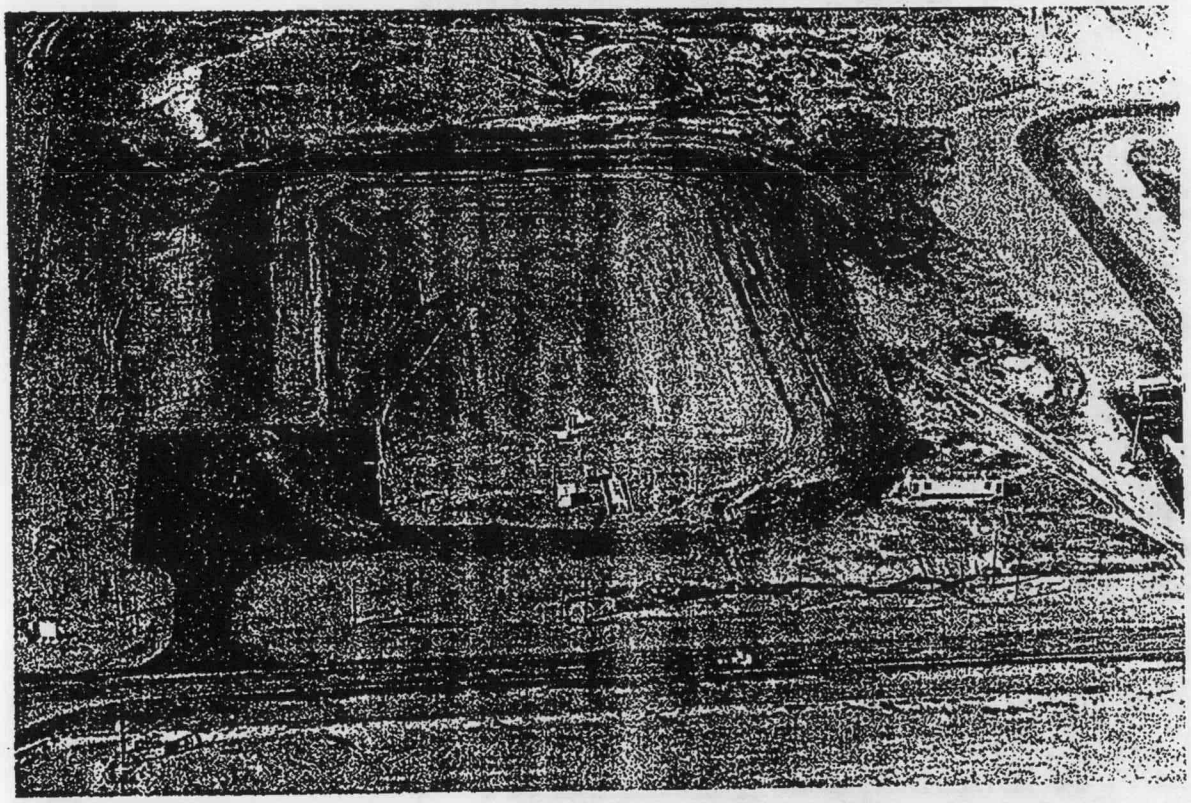

218-W-5 Burial Ground
Access Road
27th Street
200 West Area Perimeter Fence
W79450
W78250
N46380
N45660
N44650
N43230
Solid Waste Management Unit
TSD Unit Boundary
Spoil Pile
Mixed Waste Trench
Dayton Ave
METERS 0 100
FEET 0 300
Unused Waste Areas
Unused Trench Area
Radioactive Waste
Regulated Mixed Waste
Regulated Mixed Waste Area
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench in Service
Key Plan
218-W-5
Dayton Avenue
W and N numbers are Hanford Site Coordinate System points


218-W-3A Burial Ground
TSD Unit Boundary
Key Plan
Burial Ground 218-W-3A
W77000
N44000
N439450
N46505
27th Street
200 West Area Perimeter Fence
W78000
Dayton Road
0 METERS 100
0 FEET 300
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench In Service
Unused Waste Areas
Unused Trench Area
Radioactive Waste
Retrievable Transuranic
Regulated Mixed Waste
W and N numbers are Hanford Site Coordinate System points.
H9610021.8.1


218-W-3AE Burial Ground
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench In Service
Unused Waste Areas
Unused Trench Area
Radioactive Waste
Regulated Mixed Waste
N
200 West Area Perimeter Fence
27th Street
TSD Unit Boundary
Dayton Avenue
Key Plan
218-W-3AE
218-T-4 Pond
W and N numbers are Hanford Site Coordinate System points.
METERS
FEET
H961002182


218-W-6 Burial Ground
200 West Area Perimeter Fence
27th Street
N46500
N46505
W75798
N46505
TSD Unit Boundary
0 METERS 100
0 FEET 300
N45155
W74335
Power Line
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
1A Trench Number
Regulated Mixed Waste Area
W and N numbers are Hanford Site Coordinate System points.
200 West Area Perimeter Fence
27th Street
218-W-6
Key Plan
Dayton Avenue
3960201.13Cag
3/95 Set 2 1987

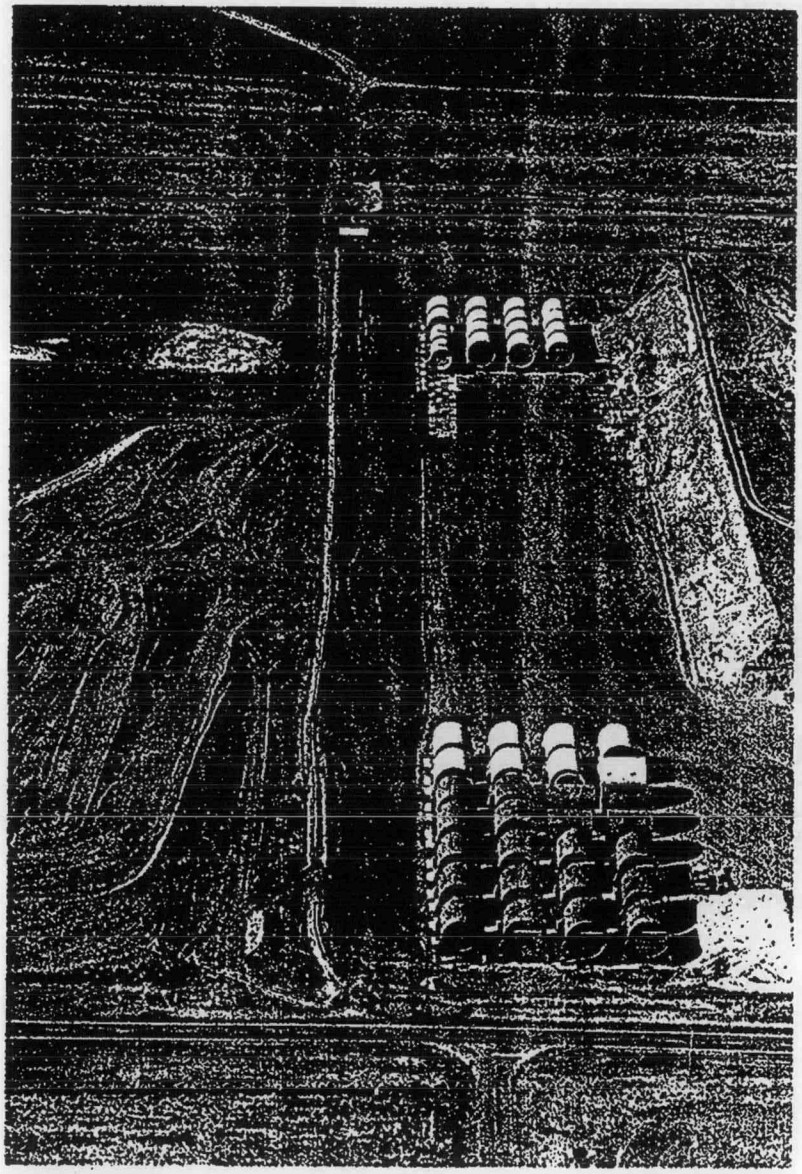
TYPICAL LINED MIXED WASTE TRENCH (TRENCH 34) 218-W-5/200 WEST AREA



46°33'36"
119°38'24"

95030469-44CN
(PHOTO TAKEN 1995)

REACTOR COMPARTMENT TRENCH 94



46°33'58"
119°31'06"

95030469-5CN
(PHOTO TAKEN 1995)

CONTENTS

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2.1.1 Other Environmental Permits 2-3
2.1.2 Construction Schedule 2-3

2.2 TOPOGRAPHIC MAP [B-2] 2-4

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APPENDIX

2A TOPOGRAPHIC MAPS . . . . . APP 2A-i

FIGURES

2-1. Low-Level Burial Grounds in the 200 East Area F2-1
2-2. Low-Level Burial Grounds in the 200 West Area F2-2

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2.0 FACILITY DESCRIPTION AND GENERAL PROVISIONS [B AND E]

Revision 0 of the LLBG dangerous waste permit application documentation described a land-based unit consisting of eight burial grounds located in the 200 East Area and 200 West Area. Seven of the original eight burial grounds (218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, 218-W-5, and 218-W-6) contain or will contain mixed waste that is subject to Washington Administrative Code (WAC) 173-303. In addition, portions of the 218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, and 218-W-5 Burial Grounds are designated as solid waste management units (SWMUs). One other burial ground (218-W-4B) within the LLBG, discussed in Revision 0, is now designated completely as SWMU (*Hanford Facility Dangerous Waste Permit Application, General Information Portion*, Chapter 2.0, DOE/RL-91-28).

Mixed waste is and has been received from onsite generating units and from offsite generators and is and will be disposed in mixed waste trenches. Leachate collected from lined trenches is transferred to leachate collection tanks that are located in proximity to the lined trenches.

A more detailed discussion of waste types and manifesting, and the identification of the processes and equipment, are provided in Chapters 3.0 and 4.0, respectively. Although the treatment, storage, and/or disposal of radioactive waste (i.e., source, special nuclear, and by-product materials as defined by the *Atomic Energy Act of 1954*) are not within the scope of *Resource Conservation and Recovery Act* (RCRA) *of 1976* or WAC 173-303, information is provided for general knowledge.

Low-level radioactive waste and transuranic waste continues to be placed in the SWMU portions of the LLBG. Transuranic mixed waste has not been placed in the LLBG since August 19, 1987. Soil is placed over some of the waste containers to provide radiological protection. Transuranic waste was placed in a manner that allows for retrieval and/or removal in the future if necessary. Any waste retrieved and/or removed will be processed and disposed in accordance with current federal and state requirements.

2.1 LOW-LEVEL BURIAL GROUNDS DESCRIPTION [B-1]

The LLBG are a land-based unit consisting of eight burial grounds located in the 200 East Area and 200 West Area. Seven of the eight burial grounds (218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, 218-W-5, and 218-W-6) are, or will be, used for the disposal of mixed waste and are subject to WAC 173-303. One burial ground (218-W-4B) is designated as SWMU (Figure 2-2 and Appendix 2A).

The 218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, and 218-W-6 Burial Grounds are classified as a landfill (D81) and the 218-W-5 Burial Ground is classified as a landfill (D81) and for greater-than-90-day container storage (S01). The regulated portions of the LLBG cover a total area of approximately 49 hectares.

The 218-E-10 and 218-E-12B Burial Grounds are located in the 200 East Area. The 218-W-3A, 218-W-3AE, 218-W-4B, 218-W-4C, 218-W-5, and 218-W-6 Burial Grounds are located in the 200 West Area. The LLBG consist of various sizes and depths of lined and unlined disposal trenches. All mixed waste destined for disposal will meet land disposal restriction (LDR) requirements [WAC 173-303-140 and 40 Code of Federal Regulations (CFR) 268] or other regulatory alternatives. The lined trenches have leachate collection and removal systems. The less-than-90-day leachate collection tanks are operated in accordance with the generator provisions of WAC 173-303-200. The less-than-90-day leachate collection tanks have a current design capacity of 37,850 liters; however, future leachate collection tank capacity might change to accommodate various sized lined trenches. The precise dimensions of leachate collection tanks for trenches 31 and 34 are provided in the construction quality assurance reports identified in Chapter 4.0.

Future mixed waste trench development and configuration within a burial ground are subject to change as disposal techniques improve or as waste management needs dictate and will be subject to an approved permit modification in accordance with the Hanford Facility (HF) RCRA Permit (Ecology 1994). Mixed waste is disposed in lined or in unlined trenches. Disposal of mixed waste in unlined trenches requires an exemption from the liner/leachate collection system requirements. This permit application documentation includes an exemption request for trench 94 for the disposal of U.S. Navy defueled reactor compartments (refer to Chapter 4.0, Section 4.3.2).

The following provides a brief description and identifies the generic types of waste disposed in the LLBG. An electronic database is maintained that documents each waste receipt, type of waste, and disposal location.

- The 218-E-10 Burial Ground is approximately 36.1 hectares in size (Chapter 1.0) and began receiving waste in 1960. Examples of waste placed in this burial ground include failed equipment, rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-E-12B Burial Ground is approximately 68 hectares in size (Chapter 1.0) and began receiving waste in 1967. Examples of waste placed in this burial ground include defueled reactor compartments (trench 94), low-level waste, and retrievable transuranic waste.

- The 218-W-3A Burial Ground is approximately 20.4 hectares in size (Chapter 1.0) and began receiving waste in 1970. Examples of waste placed in this burial ground include ion exchange resins, failed equipment, tanks, pumps, ovens, agitators, heaters, hoods, jumpers, vehicles, accessories, retrievable transuranic waste, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-W-3AE Burial Ground is approximately 20 hectares in size (Chapter 1.0) and began receiving waste in 1981. Examples of waste placed in this burial ground include rags, paper, rubber gloves,

disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-W-4B Burial Ground is approximately 3.5 hectares in size (Chapter 1.0) and began receiving waste in 1968. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, alpha caissons, and retrievable transuranic waste.

- The 218-W-4C Burial Ground is approximately 20 hectares in size (Chapter 1.0) and began receiving waste in 1978. Examples of waste placed in this burial ground include contaminated soil, decommissioned pumps, pressure vessels, post-August 19, 1987 RCRA and state-only designated mixed waste, and retrievable transuranic waste.

- The 218-W-5 Burial Ground is approximately 37.2 hectares in size (Chapter 1.0) and began receiving waste in 1986. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste. This burial ground currently contains double-lined mixed waste trenches (trenches 31 and 34). Trenches 31 and 34 also are designated as a greater-than-90-day container storage. Waste to be placed in trenches 31 and 34 for storage purposes predominately will be macro-encapsulated long-length contaminated equipment and other containerized waste that has been treated to meet LDR requirements. Adjacent to the double-lined mixed waste trenches are leachate collection tanks. Examples of waste to be placed in the double-lined mixed waste trenches include mixed waste that has been treated to meet LDR requirements (including bulk waste), macro-encapsulated long-length contaminated equipment, etc.

- The 218-W-6 Burial Ground is approximately 16 hectares in size (Chapter 1.0), has not received any waste, and is reserved for future mixed waste disposal.

2.1.1 Other Environmental Permits

All environmental permits that are required to support operation of the LLBG are identified in the *Annual Hanford Site Environmental Permitting Status Report* (e.g., DOE/RL-96-63).

2.1.2 Construction Schedule

Any proposed new construction for mixed waste trenches will be managed as described in the HF RCRA Permit.

2.2 TOPOGRAPHIC MAP [B-2]

In addition to the topographic maps, several maps at various scales have been included in this permit application documentation. Small-scale maps generally are included with the text. Appendix 2A contains topographic maps of 200 East and 200 West Areas.

2.3 ROADWAY TRAFFIC INTO THE LOW-LEVEL BURIAL GROUNDS [B-4]

General traffic information for the Hanford Facility is presented in the General Information Portion (DOE/RL-91-28). Public access to the LLBG is restricted. Figure 2-1 depicts the normal transportation routes within the 200 East Area. Waste transported to the 200 West Area LLBG is routed through Gates 609 or 611 (Figure 2-2). Trucks typically are used to transport waste to the LLBG and range in size from heavy duty pickup trucks to tractor-trailer rigs, depending on the size and weight of the load. In some cases, special equipment such as transporters are used for unusual or unique loads. When special equipment is used, an evaluation ensures that the equipment does not damage the roadways.

2.4 RELEASE FROM SOLID WASTE MANAGEMENT UNITS [E]

Information concerning releases from SWMUs is discussed in the General Information Portion (DOE/RL-91-28). However, no known releases have been detected from the LLBG since the installation of the groundwater monitoring network (refer to Chapter 5.0).

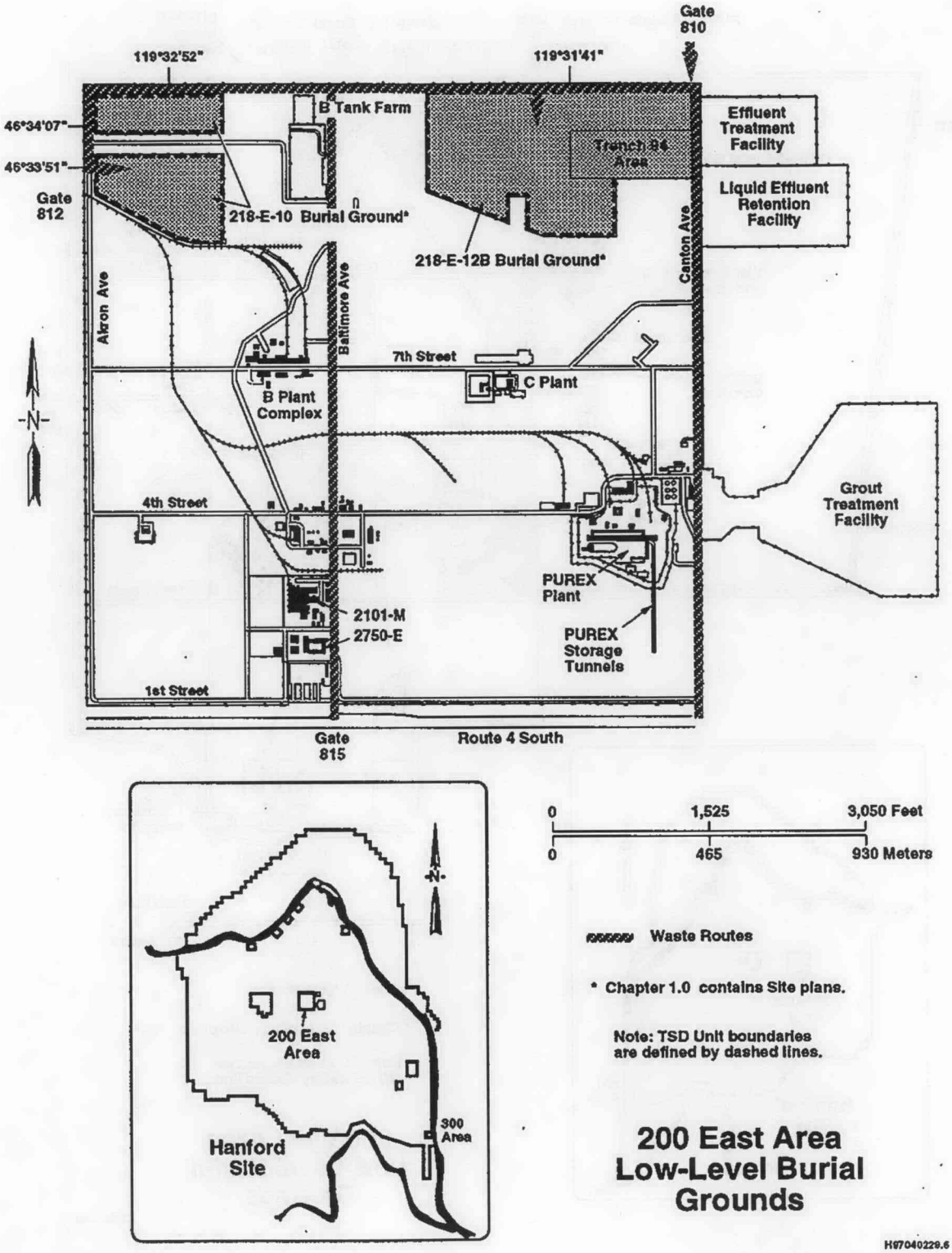

Figure 2-1. Low-Level Burial Grounds in the 200 East Area.

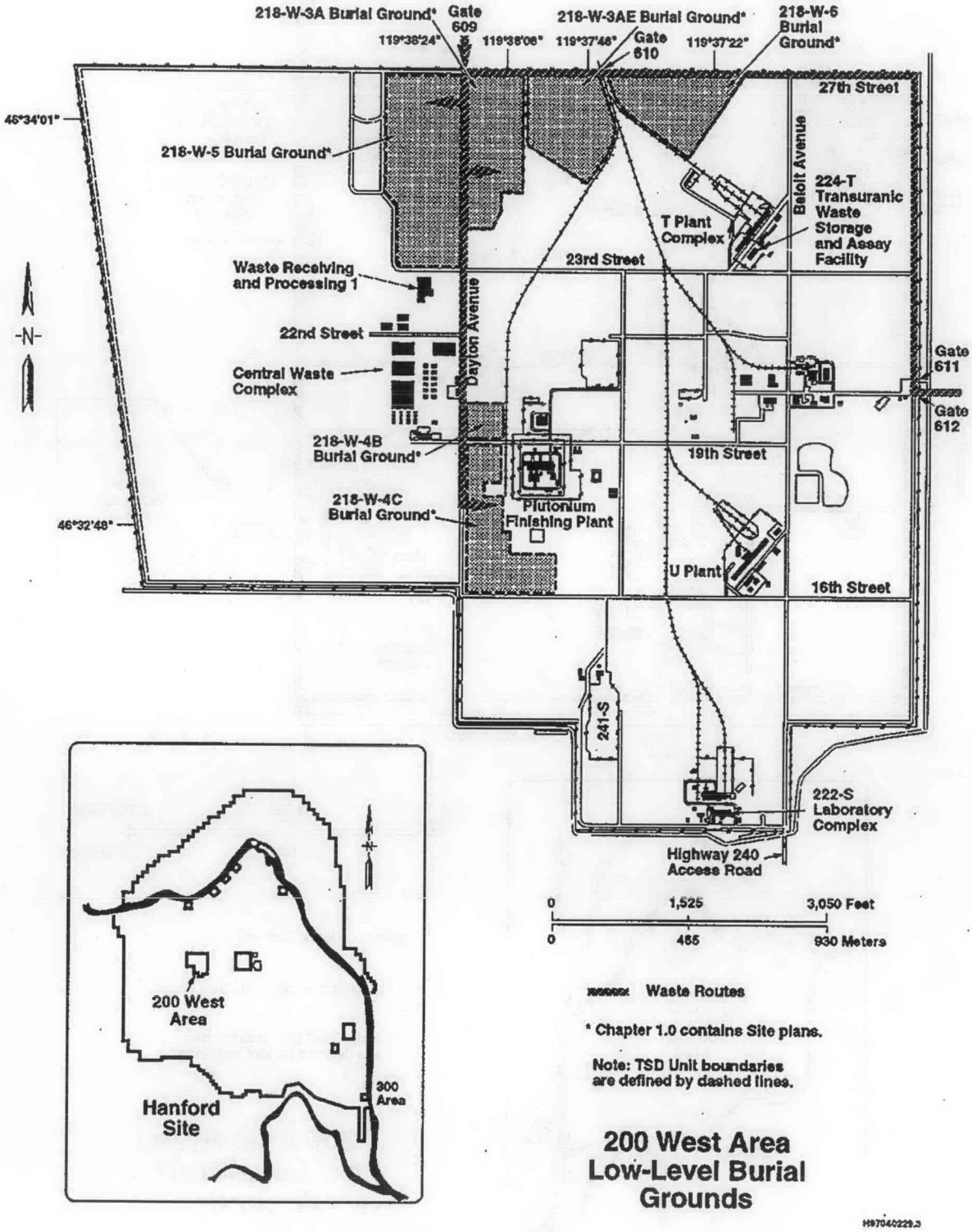

Figure 2-2. Low-Level Burial Grounds in the 200 West Area.

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3.0 WASTE CHARACTERISTICS [C]

This chapter provides information on the chemical, biological, and physical characteristics of the waste placed in the LLBG. A waste analysis plan (Appendix 3A) describes the methodology for determining waste types.

3.1 CHEMICAL, BIOLOGICAL, AND PHYSICAL ANALYSIS [C-1]

Records are available for waste placed in the LLBG since the burial grounds began operating in 1960. The detail associated with these records increases through time, particularly beginning in 1968. An account of waste placed in the LLBG since 1968 is maintained in an electronic database, on a continuing basis. This computer database lists the location of the waste container (using Hanford coordinates), the waste type, the record number of the original shipping documents, a container code, the volume of the waste container in cubic feet, and the weight of the container plus the waste in pounds. This database also tracks unpackaged or bulk waste placed in the LLBG. The last two categories include a list of dangerous constituents and the weight of each dangerous constituent in pounds. Complete records for radioactive waste with dangerous components have been maintained since 1986.

Only a relatively small fraction of the waste placed in the LLBG is classified as mixed waste. Dangerous constituents of this waste are co-contaminants of the radioactive waste. Mixed waste placed in the LLBG includes waste designated as dangerous and extremely hazardous per WAC 173-303.

Mixed waste placed in the LLBG could be packaged in a system of multiple barriers selected and specifically engineered to isolate the waste content from humans and the environment. The waste is confined in package systems that could include several plastic, metal, and glass containers as well as additional barriers to protect the environment or to make the waste more compatible with other barrier materials. Specific package barrier information is provided in Chapter 4.0.

3.2 LANDFILLED WASTES [C-1b]

Free liquids will not be accepted if the liquid is in excess of 1 percent of the volume of the waste or if the sorbent to potential liquid waste ratio is less than 2 to 1.

3.3 WASTE ANALYSIS PLAN [C-2]

The waste analysis plan (Appendix 3A) provides a description of how waste destined for the LLBG is identified to ensure proper handling and disposal.

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FIGURE

4-1. Example Liner System F4-1

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4.0 PROCESS INFORMATION [D]

This chapter discusses the processes used to dispose of mixed waste in the LLBG and includes a discussion of the design and function of the following.

- Containers
- Disposal trenches
- Leak detection system
- Leachate collection and removal system.

4.1 CONTAINERS [D-1]

All newly generated mixed waste accepted for storage at the LLBG is packaged in approved containers (U.S. Department of Transportation and/or U.S. Department of Energy), unless alternate packages are dictated by the size, shape, or form of waste (49 CFR 173) (e.g., metal boxes).

Mixed waste frequently is disposed in the container in which the waste was received. The only regulatory concerns with respect to the disposal of containerized waste in the LLBG are the potential for free liquids (free liquids will not be accepted if the liquid is in excess of 1 percent of the volume of the waste or if the sorbent to potential liquid waste ratio is less than 2 to 1) and subsidence due to void spaces in the containers. Both issues are addressed in the following sections.

4.1.1 Description of Containers [D-1a, D-1b, and D-1c]

Containers vary in shape, size, and strength depending on the form and weight of the waste. The most common containers are galvanized or aluminized 208-liter containers. Nominal 1.2-meter by 1.2-meter by 2.4-meter steel boxes are used frequently. Usually waste containers are lined to further contain the mixed waste. Liners consist of coatings to the interior of the containers, e.g., minimum 4 mil plastic liners or 90 mil polyethylene liners. Selection of the liner is driven by the chemical characteristics of the waste.

If the void space in containers of mixed waste exceeds 10 percent of the container volume, the containers must be crushed or repacked before storage.

Mixed waste containers are labeled and marked to indicate the dangerous and radioactive characteristics of the waste. The hazard labels are affixed, as required, to the sides of the containers, and each mixed waste container has a hazardous waste identification sticker attached in accordance with Ecology requirements. Marking and labeling requirements on the waste records are discussed in Chapter 3.0, Appendix 3A. In addition to the marking and labeling requirements, all waste containers are marked as follows:

- 'PERSISTENT' - If a WP01, WP02, or WP03 waste number is applicable
- 'TOXIC' - If a WT01 or WT02 waste number is applicable.

Before receipt for storage at trench 34 (and trench 31, if needed to support waste management needs), all containers are closed by the onsite generating unit or offsite generator by means of a neoprene gasket, steel lid, locking ring, locking ring bolt, and a lock nut torqued tight or by other available methods to meet requirements. On receipt, each container is inspected by LLBG operations personnel before acceptance for damage, proper closure, marking, and proper accompanying documentation.

The container packaging and container handling for trench 34 (and trench 31, if needed to support waste management needs), are designed to maintain containment of the waste, limit storage intrusion, and limit human exposure to mixed waste. The containers are placed on pallets or other support devices. Heavier containers are rotated to the bottom of the stack to ensure a stable center of gravity for each stack. Aisle space requirements are provided in Chapter 6.0, Section 6.3.5. Other unusual sized containers such as macro-encapsulated long-length contaminated equipment are handled by using cranes or other appropriate equipment.

For container disposal operations, container management practices are not applicable. However, if a container is disposed in the LLBG, the container must be 90 percent full. Alternatively, the container can be crushed, repacked, shredded, or similarly reduced in volume to the maximum practical extent before the container is buried (40 CFR 264.315).

On receipt, each container is inspected by operations personnel to confirm appropriate documentation and compliance with the waste acceptance criteria before the container is placed in the LLBG (refer to Chapter 3.0, Appendix 3A).

If containerized mixed waste must be opened (i.e., for confirmation sampling, repackaging, etc.), the container typically would be removed to an onsite treatment and/or storage unit or other approved location before being opened. The container would be sealed before being returned to the LLBG.

4.1.2 Containment Requirements for Storing Containers [D-1d]

The following sections describe secondary containment systems.

4.1.2.1 Secondary Containment System Design and Operation [D-1d(a) and (b)]. Refer to Section 4.5.3 for discussion on secondary containment system design and construction for trenches 31 and 34.

4.1.2.2 Containment System Capacity [D-1d(1)(c)]. Refer to Section 4.5.6 for discussion on containment system capacity for trenches 31 and 34.

4.1.2.3 Control of Run-On [D-1d(1)(d)]. Refer to Section 4.5.8 for discussion on control of run-on for trenches 31 and 34.

4.1.3 Removal of Liquids from Containment System [D-1d(2)]

Refer to Section 4.5.6 for discussion on containment system capacity for trenches 31 and 34.

In the event of a spill or release within trench 34 (and trench 31, if needed to support waste management needs), the following is performed.

1. Containers affected by the spill are inspected for signs of leakage. Leaking containers are repackaged and identified in the LLBG operating logbook.

2. Inspection reports and LLBG operating logbook are reviewed to identify any waste releases in trench 34 (and trench 31, if needed to support waste management needs) for which remedial actions have not been completed.

3. The containerized waste is handled as follows.

   - If the waste has been altered during stabilization and cleanup actions (absorbed, mixed, diluted, etc.), the containerized waste is managed in accordance with the provisions of the waste analysis plan (Chapter 3.0, Appendix 3A).

   - The LLBG inventory is updated to reflect the changes in waste description, volume, and storage location.

   - If the waste was not altered during stabilization and cleanup activities, the containerized waste is placed in trench 34 (and trench 31, if needed to support waste management needs) or at another onsite TSD unit. The LLBG inventory is altered to reflect any changes.

4. Cleanup soil (operations layer) will be removed and containerized; operations layer will be replaced.

5. Soil samples are taken from the operations layer (Section 4.5.3.1) and analyzed to verify cleanup adequacy.

6. When soil sampling techniques have verified cleanup, the LLBG supervisor signs the operating logbook, indicating that the waste was removed from the containment system and cleanup activities are completed.

Specific actions to be taken in response to a spill or discharge are detailed in the building emergency plan (Chapter 7.0, Appendix 7A).

4.2 CONTAINERS WITHOUT FREE LIQUIDS [D-1e]

Containers without free liquids that do not exhibit ignitability or reactivity are discussed in the following sections.

4.2.1 Test For Free Liquids

A test for free liquids is not performed unless specific instructions are received because testing would increase the radiation exposure of personnel. However, all mixed waste accepted for storage and/or disposal must comply with land disposal restriction requirements. For additional information on the waste acceptance criteria for the LLBG refer to Chapter 3.0, Appendix 3A.

4.2.2 Description of Containers

The description of containers is the same as is described in Section 4.1.1.

4.2.3 Container Management Practices

Container management practices are the same as are described in Section 4.1.1.

4.2.4 Container Storage Area Drainage

The description of the storage area drainage is the same as is described in Section 4.5.3.1.2.

4.3 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE IN CONTAINERS [D-1f]

Current LLBG operations do not allow for storage or disposal of ignitable, reactive, and incompatible waste in trenches 31 and 34 of the 218-W-5 Burial Ground.

4.4 LEACHATE COLLECTION TANKS

Each lined LLBG mixed waste disposal trench is supported by an aboveground less-than-90-day leachate collection tank. The information contained in Appendix 4A, construction quality assurance report, and Appendix 4B, definitive design report, provide specific details for the leachate collection tank installation for trenches 31 and 34 of the 218-W-5 Burial Ground. The less-than-90-day leachate collection tanks are operated in accordance with the generator provisions of WAC 173-303-200.

4.5 LANDFILLS [D-6]

This permit application documentation addresses the following types of trenches located in the LLBG:

- Regulated mixed waste trench (trench 94) for which a waiver to the liner/leachate collection system requirements has been requested (Appendix 4D)

- Unlined trenches (Section 4.5.2.2)

- Lined trenches.

4.5.1 List of Wastes [D-6a]

Mixed waste disposed in the LLBG consists of listed waste, characteristic waste, state-only waste, and waste from nonspecific sources (Chapter 1.0). Examples of waste disposed in the LLBG include containerized or bulk waste such as contaminated soil, decommissioned pumps, pressure vessels, macro-encapsulated debris and macro-encapsulated long-length contaminated equipment, defueled reactor compartments, and mixed waste that has been treated to meet LDR.

4.5.2 Liner System Exemption Requests [D-6b and D-6b(2)]

This permit application documentation seeks an exemption to liner system requirements for the reactor compartment disposal trench (trench 94).

4.5.2.1 218-E-12B Burial Ground (Trench 94). Appendix 4D, "*Request for Exemption from Lined Trench Requirements at 218-E-12B Burial Ground Trench 94*", updates the exemption request submitted to Ecology on October 9, 1992 (DOE/RL-88-20, Supplement 1, Revision 1). The defueled reactor compartments are managed as a state-only dangerous waste due to the presence of lead shielding. The following is a summation of the content of the exemption request.

Defueled reactor compartment disposal packages are a unique integrated waste form that is both containment and waste. The welded steel structure of the package forms a sealed containment barrier for the materials contained within the waste matrix. This steel structure includes a combination of existing ship hull and structure, and installed bulkhead structure and/or exterior plating. The minimum thickness of this structure is typically 1.9 centimeters but is 1.3-centimeters thick over small penetrations through the hull of older reactor compartments. The packages are designed to be water tight at higher hydraulic pressures than would be experienced after disposal. The first potential generation of contaminated leachate would occur when general corrosion, in combination with soil pressure, causes the containment structure to rupture allowing lead in the packages to be exposed. This is not expected to occur for about 2,000 years and should not occur for about 600 years at the minimum. These times are based on conservative estimates of the general corrosion rate of carbon steel in trench 94 of 0.0015 centimeters per year for the maximum rate.

Each defueled reactor compartment contains elemental lead used as shielding, chromium and nickel in corrosion-resistant steel alloys, and small

amounts of cadmium and asbestos for thermal insulation. The reactor compartments comply with WAC 173-303 requirements for removal of free liquids from waste. Before a defueled reactor compartment is sealed, liquids are removed to the maximum extent practical while keeping worker radiation exposure as low as reasonably achievable (ALARA). Therefore, some residual liquids remain in the defueled reactor compartments because removing all the residual liquids would entail significant worker radiation exposure. Where practical, absorbent is added to the reactor compartments to absorb residual liquids.

Lead is the only dangerous constituent present in quantities requiring regulation under WAC 173-303. Lead is not expected to migrate to an aquifer below the burial site for at least 240,000 years (conservative bounding case) and more likely over 2 million years (best estimate).

The exemption request (Appendix 4D) concludes that the reactor compartment waste form will prevent the generation of any contaminated leachate beyond the expected lifetime of the minimum technological liner/leachate system design. A liner/leachate collection system should not be required for the reactor compartment disposal trench because the thickness of the package structure prevents intrusion of precipitation into the compartment where waste is located. In addition, with an average annual rainfall of 15.2 to 17.8 centimeters, it is doubtful liquids will penetrate the 3.1 meters of soil covering the reactor compartments. Most of the precipitation will be lost to evapotranspiration. The potential for liquids reaching the reactor compartments will be reduced further when the 218-E-12B Burial Ground is covered (Chapter 11.0).

4.5.2.2 Unlined Trenches. The EPA published the "Final Authorization of State Hazardous Waste Management Program; Washington" (52 FR 35556). Although this authorization became effective on November 23, 1987, and included the authorization to regulate mixed waste, an agreement was reached with Ecology that the actual date for regulating mixed waste is August 19, 1987. An exemption from the liner system requirements for mixed waste is requested for all mixed waste that has been received for disposal in various unlined trenches since August 19, 1987.

4.5.3 Liner System, General Items [D-6c]

This section provides a general description of the liner systems used for mixed waste lined trenches.

The liner system is designed to prevent migration of leachate out of the lined trench during its active life. The active life consists of the operational period and the closure period. The liner system is designed to meet the EPA requirements, as identified in RCRA Subtitle C requirements for hazardous waste disposal facilities (40 CFR 264), technical guidance documents (e.g., EPA 1985), and WAC-173-303. In addition, the liner system incorporates the following general functional requirements:

- Range of Operating Conditions--year-round operation, withstand construction and long-term stresses

- Degree of Reliability--function safely and effectively throughout operating and postclosure period with minimum maintenance

- Intended Life--operational phase plus 30 years postclosure monitoring phase.

4.5.3.1 Liner System Description [D-6c(1)]. The trench liner systems comply with RCRA requirements for hazardous waste landfills. Refer to Appendix 4A and 4B for specific design information on liner systems. Figure 4-1 shows a typical design and includes the following components (from top to bottom).

- Operations layer: nominal amount (0.9-meter thick) of native soil. This layer provides a working surface for equipment, protects the liner from mechanical damage, and prevents freezing of the underlying low-permeability soil layer.

- Primary leachate collection system that contains at least one of the following:

  - a geotextile/geonet composite, with a minimum transmissivity value of 3×10^{-5} square meters per second

  - a minimum 0.3-meter-thick drainage gravel layer with a hydraulic conductivity of at least 1×10^{-2} centimeters per second (sometimes including drainage pipes)

  - a geonet, with a minimum transmissivity value of 3×10^{-5} square meters per second.

The primary leachate collection system collects and conveys leachate to the primary sump for removal and includes the following components.

- Primary geomembrane liner: generally consisting of high-density polyethylene because of its excellent resistance to chemicals. Minimum 60-mil thickness; can be textured (to improve stability against sliding) or smooth. The geomembrane acts as a moisture barrier. The primary leachate collection system includes perforated pipe that helps collect and guide water into the primary sump.

- Primary admix liner (optional; not required by regulations): a minimum 0.46-meter-thick layer of compacted soil/bentonite admixture with a permeability of 1×10^{-7} centimeter per second or less. This layer acts as an additional primary moisture barrier directly under the primary geomembrane.

- Secondary leachate collection system: same as primary system, except that pipes are not needed because very high flow capacities are not required. The purpose of this system is to collect any leachate that leaks through the primary liner system and convey the leachate to the

secondary sump for removal. The secondary leachate collection system also serves as the leak detection system.

- Secondary geomembrane liner: same as primary geomembrane liner.

- Secondary admix liner: a minimum 0.9-meter-thick layer of compacted soil/bentonite admixture with a permeability of 1×10^{-7} centimeter per second or less. This layer acts as an additional moisture barrier directly under the secondary geomembrane.

4.5.3.1.1 Rain Cover. The rain covers for mixed waste disposal trenches (e.g., trenches 31 and 34 and potential future lined trenches) would intercept the majority of precipitation before encountering the disposed mixed waste. Removing this precipitation as clean rainwater versus managing the precipitation as multi-source leachate (F039) would implement waste minimization to the extent practical. The rain covers would include a geosynthetic membrane, flexible piping, and pumps necessary to ensure a complete system to collect and remove precipitation. Because the rain cover would be installed over the slopes of the trench, significant quantities of precipitation would be collected and removed.

4.5.3.1.2 Operations Layer. The purpose of the operations layer is to protect the underlying liner components from damage by equipment during lined trench construction and operation. On the sideslopes, this layer also protects the admix layer from freezing and desiccation cracking.

Previous research and experience has shown that desiccation cracks can occur under geomembrane liners when either the liner is not in close contact with the compacted admix or when the liner is subjected to wide temperature fluctuations (Corser and Cranston 1991). The operations layer acts as a weight to keep the geomembrane in contact with the admix, thereby reducing the potential for water vapor to form in an underlying airspace. The operations layer also acts as an insulating layer, together with the dead air space trapped in the geocomposite drainage layers.

The operations-layer material typically consists of onsite granular soil that is reasonably well graded and conforms to one of the following Unified Soil Classification System designations, ASTM D2487: GM, GC, SW, SM, SP, or SC. Material has a maximum particle size limit of 10.2 centimeters or less, depending on the strength of the underlying layers.

4.5.3.1.3 Primary Leachate Collection System. The primary leachate collection system is located below the operations layer and provides a flow path for the leachate flowing into the primary sump. Although any of the options presented in Section 4.5.3.1 are acceptable in the LLBG, the following is a description of the system used in the existing mixed waste disposal trenches.

Between the operations layer and the underlying drainage gravel, a geotextile layer functions as a filter separation barrier. The geotextile prevents migration of fine soil and clogging of the drainage gravel. The

gravel is a minimum 0.3-meter-thick layer of washed, rounded to subrounded stone, with a permeability of at least 1×10^{-2} centimeter per second, as required by RCRA regulations. In addition, perforated high-density polyethylene drainage pipe is placed within the drainage gravel to accelerate leachate transport into the primary sump during high precipitation events. The gravel layer is underlain by a geotextile/geonet drainage layer resting on the primary high-density polyethylene geomembrane. The geonet provides additional drainage capacity for high-precipitation events and acts as a redundant drainage system.

On the lined trench sideslopes, the primary leachate collection system has a geocomposite drainage layer composed of a geonet, with a layer of geotextile thermally bonded to each side. This geocomposite drainage layer has a transmissivity at least as high as a 0.3-meter-thick gravel layer with a permeability of 1×10^{-2} centimeters per second. Geocomposite is used on the sideslopes to avoid problems associated with placement of clean granular material on slopes, and thereby minimizing the potential for damaging the underlying liner system.

4.5.3.1.4 Primary Geomembrane Liner. The primary geomembrane liner acts both as an impermeable leachate barrier and as a flow surface, routing leachate to the primary sump. High-density polyethylene is used because of its high resistance to chemical deterioration. However, other materials are acceptable provided these materials can achieve or exceed the performance specifications established for high-density polyethylene. Generally, textured (roughened) geomembrane is used to maximize shear strength along adjacent interfaces and to reduce the potential for sliding of the liner system.

4.5.3.1.5 Primary Admix Liner. A primary admix liner, consisting of a minimum 0.46-meter-thick compacted soil/bentonite admixture, could be installed immediately beneath the primary high-density polyethylene liner on the floor of the lined trench only. The purpose of this liner is to provide extra protection in the case of deterioration (such as stress cracking) of the primary geomembrane in those lined trenches that might be open for several years. In lined trenches that are closed after only a few years, this layer might not be necessary. The need for this layer is evaluated on a case-by-case basis during detailed design of the particular lined trench.

When used, the admix liner typically consists of silty sand from local borrow sources mixed with a nominal 12-percent sodium bentonite, by dry weight. The in-place permeability of the admix liner is 1×10^{-7} centimeter per second or less, consistent with RCRA requirements for secondary soil liners. The upper surface of the admix liner is trimmed to the design grades and tolerances as shown on the construction drawings (Appendices 4A and 4B). To prepare a smooth uniform surface on which to place the overlying geomembrane liner, the surface is rolled with a smooth steel-drum roller to remove all ridges and irregularities.

4.5.3.1.6 Secondary Leachate Collection System. The secondary leachate collection system provides the flow path for the leachate flowing into the secondary sump. Although any of the options presented in Section 4.5.3.1 are

acceptable in the LLBG, the following is a description of the system used in the existing mixed waste disposal trenches.

The secondary leachate collection system has drainage gravel on the floor, with an additional geotextile/geonet layer and a geocomposite layer on the sideslopes. These materials and their configuration are similar to the primary leachate collection system described in Section 4.5.3.1.2, except for the absence of a perforated drainage pipe system on the floor of the lined trench. The secondary leachate collection system channels leachate that penetrates the primary liner system into the secondary sump.

The secondary leachate collection system also serves as the leak detection system. Leachate collected in the secondary sump is measured to determine the leakage rate through the primary liner. Appendix 4C contains the response action plan(s) for the mixed waste disposal trenches.

4.5.3.1.7 Secondary Geomembrane Liner. The secondary high-density polyethylene liner, located underneath the secondary leachate collection system, is placed directly against the secondary compacted admix liner. The secondary liner is similar to the primary geomembrane described in Section 4.5.3.1.3.

4.5.3.1.8 Secondary Admix Liner. The secondary admix liner has a minimum 0.9-meter-thick compacted soil/bentonite admixture located immediately beneath the secondary high-density polyethylene liner, as required by RCRA regulations. The secondary admix liner typically consists of silty sand from local borrow sources mixed with a nominal 12 percent sodium bentonite, by dry weight. The in-place permeability of the admix liner is 1×10^{-7} centimeter per second or less, consistent with RCRA requirements for secondary soil liners. The upper surface of the admix liner is trimmed to the design grades and tolerances as shown on construction drawings (Appendix 4A and 4B). The surface is rolled with a smooth, steel-drum roller to remove all ridges and irregularities. The result is a smooth uniform surface on which to place the overlying geomembrane liner.

4.5.3.1.9 Subgrade/Liner System Foundation. The lined trenches in the LLBG are founded in undisturbed native soils, generally ranging from silty sands to well-graded gravels. The liner system foundation is discussed in further detail in Section 4.5.4.

4.5.3.1.10 Access Ramp. Each lined trench has an access ramp. The access ramp also includes the liner system components previously described. However, some of the components are thickened and a top-course layer is installed to support traffic. These enhancements prevent damage to the liner system from vehicle traffic into the lined trench. Access ramp design can vary depending on the location of a trench and the type and frequency of traffic into the trench.

4.5.3.1.11 Truck Unloading Area Liner System. A truck unloading area is located at the top of the access ramp to provide an area for transfer of containerized waste from over-the-road trucks to forklifts or other vehicles/equipment that place the waste in the lined trench. The truck

unloading area is lined with a high-density polyethylene geomembrane. Typically, a geotextile cushion and top-course aggregate is placed over the geomembrane. The high-density polyethylene drainage pipe can be included at the base of the aggregate to enhance drainage. The truck unloading area is paved with asphaltic concrete to facilitate cleanup of any accidental spills. Both the asphaltic concrete surface and the underlying drainage system of the unloading area direct all surface run-off into the primary leachate collection system of the lined trench.

4.5.3.2 Liner System Location Relative to High Water Table [D-6c(2)]. The groundwater level (seasonal high water table) is located 61.0 to 91.4 meters below the ground surface in the LLBG (refer to Chapter 5.0). It is anticipated that the deepest point of the liner system will be no greater than 21.3 meters below ground surface. Consequently, the liner systems are at least 39.7 meters above groundwater. The liner systems are not affected by the water table because of this large elevation difference.

4.5.3.3 Loads on Liner System [D-6c(3)]. The liner system experiences several types of stresses during construction, operation, and postclosure periods. These stresses are analyzed during the detailed design of each lined trench (Appendices 4A and 4B). The following sections discuss the types of stresses and potential analytical methods.

4.5.3.3.1 Stresses From Installation or Construction Operations. The sideslope geosynthetic liner components experience some stress during installation and before placing waste in the lined trench. A high-density polyethylene liner is temperature sensitive, expanding and contracting as liner temperatures increase and decrease. Thermally induced stresses can develop in the liner if deployment and anchoring occur just before a significant decrease in the liner temperature. The maximum potential liner thermal stress typically occurs during construction before placement of the operations layer. The high-density polyethylene liner is sufficiently thick so that this stress remains well below the yield strain and stress.

The drainage gravel has the potential to produce localized stress on the geomembrane liner during gravel placement with construction equipment. A geotextile cushion (and possibly a geonet) is placed at the base of the drainage gravel to the underlying geomembrane. A puncture analysis is performed to select a sufficiently thick geotextile. This analysis incorporates expected construction vehicle ground pressures and assumed drainage gravel gradation listed in the construction specifications. A safety factor of three is used when evaluating puncture stress.

Tension induced by liner-component load transfer is not anticipated to occur, because the liner interface coefficients of friction are higher than the sideslope angles. The liner component interface strengths are determined by laboratory direct shear tests. Both static and dynamic stability analyses are performed, using standard methods, design accelerations, and factors of safety.

Stresses on the geomembrane in the anchor trench also are evaluated during detailed design. Wind uplift and thermal expansion and contraction can

cause stress in the geomembrane during construction. However, these stresses are not a problem, because these stresses are relatively low as compared to the tensile strength of the liner. The stresses are not present after construction, because of the weight and insulating properties of the operations layer.

4.5.3.3.2 Stresses Resulting From Operating Equipment. Loads on the liner system due to operating equipment are expected to be less severe than those generated by construction equipment for two reasons. One, operations equipment typically is lighter than construction equipment, and two, the 0.9-meter-thick operations layer dissipates stresses produced by the operating equipment.

The lined trenches are filled in a way that maintains adequate factors of safety against sliding. Stability analyses are performed during detailed design, once the lined trench geometry and liner system properties have been determined. The analyses establish operational parameters such as waste lift thickness and temporary operating slope angles.

Stability of the liner system components under the access ramp is analyzed separately. The analysis considers both static and dynamic (moving vehicle) conditions.

4.5.3.3.3 Stresses From Maximum Quantity of Waste, Cover, and Proposed Postclosure Land Use. When the lined trench is full and the cover system is in place, the liner system experiences a static load from the overlying waste, backfill, and cover materials. No significant increase in stresses on the liner system is anticipated from postclosure land use. The maximum design load of material overlying the liner system includes an allowance for the cover system (Chapter 11.0). Analyses include puncture resistance of the geomembranes and decrease in transmissivity of geocomposite drainage layers. Materials are specified based on the ability of the materials to perform adequately under postclosure loading conditions.

Dynamic stresses on the liner system result primarily from ground accelerations during seismic events. Both static and dynamic analyses are performed on the subgrade and liner components based on the finished configuration of the empty trench. Under postclosure conditions, the waste, backfill, and cover materials will tend to buttress the liner system, resulting in greater stability relative to the operational phase.

4.5.3.3.4 Stresses Resulting From Settlement, Subsidence, or Uplift. The subgrade settlement produced by waste loading is essentially elastic because of the coarse-grained, noncohesive, and drained nature of the soil. The subgrade rebounds during the excavation phase of construction and settles as the trench is filled. The compacted admix liner consolidates under waste loads. The total settlement is a combination of the subgrade elastic and the admix consolidation settlements. These settlements are analyzed with standard methods during detailed design of each lined trench. In general, differential settlements are expected to occur primarily across the lined trench sideslopes as the thickness of waste decreases from maximum to zero. Because

geosynthetic liner components are highly elastic, the anticipated strains are not likely to produce any appreciable stresses in the liner system.

The potential for subsidence-induced stress is believed to be negligible based on the following information.

- The soils underlying the LLBG tend to be coarse-grained sands and gravels that are not subject to piping effects that can transport soil resulting in subsidence.

- The groundwater level is deep, at least 39.7 meters below the base of the deepest lined trenches, and does not affect bearing soils.

- No mining or tunneling has been noted. If the groundwater level was lowered substantially and consolidation occurred in the aquifer, local site-specific subsidence would be negligible because of the depth of the groundwater below the lined trenches.

- The native soils are well graded and relatively dense.

The potential for stresses resulting from uplift on the liner system also is expected to be negligible. The seasonal groundwater level is very deep, and higher-elevation perched groundwater is unlikely to develop because of the absence of aquitards in the coarse-grained Hanford formation underlying the LLBG. The coarse-grained nature of the Hanford formation also promotes rapid, primarily vertical, infiltration, which means it is unlikely that infiltration from outside the lined trench boundary will be transported laterally underneath the trench liner. Gas pressures are similarly unlikely to develop because of the absence of any noted subsurface gas generation (from organic material decomposition) and the coarse-grained, highly permeable sands and gravels underlying the landfill.

4.5.3.3.5 Internal and External Pressure Gradients. Pressure gradients across the liner caused by liquids or gases are expected to be negligible. Internal pressures due to liquids are controlled by the leachate collection and removal systems. Because leachate is removed from the sump in a timely manner, there is minimal liquid head on the liner (less than 30.5 centimeters) according to RCRA regulations). Any gas that is generated internally before closure is vented either through the waste or the leachate collection system. The closure cover design will consider gas venting.

External pressures on the liner system are expected to be minimal. Gas pressures are negligible because the subgrade soil contains no gas producing materials and is highly permeable, readily venting any potential gas to the atmosphere. External pressure from liquids is not anticipated because of the deep groundwater table and the highly permeable foundation soils.

4.5.3.4 Liner System Coverage [D-6c(4)]. The liner system covers all soils underlying the lined trench and extends over the crest of the sideslopes into the anchor trenches. In addition, the truck unloading areas at the top of the access ramps are lined with 90-mil high-density polyethylene geomembranes.

All surface water run-off from the truck unloading areas drains into the primary leachate collection systems.

4.5.3.5 Liner System Exposure Prevention [D-6c(5)]. No geosynthetic or admix components of the liner system are exposed to the atmosphere. The minimum 0.9-meter-thick operations layer covers the entire lined trench surface. This layer serves both as a physical protective barrier and as thermal insulation, protecting the admix layer from desiccation and frost damage.

The operations layer is inspected weekly for erosion. Excessive erosion, such as gullying, is repaired by replacing the eroded soil. Dust suppression agents are used to prevent excessive wind erosion. The dust suppression agents bind the surface of the operations layer and minimize wind entrainment of soil.

4.5.4 Liner System, Foundation [D-6d]

The following sections discuss the foundations beneath the liner systems.

4.5.4.1 Foundation Description [D-6d(1)]. Surficial deposits within the LLBG generally consist either of Recent eolian sands or the coarse-grained glaciofluvial flood sequence of the Hanford formation, which has an interstratified deposit of coarse sand, gravelly sand, and/or sandy gravel. Where eolian sands are present, these sands are underlain by the Hanford formation. Subsequent units underlying the Hanford formation are the early-Palouse soil, the Plio-Pleistocene unit, the middle Ringold unit, and the Elephant Mountain Member of the Columbia River Basalt Group (DOE/RL-91-28, Chapter 5.0).

The two geologic units pertinent to the LLBG lined trenches are summarized as follows.

Recent eolian sand: The sand is light olive gray in color and has a density that is loose at the surface but becomes compact with depth. The sand has a fine to medium grain size and includes little to some nonplastic silt-sized fines. The deposit is homogeneous except for a distinguishable layer of volcanic ash in some locations.

Glaciofluvial flood deposit: This deposit has well graded mixtures of sands and gravels with trace to little nonplastic silt-sized particles. The density of the deposit ranges from compact to very dense. The gravel content can vary with depth, and the deposit predominantly can become gravel. This coarse-grained deposit is part of the Cold Creek Bar, which was formed during the Pleistocene Epoch by glacial outburst flooding.

Liner system elevations are shown on the design documents for each lined trench (Appendix 4A and 4B).

4.5.4.2 Subsurface Exploration Data [D-6d(2)]. Geotechnical site investigations are used to support the detailed design of each lined trench. The investigations consist of a review of historical data, including well logs

(Chapter 5.0), and test pit data (Appendix 4E). Because the foundation soils are relatively consistent over broad areas, the need for borings and geophysical investigations are determined on a case-by-case basis. If boreholes are drilled, penetration test data are collected to determine the strength of the foundation materials in situ.

4.5.4.3 Laboratory Testing Data [D-6d(3)]. Laboratory testing is performed on soil samples from test pits and borings, both from the lined trench site and from potential borrow source locations. Testing is performed to classify soils, provide input parameters for engineering analyses, and for preparing material and construction specifications. The following tests are performed on the soil samples:

- Visual classification (ASTM D2487)--to classify soils
- Natural moisture content (ASTM D22/6)--for input to engineering analyses and preparing construction specifications
- Particle size analysis (ASTM D422 or D1140/C136)--for classification and input to engineering analyses
- Moisture-density relationships (ASTM D698 or D1557)--for preparing compaction specifications
- Triaxial strength (ASTM D4767)--for input to engineering analyses.

Laboratory testing is performed according to the most recent versions of ASTM procedures or other recognized standards. Additional tests are performed as needed.

Chemical analyses also are performed to screen for organic materials (both volatile and semivolatile) and hazardous metals. This is done to prevent incorporating contaminated material into the trench liner. Standard EPA methods are used for this screening.

4.5.4.4 Engineering Analyses [D-6d(4)]. The subgrade is required to support the liner system and overlying materials (waste, fill, and cover) without excessive settlement, compression, or uplift that could damage the liner system. This section describes the design approach used to satisfy these criteria.

4.5.4.4.1 Settlement Potential [D-6d(4)(a)]. The subgrade settlement produced by waste loading is essentially elastic because of the coarse-grained, noncohesive, and drained nature of the soil. The subgrade rebounds during the excavation phase of construction and settles as the trench is filled. An elastic settlement analysis using standard methods is performed to determine the magnitude of the total and differential settlement.

4.5.4.4.2 Bearing Capacity [D-6d(4)(b)]. The bearing capacity of the subgrade soil needs to support structures such as leachate collection tanks. The construction specifications typically require that the upper portion of the subgrade soil and all structural fill be moisture conditioned and

compacted to at least 95 percent of the maximum modified Proctor dry density (ASTM D1557). Maximum allowable bearing capacities for foundations are established using standard geotechnical methods. Bearing capacities for the types of soils expected in the LLBG are typically greater than the maximum expected loads from the support structures.

4.5.4.4.3 Stability of Lined Trench Slopes [D-6d(4)(c)]. The lined trenches are constructed in eolian sand and the underlying coarse-grained Hanford formation. In granular, cohesionless, and drained soils such as these, the stability of the slope is related primarily to the maximum slope angle. Therefore, an infinite slope or other suitable analysis method is used to determine both static and dynamic sideslope stability. A more detailed discussion on lined trench slope stability is provided in Appendix 4B.

4.5.4.4.4 Potential for Excess Hydrostatic or Gas Pressures [D-6d(4)(d)]. Because the seasonal high-water level is at least 39 meters below the base of the deepest lined trench, no external hydrostatic pressure is expected from this source. Because of the coarse-grained nature of the foundation soils, any infiltration of surface water around the perimeter of the lined trench is expected to travel primarily downward. Therefore, infiltration should not cause substantial pressure on the exterior of the liner system. Internal hydrostatic pressure from leachate is negligible because the leachate is removed from the lined trench to limit head on the liner.

Gas pressure exerted externally on the liner system is expected to be negligible, because no gas generating material (i.e., organic material) is expected in the foundation soils. If any gas were generated below the liner system, little pressure buildup would occur because of the unsaturated coarse-grained nature of the foundation soils, which would vent the gas to the atmosphere. Internal gas pressure buildup is not anticipated, because the leachate collection system is vented to the atmosphere and dissipates any gas.

4.5.4.4.5 Seismic Conditions. Potential hazards from seismic events include faulting, slope failure, and liquefaction. Disruption of the lined trench by faulting is not considered a significant risk because (1) no major faults have been identified in the LLBG (DOE 1988) and (2) only one central fault at Gable Mountain on the Hanford Site shows evidence of movement within the last 13,000 years (WHC 1991a). The potential for slope failure is considered low, because granular materials typically have high strengths relative to the maximum sideslope angles expected for the lined trenches. Liquefaction occurs in loose, poorly graded granular materials that are subjected to shaking from seismic events. Saturated soils are most susceptible because of high dynamic pore pressures that temporarily lower the effective stress. During this process, the soil particles are rearranged into a more dense configuration, with a resulting decrease in volume. The foundation materials at the LLBG are not considered susceptible to liquefaction because the materials are well graded, unsaturated, and relatively dense.

4.5.4.4.6 Subsidence Potential. Subsidence of undisturbed foundation materials is generally the result of dissolution, fluid extraction (water or

petroleum), or mining. The potential for subsidence is negligible based on the following.

- The soils underlying the LLBG are coarse-grained sands and gravels, which are not subject to piping that can cause transport of soil and resulting subsidence.

- The groundwater level is deep, at least 39.7 meters below the base of the lined trenches, and does not affect bearing soils.

- The soil and rock types below the LLBG are not soluble.

- No mining or tunneling has been noted. If the groundwater level were lowered substantially and consolidation occurred in the aquifer, local site-specific subsidence would be negligible because of the depth of the groundwater table below the lined trenches.

- The soils are well graded and relatively dense.

4.5.4.4.7 Sinkhole Potential. Extensive borings in and around the LLBG (Chapter 5.0) have not identified any soluble materials in the foundation soils or underlying sediments. Consequently, the potential for any sinkhole development is negligible.

4.5.5 Liner System, Liners [D-6e]

The following sections discuss the individual components of the LLBG liner systems.

4.5.5.1 Synthetic Liners [D-6e(1)]. As described in Section 4.5.3, the synthetic liners act as an impermeable barrier for leachate migration (Figure 4-1). The synthetic liners consist of high-density polyethylene material, which makes the liners resistant to chemical deterioration. Section 4.5.3 describes the synthetic liner system in greater detail. Additional detail is contained in Appendices 4A and 4B for each lined trench.

4.5.5.2 Synthetic Liner Compatibility Data [D-6e(1)(a)]. During detailed design of a lined trench, the composition of the expected leachate is estimated. Expected leachate composition is based on known waste composition, process information, leachate from operating lined trenches, and similar sources of data. Leachate constituents are compared to manufacturers' chemical compatibility data for synthetic liner components. In addition, the results of previous chemical compatibility testing and studies are evaluated against leachate composition. Information gained from this evaluation is used to select a liner that will be compatible with the expected leachate.

During landfill operation, the compatibility of waste receipts with the liner is ensured by the waste analysis plan (Chapter 3.0, Appendix 3A). The compatibility of the waste constituents with the liner material is established by laboratory testing. Such tests follow the procedures of EPA Method 9090A

or other appropriate methods. Test results are evaluated using statistical methods and industry-accepted criteria for liner/leachate compatibility.

A waste constituent not listed in the waste acceptance criteria can be accepted into the LLBG, provided the 9090A test results or other analytical data are provided that demonstrates the waste constituent is compatible with the liner. Appendix 4F contains 9090A test results for suitability of synthetic liners.

4.5.5.3 Synthetic Liner Strength [D-6e(1)(b)]. As discussed in Section 4.5.3.3, the liner system experiences loads from several sources. During the detailed design process for each lined trench, the strength of liner system materials is evaluated against these loads. If an analysis shows an inadequate factor of safety, a stronger material is specified or the design is modified. These strength analyses are included as part of the design document package (Appendices 4A and 4B).

Seams in geomembranes are a critical area. However, with correct installation methods the seams are stronger than the surrounding material. Detailed installation requirements are included in the construction specifications to ensure that the most appropriate methods are used. In addition, procedures are established to demonstrate adequate seam strength is achieved during installation (Appendix 4A).

Seaming requirements for the geotextiles, geonet, and geocomposite drainage materials are not as critical. These materials are overlapped sufficiently to provide complete areal coverage, and relatively light seams are used to hold the panels in position during construction. After the lining system has been completed, seam strength requirements for these materials are negligible.

4.5.5.4 Synthetic Liner Bedding [D-6e(1)(c)]. The synthetic liner system is in contact with the compacted admix, drainage gravel, and operations layers.

The secondary flexible membrane liner is in direct contact with the compacted admix layer. This type of fine-grained material typically is used for clay liners overlain by flexible membrane liners. No problems related to the mechanical integrity of the flexible membrane liner are expected in this application.

With respect to the drainage gravel and operations layers, the geomembranes are protected by overlying geotextile/geonet or geocomposite layers. These geotextiles are designed to provide adequate protection during construction and operation to withstand the loads discussed in Section 4.5.3.3.

4.5.5.5 Soil Liners [D-6e(2)]. The LLBG mixed waste lined trenches are lined with a minimum (0.9-meter thick) layer of compacted soil/bentonite mixture (admix) under the secondary flexible membrane liner. This layer has an in-place permeability of less than 1×10^{-7} centimeter per second. The soil component of the admix is silty fine eolian sand or similar material from areas near the LLBG. Approximately 12 percent bentonite by dry weight added

to the fine soil to achieve sufficiently low permeability; however, the percent might vary depending upon design. Construction of the liner is discussed in Section 4.5.7.

4.5.5.5.1 Material Testing Data [D-6e(2)(a)]. Laboratory testing is performed on soil liner materials to provide input parameters for engineering analyses and for preparing material and construction specifications. The following tests are performed:

- Particle size distribution (ASTM D422)
- Atterberg limits (ASTM D4318)
- Permeability (ASTM D5084)
- Moisture-density relationships (ASTM D698 or D1557)
- Strength (ASTM D4767)
- Consolidation (ASTM D2435).

Other types of tests might be performed if determined necessary for design or specification purposes.

Before constructing the lined trench, a full-scale test fill of the admix material is constructed (Appendix 4A). The primary purpose of the test fill is to verify that the specified soil density, moisture content, and permeability values can be consistently achieved using proposed compaction equipment and procedures. In-place density is measured using both the nuclear gauge (ASTM D2922) and rubber balloon (ASTM D2167) or sand cone (ASTM D1556) methods. In-place permeability is determined from a sealed double-ring infiltrometer test (ASTM D5093), which measures infiltration over a 27.6 square meter area. Admix permeability is estimated from thin-wall tube samples (ASTM D1587) obtained from the test fill and tested in the laboratory (ASTM D5084). Details of the test fill are developed during detailed design. During construction, field density (e.g., ASTM D2922, D2/67, and/or D1556) and moisture content (ASTM D2216) periodically are measured. Thin-wall tube samples (ASTM D1587) are taken at regular intervals and tested for permeability (ASTM D5084). Additional details of field testing during construction are developed during the design process.

Dispersion and piping in the admix are not considered likely, because the permeability, and thus the flow velocity, is very low, making it difficult to move the soil particles or otherwise disrupt the soil fabric. In addition, the admix is well graded, so the component particles tend to hold each other in place. Therefore, testing for these characteristics is not necessary.

4.5.5.5.2 Soil Liner Compatibility Data [D-6e(2)(b)]. As discussed in Section 4.5.5.2, expected leachate composition is determined as part of detailed trench design (Appendix 4A). The results of previous chemical compatibility testing and studies are evaluated against leachate composition to determine the effect of leachate on soil liner composition or permeability. If potential problems are indicated, the need for leachate specific compatibility tests is evaluated. The tests follow the procedures of (ASTM D5084) (flexible wall parameter) and California State guidelines (CSWRCB 1984), and consider the effects of radiation on the soil liner

materials. If necessary, the composition of the soil liner admix is modified until satisfactory performance is achieved.

4.5.5.5.3 Soil Liner Thickness [D-6e(2)(c)]. Calculations have been performed to evaluate the effectiveness of the soil liner as a barrier to leachate. The following assumptions were used in the analysis.

- The soil liner is 0.9-meter thick and has a permeability of 1×10^{-7} centimeter per second.

- The average annual precipitation entering the lined trench is the difference between the total precipitation and the moisture lost by evapotranspiration. These values were derived from HELP modeling (WHC 1992a; EPA 1989) and are considered conservative because no run-off is allowed and no vegetation is assumed (i.e., bare ground conditions). On this basis, the net infiltration to the lined trench is 4.11 centimeters per year.

- The net infiltration acts immediately on the soil liner. This is a very conservative assumption, as travel time through and storage within the cover soil and waste are ignored.

- There is no flexible membrane liner (this is a very conservative assumption).

- The primary and secondary leachate collection and removal systems stop functioning after the lined trenches have been filled (this is also a very conservative assumption).

- The lined trench is exposed to infiltration for 10 years before a cover is constructed.

- Darcian flow occurs within the soil liner. Diffusion and adsorption mechanisms are not considered.

The analysis shows that leachate penetrates about 7.62 centimeters into the soil liner over the 10 year period. This is less than 10 percent of the total thickness of the secondary liner and suggests that the liner has a significant margin of excess performance, particularly given the conservative assumptions, noted previously. Supporting calculations are presented in Appendix 4G.

4.5.5.5.4 Soil Liner Strength [D-6e(2)(d)]. The expected loads on the liner system are discussed in Section 4.5.3.3. Significant stresses in the soil liner that must be considered are (1) internal stresses from the weight of the liner system, (2) stresses on the interface with the overlying materials, and (3) stresses during construction.

Internal stresses are present on the sideslopes from the weight of the operations layer and soil liner itself. Using material properties determined from laboratory testing, the stability of the soil liner is evaluated under both static and dynamic loading conditions. Standard methods of slope

stability analysis are used. Interface strength is evaluated using laboratory test data and slope stability methods.

The primary concern during construction is bearing failure caused by the weight of overlying soil components of the liner system (e.g., drainage gravel on the floor) and the construction equipment used to spread these materials. Strength parameters developed from laboratory testing and standard analytical methods are used to determine bearing capacity.

If any of these analyses indicate unacceptable performance, the soil liner or geosynthetic design is changed to increase factors of safety to acceptable levels.

4.5.5.5.5 Engineering Report [D-6e(2)(e)]. An engineering report is prepared for each lined trench as part of the definitive design document package (Appendix 4B). The report describes the design of the liner system and includes supporting calculations. The engineering report is prepared and signed by a professional civil engineer registered in Washington State. Lined trench construction and material properties are provided in Appendix 4A.

4.5.6 Liner System, Leachate Collection and Removal System [D-6f]

The purpose of the leachate collection and removal system is to provide sufficient permeability and storage volume to collect, retain, and dispose of, in a timely manner, fluids falling on or moving through the waste. The primary leachate collection and removal system provides the preferential path along which the leachate flows into the primary sump. The secondary leachate collection and removal system (also called the leak detection system) is located between the primary and secondary geomembranes. The secondary leachate collection and removal system provides the preferential path along which any fluids leaking through the primary liner system flow to the secondary sump.

The collected leachate is pumped to a leachate collection tank, screened and/or sampled, and transferred to tanker trucks using methods and equipment developed to avoid accidental spills. The tanker truck is parked on an epoxy coated tanker loadout pad designed to capture and contain any possible spill of leachate. During loading operations, the leachate level in the leachate collection tank is monitored with level indicating equipment. The tanker trucks subsequently transport the leachate to a TSD unit.

4.5.6.1 System Operation and Design [D-6f(1)]. The lined trenches are operated in a way that ensures the bottom liner is maintained as dry as possible, and the head on the top liner is less than 30.5 centimeters. In extreme conditions (i.e., a 25-year storm event), the head on the top liner could exceed 30.5 centimeters for short durations. However, even in extreme conditions, the head on the bottom liner will not exceed 30.5 centimeters. The operating methodology, described in the following paragraphs, ensures that liquids on the bottom liner are removed continuously before the liquids can accumulate.

Both leachate collection systems can be operated either manually or automatically. When operated automatically, liquid level sensors cycle the pumps on and off, in response to rising and falling leachate levels. At least once a week, the leakage rate through the top liner is calculated to demonstrate that the leakage rate is less than the 'action leakage rate' (Appendix 4C). Data to support the leakage rate calculations can be obtained either from the flow totalizer in the secondary leachate collection pump discharge line or from the liquid level gauges. Collected leachate from the secondary leachate collection system can be either pumped back to the primary leachate collection system or to the leachate collection tank.

The design of the primary and secondary leachate collection systems is described in Section 4.5.3.1. System geometry is completed and material specifications are developed during the detailed design process. The leachate collection and removal system design complies with RCRA Subtitle C requirements and guidance.

Each sump has a thick layer of gravel designed to provide high permeability and storage capacity. Leachate is removed from the sumps by a pump installed in either vertical or sideslope riser pipes. Pressure transducers and/or floats are used to monitor leachate level in the sumps and provide appropriate signals to the pump control system. All pumps, transducers, and/or floats are removable for maintenance, calibration, and related activities.

4.5.6.1.1 Primary System. The base of the primary leachate collection and removal system is defined by the primary geomembrane. On the floor of the lined trench, the primary geomembrane is overlain by geonet, geocomposite, and/or granular drainage layers. A granular drainage layer is used and pipes are located at regular intervals to increase flow capacity. Geotextile layers at the top of the leachate collection and removal system prevent migration of fine soil particles into the gravel or geonet, thus prevent clogging. On the sideslopes, a geocomposite layer is used over the geomembrane. The geocomposite includes bonded geotextiles on both sides that increase the interface shear strength, and allow this material to be used on the sideslopes. Because of construction difficulties, no drainage gravel is placed on the sideslopes.

The primary leachate collection and removal system is covered by the operations layer. The layer is a minimum 0.9-meter thick, and provides protection for the underlying liner and drainage materials. The operations layer covers both the trench floor and the sideslopes.

The primary leachate collection and removal system is designed to accommodate the 25-year, 24-hour storm, as required by RCRA regulations. However, the EPA recognizes the need to temporarily store leachate from such rare events (EPA 1985). Should a greater than 25-year, 24-hour storm event occur, the primary leachate collection and removal system sump is designed to temporarily store leachate at a depth greater than 30.5 centimeters, as

opposed to the alternative of constructing an excessively large leachate collection tank.

The primary leachate collection and removal system sump is equipped with two sump pumps. One pump is a high capacity pump capable of rapid removal of large volumes of leachate and is suitable for the transfer of batch quantities of leachate and can handle the larger volumes of leachate anticipated from the 25-year, 24-hour storm event. The other pump is a low capacity submersible pump located in the base of the primary sump. The pumps are fabricated from stainless steel or other corrosion resistant material.

4.5.6.1.2 Secondary System. The base of the secondary leachate collection and removal system is formed by the secondary geomembrane. The secondary leachate collection and removal system is similar to the primary leachate collection and removal system except that pipes are not included. The pipes are not needed because high flow capacity is not required for the low leachate volumes.

The secondary leachate collection and removal system drains to the secondary sump, which is located immediately below the primary sump. Because of the low volumes, the secondary leachate collection and removal system is equipped with only one low-capacity submersible pump.

4.5.6.1.3 Response Action Plan. In compliance with regulatory requirements, a response action plan is prepared for each lined trench. As part of this plan, the 'action leakage rate' is developed (Appendix 4C). In accordance with EPA guidance, the action leakage rate is calculated as "the maximum design flow rate that the leak detection system can remove without the fluid head on the bottom liner exceeding 30.5 centimeters" (EPA 1992). If the action leakage rate is exceeded, the DOE-RL does the following:

- Notifies the appropriate regulatory authority in writing of the exceedence within 7 days of the determination

- Submits a preliminary written assessment to the appropriate regulatory authority within 14 days of the determination, on the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned

- Determines to the extent practicable the location, size, and cause of any leak

- Determines whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether the unit should be closed

- Determines any other short-term and/or long-term actions to be taken to mitigate or stop any leaks

- Within 30 days after the notification that the action leakage rate has been exceeded, submits to the appropriate regulatory authority the results of the analyses specified in the following paragraphs, the

results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the DOE-RL submits to the appropriate regulatory authority, a report summarizing the results of any remedial actions taken and actions planned.

The leachate will be analyzed for chemical compounds and radionuclides. If the analytical results indicate that these constituents are present, and if the constituents can be traced to a particular type of waste placed in a known area of the lined trench, it might be possible to estimate the location of the leak. In addition, waste packages might not undergo enough deterioration during the active life of the trench to permit escape of the contents, it is possible that the leachate might be clean or the composition too general to show a specific source location.

If the source location cannot be identified, large-scale removal of the waste and operations layer to find and repair the leaking area of the liner would be one option for remediation. However, this procedure risks damaging the liner. In addition, waste would have to be handled, stored, and replaced in the trench. Backfill would need to be removed from around any waste packages to accomplish this. If the waste packages are damaged during this process, the risk of accidental release might be high. For these reasons, large-scale removal of waste and liner system materials is not a desirable option and will not be implemented except as a last resort.

The preferred alternative depends on factors such as the amount of waste already in the trench, the rate of waste receipt, the chemistry of the leachate (i.e., is it clean?), the availability of other disposal units, and similar considerations. Therefore, no single approach can be selected at this time. If necessary, an interim solution could be implemented while the evaluation and permanent remediation is performed. Examples of potential approaches include the following.

- The surface of the waste could be graded to direct run-off into a shallow pond. The surface would be covered with the low-hydraulic conductivity layer (geomembrane). Precipitation would be pumped or evaporated from the pond and would not infiltrate the waste already in the lined trench. Waste would be placed only during periods of dry weather, and stored at other onsite TSD units at other times. This type of approach also could be used to reduce leakage immediately after the action leakage rate is exceeded, while other remediation options are evaluated.

- Partial construction of the final closure cover could begin earlier than planned. This would reduce infiltration into the lined trench, and possibly reduce the leakage rate if the cover is constructed over the failed area.

- A layer of low-permeability soil could be placed over the existing waste, perhaps in conjunction with a geomembrane, to create a second 'primary' liner higher in the lined trench. This new liner would intercept precipitation and allow its removal.

- A rigid-frame or air-supported structure could be constructed over the trench to ensure that no infiltration occurs. Although costly, this approach could be less expensive than constructing a new trench.

In general, the selected remediation efforts will be progressive. Those remediation methods that are judged to be the least difficult and the most cost effective will be used first. If these efforts are not effective, more difficult or expensive options would be used.

4.5.6.2 Equivalent Capacity [D-6f(2)]. The geocomposite drainage layers used are commercially available that have equivalent flow capacity to a 30.5-centimeters layer of granular drainage material with a permeability of 1×10^{-2} centimeter per second. The construction quality assurance report (Appendix 4A) contains material specifications developed during detailed design and considers loads imposed by waste and cover materials.

4.5.6.3 Grading and Drainage [D-6f(3)]. In accordance with EPA guidance, all areas of the lined trench floor (except possibly sump bottoms) are graded at a slope of at least 1 percent to facilitate drainage and avoid ponding on the liners. In practice, floor slopes are designed with minimum slopes of 1.5 percent to accommodate slight variations associated with construction techniques. Grading tolerances are established so that the actual slope is at least 1 percent at all locations. For specific details of piping systems, sumps, pumps, etc., used to collect, hold, and transport leachate, refer to Appendices 4A and 4B.

4.5.6.4 Maximum Leachate Head [D-6f(4)]. The maximum head on the primary liner is less than 30.5 centimeters, except for rare storm events as discussed in Section 4.5.6.1. The sump is sized and designed to provide adequate surge storage to prevent leachate build up on the primary liner.

4.5.6.5 System Compatibility [D-6f(5)]. The primary and secondary leachate collection and removal systems are composed of inert geologic materials (sand and gravel), high-density polyethylene, and other geosynthetic materials such as polypropylene. As described in Section 4.5.5.2, the geosynthetics are evaluated for compatibility with the expected leachate. To ensure that the geosynthetics used in the lined trenches are chemically similar to those evaluated, manufacturers are required to submit quality control certificates and other manufacturing information and conformance tests performed on all materials. The results of these tests are presented in Appendix 4A.

Before a waste constituent is allowed in the lined trench, the waste constituent is evaluated for compatibility with the liner (e.g., identified in 9090A test results, testing, etc.). Other materials could contact the leachate, for example:

- Stainless steel, used for piping and wetted parts of pumps
- Rubber coatings for pump impellers and cases
- Polyvinyl chloride and other plastics in miscellaneous uses
- Epoxy or other materials used as tank coatings.

Compatibility of these materials with the expected leachate is considered in the trench liner system design. Compatibility of these materials is of lesser concern, because items that are comprised of these materials are entirely located within the containment area. Failure of these items would not result in a dangerous waste release, and the materials would be replaced or repaired.

4.5.6.6 System Strength [D-6f(6)]. Stability of drainage layer, strength of piping, and prevention of clogging are discussed in the following sections.

4.5.6.6.1 Stability of Drainage Layers [D-6f(6)(a)]. As described in Sections 4.5.3.3 and 4.5.5.3, the stability of the liners and leachate collection and removal system on the sideslopes is evaluated as part of detailed design. To provide sufficiently high shear strengths at the interfaces between geosynthetic components, textured geomembranes and thermally bonded geocomposites can be used.

Bearing capacity of the drainage and sump gravels is expected to be adequate, based on typical strength values for granular materials. Standard bearing capacity analyses are performed during detailed design to verify this assumption.

The transmissivity of the drainage layers under the combined load of the waste and cover was addressed in the design and is adequate to support leachate removal.

4.5.6.6.2 Strength of Piping [D-6f(6)(b)]. The drain pipes in the primary drainage and sump gravel and sideslope riser pipes are high-density polyethylene pipe, or equal. During detailed design, the required wall thickness of the pipe is determined according to the manufacturer's recommendations and standard analytical methods used by the piping industry. In these analyses, the ultimate load (derived from the estimated weight of the waste cover) is used, the allowable deflections are limited to 5 percent, and conservative values for soil modulus and lateral confinement are assumed. The calculations evaluating the pipe loads, required thickness, and strengths are presented in the definitive design report for each lined trench (Appendix 4B).

4.5.6.7 Prevention of Clogging [D-6f(7)]. The geotextiles that separate the drainage layers from adjacent soil layers are selected based on the ability of the geotextiles to retain the soil and prevent the soil from entering the leachate collection and removal system. Standard methods are used to determine the allowable range of opening sizes in the textiles. In addition, the amount of fine material in the drainage and sump gravels is limited by specification to less than a few percent, and is not expected to cause clogging problems. Because the waste disposed in the lined trench is required to satisfy LDR (40 CFR 268), the amount of organic material is minimal, and consequently biologic clogging is not a problem.

4.5.7 Liner System, Construction and Maintenance [D-6g]

Details relating to the liner system construction and maintenance are discussed in the following sections.

4.5.7.1 Material Specifications [D-6g(1)]. Material specifications are provided in the following sections for each of the materials used in the liner system.

4.5.7.1.1 Synthetic Liners [D-6g(1)(a)]. As described in Section 4.5.3.1, both the primary and secondary geomembrane liners are comprised of high-density polyethylene, or equal. Detailed specifications are prepared for each lined trench as part of the design process (Appendices 4A and 4B).

4.5.7.1.2 Soil Liners [D-6g(1)(b)]. As described in Section 4.5.3.1, the soil liner consists of imported bentonite (expansive clay) blended with fine soil deposits on or next to the LLBG. The fine soil is free of roots, woody vegetation, rocks greater than 2.54 centimeter in diameter, and other deleterious material. The bentonite content depends on the characteristics of fine soil. Mixing is performed under carefully controlled conditions in a pugmill or other approved alternatives. The admix is placed at a saturation of 85 percent or higher, to achieve an in-place permeability of 1×10^{-7} centimeter per second or less. The surfaces of the soil liners are rolled smooth before placing the overlying geomembranes. Additional specifications are prepared for each lined trench as part of the design process.

4.5.7.1.3 Leachate Collection and Removal System [D-6g(1)(c)]. Drainage and sump gravel consists of hard, durable, rounded to subrounded material. The gravel is washed and the amount of fine material (i.e., passing the number 200 sieve) is limited to a few percent. The permeability of the gravel is 1×10^{-2} centimeter per second or greater. Additional specifications are prepared as part of the design process.

For geotextiles and geonets, the composition, thickness, transmissivity, unit weight, apparent opening size, strength, and other properties are determined during detailed design based on results of engineering analyses, experience, and industry standard approaches.

4.5.7.2 Construction Specifications [D-6g(2)]. Construction requirements for major components of the lined trench are summarized in the following sections. Additional detail regarding methods, materials, inspection procedures, etc., are presented in Appendix 4A for each lined trench.

4.5.7.2.1 Liner System Foundation [D-6g(2)(a)]. The excavated subgrade surfaces are moisture conditioned and compacted to a depth of at least 20.3 centimeters before placing the admix layer.

4.5.7.2.2 Soil Liners [D-6g(2)(b)]. The soil and bentonite are blended thoroughly and moisture conditioned so that the admix is uniform and homogeneous throughout. The admix layer is placed in 20.3- to

25.4-centimeter-thick loose lifts and compacted so that the compacted lift thickness is 15.24 centimeter or less, except that the first lift could be up to 30.5-centimeter thick (loose). In the secondary liner, additional thickness might be necessary to prevent incorporation of the sandy subgrade soil into the liner. An admix layer is used in the primary liner system, the additional thickness prevents damage to underlying layers. Each new lift of admix is kneaded into the previously placed lift. The methods for admix preparation, type of compaction equipment, number of passes, and other details of the placement process are determined by constructing a test fill section before placing admix in the lined trench.

4.5.7.2.3 Synthetic Liners [D-6g(2)(c)]. To protect the overlying geomembranes, the admix surface is smooth and free of rocks, stones, sticks, roots, sharp objects, and debris of any kind. In all cases, the high-density polyethylene liners are deployed with the length of the roll parallel to the slope; no horizontal seams are allowed on slopes. Adjacent panels are overlapped 7.6 to 15.2 centimeters and thermally seamed using fusion or extrusion methods. Seams are inspected continuously using a vacuum box and air pressure tests. Destructive seam tests (peel and adhesion) are performed on samples taken at regular intervals. The geomembranes are protected by placing the overlying geosynthetic layers when practicable.

4.5.7.2.4 Leachate Collection and Removal Systems [D-6g(2)(d)]. Drainage and sump gravel are placed and spread carefully over the underlying geosynthetics using suitable equipment to prevent damage. Hauling and placing equipment operate on a minimum thickness of soil above any geosynthetic layer to avoid damage. Geosynthetic layers in the leachate collection and removal system are deployed, overlapped, and joined (e.g., tying for geonets, sewing for geotextiles) according to standard industry practice and the manufacturers' recommendations. Drainage and riser pipes are installed in the trenches. Pipes carefully are bedded and the trenches backfilled to provide adequate lateral support. Pumps and other mechanical components are installed according to manufacturers' recommendations. Appendix 4A contains the construction specifications for placement of all components of leachate collection and removal systems.

4.5.7.3 Construction Quality Control Program [D-6g(3)]. A construction quality assurance plan is prepared for use during lined trench construction and establishes in detail the following:

- The duties, responsibilities, and authority of all individuals and organizations involved in the work, including the engineer, contractors, and third-party construction quality assurance personnel

- Required qualifications and certifications for various technical personnel

- Inspection and sampling activities, both during manufacturing and construction, including sampling frequency and procedures

- Description of test methods, either directly or by reference to standard test methods such as ASTM, etc.

- Documentation requirements, including standard forms and inspection data sheets.

4.5.7.4 Maintenance Procedures for Leachate Collection and Removal Systems [D-6g(4)]. The accessible components of the leachate collection and removal systems are maintained according to preventive maintenance methods. These methods require periodic testing to prove that the equipment, controls, and instrumentation are functional and are properly calibrated. Testing intervals are derived from applicable regulations and manufacturer's recommendations. All pumps and motors are started or bumped monthly; first, to demonstrate that the pumps and motors are functional, and second, to move the bearing(s) so that the bearing surfaces do not seize or become distorted. Instruments are calibrated annually or at intervals suggested by the manufacturer. When applicable, the preventive maintenance methods include calibration instructions. Instruments that require annual calibration are as follows:

- Primary sump level indicator
- Secondary sump level indicator
- Primary sump level transducer.

Trenches 31 and 34 are equipped with leachate transport tanker loading areas. These tanker loading areas are approximately 6.4 meters wide by 19.5 meters long. Future tanker unloading areas could vary in size, as waste management needs dictate. The tanker loading areas are designed to collect any leachate that might spill during the loading operation. These loading areas contain curbs, sloping floors, and sump areas to channel any spilled liquid to an accumulation area where the liquid is collected and sent to an appropriate treatment and storage unit.

4.5.7.5 Liner Repairs During Operations [D-6g(5)]. Because of the 0.9-meter-thick operations layer, damage to the liner system is not expected. If damage does occur, the operations layer could be removed laterally as far as required. Underlying geosynthetic and gravel layers will be removed until an undamaged layer is encountered. The damaged layers will be repaired and replaced from the lowest layer upwards using similar procedures to those employed during construction. Most repairs to the geomembranes will be performed using a patch, which will be placed, welded, and tested by construction quality assurance personnel. Details of liner construction and inspection procedures in Appendix 4A.

4.5.8 Run-On and Run-Off Control Systems [D-6h]

Because of the sandy soils, small drainage area, and arid climate at the LLBG, storm water run-on and run-off are not expected to require major engineered structures. Interceptor and drainage ditches are adequate for run-on and run-off control. The 25-year, 24-hour precipitation event is the design storm used to size the lined trench systems. Beyond this, surface water evaluation is highly site-specific, and appropriate analyses are performed as part of detailed design for each lined trench.

4.5.8.1 Run-On Control System [D-6h(1)]. Run-on is controlled by drainage ditches or berms around the perimeter of the lined trench. Any overland flow approaching the trench is intercepted by the ditches or berms and conveyed to existing drainage systems or suitable discharge points. All the drainage ditches or berms are designed to handle the peak 25-year flow from the potential drainage area. By using low channel slopes, design flow velocities in the ditches are maintained below established limits for sand channels. Erosion protection (such as riprap) is not required because of the very low velocities.

The drainage for trenches 31 and 34 are designed and constructed such that the paved truck unloading area drains into the trenches and all other areas beyond the crest of the trenches drain outward, away from the trenches. The pavement in the truck staging area drains away from the trenches. Between the trench crest and the perimeter road, the area was graded to provide drainage toward the perimeter road. The perimeter road is sloped outward, at a grade of approximately 1 percent, to provide drainage away from the trenches. On the outside of the perimeter road, on the north and west sides of the trenches, drainage ditches were excavated to provide drainage away from the trenches.

4.5.8.1.1 Design and Performance [D-6h(1)(a)]. Design and performance details are determined for each lined trench as part of the detailed design process (Appendix 4B).

4.5.8.1.2 Calculation of Peak Flow [D-6h(1)(b)]. Computation of design discharge for the drainage ditches or berms is performed using standard analytical methods, such as the Rational Method or the computer program HEC-1 (USACE 1981). The 25-year, 24-hour precipitation depth is 4.0 centimeters, based on precipitation data recorded from 1947 to 1969 (PNL 1983). The tributary area for each section of ditch or berm depends on local topography.

4.5.8.2 Run-Off Control System [D-6h(2)(a and b) and (3)]. There is no run-off from the lined trenches because the trenches are constructed below grade. Any precipitation falling on the trenches is removed by either evapotranspiration or the leachate collection and removal systems. Therefore, a run-off control system is not needed.

4.5.8.3 Construction [D-6h(4)]. The drainage ditches or berms around the lined trenches are constructed with conventional earthmoving equipment such as graders and small dozers.

4.5.8.4 Maintenance [D-6h(5)]. The drainage ditches or berms require periodic maintenance to ensure proper performance. The most frequent maintenance activity, beyond periodic inspection, is cleaning the ditches or berms to remove obstructions caused by windblown soil and vegetation, (e.g., tumbleweeds). After rare storm events, regrading of the ditch bottom or repair of the berm might be required to repair erosion damage. This is expected to occur infrequently, however inspections will be conducted after 25-year storm events or at least annually.

4.5.9 Control of Wind Dispersal [D-6i]

The LLBG use varied methods to prevent wind dispersal of mixed waste, depending on the waste form. Methods to prevent wind dispersal include containerizing, stabilizing, grouting, spray fixitants, and backfill. Sometimes the natural form of the waste precludes the need for wind dispersal protection, (i.e., scrap piping and other solid debris). In other instances, the operating contractor implements a wind speed restriction during handling, and immediately backfills the waste to prevent wind dispersal.

4.5.10 Liquids in Landfills [D-6j]

Free liquids will not be accepted if the liquid is in excess of 1 percent of the volume of the waste or if the sorbent to potential liquid waste is less than 2 to 1. Waste received at the LLBG must comply with waste acceptance requirements as identified in Chapter 3.0, Appendix 3A.

4.5.11 Containerized Waste [D-6k]

Containerized waste received in the LLBG lined trenches is limited to a maximum of 10 percent void space. Several inert materials (diatomaceous earth, sand, lava rock) are used as acceptable void space fillers for waste that does not fill the container. Compliance with the void space restrictions is provided by the representative sampling performed (Chapter 3.0), and the assessments performed (Chapter 3.0, Appendix 3A).

4.6 AIR EMISSIONS CONTROL [D-8]

The LLBG also are required to adhere to applicable air regulations. The LLBG were 'air sampled' for constituents of concern during the last quarter of calendar year 1996. The results indicated that no constituents of regulatory concern were identified.

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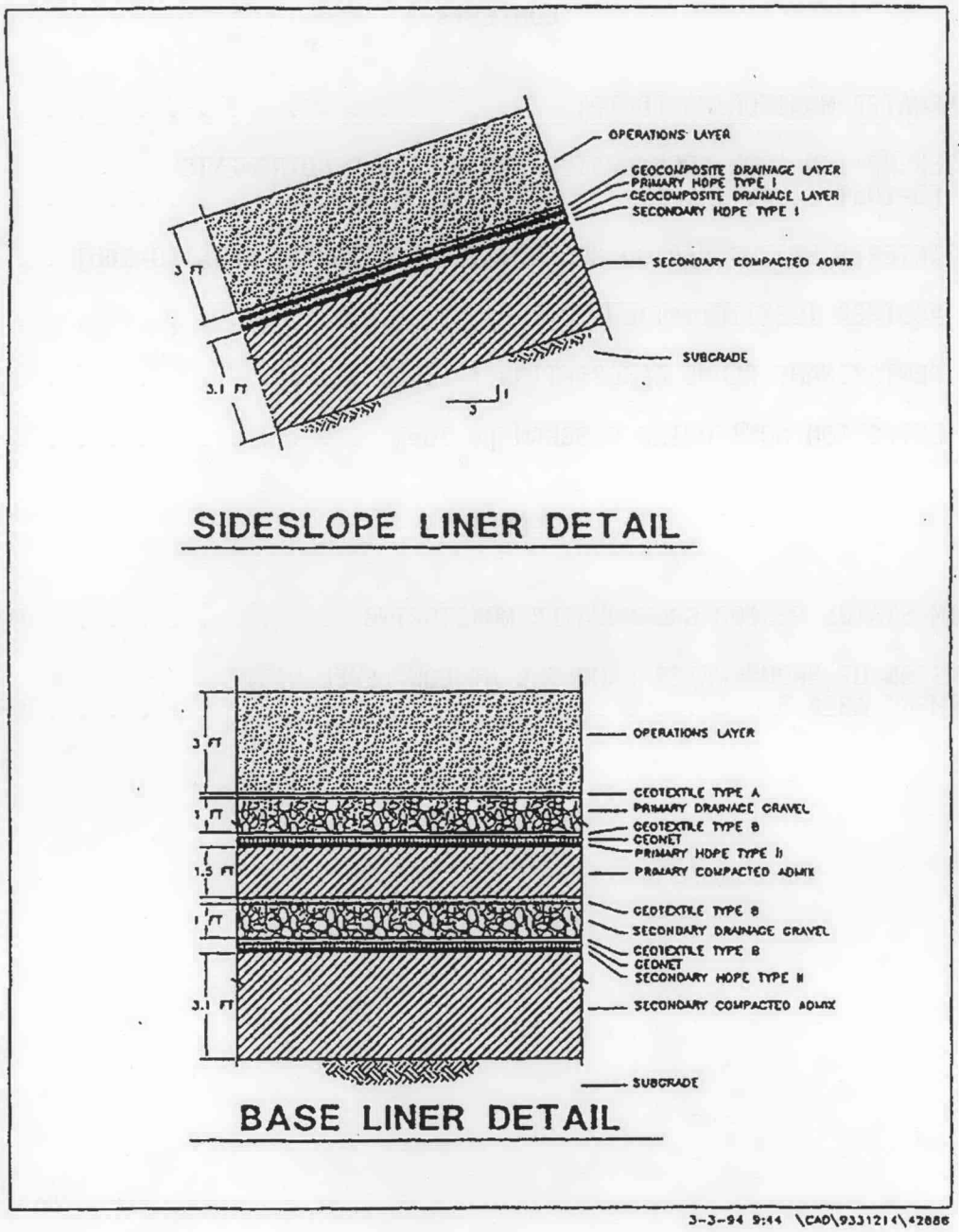

Figure 4-1. Example Liner System.

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5.0 GROUNDWATER MONITORING [D-10]

5.1 EXEMPTION FROM GROUNDWATER PROTECTION REQUIREMENTS [D-10a]

A waiver from the groundwater monitoring requirements as allowed under WAC 173-303-645 is not requested. Therefore, the requirements of the Washington Administrate Code for groundwater monitoring are applicable to the LLBG.

5.2 INTERIM STATUS PERIOD GROUNDWATER MONITORING DATA [D-10b]

Information on interim status groundwater monitoring activities is provided in Appendix 5A, in *Hanford Site Groundwater Monitoring for Fiscal Year 1996* (PNNL 1997), and in the Hanford Environmental Information System. There have been no significant detections of the indicator parameters that could be attributed to the LLBG.

5.3 AQUIFER IDENTIFICATION [D-10c]

The characteristics of the uppermost aquifer beneath the LLBG and the regional physiographic, geologic, and hydrogeologic setting of the LLBG are summarized in Chapter 5.0 of the General Information Portion (DOE/RL-91-28).

5.4 CONTAMINANT PLUME DESCRIPTION [D-10d]

A description of the contaminant plumes existing beneath the LLBG and the 200 East Area and 200 West Area is provided in Chapter 5.0 of the General Information Portion (DOE/RL-91-28). However, there is no evidence the contamination described entered the groundwater from the LLBG.

5.5 DETECTION MONITORING PROGRAM [D-10e]

Interim status groundwater monitoring will be continued until a final status groundwater monitoring plan is submitted by DOE and approved by Ecology. The approved final status groundwater monitoring plan will be implemented immediately on approval and will be submitted for incorporation as a modification to the LLBG permit before the end of calendar year 1998. The ultimate goal is to develop a consolidated groundwater monitoring plan for the Hanford Site, which will supersede the LLBG specific final status groundwater monitoring plan.

Groundwater monitoring activities have been suspended for Low-Level Waste Management Area 5, which includes the 218-W-6 Burial Ground (Appendix 5B).

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6.0 PROCEDURES TO PREVENT HAZARDS [F]

This chapter discusses security, inspection schedules, preparedness and prevention requirements, preventive procedures, structures, equipment, and prevention of reaction of ignitable, reactive and incompatible waste disposed and stored in the LLBG.

The LLBG is designed and operated to minimize exposure of the general public and operating personnel to mixed waste. Shielding, contamination control, control of toxic or dangerous material, and safety and security procedures are used to keep exposure ALARA.

6.1 SECURITY [F-1]

The following sections describe the security measures, equipment, and warning signs used to control entry to the LLBG. A discussion of Hanford Facility security is provided in the General Information Portion (DOE/RL-91-28).

6.1.1 Security Procedures and Equipment [F-1a]

The following sections describe the 24-hour surveillance system, barrier, and warning signs used to provide security and control access to the LLBG.

6.1.1.1 24-Hour Surveillance System [F-1a(a)]. The entire Hanford Facility is a controlled access area [refer to General Information Portion (DOE/RL-91-28)].

6.1.1.2 Barrier and Means to Control Entry [F-1a(b)]. Within the LLBG, access to the waste is minimized by the operational policy of burying the waste as soon as practical or if left uncovered, administrative procedures are used to control access. However, wherever waste is placed or exposure hazards are identified, barriers (e.g., chains, flagging, etc.) and warning signs are erected that surround the waste. In addition, the access ramps to trenches 31, 34, and 94 are provided with gates to control vehicle entry. Onsite training programs ensure that personnel are cognizant of the meaning of barriers and warning signs.

6.1.1.3 Warning Signs [F-1a(2)]. The active portions of the LLBG are within chained radiation zones with radiation signs every 30 meters along the chain. The signs are visible from all angles of approach, and are legible from a distance of at least 7.6 meters. Each active area used for mixed waste disposal is posted with a sign, in English, reading, "DANGER-UNAUTHORIZED PERSONNEL KEEP OUT". In addition to these signs, the fences around the 200 East Area and 200 West Area burial grounds are posted with signs warning against unauthorized entry. The signs are visible from all angles of approach.

6.1.2 Waiver [F-1b]

Waiver of the security procedures and equipment requirements for the LLBG are not requested. Therefore, WAC 173-303-310(1)(a) and (b) are not applicable.

6.2 INSPECTION PLAN [F-2]

This section describes the method and schedule for inspection of the LLBG. These inspections help to ensure that situations do not exist that might cause or lead to the release of mixed waste to the environment or that might pose a threat to human health. In addition, containers stored in trench 34 (and trench 31, if needed to support future waste management needs) are inspected to identify leaking containers, improperly stored containers, and degradation of safety equipment and/or systems. Abnormal conditions identified by inspections must be corrected on a schedule that helps prevent hazards to workers, the public, and the environment.

6.2.1 General Inspection Requirements [F-2a, F-2b]

The content and frequency of inspections are described in this section. The inspections are documented on inspection checklists and log sheets. The schedule and inspection records are kept in the inspection logbooks and retained by the LLBG operations personnel. Inspection records are retained for a minimum of 5 years, and contain the following information:

- Date and time of inspection
- Printed name and the hand written signature of the inspector
- Notation of the observations made
- An account of spills or discharges in accordance with WAC 173-303-145
- Date and nature of any repairs or remedial actions taken.

The inspection checklists consist of a listing of items that are to be assessed during each inspection. A yes/no response is made for each listed item. A 'yes' response means that the item is in compliance with the conditions stated on the checklist. Any problems identified during the inspection, as indicated by a 'no' response on the checklist, are reported immediately to the LLBG operations supervisor.

6.2.1.1 Types of Problems [F-2a(1), (2), (4), and (5)]. Each day the LLBG are used for the purposes of waste handling, an operator performs a daily inspection of areas subject to spills (e.g., loading and unloading areas and waste handling areas). The LLBG weekly inspections are performed to ensure operation and management of the LLBG is in accordance with WAC 173-303-630. Discrepancies are noted on the checklist. If the LLBG has no containerized waste in storage, weekly inspections will not be conducted. When completed, the inspector prints, signs, and dates the inspection checklist. The inspection checklist is placed in the LLBG inspection logbook and kept on file for a minimum of 5 years.

Backfilled trenches are inspected for signs of erosion of the trench cover. Evidence of settling or unevenness at a backfilled trench that would indicate subsidence is recorded to initiate corrective action.

Truck unloading areas at trenches 31 and 34 are inspected for signs of deterioration that would impact the ease of a chemical spill cleanup should a spill occur. Any spills will be managed as identified in the building emergency plan/contingency plan (Chapter 7.0). Cracks and wear are recorded to initiate corrective action.

6.2.1.2 Frequency of Inspections [F-2a(3)]. The inspection schedule for the LLBG is weekly for all regulated trenches. All regulated trenches are inspected for run-on, run-off, and erosion problems after a significant precipitation event. Only deficiencies are documented.

The LLBG operations organization performs a weekly inspection of trench 34 (and trench 31, if needed to support waste management needs) and the waste inventory (Section 6.2.3.1) (regardless of occupation) to ensure compliance with applicable federal and state regulations. Inspections cover condition of trench floor and sides, container structural integrity, corrosion of containers, aisle space, and evidence of leaks or spills. Inspection frequencies are indicated on the respective inspection checksheets. Trench 34 (and trench 31, if needed to support waste management needs) only stores mixed waste that meets LDR requirements. No ignitable, reactive, or corrosive waste will be stored in trench 34 (and trench 31, if needed to support waste management needs).

6.2.2 Schedule for Remedial Action for Problems Revealed [F-2c]

If leachate collection tank system inspections identify corrosion, leaks, spills, and/or precipitation in the secondary containment, the resultant liquid will be removed within 24 hours of detection. Further corrective actions are discussed in the building emergency plan (Chapter 7.0). If significant corrosion is observed, corrective actions will be pursued. Depending on the severity of the corrosion, corrective action could range from correcting upon discovery or longer if procurement of needed materials and personnel are required. Any problems revealed by the inspection must be remedied on a schedule that prevents hazards to human health and the environment.

Other conditions that are not a threat to human health and the environment (e.g., torn tank insulation) will be dispositioned in a timeframe established by the operations supervisor.

6.2.3 Specific Process or Waste Type Inspection Requirements [F-2d]

The following sections detail the inspections to be performed at the LLBG.

6.2.3.1 Container Inspection [F-2d(1)]. On receipt, each container for disposal is inspected by operations personnel to confirm appropriate documentation and compliance with the waste acceptance criteria (Chapter 3.0, Appendix 3A) before the container is placed in the LLBG.

While in the greater-than-90-day container storage configuration, specific items and/or problems to be noted during weekly container inspection include the following:

- Condition trench floor and sides
- Container structural integrity
- Containers closed
- Appropriate aisle spacing
- Corrosion of containers
- Evidence of spills or leaks
- Container labels and markings in place, legible, and unobscured
- Areas in and around waste stored in trench 34 (and trench 31, if needed to support waste management needs) are free of combustibles (e.g., tumbleweeds)
- Access ramp is intact (e.g., free of erosion)
- Chain barricades and postings are intact.

Records of inspection are maintained as detailed in Section 6.2.1.

6.2.3.2 Landfill Inspection [F-2d(8)]. All regulated trenches subject to WAC 173-303-665 requirements are inspected weekly and after a significant precipitation event.

6.2.3.2.1 Run-On and Run-Off Control System [F-2d(8)(a)]. A run-on control system is installed around the perimeter of each lined trench (Chapter 4.0, Section 4.5.8.1). The system consists of a berm along the outer margin of each lined trench and prevents run-on from entering the trench. All run-on control system berms will be inspected weekly and after significant storms for signs of deterioration, malfunction, or improper operation. Any precipitation that falls between the run-on control berm and the edge of the trench excavation eventually might flow into the primary leachate control and removal system sump and will be treated as leachate.

6.2.3.2.2 Leak Detection System [F-2d(8)(b)]. Leak detection for the lined trenches is accomplished by the following:

- Monitoring liquid level above the secondary liner
- High- and low-level alarms tested periodically
- Monitoring liquid levels above primary liner
- Inspections for the presence of liquids after significant precipitation events
- Verification of certain gauges and instruments to ensure these are in current calibration; calibration is performed annually (refer to Chapter 4.0, Section 4.5.7.4)
- Test leak detection system to ensure system is functioning properly:
  - Testing includes checking the indicator levels in the sumps
  - Levels are recorded on a daily action leakage rate calculation sheet (Table 6-1).

If the action leakage rate (Chapter 4.0, Appendix 4C) has not been exceeded, the liner system is functioning properly.

6.2.3.2.3 Wind Dispersal Control System [F-2d(8)(c)]. Waste packages placed in the LLBG that are containerized or have the characteristics of a container are in a form that eliminates the concern of wind dispersal. Waste packages are inspected upon receipt for evidence of damage, corrosion, or deterioration that might lead to dispersal of the contents. This inspection is repeated daily if waste management operations are being conducted and weekly to ensure that dispersal of contained material is not a concern.

Trench 94 is inspected weekly to verify the integrity of the defueled reactor compartments and to perform corrective action if needed.

Unpackaged or bulk waste with any potential for wind dispersal is covered or sprayed with fixative after being placed in a trench.

In addition, waste handling operations are suspended in winds exceeding 24 kilometers per hour unless specifically approved by operations supervisors. The supervisor only would grant approval to operate in winds over 24 kilometers per hour after determining that the risk to human health or the environment would be diminished by completing the work activity, or that the nature and form of the waste handling activity (work in progress with unstable physical form of waste package where wind may cause waste container to fail and disperse contamination) was such that the wind speed would have no significant impact.

6.2.3.2.4 Leachate Collection and Removal System [F-2d(8)(d)]. The following areas of the leachate collection and removal system are inspected weekly to identify the presence of leachate and to ensure proper functioning:

- Leachate collection tank(s), tank piping, transfer pump piping, sump piping and valve gallery area, and tank level gauge scale and tank area for leaks and/or damage

- Secondary containment for accumulation of liquids

- Aboveground portions of the leachate collection tank(s), tank piping, transfer pump, tank level gauge, and tank area and associated structural supports for corrosion

- Leachate collection tank(s), tank piping, transfer pump, tank level gauge, tank area, associated structural supports construction materials, and area immediately surrounding the externally accessible portion, including the secondary containment, for detection of erosion

- Trench general area for evidence of deterioration, malfunctions, or improper operation of run-on and run-off control systems.

In addition, verification will be performed when pumping occurs to check if the amount of actual leachate pumped from the leachate collection and removal system corresponds to the amount that is accumulated in the leachate collection tank (Table 6-2). This periodic check will verify the proper function of the leachate collection and removal sump pumps. Periodic evaluations (October through March) on the leachate transfer lines for freeze and thaw damage also is conducted.

6.3 PREPAREDNESS AND PREVENTION REQUIREMENTS [F-3, F-3a]

The following sections describe the preparedness and prevention measures taken at the LLBG and the internal and external communications and emergency equipment required. Further discussions on the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of dangerous or dangerous waste constituents to air, soil, or surface water that could threaten human health or the environment are contained in the building emergency plan (Chapter 7.0).

6.3.1 Internal Communication [F-3a(1)]

There is one building, MO223, that is equipped to support communications. Immediate emergency instruction to personnel working at the LLBG is provided by two-way radios and cellular telephones.

6.3.2 External Communications [F-3a(2)]

Personnel at the LLBG have voice communication or equivalent (e.g., hand signals) during work assignments to maintain external communications with shift supervisors. Supervision contacts the Hanford Facility emergency telephone number (911) (811 for cellular telephones) if assistance is needed in the field.

6.3.3 Emergency Equipment [F-3a(3)]

Emergency equipment is available for use at the LLBG. The Hanford Facility maintains a sufficient inventory of heavy equipment (Attachment 4 of the Hanford Facility RCRA Permit). The Hanford Facility relies primarily on the Hanford Fire Department to control fires. Emergency equipment is not located at burial ground trenches. Portable fire extinguishers are carried on LLBG operations vehicles. Fire Station #2 (Attachment 4 of the HF RCRA Permit) is equipped with trained firefighting and emergency medical personnel and equipment, and is located within 5 minutes of any location within the LLBG. Spill cleanup materials are readily available from the Central Waste Complex, and other locations (overpack containers, protective clothing, handling and cleanup equipment). The building emergency plan (Chapter 7.0) references the emergency equipment.

The concrete pad used for staging the loading and unloading of leachate from the leachate collection tank(s) to a tanker truck contains a collection sump should any spills occur during transfer operations. Only collected liquids resulting from a spill will be pumped back into the leachate collection tank(s). A portable sump pump is used to transfer collected spills/liquids from the concrete pad sump. Tanker trucks are equipped with overflow shutoff switches or visual verification could be used to prevent the accidental spill of leachate during transfer operations.

6.3.4 Water for Fire Control [F-3a(4)]

Water for fire control at the LLBG is supplied by Hanford Fire Department trucks for fires requiring high water volume and pressure. Water is supplied by the following equipment:

- Each fire station normally has a truck equipped with a hydraulically operated aerial ladder, and one pumper (backup fire engine, without a boom, that is used if the aerial ladder is inoperable). Fire engines have a pumping capacity of at least 5,700 liters of water per minute.

- Other fire protection equipment uses chemicals rather than water as an extinguishing media.

6.3.5 Aisle Space Requirement [F-3b]

Aisle spacing for trench 34 (and trench 31, if needed to support waste management needs) is sufficient to allow the movement of personnel and fire protection equipment in and around the containers. This aisle spacing meets the requirements of the National Fire Protection Association and the Life Safety Code (NFPA 1996) for the protection of personnel and the environment. Inspection aisle space must be at least 76.2 centimeters.

Rows of containers are placed no more than two containers wide in accordance with WAC 173-303-630(5)(c). The containers are loaded and unloaded via the access ramp on the south side of each trench.

6.4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT [F-4]

The following sections describe preventive procedures, structures, and equipment.

6.4.1 Unloading Operations [F-4a]

Methods used to prevent releases during unloading operations depend on waste form (e.g., containerized or bulk). The methods employed are as follows.

- Containers are inspected for damage before being unloaded from the transport vehicle.
- Containerized waste is handled by appropriate equipment (e.g., forklift or crane) during unloading.
- Path from loading area to storage area is clear of obstructions.
- Bulk waste is not unloaded with winds in excess of 24 kilometers per hour.
- Bulk waste is handled in a manner to ensure that dispersal does not occur (e.g., use of fixatives while placing bulk waste in trenches and air monitoring).

Any spills will be managed as identified in the building emergency plan (Chapter 7.0). Cracks and wear are recorded to initiate corrective action. In the LLBG, container pallets, burial containers, and other approved waste packages are placed individually in the trenches for burial.

Waste will be staged at the waste unloading area no longer than necessary for placement into the trench; however, waste might be left in place overnight should the daily operational shift end before waste is placed into the trench.

6.4.2 Run-Off [F-4b]

The waste in the LLBG is buried below the land surface; thus, the LLBG are designed to prevent run-off of precipitation that might have come in contact with waste. The average precipitation is 16 centimeters per year, so minimal run-off occurs. The land surface is relatively level, so trenches have only internal drainage. The minimal amounts of precipitation that accumulate are contained within the trenches.

The lined mixed waste trenches are designed to channel run-on liquid away from the burial trench. Run-off liquid is captured within the trench. Surface liquid evaporates. The liquid that leaches through the waste is captured in the leachate collection system and is managed as mixed waste.

6.4.3 Water Supplies [F-4c]

The design and operation of the LLBG are intended to minimize the generation of potentially contaminated leachate and to prevent its migration into groundwater resources in the local area. Operations (Chapter 4.0) are designed to protect local water supplies while site conditions (Chapter 5.0) also mitigate contaminant migration through surface water and groundwater.

A description of activities that prevent contamination of water supplies or groundwater include the following:

- Placement of mixed waste in lined trenches
  - Waste is containerized or stabilized to control migration of mixed waste
  - Run-on and run-off are controlled
  - Leak detection systems are used
  - Leachate is collected and managed as mixed waste
  - Inspections are performed
- Placement of backfill on completed portions of trenches
- Revegetation to control erosion of protective cover (Chapter 11.0).

6.4.4 Equipment and Power Failure [F-4d]

Electrical power for MO223 is provided. Loss of electricity at MO223 will not impair functions or constitute an emergency. Backup equipment is available for failed mechanized equipment.

Electrical power is required for trenches 31 and 34 of the 218-W-5 Burial Ground; however, loss of electricity does not constitute an emergency, but should be restored as soon as possible. Electricity supplies power to the sump pumps used to remove accumulated leachate from the primary and secondary liners.

6.4.5 Personal Protection Equipment [F-4e]

Personnel are trained in the use of applicable personal protection equipment. Examples of personal protection equipment frequently used include clothing (i.e., cloth coveralls, cloth and rubber shoe cover, cloth and rubber gloves and cloth caps); hard hats; safety shoes; safety glasses; and respiratory protection devices. The protective clothing required in the LLBG varies depending on the form and content of the waste.

Available respiratory protection equipment includes the following:

- Airpacks
- Filter masks with a graphite filter. This type of mask is for removing particulates from the respiratory stream
- Face masks with cartridges that react with various chemical fumes. These masks are used in special circumstances
- Full-face masks, with hoses attached to an air compressor some distance away, also are available when needed.

Personnel are required to be trained in using the various respiratory devices and must be checked routinely for mask fit (Chapter 8.0).

6.5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE [F-5]

The following sections describe prevention of reaction of ignitable, reactive, and incompatible waste.

6.5.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste [F-5a]

Waste preparation requirements prohibit the disposal of ignitable or reactive waste at the LLBG. Reactive and ignitable waste must be treated and/or neutralized before receipt and disposal (Appendix 3A). No ignitable or reactive waste will be stored in trench 34 (and trench 31, if needed to support waste management needs).

6.5.2 Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste [F-5b]

The waste analysis plan (Appendix 3A) requires that ignitable or reactive waste be treated in accordance with RCRA-specified treatment standards. In addition, measures are taken to ensure that the commingling of incompatible waste does not occur. Waste acceptance criteria ensure that the generating unit has performed the required treatment before the waste is disposed or stored in the LLBG.

Table 6-1. Typical Average Daily Action Leakage Rate Calculation.

AVERAGE DAILY ACTION LEAKAGE RATE CALCULATION

Operating Day ___/___/___ _____.____ Gallons

Operating Day ___/___/___ _____.____ Gallons

Operating Day ___/___/___ _____.____ Gallons

Operating Day ___/___/___ _____.____ Gallons

Operating Day ___/___/___ _____.____ Gallons

Operating Day ___/___/___ _____.____ Gallons

Operating Day ___/___/___ _____.____ Gallons

Secondary Sump Total Volume **TOTAL** _____.____ Gallons
(DIVIDE TOTAL VOLUME BY 7)

AVERAGE DAILY ACTION LEAKAGE RATE: _____.____ Gallons

NOTIFY LLBG Operations Supervisor if Average Daily Action Leakage Rate is GREATER than 670 Gallons

_____

Repairs or remedial action taken:_____

_____

Operator's Printed Name: _____ Date ___/___/___

Operator's Signature: _____ Time ____.____ hrs

Operations Supervisor Printed Name: _____ Date ___/___/___

Operations Supervisor Signature: _____ Time ____.____ hrs

Table 6-2. Conversion Chart.

Trench 31, primary sump conversion chart, from sump level indication, TR31-SP-LI-1, in inches to sump volume in gallons					
Primary sump level indication TR31-SP-LI-1 (inches)	Sump volume (gallons) per inch	Sump volume running total (gallons)	Primary sump level indication TR31-SP-LI-1 (inches)	Sump volume (gallons) per inch	Sump volume running total (gallons)
06.00	51	51	23.00	250	2,696
07.00	83	134	24.00	280	2,976
08.00	90	224	25.00	285	3,261
09.00	100	324	26.00	305	3,566
10.00	102	426	27.00	350	3,916
11.00	105	531	28.00	375	4,291
12.00	110	641	29.00	385	4,676
13.00	133	774	30.00	405	5,081
14.00	145	919	31.00	445	5,526
15.00	152	1,071	32.00	533	6,059
16.00	155	1,226	33.00	545	6,604
17.00	180	1,406	34.00	560	7,164
18.00	188	1,594	35.00	565	7,729
19.00	202	1,796	36.00	575	8,304
20.00	210	2,006	37.00	640	8,944
21.00	215	2,221	38.00	800	9,744
22.00	225	2,446	39.00	860	10,604

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APPENDIX

7A BUILDING EMERGENCY PLAN FOR LOW-LEVEL BURIAL GROUNDS . . . . . APP 7A-i

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7.0 CONTINGENCY PLAN [G]

The WAC 173-303 requirements for contingency plans are satisfied in the following documents: the *Building Emergency Plan for Low-Level Burial Grounds* (Appendix 7A) and the *Hanford Facility Contingency Plan*, Attachment 4 of the Hanford Facility RCRA Permit).

The unit-specific contingency plan document also serves to satisfy a broad range of other requirements [e.g., Occupational Safety and Health Administration standards (29 CFR 1910) and U.S. Department of Energy Orders]. Therefore, revisions made to portions of the contingency plan documents that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to review or approval by Ecology.

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APPENDIX

8A TRAINING . . . . . APP 8A-i

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8.0 PERSONNEL TRAINING [H]

The training plan provided in Appendix 8A discusses training requirements pertaining to the LLBG.

The training program is designed to be compliant with all applicable federal, state, and DOE-RL training requirements. The training program complies with requirements contained within WAC 173-303-330 for the development of a written dangerous waste training program. The training program is designed to prepare personnel to manage and maintain TSD units in a safe, effective, efficient, and environmentally sound manner. In addition to preparing employees to manage and maintain TSD units under normal conditions, the training program ensures that employees are prepared to respond in a prompt and effective manner should offnormal or emergency conditions occur.

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CONTENTS

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9.0 EXPOSURE INFORMATION REPORT

Exposure information for the LLBG is discussed in the General Information Portion (DOE/RL-91-28).

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10.0 WASTE MINIMIZATION [D-9]

To fulfill the requirements of 40 CFR 264.73(b)(9), a certification form that the LLBG have a waste minimization/pollution prevention program in place will be entered, annually, into the LLBG operating record.

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11.0 CLOSURE AND FINANCIAL ASSURANCE [I]

This chapter discusses closure and postclosure activities for the LLBG. This closure plan complies with WAC 173-303-610 and represents the baseline for closure of the LLBG.

Closure and postclosure of the LLBG will be a complex activity. In an effort to understand how the LLBG eventually will be closed, a brief description of the current operational and regulatory status of the various burial grounds must be understood. The following discusses the current status of each burial ground.

- The 218-E-10 Burial Ground, with the exception of a few small areas that contain post-August 19, 1987 RCRA/WAC 173-303 regulated waste, is a SWMU and continues to receive only low-level waste.

- The 218-E-12B Burial Ground with the exception of trench 94, contains no RCRA/WAC 173-303 regulated waste. The majority of this burial ground, with the exception of trench 94, is a SWMU and continues to receive only low-level waste. This burial ground also contains retrievable transuranic waste. This transuranic waste eventually will be removed and the trenches will be used only for low-level waste disposal.

- The 218-W-3A Burial Ground, with the exception of a few small areas that contain post-August 19, 1987 RCRA/WAC 173-303 regulated waste, is a SWMU and continues to receive only low-level waste. This burial ground also contains retrievable transuranic waste. This transuranic waste eventually will be removed and the trenches will be used only for low-level waste disposal.

- The 218-W-3AE Burial Ground, with the exception of a few small areas that contain post-August 19, 1987 RCRA/WAC 173-303 regulated waste, is a SWMU and continues to receive only low-level waste. This burial ground also contains retrievable transuranic waste. This transuranic waste eventually will be removed and the trenches will be used only for low-level waste disposal.

- The 218-W-4B Burial Ground contains no RCRA/WAC 173-303 regulated waste. This burial ground is full and no longer receives waste. However, this burial ground also contains retrievable transuranic waste. This transuranic waste eventually will be removed and the trenches will be used only for low-level waste disposal.

- The 218-W-4C Burial Ground, with the exception of a few small areas that contain post-August 19, 1987 RCRA/WAC 173-303 regulated waste, is a SWMU and continues to receive only low-level waste. This burial ground also contains retrievable transuranic waste. This transuranic waste eventually will be removed and the trenches will be used only for low-level waste disposal.

- The 218-W-5 Burial Ground contains RCRA double-lined leachate collection and removal system trenches (trenches 31 and 34). Trenches 31 and 34 are located in the southern one-third portion of this burial ground. There are two small areas in the northern two-thirds portion of this burial ground that contains post-August 19, 1987 RCRA/WAC 173-303 regulated waste. The majority of this burial ground is a SWMU and continues to receive only low-level waste.

- The 218-W-6 Burial Ground has yet to be used. This burial ground, in its entirety, is identified for future disposal of RCRA/WAC 173-303 regulated mixed waste.

11.1 CLOSURE PLAN [I-1]

This closure plan addresses the pre-closure activities for the LLBG. Mixed waste that meets LDRs is, and will be, disposed in lined trenches that comply fully with RCRA Subtitle C standards (Chapter 4.0). Also, the use of unlined trenches for the disposal of mixed waste is, and will be, performed in accordance with applicable dangerous and hazardous waste regulations (defueled reactor compartments placed in trench 94 meet LDR in their as-built condition). Future mixed waste trenches will be located in the currently unused portions of the LLBG. Refer to Section 11.5 for discussion on removal of transuranic waste from the LLBG.

The LLBG RCRA-regulated areas will be closed according to the applicable dangerous waste regulations, U.S. Department of Energy requirements, and the best management practices available at the time of closure.

The cover(s) will be designed and located so that the cover(s) passively isolate the recognized hazard and properly protect human health and the environment. The cover(s) will conform to the requirements of WAC 173-303-610. The specification and/or variation for other cover designs will be provided at the time of closure once the hazard(s) have been defined. Although a final detailed cover design cannot be provided for all applications at this time, at closure, all covers will be designed to adequately protect human health and the environment.

11.2 CLOSURE PERFORMANCE STANDARDS [I-1a]

Refer to General Information Portion (DOE/RL-91-28, Chapter 11.0) for discussion regarding landfill closures.

11.3 PRE-CLOSURE ACTIVITIES

A complete list of partial closure activities has not been defined. It is assumed that pre-closure activities could include, at a minimum, placing interim or final covers over the lined mixed waste trenches once these trenches are no longer receiving waste. Placement of covers over individual

trenches might be deferred until closure of the entire LLBG. Once a decision is made to construct final covers over the various burial grounds, a cover will be designed based on the hazard to be isolated. A closure cover design that satisfies the dangerous waste disposal requirements as defined in WAC 173-303 will be placed over the lined mixed waste trenches at the time of closure.

This closure plan does not address the closure of adjacent waste management areas (e.g., CERCLA operable units, other TSD units, etc.). However, this closure plan does address some of the parameters that will have to be evaluated when a burial ground is filled and ready for closure (Figure 11-1). In addition, this closure plan does not address activities outside the present scope and operation of the LLBG that might impact future disposal activities across the Hanford Facility.

Current waste management operations require that when a trench is filled with only low-level waste, the trench is backfilled with approximately 2.44 meters of soil to match the surrounding topography, which is predominately flat. These operations could change as waste management needs dictate. This cover is compacted by track-walking (e.g., weight of dozer) to stabilize and minimize subsidence. A maintenance and inspection program is implemented during this interim period to control erosion (e.g., the planting of shallow-rooted plants; an ongoing ocular monitoring program to remove any deep rooted plants, filling in areas of subsidence, and correcting any wind or water erosion if observed, and burrowing animals and insect intrusion) and other natural deterioration that could compromise human health or the environment. A chain-link fence might be erected around the perimeter of a backfilled burial ground for safety. On filling an entire burial ground, a detailed analysis might be necessary to determine the best method for final closure.

As stated previously, the majority of the LLBG are used only for low-level waste disposal (SWMU) and this disposal is outside the regulatory scope of RCRA and WAC 173-303. However, the low-level portions do impact the ability to perform final closure of the RCRA portions of the LLBG. Another significant impact affecting closure of the LLBG is integration with nearby CERCLA operable units, operating TSD units (e.g., Double-Shell Tank System and active burial grounds), roads, rails, and utility lines. Depending on how the LLBG are closed, closure caps for the low-level portions and the RCRA portions could cover, partially cover, or impact these structures in an adverse manner. A combined approach to address the radioactive and RCRA/WAC 173-303 portions might be necessary (Table 11-1).

The LLBG are located in an arid climate. To date, no known releases (radioactive and/or mixed waste) have been detected from the LLBG (Chapter 5.0). As stated previously, as a trench is filled, soil is added to make the trench match the surrounding topography and a program of erosion prevention is initiated. An exception is trench 94 of the 218-E-12B Burial Ground. To maximize the disposal capacity of this trench, the best operating method is to delay backfilling until the trench is filled with defueled reactor compartments. Other exceptions for delay would depend on best waste management practices.

The selection of a cover design has not been identified for all applications. The specification and/or variation for other designs will be provided at the time of closure once the hazard(s) have been defined. Although a final detailed cover design cannot be provided for all applications at this time, at closure, all covers will be designed to adequately protect human health and the environment. Furthermore, it is assumed that the cover design(s) could include features that satisfy or exceed the minimum requirements found in 40 CFR 260 through 270 to protect human health and the environment.

11.4 MAXIMUM EXTENT OF OPERATION [I-1b(1)]

The design capacity of the LLBG for mixed waste conservatively is calculated to be 174 hectare meters (Chapter 1.0).

11.5 REMOVING DANGEROUS WASTE [I-1b(2)]

Transuranic waste has been placed in various trenches of the LLBG since May 1970. Transuranic waste containers were placed on asphalt pads on the bottom of the trenches or placed in plywood-lined trenches. An earthen cover, where appropriate, was placed over the trenches to provide radiological protection. This waste was placed in a manner that allows for retrieval and/or removal in the future if necessary. No transuranic mixed waste has been placed into the LLBG since August 19, 1987. This waste eventually will be retrieved, processed, and disposed in accordance with current federal and state requirements. The low-level portion of the transuranic waste will be disposed of as low-level waste. This disposal could take place in the trenches in which the transuranic waste was removed. The pre-August 19, 1987 mixed waste portion of the transuranic waste will be disposed in lined trenches. The transuranic portion will be processed and prepared for offsite disposal. It is assumed that the retrieval of transuranic waste will be conducted and completed during the operational phase of the LLBG.

11.5.1 Retrievable Transuranic Waste

Transuranic waste has been placed in several different configurations (WHC 1989a, WHC 1989b, WHC 1989c, and WHC 1989d). All transuranic waste packages placed in the LLBG were free of external contamination at the time of emplacement and were designed to maintain integrity for a minimum of 20 years. It is assumed that retrieval of this waste can be accomplished without generating an airborne release of radioactivity.

Where retrievable transuranic waste has been covered with soil, conventional excavating equipment could be used to remove the bulk of the fill soil, taking care not to damage the waste containers. If necessary, manual removal of soil could be required from around the waste containers. If the structural integrity of a container is questionable, additional precautions will be exercised that could include, but are not limited to, wrapping with polyethylene sheets, overpacking the container to prevent airborne release

during subsequent handling operations, or retrieval would be conducted inside a full-containment structure to minimize the risk of an environmental release and to protect personnel.

It is assumed that the retrieval of transuranic waste would be completed during the operational phase of the LLBG. As such, this activity would not be subject to requirements contained in WAC 173-303-610.

11.5.2 Gas Sampling

In most transuranic waste areas, polyvinylchloride tubes were installed downward through the temporary waste area cover and operational cover into the waste zone for ambient air sampling. The tubes were installed and samples were taken periodically from the early 1970s through the mid-1980s. The primary objective of this testing program was to determine if the concentration of hydrogen gas generated by radioactive decay was sufficient to be of concern during retrieval operations and to determine moisture content. Although the results indicated that generation of hydrogen gas would not be of concern, additional confirmatory sampling will be conducted before retrieval.

The gas sampling system will be removed during retrieval of transuranic waste. Because these systems will be removed before closure, removal of these systems will not be subject to WAC 173-303-610.

11.6 DECONTAMINATING STRUCTURES, EQUIPMENT, AND SOIL [I-1b(3)]

All equipment used during waste sampling or retrieval will be decontaminated as required to ensure the safety of personnel. Decontamination also will be performed before the use of such equipment in a subsequent retrieval operation to prevent cross-contamination. If required, radiological decontamination will be performed before nonradiological decontamination. Although certain types of materials will require special chemical or other decontamination procedures, routine decontamination generally will be accomplished by one of the following:

- Washing the items in nonphosphate detergent and tap water
- Rinsing or washing down three times with tap water
- Wiping with nonflammable, nontoxic cleaning solution.

If, after decontamination activities, waste retrieval equipment or structures are shown to have contamination above the established decontamination standards, the use of such items will be restricted or discontinued. The overburden soil once removed will be carefully managed and stockpiled for future use. This soil could be used to cover waste that is disposed in the LLBG.

Equipment and structures that cannot be decontaminated to operational standards and contaminated soils, pavements, and waste residuals will be disposed in accordance with WAC 173-303-610(5).

11.7 CLOSURE OF LANDFILL UNITS [I-1e and I-1e(2)]

Closure of the LLBG will be consistent with the closure requirements specified in WAC 173-303-610 where appropriate.

The cover design(s) that will be used at the time of closure will satisfy the requirements for dangerous waste disposal as defined by WAC 173-303 and 40 CFR 264.

11.7.1 Cover Design [I-1e(2), I-1e(4), I-1e(5), I-1e(6), I-1e(7), and I-1e(8)]

The cover could consist of several layers that could be constructed on top of native soil base. A generalized cross-section of an example cover is shown on Figure 11-2. The cover could be constructed on a soil grade layer (graded fill) shown as layer 9 in Figure 11-2. It is assumed that before construction of the final cover, the waste form would be appropriately stabilized.

11.7.1.1 Grade Layer. The surface of the burial ground would be graded and/or shaped, if necessary, to match the slope of the desired low-permeability layer. Additional soil would be placed over the burial ground to achieve the required cover grade. This grade layer could taper from zero thickness near the edge of the outermost burial ground (the cover boundary) to perhaps several meters at the center of the cover; the thickness would depend on the lateral dimensions of the particular cover and the grade of the cover. As discussed, the grade layer also would provide a firm (nonsettling) foundation for the overlying layers.

The grade layer would consist of native soils. This material would be sufficiently well-graded to allow effective compaction. Field studies would be performed to identify suitable borrow sites. These studies would consist of evaluating existing geologic data pertaining to surficial deposits, surface mapping and sampling, test pits, laboratory testing, and possibly surface geophysics and/or limited drilling. This information is available for most cover material located on the Hanford Site. During construction of the prototype barrier at the 200-BP-1 operable unit (DOE/RL-94-76), design requirements specified that the subgrade fill be constructed from sandy soil (containing cobbles less than 75 millimeters at their greatest dimension with a constitution not more than 20 percent of the fill), obtained from a local borrow site. The material was found within a kilometer of the location.

The grade layer generally would be placed in uniform horizontal lifts, or tapered for sloped or crowned covers, to meet grade specifications after compaction. The optimum lift thickness would depend on the soil and equipment characteristics and would be determined using laboratory test data. Field verification could be provided by constructing a test pad before cover construction. To minimize settlement, the grade layer would be compacted to 95 percent of maximum density as determined by ASTM D 1557 [modified proctor (ASTM 1993)] or other approved method. Compaction will be accomplished with a

large, smooth, drum vibratory roller or similar piece of equipment, sized to prevent damage to underlying liner system components if present.

During construction of the cover, measurements on density of the placed grade layer would be taken periodically by bulk sampling and volume measurement techniques (e.g., ASTM D 4914). This testing would be used to determine the need for moisture conditioning, time constraints for placement, the optimum lift thickness, the required number of passes to achieve compaction, and similar information necessary to establish quality control specifications.

11.7.1.2 Low-Permeability Layer. The low-permeability layer could consist of either a 0.61 meter layer of soil mixed with bentonite, a geosynthetic clay liner (GCL), or a composite asphalt layer. The permeability of this layer would be greater than the permeability of the liner, if a liner is present. The selection of an appropriate material for this layer would be based on the hazard that is to be isolated. The low-permeability layer is the primary barrier in preventing soil and/or water from migrating into the waste zone.

The GCLs would be placed as panels on top of the grade layer. All GCLs are manufactured as panels approximately 4 to 5 meters in width and approximately 25 to 60 meters in length. The panels are placed on rolls at the factory and unrolled at or near the burial ground. The weight of the roll varies but ranges from 600 to 2,000 kilograms. The panels typically are overlapped 75 to 300 millimeters and tend to be self-sealing. Slight differences in the recommended installation exists between the various manufactures.

A 60-centimeter thick layer of soil mixed with bentonite could be used as the low-permeability layer. The soil component would consist of well-graded silt or silty sand from a suitable borrow source or else screened from native soils. The maximum particle size generally would be 4.75 millimeters (No. 4 sieve) to exclude larger particles that might reduce the overall permeability of the mixture or puncture the overlying geomembrane. This soil would be mixed with enough bentonite to lower the hydraulic conductivity of the mixture to 1×10^{-7} centimeters per second per day or less at a readily achievable degree of compaction. The optimum percentage of bentonite would depend on the properties of both the soil and the bentonite itself and would be determined by laboratory testing of candidate mixtures. However, previous studies (Daniels 1988) indicate that approximately 10 percent bentonite should provide satisfactory performance.

The soil/bentonite material would be mixed (e.g., by disking or in a pugmill) at a location close to the cover and would be stockpiled to minimize moisture changes. If necessary, the surface of the grade layer would be moistened and proof rolled immediately before placing this admixture. To meet permeability specifications, the soil/bentonite layer would be placed in 15-centimeter thick lifts and compacted with a self-propelled sheepsfoot compactor. The first lift could be somewhat thicker depending on compactor and grade layer characteristics, to prevent the soil/bentonite from being driven into the underlying layer. In-place densities would be measured with a sand cone or other direct method or a nuclear density gage calibrated to the

specific mixture used for the cover. Permeability would be measured on thin-walled tube samples in the laboratory. The sample holes in the cover would be carefully backfilled and compacted by hand. Material that does not have an in-place hydraulic conductivity of $1x10^{-7}$ centimeters per second or less would be recompacted or replaced as appropriate, and the permeability test repeated. The top surface of the soil/bentonite layer would be rolled with a smooth drum roller to provide a flat, even surface for the overlying geomembrane. The moisture content of the admix surface would be maintained by sprinkling, covering, or other means to prevent drying and desiccation. Potential concerns about desiccation also would be mitigated by installing the other layers of the cover as soon as possible after the admix layer has been placed.

Placement of the composite asphalt layer would follow the procedure used to construct the prototype barrier (DOE/RL-94-76). The layer would be placed using conventional paving practices. Material either would be batched in the 200 Areas or hauled from the nearest batch plant. A conventional paving machine would be used to place the asphalt. The asphalt would be placed in two lifts. Each lift would be approximately 7.5-centimeters thick. An overlap of approximately 1.5 meters is specified. A material specification that at least 6 percent of the material would be less than 0.074 millimeter was used during construction of the prototype. The asphalt would be covered with either a coat of polymer-modified asphalt or gilsonite, a naturally occurring derivative of tar sand. It is recommended that the protective coat be at least 250 millimeters in thickness.

It has been reported that GCLs are much better able to resist damage from freeze-thaw considerations, desiccation, and differential settlement than are compacted soil liners (Daniels 1994). The GCLs are thin blankets of bentonite clay attached to one or more geosynthetic materials (geotextile or geomembrane). These are commercially available and are particularly well suited for arid or dry conditions. The liners typically contain approximately 5 kilograms per square meter of bentonite that has an effective hydraulic conductivity of $1x10^{-9}$ centimeters per second.

It has been shown that desiccation-induced cracking can occur after several freeze-thaw cycles or dry-wetting cycles for the composite clay soil layers. Furthermore, the data published by Lagatta (1992) indicates that most compacted soil layers cannot withstand tensile strains greater than 0.1 to 1.0 percent. The GCLs can withstand tensile strains from 5 to 20 percent (Daniels 1994). Therefore, if freeze-thaw or wetting drying cycles are anticipated and/or differential settlement, which could result in significant distortion is anticipated, it is recommended that a GCL be used instead of compacted soil/bentonite layer. If biological intrusion, freeze-thaw or wetting-drying, and differential settlement are not anticipated, a 60-centimeter two component [flexible membrane liner (FML) and compacted soil/bentonite layer] might prove to be the most economical low-permeability layer.

It is recommended that GCLs and/or composite soil/bentonite layers be used to isolate mixed waste where the radiological component of risk is very low. As opposed to the asphaltic concrete composite layer, the GCL would not

provide a barrier to biological intrusion. Although the design life of the GCL is unknown, it is assumed to be several hundred years (Daniels 1994). By comparison, the design life of the composite asphalt layer is estimated to be several thousand years.

11.7.1.3 Flexible Membrane Liner (optional). If the soil/bentonite layer is used, a low-permeability layer FML (or geomembrane) could be placed over the soil/bentonite layer. Using a FML is consistent with the two component EPA guidance for RCRA cover design (EPA 1989).

The geomembrane would consist of a 40-mil sheet of high-density polyethylene (HDPE), very-low-density polyethylene (VLDPE), or other suitable material. The 40-mil thickness is twice that recommended by the EPA (EPA 1989), but is considered appropriate to reduce the risk of damage during construction and subsequently during the postclosure period from such potential hazards as settlement, roots, and burrowing animals. The composition of the geomembrane would be selected for high resistance to normal weathering and chemical deterioration, including any fertilizers and herbicides that might be used to establish the vegetative cover. Physical and mechanical properties of the geomembrane, such as thickness, strength, and density, would be verified by conformance testing (to ASTM and other standard tests as appropriate) on samples of material received at the site. A FML that does not meet manufacturer's or design specifications would be rejected.

The geomembrane would be placed on the prepared soil/bentonite surface with several centimeters of overlap between adjacent sheets. In most cases, the panels would be placed so that the seams run down gradient. Sheets would be joined by fusion or extrusion welding. Samples for destructive seam-strength tests would be taken every few hundred meters to ensure adequacy of the welding process, and the sample locations would be patched. Nondestructive tests such as vacuum box or pressure testing (the type of test would depend on the welding method) would be performed along the entire length of all seams to ensure total seam integrity. Any part of a seam that fails these tests would be repaired or removed and patched as appropriate. A FML installation would be performed by specialists experienced in this technology and would be conducted under detailed quality assurance/quality control procedures to be developed as part of the final cover design.

Depending on construction staging, sandbags would be placed on the FML at approximately regular intervals to prevent damage from wind uplift before the overlying layers are placed. Design methods, such as those described by Wayne and Koerner (1988), would be used to estimate more precisely the sandbag requirements. The sandbags will be removed before placing the drainage layer.

As stated, this is an optional layer that would only be used if the 60 centimeter thickness of soil mixed with bentonite is used as the low-permeability layer.

11.7.1.4 Drainage Layer. The drainage layer would conduct any water that percolates through the overlying layers laterally to the drainage ditch. Thus, the drainage layer would prevent hydraulic pressure from building up

directly on the low-permeability liner, and thereby eliminate one set of forces that would drive moisture through the primary moisture control barrier.

The design criteria for the drainage layer would be that the layer convey water at a rate no less than $1x10^{-2}$ centimeters per second per day. The drainage layer would consist of a geonet or layers of sand and gravel. If asphalt is used as the primary low-permeability layer, a 15-centimeter layer of gravel would be placed directly on the asphalt. If either the GCL or two component FML composite soil and bentonite layer is selected for use, then either a geocomposite (geotextile combined with a geonet), if a capillary break is not included in the design, or a 30 centimeter layer of sand (15 centimeters) overlaid by gravel (15 centimeters) would be used. For this case, the drainage layer would be constructed by first placing the 15 centimeter thickness of sand on the FML and placing the 15-centimeter thickness of gravel on the layer of sand. If the surface grade of the FML is 3 percent or greater, a geosynthetic bedding material might need to be placed on the FML before placement of the sand to prevent the slippage of sand off the surface of the FML. This is a characteristic that would need further review before construction of the cover.

The gravel or sand followed by gravel layer would be placed using conventional construction practice. Placement of the material would be in two 15 centimeter lifts. Each lift would be consolidated using a vibratory roller. During the construction of the prototype barrier, two passes of the vibratory roller were found to be sufficient. If a FML or GCL is used, it is recommended that rounded (not crushed) material be used as the drainage medium to avoid damaging the FML. The maximum grain size should be no greater than 0.95 centimeter. If a composite asphalt layer is used, crushed material can be used. However, if crushed material is used, the material as applied (specifications) would need to satisfy the minimum drainage criteria of $1x10^{-2}$ centimeters per second.

11.7.1.5 Plant, Animal, and Human Intrusion Layer (optional). The performance objectives for the permanent isolation surface barrier are summarized as follows:

- Function in a semiarid to sub-humid environment
- Limit the recharge of water through the waste to near zero amounts [0.05 centimeter per year ($1.6x10^{-9}$ centimeters per second)]
- Be maintenance free
- Minimize the likelihood of plant, animal, and human intrusion
- Limit the exhalation of noxious gases
- Minimize erosion-related problems
- Meet or exceed RCRA Subtitle C cover performance requirements
- Isolate waste for 1,000 years.

To satisfy the intrusion performance objective, a layer of fractured basalt riprap 1.5-meter thick has been incorporated into the design of the prototype permanent isolation surface barrier. This is an optional layer that would only be included in the design of barriers that require the additional human and/or bio-intrusion protection to reduce either the environmental or human health risk.

11.7.1.6 Graded Filter Layer. A graded filter consisting of crushed rock overlaid by sand is the next layer. This layer would be placed on either the plant, animal and human intrusion layer (Section 1.5) if incorporated into the design, directly over the drainage layer (Section 1.4) if the bio-barrier is not included in the design and a geosynthetic drainage layer (geonet) is used. The graded filter layer would function as a capillary break and will increase the effectiveness of the surface layer by imposing the use of the "Richards" principal. The graded filter serves to separate the surface soil layer from the drainage layer. A geotextile would be placed on the top of the graded filter to decrease the potential for fine material to enter the filter and drainage zone. The geotextile would be permeable to drainage and would not support a standing head of water.

The thickness of the graded filter could vary. For the prototype barrier, 30 centimeters of crushed rock was placed on the railroad or highway ballast. The crushed rock was placed in two lifts of 15 centimeters graded, and rolled to 95 percent maximum density using a steel drum vibratory roller. The crushed material was screened through a 16-millimeters mesh before being placed.

During the construction of the prototype barrier, a 15-centimeter layer of sand was placed directly over the crushed rock. The sand was obtained onsite and placed in accordance with WSDOT M41-10, 2-03.3(14) (WSDOT 1991). Standard dump trucks were used to haul the sand from Pit 30 located in the 200 Areas to the construction site. A grader was used to level and finish grade the sand layer. A geotextile was placed on top of the graded filter before construction of the surface soil layer.

It is important to note that the creation of the 'capillary break' allows the surface soil layer to both store and recycle water. This will reduce and might eliminate the need to build a surface slope into the final grade of the surface soil layer under semiarid conditions.

11.7.1.7 Surface Soil Layer. A surface soil would be placed over the geotextile to intercept, store and recycle water, and prevent damage to the underlying structure from natural and synthetic processes. Factors assimilated into the design of the surface soil layer include the following:

- Aspects of soil physics including the characterization and quantification of soil physical properties

- The collection, interpretation, and use of meteorological and long-term climatology data

- The collection and use of wind and water erosion

- The collection and use of information on vegetation, bio-intrusion, and human intrusion

- The use of physical models (lysimeters) and numerical models (computer codes) to simulate performance and help optimize design.

Analytical methods (simulation modeling) have been used to size the surface soil layer. Using field data collected from the Field Lysimeter Test Facility, both the UNSAT-H and HELP numerical models have been calibrated to simulate onsite conditions. For several years, these calibrated models have been used to compute the performance of barrier designs thereby, defining the appropriate surface soil thickness for the barrier. The two most important factors in engineering the surface soil thickness are the assignment of the water retention characteristics for soil and climate information.

The selection of soil to be used for the surface soil layer started in the mid-1980's. By the time the Hanford Defense Waste Environmental Impact Statement was issued (DOE 1989), it had been decided that the Warden Silt Loam Soil available at several locations on the Central Plateau was the desired material for constructing surface barriers that would recycle water. Most design studies have assumed the use of this material. The physical and hydraulic properties of this soil have been quantified.

The surface soil layer could consist of two layers. The top layer consists of the selected silt loam to which 15 percent (by weight) pea gravel is added. The addition of this pea gravel serves to armor this layer thereby reducing the rate of soil deflation to less than 5 percent of the nominal unprotected rate. The bottom layer consists of silt rich material. The silt rich material is found naturally occurring at several locations on the Central Plateau and is characterized with more than 30 percent passing the No. 230 sieve. The silt layers are placed using conventional construction techniques in a single lift. Once the material is placed, it is groomed to a compaction of 88 percent maximum dry density.

As discussed in Section 11.1.7.6, the actual thickness of the two layers would vary depending on the desired water storage of the soil. The minimum thickness guideline recommended by EPA is 60 centimeters (EPA 1989).

11.7.1.8 Vegetative Cover. The vegetative cover performs three functions. First, the plants return water stored in the surface soil back to the atmosphere, significantly decreasing net infiltration and reducing the amount of moisture available to penetrate the cover. Second, the vegetation stabilizes the surface soil component of the cover against wind and water erosion. Finally, the vegetative cover restores the appearance of the land to a more natural condition and appearance.

The importance of vegetation on the recycling of water has been recognized and measured for years onsite and at other locations in the semiarid west. A number of lysimeters have been constructed onsite to measure recharge and the effectiveness of plants and grasses in reducing recharge. The most controlled studies on this phenomenon have been performed at the Field Lysimeter Test Facility. In these studies, it has been observed that a

2.0-meter thickness of soil supporting no vegetation and isolated through the use of a capillary break has sufficient storage capacity to recycle twice the annual amount of seasonable precipitation on the Hanford Site. If vegetation is introduced, the storage capacity of the soil column is increased to three times the annual average (Gee et al. 1992).

A mixture of seeds will be used to establish vegetation. The selection of the seed mix would be based on past vegetation activities onsite and work performed in support of the engineered barrier (Link et al. 1994). The seed types would be selected based on resistance to drought, rooting density, and ability to extract water. In particular, attention would be given towards those factors that prevent deep root penetration into the buried waste. It has been observed that the best way to control root penetration is to construct a layer of rocks that creates a void space. Both the graded filter and the optional bio-barrier serve this purpose. During final design, suitable plant and grass species, such as wheatgrasses, would be identified.

11.7.1.9 Wind Erosion. The principal hazard associated with wind erosion is the thinning of the cover surface soil layer. This in turn potentially could lead to breaching of the moisture barriers, gradually allowing larger quantities of water to reach the waste. The engineering approaches to mitigating wind erosion of the cover are (1) designing the surface soil layer with an appropriate total thickness to compensate for future soil loss that might result from wind erosion, (2) establishing a vegetative cover on the surface to reduce wind erosion, and (3) include an appropriate coarse material (admix) in the upper layer of the surface soil to form an armor layer.

The use of coarse soil on the cover surface is expected to reduce wind erosion to negligible levels. The use of gravel admixtures for protecting silt-loam Hanford soils exposed to environmental conditions has been studied for several years by PNNL (PNL 1994). As a result of this work, a pea gravel admix of 15 percent has been added to the surface layer. Use of the pea gravel admix would serve as an armor layer thereby minimizing the rate of soil deflation.

Although soil deflation has been minimized (estimated to be less than 5 percent of an unarmored surface), some erosion of the native surface soils in the vicinity of the cover would certainly occur. The rate of deflation will be governed by wind speed and saltating sand. The result of wind erosion could effect the operation of the drainage ditches. Periodic maintenance of these ditches might be required.

11.7.1.10 Water Erosion. The potential hazard associated with water erosion is the same as that for wind erosion, namely the loss of soil from the top or surface layer. The effect of water erosion on cover designs on the Hanford Site has been studied for several years by PNNL. The results indicate that vegetation cover has the most dominant effect on reducing water erosion. The rock mulch or pea gravel admix also has a positive effect in reducing water erosion but is less effective than vegetation. The effects of potential water erosion have been measured and quantified in terms of the universal soil loss equation (PNL 1992).

Several engineering approaches have been adopted to minimize the potential for water erosion:

- Limiting the surface slopes
- Providing run-on control with the sideslope drainage ditches
- Compacting the surface soil in a way that promotes significant infiltration rather than excessive run-off
- Properly designing the sideslopes to prevent gullying
- Establishing a vegetative cover to slow surface run-off
- Incorporating coarse material (pea gravel admix) in the upper portion of the surface soil layer to help form an erosion-resistant armor
- Limiting flow path lengths through the use of vegetation and admix.

The cover design was evaluated for potential erosion damage from overall soil erodibility, sheet flow, and gullying. The results indicate that expected erosion under worst-case conditions is within acceptable limits (refer to Chapter 11.0, Section 11.1.5).

11.7.1.11 Settlement and Subsidence. A discussion on settlement and subsidence is provided in Section 11.3.

11.7.1.12 Deep-Rooted Plants. The potential hazard from deep-rooted plants are roots penetrating the GCL and compacted soil/bentonite layers. The asphalt layer is assumed to resist this hazard. Penetration of this layer could provide a pathway for surface water to infiltrate the waste. Dangerous materials could be absorbed by the roots and brought to the ground surface where it could be released into the environment. Plants common to the 200 Areas are reported to have roots up to approximately 2.4-meters deep (PNL 1985), and might be sufficient to penetrate the thickness of the cover.

The following are design features that would minimize the potential for problems with deep-rooted plants.

- The surface soil (top two layers) will retain most of the precipitation, because the underlying drainage layer has significantly higher permeability and much less water retention capacity. Therefore, it is expected that vegetation preferentially will occupy the surface soil layer and not have an affinity for growing into the drier underlying layers.
- The thickness of the surface soils will be sized to promote the development of semiarid deep-rooted perennial grasses and to discourage the development of deep-rooting intrusive species.

The use of plants to recycle water has been studied for several years. This work was initiated at the Field Lysimeter Test Facility in the 200 Areas and continues at the prototype barrier test site located on the 200 Areas Plateau. Results of this work have been documented by Link (1994). Results from the ongoing work at the prototype barrier test site could be used during final design of the cover.

11.7.1.13 Burrowing Animals. Small animals indigenous to the Hanford Site have been reported to burrow to depths of more than approximately 2 meters (PNL 1986b). This is sufficient to penetrate the thickness of the top two layers. The sand and gravel filter layers and the gravel drainage layer should prevent the animals from burrowing any deeper. Of primary concern is the effect of borrowing on either reducing the storage capacity of the cover or providing a burrow that would in effect short circuit the effectiveness of the soil layers to store water.

This possible condition has been studied by Landeen (1994). An animal intrusion lysimeter test facility consisting of six lysimeters (150 centimeters by 150 centimeters by 180 centimeters deep) was constructed. Small burrowing animals common to the Hanford Site (Great Basin pocket mice, Townsend ground squirrels, and pocket gophers) were introduced over a 3 to 4 month test period. The animals were allowed to habitat the lysimeters. The soil wetting and drainage were forced using a rainulator. Tests were performed from April 1988 through August 1990.

Information collected from five tests indicated that water was lost from all the lysimeters including the control lysimeter (no animals) during the summer months. During the winter months, all lysimeters gained water. The data collected from the lysimeters also indicated that there was little difference in the total water content between the control and animal held lysimeters during the test periods. This suggest that burrow systems will not significantly increase the amount of water at depth or in storage. In fact the burrowing activity may enhance the removal of water from the soil (Landeen 1994).

11.7.2 Meteorology and Climatology

Meteorological records have been collected for over 75 years in eastern Washington. Meteorological records have been collected for approximately 50 years as part of the Hanford onsite operations. On the Hanford Site, the 79-year average annual precipitation is 16.2 centimeters per year. This annual precipitation record has been extended to over 75,000 years using a pollen analog developed on the Hanford Site (Petersen 1994). Based on this record, the long-term range of annual precipitation has ranged from 50 percent below the present day mean annual precipitation to more than 25 percent greater than the present day mean annual precipitation.

Based on extreme-value analysis, the 100-year and 1,000-year storm events have been predicted for the Hanford Site. The 24-hour maximum accumulation for the 100-year return period is 5.05 centimeters and for the 1,000-year return is 6.81 centimeters. Using 35 years of extreme event precipitation

records (1946-1980), there were two 24-hour precipitation events where the accumulated precipitation exceeded 5.0 centimeters (Peterson 1994). The 100-year and 1,000-year recurrence events were based on this record.

About 38 percent of all precipitation is in the form of snow. This form of precipitation usually occurs during December through February. One out of every four winters is expected to produce an accumulation of snow that exceeds 16.2 centimeters (Peterson 1994). The water content of the snow varies greatly.

11.7.3 Numerical Simulation Models

Both the HELP model and UNSAT-H numerical simulation models have been used to predict the performance of various cover designs for possible use onsite. The two models have been compared and have been found to provide consistent results. The HELP model usually overpredicts drainage.

Both models were used by Martian (1994) to compare the performance of three designs with a surface soil thickness ranging from 1 to 2 meters. The results from this analysis tends to bound the design considerations that are of interest for use onsite. The soil layering consisted of a Warden Silt layer containing the pea gravel admix overlaying a Warden silt layer. The thickness of the layers is provided in Table 11-2.

Water balance simulations were conducted for each design for three different precipitation treatments: (a) ambient conditions, (b) 2X ambient precipitation conditions, and (c) design storm condition. The ambient precipitation scenarios used daily precipitation information from the Hanford Meteorological Station for the 10-year period 1979 through 1988. The 2X ambient precipitation scenario was realized by simply doubling the daily precipitation. The design storm event varied for each design and was superimposed on the ambient and 2X precipitation condition when the soil was at its maximum moisture content following the maximum precipitation event. For all three designs, this event was simulated to occur on December 31, 1983. The results from these calculations, using both the UNSAT-H and HELP simulation models, are provided in Table 11-3.

The design storm events are summarized as follows; (a) a 1,000-year, 24-hour event for design 1, (b) a 500-year, 24-hour event for design 2, and (c) a 100 year, 24-hour event for design 3. Superimposing these events on the simulated precipitation treatments had no effect on the calculated drainage.

11.8 SCHEDULE FOR CLOSURE [I-1f]

As stated previously, closure of the LLBG will be a complex process. Closure of the various burial grounds that comprise the LLBG is not expected to occur within the next 30 or more years. A disposal strategy document (WHC 1996) addresses the filling sequence of various trenches and provides an estimate as to when a burial ground will be filled. This document, addressing both mixed and low-level waste, is based on waste forecasts and is designed to

be modified to account for the constantly changing waste forecasts. The majority of waste identified in this document is low-level only. This document projects to the year 2023.

This closure plan will be updated accordingly to reflect the current closure plan schedule per WAC 173-303-830, Appendix I. In addition, at a time when a closure date is established, a revised closure plan and closure schedule will be submitted to Ecology that contains detailed information regarding specific activities and implementation timeframes.

11.9 EXTENSION FOR CLOSURE [I-1(g)]

An extension for closure of post-August 19, 1987, regulated mixed waste that has been disposed in the various burial grounds (refer to Chapter 1.0) until permit expiration is requested. At that time it is likely that another extension will be requested consistent with the schedule for closure as identified in Section 11.8.

11.10 POSTCLOSURE PLAN [I-3]

Because of the long active life of the LLBG, a comprehensive postclosure plan will be developed when closure becomes imminent.

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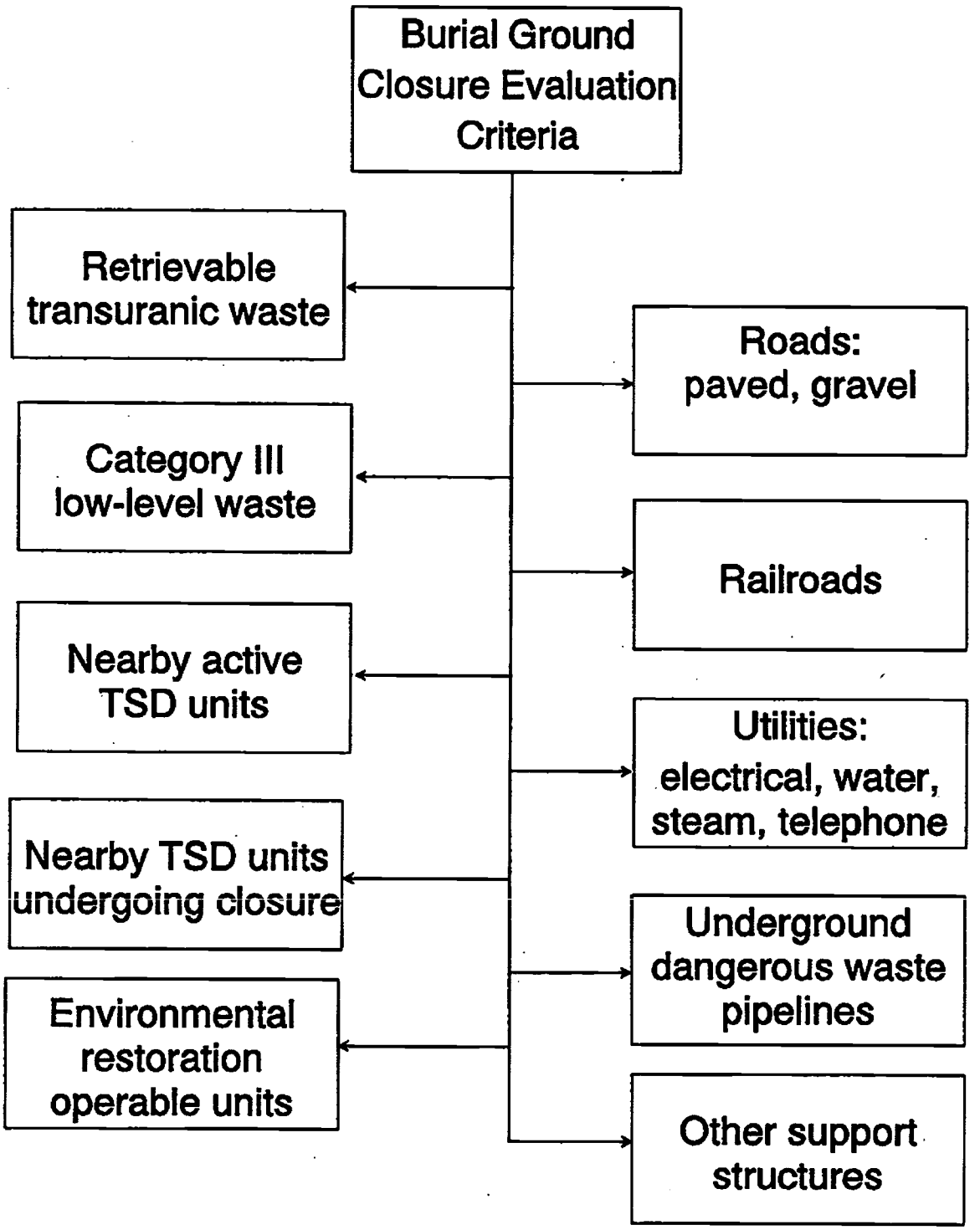


Figure 11-1. Low-Level Burial Grounds Closure Evaluation Process.

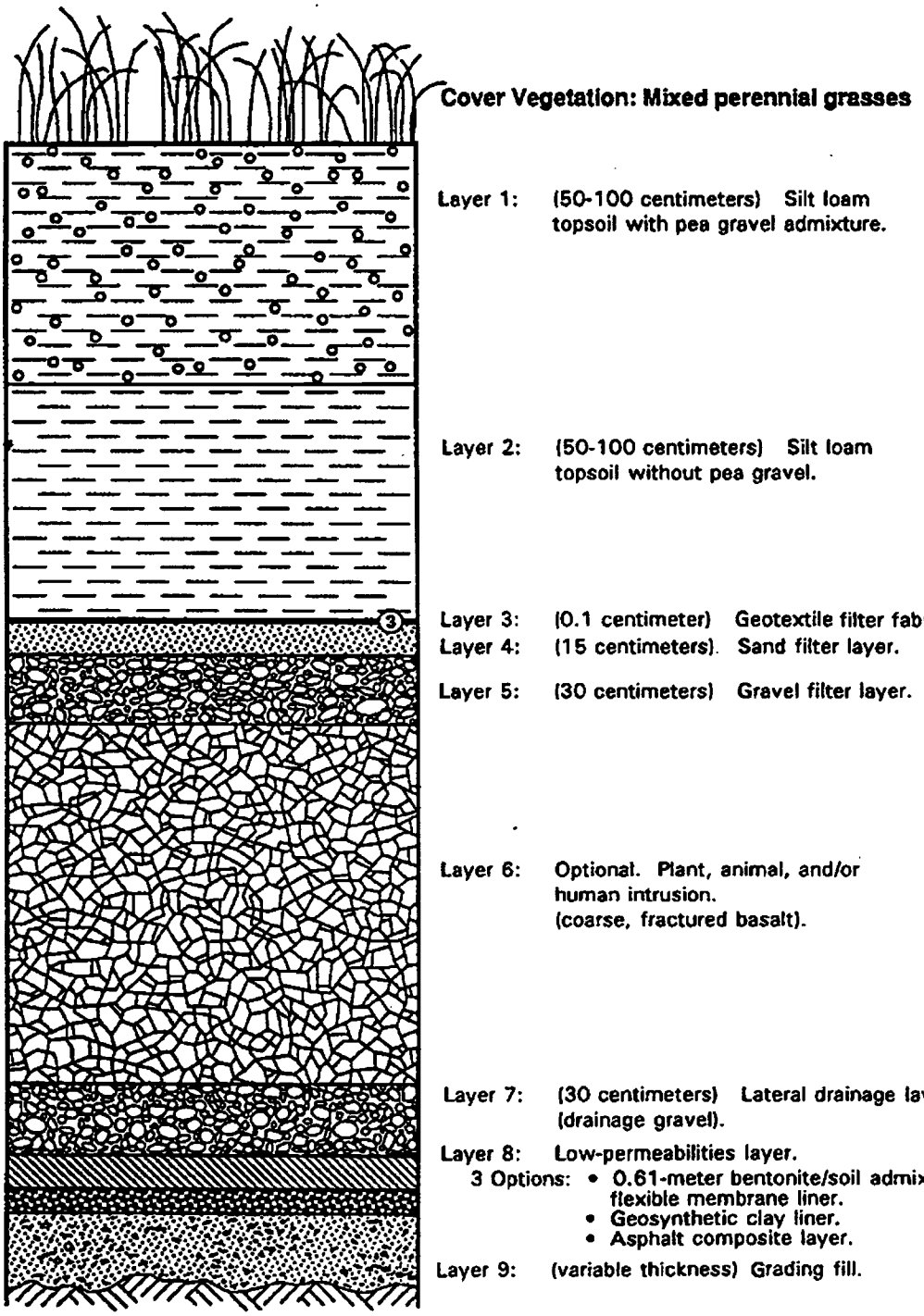
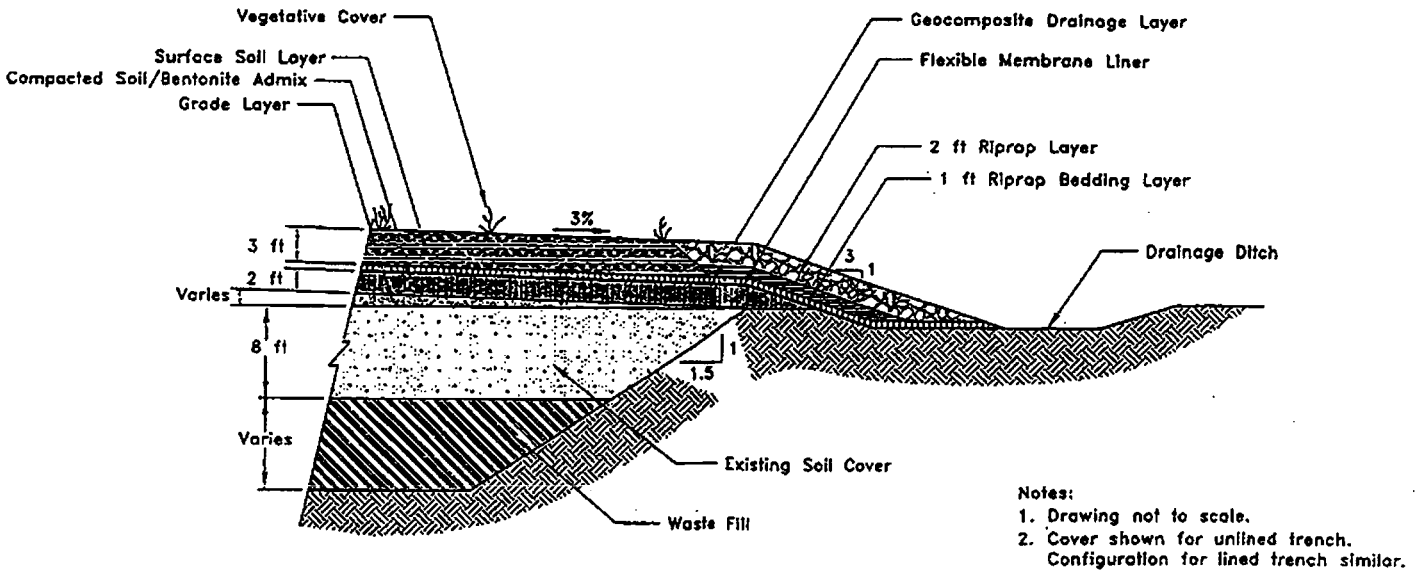


Figure 11-2. Generalized Cross-Section of Landfill Cover.



Note: To convert feet (ft) to meters, multiply by 0.3048.

Figure 11-3. Typical Cross-Section Showing Proposed Sideslope Treatment and Drainage Ditch.

Table 11-1. Potential Interferences/Integration Opportunities With Closure Cap.

Burial ground	Predominant waste received	Land area used as of 01/97 (percent)	Contains retrievable transuranic waste	Contains Category III low-level waste	Active TSD units in vicinity	Operable unit	Roads	Railroads	Utilities	Environmental impacts (affected flora/fauna)
218-E-10	Low-level	60	No	Yes	No	200-BP-10	Akron Avenue 12th Street	Yes	Electrical	TBD
218-E-12B	Low-level, defueled reactor compartments (mixed waste)	20	Yes	Yes	No	200-PO-6	Canton Avenue 12th Street	No	Electrical Telephone	TBD
218-W-3A	Low-level	99	Yes	Yes	218-W-3AE 218-W-5	200-ZP-3	Dayton Avenue 27th Street	No	No	TBD
218-W-3AE	Low-level	30	No	Yes	218-W-3A 218-W-6	200-ZP-3 200-TP-3	27th Street	Yes	No	TBD
218-W-4B	Low-level	100	Yes	No	218-W-4C	200-ZP-3	Dayton Avenue 19th Street	Yes	Electrical	TBD
218-W-4C	Low-level	26	Yes	Yes	218-W-4B	200-ZP-3 200-ZP-1 200-UP-1	Dayton Avenue 16th Street 19th Street	Yes	Pump and treat Electrical	TBD
218-W-5	Low-level, mixed waste	20	No	Yes	218-W-3A WRAP 1	200-ZP-3	Dayton Avenue 23rd Street	No	Electrical Telephone	TBD
218-W-6	Future mixed waste	0	No	No	218-W-3AE	200-ZP-3	27th Street	Yes	Electrical	TBD

Table 11-2. Comparison of Three Surface Soil Geometries.

Design 1	Design 2	Design 3
Layer 1: 101.6 centimeters (Silt/15 % Pea Gravel by volume)	Layer 1: 50.8 centimeters (Silt/15 % Pea Gravel)	Layer 1: 20.32 centimeters (Silt/15 % Pea Gravel)
Layer 2: 101.6 centimeters (Silt)	Layer 2: 101.6 centimeters (Silt)	Layer 2: 71.12 centimeters (Silt)

Table 11-3. Comparison of Calculated Drainage for Three Surface Soil Geometries.

Numerical Model	Design	Treatment	Drainage (centimeters)
UNSAT-H	Design 1	Ambient	0.0
UNSAT-H	Design 1	2X	0.0
UNSAT-H	Design 2	Ambient	0.0
UNSAT-H	Design 2	2X	0.0
UNSAT-H	Design 3	Ambient	0.005
UNSAT-H	Design 3	2X	0.683
HELP	Design 1	Ambient	0.0001
HELP	Design 1	2X	0.0011
HELP	Design 2	Ambient	0.00025
HELP	Design 2	2X	0.299
HELP	Design 3	Ambient	0.0022
HELP	Design 3	2X	0.2872

CONTENTS

12.0 REPORTING AND RECORDKEEPING 12-1

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12.0 REPORTING AND RECORDKEEPING

Reporting and recordkeeping requirements that could be applicable to the Hanford Facility are described in Chapter 12.0 of the General Information Portion (DOE/RL-91-28). Not all of these requirements and associated reports and records identified in Chapter 12.0 of the General Information Portion are applicable to the LLBG. Those reporting and recordkeeping requirements determined to be applicable to the LLBG are summarized as follows:

- Hanford Facility Contingency Plan and incident records (as identified in the General Information Portion):
  - Immediate reporting
  - Written reporting
  - Shipping paper discrepancy reports.
- Unit-specific Part B permit application documentation and associated plans
- Personnel training records
- Groundwater monitoring records
- Inspection records (unit)
- Onsite transportation documentation
- Land disposal restriction records
- Waste minimization and pollution prevention.

In addition, the following reports prepared for the Hanford Facility will contain input, when appropriate, from the LLBG:

- Quarterly Hanford Facility RCRA Permit modification report
- Anticipated noncompliance
- Required annual reports.

Annual reports updating projections of anticipated costs for closure and postclosure are described in the General Information Portion (DOE/RL-91-28).

The LLBG Operating Record 'records contact' is kept on file in the General Information file of the Hanford Facility Operating Record (refer to DOE/RL-91-28, Chapter 12.0).

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CONTENTS

13.0 OTHER FEDERAL AND STATE LAWS [J] 13-1

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13.0 OTHER FEDERAL AND STATE LAWS [J]

Applicable federal, state, and local laws applicable to the LLBG are discussed in Chapter 13.0 of the General Information Portion (DOE/RL-91-28). Generally, the laws applicable to the LLBG include, but might not be limited to, the following:

Atomic Energy Act of 1954
Federal Facility Compliance Act of 1992
Clean Air Act of 1977
Safe Drinking Water Act of 1974
Emergency Planning and Community Right-to-Know Act of 1986
Toxic Substances Control Act of 1976
National Historic Preservation Act of 1966
Endangered Species Act of 1973
Fish and Wildlife Coordination Act of 1934
Federal Insecticide, Fungicide, and Rodenticide Act of 1975
Hazardous Materials Transportation Act of 1975
National Environmental Policy Act of 1969
Washington Clean Air Act of 1967
Washington Water Pollution Control Act of 1945
Washington Pesticide Control Act of 1971
Model Toxics Control Act
Benton Clean Air Authority Regulation 1
State Environmental Policy Act of 1971.

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14.0 PART B CERTIFICATION [K] 14-1

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14.0 PART B CERTIFICATION [K]

The following certification, required by WAC 173-303-810(13), for all applications and reports submitted to Ecology is hereby included:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy,
Richland Operations Office

Date 7/25/97

Co-operator*
H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford, Inc.

Date 7/24/97

* Fluor Daniel Hanford, Inc. is responsible for information presented in Chapters 1.0 through 4.0 and 6.0 through 15.0, including the associated appendices.

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14.0 PART B CERTIFICATION [K]

The following certification, required by WAC 173-303-810(13), for all applications and reports submitted to Ecology is hereby included:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy,
Richland Operations Office

Date 7/25/97

Co-operator*
W. J. Madia, Director
Pacific Northwest National Laboratory

Date 24 July 1997

* Pacific Northwest National Laboratory is responsible for information presented in Chapter 5.0, including any associated appendices.

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CONTENTS

15.0 REFERENCES 15-1

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15.0 REFERENCES

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APPENDICES

2A TOPOGRAPHIC MAPS

3A WASTE ANALYSIS PLAN FOR LOW-LEVEL BURIAL GROUNDS

4A CONSTRUCTION QUALITY ASSURANCE REPORT

4B DEFINITIVE DESIGN

4C RESPONSE ACTION PLAN

4D REQUEST FOR EXEMPTION FROM LINED TRENCH REQUIREMENTS AT 218-E-12B BURIAL GROUND TRENCH 94

4E SITE INVESTIGATION REPORT

4F 9090A TEST RESULTS

4G SOIL LINER PERFORMANCE CALCULATIONS

5A INTERIM STATUS GROUNDWATER MONITORING

5B SUSPENSION OF GROUNDWATER SAMPLING AT LOW-LEVEL WASTE MANAGEMENT AREA 5

7A BUILDING EMERGENCY PLAN FOR LOW-LEVEL BURIAL GROUNDS

8A TRAINING

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APPENDIX 2A

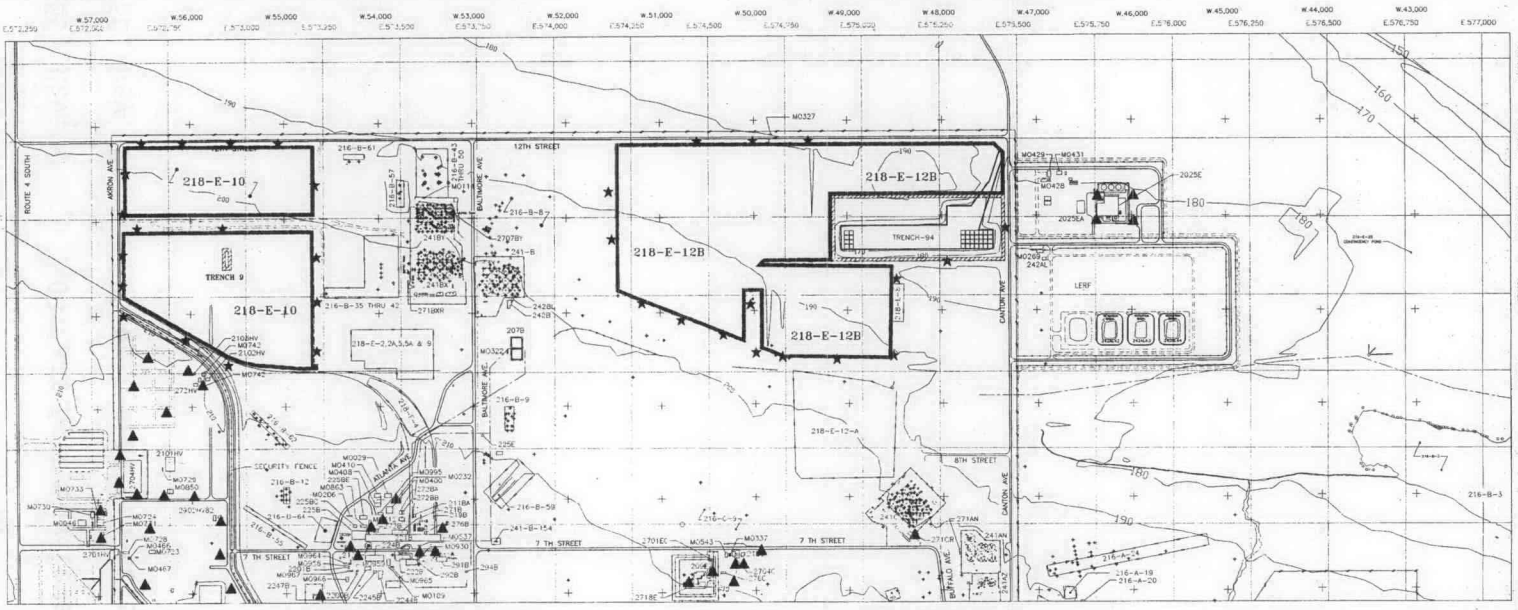
TOPOGRAPHIC MAPS

APPENDIX 2A

H-13-000259, Rev. 0	200 East Area Low-Level Burial Grounds.
H-13-000260, Rev. 0	200 West Area Low-Level Burial Grounds.

LEGEND

- W.47,000 N.43,000 — HANFORD PLANT COORDINATES (FEET)
- E.576,250 N.136,000 — WASHINGTON STATE COORDINATES (METERS)
- MAJOR CONTOUR (METERS)
- MINOR CONTOUR (METERS)
- IMPROVED ROAD
- UNIMPROVED ROAD
- DIRT ROAD
- SIDEWALKS\PARKING LOTS
- RAILROADS
- RETAINING WALL
- BUILDINGS/STRUCTURES & TOWERS
- 242A — BUILDING NUMBER
- MOBILE OFFICES
- SECURITY,WARNING,MISC FENCES
- POST & CHAIN (CRIB,BURIAL GROUND FENCES)
- PERIMETER FENCES
- WELL
- TANKS
- PROCESS SEWER
- SANITARY SEWER
- 216-A-42 — CRIB
- 218-E-10 — BURIAL GROUND
- SOLID WASTE MANAGEMENT UNIT (SWMU), TREATMENT, STORAGE, AND/OR DISPOSAL (TSD) UNIT BOUNDARY SEE NOTE 4.
- POST-AUGUST 19, 1987 TSD UNIT BOUNDARY SEE NOTE 4.
- WITHDRAWAL WELL
- INJECTION WELL
- RCRA MONITORING WELLS FOR LLBG
- FIRE HYDRANTS

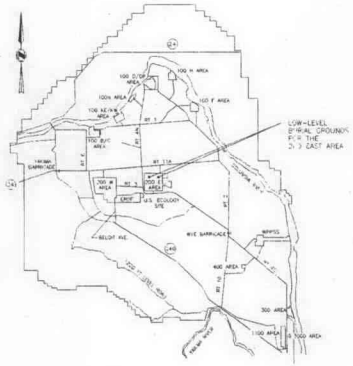


GENERAL NOTES

1. THIS MAP IS BASED ON AERIAL PHOTOGRAPHY FLOWN ON 6-24-89. THE ORIGINAL TOPOGRAPHIC MAP WAS PREPARED BY MERRICK & COMPANY AND CERTIFIED TO MEET NATIONAL MAP ACCURACY STANDARDS. OFFICIAL COPIES OF THE MERRICK MAPS THAT SHOW THE CERTIFICATE ARE LOCATED IN THE LOCKHEED MARTIN ENGINEERING FILES AS DRAWING NUMBERS H-2-79476 SHEET 1 AND H-2-79477 SHEET 1 THRU 37. NAMES OF ADDITIONAL FEATURES AND THE TITLE BLOCK WERE ADDED BY WESTINGHOUSE HANFORD COMPANY.
2. WASHINGTON STATE PLANE COORDINATE SYSTEM: THE OFFICIAL COORDINATE SYSTEM AS DEFINED BY THE REVISED CODE OF WASHINGTON (RCW). THE HANFORD SITE LIES WITHIN THE WASHINGTON COORDINATE SYSTEM, SOUTH ZONE. THIS GRID COVERS THE ENTIRE SITE AND USES X (EASTINGS) AND Y (NORTHINGS) COORDINATES.

   HORIZONTAL DATUM: NAD-83 LAMBERT PROJECTION. WASHINGTON STATE PLANE COORDINATES ARE SHOWN IN METERS.

   CONTOUR INTERVAL: 2.5 METERS.
3. HANFORD PLANT GRID: A LOCAL GRID SYSTEM WITH ITS INITIAL POINT NORTHEAST OF THE 400 AREA. IT COVERS 200 EAST AND 200 WEST AREA AS WELL AS GENERAL SITE WORK SUCH AS WELLS AND BURIAL GROUNDS. HANFORD COORDINATES ARE SHOWN IN FEET.
4. THE SWMU AND THE POST-AUGUST 19,1987 (TSD) UNIT BOUNDARY COMPRISE THE TSD UNIT BOUNDARY AS IDENTIFIED IN THE HANFORD FACILITY DANGEROUS WASTE PERMIT APPLICATION, LOW-LEVEL BURIAL GROUNDS (DOE/RL-88-20).



KEY PLAN

SCALE: NONE

SITE PLAN

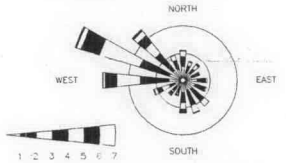
SCALE: 1:6000

0 60 120 240 360 480

1 DIV. = 60 meters

WIND ROSE FOR: 200E AREA
% CALM WINDS = .7
STATION NO.6

PERIOD COVERED
1/1/93 - 12/31/93



PADDLES INDICATE DIRECTION WIND IS COMING FROM. RADIAL GRIDS REPRESENT 5.0% AND 10.0% OCCURRENCE.

WIND CLASS	MILES/HOUR
1	>1.0 - 3.0
2	4.0 - 7.0
3	8.0 - 12.0
4	13.0 - 18.0
5	19.0 - 24.0
6	25.0 - 31.0
7	32.0 +

WIND ROSE

THIS MAP IS TO BE USED FOR REFERENCE PURPOSES ONLY. DO NOT USE THIS MAP FOR CONSTRUCTION PURPOSES.

DWG NO	TITLE
H-13-000200 THRU H-13-000207	200 AREA TOPOGRAPHIC MAP
H-13-000213 THRU H-13-000216	200 AREA TOPOGRAPHIC MAP
H-13-000221 THRU H-13-000224	200 AREA TOPOGRAPHIC MAP
H-13-000228 THRU H-13-000231	200 AREA TOPOGRAPHIC MAP

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
NEXT USED ON	H-13-000200

REFERENCES

REV NO	REV NO	DESCRIPTION	REV BY DATE	CHK BY DATE	APPD BY DATE	CUST APPD	OTHER	OTHER

REVISIONS

CADFILE N000258A | CADCODE 005:6.0:AC02:12.0:SS

DRAWN RAFAEL TORRES	DATE 4-30-97	U.S. DEPARTMENT OF ENERGY Richland Operations Office Fluor Daniel North, West
CHECKED		200 EAST AREA LOW-LEVEL BURIAL GROUND TOPOGRAPHIC MAP
DFTG APVD	4/4/97	
CUS ENGR	5/14/97	
APVD	5/14/97	
APVD	5/14/97	
APVD	5/14/97	
APVD		
APVD		

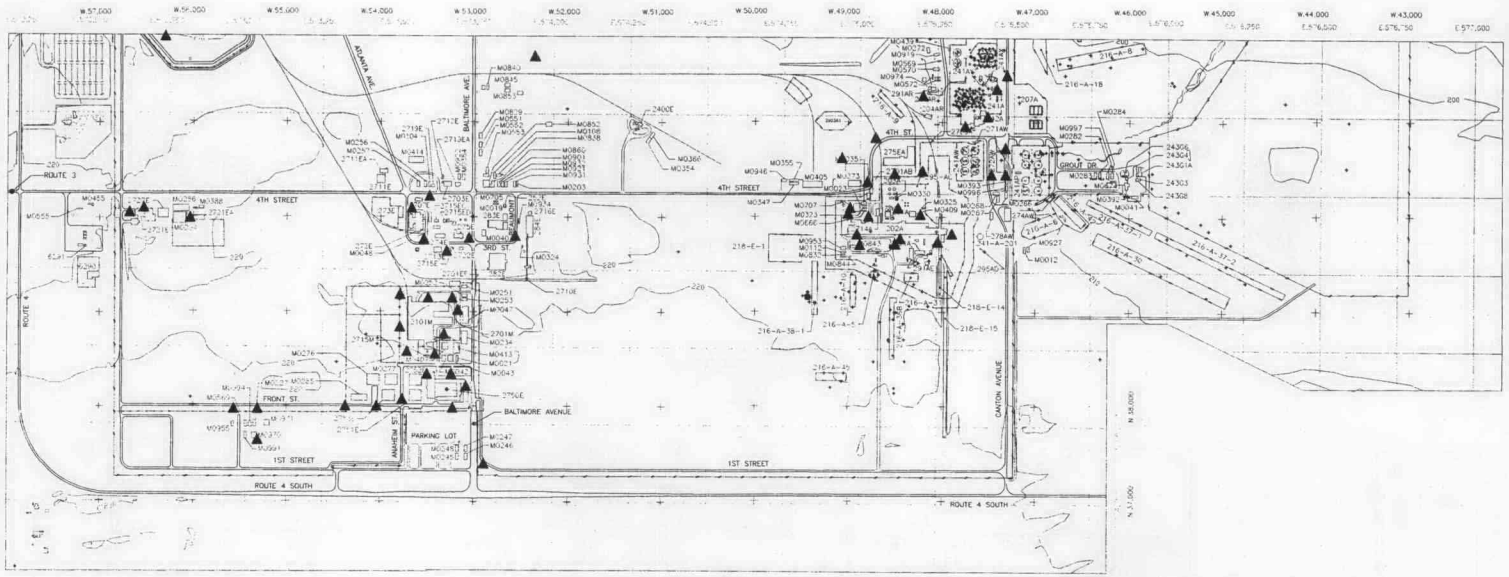
SIZE	BLDG NO.	DWG NO	DWG NO	REV
F	200E	0103	H-13-000259	0

SCALE: SHOWN | SHEET 1 OF 1 | 618448

CUS PRINT DATE | CUSTOMER APPD DATE

H-13-000259 | 1 = 2 | 0

54-6000-027(5/89)



SITE PLAN

SCALE: 1:800

WIND ROSE

1. FOR WIND ROSE SEE SHEET 1.

GENERAL NOTES

1. FOR GENERAL NOTES AND LEGEND SEE SHEET 1.

THIS MAP IS TO BE USED FOR REFERENCE PURPOSES ONLY. DO NOT USE THIS MAP FOR CONSTRUCTION PURPOSES.

DRAWN RAFAEL TORRES	4-30-97
CHECKED	
DSTG APVD	5/1/97
CNS ENGR	5/1/97
APVD	5/1/97
APVD	5/1/97
APVD	5/1/97
APVD	
APVD	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
Fluor Daniel North West

200 EAST AREA
LOW-LEVEL BURIAL GROUND
TOPOGRAPHIC MAP

TILE	BLDG NO	PICKS NO	DWG NO	REV
F	200E	0103	H-13-000259	0

SCALE SHOWN | EDT 614845 | SHEET 2 OF 2

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON	H-13-000200

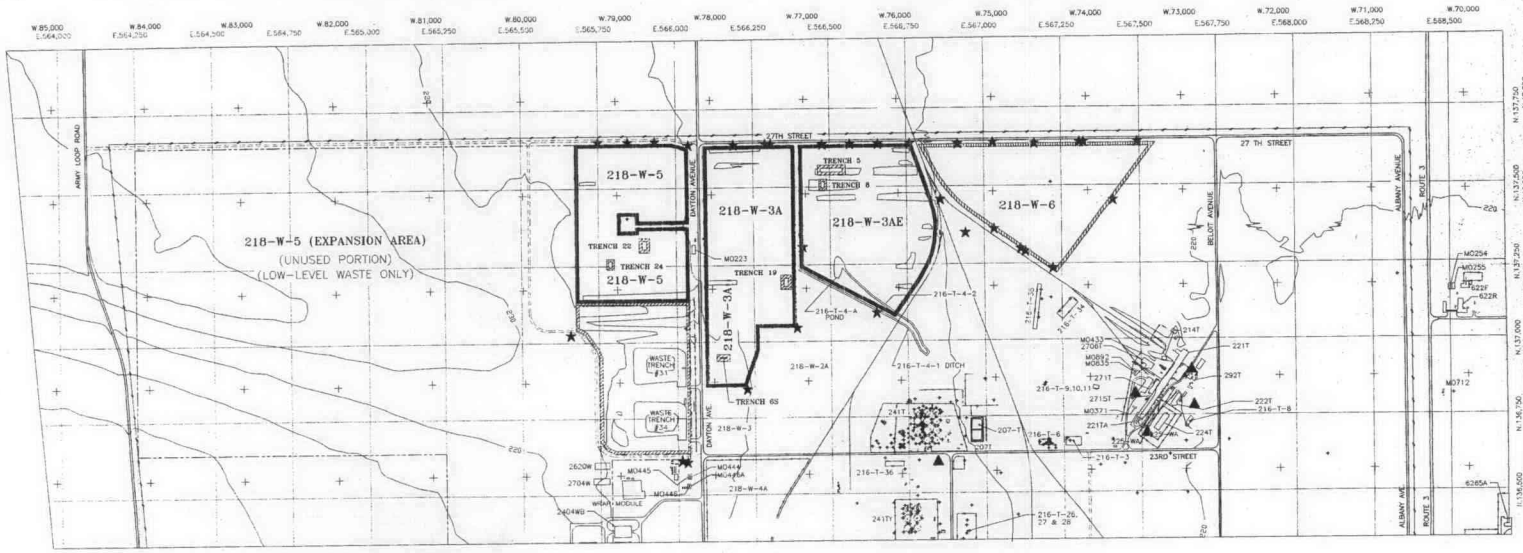
REV NO	REV DATE	DESCRIPTION	CHK BY	CHK DATE	OR DG APVD	COG ENGR	OTHER	OTHER
						APPROVALS BY/DATE		

REVISIONS

CADFILE N000259B | CADCODE 005-6.0-AC02-12.0-SS

54-4000-027(5/89)

H-13-000259 2 of 2 REV 0



SITE PLAN

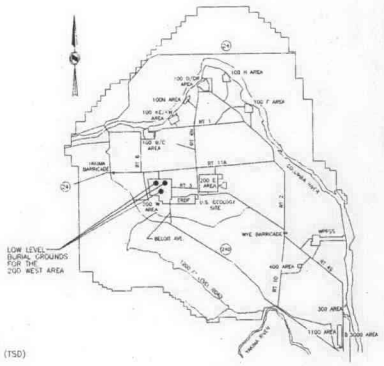
SCALE: 1:6000

0 60 120 240 360 480

1 cm = 60 meters

LEGEND

- W 47,000 N 43,000 — HANFORD PLANT COORDINATES (FEET)
- E 576,250 N 136,000 — WASHINGTON STATE COORDINATES (METERS)
- INDEX CONTOUR (METERS)
- INDEX CONTOUR (METERS)
- IMPROVED ROAD
- UNIMPROVED ROAD
- DIRT ROAD
- SIDEWALKS\PARKING LOTS
- RAILROADS
- RETAINING WALL
- BUILDINGS/STRUCTURES & TOWERS
- 224-T — BUILDING NUMBER
- MOBILE OFFICES
- SECURITY,WARNING,MISC FENCES
- POST & CHAIN (CRIB,BURIAL GROUND FENCES)
- PERIMETER FENCES
- WELL
- TANKS
- 216-A-42 — CRIB
- 218-W-5 — BURIAL GROUND
- SOLID WASTE MANAGEMENT UNIT (SWMU), TREATMENT, STORAGE, AND/OR DISPOSAL (TSD) UNIT BOUNDARY, SEE NOTE 5.
- POST-AUGUST 19, 1987 TSD UNIT BOUNDARY SEE NOTE 5.
- BURIAL GROUND BOUNDARY
- WITHDRAWAL WELL
- INJECTION WELL
- RCRA MONITORING WELLS FOR LLBG
- FIRE HYDRANTS



KEY PLAN

SCALE: NONE

GENERAL NOTES

1. THIS MAP IS BASED ON AERIAL PHOTOGRAPHY FLOWN ON 6-24-89. THE ORIGINAL TOPOGRAPHIC MAP WAS PREPARED BY MERRICK & COMPANY AND CERTIFIED TO MEET NATIONAL MAP ACCURACY STANDARDS. OFFICIAL COPIES OF THE MERRICK MAPS THAT SHOW THE CERTIFICATE ARE LOCATED IN THE LOCKHEED MARTIN ENGINEERING FILES AS DRAWING NUMBERS H-2-79476 SHEET 1 AND H-2-79477 SHEET 1 THRU 37. NAMES OF ADDITIONAL FEATURES AND THE TITLE BLOCK WERE ADDED BY WESTINGHOUSE HANFORD COMPANY.

2. WASHINGTON STATE PLANE COORDINATE SYSTEM: THE OFFICIAL COORDINATE SYSTEM AS DEFINED BY THE REVISED CODE OF WASHINGTON (RCW). THE HANFORD SITE LIES WITHIN THE WASHINGTON COORDINATE SYSTEM, SOUTH ZONE. THIS GRID COVERS THE ENTIRE SITE AND USES X (EASTINGS) AND Y (NORTHINGS) COORDINATES.

   HORIZONTAL DATUM: NAD-83 LAMBERT PROJECTION. WASHINGTON STATE PLANE COORDINATES ARE SHOWN IN METERS.

   CONTOUR INTERVAL: 2.5 METERS.

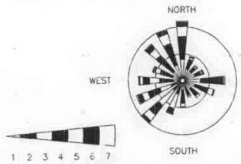
3. HANFORD PLANT GRID: A LOCAL GRID SYSTEM WITH ITS INITIAL POINT NORTHEAST OF THE 400 AREA. IT COVERS 200 EAST AND 200 WEST AREA AS WELL AS GENERAL SITE WORK SUCH AS WELLS AND BURIAL GROUNDS. HANFORD COORDINATES ARE SHOWN IN FEET.

4. 218-W-5 EXPANSION AREA IS IDENTIFIED IN THE ENGINEERING SUPPORT DATA UPDATE FOR THE HANFORD DEFENSE WASTE ENVIRONMENTAL IMPACT STATEMENT, RHD-RE-ST-30 ADD P, 1980, RICHLAND, WASHINGTON.

5. THE SWMU AND THE POST-AUGUST 19,1987 TSD UNIT BOUNDARY COMPRISE THE TSD UNIT BOUNDARY AS IDENTIFIED IN THE HANFORD FACILITY DANGEROUS WASTE PERMIT APPLICATION, LOW-LEVEL BURIAL GROUNDS (DOE/RL-88-20).

WIND ROSE FOR: HANFORD MET STATION
% CALM WINDS = .5
STATION NO. 21

PERIOD COVERED
1/1/93 - 12/31/93



PADDLES INDICATE DIRECTION WIND IS COMING FROM.
RADIAL GRIDS REPRESENT 5.0% AND 10.0% OCCURRENCE.

WIND CLASS	MILES/HOUR
1	>1.0 - 3.0
2	4.0 - 7.0
3	8.0 - 12.0
4	13.0 - 18.0
5	19.0 - 24.0
6	25.0 - 31.0
7	32.0 +

WIND ROSE

THIS MAP IS TO BE USED FOR REFERENCE PURPOSES ONLY. DO NOT USE THIS MAP FOR CONSTRUCTION PURPOSES.

DRAWING TRACEABILITY LIST		
DWG NO	TITLE	REFERENCES
H-13-000201 THRU H-13-000203	200 AREA TOPOGRAPHIC MAP	
H-13-000209 THRU H-13-000211	200 AREA TOPOGRAPHIC MAP	
H-13-000217 THRU H-13-000219	200 AREA TOPOGRAPHIC MAP	
H-13-000225 THRU H-13-000227	200 AREA TOPOGRAPHIC MAP	
H-13-000233	200 AREA TOPOGRAPHIC MAP	
H-13-000234	200 AREA TOPOGRAPHIC MAP	
REF NUMBER	TITLE	
NEXT USED ON	H-13-000230	

REV NO	REV DATE	DESCRIPTION	DWN	CKD	APVD	COG ENGR	COG PROJ	DESIGN
REVISIONS						APPROVALS BY/DATE		

CADFILE N000260A

CADCODE: DOE.S.0.AC07112.0.95

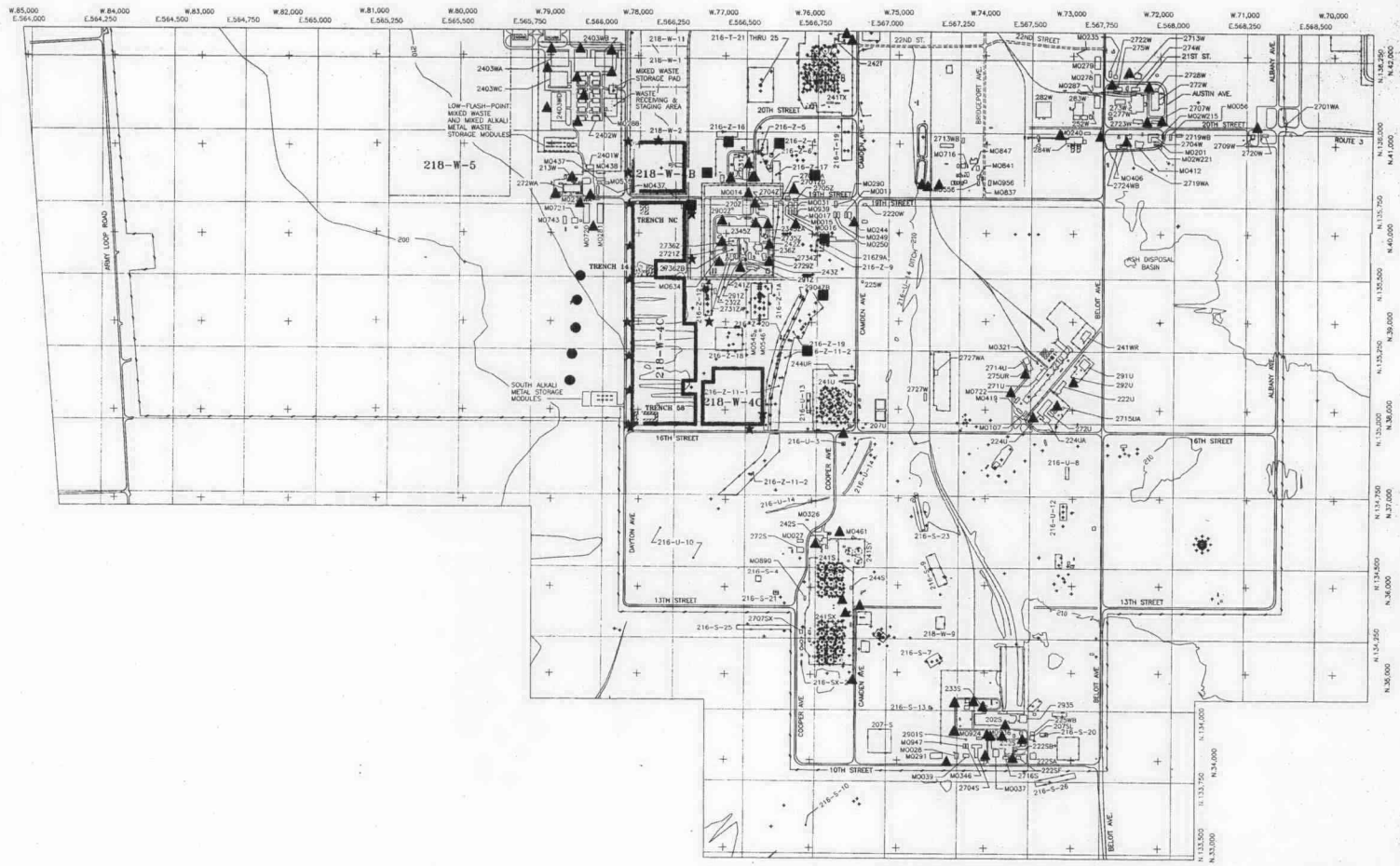
DRAWN RAFAEL TORRES	4-30-97	U.S. DEPARTMENT OF ENERGY Richland Operations Office Fluor Daniel North West
CHECKED		200 WEST AREA LOW-LEVEL BURIAL GROUND TOPOGRAPHICAL MAP
DATE APVD	4/30/97	
COG ENGR	5/20/97	
APVD	5/20/97	
APVD	5/20/97	
APVD	5/20/97	
APVD		

SIZE F | REF DWG NO 200W | REF DWG NO 0103 | DWG NO H-13-000260 | REV 0

SCALE 1" = 2000' | SHEET 1 OF 1

DRAWN | CHKD | APVD | DATE

H-13-000260 1 = 2 0



SITE PLAN

SCALE: 1:6000

0 60 120 240 360 480

1 cm = 60 meters

GENERAL NOTES

1. FOR GENERAL NOTES SEE SHEET 1.

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U.S. DEPARTMENT OF ENERGY
Richland Operations Office
Fluor Daniel Hanford

200 WEST AREA
LOW-LEVEL BURIAL GROUND
TOPOGRAPHICAL MAP

DRAWN: RAFAEL TORRES 5-7-97

DWG NO: H-13-000260

CADFILE: M0002609

CADCODE: D05/A04/S2/1-USE

NEXT USED ON: H-13-000260

54-6000-0275(5/89)

APPENDIX 3A

WASTE ANALYSIS PLAN FOR LOW-LEVEL BURIAL GROUNDS

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GLOSSARY

ALARA	as low as reasonably achievable
AWMP	alternative waste management plan
CAP	corrective action plan
COLIWASA	composite liquid waste sampler
CFR	Code of Federal Regulations
CWC	Central Waste Complex
DOE-RL	U.S. Department of Energy, Richland Operations Office
Ecology	Washington State Department of Ecology
HF	Hanford Facility
LDR	land disposal restriction
LLBG	Low-Level Burial Grounds
MSDS	material safety data sheet
PCB	polychlorinated biphenyl
PES	performance evaluation system
pH	negative concentration logarithm of the hydrogen-ion concentration
QA/QC	quality assurance and quality control
RCRA	*Resource Conservation and Recovery Act of 1976*
RCW	Revised Code of Washington
RTR	real-time radiography
SWITS	solid waste information tracking system
SWMU	solid waste management unit
TRU	transuranic
WAC	Washington Administrative Code
WAP	waste analysis plan
WRAP 1	Waste Receiving and Processing 1
WSRd	waste specification record
°C	degrees Celsius

METRIC CONVERSION CHART

The following conversion chart is provided to the reader as a tool to aid in conversion.

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

1.0 UNIT DESCRIPTION

The purpose of this waste analysis plan (WAP) is to document the waste acceptance process, sampling methodologies, analytical techniques, and overall processes that are undertaken for waste accepted for disposal at the Low-Level Burial Grounds (LLBG), which are located in the 200 East and 200 West Areas of the Hanford Facility, Richland, Washington. Because dangerous waste does not include the source, special nuclear, and by-product material components of mixed waste, radionuclides are not within the scope of this documentation. The information on radionuclides is provided only for general knowledge. The LLBG also receive low-level radioactive waste for disposal. The requirements of this WAP are not applicable to this low-level waste.

1.1 DESCRIPTION OF PROCESSES AND ACTIVITIES

The LLBG are a land-based unit consisting of eight burial grounds located in the 200 East Area and 200 West Area. Seven of the eight burial grounds (218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, 218-W-5, and 218-W-6) are, or will be, used for the disposal of mixed waste and are subject to *Dangerous Waste Regulations*, Washington Administrative Code (WAC) 173-303. One burial ground (218-W-4B) is designated as a solid waste management unit (SWMU) (Figures 1-1 and 1-2).

The 218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, and 218-W-6 Burial Grounds are classified as landfills and the 218-W-5 Burial Ground is classified as a landfill and for greater-than-90-day container storage. The regulated portions of the LLBG cover a total area of approximately 49 hectares.

The 218-E-10 and 218-E-12B Burial Grounds are located in the 200 East Area. The 218-W-3A, 218-W-3AE, 218-W-4B, 218-W-4C, 218-W-5, and 218-W-6 Burial Grounds are located in the 200 West Area. The LLBG consist of various sizes and depths of lined and unlined disposal trenches. All mixed waste destined for disposal will meet land disposal restriction (LDR) requirements [WAC 173-303-140 and 40 Code of Federal Regulations (CFR) 268] or other regulatory alternatives. The lined trenches have leachate collection and removal systems. The less-than-90-day leachate collection tanks are operated in accordance with the generator provisions of WAC 173-303-200 and are not subject to this WAP.

Future trench development and configuration within a burial ground are subject to change as disposal techniques improve or as waste management needs dictate and will be subject to an approved permit modification in accordance with the Hanford Facility (HF) *Resource Conservation and Recovery Act* (RCRA) *of 1976* Permit (Ecology 1994). Mixed waste is disposed in lined or in unlined trenches in accordance with applicable LDR requirements.

The following provides a brief description and identifies the generic types of waste disposed in the LLBG. An electronic database, which can be

found within the LLBG operating organization, is maintained that documents each waste receipt, type of waste, and disposal location.

- The 218-E-10 Burial Ground (Figure 1-3) is approximately 36.1 hectares in size and began receiving waste in 1960. Examples of waste placed in this burial ground include failed equipment, rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-E-12B Burial Ground (Figure 1-4) is approximately 68 hectares in size and began receiving waste in 1967. Examples of waste placed in this burial ground include defueled reactor compartments (trench 94), low-level waste, and retrievable transuranic waste.

- The 218-W-3A Burial Ground (Figure 1-5) is approximately 20.4 hectares in size and began receiving waste in 1970. Examples of waste placed in this burial ground include ion exchange resins, failed equipment, tanks, pumps, ovens, agitators, heaters, hoods, jumpers, vehicles, accessories and post-August 19, 1987 RCRA and state-only designated mixed waste, and retrievable transuranic waste.

- The 218-W-3AE Burial Ground (Figure 1-6) is approximately 20 hectares in size and began receiving waste in 1981. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-W-4B Burial Ground (Figure 1-7) is approximately 3.5 hectares in size and began receiving waste in 1968. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, alpha caissons, and retrievable transuranic waste.

- The 218-W-4C Burial Ground (Figure 1-8) is approximately 20 hectares in size and began receiving waste in 1978. Examples of waste placed in this burial ground include contaminated soil, decommissioned pumps, pressure vessels, and post-August 19, 1987 RCRA and state-only designated mixed waste, and retrievable transuranic waste.

- The 218-W-5 Burial Ground (Figure 1-9) is approximately 37.2 hectares in size and began receiving waste in 1986. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste. This burial ground currently contains double-lined mixed waste trenches (trenches 31 and 34) (Figure 1-10). Trenches 31 and 34 also are designated as greater-than-90-day container storage. Waste placed in trenches 31 and 34 for storage purposes and eventual disposal predominately is macro-encapsulated long-length contaminated equipment and other containerized waste treated to meet LDR requirements. Adjacent to the double-lined mixed waste trenches are leachate collection tanks operated in accordance with the generator provisions of WAC 173-303-200. Examples of waste

to be placed in the double-lined mixed waste trenches include mixed waste that has been treated to meet LDR requirements (including containerized bulk waste), macro-encapsulated long-length contaminated equipment, etc.

- The 218-W-6 Burial Ground (Figure 1-11) is approximately 16 hectares in size, has not received any waste, and is reserved for future mixed waste disposal.

1.1.1 How Waste is Accepted, Moved, Processed, and Managed

The following sections describe the different types of information and knowledge for waste acceptance. The movement, processing, and management of waste at the LLBG is described in Chapter 4.0 of the *Hanford Facility Dangerous Waste Permit Application, Low-Level Burial Grounds* (DOE/RL-88-20).

1.1.1.1 Narrative Process Descriptions. The LLBG currently accepts mixed waste. All mixed waste is disposed in lined mixed waste trenches or other approved alternatives. Waste accepted either can be containerized or bulk solids. Typical onsite generating units include research laboratories, and chemical and nuclear reprocessing units. Waste also is accepted from decommissioning of structures, waste retrieval and cleanup, waste sampling, etc. Typical offsite generators include research laboratories, chemical and nuclear processing plants, test sites, etc. The onsite generating unit, offsite generator, treatment, storage, and/or disposal unit transferring waste to the LLBG will be hereafter referred to as the 'generator'.

Mixed waste that meets LDR requirements, as specified in 40 CFR 268 and WAC 173-303-140, is disposed in lined trenches with leachate collection and removal systems. The Hanford Facility is required to test certain mixed waste depending on the type of treatment standard to ensure that the waste or treatment residuals are in compliance with applicable LDR. Such testing is performed according to the frequency specified in this WAP.

Two types of mixed waste are disposed in the LLBG under exemption allowed by WAC 173-303-806: remote-handled mixed waste and other waste (e.g., defueled reactor compartments; refer to DOE/RL-88-20, Appendix 4D).

1.1.1.2 Types of Acceptable Knowledge. When collecting documentation on a waste stream or container, the LLBG operating organization must determine if the information provided by the generator is acceptable knowledge. Acceptable knowledge requirements could be met using the following types of information:

- Mass balance from a controlled process
- Material safety data sheet (MSDS) on unused chemical products
- Test data from a surrogate sample
- Analytical data on the waste or a waste from a similar process

- A combination of two or more of the following:
  - Interview information
  - Logbooks
  - Procurement records
  - Validated analytical data
  - Radiation dose rate profiles
  - Procedures and/or methods
  - Process flow charts
  - Inventory sheets
  - Vendor information
  - Mass balance from an uncontrolled process (e.g., spill cleanup)
  - Mass balance from a process with variable inputs and outputs (e.g., washing/cleaning methods).

If the information is sufficient to quantify constituents and/or characteristics as required by the regulations and unit specific acceptance criteria, the information is acceptable knowledge.

1.1.1.3 Description of Waste Profile System. The performance evaluation system (PES) is used to determine initial physical screening frequency of the generator. The PES provides a periodic status of an individual generator's performance for waste received. Also, the PES provides a mechanism for determining corrective actions and physical screening frequency adjustments when a problem has been discovered after waste has arrived at the LLBG.

1.1.1.3.1 Initial Physical Screening Frequency Determination. The initial physical screening frequency determination is based on the following general process.

- The LLBG operating organization reviews the waste profile information to determine if there is any misdesignated or inappropriately segregated waste. Based on this review, the LLBG operating organization identifies any concerns associated with the following:
  - documented waste management program
  - waste stream characterization information
  - potential for inappropriate segregation.

- Based on the identification of concerns during the review, the LLBG operating organization establishes an initial physical screening frequency for the new waste stream(s).

1.1.1.3.2 Monthly Performance Evaluation. The monthly performance evaluation is used to trend generator performance on a programmatic basis and is used to adjust the overall physical screening frequency. However, only a portion of the general waste streams could be affected by the monthly performance evaluation if substantial documentation can be provided to demonstrate that one or more general waste streams will not exhibit similar problems.

Conformance issues are documented during the pre-shipment review and/or verification. These conformance issues are tracked on a conformance report. The conformance report is used to complete the generator evaluation worksheet

(Figure 1-12). A generator receiving a score of 10 or greater has demonstrated less than satisfactory performance, and must be evaluated for corrective action determination.

1.1.1.3.3 Conformance Issue Resolution. Conformance issues identified during verification might result in a waste container that does not meet the LLBG waste acceptance criteria. If a possible conformance issue is identified, the following steps are taken to resolve the issue.

- LLBG operating organization personnel compile all information concerning the possible conformance issue(s).

- The generator is notified and requested to supply additional information to assist in the resolution of the issue(s). If the generator-supplied information resolves the issue(s), no further action is required.

- On resolution of the initial conformance issue, the generator provides a corrective action plan (CAP) that clearly states the reason for the failure and describes the actions to be completed to prevent a reoccurrence.

- The LLBG operating organization reviews the CAP and waste stream justification for adequacy.

- If a CAP is determined to be inadequate, the generator remains at a physical screening rate set by the LLBG operating organization.

1.1.2 Process for Reducing the Physical Screening Frequency

After a generator's frequency has been adjusted (e.g., poor performance or following initial frequency) the physical screening frequency can be reduced in accordance with the following criteria:

- The physical screening frequency is stepped down in a minimum of two steps based on the ability of the generator to quickly implement their CAP or demonstrate their ability to appropriately manage waste (as applicable)

- The reduction is determined during the monthly evaluation process; however, the following minimum criteria must be met before the reduction of the frequency:

  - Five containers from the streams in question must pass verification

  - The LLBG operating organization believes that there is adequate evidence that the CAP or new generator's waste management program has been implemented and is effective.

  NOTE: The LLBG operating organization could perform a generator visit to obtain documentation that the CAP has been fully implemented.

If the frequency was adjusted based on conformance issues, the CAP must be fully implemented before the generator is allowed to return to the minimum physical screening frequency.

1.1.3 Process Flow Diagram

Refer to Figure 1-13 for LLBG waste analysis plan flowchart.

1.1.4 Operating Conditions and Process Constraints

The following sections discuss the operating conditions and process constraints for the LLBG.

1.1.4.1 Operating Conditions. For information determined to be 'acceptable knowledge', the LLBG operating organization must determine if the information is adequate for management of the waste at the LLBG. Adequate acceptable knowledge is based on (1) general waste knowledge requirements, (2) LDR waste knowledge requirements, and (3) waste knowledge exceptions.

1.1.4.1.1 General Waste Knowledge Requirements. At a minimum, the generator must supply enough information for the waste to be managed at the LLBG. The minimum level of acceptable knowledge consists of designation data where the toxic constituents causing a waste number to be assigned are quantified and data are provided to address any operational parameters necessary for proper management of the waste in the LLBG.

1.1.4.1.2 Land Disposal Restriction Information Requirements. Waste can be placed in the LLBG only if the waste meets all applicable treatment standards. The LLBG operating record contains all information required to document that the appropriate treatment standards have been met. For waste that does not meet all applicable treatment standards, the waste is transferred to another TSD unit for proper disposition.

For the purposes of this WAP, only one representative sample is required to demonstrate compliance with a concentration-based treatment standard and the corroborative testing for the sample could be accomplished in the following manner.

- Generators could use onsite laboratories or offsite contract laboratories and must certify that the waste meets LDR requirements. The LLBG operating organization will use these analytical data to meet the requirements found in 40 CFR 268.7 and WAC 173-303-140(4).

- Generators could use an independent laboratory (independent meaning not part of the generator's management structure; contract laboratories are acceptable), or send a sample to the Hanford Site for laboratory testing. The generator must certify the waste meets LDR requirements.

1.1.4.1.3 Waste Knowledge Exceptions. The following waste knowledge exceptions have been developed to account for those instances when the generator cannot meet the general waste knowledge and LDR waste knowledge requirements of this WAP.

- Hazardous debris, as defined in WAC 173-303-040, that is managed in accordance with 40 CFR 268.45 (Debris Rule) is not required to be sampled. Management of debris in this manner does not depend on the quantification of constituents to meet federal and state-only LDR regulations. Hazardous debris meeting treatment standards in accordance with 40 CFR 268.45 also meets any state-only LDR in WAC 173-303-140(4).

- Waste that is retrieved from the LLBG could be transferred to an onsite TSD storage unit with only the necessary information to properly manage the waste at the unit.

Other exceptions should be brought to the attention of the LLBG operating organization for appropriate disposition.

1.1.4.2 Process Constraints. The process constraints for the LLBG consist of the following:

- Defining whether there is acceptable knowledge
- Acceptable knowledge is adequate for disposal
- Waste meets LLBG safety criteria [e.g., as low as reasonably achievable (ALARA) concerns, etc.].

1.2 IDENTIFICATION AND CLASSIFICATION OF WASTE

Mixed waste is acceptable for disposal in the LLBG except for the following waste types.

- Waste is not accepted for disposal when the waste contains free-standing liquid unless all free-standing liquid:

  - Has been removed by decanting, or other methods
  - Has been mixed with sorbent or stabilized (solidified) so that free-standing liquid is no longer observed
  - Has been otherwise eliminated
  - Container is very small, such as an ampule
  - Container is a labpack and is disposed in accordance with WAC 173-303-161 or 40 CFR 264.316
  - Is less than 1 percent of the volume of the waste or if the sorbent to potential liquid waste ratio is greater than 2 to 1.

  Free liquid is determined by SW-846, Method 9095 (Paint Filter Liquids Test) [WAC 173-303-140(4)(b) and 40 CFR 264.314(d)] only for waste that has the potential for free liquid formation.

- Gaseous waste is not accepted for disposal if the waste is packaged at a pressure in excess of 1.5 atmospheres at 20°C.

- Pyrophoric waste is not accepted for disposal. Waste containing less than 1 weight percent pyrophoric material partially or completely dispersed in each package is not considered pyrophoric for the purposes of this requirement.

- Solid acid waste is not accepted for disposal (WAC 173-303-140(4)(c)).

- Untreated mixed waste with greater than 10 percent dangerous organic/carbonaceous constituents is not accepted for disposal [WAC 173-303-140(4)(d)]. Paper, sawdust, wood, and other similar carbon-to-carbon bonded debris matrix items are not considered organic/carbonaceous constituents.

- Waste not meeting the applicable treatment standards is not accepted for disposal [40 CFR 268 and WAC 173-303-140(4)].

Untreated extremely hazardous waste is not accepted for disposal. Extremely hazardous waste that has been treated could be disposed in accordance with the Revised Code of Washington (RCW) 70.105.050(2). Mixed waste with constituents that could result in loss of liner integrity is not accepted in the LLBG. Table 1-1 provides a list of chemicals that have been shown to be incompatible with the liner (DOE/RL-88-20). Mixed waste with chemical constituents other than heavy metals, heavy metal salts, or those listed in Table 1-1 are evaluated on a case-by-case basis.

1.2.1 Dangerous Waste Numbers, Quantities, and Design Capacity

The Part A, Form 3, permit application for the LLBG identifies dangerous waste numbers, quantities, and the design capacity and is located in Chapter 1.0 of the LLBG dangerous waste permit application documentation (DOE/RL-88-20).

For waste that cannot be managed in accordance with the requirements set forth in this WAP, an alternative waste management plan (AWMP) could be submitted to the Washington State Department of Ecology (Ecology) for review. Because many activities associated with or necessary to support waste management projects readily would not be predictable, some flexibility in timeframes for submitting, reviewing, and completing waste management plans would be necessary. In general, the following schedules could be observed.

- Submit the AWMP to the Ecology Project Manager at least 120 days before the project is expected to begin. The cover letter must state that "no reply within 45 days constitutes approval".

- Ecology reviews and provides comments (if any) within 45 days after receiving the AWMP.

- If comments are received, comments will be resolved through project manager meetings or other workshops as agreed to by the U.S. Department of Energy, Richland Operations Office (DOE-RL) and Ecology. When the plan is resubmitted on resolution of Ecology's comments, the same review timeframes are applicable.

- If no comments are received from Ecology within 45 days after the AWMP is submitted, the plan is denoted as being approved.

These timeframes could be adjusted by mutual agreement to account for project-specific needs and priorities. The AWMP is reviewed to ensure the following.

- The project does not endanger human health and the environment.

- The course of action chosen is well justified.

On gaining written or automatic approval, the DOE-RL proceeds as described in the AWMP. Should the plan require revision due to unforseen circumstances, the DOE-RL will resubmit the plan before continuing. On conclusion of the project, the DOE-RL will supply Ecology with a report outlining the activities performed and the results of these activities. A determination also will be made if the WAP requires revision. Under most circumstances, it is expected that the AWMP will not result in the need to amend the WAP.

1.2.2 Unit-Specific Information

For a detailed description on processes, operations, and physical dimensions, refer to Chapter 4.0 of the Hanford Facility dangerous waste permit application LLBG documentation (DOE/RL-88-20).

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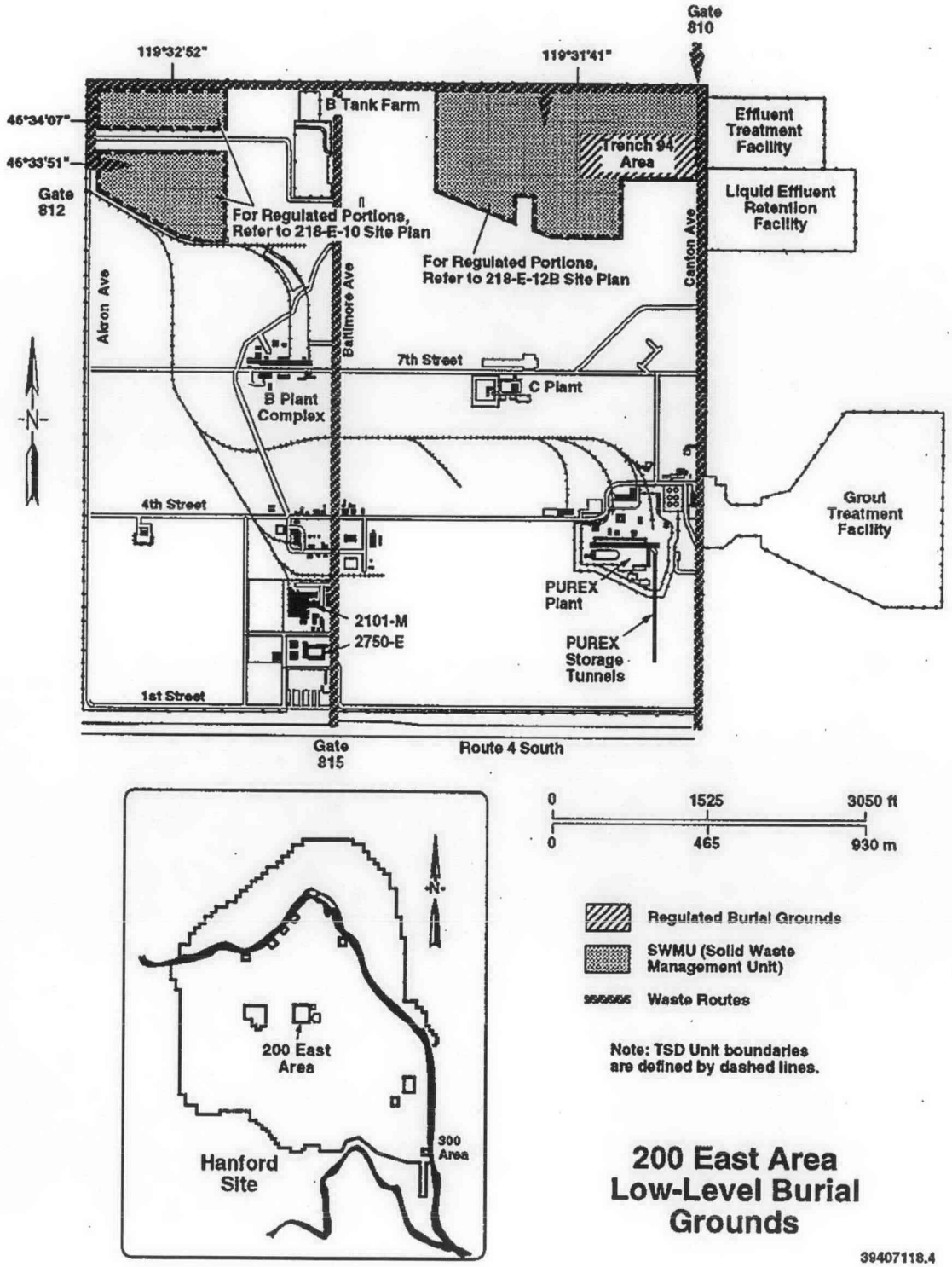

Figure 1-1. Locations of Low-Level Burial Grounds in the 200 East Area.

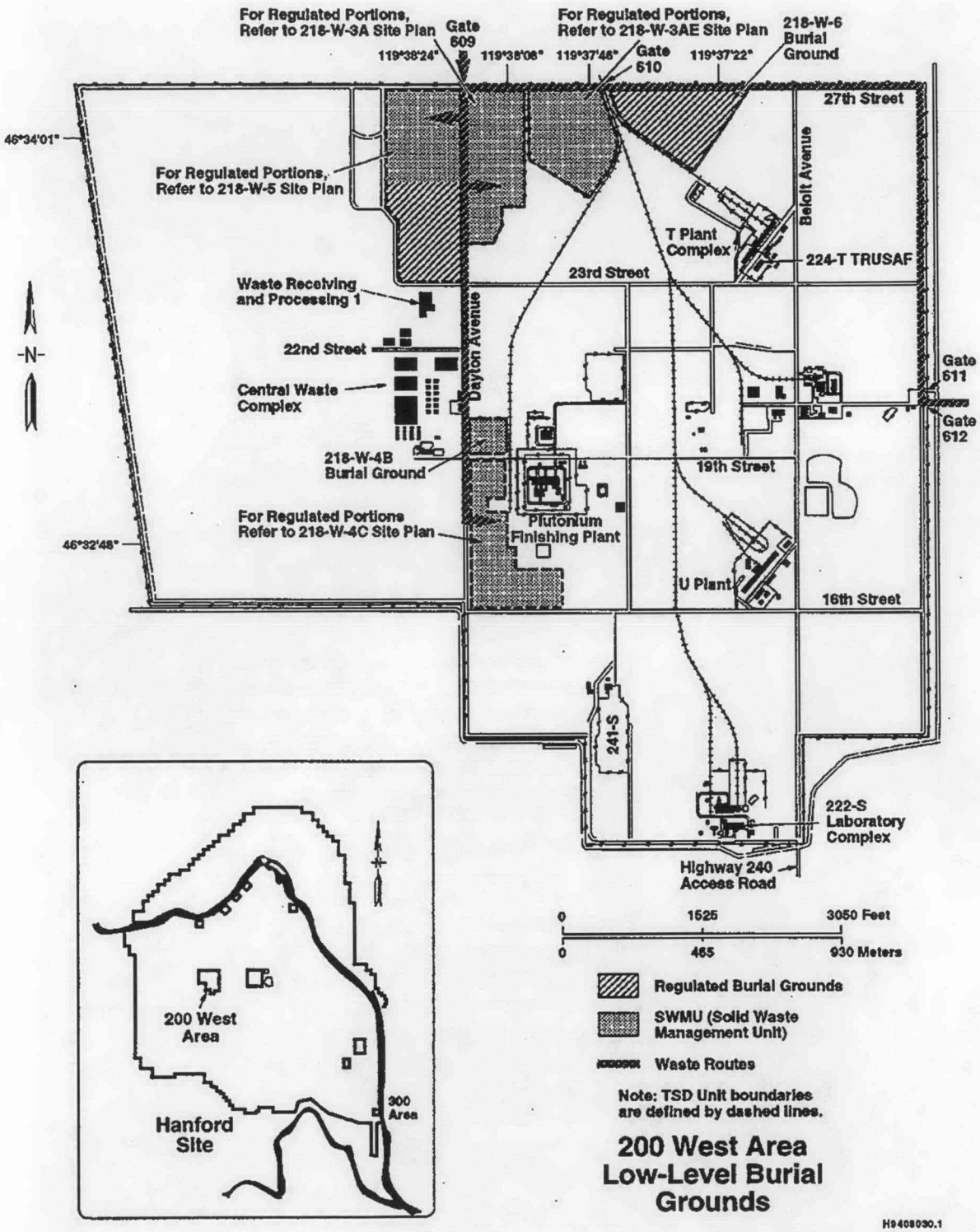

Figure 1-2. Locations of Low-Level Burial Grounds in the 200 West Area.

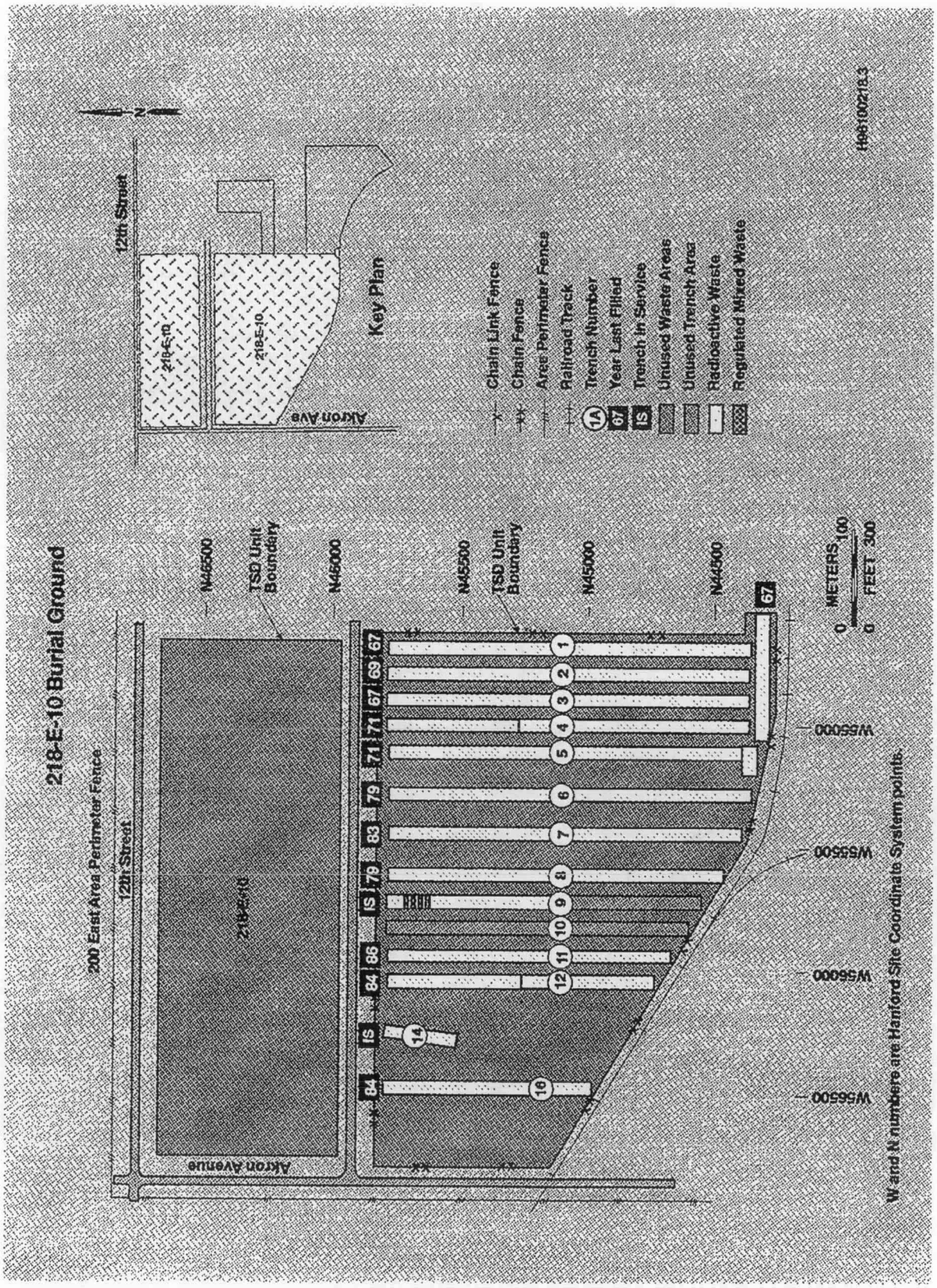

Figure 1-3. 218-E-10 Burial Ground.

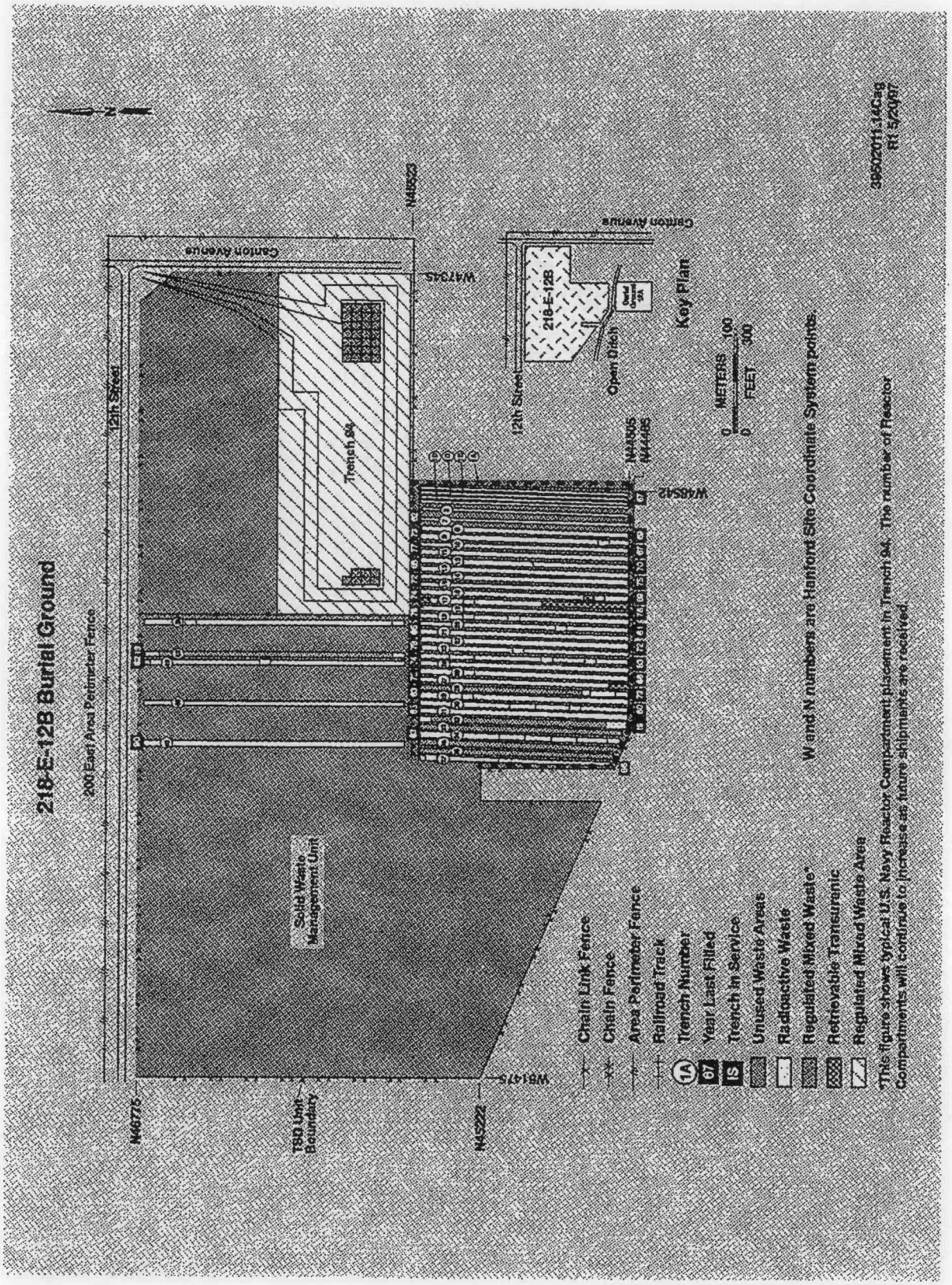

Figure 1-4. 218-E-12B Burial Ground.

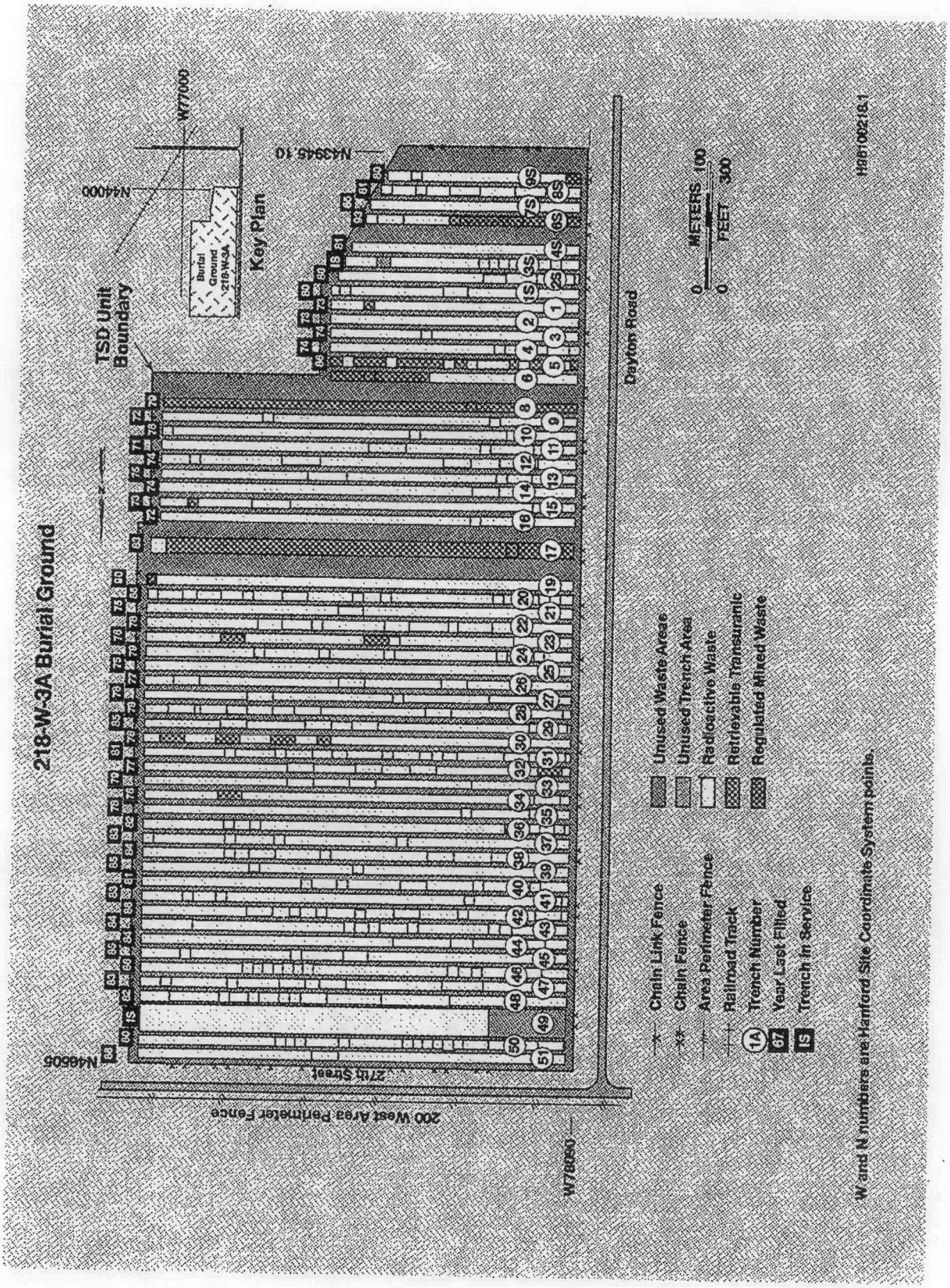

Figure 1-5. 218-W-3A Burial Ground.

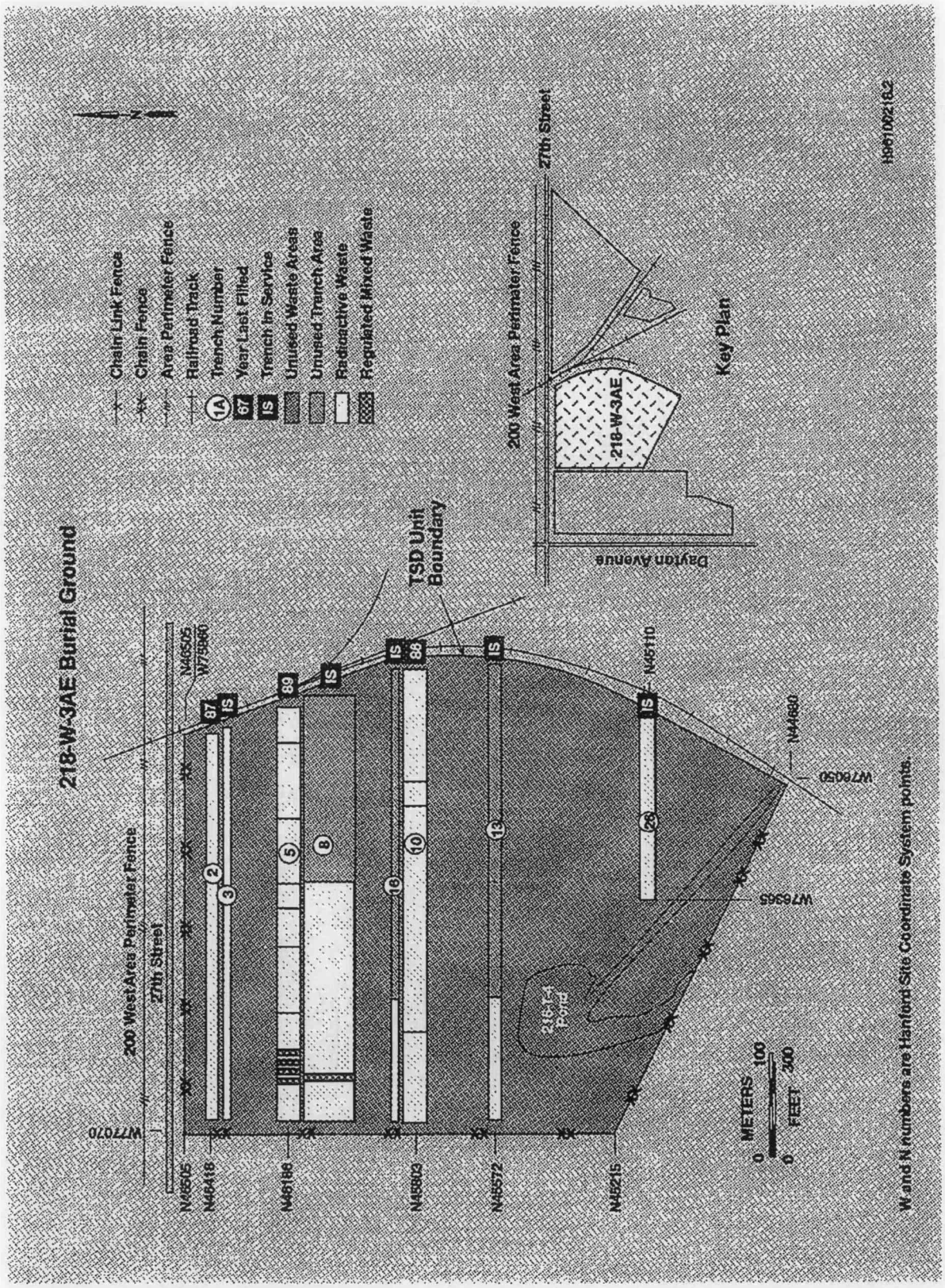

Figure 1-6. 218-W-3AE Burial Ground.

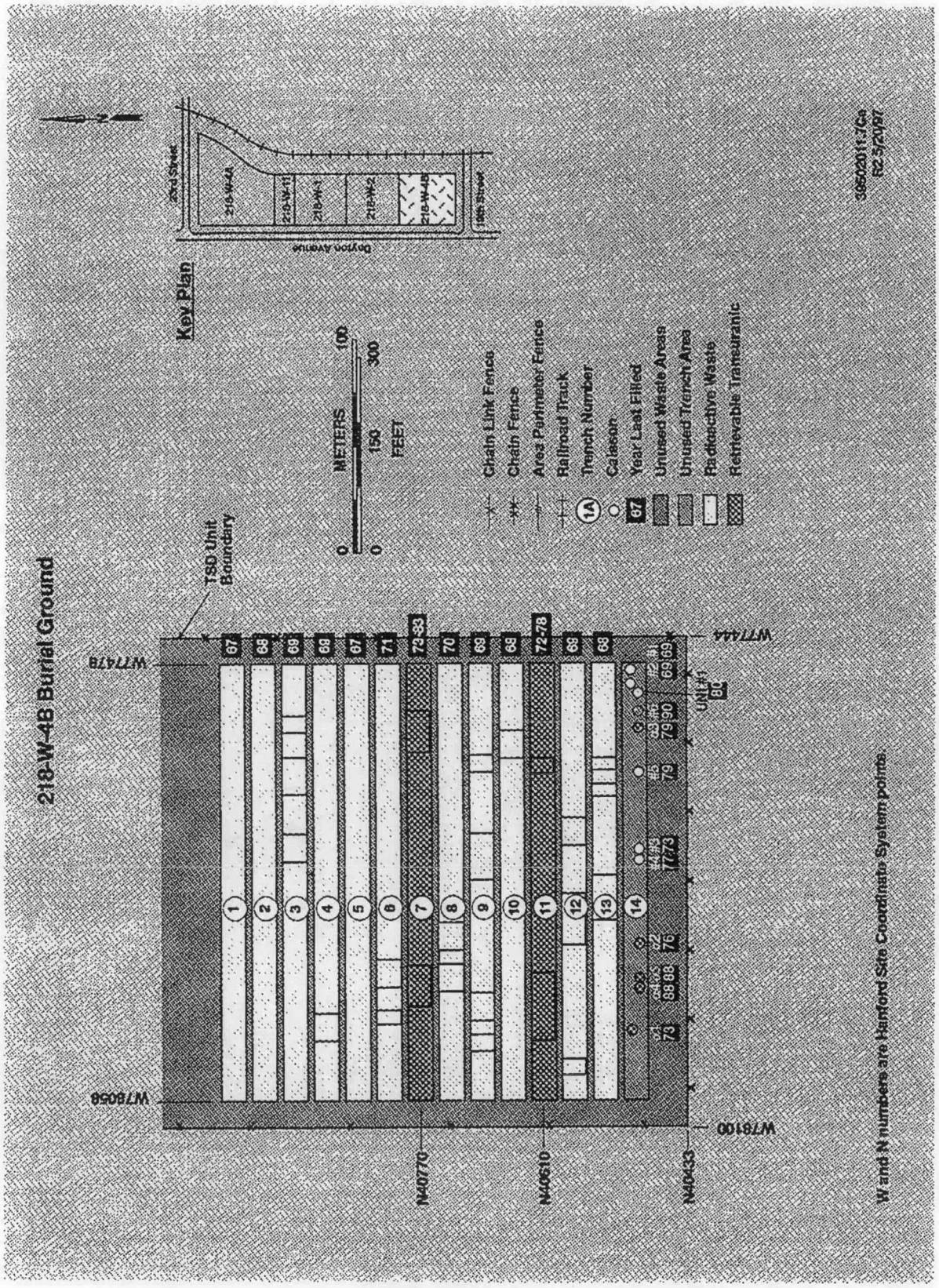

Figure 1-7. 218-W-4B Burial Ground.

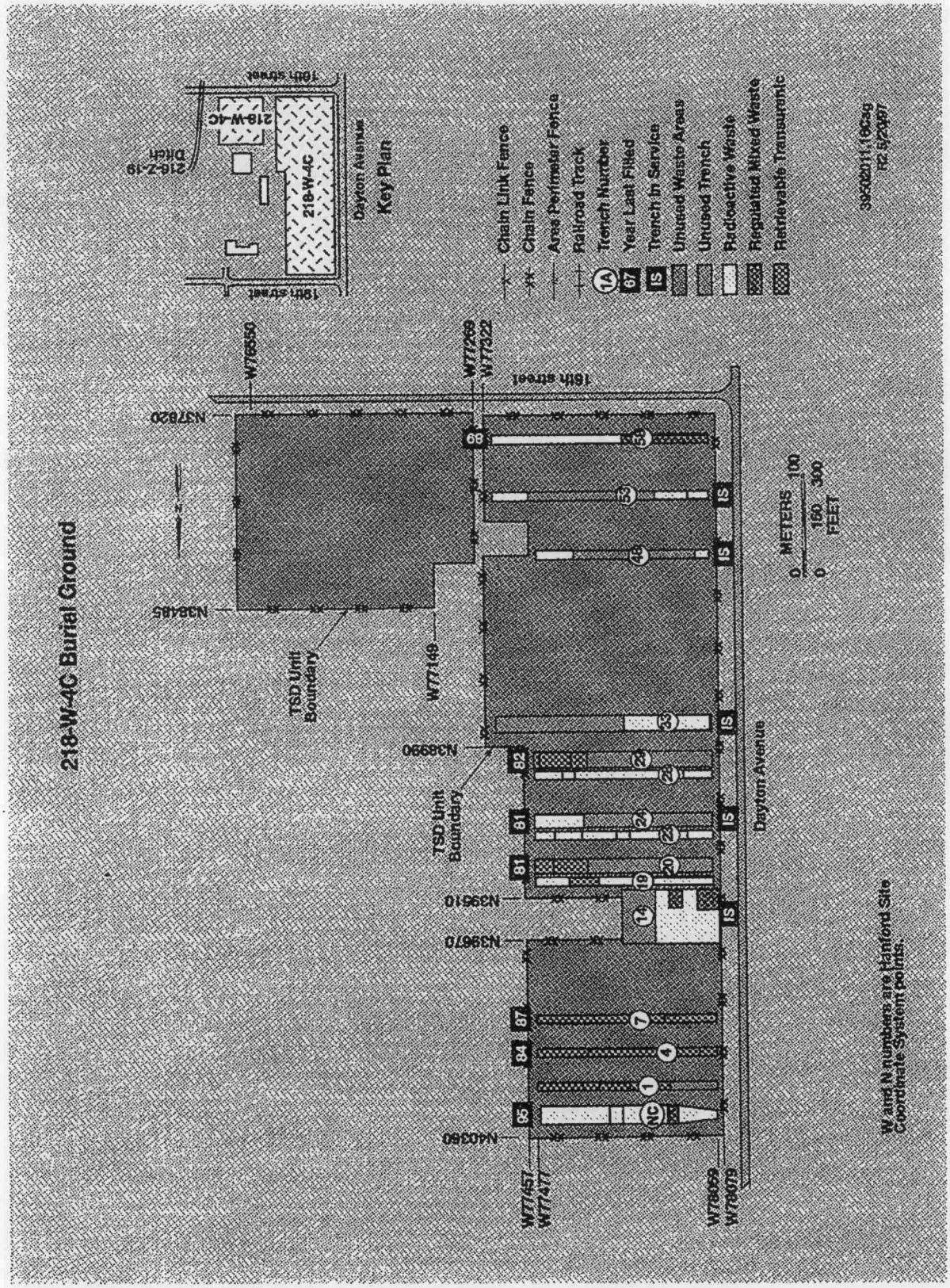

Figure 1-8. 218-W-4C Burial Ground.

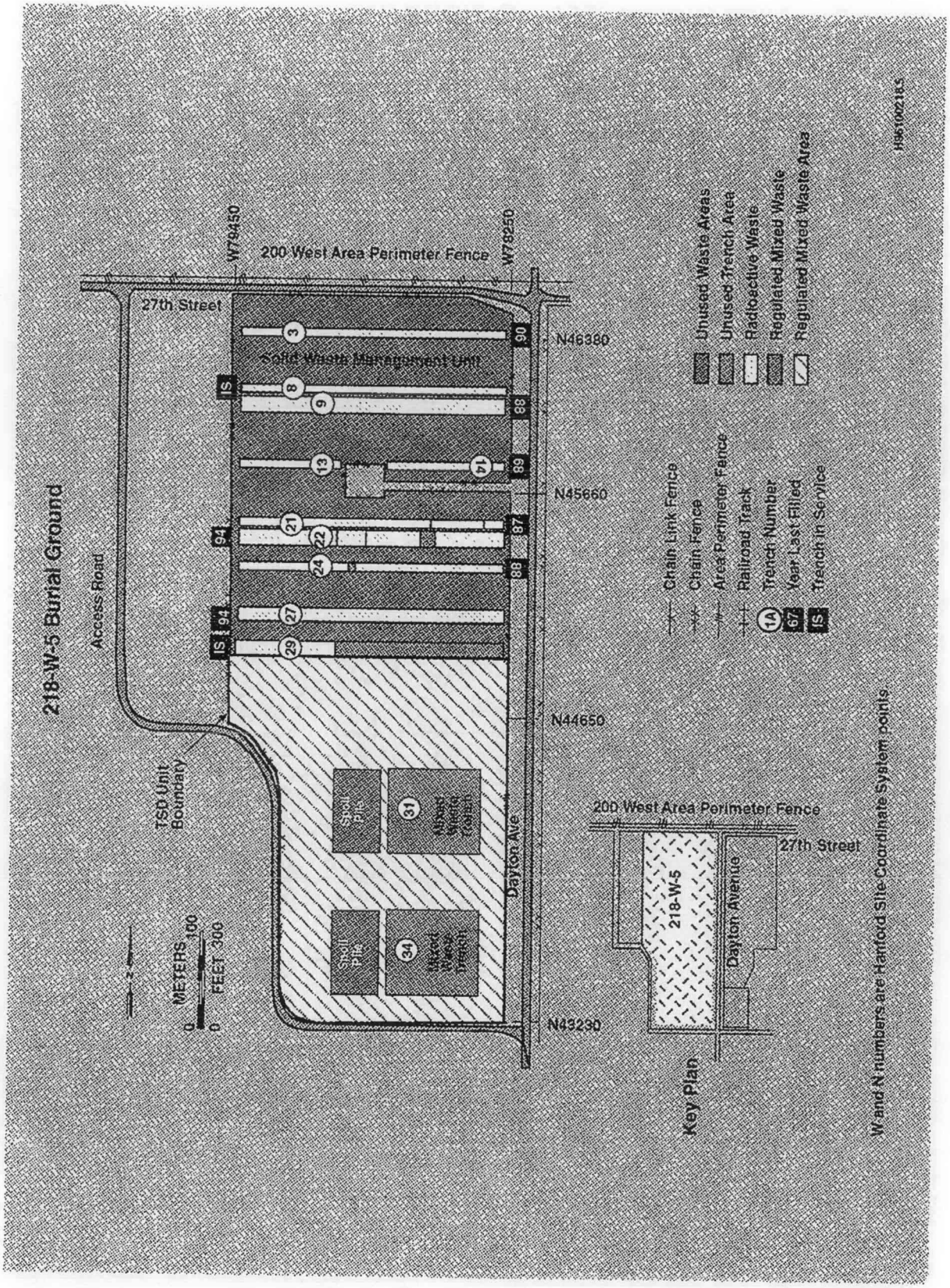

Figure 1-9. 218-W-5 Burial Ground.

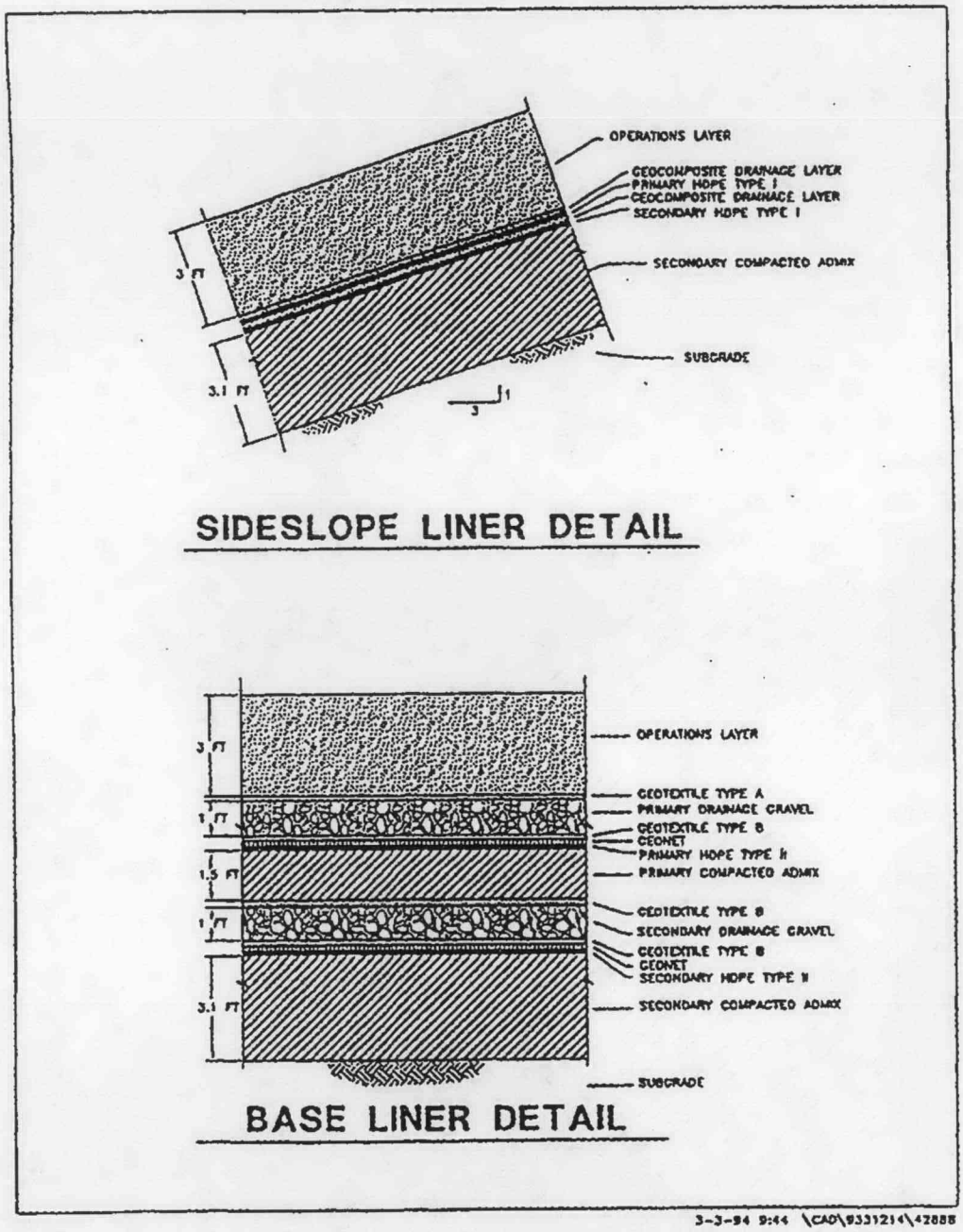

Figure 1-10. Typical Resource Conservation and Recovery Act-Compliant Liner System.

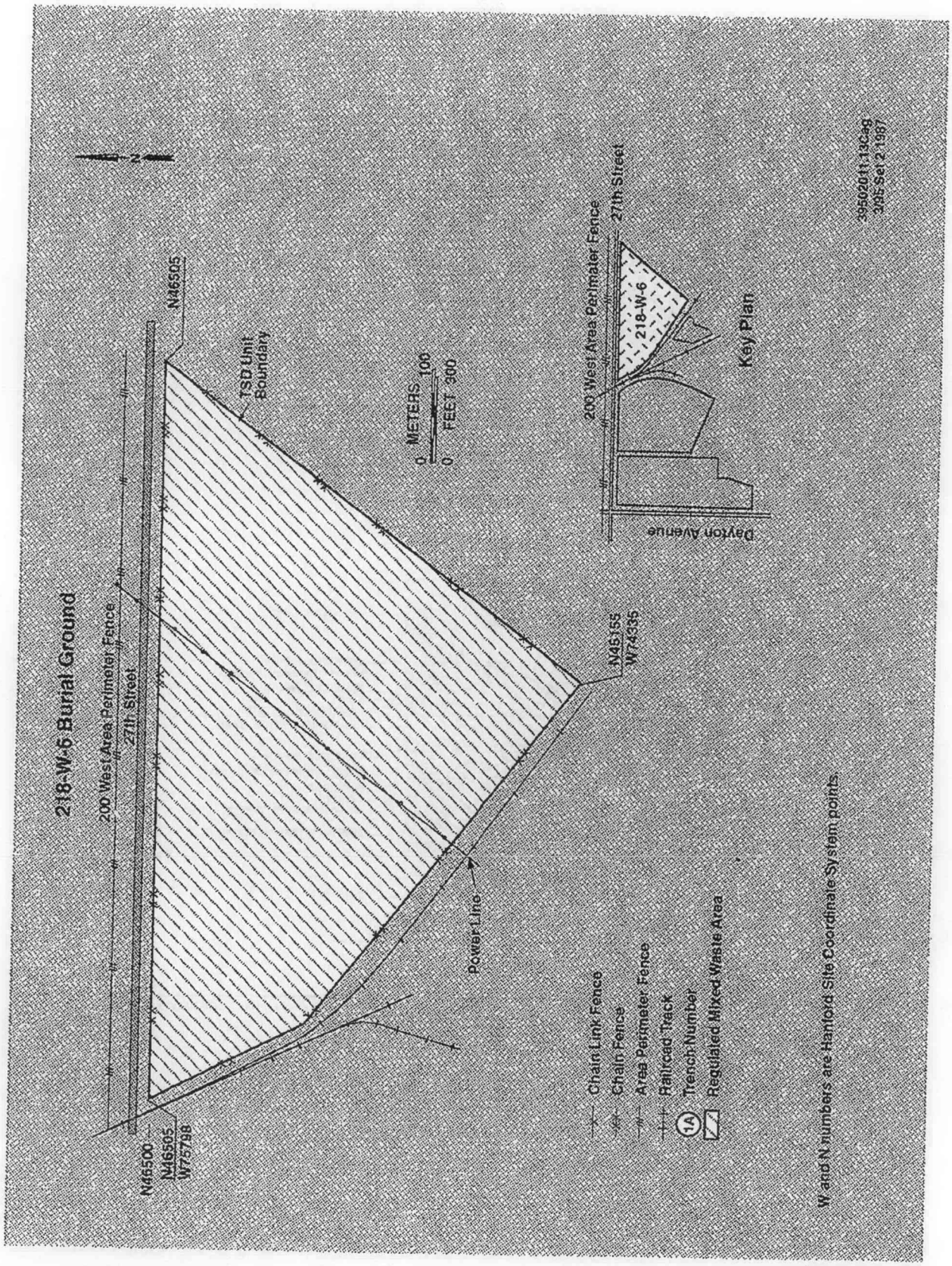

Figure 1-11. 218-W-6 Burial Ground.

Generator : _____

Month _____ Year _____

Generator:	Range	Score -include justification
Designation Conformance Issue(s)		
regulatory violation	7-10	
mismanagement of waste	4-6	
no mismanagement of waste	1-3	
Characterization Conformance Issue(s)		
safety issue	7-10	
mismanagement of waste	4-6	
no mismanagement of waste	1-3	
Paperwork Inconsistencies		
LDR form	1-3	
shipping papers or waste tracking forms	1-3	
profile discrepancies	1-3	
incomplete shipment/transfer information	1-3	
Screening Conformance Issue(s)		
regulatory violation and/or a safety issue	7-10	
mismanagement of waste	4-6	
no mismanagement of waste	1-3	
Receipt Conformance Issue(s)		
regulatory violation and/or a safety issue	7-10	
mismanagement of waste	4-6	
no mismanagement of waste	1-3	
		SCORE:

Number of containers received: _____

Number of containers screened (including date of activity): _____

Additional Comments:

_____

_____

_____. Initial Evaluation completed by: _____

Note - a score of 10 or more requires input from the performance evaluation system team.

Figure 1-12. Example Generator Evaluation Worksheet.

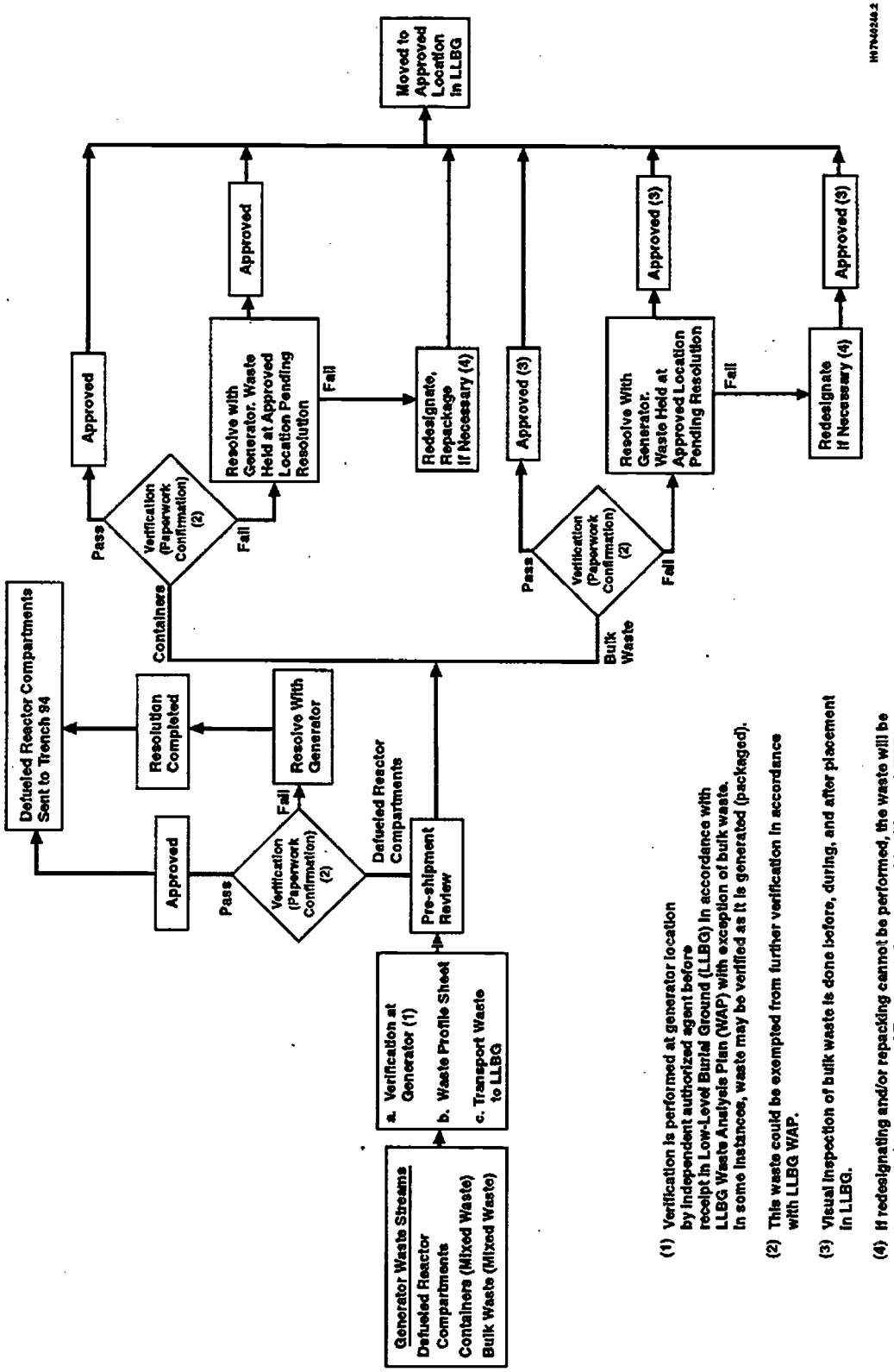

Figure 1-13. Low-Level Burial Grounds Waste Analysis Plan Flowchart.

Table 1-1. Incompatible Chemicals.

Amyl chloride	Diethyl benzene	Nitrobenzene
Aqua regia	Diethyl ether	Perchlorobenzene
Bromic acid	Elemental bromine	Propylene dichloride
Bromobenzene	Elemental chlorine	Sulfur trioxide
Bromoform	Elemental fluorine	Sulfuric acid (fuming)
Calcium bisulfite	Ethyl chloride	Thionyl chloride
Calcium sulfide	Ethylene trichloride	Vinylidene chloride.

2.0 DESCRIPTION OF CONFIRMATION PROCESS

This section covers the confirmation process and includes the appropriate pre-shipment review and/or verification steps and/or parameters. Confirmation process requirements appear twice in WAC 173-303-300 and apply to two different scenarios [refer to process flowchart (Section 1.0, Figure 1-13) for confirmation process].

Scenario 1: The process that an owner or operator uses to confirm knowledge supplied by the generator is acceptable knowledge to ensure that the waste is managed properly. [WAC 173-303-300(1)].

Scenario 2: The process that the LLBG operating organization uses to determine, by analysis if necessary, that each offsite waste received at the LLBG matches the identity of the waste specified on the accompanying manifest or shipping paper. [WAC 173-303-300(3)].

2.1 PRE-SHIPMENT REVIEW

Pre-shipment review takes place before waste can be scheduled for transfer or shipment to the LLBG. The review focuses on whether the waste stream is defined accurately and the LDR status determined correctly. Only waste determined to be acceptable for disposal is scheduled. This determination is based on the information that the generator provides. The following sections discuss the pre-shipment review process.

2.1.1 Pre-Shipment Review Process

The pre-shipment review ensures the waste has been characterized and the data provided qualify as 'acceptable knowledge' (Section 1.1.4.1). The information obtained from the generator during the pre-shipment review, at a minimum, includes all information detailed in Section 1.1.4.2.

Waste could be characterized on a waste stream basis. Individual container data must be compared to the waste profile data to ensure the information is accurate. Every transfer or shipment must be reviewed to ensure the waste meets the acceptance criteria for the LLBG. The repeat and review frequency for generators to review profile information will be yearly or as the waste generation process changes.

For each waste transfer or shipment that is a candidate for disposal, the generator provides (1) all pertinent chemical, radiological, and physical data requested on the waste tracking form/shipping paper; (2) other supporting documentation such as MSDS, analytical data, etc.; (3) a description of the waste contents on the container inventory record; and (4) LDR notification/certification information or equivalent documentation (e.g., national capacity variance, contained-in determination variance, etc.,) as applicable. The pertinent information is entered into a solid waste information tracking system (SWITS).

Based on waste identification information provided, the waste designation is reviewed to ensure consistency with waste designations per WAC 173-303-070, as well as for technical accuracy to ensure the waste meets the waste acceptance criteria. If the transfer or shipment information is found to be acceptable, a final operations review is completed and the transfer or shipment is scheduled. For bulk waste, every truck load is inspected visually; any waste showing visible variations in color, texture, or wetness is subject to sampling per this WAP.

Where potential nonconformances exist in the information provided, waste characteristics do not match the waste certification summary, or additional constituents are expected to be present that do not appear on the documentation, the generator is contacted by the LLBG operating organization or an approved designated organization for resolution.

2.1.2 Methodology to Ensure Compliance with Land Disposal Restrictions Requirements

Only mixed waste that meets the treatment standards of 40 CFR 268 and WAC 173-303-140 is considered for disposal. Because waste treatment to meet LDR criteria does not occur at the LLBG, all generators are subject to LDR or any LDR-related variances and are required to submit all the notifications and certifications described in 40 CFR 268.7. The following are general requirements for notifications and supporting documentation.

- The waste is subject to LDR and the generator has treated the waste.
  - The generator supplies the appropriate LDR certification information (40 CFR 268 and WAC 173-303-140).
- The waste is subject to LDR and the generator has determined that the waste naturally meets the LDR treatment standard for disposal.
  - The generator develops the certification based on process knowledge, analytical data, and supplies the appropriate LDR certification information necessary to demonstrate compliance with the LDR treatment standards of 40 CFR 268 and WAC 173-303-140.
- The waste is subject to an exemption from a prohibition on landfill disposal.
  - The generator submits a notice stating the waste is not prohibited from land disposal as required by 40 CFR 268.7(a)(3) and WAC 173-303-140(6).

A representative sample of the waste could be required to be submitted for analysis to ensure that contamination-based LDR requirements are met. The frequency of corroborative testing for the purpose of confirming compliance with LDR standards (concentration based and underlying hazardous constituents) is (1) a minimum of one test for the case where the variability of the waste constituents of concern(s) is determined and (2) a minimum of three tests for

the case where the variability of the waste constituents of concern(s) is not determined. In both cases, if the test results are less than the standard or underlying hazardous constituent threshold or if above the threshold but not statistically different than the data on which the certification of LDR compliance was made, the waste is corroborated as being compliant with LDR standards.

2.2 WASTE VERIFICATION

Verification consists of container receipt inspection, physical screening, and chemical screening as required by the criteria set forth in this WAP. Waste verification consists of testing key physical and chemical properties. Waste verification parameters are selected based on the following criteria:

- The need to identify restricted waste
- Parameters important to the proper management of waste at the LLBG
- Parameters that can be used to corroborate that waste received matches the identity of waste specified on accompanying transfer or shipping papers
- The need to protect human health and the environment.

Incoming waste verification is accomplished by reviewing applicable documentation and waste tracking forms or shipping papers against the waste. The physical/chemical screening frequencies are applied for verification purposes only. A waste stream is defined as having similar physical and chemical characteristics and dangerous waste numbers and the same LDR treatment requirements and waste management requirements.

For containers disposed in the lined trenches, the following verification rates apply:

- Offsite--the minimum physical verification rate is 10 percent of each waste stream applied per generator, per shipment
- Onsite--for verification purposes only, waste streams generated by each Hanford Site contractor and each of their subcontractors is verified at 5 percent per year.

Verification is performed using a combination of container receipt inspection, physical screening, and/or chemical screening. Verification is performed at an approved location [e.g., Central Waste Complex (CWC), Waste Receiving and Processing 1 (WRAP 1), etc.] as determined by the LLBG operating organization.

A bulk waste stream could be verified by screening the allowable rate of the total number of loads throughout the waste stream*.

2.2.1 Container Receipt Inspection

The container receipt inspection is a mandatory element of the confirmation process. Therefore, 100 percent of the containers/shipments are inspected for damage and to ensure the waste containers shipped are those denoted in the documentation. This activity is a mechanism for identifying containers that have not been subject to a pre-shipment review, identifying any paperwork issues, or identifying damaged containers before receipt of the container.

2.2.2 Physical Screening Process Guidance

Physical screening is considered an additional verification element. This section provides guidance on the methods and frequency concerning the use of physical screening as a verification activity.

Waste received before the establishment of a verification program must be verified when initially transferred to the LLBG. However, waste stored in the CWC, WRAP 1, etc., that has been processed through a physical screening program does not require additional physical screening [e.g., transuranic (TRU) certification program, current waste specification program, and backlog confirmation program, 183-H Solar Evaporation Basins sampling program].

2.2.2.1 Physical Screening Methods. Each of the following physical screening methods identified complies with the requirement to verify a waste and are listed in order of preference. The verifier must document the reasoning behind the method chosen when using a method other than #1 or #2.

1. Visual inspection (opening the container)
2. Nondestructive examination [real-time radiography (RTR)]
3. Nondestructive assay
4. Dose rate profile.

2.2.2.2 Physical Screening Frequency. The minimum physical screening frequency is in accordance with Section 2.2. The LLBG operating organization adjusts the physical screening frequency for generators based on objective performance criteria (refer to Section 1.1.2).

Containers that comprise the verification sample set are chosen using the following bias sampling methodology:

- Choose any and all containers for which concerns were identified during pre-shipment review

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* Note: A bulk waste stream is defined as large volumes of waste from a single generating event (e.g., soil remediation from a single location).

- Choose containers from separate locations and containing waste from different waste specification records (WSRds) to ensure that the verification program accurately tests for variability within programs and waste types

- If one and two are not applicable, randomly choose containers from the 'General Waste Stream'* as required to meet the applicable physical screening frequency.

If one container out of a verification sample set fails, another sample set or 3 additional containers (whichever is larger) must be chosen for physical screening (i.e., if the initial verification sample set equals three containers and one fails, then three more containers must be chosen). If two containers fail, the entire shipment fails.

If RTR is used to meet the physical screening requirements, 5 percent per year of the containers that have been nondestructively examined must be opened to ensure the equipment is functioning appropriately. Containers opened for other reasons, such as chemical screening or to investigate inconsistencies, could be used to meet this requirement. This requirement is based on the total number of containers reviewed not on a shipment or general waste stream basis. The generator is required, at a minimum, to meet this requirement over a 3 month average with a minimum of one container being opened every month the RTR is used for physical screening.

2.2.2.3 Physical Screening Exceptions. There are cases in which physical screening is not required. Therefore, the following exceptions have been developed to account for these instances.

- Shielded, classified, and remote-handled mixed waste is not required to be physically screened; however, the generator must perform a more rigorous documentation review and obtain the raw data used to characterize the waste. Ecology will be notified and have the opportunity to review information on this waste type before shipment. For classified waste, it is necessary to have an appropriate DOE security clearance and a need-to-know the information as defined by the classifying organization or agency.

- Mixed waste that cannot be physically screened at the LLBG or associated verification facility by acceptable physical screening methods must be physically screened at the generator location (e.g., large components, containers that cannot be opened, greater than 20 millirem per hour at 30 centimeters, contain greater than 10 nanocuries per gram of transuranic radionuclides, or will not fit into the nondestructive examination unit). Physical screening at the generator location consists of observing the packaging of the waste.

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* Note: 'General Waste Stream' is defined as a waste from a single generator in the same waste management group.

If no location can be found to perform the physical screening, no screening is required.

- Mixed waste that is packaged by an independent authorized agent for the LLBG operating organization is considered to have met the physical screening requirements denoted in this WAP.

- A bulk mixed waste stream could be verified by an applicable screening frequency identified in Section 2.2.

2.2.3 Chemical Screening Process Methods

Chemical screening is considered an additional verification element. This section provides guidance on the methods and frequency concerning the use of chemical screening as a verification activity.

The LLBG operating organization must describe the appropriate parameters for the waste accepted into the LLBG. At a minimum, at least three of the following methods must be used to complete the chemical screening process for mixed waste subject to physical screening. However, if only three methods are used, the generator must document the reasoning used to determine the chemical screening methods chosen (at a minimum, pH will be one of the three methods chosen):

- pH

- HH (Chlor-n-oil/water/soil)

- Ignitability and/or headspace testing (e.g., lower explosive limit, portable gas chromatograph, flame ionization detector, photoionization detector, high-voltage adapter. Instrument must be appropriate for conditions)

- Peroxide

- Oxidizer

- Sulfide

- Cyanide

- Paint Filter

- Water Reactivity.

2.2.3.1 Chemical Screening Frequency. At a minimum, 10 percent of the mixed waste verified by physical screening (Section 2.2.2.2) must be screened chemically. Chemical screening is not required to use SW-846 methodology. Although grab samples are acceptable, the LLBG operating organization must obtain a representative sample.

Laboratory hood waste packaged in accordance with 40 CFR 264.316/ 40 CFR 265.316, and WAC 173-303-161 must be screened chemically. Inner containers are segregated by physical appearance. At least one container from each group (or three containers if all similar) will be screened chemically. Solids require no chemical screening.

2.2.3.2 Chemical Screening Exceptions. There are cases in which chemical screening is not required. Therefore, the following exceptions have been developed to account for these instances:

- Waste that is exempted from the physical screening requirements (Section 2.2.2.3) is exempted from chemical screening
- Commercial chemical products (mixed waste) in the original product container(s) (i.e., off-specification, outdated, or unused products)
- Chemical containing equipment (mixed waste) removed from service, (i.e., ballasts, batteries, etc.)
- Hazardous debris (mixed waste) as defined in WAC 173-303-040
- Mixed waste containing asbestos
- Mixed waste, environmental media, and/or debris from the cleanup of spills or release of single substance or commercial product or otherwise known material (i.e., material for which an MSDS can be provided)
- Confirmed noninfectious mixed waste (i.e., xylene, acetone, ethyl alcohol, isopropyl alcohol) generated from laboratory tissue preparation, slide staining, or fixing processes
- Containers with an external dose rate of >20 millirem per hour at 30 centimeter and/or contain >10 nanocuries per gram of transuranic radionuclides
- Other special-case situations handled on a case-by-case basis.

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3.0 SELECTING WASTE ANALYSIS PARAMETERS

The following discusses selecting waste analysis parameters, associated rationale, and methods for these analyses. The analytical screening parameters that could be used for waste received at the LLBG are as follows.

- Physical description--used to determine the general characteristics of the waste. This facilitates subjective comparison of the sampled waste with previous waste descriptions or samples. Also, a physical description is used to verify the observational presence or absence of free liquids.

  Methods--samples are inspected and the physical appearance of the waste is recorded. RTR and/or visual examination is used.

- Radioactivity screen--used to quantify radionuclides for verification of transuranic radionuclide content, nontransuranic radionuclide content, and the waste classification (i.e., low-level waste or transuranic).

  Methods--a sample of the waste is passed by a geiger counter, survey meter, or a waste container is assayed using passive-active neutron or segmented gamma scanning techniques.

- Ignitability and/or headspace volatile organic compound analysis--performed to determine the ignitability and the presence or absence of solvents or other volatile organic compounds in waste. The headspace volatile organic compound analysis is one of the few methods available to evaluate the presence of volatile organic compounds that could be associated with heterogeneous materials.

  Methods--for headspace volatile organic compounds, a sample of the headspace gases in a container is analyzed by one or more of the following: Fourier transform infrared spectroscopy, gas chromatography/mass spectroscopy, HNU, organic vapor analyzer, and colorimetric tubes.

- Paint filter liquids test--used to verify the presence or absence of free liquid in solid or semisolid material to be landfilled.

  Method--to a standard paint filter, 100 centimeters or 100 grams of waste are added and allowed to settle for 5 minutes. Any liquid passing through the filter signifies failure of the test (SW-846 Method 9095).

- pH screen--used to identify the pH and corrosive nature of an aqueous or solid waste, to aid in establishing compatibility strategies, and to indicate if the waste is acceptable for disposal in the LLBG.

  Methods--full range pH paper is used for the initial screening. If the initial screen indicates a pH below 4 or above 10, a pH meter is

used. Procedures for preparing and extracting the solution and liquid are described in the test procedures of WAC 173-303-110(3)(a).

- Oxidizer potential screen--used to determine the fire-producing potential of the waste. This test can be applied to waste liquids, solids, and semisolids.

  Methods--all waste forms are tested using oxidizer tests.

- Water reactivity screen--used to determine if the waste has the potential to react vigorously with water to form gases or other reaction products.

  Method--for liquid waste, water is added to the waste. The solution is observed for evidence or fuming, bubbling, or spattering. These reactions are considered to be positive evidence that the waste is water reactive.

- Cyanide screen--used to indicate whether the waste produces hydrogen cyanide upon acidification below pH 2.

  Method--to a test tube or beaker containing approximately 5 milliliters of sample, an equal amount of freshly prepared ferrous ammonium citrate is added. 3 Normal hydrochloric acid is used to reduce the pH of the solution to about 2.0. A deep blue color indicates the presence of cyanide. The test can detect free cyanide and complex cyanides in concentrations above 200 parts per million.

- Sulfide screen--used to indicate if the waste produces hydrogen sulfide upon acidification below pH 2.

  Methods--sample is added to beaker or test tube and enough 3 Normal hydrochloric acid is added to bring the pH down to 2.0. A sulfide test strip is placed in the solution. If the paper turns brown or silvery black, the presence of sulfides in the sample is indicated. If there is no color change, the total sulfides are reported as nondetectable.

- HH screen--used to indicate whether polychlorinated biphenyls (PCBs) are present in oil-bearing waste and to determine if the waste needs to be managed in accordance with the regulations prescribed in the *Toxic Substance Control Act of 1976*.

  Method--the tests to be conducted include the HAZCAT* beilstein test, and/or the appropriate organic chlorine test.

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* HAZCAT is a registered trademark of Haztech Systems Incorporated, San Francisco, California.

4.0 SELECTING SAMPLING PROCEDURES

Specific sampling processes depend on both the nature of the material and the type of packaging. This section describes the sampling methodology.

4.1 SAMPLING STRATEGIES

Chemical screening is done in accordance with Table 4-1. Refer to Section 2.0 for discussion on sampling limitations, criteria for frequency, numbers and types of samples, and exceptions of waste categories and/or waste streams that cannot be sampled. Chemical screening might be performed in the trench, at the generator, or at another location approved for the waste to be sampled.

4.2 SELECTING SAMPLING EQUIPMENT

Sampling equipment selection is detailed in Table 4-1. Sampling equipment needed to sample waste is maintained and decontaminated by the LLBG operating organization.

4.3 SAMPLE PRESERVATION

Chemical screening methods referenced or described in Section 3.0 do not require any preservation methods.

4.4 ESTABLISHING QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES FOR SAMPLING

The following quality assurance/quality control (QA/QC) elements are used by LLBG operating organization, before transferring or shipping waste to the LLBG, to ensure sampling activities result in acceptable laboratory data:

- Using representative sampling methods as defined by WAC 173-303-110(2), 40 CFR 261 Appendix I, and/or SW-846 Chapter 9, whenever possible
- Using appropriate sample containers and equipment
- Numbering samples properly
- Using a standard labeling procedure
- Using field QA/QC samples
  - 1 in 20 to laboratory
  - 1 duplicate per event
  - 1 in 20 blank.

- Expiration date not expired
- Equipment calibration current.

Table 4-1. Low-Level Burial Ground Chemical Screening Sampling Results.

Waste type	Reference in SW-846 (EPA 1986)	
	Waste type	Equipment
Liquids	Free-flowing liquids and slurries	COLIWASA, SW-846, Chapter 9, glass thief or pipet
Solidified liquids	Sludges	Trier, SW-846, Chapter 9, scoops and shovels
Sludges	Sludges	Trier, SW-846, Chapter 9, scoops and shovels
Soils	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels
Absorbents	Large-grained solids	Large trier, SW-846, Chapter 9, scoops and shovels
Wet absorbents	Moist powders or granules	Trier, SW-846, Chapter 9, scoops and shovels
Process solids and salts	Moist powders or granules	Trier, SW-846, Chapter 9, scoops and shovels
	Dry powders or granules	Thief, SW-846, Chapter 9, scoops and shovels
	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels
	Large-grained solids	Large trier, SW-846, Chapter 9, scoops and shovels
Ion exchange resins	Moist powders or granules	Trier, SW-846, Chapter 9, scoops and shovels
	Dry powders or granules	Thief, SW-846, Chapter 9, scoops and shovels
	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels

COLIWASA = composite liquid waste sampler.
NA = not applicable.

5.0 SELECTING A LABORATORY, LABORATORY TESTING, AND ANALYTICAL METHODS

The following sections discuss selecting a laboratory for analyzing samples for QA/QC elements.

5.1 SELECTING A LABORATORY

The following laboratory QA/QC requirements apply to laboratory analyses of generator waste.

- The daily quality of analytical data generated in the contracted analytical laboratories is controlled by the implementation of an analytical laboratory QA plan.

- Before commencement of the contract for analytical work, the laboratory submits their QA plan for approval. At a minimum, the plan documents the following:

  - Sample custody and management practices
  - Sample preparation and analytical procedures
  - Instrument maintenance and calibration procedures
  - Internal QA/QC measures, including the use of method blanks
  - Sample preservatives used
  - Analyses requested.

When required, replicate testing usually is accomplished by analyzing two samples, one by the generator and another by the LLBG operating organization.

5.2 SELECTING TESTING AND ANALYTICAL METHODS

The generator describes and identifies the analytical methods to be used to analyze for the physical and chemical screening parameters identified in Section 3.0 for the mixed waste categories. If more than one testing and/or analytical method is used for a given physical and chemical screening parameter, the LLBG operating organization identifies all methods and applications.

The generator identifies the type of testing and analytical method to be used at the laboratory (e.g., for metals analysis state which type of determination procedure will be used such as inductively coupled plasma metals by atomic absorption).

The generator identifies the decision level necessary for each analytical parameter. If the decision level is found in a regulation, the generator references the regulation. Section 3.0 identifies the applicable decision levels, operational parameter(s), and analytical methods necessary to ensure that the waste is within the LLBG acceptance criteria.

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6.0 SELECTING WASTE RE-EVALUATION FREQUENCIES

This section is not applicable to the LLBG for waste that is placed in a disposal configuration. Newly generated waste is re-evaluated annually as necessary to ensure the waste stream has not changed.

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7.0 SPECIAL PROCEDURAL REQUIREMENTS

This section discusses any special process requirements for receiving mixed waste at the LLBG.

7.1 PROCEDURES FOR RECEIVING WASTE GENERATED ONSITE

Mixed waste received from onsite generators is detailed in Sections 2.2 and 3.0 and a flowchart is provided (Figure 1-13).

7.2 PROCEDURES FOR RECEIVING WASTE GENERATED OFFSITE

Mixed waste received from offsite is handled in the same manner as mixed waste received from onsite, with the exception of defueled reactor compartments disposed in trench 94 of the 218-E-12B Burial Ground, which are transported directly from the generator to trench 94.

7.3 PROCEDURES FOR IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE

The LLBG does not accept ignitable, reactive, or incompatible waste (refer to Section 1.2). The following is how the LLBG operating organization ensures that ignitable, reactive, or incompatible waste is not accepted at the LLBG.

- Pre-shipment review and chemical screening ensures ignitable and reactive waste are not accepted.

- Pre-shipment review alone ensures waste incompatible with the liner in the lined trenches are not accepted.

7.4 PROVISIONS FOR COMPLYING WITH FEDERAL AND STATE LAND DISPOSAL RESTRICTION REQUIREMENTS

Sections 1.1.4.1.2 and 2.1.2 describe compliance with federal and state LDR requirements.

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8.0 RECORDKEEPING

Recordkeeping requirements that are applicable to this WAP are described in Chapter 12.0, Table 12-1, of the General Information Portion (DOE/RL-91-28).

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9.0 REFERENCES

DOE/RL-88-20, *Hanford Facility Dangerous Waste Permit Application, Low-Level Burial Grounds*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-91-28, *Hanford Facility Dangerous Waste Permit Application, General Information Portion*, U.S. Department of Energy, Richland Operations Office, Richland, Washington, revised periodically.

EPA, 1986, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Third Edition, as amended, U.S. Environmental Protection Agency, Washington, D.C.

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APPENDIX 4A

CONSTRUCTION QUALITY ASSURANCE REPORT

Transmitted from DOE-RL to Ecology.

Reference: Transmittal of the Hanford Facility Low-Level Burial Grounds Construction Quality Assurance Report and W-025 As-Built Drawings

Document Number: WHC-SD-W025-RPT-002, Revision 0.

Correspondence Number: 95-PCA-238, March 28, 1995.

Document Number: WHC-SD-W025-RPT-001, Revision 0.

Correspondence Number: 95-SWT-568, September 19, 1995.

APPENDIX 4B

DEFINITIVE DESIGN

Transmitted from DOE-RL to Ecology.

Reference: Low-Level Burial Grounds Dangerous Waste Permit Application Supplement 2: Design Documentation for Mixed Waste Nondragoff Land Disposal Facility (DOE/RL-88-20, Supplement 2, Revision 0).

Definitive Design Report, WHC-SD-W025-FDR-001, Revision 0.

Correspondence Number: 90-PPB-186, September 20, 1990.

APPENDIX 4C

RESPONSE ACTION PLAN

Transmitted from DOE-RL to Ecology.

Reference: Revision to Response Action Plan.

Document Number: WHC-SD-W025-AP-001, Revision 1.

Correspondence Number: 95-SWT-427, July 19, 1995.

APPENDIX 4D

REQUEST FOR EXEMPTION FROM LINED TRENCH REQUIREMENTS AT 218-E-12B BURIAL GROUND TRENCH 94

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2 LETTER FROM WASHINGTON STATE DEPARTMENT OF ECOLOGY TO U.S. DEPARTMENT OF ENERGY, RICHLAND OPERATIONS OFFICE REGARDING REACTOR COMPARTMENT COMPLIANCE WITH LAND DISPOSAL RESTRICTIONS . . . . . ATT 2-i

3 PREDICTION OF PITTING CORROSION PERFORMANCE OF SUBMARINE REACTOR COMPARTMENTS AFTER BURIAL AT TRENCH 94, HANFORD, WASHINGTON . . . . . ATT 3-i

4 LETTER REPORT FROM E.N. PUGH (NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY) TO G.R. YOUNT (PUGET SOUND NAVAL SHIPYARD) REGARDING REVIEW OF "PREDICTION OF PITTING CORROSION PERFORMANCE OF SUBMARINE REACTOR COMPARTMENTS AFTER BURIAL AT TRENCH 94, HANFORD, WASHINGTON" . . . . . ATT 4-i

5 LETTER FROM D.R. HELGESON (CORROSION CONTROL SPECIALISTS) TO C.L. REAUME (PUGET SOUND NAVAL SHIPYARD) REGARDING SOIL RESISTIVITY TESTING, HANFORD, WASHINGTON . . . . . ATT 5-i

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1.0 INTRODUCTION

This request for exemption applies only to the decommissioned, defueled reactor compartments disposed in trench 94 of the 218-E-12B Burial Ground (Figure 1-1: refer to regulated mixed waste area). This exemption request* does not apply to any other waste at the 218-E-12B Burial Ground or to any other burial ground on the Hanford Facility, and is limited to regulatory requirements addressing liner/leachate collection systems.

Decommissioned, defueled reactor compartments contain radioactivity caused by exposure of structural components to neutrons during normal operation of the ships and submarines. In addition to radioactivity, the reactor compartments disposed in trench 94 contain lead used as shielding and polychlorinated biphenyls (PCBs). The lead used as shielding is regulated as a state-only dangerous waste in accordance with WAC 173-303. The PCBs are regulated in accordance with TSCA.

In May of 1984, the Navy issued an environmental impact statement (EIS) that evaluated alternatives for disposal of reactor compartments from submarines preceding the LOS ANGELES (SSN 688) class (USN 1984). Land disposal was the alternative selected. Shipment of reactor compartments from pre-LOS ANGELES submarines to trench 94 of the 218-E-12B Burial Ground began in April of 1986 (referred to hereafter as reactor compartments being disposed of under the current program).

In 1996, the Navy issued an EIS that considered the disposal of reactor plants from cruisers, and from LOS ANGELES and OHIO Class submarines (USN 1996) (hereafter referred to as reactor compartments considered for disposal under the 1996 EIS). The record of decision for this EIS selected disposal by land burial of the entire reactor compartment at the LLBG. Land disposal of these reactor compartments may require additional capacity beyond the existing size of trench 94. It might be necessary to expand trench 94 to accommodate the additional reactor compartments.

The DOE-RL's objectives in preparing and submitting this exemption request is as follows.

1. **Request an exemption from dangerous waste landfill liner and leachate collection and removal system (hereinafter referred to as liner/leachate collection system) requirements for trench 94 of the 218-E-12B Burial Ground.**

   Revision 0 of the LLBG Part B dangerous waste permit application was submitted in December 1989 to Ecology and the U.S. Environmental Protection Agency (EPA), Region 10. The Part B dangerous waste permit application indicated that a request for exemption from

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* For practical purposes, the terms 'exemption' and 'waiver' are used interchangeably. The term 'exemption' is used in WAC 173-303 whereas 'waiver' is used in 40 CFR 761.

liner/leachate collection system requirements for disposal of the reactor compartments would be submitted to Ecology and the EPA. The *Low-Level Burial Grounds Dangerous Waste Permit Application Request for Exemption from Lined Trench Requirements for Submarine Reactor Compartments* (Revision 0) was submitted in July 1990 (DOE/RL-90-12).

2. **Obtain EPA Region 10 review and comment on the request to Ecology for exemption from liner/leachate collection system requirements.**

   In accordance with the Compliance Agreement between DOE-RL and the EPA, Region 10 (DOE/RL-90-12, Appendix H), the EPA (Region 10) would grant final approval of a TSCA chemical waste landfill permit for trench 94 based, in part, on documentation of compliance with state requirements for dangerous waste landfills. Therefore, obtaining EPA Region 10 review and comment would ensure that the EPA regulations for waiving liner/leachate collection system requirements are addressed in this exemption request.

1.1 SCOPE

This exemption request applies only to the decommissioned, defueled reactor compartments that are being disposed in trench 94 of the 218-E-12B Burial Ground. This exemption request does not apply to any other waste at the 218-E-12B Burial Ground or to any other burial ground on the Hanford Facility, and is limited to regulatory requirements addressing liner/leachate collection systems.

1.2 BACKGROUND

The 218-E-12B Burial Ground began receiving waste in 1967. Waste contained in the 218-E-12B Burial Ground includes mixed waste, low-level waste, and transuranic waste. Trench 94 is used for the final disposal of decommissioned, defueled reactor compartments.

The first defueled reactor compartment was placed in trench 94 in April 1986. The reactor compartments are prepared for disposal by the Puget Sound Naval Shipyard (PSNS) in Bremerton, Washington, and are transported by barge to the Port of Benton adjacent to the Hanford Facility and then over land to the 218-E-12B Burial Ground.

Final disposal of the decommissioned, defueled reactor compartments has been addressed in the Navy's EISs (USN 1984, USN 1996). The EISs discuss the presence of potentially hazardous materials. Because of the large amount of lead shielding in the reactor compartments, the EISs specifically discussed the long-term potential hazard of the lead shielding.

Extraction procedure testing of elemental solid lead has determined that the leachate contains lead in concentrations that would require regulation of elemental lead as a RCRA hazardous waste. However, the EPA, in a June 1987 letter, stated that "lead whose primary use is shielding in low-level waste

disposal operations is not subject to Federal hazardous waste regulations when placed on the land as part of its normal commercial use." This was reiterated by the EPA in a February 1991 letter (Attachment 1), which stated that "the lead shielding contained in the SRC disposal packages is not considered to be solid waste as defined by 40 CFR § 261.2," and the EPA believes that the reactor compartment disposal packages are not subject to regulation under RCRA. Regardless, the thick metal encapsulation of the shielding lead within the reactor compartments, as built, already meets the RCRA treatment standards of 40 CFR 268.42, Treatment Code MACRO, for disposal of radioactive lead solids.

The presence of the lead shielding within the reactor compartments has caused the reactor compartments to be regulated as 'state-only' dangerous waste for disposal under WAC 173-303. The PSNS has studied the feasibility of removing this lead from the reactor compartments (e.g., PSNS 1990a, USN 1996). These studies found that removal of the lead would be very difficult and would result in radiation exposure to shipyard workers ranging from about 184 to 1,065 roentgen equivalent man (rem) per reactor compartment depending on the ship class. This exposure is orders of magnitude higher than the exposure that results from preparing reactor compartments for disposal. Additionally, lead removal would cost about $14 to $108 million dollars per reactor compartment depending on the ship class. Thus, both the additional exposure and expense would be substantial. The studies concluded that the removal of lead from the reactor compartments is not a reasonable method to mitigate the hazards associated with the lead contained within the reactor compartments. As discussed in Section 4.2.2, lead is not expected to migrate from the reactor compartments to groundwater for over 2 million years (240,000 years at the minimum) (USN 1995).

The PCB impregnated wool felt sound damping material is removed from reactor compartments when present. The reactor compartments might contain several kilograms of PCBs (typically less than 5 kilograms) tightly bound in the composition of solid materials such as thermal insulation, electric cable coverings, and rubber items manufactured before PCBs were banned. Because the PCBs would be present in materials in concentrations over 50 parts per million, the reactor compartments would be regulated as a toxic waste by the EPA under 40 CFR 761. The PCB-containing materials are distributed widely throughout the reactor compartment, and their removal would be difficult and would result in significant exposure of personnel to radiation. These PCBs would be contained totally within the fully sealed, all-welded reactor compartment structures.

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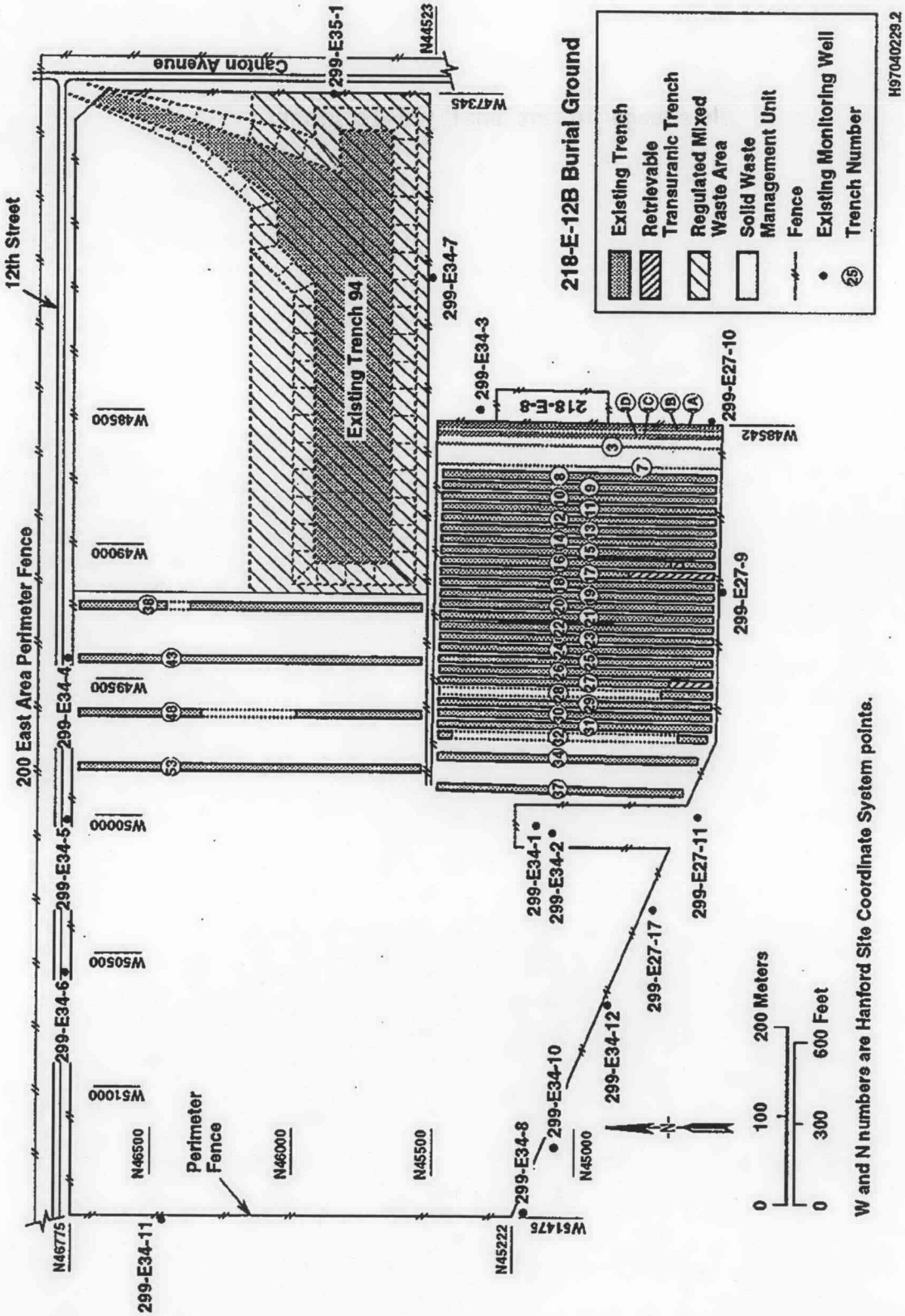

Figure 1-1. Location of Trench 94 within the 218-E-12B Burial Ground.

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2.0 BASIS FOR LINER/LEACHATE COLLECTION SYSTEM EXEMPTION REQUEST

Landfills used for the disposal of mixed waste, dangerous waste, and PCB waste must meet a number of regulatory requirements. For some of these requirements, the regulations allow exemptions provided that certain conditions are met (Table 2-1). One of the requirements for which an exemption may be granted is the requirement for liner/leachate collection systems. This section describes the specific regulatory requirements for mixed waste and PCB waste landfill liner/leachate collection systems applicable to reactor compartments in trench 94 and describes the conditions that must be met to obtain an exemption. The approach to be applied to satisfy these requirements also is described, including specific performance objectives and a criterion to be used to determine whether requirements have been met.

2.1 REGULATORY REQUIREMENTS

The following discusses the WAC 173-303-665(2) regulations determined to be applicable to liner/leachate collection systems and their exemption. The approach for the exemption request is to meet all the following applicable conditions for exemption:

- Condition given in WAC 173-303-665(2) to prevent the migration of any dangerous constituents into the groundwater or surface water at any future time

- Condition given in 40 CFR 761.75(c)(4) for no unreasonable risk.

2.1.1 Requirements of Washington Administrative Code Chapter 173-303

Requirements for mixed waste and dangerous waste landfill liner/leachate collection systems are given in WAC 173-303-665(2). Under WAC 173-303-665(2)(a)(i), dangerous waste landfills are required to have a liner "that is designed, constructed, and installed to prevent any migration of wastes out of the landfill to the adjacent subsurface soil or groundwater or surface water at anytime during the active life (including the closure period) of the landfill. The liner must be constructed of materials that prevent wastes from passing into the liner during the active life of the facility". Under WAC 173-303-665(2)(a)(ii), dangerous waste landfills are required to have "a leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the landfill". Under WAC 173-303-665(2)(h), a landfill unit that commences construction on a lateral expansion after July 29, 1992 must install two or more liners and a leachate collection and removal system above and between such liners.

Provisions for exemptions from liner/leachate collection system requirements are given in WAC 173-303-665(2)(b). Exemptions could be given if Ecology finds, based on a demonstration by the owner or operator, that

alternative design and operating practices, together with location characteristics, would prevent migration of any dangerous constituents into the groundwater or surface water at any future time. Specific requirements for exemption requests in permit applications are given in WAC 173-303-806(4)(h)(ii)(A). These requirements include detailed plans and engineering and hydrogeologic reports, as appropriate, describing alternate design and operating practices that will, in conjunction with location aspects, prevent the migration of any dangerous constituent into the groundwater or surface water at any future time.

Conditions for waiver of the minimum technological design requirements are contained in WAC 173-303-665(2)(j). Waivers may be granted if the owner/operator demonstrates that alternative design and operating practices, together with location characteristics: "Will prevent the migration of any dangerous constituent into the groundwater or surface water at least as effectively as the liners and leachate collection and removal systems" and "will allow detection of leaks of dangerous constituents through the top liner as least at effectively".

2.1.2 Requirements of Title 40 Code of Federal Regulations Part 761

Requirements for liner/leachate collection systems for chemical waste landfills used to dispose of PCBs are given in 40 CFR 761.75(b). Under 40 CFR 761.75(b)(1), chemical waste landfills are required to be located in thick, relatively impermeable formations such as large-area clay pans. Where this is not possible, the soil will have a high clay and silt content with the following parameters:

(i) In-place soil thickness, 1.2 meters or compacted soil liner thickness, 0.9 meter;

(ii) Permeability (cm/sec), equal to or less than 1×10^{-7};

(iii) Percent soil passing No. 200 sieve, <30;

(iv) Liquid limit, <30; and

(v) Plasticity index <15.

Alternately, under 40 CFR 761.75(b)(2) "synthetic membrane liners shall be used when, in the judgment of the Regional Administrator, the hydrologic or geologic conditions at the landfill require such a liner in order to provide at least a permeability equivalent to the soils in paragraph (b)(1) of this section." Under 40 CFR 761.75(b)(7), a leachate collection system is required consisting of: (1) a gravity flow drain field installed above the liner, (2) a gravity flow drain field installed above the liner and above a secondary liner, or (3) a network of suction lysimeters installed along the sides and under the bottom of the liner.

Conditions for the waiver of liner/leachate collection system requirements are contained in 40 CFR 761.75(c)(4). A waiver for chemical

waste landfill requirements may be granted by the EPA Administrator, Region 10, if the owner/operator submits evidence that "operation of the landfill will not present an unreasonable risk of injury to health or the environment from PCBs when one or more of the requirements of paragraph (b) of this section are not met."

2.2 APPROACH TO LINER/LEACHATE COLLECTION SYSTEM EXEMPTION REQUEST

The following sections discuss the regulatory approaches to a liner/leachate collection system exemption request.

2.2.1 Approach to Washington Administrative Code Chapter 173-303

Washington State requirements for landfills are contained in WAC 173-303-665(2). The basic design to which the alternate design (i.e., reactor compartment burial in an unlined trench) will be compared is the Ecology minimum technological design specified in WAC 173-303-665(2)(h), which requires liners and leachate collection systems.

The results of a detailed site-specific lead migration study show that the trench 94 location characteristics will prevent migration of lead from reactor compartments to the unconfined aquifer or to the Columbia River for very long periods of time [hundreds of thousands of years or greater (PNL 1992)]. Available data on the geology, geochemistry, and geohydrology of the disposal site were used to develop a conceptual model for release and transport of lead from the reactor compartments. Laboratory studies were performed to provide information needed for the model that was not available from existing databases.

The condition for waiver of minimum technological design requirements under WAC 173-303-665(2)(j) for each new landfill unit on which construction commences after January 29, 1992, and each lateral expansion of a landfill unit on which construction commences after July 29, 1992, is that alternative design and operating practices, together with location characteristics: (i) "Will prevent the migration of any dangerous constituent into the ground water or surface water at least as effectively as the liners and leachate collection and removal systems" and (ii) "Will allow detection of leaks of dangerous constituents through the top liner at least as effectively." The minimum technological design relies on the use of engineered features (i.e., liner/leachate collection system) to prevent the release of dangerous constituents to the environment. These features have a finite lifetime after which a release can occur and a finite lifetime during which the features can be operated to prevent release of contaminants. The effective lifetime of these features, therefore, is the reasonable time for which the minimum technological design should be expected to prevent the release of dangerous constituents to the environment.

It will be demonstrated that the design and operating practice of the reactor compartment package buried in an unlined trench will contain the

dangerous constituents within the reactor compartments for a much longer period than the expected design life of the geosynthetic liner components.

2.2.2 Approach to Title 40 Code of Federal Regulations Part 761

The condition for a waiver from liner/leachate collection system requirements under 40 CFR 761.75(c)(4) requires prevention of unreasonable risk of injury to health or the environment due to PCBs. The design required under 40 CFR 761.75(b) consists of only a single liner with a leachate collection system. The minimum technological design requires double liners and leachate collection systems and, therefore, is more protective of the environment and will result in less risk than the design required under 40 CFR 761.75(b). The resultant risk from the minimum technological design, therefore, is judged to be 'reasonable'. An alternate design, which is demonstrated to have better performance than the minimum technological design, also will result in 'reasonable' risk.

2.3 PERFORMANCE OBJECTIVES AND CRITERION

In the preceding section, conditions were established that, if met, will allow exemption from liner/leachate collection system requirements. In this section, specific, measurable performance objectives and criterion of the alternate landfill design are defined to determine whether these conditions have been met.

Performance is evaluated for both the active life of the unit and the period after the active life. The active life is defined as the period from initial receipt of dangerous waste until certification of final closure, which is effectively the period preceding installation of a cover. The period after the active life will include a postclosure care period for the 218-E-12B Burial Ground. For the purpose of the performance evaluations, the postclosure care period is defined as the period 30 years after final closure of the 218-E-12B Burial Ground*. This definition is consistent with postclosure care requirements given in WAC 173-303-610(7).

The following sections establish the specific performance objectives and criterion.

2.3.1 Performance Objectives and Criterion to Demonstrate Better Performance than the Minimum Technological Design Requirements for Liner/Leachate Collection Systems

As the WAC 173-303-665(2) liner/leachate system minimum technological design requirements are more stringent than the TSCA requirements, the

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*The period 30 years after final closure of the 218-E-12B Burial Ground extends more than 30 years beyond final closure of trench 94 because the burial ground could be closed in phases (Chapter 11.0).

WAC 173-303-665(2) requirements will be the basis for comparison of the performance objective.

The preamble to the final minimum technological requirement rules states that "The goal of liners and leachate collection systems is to prevent migration by collecting and removing leachate before it can migrate during the unit's active life and post-closure care period" (51 FR 60, p. 10708). This was reiterated in the preamble to the rules as amended in response to the requirements of the 1984 HSWA to RCRA (57 FR 3462). This objective recognizes that at many landfills leachate will be generated during the active life and will continue to be generated during the postclosure care period. An impermeable cover is installed at closure to promote drainage and to provide long-term minimization of liquid migration through the landfill. Thus, the minimum technological performance objective will be the basis for comparison. The minimum technological design performance objective is to prevent leachate migration from the landfill unit by collecting and removing leachate before the leachate can migrate during the active life of the unit and the postclosure care period.

Trench 94 has been in operation since 1986 without burial of the reactor compartments placed there. This mode of operation allows flexibility in the disposal of this unique waste and this practice could continue until installation of the final RCRA cover. The following operating practices are employed to monitor the condition of the reactor compartments until they are buried. Each week a nuclear operator performs an inspection of trench 94. The reactor compartments are visually inspected to verify their integrity. In addition, trench 94 is inspected for run-on, run-off, and erosion problems after a significant precipitation or windstorm event. Further corrective actions are discussed in the building emergency plan (Chapter 7.0).

The performance of the alternate design must be at least as effective as the liners and leachate collection and removal system of the minimum technological design and must allow detection of leaks of hazardous constituents through the top liner at least as effectively. It can be concluded that the performance of the minimum technological design will be exceeded if generation of contaminated leachate is prevented beyond the expected lifetime of the minimum technological design. Therefore, the performance criterion selected for evaluating the alternate design is as follows:

> Demonstrate that the alternate design and operating practice, together with location characteristics, prevent generation of any contaminated leachate beyond the expected design lifetime of the minimum technological liner/leachate collection system design.

Section 4.0 demonstrates that the containment provided by the reactor compartment package outlasts the expected design life of a liner/leachate collection system, and that no contaminated leachate will be generated during the active life and postclosure period of the unit.

2.3.2 Performance of Designs After Expected Lifetime of a Liner/Leachate Collection System

This section addresses performance of the disposal system design after the expected lifetime of a liner/leachate collection system.

As discussed in Sections 2.3.1 and 2.3.2, the liner/leachate collection systems are intended to prevent migration of contaminants during the active life and postclosure care period of the unit. Liner/leachate collection systems are not designed specifically to provide long-term control over migration of contaminants; the cover provides that function by preventing the infiltration of water. In the preamble to the final minimum technological requirement rules, the EPA (51 FR 60, p. 10711) stated the following:

"Based on presently available information, the Agency does not view liner systems as the primary means of controlling the migration of hazardous constituents in the long term. The Agency continues to believe that liners are best used to facilitate the collection and removal of leachate (47 FR 32284, July 26, 1982). Because the function of liner systems then, is relatively short-term in nature, as opposed to providing protection for many decades or even hundreds of years, the effectiveness of liners is overshadowed by other factors that include: (1) the nature of the location of the unit with respect to climate, hydrogeology, and population, (2) the nature of the waste in the unit, and (3) the long-term performance of the final cover that is placed over the unit at closure."

For many hundreds of years, the reactor compartment package will prevent migration of contaminants. Over the very long periods of interest with respect to preventing contaminant migration, however, neither the liner/leachate collection system nor the reactor compartment (which will outlast the liner/leachate collection system) will prevent contaminant migration. Over the very long timeframes under consideration, even the cover cannot be expected to withstand the elements and remain fully functional. Thus, the factors that most influence the potential for long-term contaminant migration are the hydrogeologic and geochemical characteristics of the disposal site. Therefore, Section 4.0 also addresses the performance of the disposal system over these very long timeframes.

Table 2-1. Comparison of Regulatory Requirements for Liners, Leachate Collection, and Exemptions.

Requirement	Dangerous waste regulations	PCB regulations
Liner(s)	WAC 173-303-665(2) requires liners that will prevent migration out of the landfill during the active life.	40 CFR 761.75(b) requires landfill to be located in thick relatively impermeable formations or to have 0.9 to 1.2 meters of compacted soil liner or in place soil having a permeability less than or equal to $1x10^{-7}$ cm/sec, etc.
Leachate collection	WAC 173-303-665(2) requires a leachate collection and removal system above and between liners. WAC 173-303-665(2)(h) requires a leachate collection and removal system above and between the liners (refer to note).	40 CFR 761.75(b) requires leachate collection system above the liner.
Exemption conditions	WAC 173-303-665(2)(b) allows for exemptions from liner and leachate collection requirements upon demonstrating no migration of dangerous constituents to surface water or groundwater at any future time.	40 CFR 761.75(c)(4) allows for waiver of liner and leachate collection system requirements of 40 CFR 264.301(c) upon demonstrating no unreasonable risk from PCBs.
	WAC 173-303-665(2)(j) allows for approval of alternative design or operating practices upon demonstration that design will prevent migration of dangerous constituents into the groundwater and will allow detection of leaks of dangerous constituents through the top liner.	

CFR = Code of Federal Regulations.
PCB = polychlorinated biphenyl.
WAC = Washington Administrative Code.
cm/sec = centimeter per second.

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3.0 NATURE AND QUANTITY OF WASTE

This section describes the reactor compartment waste that will be disposed of in trench 94.

3.1 WASTE CHARACTERISTICS

Each reactor compartment package is that section of the ship containing the nuclear reactor plant. The nuclear reactor plant consists of the reactor vessel, steam generators, pumps, valves, and piping. Figure 3-1 provides typical dimensions and weights of reactor compartment packages. The reactor compartments are completely sealed by welding to prevent release of the radioactive and dangerous materials contained within the reactor compartments. All nuclear fuel has been removed from the reactor compartments; therefore, the radioactive materials remaining in the reactor compartments consist only of activation products from operation of the nuclear reactors. Figures 3-2 and 3-3 provide general cross-sections of typical submarine and cruiser reactor compartment packages. Before shipment to the Hanford Facility, the reactor compartment is removed from the decommissioned/defueled ship. Removal of the reactor compartment from the ship includes the following:

- Removing spent nuclear fuel from the reactor
- Removing liquids that can be pumped or drained
- Removing wool felt sound damping material that contains PCB (when present)
- Cutting and sealing radioactive system piping at the reactor compartment boundary
- Cutting the reactor compartment from the rest of the ship
- Sealing the reactor compartment with welded steel plates
- Testing the reactor compartment package to verify that all penetrations and openings have been closed and sealed to meet U.S. Department of Transportation and Nuclear Regulatory Commission standards. Once prepared for shipment, the reactor compartment is a completely sealed unit.

The reactor compartments each contain more than 90.7 metric tons of permanently installed lead shielding in the form of panels or poured-in-place lead contained within thick metal sheathing plates. The thick metal encapsulation of this lead, as originally constructed, meets the treatment standards of 40 CFR 268.42, Treatment Code MACRO, for disposal of radioactive lead solids, including lead shielding. Work during the reactor compartment preparation process maintains this encapsulation with no treatment of the lead shielding occurring. The PSNS has studied the feasibility of removing this lead from the reactor compartments (Section 1.0).

The presence of the large quantity of lead as a dangerous waste constituent within the reactor compartments causes the reactor compartments to be regulated as 'state-only' dangerous waste for disposal under WAC 173-303.

The reactor compartments also could contain several kilograms of PCBs (typically less than 5 kilograms) tightly bound in the composition of solid materials such as thermal insulation, electric cable coverings, and rubber items manufactured before PCBs were banned. Because the PCBs currently are present in materials in concentrations over 50 parts per million, the reactor compartments in trench 94 are regulated under 40 CFR 761. The PCB containing materials are distributed widely throughout the reactor compartment, and their removal is difficult and would result in significant exposure of personnel to radiation. These PCBs are contained totally within the fully sealed, all-welded reactor compartment packages. Some reactor compartments considered for disposal under the 1996 EIS might not contain solid PCBs in regulated concentration due to their later date of construction. These reactor compartments also would be placed at trench 94 under the preferred alternative.

A variety of other hazardous materials could be present in small amounts in reactor compartments, including silver plating on electrical contacts; silver brazing alloys; cadmium plating or fasteners and components; chromates; amines, and ethylene glycol in small pockets of residual liquid; arsenic trioxide in glass; cyanoacrylate adhesive; and paints containing cyanide, red lead, lead napthenate, coal tar, and chromium trioxide. Preliminary investigations indicate these materials at below regulated levels for the reactor compartments considered for disposal under the 1996 EIS. This is consistent with the conclusions of earlier work conducted in support of the current reactor compartment disposal program (PSNS 1990b). Reactor compartments constructed before the mid-1970s also contain thousands of kilograms of asbestos in the insulation on pipes and other components. The asbestos would be fully contained within the reactor compartment package, complying with 40 CFR 61. The reactor compartments are a unique, integrated waste form that is both containment and waste. Thus, the entire reactor compartment disposal package is the waste under evaluation. For cruiser reactor compartments, the reactor compartment forms part of the containment that would be supplemented by exterior structure built around the reactor compartment, enclosing the reactor compartment to form the disposal package. For these packages, the supplemental structure would not be considered part of the waste when evaluated.

Residual liquid is removed from the reactor compartments to the maximum extent practical, while keeping radiation exposure to workers ALARA. Federal radiation exposure guidelines require that nuclear work be accomplished in a manner that keeps radiation exposure to workers and the public ALARA (10 CFR 20). Proven liquid removal methodologies used for the current reactor compartment disposal program would be adapted for the reactor compartments considered for disposal under the 1996 EIS. Residual liquid in reactor compartments is trapped in pockets within valves, pumps, tanks, vessels, and other inaccessible piping system components of the reactor plant and associated ship support systems (widely distributed in over 300 discrete locations for current reactor compartments). The piping and components of the

reactor plant and associated ship support systems are designed and intended to hold water for a use other than storage (e.g., the transfer of heat energy from the reactor to produce steam for propulsion). The reactor plant and associated ship support systems are a part of the reactor compartment disposal package, a unique integrated waste form that also contains a number of other structures designed to perform other functions not related to liquid containment. However, the reactor compartment package provides multiple barriers to liquids within the structures. Absorbent also is added to a shield tank and the reactor vessel, when component configuration allows, in quantities calculated to absorb two times the maximum residual liquid volume that could be present. Ecology has determined that the reactor compartment packages are protective of the environment and in compliance with WAC 173-303 (Attachment 2).

3.2 WASTE PACKAGE STRUCTURAL DESCRIPTION

Figures 3-2 and 3-3 provide cross-sections of typical reactor compartment packages. Major structural components are shown. The ship's hull and inner bulkheads provide barriers for containment of materials within the reactor compartment packages and provide strength to the packages. External structures installed by PSNS provide additional strength and containment to seal the packages.

The containment lifetime of the reactor compartment package is discussed in Section 4.0 and is based on these figures.

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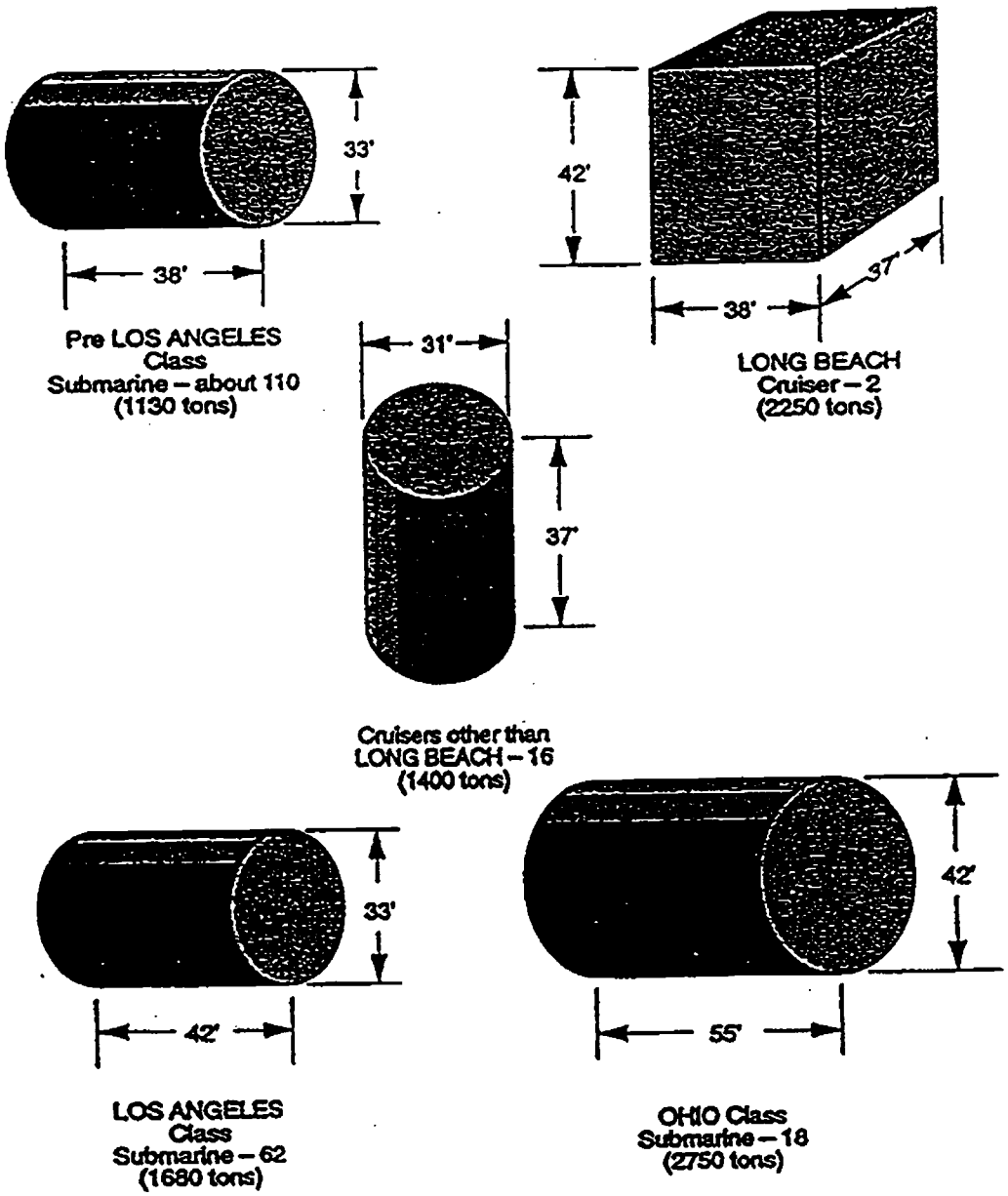
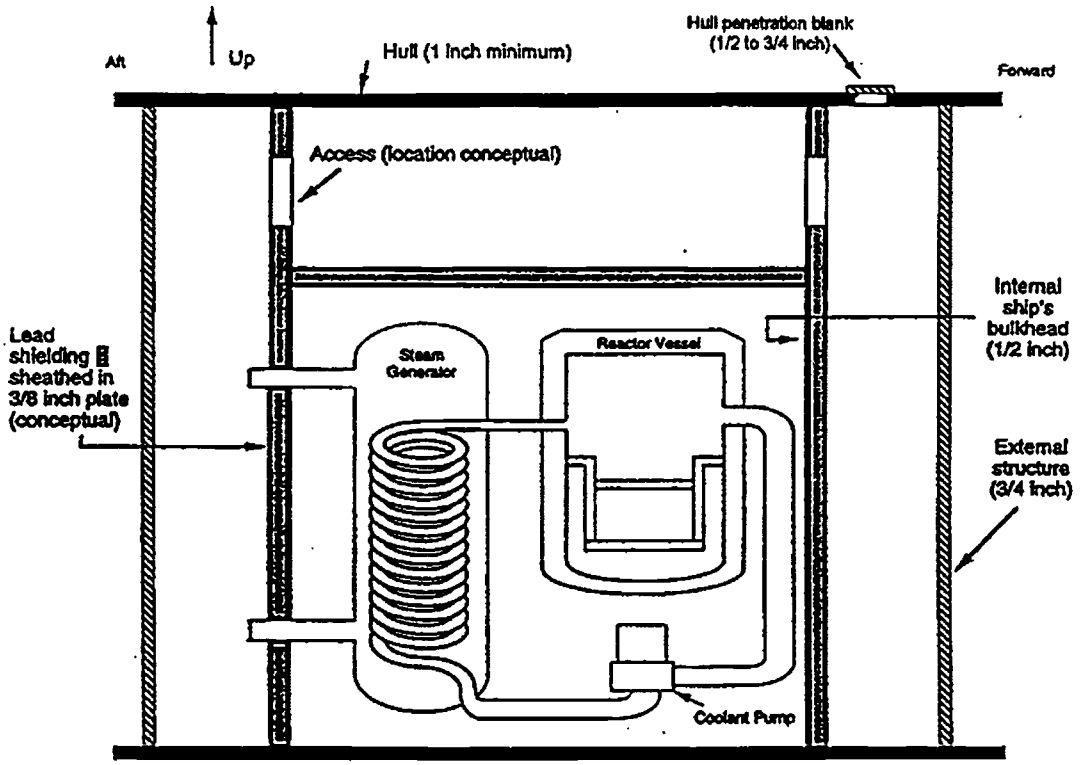


Note: Dimensions and weights are approximate. Quantities are current projections.

Figure 3-1. Comparison of Reactor Compartment Packages.



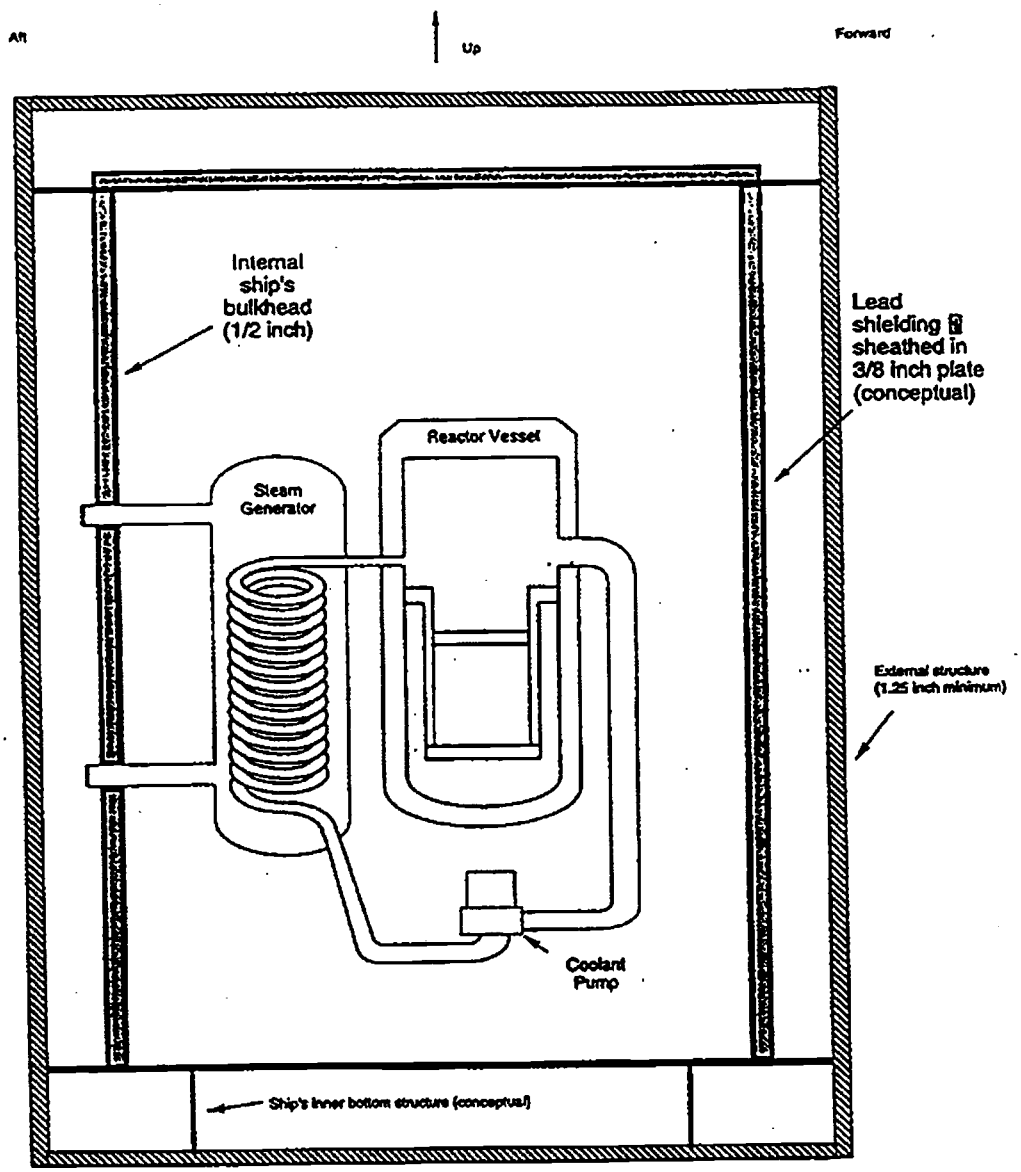
General Notes:

(1) PSNS installed structure is cross hatched:

(2) There are a limited number of small diameter penetrations through the hull (e.g., about 10 with maximum 6 inch diameter is typical for pre-LOS ANGELES Class ships). These are sealed with 1/2 to 3/4 inch blanks (typical location shown).

(3) On some submarines, the aft end of the hull tapers inwards with an external shelf (at least 3/8-inch thick) forming a ballast tank external to the hull.

Figure 3-2. General Cross-Section of Typical Submarine Reactor Compartment Package.



General Note:
PSNS installed structure is cross hatched:

Figure 3-3. General Cross-Section of Typical Cruiser Reactor Compartment Package.

4.0 PERFORMANCE EVALUATION

The purpose of this section is to demonstrate that the following performance criterion is satisfied. The criterion was established in Section 2.3.1, as meeting the regulatory requirements for obtaining an exemption from the lined trench and leachate collection system requirements for dangerous waste landfills. The performance criterion is as follows:

Demonstrate that the alternate design (i.e., burial without a liner/leachate collection system) and operating practices, together with location characteristics, prevent generation of any contaminated leachate beyond the expected lifetime of the minimum technological liner/leachate collection system design.

Sections 2.1.1 and 2.2.1 discuss the minimum technological requirements that hazardous waste landfills have two or more liners and a leachate collection system above and between the liners. The liner/leachate collection design life is discussed in Chapter 4.0. Studies on estimated lifetimes of geosynthetics have been performed (WHC 1991b, WHC 1992a). It has been noted that "buried HDPE is expected to have a lifetime of about 50 years, while more optimistic studies cite evidence that indicates polypropylene geotextiles could survive as long as 200 years" (WHC 1992a).

The performance of the cover (Chapter 11.0) will affect the overall performance of the 218-E-12B Burial Ground. The cover will limit further the amount of moisture available to corrode the reactor compartments. The amount of lead or PCBs that could be reached from the waste in trench 94, after ultimate breach of the reactor compartment containment, will be controlled by the amount of moisture that can migrate through the cover to contact the waste and the chemistry of this moisture.

This section demonstrates that the criterion is met and that no benefit would result from using liner/leachate collection systems.

4.1 INTEGRITY OF THE REACTOR COMPARTMENT PACKAGE

For the following reactor compartment integrity corrosion studies, credit was not taken for the presence of the cover.

The thick structure of reactor compartment packages inherently provides a very high-integrity waste package. The packages have substantial ability to contain waste for a long time.

Waste containers are required to be at least 90 percent full when placed in a landfill to minimize subsidence. Although this rule is not directly applicable to the reactor compartments, which are a unique, integrated waste form that is both containment and waste, the capacity of the reactor compartment package structure to withstand soil loading at trench 94 was evaluated. For submarine reactor compartments (Figure 3-2), the hull and external structure on each end make up the outer containment boundary. These

structures easily can withstand the soil pressure of burial. Cruiser reactor compartments (Figure 3-3) would perform comparably given their thick external structure. All of the radioactivity, lead, and PCBs in the reactor compartments are contained within these boundaries. Burial of the reactor compartment packages will not compromise their containment integrity. There will not be subsidence in the landfill cover due to package containment failure over the cover's engineered design life as a moisture barrier.

The integrity of the reactor compartment is its ability to provide a containment barrier to prevent the lead shielding and PCB containing materials from contacting the environment. The time required for corrosion of the reactor compartment to allow exposure of lead and PCBs to the environment depends on the corrosion rate of steel in trench 94, the thickness of the steel barriers, and the ability of the reactor compartment to withstand soil pressure after its structure is weakened by corrosion.

4.1.1 Reactor Compartment Corrosion Studies

The Naval Civil Engineering Laboratory (NCEL) study (Attachment 3) quantified corrosion of reactor compartments in trench 94 using two approaches. First, corrosion information from the National Institute of Standards and Technology (NIST) (formerly National Bureau of Standards) test sites was researched to obtain data from test sites with soil conditions similar to the Hanford Facility (Attachment 4). Second, the NCEL reviewed the *Underground Fuel Storage Tank Corrosion Study* (WHC 1992b), which reported the results of the inspection of recently unearthed fuel storage tanks on the Hanford Facility to determine their rate of corrosion. The following discussion is derived from these studies.

Steel buried in soil experiences both general and pitting* corrosion. General corrosion is the type of corrosion that is uniformly distributed over a metal surface. Conversely, pitting corrosion is a localized corrosion that results in small pits or cavities randomly distributed over a surface. The pits result from variations in the environment in contact with the surface of the steel that cause local variations in the corrosion rate. It is important to note that for carbon steel, the pitting rate decreases with time because of corrosion products that accumulate on the surface of the metal and that retard the pitting process. Thus, in the early years of burial, steel will exhibit a higher pitting rate. As the corrosion products accumulate on the steel surface, the pitting process slows down. The pit will continue to get deeper, but at a progressively decreasing rate.

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*The term 'pitting' used in this report refers to the type of local corrosion that forms pits when carbon steels corrode in soil and where the rate of pit propagation decreases with time. This is not the same as pitting corrosion associated with passive metals such as stainless steels when these steels are exposed to solutions containing halide ions, where the rate of pit propagation increases with time.

Factors that affect the rate of corrosion of steel in soil include soil resistivity, soil chloride content, soil sulfate content, and soil acidity (pH). Site-specific data were collected at trench 94 to determine the corrosion potential of the soils in which the reactor compartments will be buried.

The soil resistivity was measured at depths of 3, 6, 9, 12, and 15 meters at each of six locations around the perimeter of and adjacent to trench 94 using the Wenner Four Electrode Method [Standard Method G-57-78 (ASTM 1989)], identified in Attachment 5. The results of this investigation indicate that the soils at and near trench 94 are generally of high resistivity and present a low corrosion potential. Soil resistivity values ranged from 10,140 ohm-centimeter to 166,305 ohm-centimeters, with an average of 31,000 ohm-centimeter. For comparison, values above 10,000 ohm-centimeters are considered by the National Association of Corrosion Engineers (NACE) to indicate low relative corrosion rates. Although resistivity is a good indicator of soil corrosivity, the resistivity data used alone do not allow calculation of site-specific corrosion rates for the reactor compartments in trench 94.

Soil samples were taken from representative locations in trench 94 and tested for moisture content and soil chemistry, including pH, and chloride and sulfate concentrations.

Information from NIST corrosion test sites with soil characteristics comparable to those at trench 94 was evaluated. These sites (Springfield, Ohio; Los Angeles, California; and Salt Lake City, Utah) provided a good indication of expected corrosion rates for trench 94. Corrosion data from these NIST test sites showed a pitting corrosion rate that ranged between 0.0058 and 0.0091 centimeter per year for bare uncoated steel. These comparisons are shown in Attachment 3, Table 1. The NCEL predicts the pitting corrosion rate for trench 94 actually to be lower than the values from the comparison sites because the soil resistivity at the 218-E-12B Burial Ground is significantly higher than at the comparison sites.

Based on these comparisons, the maximum pitting rate is predicted to be no more than 0.0089 centimeter per year. A linear projection predicts a maximum pit depth of 0.89 centimeters in 100 years. However, a pit depth of 0.254 centimeter in 100 years is more likely (averages to an expected pitting rate of 0.0025 centimeter per year) because of the benign conditions that are established in the controlled burial of reactor compartments in trench 94, and the fact that the pitting rate for steel buried in soil will not follow a linear rate, but actually will decrease with time.

These predicted values were supported by the data obtained from inspection of fuel storage tanks unearthed at the Hanford Facility (WHC 1992b). Sixteen underground fuel storage tanks were exhumed from soil between 1989 and 1990. These tanks were constructed of carbon steel somewhat similar to the steel of the reactor compartments. The tanks had been buried for as long as 46 years and provided good evidence of the expected performance of steel buried at the Hanford Facility over long periods (WHC 1992b).

An independent review of the NCEL study was performed by NIST, who combined the NCEL data from comparison sites and performed a linear regression analysis to evaluate the validity of the linear model used by NCEL to predict pitting at 100 years (Attachment 4). Based on analysis of these data, the expected maximum pit depth in samples buried at the NIST sites for 100 years is 0.553 ± 0.262 centimeter) with a 99 percent confidence interval (dashed lines Figure 1, Attachment 4). This averages to a pitting rate of 0.005 ± 0.0014 centimeter) per year (solid line of Figure 1, Attachment 4). Considering that trench 94 has higher resistivity than the NIST sites used for comparison, and considering that a linear projection to estimate maximum pit penetration provides a conservative estimate, the NIST review indicated that the estimated maximum pit depth in steel buried in the trench 94 environment will be less than 0.89 centimeter after 100 years with an expected pit depth of 0.25 centimeter in 100 years being reasonable. These 100-year pit depths, when converted to linear pitting rates, result in a maximum pitting rate of 0.0089 centimeter per year and an expected pitting rate of 0.0025 centimeter per year.

4.1.2 Reactor Compartment Package Expected Lifetime

Based on the containment thicknesses presented in Section 3.2, and the predicted corrosion rates, the containment lifetime of the reactor compartments can be calculated. For submarine reactor compartments, the earliest time to penetration of the 1.27-centimeter-thick plates (covering small diameter hull penetrations on older reactor compartments at trench 94) is 143 years, using the maximum pitting corrosion rate of 0.0089 centimeter per year. Using the expected pitting corrosion rate of 0.0025 centimeter per year, the covers would not be penetrated for 500 years. It would take 1.5 times as long to penetrate the 1.9-centimeter-thick hull penetration covers currently installed on submarine reactor compartments and the 1.9-centimeter-thick plate forming the ends of submarine reactor compartment packages. It would take even longer to penetrate the minimum 3.18-centimeter-thick exterior structure of cruiser reactor compartment packages.

Pitting corrosion of the 1.27-centimeter-thick cover plates is, however, unlikely to be the controlling factor in exposing contaminants to the soil. Pitting corrosion initially would result in only very small pits (0.159 centimeter diameter) randomly distributed over the surface of the reactor compartment. Because of the arid climate, and dry nature of in situ soil at trench 94, the soil above the reactor compartments (when buried) is not expected to become saturated with water, and thus moisture should not separate from the soil and enter pits at the reactor compartment surface. In addition, these pits will not allow soil to enter the reactor compartment in any significant quantity. Because of the geometry of the reactor compartment, small amounts of soil entering through pits in the 1.27-centimeter covers will not contact contaminants. Oxygen depletion will inhibit corrosion in the sealed reactor compartments until the time the containment is penetrated by external corrosion. An analysis of corrosion failure of the reactor compartments indicates that the first significant contact of soil with lead

probably will occur when general corrosion weakens external containment structures to the degree where soil loading causes the structures to rupture.

Pitting corrosion rates are based essentially on the depth of the deepest pit measured on a test surface. Figure 4-1 depicts a typical corrosion profile on a corroded steel surface. Pit depth and volume, shown by the solid line, vary across the surface. This variation can be normalized across the corroded surface to a uniform reduction in metal thickness (shown by the dashed line). This is accomplished by measuring the weight loss of the corrosion specimen, converting to a metal volume loss by use of a material density, and applying this volume loss across the entire surface. Dividing this uniform thickness reduction over a time period produces a general (uniform) corrosion rate. General corrosion rates in soils are significantly lower than pitting rates. Table 4-1 is a list of 'maximum penetrations' (pitting rates) and 'average penetrations' (general corrosion rates) derived from NIST corrosion test sites. The ratio of pitting rate to general corrosion rate is called the pitting factor. To estimate the general corrosion rate from a predicted pitting rate, the pitting rate is divided by the pitting factor. As shown, the general corrosion rates in soils considered to be similar to those in trench 94 are approximately 10 times less than the pitting rates (pitting factor of 10). To be conservative, general corrosion rates for trench 94 were estimated using a pitting factor of 6, thus set at 1/6th the pitting rates predicted by NCEL vice 1/10th as the data would suggest. Using this ratio, the maximum long-term general corrosion rate for trench 94 would be 0.0015 centimeter per year based on the maximum 0.0089 centimeter per year pitting rate predicted by NCEL. Similarly, an expected long-term general corrosion rate of 0.0005 centimeter per year would be calculated from the expected pitting rate of 0.0025 centimeter per year.

General corrosion eventually will cause reactor compartment package containment structures to be unable to resist the pressure exerted by the soil, causing the structures to rupture. The capacity of these structures to withstand soil loading is evaluated. The 1.9-centimeter-thick containment structure forming the ends of submarine reactor compartment packages (spanning most of the hull diameter) is expected to be the limiting case in this regard, rupturing before the small cover plates. The earliest time at which rupture occurs is approximately 600 years, using the maximum general corrosion rate of 0.0015 centimeter per year. Using the expected general corrosion rate of 0.0005 centimeter per year, rupture would not occur for approximately 2,100 years. Even then, only a small amount of lead would be exposed because there is typically 0.95-centimeter-thick steel plate covering the lead shielding panels inside the reactor compartment packages. Cruiser reactor compartments are expected to be as durable as submarine reactor compartments due in part to the minimum 3.18-centimeter-thick external structure of these reactor compartment packages.

It is important to note that the structures being discussed are separated from the internal shielded bulkheads of the reactor compartment. Even after the external containment structures begin to fail, structural support would be provided by the internal shielded bulkheads and, for submarines, also internal hull stiffeners, which have not been exposed to soil.

It is concluded that pitting corrosion will not penetrate the thinnest containment plating (the small 1.27-centimeter-thick hull penetration covers on submarine reactor compartments) for at least 143 years and more likely about 500 years; however, this penetration would not result in generation of contaminated leachate. Using a conservative approach, the first potential generation of contaminated leachate would not occur for about 600 years at the minimum and more likely about 2,000 years, as a result of general corrosion and soil pressure causing the rupture of external containment structures allowing soil to enter areas containing lead shielding.

4.2 LEAD MIGRATION

Leachate can be generated when waste is contacted by moisture that infiltrates down through the soil. The characteristics of the leachate, combined with the geochemical and geohydraulic properties of the soil, determine how quickly and at what concentration contaminants will reach groundwater. This section discusses the potential of the lead shielding in the reactor compartments to dissolve and migrate to groundwater (the unconfined aquifer) and to surface water (the Columbia River). Section 4.5 discusses the migration potential of the PCBs contained within the reactor compartments.

Lead is relatively stable and insoluble in the environment and does not readily form leachate through dissolution or by soil chemical reactions. Additionally, soil has a strong tendency to adsorb lead and lead compounds. Thus lead will not migrate readily from the reactor compartments to groundwater. However, the detrimental health effects of lead cause lead to be of concern in drinking water, even at very low concentrations. Therefore, the DOE-RL considers that there would be an inherent responsibility to evaluate the potential for the lead in the reactor compartment to migrate to groundwater and to potential future downstream users, even if this were not required to support a request for exemption from lined trench requirements.

4.2.1 Lead Migration Analysis

A lead migration analysis was conducted by PNL using the site-specific information of trench 94 (PNL 1992). The following discussion summarizes the results of the report.

Over the future millennia, the reactor compartments will be subject to degradation by the natural environment, primarily through corrosion caused by chemical weathering, and dissolution by vertically infiltrating water. The resulting leachate (infiltrating water containing solute) will drain downward through the unsaturated vadose zone under the influence of gravity until the leachate enters the unconfined aquifer, where the leachate would disperse and would be transported to the Columbia River. Some materials are transported at the same velocity as the water in which the materials are dissolved. Others are retarded by soil adsorption mechanisms. These mechanisms are represented by a retardation factor (R), which is the ratio of the velocity of the water

to the velocity of the solute. These transport processes occur very slowly in the dry, slightly alkaline Hanford Facility soils.

The potential for lead within the reactor compartments to enter groundwater under the 218-E-12B Burial Ground was investigated by examining available data on the geology, geochemistry, and geohydrology of the 218-E-12B Burial Ground. The data were used to develop a conceptual model for release and transport of lead from the reactor compartments. This model assumes that the geology of the site will remain constant over the future millennia. The characteristics of the Hanford formation beneath the burial ground were investigated using existing data and by sampling soil from the excavated faces of trench 94. Strata in the faces of trench 94 were mapped, and drilling logs from boreholes and wells adjacent to the 218-E-12B Burial Ground were used to map sediment in the strata between the floor of trench 94 and the basalt formation. Sediment samples collected at trench 94 and a limited number of samples from borehole cuttings were tested to determine their physical and hydraulic properties, including grain size distribution, moisture content, porosity, permeability, and bulk density.

The solubility of lead in Hanford Facility soils and groundwater was predicted using the MINTEQ computer code (PNL 1987a) along with groundwater chemistry data from laboratory analysis of samples from an onsite monitoring well. Laboratory batch adsorption studies and flow through soil column studies were conducted to determine the distribution coefficient (Rd) for lead adsorbed on Hanford formation sediments. These studies also included experiments to determine the effect of other major materials in the reactor compartments, such as nickel, to compete with lead for adsorption by the soil. The retardation factor (R) was calculated using the distribution coefficient (Rd), soil bulk density, and soil porosity.

Computer modeling was employed to quantify the rate of groundwater movement through the vadose zone and the unconfined aquifer, and to predict the rate of lead migration from trench 94 to downgradient locations. The CFEST code was used to produce a two-dimensional model of the regional aquifer to obtain parameters necessary for the lead transport analysis. The TRANSS code (PNL 1986a) was employed to simulate mass flow and transport through the vadose zone and the unconfined aquifer using a one-dimensional stream tube approach. This approach is similar to that used in previously published documents for the Hanford Site (DOE 1987; DOE 1989). The TRANSS code used for the modeling is a less sophisticated code than the VAM3D or PORFLO-3 codes. The TRANSS code was selected because it had been used in previous onsite studies (e.g., DOE 1987; DOE 1989). The TRANSS code provided a relatively uncomplicated approach to generate a conservative model of lead migration. A conservative code uses weighted input parameters to generate the shortest likely migration times and the largest likely groundwater concentrations. Extensive conservatism was built into the one-dimensional TRANSS code analysis.

Results were obtained for a single reactor compartment and for 120 reactor compartments in trench 94, using both current climactic conditions and a potential future wetter condition. The 'recharge' volume of water moving down through the soil was established as 0.5 centimeter per year for

the current climate case and 6.0 centimeters per year for the wetter condition, which generally is consistent with values used in other Hanford Site environmental impact studies (DOE 1987; DOE 1989). Neither scenario takes credit for the cover. The models were used to calculate the travel times and potential lead concentrations in the aquifer 100 meters from the reactor compartment burial site, and at a well location 5 kilometers downstream. The travel times and potential concentration of lead in the Columbia River also were calculated.

The results from the PNL lead migration study (PNL 1992) were extrapolated (USN 1995) to consider the cumulative effects of the disposal at trench 94 of all of the reactor compartment types shown in Figure 3-1. A total of 220 reactor compartments were considered in the extrapolation for a conservative estimate of impact. The extrapolation incorporated refinements in the migration modeling developed by PNL after the original lead migration study, namely a more accurate estimate of the amount of recharge water contacting reactor compartments and a more accurate aquifer streamtube dimension. These refinements tended to reduce predicted lead concentrations in the aquifer. The very long times predicted by PNL for lead to migrate to groundwaters were unchanged.

4.2.2 Lead Migration Results

The results of the lead migration studies indicate the following (as extrapolated for 220 reactor compartments at trench 94) (USN 1995; PNL 1992).

- For an arid climate similar to present conditions at a recharge rate of 0.5 centimeter per year:

  - Lead would not reach the unconfined aquifer for 2.2 million years

  - The maximum predicted concentration of lead after 2.2 million years is 4 parts per billion at 100 meters and at 5 kilometers from the reactor compartment burial site

  - Lead would not reach the Columbia River for 2.8 million years

  - The quantity of lead entering the Columbia River would not exceed 94 grams per year (not presented in USN 1995).

- For the wetter condition at a recharge rate of 6 centimeters per year:

  - Lead would not reach the unconfined aquifer for 240,000 years

  - The maximum predicted concentration of lead after 240,000 years is 26 parts per billion at 100 meters and at 5 kilometers from the reactor compartment burial site

  - Lead would not reach the Columbia River for 740,000 years

- The quantity of lead entering the Columbia River would not exceed 1,110 grams per year (not presented in USN 1995).

It is important to note that these studies are very conservative.

- The modeling does not account for the presence of a (moisture barrier) cover.

- The studies conservatively assume that all moisture contacting lead dissolves lead to the maximum concentration of lead that the moisture can hold (i.e., the lead solubility limit). Conservative lead solubilities are assumed at about twice the value obtained through laboratory testing.

- The adsorption of lead in soil is characterized with a Rd that effectively shows the ratio of lead adsorbed in soil to that remaining in solution. Conservative values for this coefficient are assumed at about one-half the values obtained through laboratory testing.

- The one-dimensional TRANSS code simulation of lead mass transport modeling assessed the magnitude of potential problems resulting from contaminant migration. The code was used as a conservative screening tool. In general, this less sophisticated code would be expected to overestimate groundwater concentrations when compared with the results of two- and three-dimensional groundwater flow and transport codes (PNL 1992). The calculations indicate that any lead migration will be tens to hundreds of thousands of years into the future, and the resulting groundwater concentrations will be low.

4.3 POLYCHLORINATED BIPHENYL MIGRATION

The reactor compartments also might contain several kilograms of PCBs (typically less than 5 kilograms) tightly bound in the composition of solid materials such as thermal insulation, electrical cable coverings, and rubber items manufactured before PCBs were banned in the mid-1970's. Because PCBs are present in materials in concentrations above 50 parts per million, disposal of the reactor compartments in trench 94 is regulated by the EPA under TSCA (40 CFR 761). To obtain a waiver from liner/leachate collection system requirements under 40 CFR 761.75(c)(4), it is necessary to demonstrate that this disposal will not present an unreasonable risk to human health or the environment.

The conclusion that these PCBs do not pose an unreasonable risk to human health or the environment is supported by the following.

- **The small amount of PCBs initially present**-- Several kilograms (typically less than 5 kilograms) typically represents only about 3 to 5 parts per million of a whole reactor compartment package. In addition, reactor compartments constructed after PCBs were banned might not contain solid PCBs. No liquid PCBs are present in the reactor compartments.

- **The difficulty of extracting the PCBs from the components or materials**--The initial concentrations of PCBs in leachate will be controlled by solubility of the PCBs present. The potential leachate is water. The PCBs present in the reactor compartments consist primarily of Aroclor* 1254 with lesser amounts of Aroclor 1260 (PSNS 1990b). The water solubilities of these PCB formulations are 0.012 milligrams per liter and 0.003 milligrams per liter, respectively (EPA 1985, p. 4-11). Therefore, even if the PCBs were not tightly bound in the solid materials of the reactor compartment, their solubility in water is extremely low and the potential concentration in leachate is very low. However, the PCBs in the reactor compartments are not free to dissolve in water. The PCBs are part of the formulation of solid materials within the reactor compartment and are tightly bound in the material's matrix. In this form, the PCBs are not measurably soluble and cannot be removed by wipe sampling methods. Thus, the release of the PCBs will be over long periods as the parent materials break down.

- **The small amount of water in the soil**--The arid conditions of the Hanford Facility environment strictly limit the amount of water available to support PCB extraction and transport. Trench 94 soils are a typical mix of Hanford formation sandy gravel and gravelly-sand. The water content in the vadose zone is less than 6 percent by weight.

- **Containment**--The reactor compartments are expected to contain the PCB materials for about 600 years at the minimum and more likely about 2,000 years, at least as long as for lead. The dry soil will inhibit breakdown of the PCB materials.

- **The dilution in the vadose zone and aquifer over very long periods**--The nature of the PCBs and the reactor compartment disposal site severely will restrict the release of PCBs from entering the food chain or being consumed by humans. Using the transport modeling from the lead migration study (PNL 1992), if 1/2 the moisture assumed to contact the reactor compartments (as a result of surface precipitation falling on soil directly above the reactor compartments) is very conservatively assumed to dissolve PCBs at the maximum cumulative solubility of 0.015 milligrams per liter, downstream PCB concentrations in the aquifer under the site should be less than 1/2 part per billion even under the conservative wetter condition case (USN 1995).

- **The attenuation on soil**--It is unlikely that soluble PCBs would travel at the same velocity as the downward percolating water in the vadose zone or in the stream tube in the aquifer. As PCB-contaminated leachate moves through the soil, the PCBs will be retarded by soil attenuation. The primary mechanism for attenuation of water-soluble PCBs is adsorption on organic carbon present in the soil.

---

*Aroclor is a trademark of Monsanto Chemicals.

For soil attenuation of organics such as PCBs, a distribution coefficient, K_{oc}, describes the equilibrium ratio of the concentration of contaminant in solid organic carbon to the concentration in the liquid phase (i.e., milligram per kilogram-oc per milligram per liter). Values of K_{oc} for Aroclor 1254 and Aroclor 1260 are 530,000 liters per kilogram and 6,700,000 liters per kilogram, respectively (Mabey et al. 1982). For comparison, the K_{oc} values for typical organic contaminants were reported by Lyman et al. (1982, p. 4-1) to range from 1 liter per kilogram to 10,000,000 liters per kilogram, with the low value representing low adsorption and the high value representing very high adsorption. The values for Aroclor 1254 and Aroclor 1260 are near the upper end of this range, which indicates a high adsorption potential. Even though the organic carbon content in trench 94 soil is low, some adsorption on soil will occur, retarding the PCB migration and potentially further reducing the already low concentrations predicted.

In summary, the containment of the reactor compartment package and the tightly bound nature of the small amount of PCBs present will prevent any migration for many centuries or longer. Any subsequent release and migration of PCBs should occur so slowly, and the concentrations of PCBs that enter the environment will be so small, that it can be concluded that this disposal of PCBs will not present an unreasonable risk to human health or the environment.

4.4 DEMONSTRATION THAT PERFORMANCE EVALUATIONS SATISFY PERFORMANCE CRITERION

This section demonstrates that the results of the previous performance evaluations satisfy the performance criterion of Section 2.3, which was established to determine if the regulatory requirements of WAC 173-303 and 40 CFR 761 for exemption from liner/leachate collection system requirements are met.

4.4.1 Demonstration of Better Performance than Minimum Technological Design Requirements for Liner/Leachate Collection Systems

Section 4.1.2 contains an estimate of the containment lifetime of reactor compartment packages buried in trench 94 using site-specific corrosion studies. Without credit for the cover, and using the 'maximum' pitting corrosion rate of 0.0089 centimeter per year, the first pit would not penetrate the containment for at least 143 years. Using the more probable 'expected' pitting corrosion rate of 0.0025 centimeter per year, the first pit would not penetrate the containment for 500 years. These first small penetrations would occur in the minimum 1.27-centimeter-thick cover plates and would not result in the generation of contaminated leachate. It is estimated that the first potential for generation of contaminated leachate would not occur until general corrosion caused structural failure that allowed the surrounding soil to contact lead. This event would not occur for about 600 years at a minimum, and more likely for about 2,000 years after burial.

It is clear that the optimistic estimate of liner design life falls far short (by an estimated 500 years) of the conservative estimate of reactor compartment containment lifetime (i.e., based on 'maximum' corrosion rates). Thus, the performance criterion is satisfied.

Trench 94 has been in operation since 1986 without burial of the reactor compartments placed there. This mode of operation allows flexibility in the disposal of this unique waste and this practice could continue until installation of the final RCRA cover. The following operating practices are employed to monitor the condition of the reactor compartments until these are buried. Each week a nuclear operator performs an inspection of trench 94. The reactor compartments are visually inspected to verify their integrity. In addition, trench 94 is inspected for run-on, run-off, and erosion problems after a significant precipitation or windstorm event. Further corrective actions are discussed in the building emergency plan (Chapter 7.0).

4.4.2 Demonstration of Long-Term Performance of the Disposal System

Section 4.2.2 summarized the results of the site-specific lead migration studies. The PNL study (PNL 1992) showed that lead is strongly retained by soil adsorption. This result was not affected by the addition of reactor compartments to trench 94 (USN 1995). For the current arid climate condition, using conservative assumptions and the immediate availability of soluble lead, with conservative modeling, lead would not migrate to the aquifer at 100 meters from trench 94 for at least 2.2 million years or to the Columbia River for at least 2.8 million years.

For a potential future wetter condition, using the same conservative assumptions and modeling, lead would not migrate to the aquifer at 100 meters from trench 94 for at least 240,000 years or to the Columbia River for at least 740,000 years.

These timeframes are well beyond the time the Hanford Site geological and hydrological features could be transformed by glacial flooding and scouring (DOE 1987, p. 3.58). The predicted timeframe for return of an ice age is 40,000 to 50,000 years (DOE 1987, p. 5.25). Studies based on previous ice age events postulate that breakthrough of ice dams on upper tributaries of the Columbia River will produce glacial flooding in the Hanford Basin, which reasonably could be expected to scour out the waste sites to a depth of several meters. Then, as flood waters back up at Wallula Gap, the water velocity markedly would decrease and most of the sediments and waste probably would be reworked and redeposited within the Pasco Basin (PNL 1985). Waste in burial ground trenches could be scoured out and either would be carried to the ocean or redeposited along with other sediments in the Pasco Basin. The Hanford Site defense waste EIS indicated that "In any event, such floods would obliterate most evidence of civilization along the Columbia River" (DOE 1987, p. 5.25). Thus, it is generally accepted that events that reasonably cannot be expected to occur within a 100,000-year timeframe should not be considered in environmental evaluations. In fact, most studies are limited to 10,000 years, with a period of interest occasionally extending up to 100,000 years.

It is clear that even the most conservative estimate of the time for lead to reach groundwater or surface water significantly exceeds the timeframes of concern.

4.5 SUMMARY

The information presented in this section has demonstrated that the reactor compartments will outlast, by a considerable margin, the estimated design life of a liner/leachate collection system. This section also has demonstrated that the lead in the reactor compartments will not migrate to groundwater before a timeframe that is beyond the geologist's ability to predict future geologic conditions. Finally, the information presented has demonstrated that the small amount of PCBs in the reactor compartments does not present an unreasonable risk to the environment. These demonstrations satisfy the regulatory requirements for exempting trench 94 from liner/leachate collection system regulatory requirements.

The strong structure of the reactor compartments and the low corrosion rates identified for buried steel at trench 94 provide an excellent barrier to the generation of leachate from the waste. The dry climate and native soil together will further limit any potential movement of lead from the waste. Even when considering future wetter conditions, lead would not reach the groundwater aquifer for about 240,000 years. Over this time, impacts from human activities and geologic events (e.g., next ice age) would be far greater than any impacts from the lead.

Trench 94 has been in operation since 1986 without burial of the reactor compartments placed there. This mode of operation allows flexibility in the disposal of this unique waste and this practice could continue until installation of the final RCRA cover. Weekly inspections of the waste and trench are conducted and will continue until the reactor compartments are buried.

The beneficial site and waste characteristics combined with the operating practices for trench 94 ensure that human health and the environment are protected adequately by the proposed alternative of land disposal of the reactor compartments in an unlined trench with a cover.

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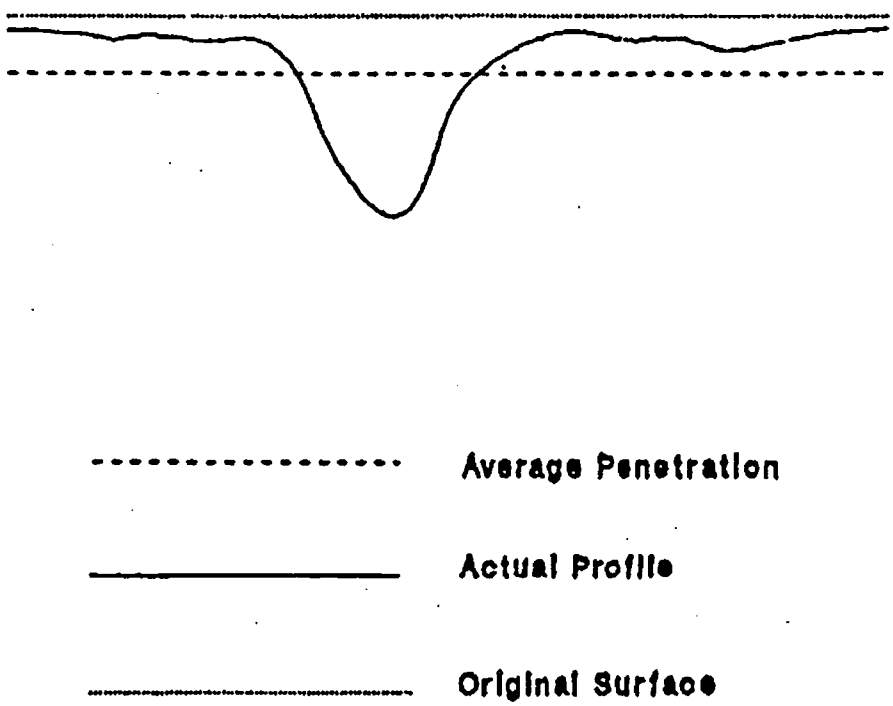

Figure 4-1. Typical Corrosion Profile.

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Table 4-1. National Institute of Standards and Technology Corrosion Test Site Data.

Test site	Maximum penetration rate (inches per year)	Average penetration rate (inches per year)	Pitting factor*
Springfield, Ohio	0.00355	0.00037	9.59
Los Angeles, California	0.00338	0.00028	12.07
Salt Lake City, Utah	0.00229	0.00023	9.96

*Pitting factor = maximum penetration/average penetration.
For conversion to centimeters, multiply inches by 2.54.

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5.0 REQUEST FOR EXEMPTION FROM LINED TRENCH REQUIREMENTS

Section 4.0 provides the following:

- Performance of the proposed alternate design in preventing migration of the only WAC 173-303 regulated dangerous waste constituent, the shielding lead; and performance results from the ability of the site characteristics to strongly attenuate migration of this constituent

- Demonstrates that this performance satisfies the previously stated conditions for waiving liner/leachate collection system requirements (i.e., there is no technical advantage to installing a liner/leachate collection system at trench 94)

- Concludes that not only are the regulatory criteria for waiving liner/leachate collection system requirements satisfied, but in addition, operating practices are employed that are protective of the environment.

Thus, the DOE-RL hereby applies for an exemption from the dangerous waste landfill liner/leachate collection system requirements specified in WAC 173-303-665(2)(a) and WAC 173-303-665(2)(h), under the provisions of WAC 173-303-665(2)(b) and WAC 173-303-665(2)(j), for disposal of reactor compartments in trench 94 of the 218-E-12B Burial Ground on the Hanford Facility.

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ATTACHMENT 1

LETTER 02/01/91 FROM M. GEARHEARD (U.S. ENVIRONMENTAL PROTECTION AGENCY) TO K.W. BRACKEN (U.S. DEPARTMENT OF ENERGY, RICHLAND OPERATIONS OFFICE) REGARDING "REGULATION OF SUBMARINE REACTOR COMPARTMENT DISPOSAL PACKAGES"

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United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

February 1, 1991

Reply To
Attn Of: HW-074

Kenneth W. Bracken, Acting Director
Waste Management Division
Department of Energy
Richland Operations Office
P.O. Box 550 (A5-21)
Richland, Washington 99352

Re: Regulation of Submarine Reactor Compartment Disposal Packages

Dear Mr. Bracken:

The U.S. Environmental Protection Agency (EPA) Region 10 has recently reviewed the regulation of the Submarine Reactor Compartment (SRC) disposal packages under the Resource Conservation and Recovery Act (RCRA). The lead shielding in the SRC disposal packages is considered by EPA Region 10 to be an integral part of the container and still serving its intended primary purpose. Therefore, the lead shielding contained in the SRC disposal packages is not considered to be solid waste as defined by 40 CFR § 261.2. This position is consistent with the enclosed EPA-Headquarters policy and guidance regarding lead used as shielding. In addition, since the lead shielding is not a RCRA hazardous waste, it is not subject to the treatment requirements under RCRA for a D008 radioactive lead solid as defined in 40 CFR § 268.42, Table 3. The SRC lead shielding is, however, regulated as a "state only dangerous waste" by the Washington State Department of Ecology.

EPA Region 10, based on a review of the Puget Sound Naval Shipyard, March 12, 1990 "Reactor Compartment Disposal Package Hazardous Material Investigation" and December 12, 1990 "Engineering Report of Liquid Removal from Submarine Reactor Compartment Disposal Packages", believes that the SRC disposal packages are not subject to regulation by EPA Region 10 under RCRA. The EPA Region 10 will, however, continue to regulate the polychlorinated biphenyls (PCBs) contained in the SRC disposal packages in accordance with the Toxic Substances Control Act (TSCA). Until such time as the TSCA chemical waste landfill approval is granted, the Department of Energy (DOE) must continue to operate under the terms of the March 27, 1990 TSCA Compliance Agreement regarding PCB disposal for the SRC disposal packages. If any additional information pertinent to the regulation of the SRC disposal packages becomes available, the DOE must inform EPA Region 10 of any changes.

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DOE-RL/AMR

If any additional information is required, please contact Daniel Duncan at (206) 553-6693/FTS 399-6693.

Sincerely,

Michael Gearheard, Chief
Waste Management Branch

cc:

Paul Day, EPA
Tom Eaton, Ecology
Toby Michelena, Ecology
Timothy Nord, Ecology
Roger Stanley, Ecology
Captain Arthur Clark, PSNS

ATTACHMENT 2

LETTER FROM WASHINGTON STATE DEPARTMENT OF ECOLOGY TO U.S. DEPARTMENT OF ENERGY, RICHLAND OPERATIONS OFFICE REGARDING REACTOR COMPARTMENT COMPLIANCE WITH LAND DISPOSAL RESTRICTIONS

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
1315 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

February 28, 1996

Mr. James E. Rasmussen
U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, WA 99352

Dear Mr. Rasmussen:

Re: Reactor Compartments Disposal Packages Meet Disposal Requirements

The Washington State Department of Ecology (Ecology) has reviewed your January 12, 1996, letter, Request for Concurrence that Reactor Compartment Disposal Packages Comply with Amended Disposal Regulations Regarding Residual Liquids.

Ecology understands the Reactor Compartment Disposal Packages are a unique waste form and agrees the proposed disposition of these packages is environmentally protective and in compliance with WAC 173-303, provided the following conditions are satisfied.

- Liquids in the Reactor Compartment Disposal Packages shall be removed to the maximum extent practical considering As Low As Reasonably Achievable principles for controlling worker radiation exposure.

- Liquids existing in piping systems external to the forward and aft bulkhead shall be removed by draining from existing valves at low points, dismantling of the piping systems, or equivalent method.

- Liquids existing in piping systems internal to the forward and aft bulkheads shall be removed by draining from existing valves at low points, pumping out, "blowing down," using compressed gas, or equivalent method.

- Liquids in the reactor vessel and primary shield water tanks shall be removed to the maximum extent practical by pumping or equivalent method. A non-biodegradable sorbent shall be added to reactor vessels and primary water shield tanks (as internal configuration permits) to absorb any liquids remaining.

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In the event a Reactor Compartment Disposal Package does not meet the criteria listed above, Ecology should be contacted prior to disposal to determine compliance with WAC 173-303. If you have any questions, please call me at 736-3048.

Sincerely,

Norman T. Hepner, P. E.
Nuclear Waste Program

NH:mf

cc: Mark French, USDOE
Jim Wrzeski, PSNS

ATTACHMENT 3

PREDICTION OF PITTING CORROSION PERFORMANCE OF SUBMARINE REACTOR COMPARTMENTS AFTER BURIAL AT TRENCH 94, HANFORD, WASHINGTON

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DEPARTMENT OF THE NAVY

NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CA 93043-5003

IN REPLY REFER TO:
3900
Ser L43/0286

25 MAR 1992

From: Commanding Officer, Naval Civil Engineering Laboratory, Port Hueneme

To: Commander, Puget Sound Naval Shipyard, Bremerton, WA 98314-5000 (Code 2300.1)

Subj: CORROSION OF BURIED SUBMARINE REACTOR COMPARTMENTS

Encl: (1) NCEL Report "Prediction of Pitting Corrosion Performance of Submarine Reactor Compartments After Burial at Trench 94, Hanford, Washington" - March 1992

1. Enclosure (1) is a final report on an effort by the Naval Civil Engineering Laboratory (NCEL) to predict the corrosion behavior of decommissioned submarine reactor compartments that are to be buried at Hanford, Washington. The report was prepared at the request of the Nuclear Engineering Department, Code 2300.1, Puget Sound Naval Shipyard (PSNS) and is based upon both the evaluation of historical corrosion data from the literature and an NCEL inspection of steel structures exhumed from the vicinity of the burial site. This report completes the NCEL effort on this project.

2. Based upon a conservative evaluation of both the historical corrosion data from the literature and from the evaluation of structures exhumed from the vicinity of the burial site, a maximum penetration of 0.350 inches over a 100 year burial period was projected. A more realistic maximum penetration of 0.100 inches in 100 years can be achieved through the use of select backfill adjacent to the reactor compartments and the installation of a moisture barrier cover over the trench.

Paul A. Chapla

PAUL A. CHAPLA

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Prediction of Pitting Corrosion Performance of Submarine Reactor Compartments After Burial at Trench 94, Hanford, Washington

March 1992

NCEL
Naval Civil Engineering Laboratory
Port Hueneme, CA 93043-5003

Author: Jim Jenkins

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PREDICTION OF PITTING CORROSION PERFORMANCE OF SUBMARINE REACTOR COMPARTMENT AFTER BURIAL AT TRENCH 94, HANFORD, WASHINGTON

I. PURPOSE

The intent of this review is to provide a prediction of the maximum penetration which can be expected to occur due to pitting corrosion of Submarine Reactor Compartments during a 100 year period of burial in Trench 94 at Hanford, Washington. This information is needed to determine the need for controlling corrosion of the reactor compartments during the post burial period.

II. BACKGROUND

No site specific corrosion testing has been performed for reactor compartments buried in Trench 94. However, corrosion in Trench 94 soil can be related to experience with corrosion at other sites when comparisons are made based on chemical content, resistivity, aeration and method of burial. This relationship permits long range estimation of corrosion performance in Trench 94 using historical data from the other sites.

This method of predicting corrosion is supported by the results of a study on the conditions of underground fuel storage tanks exhumed at Hanford[1]. Thus, based on an investigation of testing conducted at various sites by the National Institute of Standards and Technology (NIST), formerly National Bureau of Standards, and correlating the results with the corrosion of fuel storage tanks at Hanford, it was possible to establish a conservative estimate of the corrosion of reactor compartments buried in Trench 94 over a 100 year period.

III. CONCLUSIONS

The predicted maximum pitting corrosion penetration for a 100 year period is 0.350 inches for the reactor compartments buried in Trench 94 at Hanford, Washington. The actual amount of pitting corrosion is likely to be considerably less than the estimated maximum penetration for the following reasons:

The HY80 steel used for the submarine hull and the MIL-S-22698 Grade DH-36, CL-U steel used for fabrication of the containment bulkheads on the ends of the compartments are more resistant to corrosion than the open hearth carbon steel used in the NIST corrosion tests.

The reactor compartments will be buried with native soil prepared to provide properties which will give corrosion rates lower than for unprepared native soils. The Hanford soil will be graded to remove stones greater than a half inch to create a uniform backfill that will prevent differential environments that can create galvanic cells that accelerate corrosion. The NIST test data and most of the data from the fuel storage tanks is for steel buried in native soil.

Moisture content of the soil in Trench 94 will be lower since a cover compliant with the requirements of the Resource Conservation and Recovery Act (RCRA) will be installed that reduces moisture incursion into the soil. The NIST test data and the fuel storage tank data are from sites that did not have such a cover. Even without a RCRA cover the moisture content would be lower in Trench 94 since the reactor compartments will be buried 10 to 40 feet underground as compared to NIST testing that was accomplished at 5 feet where the moisture content is higher.

Soil characteristics at Trench 94 are less corrosive than NIST test sites because of the comparable chloride and sulfate content and higher resistivity.

The estimation of the upper limit of corrosion is based on a linear projection of corrosion data which results in a conservative prediction of long term corrosion performance, since actual corrosion rates usually decrease over time.

IV. DISCUSSION

A review of historical corrosion data from studies previously accomplished at Hanford revealed that the conditions affecting corrosion and the materials investigated in most of these studies are not comparable to the reactor compartments buried in Trench 94, (as discussed in Appendix A). Thus, it was concluded that corrosion rates derived from these studies should not be used to predict corrosion rates for reactor compartments in Trench 94.

On the other hand, investigation of corrosion data from tests conducted by the NIST at various sites, and corrosion data from exhumed fuel storage tanks at Hanford, identified conditions more representative of the burial conditions for the reactor compartments in Trench 94 at Hanford, allowing the maximum depth of penetration to be confidently predicted for the 100 year post burial period.

Review of National Institute of Standards and Technology Corrosion Test Data

The use of historical data from other sites to predict corrosion rates at Hanford requires that the soil characteristics be comparable. The characteristics of soil which have the most significant effect on the corrosion performance of buried steel are the resistivity, chloride ion content, sulfate ion content, aeration, and pH.

Extensive soil analysis conducted in Trench 94 by Ebasco Services Incorporated[2X3] confirm that soil characteristics are very comparable with values normally used to describe Hanford[1X5]. Testing did identify an isolated area in Trench 94 with undesirable amounts of chloride and sulfate. However, as reported by Ebasco, these samples were obtained from a thin layer of clay in the trench side and are not representative of the soils in Trench 94.

NIST has conducted extensive corrosion studies on uncoated metals exposed to soil at many test sites[4]. While none of these tests were performed at the Hanford site, the data from several NIST test sites can be used to establish a probable corrosion rate for Trench 94 since the soil characteristics are similar. Soil characteristics and corrosion rates at several of the NIST test sites, and typical soil characteristics for Hanford are given in Table 1. All of the NIST sites have well aerated soils as does Hanford.

While soil characteristics of the NIST test sites are similar to those of Trench 94, the resistivity, which is the predominant factor in terms of corrosivity in these types of soils, is much higher at Trench 94. Therefore, higher corrosion rates are likely to result at the NIST test sites than will be experienced by the reactor compartments buried in prepared backfill in Trench 94. The data from the least corrosive NIST test site, Salt Lake City, indicates a penetration rate of 0.00229 inches per year based upon a test duration of 17.4 years. A projection of the data from the Salt Lake City data is shown in Figure 1. This projection gives a maximum penetration of 0.230 inches in 100 years and establishes a more realistic prediction of long term corrosion of the reactor compartments at Trench 94.

Prediction of long term corrosion performance from short term corrosion data, using a linear projection as discussed above, is imprecise because the corrosion rate varies with time. The corrosion rate for carbon steel generally decreases with time giving a curve which is concave downward as depicted in Figure 2. If the data is from a sufficiently long period, the corrosion data from intermediate periods of exposure can be used to project a realistic, but conservative estimate of long term corrosion performance. This is demonstrated by a linear projection, tangent to the curve for corrosion penetration versus time shown as the line to point A in Figure 2. Linear projection of long term performance from only one data point, a secant projection, will result in a very conservative estimate of long term corrosion performance shown as the line to point B in Figure 2. This secant projection results in a higher estimate of long term corrosion from the same corrosion data. Thus the linear projection used in this study to predict corrosion of reactor compartments is considered conservative

Data from Hanford Underground Storage Tanks

In the period between 1989 and 1991, 16 carbon steel fuel storage tanks, buried for as long as 46 years, were exhumed from the Hanford Site in the vicinity of Trench 94. An evaluation of the external corrosion of these tanks was performed[1] and established a maximum pitting corrosion rate of 0.0035 inches per year. The conclusions of this study are in agreement with results obtained using the NIST test data from other sites for predicting corrosion attributed to soil conditions at Hanford.

Of all the corrosion studies conducted at Hanford, the study of the buried fuel storage tanks most closely relates to the conditions under which the reactor compartments will be buried in Trench 94. The fuel storage tanks were buried in soils and backfill representative of the general characteristics of the Hanford Site[1] as described in Table 1. From inspections of the backfill adhering to the fuel storage tanks, it was apparent that some of the tanks were buried using select backfill (sand), while others had been buried using backfill which had not been prepared, containing both very fine material and large rocks. The tanks buried with unprepared backfill exhibited the worst cases of pitting corrosion due to large stones being in contact with the tank. This created galvanic cells that accelerated the corrosion rate at the point of contact. In comparison, the maximum pitting corrosion rate for the fuel storage tanks buried in prepared-backfill was significantly less and ranged between 0.0013 and 0.0019 inches per year.

The corrosion data from the evaluation of the fuel storage tanks is considered to be applicable for establishing an upper limit on the pitting corrosion of the reactor compartments at Trench 94. A linear projection of the highest pitting corrosion rate gives a conservative estimate of 0.350 inches of pitting corrosion penetration over a 100 year period. For the reactor compartments, lower corrosion rates will be achieved by using prepared native soil, providing an environment which is free from stones or other debris which can cause differential cells that accelerate corrosion. In addition, a lower moisture content will be achieved by installation of a RCRA cover.

V. SUMMARY

In estimating an upper limit for the corrosion of reactor compartments buried in Trench 94 at Hanford, Washington, both historical test data from similar sites and data from excavated material buried in the vicinity of Trench 94 were assessed. In all cases assumptions made in assessing the data were conservative and result in a projection of corrosion penetration higher than that which is realistically anticipated. An estimate of 0.350 inches of penetration of the reactor compartments over a 100 year period is projected as a conservative upper limit considering the assumptions used in the evaluation of the corrosion data. However, a penetration of 0.100 inches in 100 years is expected due to the benign conditions which will be established in the controlled burial of reactor compartments in Trench 94.

Table 1

Soil Characteristics
and Pitting Corrosion Data for
the National Institute of Standards and Technology[4]
Corrosion Test Sites
Compared to Hanford[8X2]

Site	Resistivity (ohm-cm)	Chloride (mg-eq/100g)	Sulfate (mg-eq/100g)	pH	Maximum Penetration Rate (Inches/yr.)
Springfield Ohio	2,980	0.03	0.12	7.3	0.00355
Los Angeles California	2,600	0.06	0.25	7.3	0.00338
Salt Lake City, Utah	1,700	0.06	0.48	7.6	0.00229
Hanford Washington	5,000	0.01	0.10	8.2	—
Trench 94 Hanford Washington	31,000	0.08	0.21	8.2	—

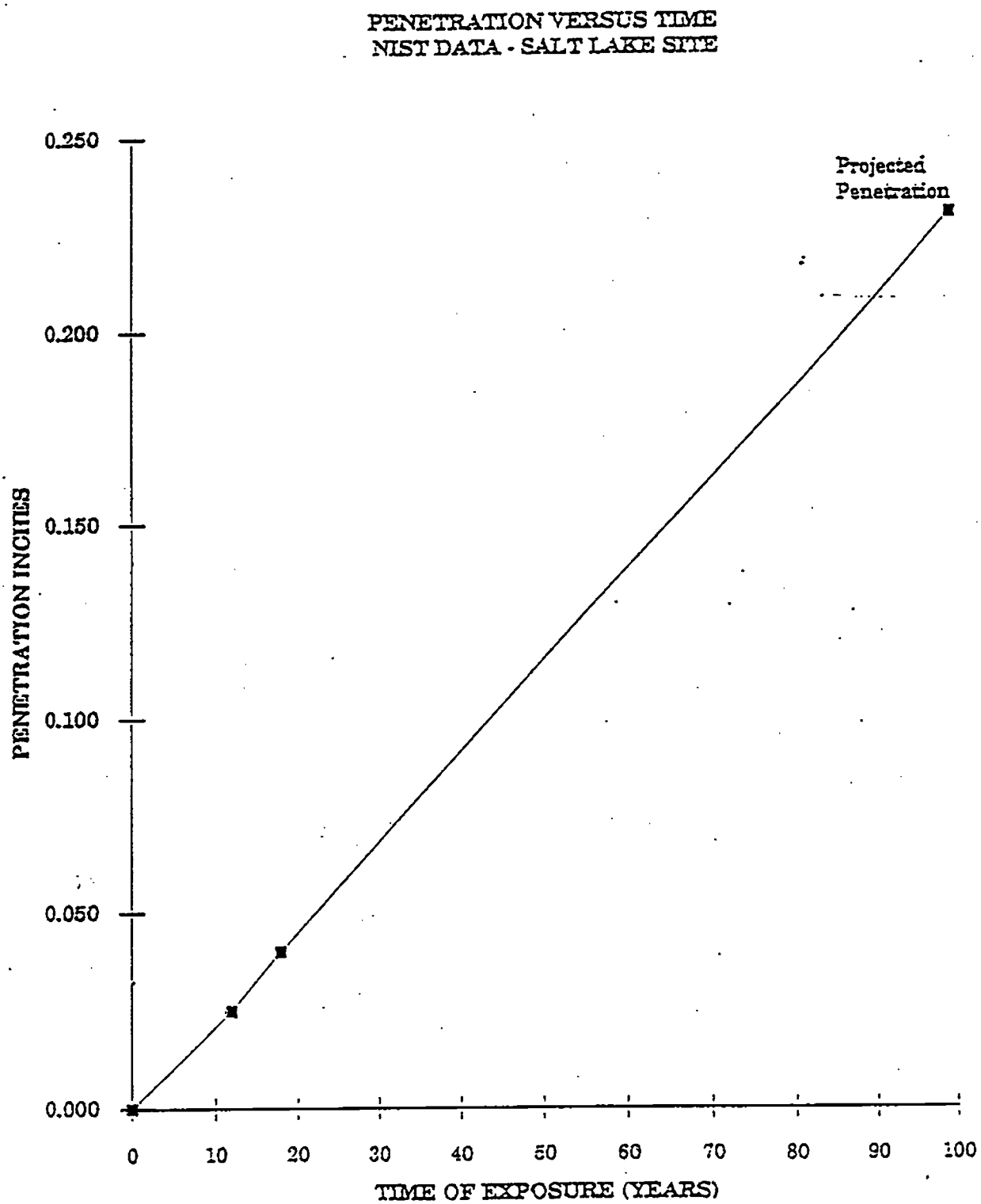

Figure 1. Projection of NIST Salt Lake City Pitting Corrosion

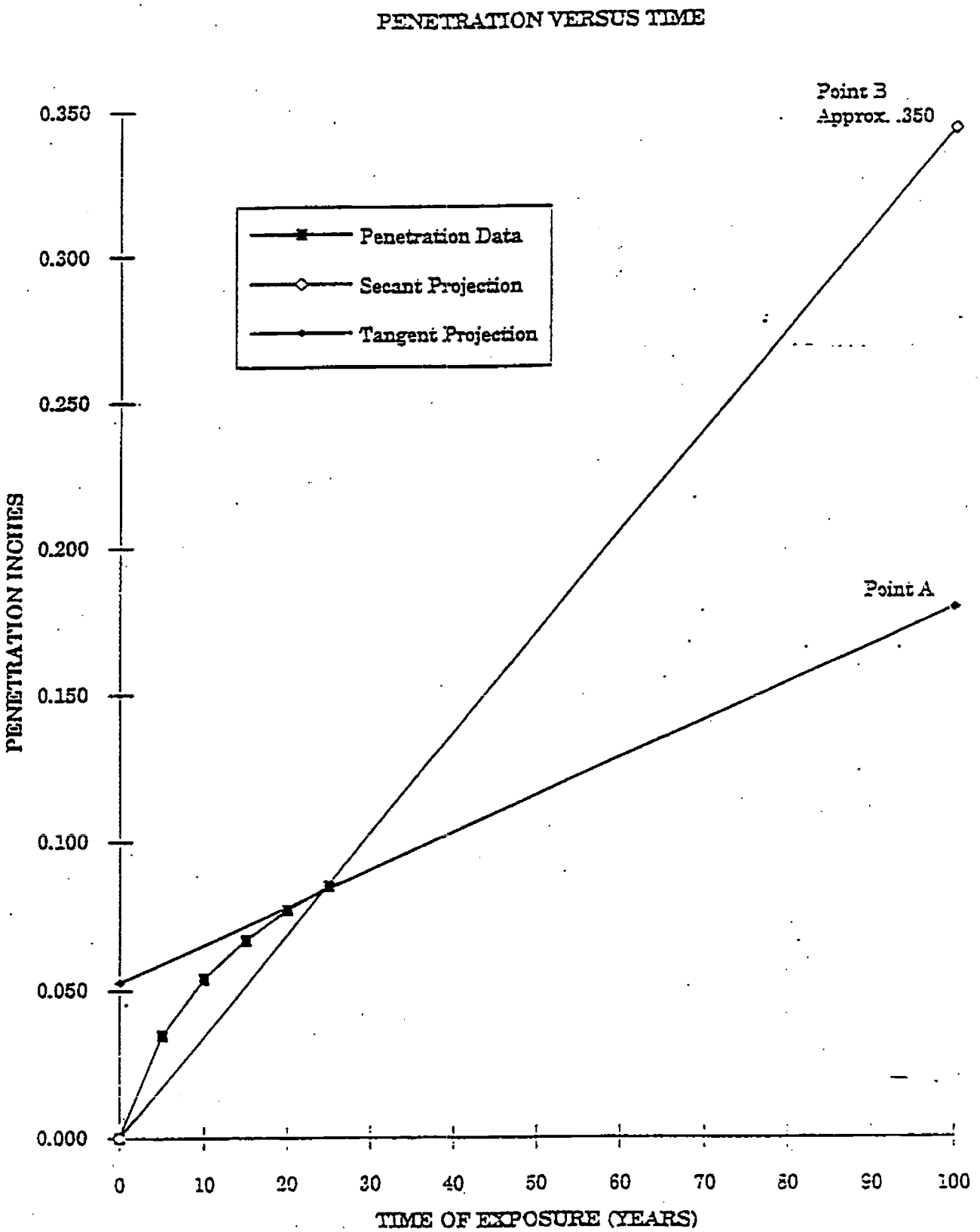

Figure 2. Comparison of Actual Pitting Corrosion Data to Single Point Data Projection (using simulated data)

References

1. "Underground Fuel Storage Tank Corrosion Study" by W.C. Carlos, WHC-EP-0507, Westinghouse Hanford Company, February 1992.

2. "Report on Soils in Naval Trench 94" by Ebasco Services Incorporated, September 4, 1991.

3. "Supplemental Report on Soils in Naval Trench 94" by Ebasco Services Incorporated, October 29, 1991.

4. "Underground Corrosion" by Melvin Romanoff, National Bureau of Standards Circular 579, April 1957.

5. "A Review of the Hanford Site Soil Corrosion Applicable to Solid Waste containers" by J. R. Divine, WHC-EP-0408, Pacific Northwest Laboratory, May 1991.

6. "Corrosion in Waste Drums from the 183H Solar Evaporation Basin Cleanout Project" by D. R. Duncan, WHC-IP-0716. Westinghouse Hanford Company, January 16, 1991.

7. "Inspection of Retrievably Stored Transuranic Waste Containers" by R. C. Morton, SD-WM-TRP-002. Rockwell Hanford Operations, July 15, 1982

8. "Evaluation of Soil Corrosion at Hanford Atomic Products Operation - Summary Report - Underground Pipeline and Structure Corrosion Study Program" by R. T. Jaske, General Electric, April 15, 1955.

9. "Corrosion Behavior of Selected Stainless Steels in Soil Environments" by E. Escalante, National Bureau of Standards Circular NBS-IR-81-2228 (NBS).

Appendix A

Summary of Previous Corrosion Studies as They Relate to Burial of Submarine Reactor Compartments in Trench 94

Prior to the underground fuel storage tank corrosion study [1], corrosion studies at the Hanford Site have been performed, mainly to determine the estimated service life of drum type waste containers and underground utilities. Previous Hanford Site data is based primarily on visual observation, as opposed to that obtained using more accurately measured data and well documented data gathering techniques[5]. Thus, existing data is considered only approximate and is limited in scope.

Many corrosion studies previously performed at Hanford have limited applicability since they document specific burial conditions that accelerated the rate of corrosion beyond that occurring in native Hanford soil. These conditions include elevated corrosivity of waste internal to the container[6], excessive humidity in the disposal environment[7] and elevated temperatures of soil with mineral or chemical content not representative of native Hanford soil[8]. Therefore, a close examination of the burial conditions is necessary before information from a specific study can be used to predict corrosion rates of materials at Hanford. In particular, none of the burial conditions discussed in these studies are representative of the conditions that will exist for the reactor compartments buried in Trench 94.

The corrosion data from NIST studies conducted at the Toppenish[9] site is commonly used in the projection of the corrosion behavior of steel at the Hanford site. However, as shown in Table A-1, the soil characteristics at the other three sites are considered more representative of Hanford than Toppenish. The chloride and sulfate levels at Toppenish are significantly higher than Hanford and the other NIST tests sites. The only soil characteristic at Toppenish that is comparable to the Hanford Site is pH.

Values for pH between 7 and 11 are normally considered mildly alkaline. Consequently, it is concluded that a higher corrosion rate at Toppenish results from the higher chloride and sulfate levels. It appears that the decision to use corrosion rates for Toppenish to predict corrosion at Hanford was very conservative because of the higher chloride and sulfate content of the Toppenish soil, as indicated by previous studies[5].

In summary, these earlier reports document corrosion rates which are higher and not solely a result of exposure to native Hanford soil as will be the condition for the reactor compartments in Trench 94 at Hanford. In fact, little existing Hanford corrosion data is considered useful in the accurate prediction of corrosion performance of reactor compartments in Trench 94 and studies with more comparable conditions and materials, such as the exhumed fuel storage tank study, should be utilized.

TABLE A-1

Soil Characteristics
and Pitting Corrosion Data for
the National Institute of Standards and Technology[4]
Corrosion Test Sites
Compared to
Toppenish[9] and Hanford[8X2]

Site	Resistivity (ohm-cm)	Chloride (mg-eq/100g)	Sulfate (mg-eq/100g)	pH	Maximum Penetration Rate (Inches/yr.)
Springfield Ohio	2,980	0.03	0.12	7.3	0.00355
Los Angeles California	2,600	0.06	0.35	7.3	0.00338
Salt Lake City, Utah	1,700	0.06	0.48	7.6	0.00229
Toppenish Washington	6,000	0.93	0.45	8.8	0.00890
Hanford Washington	5,000	0.01	0.10	8.2	—
Trench 94 Hanford Washington	31,000	0.08	0.21	8.7	—

ATTACHMENT 4

LETTER REPORT FROM E.N. PUGH (NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY) TO G.R. YOUNT (PUGET SOUND NAVAL SHIPYARD) REGARDING REVIEW OF "PREDICTION OF PITTING CORROSION PERFORMANCE OF SUBMARINE REACTOR COMPARTMENTS AFTER BURIAL AT TRENCH 94, HANFORD, WASHINGTON"

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NIST
UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

April 16, 1992

Capt. G.R. Yount, U.S. Navy
Commander
Puget Sound Naval Shipyard
Code 100
Bremerton, WA 98814-5000

Dear Capt. Yount,

As requested in your Order For Work And Services number N00251-92-WR-20230, attached is our letter report on the review of the Naval Civil Engineering Laboratory document entitled "Prediction of Corrosion Performance of Submarine Reactor Compartments After Burial at Trench 94, Hanford, Washington".

Sincerely,

Dr. E.N. Pugh, Chief
Metallurgy Division

NIST
UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

April 16, 1992

Capt. G. R. Yount, U.S. Navy
Commander
Puget Sound Naval Shipyard
Code 100
Bremerton, WA 98814-5000

Dear Capt. Yount,

This is a letter report on our review of the document entitled "Prediction of Corrosion Performance of Submarine Reactor Compartments After Burial at Trench 94, Hanford, Washington" by Jim Jenkins [1]. Jenkins examined the results of NBS (now renamed NIST) underground corrosion tests with soils similar to Trench 94 at Hanford [2,3] and the results of examinations of tanks buried for up to 46 years at a site near Trench 94 at Hanford [4] and concluded that the expected pitting corrosion rate of steel in the trench would be approximately 0.001 inches per year and that the maximum corrosion penetration after 100 years would be less than 0.350 inches. After careful review of Jenkins' report, the report on tanks buried at Hanford and the original NIST data, we conclude that Jenkins utilized conservative procedures for developing these estimates and, in our opinion, the corrosion rates for the reactor compartments in Trench 94 will be within these figures.

This opinion is based on the following conditions. The first is that the corrosion behavior of the NIST samples at the NIST sites with soils identified as similar to Trench 94 will be representative of the behavior of the reactor components. The second is that the processes that determined that corrosion behavior during the exposure periods used for the NIST study (≈17 years) will continue to limit the corrosion rate in a similar manner in Trench 94 for 100 years. The third is that the soils in contact with all of the steel surfaces will be essentially the same as that given in the specification for Trench 94 soil. The fourth, is that in using the maximum penetration data from the tanks buried at Hanford, it is assumed that the corrosion behavior of these tanks was similar to that observed in the NIST studies.

To evaluate the condition that soils at the NIST sites are representative of the soil in Trench 94, we examined the original data on the characteristics of the soils at the NIST sites identified by Jenkins. In Table 1 of his report, Jenkins specifies three soils at NIST sites as similar to soils at Trench 94 in Hanford. These are site #26 in Springfield OH, site #35 in Los Angeles CA, and site #47 in Salt Lake City UT. In

Table A1, appendix A, he also lists NIST site A in Toppenish WA as of interest because of its proximity to Hanford, but not necessarily similar to the Hanford soils [2]. References in his document identify NIST sites #12 in Los Angeles, site #20 in Cleveland OH, and site #32 in Rochester NY as similar to soils in the Hanford complex, but not necessarily at Trench 94 [3]. We agree with Jenkins that, except for the Toppenish site, these soils are similar to that reported for Trench 94. To evaluate the validity of using the Toppenish site to estimate the behavior in Trench 94, we went back to the original measurements of the soil characteristics and found that the values given in reference [3] and cited by Jenkins are correct. This is important as the chloride content of the Toppenish soil is more than ten times that given for Trench 94 and, therefore, this site should not be considered representative of conditions expected for Trench 94. The other sites are reasonable choices, but underground corrosion is a complex issue and the use of corrosion data from one site to predict corrosion behavior at another site has not been thoroughly evaluated scientifically and, in some cases [6], has failed to provide accurate estimates.

To develop a corrosion penetration estimate from the NIST data for comparison to Jenkins' estimate, we combined all of the average maximum penetration data from the NIST sites identified by Jenkins as similar to Trench 94, excepting the Toppenish site, and performed a linear regression analysis, figure 1. This approach assumes that the variations in the soil characteristics and the corrosion rates at these NIST sites should encompass the variations at Trench 94. Linear regression analysis of this data estimates the expected maximum penetration in samples buried at the NIST sites for 100 years as 0.218±0.103 inches with a 99% confidence interval. While this corresponds to an estimated penetration rate of 0.00198±0.00054 inches which is greater than the 0.001 inches per year determined by Jenkins, the maximum penetration estimated by this technique with a 99.5% confidence is 0.321 inches which is below Jenkins' maximum penetration estimate of 0.350 inches.

To evaluate the validity of using a linear model for the maximum penetration (a constant corrosion rate), we examined the exponent, n, determined by Romanoff [3] by fitting the NIST data to the relationship

$$P=Kt^n$$

For a constant corrosion rate as required for linear behavior, the value determined for this exponent would be one and, if the corrosion rate decreases with time, the value of this exponent will be less than one. Romanoff's results are given in Table 1 and, by examining this table, it can be seen that for all of the sites identified by Jenkins as having soil characteristics similar to Trench 94, the exponent, n, was less than one and, in most cases, significantly less than one. Therefore, Romanoff's results demonstrate that using 1 as the exponent for estimating the maximum corrosion penetration is a conservative estimate.

In our discussion, we have used the term maximum penetration rate to represent the maximum wall thinning that occurs at the bottom of the corrosion pits that form when steel corrodes in soils. We avoided using the term "pitting corrosion" to describe this form of attack because we did not want to confuse this type of attack with the pitting corrosion that is observed on passive metals such as stainless steels when they are exposed to solutions containing halide ions. For pitting of steels in soils, the pits result from variations in the environment in contact with the surface of the samples which cause local variations in the corrosion rate and, as corrosion products accumulate on the surface, the rate of pit propagation decreases as shown by Romanoff.

Jenkins uses five additional arguments explain why the maximum penetration at Trench 94 would be less than that observed at the NIST test sites. Our comments on each of these is as follows:

1) Jenkins states that the HY 80 steel and the Grade DH-36, CL-U steel are more resistant to underground corrosion than steels used by NIST. Although 3.5 % Ni and 0.9% Cr are added to the HY80 alloy to enhance low temperature toughness and the low carbon improves weldability, these slight variations from a plain carbon steel would provide only minimal improvement of the underground corrosion performance of alloy HY 80 for the time frame of interest. Similarly, the Grade DH-36 CL-U Steel has a slightly elevated Mn and Si compared to a plain carbon steel, but again, these modifications will not significantly improve its corrosion performance in an underground environment.

2) Jenkins states that by using prepare backfill with no stones larger than 0.5 inches the soils will be less corrosive than similar NIST soils. We believe that removal of large stones from the Trench 94 backfill makes the Trench 94 backfill more similar to the NIST soils. None of the NIST test site soils contain the large (10 inch), oblong stones found at trench 94. The largest (2 inch) stones at any NIST site are found at Site B in Baltimore, and they are relatively few in number compared to Trench 94. Jenkins statement is more appropriate for the tanks buried at Hanford where the maximum penetrations were higher for the tanks buried with unprepared native soil than the tanks buried with prepared backfill.

3) We agree that a continuous, unperforated plastic cover at Trench 94 will reduce moisture intrusion from the soil surface. It is also true that the water table at most NIST sites is considerably higher than that found at Trench 94, because water tables are closer to the soil surface and in general, rainfall is greater. Since the deterioration rate of the plastic cover is unknown, it cannot be factored into the estimates.

4) We agree that the resistivity of soil at Trench 94 is generally higher than that found at any of the NIST underground test sites, and in this respect is expected to be less corrosive than the NIST soils. Chloride and sulfate content at Trench 94 and the NIST sites identified by Jenkins are very similar, and would not be expected to have a significant effect on relative corrosivity of these soils.

5) We agree that a linear projection of maximum pit penetration as performed by Carlos, provides a conservative estimate of the corrosion penetration. There is an uncertainty associated with any extrapolation beyond existing data and conservative approaches are required.

In summary, it is our opinion that Jenkins' conclusion, that the maximum penetration of steels buried in these environments will be less than 0.350 inches after 100 years and the expected or average pitting corrosion rate will be 0.001 inches per year, is reasonable given the conservative estimation procedures he employed, our existing knowledge of corrosion mechanisms, the environmental conditions expected at Trench 94, and the existing NIST data on corrosion behavior of similar steels at similar sites.

Sincerely,

Edward Escalante
Corrosion Group

Richard E. Ricker, Ph.D.
Group Leader
Corrosion Group

References

1) J. Jenkins, "Prediction of Corrosion Performance of Submarine Reactor Compartments After Burial at Trench 94, Hanford, Washington, (DRAFT), Naval Civil Engineering Laboratory, Port Hueneme, CA, January 1992.

2) W.F. Gerhold, "Corrosion Behavior of Ductile Cast-Iron Pipe in Soil Environments", J. American Water Works Assoc., v68, n12, December 1976.

3) M. Romanoff, "Underground Corrosion", National Bureau of Standards Circular 579, April 1957, reprinted by the National Association of Corrosion Engineers, Houston, TX, 1989.

4) W.C. Carlos, "Underground Fuel Starage Tank Corrosion Study", Westinghouse Hanford Co., WHC-EP-0507, February 1992.

5) R.E. Walpole, R.H. Myers, "Probability and Statistics for Engineers and Scientists", The Macmillan Co., New York, 1972.

6) W. J. Schwerdtfeger, "Soil Resistivity as Related to Underground Corrosion and Cathodic Protection," J. Res. of NBS, v69c, n1, January-March 1965.

Table 1 - Mean values of constants $k_{5.3}$ and n and their standard errors. [3]

Site No.	Soil Type	$k_{5.3}$	$\sigma_{k5.3}$	n	σ_n
12	Hanford fine sandy loam	51.2	14.0	0.13	0.73
20	Mahoning silt loam	34.4	2.7	0.42	0.09
26	Miami silt loam	45.7	7.1	0.41	0.22
32	Ontario loam	44.8	2.6	0.33	0.07
35	Ramona loam	26.5	1.3	0.25	0.08
47	Unidentified silt loam	20.1	1.2	0.32	0.08

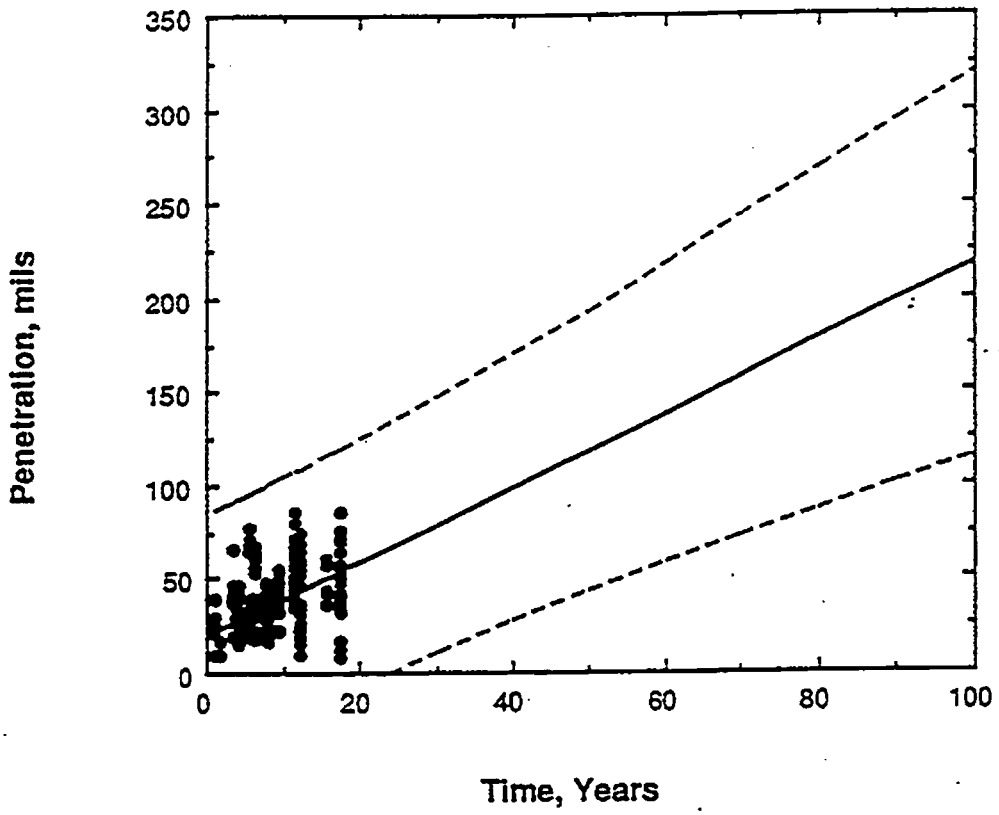

Figure 1 - Linear regression analysis of the average maximum penetration data obtained at all of the sites identified by Jenkins as having soils similar to Trench 94. The dashed lines represent the upper and lower limits of the expected values at the 99% confidence level based on the linear growth rate assumption.

ATTACHMENT 5

LETTER FROM D.R. HELGESON (CORROSION CONTROL SPECIALISTS) TO C.L. REAUME (PUGET SOUND NAVAL SHIPYARD) REGARDING SOIL RESISTIVITY TESTING, HANFORD, WASHINGTON

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CCS CORROSION CONTROL SPECIALISTS
R & B Corporate Park, Suite P101
6617 South 193rd Place
Kent, Washington 98032
(206) 251-8075

June 29, 1990

Puget Sound Naval Shipyard
Officer In Charge of Construction
Public Works Dept. Code 460
Bremerton, Washington

Attn: Cheryl L. Reaume

Ref: Soil Resistivity Testing
Hanford, Washington
Contract No. N62474-90-M-6478

Dear Ms. Reaume,

On Wednesday June 27,1990 CCS completed the testing as directed by the referenced contract. The preliminary results were faxed to your office on June 28, 1990. The following is a summary of the procedures used and a brief analysis of the data.

Test Procedures

The test procedure followed was that described by The ASTM Standard Method G-57-78, " Field Measurements of Soil Resistivity Using The Wenner Four electrode Method ". The testing was completed using a Nilsson Model 400 soil resistivity meter Certified and Calibrated on June 26, 1990. A sketch is attached depicting the general arrangement of the meter, electrodes, and wiring.

Testing was witnessed by William Carlos (Westinghouse) and by G.L. Ecklund (U.S. Navy). Testing was done at six locations. One test was completed on each side of the existing excavation for Trench 94 and one test for each of two spoil piles. Testing was done at each location with pin spacings of 10, 20, 30, 40, and 50 feet.

Prior to leaving the site copies of the raw data collected was provided to William Carlos.

The Wenner four pin test procedure provides the average resistivity of the soil to a depth equal to the pin spacing. Therefore testing was completed at several depth in addition to the 50 foot spacing requested to better characterize the soil. Moreover the data may be enhanced by processing the data with formulations developed by H.E. Barnes. The Barnes formulations provides an approximation of soil resistivities for depth layers. The data collected for these test were processed in this manner. The data is tabulated on the attached data sheets.

The data is useful in both evaluating the potential for corrosion activity and for designing cathodic protection. However in evaluating the potential for corrosion activity of a site, it should not be done using soil resistivities alone. Soil resistivities should be combined with the other parameters, as you have scheduled for testing, including conductivity, sulfides, sulfates, chlorides, moisture content, and pH.

Results and Analysis

The soil resistivity data collected at this site is generally classified as high and not very corrosive but it does show some stratification. Further the Barnes layer calculations on the north side of the trench would indicate a more aggressive environment for buried steel. However in analyzing soil resistivities by themselves, caution should be used in drawing any firm conclusions regarding the potential for corrosion. The National Association of Corrosion Engineers (NACE) in their basic short courses provide a guideline for the relative amount of corrosion in the absence of mitigating measures. Those guidelines are as follows:

Soil Resistivity		Relative Corrosion Rate
Below 500	ohm-cm	Very Corrosive
500 to 1000	ohm-cm	Corrosive
1000 to 2000	ohm-cm	Moderately Corrosive
2000 to 10,000	ohm-cm	Mildly Corrosive
Above 10,000	ohm-cm	Progressively less Corrosive

NACE does not suggest that in high resistivity soils that there is no corrosion but only that the rates of corrosion in general decrease. The conceptual cathodic protection design package being evaluated by the Navy for the SRC site provides a reference in Attachment 3 to H.C. Van Nouhuys. Van Nouhuys classifies and evaluates soils in

high ranges that extend up to a million ohm-cm. The majority of his conclusions were arrived at by collecting pipeline leak histories in high resistivity soils. His work is supported by many others working with underground pipelines and tanks.

Thus it is our recommendation that cathodic protection be applied to the SRC's even though the soil resistivities are classified as high with relativity low corrosion rates. The basis for this recommendation is based on the present plan to maintain the integrity of the SRC in excess of 100 years.

Also in reviewing the conceptual design being prepared..., it would appear the Navy is desirous of a galvanic system. This is the most desirable type of cathodic protection system in nearly all applications. However, to make the installation of a galvanic system effective in high resistivity soils economically feasible, the current requirement must be low. Based on my casual inspection of the SRC's while on site, it is my opinion the quality of coating may need to be upgraded to achieve that end. It would be my recommendation the a detailed coating inspection of each SRC be completed prior to formalizing the selection of a galvanic anode design.

CCS would be pleased to assist the Navy with this project as it proceeds. If we can clarify any of the above please contact our office.

Sincerely

Dennis R. Helgeson, P.E.

: Site (Trench 94)
nford, Washington
34

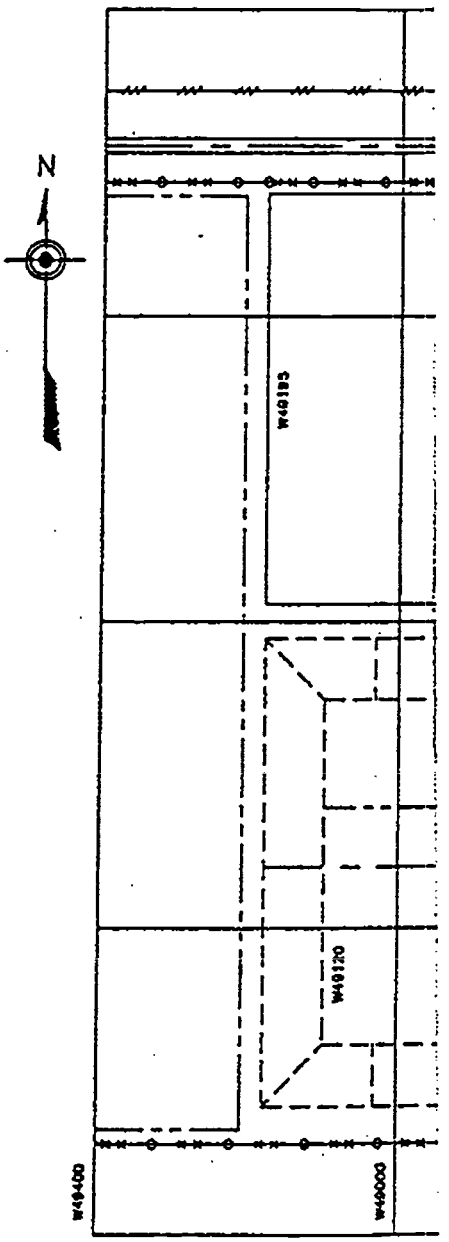
D. Helgeson
6/27/90
Nilsson (Model 400)
S/N 40-2291

Soil Resistivity Data
Wenner four Pin Method

Test Site	Location	Pin Spacing (ft)	Soil Resistivity (ohm-cm)	Barnes Layer Resistivity (ohm-cm)
1	East side of trench	10	36,385	--
		20	65,110	309,270
		30	22,980	10,017
		40	37,534	**
		50	41,173	67,247
2	South side of trench	10	70,855	--
		20	103,410	191,309
		30	166,305	**
		40	72,004	26,634
		50	41,173	15,177
3	Spoil pile to south of trench	10	23,938	--
		20	22,980	22,096
		30	34,470	**
		40	35,236	37,753
		50	54,578	**
4	West side of trench	10	107,240	--
		20	91,920	80,432
		30	97,665	111,616
		40	91,920	78,131
		50	85,218	65,975

est ite	Location	Pin Spacing (ft)	Soil Resistivity (ohm-cm)	Barnes Layer Resistivity (ohm-cm)
5	North side of trench	10	21,065	--
		20	10,140	**
		30	25,283	114,182
		40	21,448	14,194
		50	14,363	6,187
6	Spoil pile to north of trench	10	36,385	--
		20	32,385	30,087
		30	41,939	92,481
		40	29,108	15,178
		50	53,620	**

The Barnes layer calculation is not valid for these layers



SITE

SCALE: 1"

NOTES:

1. S.R.C. STANDS FOR SUBMARINE REACTOR COMPARTMENT.
2. SOIL RESISTIVITY TESTS. WENNER FOUR-ELECTRODE METHOD ASTM-G 57-78 (1984).

RESISTIVITY TEST TABLE

TEST NO.	LOCATION
1.	EAST SIDE OF TRENCH, FIRST PIN LOCATED 65.5' FROM ℄ OF CANTON AVE., IN-LINE WITH SOUTH SIDE OF SRC NO. 1. (PIN ALIGNMENT N-S)
2.	SOUTH SIDE OF TRENCH, FIRST PIN LOCATED 55' DUE WEST OF POWER POLE. (PIN ALIGNMENT E-W)
3.	TOP OF SOUTH SPOIL AREA, FIRST PIN LOCATED 70' DUE SOUTH OF TEST 2. (PIN ALIGNMENT E-W)
4.	WEST SIDE OF TRENCH, FIRST PIN LOCATED 20' DUE WEST OF EDGE OF TRENCH, IN-LINE WITH SOUTH SIDE OF SRC NO. 1. (PIN ALIGNMENT N-S)
5.	NORTH SIDE OF TRENCH, FIRST PIN LOCATED AT EDGE OF PIT. (PIN ALIGNMENT E-W)
6.	TOP OF NORTH SPOIL AREA, FIRST PIN LOCATED AT EDGE OF PIT. (PIN ALIGNMENT E-W)

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
Westinghouse Hanford Company

NAVAL SRC
TRENCH 94
SOIL RESISTIVITY TEST

APPENDIX 4E

SITE INVESTIGATION REPORT

Transmitted from DOE-RL to Ecology.

Reference: Low-Level Burial Grounds Dangerous Waste Permit Application Supplement 2: Design Documentation for Mixed Waste Nondragoff Land Disposal Facility (DOE/RL-88-20, Supplement 2, Revision 0).

Site Investigation Report: WHC-SD-W025-SE-001, Revision 0.

Correspondence Number: 90-PPB-186, September 20, 1990.

APPENDIX 4F

9090A TEST RESULTS

Transmitted from DOE-RL to Ecology.

Reference: A Final Report: Laboratory Testing of Geomembrane for Waste containment Environmental Protection Agency Method 9090

Document Number: 9090 Test Results, WHC-SD-WM-TRP-237, Revision 0.

Correspondence Number: 96-SWT-333, November 7, 1996.

APPENDIX 4G

SOIL LINER PERFORMANCE CALCULATIONS

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APPENDIX 4G

SOIL LINER PERFORMANCE CALCULATIONS

Assume Net Infiltration = Total precip - evapotrans (no run-off)

[From WHC 1992 (Project W-025 Design Report), Appendix C.1, page 44]:

Precip	=	"7.08"
Evapotrans	=	5.46
Net Infiltration	=	1.62"

Assume landfill is open for 10 years.

Assume no flexible membrane liner, no holding time/storage for precipitation.

$\therefore$ Head on soil liner after 10 years = 10 x 1.62 = 16.2"

Average head = 16.2"/2 = 8.1"

Darcy's Law: q = KiA

and q/A = V

$\therefore$ V = Ki where K = hydraulic conductivity = 10^{-7} cm/sec
i = pressure gradient = 8.1"/36" = 0.225

$\therefore$ V = 0.225 x 10^{-7} cm/sec

In 10 years, penetration = 0.225 x 10^{-7} cm/sec x 3600 sec/hr x 24 hr/day x 365 day/yr x 10 years
= 7.1 cm
= 2.8 in

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APPENDIX 5A

INTERIM STATUS GROUNDWATER MONITORING

APPENDIX 5A

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APPENDIX 5A

INTERIM STATUS GROUNDWATER MONITORING

Eight burial grounds were included in the interim status groundwater monitoring program. These are the 218-E-10 and 218-E-12B Burial Grounds in the 200 East Area (refer to Chapter 1.0) and the 218-W-3A, 218-W-3AE, 218-W-4B, 218-W-4C, 218-W-5, and 218-W-6 Burial Grounds in the 200 West Area (refer to Chapter 1.0).

In accordance with an agreement signed by Ecology and the DOE-RL (Ecology 1986), an initial groundwater monitoring system consisting of 35 wells was installed around the LLBG. This system was designed in accordance with WAC 173-303-400 and 40 CFR 265, Subpart F requirements. Based on information from the initial 35 wells, 46 additional wells have been installed completing the monitoring network for the LLBG.

The following sections provide a summary of the groundwater monitoring data obtained from wells installed during the interim status period.

1.0 INTERIM STATUS GROUNDWATER MONITORING APPROACH

A specific investigative approach was taken to support the design of the LLBG groundwater monitoring system. This approach consisted of the following elements.

- Define specific waste management areas for the LLBG. These low-level waste management areas (LLWMAs) consisted of one or more regulated units treated as a single monitored unit with respect to groundwater monitoring. The size and extent of a LLWMA were determined principally by the size and location of regulated units.

- Establish an initial groundwater monitoring well network from which stratigraphic, hydrogeologic, and background water quality information can be obtained. The data was used to determine the need for additional groundwater monitoring wells.

- Provide preliminary hydrogeologic properties of the uppermost aquifer system beneath the LLBG using data collected from the monitoring well network and from previously collected or published data.

Within the scope of the 1986 agreement (Ecology 1986), the DOE-RL agreed to install an initial network of 35 groundwater monitoring wells of no more than 305 total meters drilled to supplement the interim status program. The groundwater monitoring plan for installation contained specific details for these 35 wells (PNL 1987). These wells were to provide information regarding the hydrogeologic properties of the uppermost aquifer beneath the LLBG and also were to be used in collecting background water quality data at quarterly intervals for at least 1 year from the time of installation. The initial

network of 35 wells was installed as planned, and the goals of the network in providing preliminary hydrogeologic information and background water quality data were met. Based on data from the initial well network, 46 additional groundwater monitoring wells were installed. The construction details for these wells are contained in the various borehole completion reports (WHC 1990a; WHC 1990b; WHC 1993a, WHC 1993b, and WHC 1994).

Preliminary hydrogeologic properties within the uppermost aquifer were documented by PNL (1989a) based on information from the initial network of 35 wells. Within the scope of the characterization plan, the following four specific objectives were achieved:

- Development of a preliminary conceptual model of the hydrogeologic system within the uppermost aquifer
- Determination of horizontal and vertical hydraulic gradients within the uppermost aquifer
- Determination of the range and distribution of horizontal hydraulic conductivity values within the uppermost aquifer
- Determination of the storativity of the sediments within the uppermost aquifer.

The methods applied to achieve the objectives are described in Section 2.2. Hydrogeologic properties for the 46 additional groundwater monitoring wells were reported in WHC 1989e; WHC 1990b; and WHC 1993a, WHC 1993b, and WHC 1994.

Compliance boundaries were established for five LLWMA that incorporate portions of one or more burial grounds. These boundaries, shown in Figure 1 and Figure 2, were defined by a line that connects the monitoring wells spaced around the perimeter of each LLWMA. Because of uncertainties and potential future changes in the direction of groundwater flow described later in this text, the compliance boundaries are shown in the figures to extend around the entire LLWMA. However, at any specified time, the regulatory compliance boundary will be considered to be present only along the existing downgradient limit of the LLWMA, in compliance with WAC 173-303-645(6)(a). The individual monitoring wells were located in accordance with WAC 173-303-645(9)(b), as close as possible to the hydraulically downgradient limit of the LLWMA taking into account rights-of-way and other physical obstructions. The following are the designated burial grounds incorporated in the LLWMA:

- LLWMA-1--218-E-10 Burial Ground
- LLWMA-2--218-E-12B Burial Ground
- LLWMA-3--218-W-3A, 218-W-3AE, and 218-W-5 Burial Grounds
- LLWMA-4--218-W-4B and 218-W-4C Burial Grounds
- LLWMA-5--218-W-6 Burial Ground.

2.0 INVESTIGATIVE METHODS

This section summarizes the techniques and methods used to assess the hydrogeologic properties of the uppermost aquifer beneath the LLBG.

2.1 EXISTING SITE HYDROGEOLOGIC INFORMATION

Hydrogeologic information has been collected since activities began in the mid-1940s. Much of the information on subsurface geology in the 200 Areas has resulted from the analysis and interpretation of more than 1,400 boreholes and wells completed in and around the 200 Areas. Raw data have been compiled into the following databases:

- Hanford Groundwater Database
  - Summarized borehole geologic logs
  - Water level data
  - Groundwater quality data
  - Well elevation data

- ROCSAN Database System
  - Particle size distribution from borehole sediment samples
  - Calcium carbonate content from borehole sediment samples.

Borehole samples were archived in the Hanford Geotechnical Sample Library and have been catalogued (Additon 1977). Geophysical logs from the boreholes are maintained by Pacific Northwest National Laboratory's (PNNL) Earth and Environmental Sciences Center.

Interpretations of the raw data were published and a well-documented list of published studies was provided by PNL (1989a). Many of the early reports, however, present relatively little detail because of the limited groundwater and subsurface geologic data available at the time.

2.2 GENERAL WELL DESIGN

As required by WAC 173-303-400(3)(a) and 40 CFR 265.91, the interim status groundwater monitoring system included monitoring wells completed to obtain representative groundwater samples from the uppermost saturated zone beneath each of the LLWMAs. This saturated zone is within the Ringold Formation and/or the Hanford formation, depending on the local geology [Chapter 5.0 of the General Information Portion (DOE/RL-91-28)]. The interim status groundwater monitoring wells were drilled and constructed consistent with Ecology and EPA guidance and with Ecology review, and are in compliance with WAC and RCRA regulations.

The initial interim status monitoring well network consisted of 35 wells located around four existing LLWMA. These wells were drilled and installed from July to October 1987, and are referred to hereafter as the '1987 wells'. Sixteen wells were installed in the 200 East Area and 19 wells were installed in the 200 West Area. Eleven of the wells in the 200 West Area and all

16 wells in the 200 East Area were drilled as single wells. The remaining eight wells were in the 200 West Area and were drilled as four pairs with wells of a given pair located 7.6 to 15.2 meters apart. For each pair, one is a deep well penetrating the uppermost aquifer system to a lower semiconfining unit (a depth of approximately 61 to 76 meters below the water table) and is screened over the lower 6.1 meters of the aquifer, while the second is a shallow well penetrating only the upper 6.1 to 9.1 meters of the aquifer. Dimensions and locations for each of these wells are presented in Figures 1 and 2, and Tables 1 through 5.

A larger number of wells monitor the upper part of the uppermost aquifer than have been installed to monitor the lower part of that aquifer. This is because there is considered to be virtually no likelihood of dense, nonaqueous phase liquids (DNAPL) from the waste in the LLBG reaching the groundwater and sinking to the bottom of the aquifer. This conclusion is based on the lack of large volumes of liquid waste disposed in the LLBG, and the disposal of small liquid volumes in sorbing materials. Such waste could migrate to the groundwater only as low density aqueous phase solutions dissolved in infiltrating precipitation. However, despite the very low likelihood of generating DNAPLs from the LLBG, four wells were completed in the lower part of the uppermost aquifer for verification.

Ten additional wells, referred to hereafter as the '1989 wells', were drilled and installed from June to November 1989. Six more wells were installed from October 1989 to February 1990, and are referred to hereafter as the '1990 wells'. All 1989 and 1990 wells are shallow wells screened over the upper 6.1 to 9.1 meters of the aquifer. Seven of these wells are located in the 200 East Area and nine wells are located in the 200 West Area. In 1991, 18 wells were installed between March and December. Two of these wells were designed to monitor the lower portion of the unconfined aquifer at LLWMA-5. All remaining 1991 wells were designed to monitor the upper part of the aquifer. However, problems encountered during drilling one well at LLWMA-4 resulted in the well being completed in a localized perched water zone associated with a nearby liquid disposal unit. Ten wells were installed in 1992 and two in 1993. These 12 shallow wells monitor the upper 6.1 meters of the aquifer and completed the monitoring network for the LLBG. Dimensions and locations for each of these wells are presented in Figures 1 and 2, and Tables 1 through 5.

The following summarizes the general design used in the construction of wells. The procedures employed in drilling the 1987 wells followed guidelines specified in Kasper and Myers (1987) and presented in PNL (1989a). Procedures for installation of the 1989 and 1990 interim status wells were provided in the revised groundwater monitoring plan (WHC 1989f). Procedures for installation of the 1991, 1992, and 1993 wells were documented in drilling specifications (WHC 1990c) and in subsequent revisions.

Figure 3 presents a schematic diagram for both the shallow and the deep groundwater monitoring wells. The majority of the wells were drilled with cable-tool rigs using either drive-barrel or hard-tool methods; however, two of the 1992 and both of the 1993 wells were drilled using the air rotary method. During cable-tool drilling, the hard-tool method normally was used

when gravels consisted of very large particles or when the sediments were saturated. Using the drive-barrel method, a short length of heavy-walled pipe was driven into the sediments and withdrawn. The sediments removed from the barrel generally were representative of the formation. During hard-tool drilling, a solid metal bit was used to break up the sediments. Water was added to the sediments to form a mud that was bailed out of the borehole providing formation samples for geologic description.

Each well was drilled to its required depth using temporary carbon steel casing to support the walls of the borehole. The temporary casing was nested to facilitate its removal once the final stainless steel casing was in place. The temporary casings were removed from the borehole in 0.6-meter increments for every 0.6 meter of completion material emplaced (e.g., filter sand, bentonite grout). This prevented the completion materials from 'locking up' the casings and prevented sediments from collapsing into the borehole. For the 1987 wells, a 3.1-meter long, 20-centimeter outside diameter stainless steel screen (30-slot) was installed at the bottom of the temporary casing for aquifer testing. For the 1989 and 1990 wells, slug tests were performed after the monitoring well installation was completed.

Once the temporary outer casing was in place (and aquifer testing was completed in the 1987 wells), the permanent casing was set. Permanent casing consisted of factory-slotted, 4-inch Schedule-5 type 304 stainless steel screen, and threaded, flush-jointed Schedule-40 type 304 stainless steel casing. Screen lengths ranged from 3.1 to 9.1 meters. For all the 1987 wells and two of the 1989 wells (299-E34-7 and 299-E35-1), the screens were wire-wound with a slot size of 0.03 centimeter (10-slot) to 0.8 centimeter (30-slot). The remaining 1989 and all 1990 wells were completed using 10-slot screens. All subsequent wells were completed using screens. All well casings and screens were factory cleaned and wrapped in polyethylene for delivery to the site. Factory cleaning included a phosphoric acid bath, pressure washing using an alkaline degreaser/cleaner, a warm water rinse, and air drying. All casing and screen segments were inspected for integrity and cleanliness before installation.

Before setting the permanent casing, Colorado silica sand (20-40, 16-30, 10-20, 20-30, or 8-12 mesh) was used to backfill the hole to the desired depth. The bottom of the screen was set at approximately 15 centimeters above the base of the aquifer for the deep wells, while the top of the screen was placed no more than 0.9 meter above the water table for the shallow wells. Once the stainless steel permanent casing and screen were set in the hole, silica sand was used to fill the annulus between the outer and inner casing to 1.5 meters above the top of the screen. Above the sand pack, approximately 1.5 meters of bentonite pellets were emplaced. In 12 of the 1987 wells, grout was used to seal the well to the surface. The remaining wells were sealed to the surface with either bentonite granules or bentonite slurry. The type of seal used was determined by the drilling contractors.

After settlement of the bentonite seal, cement was used to permanently seal either the upper 0.9 to 1.5 meters of the annulus for the 1987 wells, or the upper 5.2 to 6.1 meters of the annulus for the 1989 and 1990 wells. A 1.2-meter by 1.2-meter concrete pad was placed around the well and marked by a

brass plate stamped with the well number. Protective guard posts were installed around each well.

2.3 WELL LOCATIONS AND CONSTRUCTION DETAILS

The locations of the 81 interim status monitoring wells for the 200 East and 200 West Areas are shown in Figure 1 and Figure 2, respectively. The wells also are shown on the topographic maps in Appendix 2A. The location coordinates, surface elevations, drilled depths, and screened interval depths are summarized in Tables 1 through 5. The 1987 wells represent 2,893 total meters drilled. The general construction of all wells is described in Section 2.2.2. Construction logs for the monitoring wells are presented in the following documents: WHC 1989a; WHC 1990a; WHC 1990b; and WHC 1993a, WHC 1993b, and WHC 1994.

Of the 33 wells installed around LLWMA-1 and LLWMA-2 in the 200 East Area, 23 wells were drilled through the relatively thin uppermost aquifer to the top of the Elephant Mountain Member of the Saddle Mountains Basalt. The remaining wells were drilled to a maximum of 5.2 meters into the unconfined aquifer. All wells were completed in the top of the unconfined aquifer with 3.1 to 6.1 meters of screen.

In the 200 West Area, 48 wells were constructed around LLWMA-3, LLWMA-4, and LLWMA-5, of which one well (299-W7-3) was completed to the top of the basalt. Five other wells (299-W6-3, 299-W6-6, 299-W10-14, 299-W15-17, and 299-W18-22) were drilled to the top of the lower mud unit of the Ringold Formation. Approximately 7.6 to 15.2 meters from each deep well, a second well was completed in the top 5.2 to 8.2 meters of the aquifer. One well at LLWMA-4 (299-W18-29) was completed in an area of localized perched water because attempts to seal the annulus in the perched zone casing failed. This well has a 4.9-meter screen. Thirty-three of the shallow wells in the 200 West Area were completed with 6.1-meter screens. Seven were completed with 9.1-meter screens to account for projected water level declines in response to the 1984 decommissioning of the 216-U-10 Pond (U Pond). One well at LLWMA-5 (299-W6-12) was completed with a 4.9-meter screen because of a suspected localized confining layer of silt at the water table.

2.4 DOWNGRADIENT AND UPGRADIENT INTERIM STATUS WELLS

Based on water table elevations at the time of well installation, and consistent with recent water table elevations, the following wells are considered downgradient and upgradient wells for each LLWMA. The wells have been identified with a superscript indicating the year of installation:

<u>Downgradient Shallow Wells</u>

LLWMA-1 299-E32-2^{87}, 299-E32-3^{87}, 299-E32-5^{89}, 299-E32-6^{91}, 299-E32-7^{91}, 299-E32-8^{91}, 299-E32-9^{91}, 299-E32-10^{92}, 299-E33-30^{87}, 299-E33-34^{90}

LLWMA-2 299-E27-8[87], 299-E27-9[87], 299-E27-11[89], 299-E27-17[91], 299-E34-2[87], 299-E34-3[87], 299-E34-7[89], 299-E34-9[91], 299-E34-10[91], 299-E34-11[92], 299-E34-12[92]

LLWMA-3 299-W6-2[87], 299-W7-1[87], 299-W7-2[87], 299-W7-4[87], 299-W7-5[87], 299-W7-6[87], 299-W7-7[89], 299-W7-8[89], 299-W7-9[90], 299-W7-10[90], 299-W7-11[91], 299-W7-12[91], 299-W8-1[87]

LLWMA-4 299-W15-15[87], 299-W15-19[89], 299-W15-20[89], 299-W15-23[90], 299-W15-24[89], 299-W18-21[87], 299-W18-23[87], 299-W18-26[89], 299-W18-27[91], 299-W18-28[91], 299-W15-21 was drilled and abandoned in 1989 because of problems encountered in well completion.

LLWMA-5 299-W6-5[91], 299-W6-7[91], 299-W6-8[91], 299-W6-11[92], 299-W6-12[92]

<u>Upgradient Shallow Wells</u>

LLWMA-1 299-E28-26[87] 299-E28-27[87], 299-E28-28[90], 299-E32-4[87], 299-E33-28[87], 299-E33-29[87], 299-E33-35[90]

LLWMA-2 299-E27-10[87], 299-E34-4[87], 299-E34-5[87], 299-E34-6[87], 299-E35-1[89]

LLWMA-3 299-W9-1[87], 299-W10-13[87], 299-W10-19[92], 299-W10-20[93], 299-W10-21[93]

LLWMA-4 299-W15-16[87], 299-W15-18[87], 299-W18-24[87], 299-W18-32[92]

LLWMA-5 299-W6-2[87], 299-W6-4[91], 299-W6-9[92], 299-W6-10[92], 299-W7-10[90], 299-W11-31[92]

<u>Upgradient Perched Well</u>

LLWMA-4 299-W18-29[91]

<u>Downgradient Deep Wells</u>

LLWMA-3 299-W7-3[87]

LLWMA-4 299-W18-22[87]

LLWMA-5 299-W6-6[91]

<u>Upgradient Deep Wells</u>

LLWMA-3 299-W10-14[87]

LLWMA-4 299-W15-17[87].

LLWMA-5 299-W6-3[91]

The designation of monitoring wells as being upgradient or downgradient is complicated in certain instances because of low groundwater gradients and complex site geometries. Wells 299-E28-26 and 299-E32-4 at LLWMA-1 and wells

299-E34-4, 299-E34-5, and 299-E34-6 at LLWMA-2 were at one time considered to be downgradient wells, based on limited data from the immediately surrounding groundwater monitoring wells. However, a reevaluation of the water level data from an expanded network of wells and over a 6-year period from 1987 to 1993 indicates that these are upgradient wells. These data are presented in Section 2.3.2.1. Well 299-E34-3 at LLWMA-2 originally was listed as an upgradient well, but because of its location at an interior corner of the unit, it is more appropriately designated a downgradient well. Other wells are located in alcoves, corners, or between sections of burial grounds such that these are downgradient of one part of the burial ground and upgradient of another part. These wells include 299-E32-2 in LLWMA-1, 299-E34-2 in LLWMA-2, and 299-W7-4 in LLWMA-3. These wells have been tentatively designated as either downgradient or upgradient based on the presently filled portions of the burial grounds.

Well 299-E32-4 at LLWMA-2 was completed to the top of basalt without encountering the water table. In the years following installation of the well, the water level has declined as a result of diminishing liquid disposal activities in the 200 East Area. As a result, water sampling at three other wells at LLWMA-2 (299-E34-4, 299-E34-6, and 299-E35-1) has been discontinued because of the lack of water.

The upgradient wells were screened at approximately the same hydrostratigraphic horizon as the downgradient wells. The *RCRA Groundwater Monitoring Technical Enforcement Guidance Document* (EPA 1986) recommends that the upgradient wells be located beyond the upgradient extent of potential contaminants from the regulated LLWMA. In addition, 40 CFR 265.91(a)(1)(i) and (ii) requires that upgradient wells provide background water quality data that are 'representative' of the uppermost aquifer near the unit and not affected by the unit. The upgradient wells, with the exception of 299-W18-24 in LLWMA-4, are located at the upgradient edge of the respective LLWMA.

2.5 GENERAL HYDROGEOLOGIC INVESTIGATIVE TECHNIQUES

Characterization of the geohydrologic properties of the LLBG was based on information gained from borehole sediment samples, geophysical logging, aquifer testing, and water level measurements.

Borehole sediment samples were collected using four different sampling methods: split-barrel continuous core, drive-barrel grab samples, hard-tool and bailer grab samples, and grab samples from the rotary drillings. Split-barrel sampling was conducted on five wells: 299-W15-21, 299-W7-8, 299-E32-5, 299-E35-1, and 299-W7-9. Well 299-W15-21 subsequently was abandoned when a casing broke and was replaced with well 299-W15-24; no soil sampling was performed in the replacement well. Soil samples were collected from the remainder of the wells using either drive-barrel or hard-tool and bailer. Although drive-barrel sampling was preferred over hard-tool and bailer sampling, the noncohesive, gravelly nature of the sediments (particularly in the 200 East area) precluded the use of the drive-barrel for much of the drilling. Samples were collected at 1.5-meter intervals. Additional samples were collected at lithologic contacts, in moist zones, and

in zones where organic substances were detected. The following testing was conducted on selected sediment samples:

- Field lithologic characterization
- Laboratory petrographic and mineralogic analyses (thin sections, x-ray diffraction, x-ray fluorescence)
- Grain size distribution
- Field moisture content
- Water retention capacity
- Calcium carbonate content
- Total and inorganic carbon analysis
- Cation exchange capacity
- Hydraulic conductivity.

Field moisture content, water retention capacity, and hydraulic conductivity analyses were not performed on bailed samples because of the high degree of physical disturbance.

The following types of geophysical borehole logging were conducted:

- Natural gamma (gross gamma ray)
- Porosity (neutron-epithermal neutron; 1987 wells only)
- Density (gamma-gamma; 1987 wells only).

Predevelopment groundwater sampling was conducted in the 1987 wells for volatile organics, gross alpha and beta radiation, gamma radiation, tritium, total strontium, plutonium, uranium, cyanide, and semivolatile organics (200 East Area only), and WAC 173-303-9905 constituents (three wells in 200 West Area, one well in 200 East Area). This sampling was conducted to determine the disposition of purgewater. No predevelopment groundwater sampling was conducted in the later wells because all purgewater was handled as if it were contaminated in 1989 and 1990. In 1990, a strategy for dealing with purgewater was developed [HF RCRA Permit, Attachment 5 (Ecology 1994)].

Constant discharge production and recovery aquifer testing was conducted in all 1987 wells except in 299-E28-26 (high uranium), 299-E34-4 (dry), and 299-E34-6 (low water). Slug tests were conducted in wells installed in later years and after 1991 drawdown and recovery data were collected during well development. Water level measurements were conducted before and after well installation and subsequently at least quarterly.

Detailed results for the 1987 wells are presented in PNL (1989a). Results for the remaining wells are reported in WHC 1989e; WHC 1990b; and WHC 1993a, WHC 1993b, and WHC 1994.

3.0 INTERIM STATUS DATA

This section summarizes groundwater monitoring activities during the interim status period. The sampling and analysis plan, water level measurements, and analytical chemistry results are presented.

3.1 SAMPLING AND ANALYSIS PLAN

This section summarizes aspects of the groundwater sampling and analysis plan (PNL 1989a, Appendix B) that have been and currently are being used for the interim status program at the LLBG groundwater monitoring wells. Groundwater samples representative of the uppermost aquifer beneath the LLBG have been obtained and analyzed for detecting potential contaminant releases.

All interim status sampling activities at the LLBG currently are performed under contract by PNNL. The interim status groundwater sampling program at the LLBG was designed to provide initial water quality information on the uppermost aquifer beneath active and proposed regulated units within the LLWMA. Dedicated sampling equipment is provided for most of the wells, thus minimizing the potential for cross-contamination between the wells. The dedicated components of the system consist of a pump, well cap, and access for a water-level measurement device. In all wells, a dedicated pump was installed.

3.1.1 Static Water-Level Measurements

Before purging or sampling the monitoring well, the static water level is measured, recorded, and remeasured until reproducible results are obtained. These measurements are taken as depth-to-water from the top of the well casing and are subtracted from the surveyed elevation of the casing to obtain the elevation of the water level. Graduated steel measuring tapes are used for official measurements. Measurements are reported to the nearest 0.3 centimeter and are repeated until two readings agree to within plus or minus 0.6 centimeter. Between wells, the wetted section of tape is rinsed with de-ionized water and dried with a paper towel to minimize the risk of cross-contamination.

3.1.2 Well Purging

Interim status monitoring wells are purged before sample collection to obtain groundwater samples that are representative of the formation water rather than of the stagnant water from the well casing. Groundwater that has occupied the well undergoes chemical changes and becomes dissimilar from true formation water. Monitoring wells are purged until a minimum of three casing volumes of water have been removed.

3.1.3 Sample Withdrawal

After the interim status monitoring well has been purged, water samples are withdrawn from the well using the dedicated pump. The pumping rate during purging is approximately 11.4 to 18.9 liters per minute. If a monitoring well is not capable of sustaining this extraction rate, the pumping rate is reduced. The pumping rate is reduced to about 3.8 liters per minute for collection of groundwater samples.

During the sampling event, multiple groundwater samples are obtained for the specific laboratory analyses. Samples are collected and bottled in the following order:

- Bottles with septum caps (volatiles)
- Unfiltered samples (major-ions, cyanide, semivolatiles, metals)
- Filtered samples (metals).

3.1.4 Field Analyses

During interim status well purging and sample withdrawal, field determinations of temperature, pH, and specific conductivity are measured and recorded. Groundwater samples for laboratory analysis are not collected until each of these parameters has stabilized (PNL 1989a).

3.1.5 Sample Preservation and Handling

Measurements of temperature, specific conductance, and pH are taken in the field on unpreserved samples. Samples submitted for dissolved metals analysis are filtered in the field using a 0.45-micrometer membrane filter and are acidified with nitric acid to a pH of less than 2.0. Samples analyzed for cyanide are not filtered and are preserved by adding sodium hydroxide to raise the pH to greater than 12.0. Samples for volatile and semivolatile organic compounds are unfiltered and unpreserved. Samples for total organic halogen (TOX) and total organic carbon (TOC) are acidified to a pH of less than 2.0 using sulfuric acid and phosphoric acid, respectively. Samples for radium, gross alpha, and gross beta radiation are acidified with nitric acid to a pH of less than 2.0.

Prelabeled sample bottles containing the appropriate preservative are used for each monitoring well. Bottles that contain samples to be analyzed for volatile compounds, TOX, and TOC are filled to slightly more than full to ensure that there is no free head space. Bottles containing samples for all remaining parameters are filled to approximately 95 percent of capacity. Recommended sample containers and sample volumes are presented in Table 6.

Immediately after collection, the sample bottles are placed in sealed, insulated coolers packed with ice to cool the bottles to approximately 4°C. The coolers are transported to the lead laboratory for analysis. Field parameter record forms are attached to the sealed containers. The temperatures of the samples are measured upon opening the cooler in the laboratory. If the temperature is approximately 4°C and some of the original unmelted ice is found to remain in the cooler, the samples are considered to have been maintained at the appropriate temperature during the time the samples were in the cooler.

3.1.6 Chain-of-Custody

Chain-of-custody procedures are followed in collecting interim status data to ensure the integrity of groundwater samples from the time of collection through laboratory analysis and data reporting. This program includes sample labels, sample seals, field record forms, chain-of-custody forms, sample analysis request forms, and laboratory acceptance procedures.

3.1.7 Quality Assurance and Quality Control Procedures

Quality assurance and quality control procedures are applied to both field and laboratory interim status data to ensure the reliability and validity of the data. One aspect of the quality assurance and quality control program is to monitor field and trip blanks and interlaboratory samples to evaluate the accuracy of results from the lead laboratory.

Interlaboratory comparisons are conducted to determine if the analytical results obtained from the lead laboratory are comparable to results from other laboratories. Comparisons are conducted for anions, volatile organics, and metals.

Spiked samples are submitted to the lead laboratory to estimate any bias in laboratory analytical procedures and to determine whether such bias exceeds control limits. Blind, spiked samples prepared by PNNL and spiked samples prepared under a multilaboratory comparison program are both used in this procedure. Field duplicates are obtained by retrieving a second sample from the same well using the same sampling equipment and sampling techniques. Field duplicates are taken on a frequency of one for every 20 wells.

Field and trip blanks are submitted to the lead laboratory to determine whether environmental conditions encountered during collection and transportation of samples have affected the results of sample analyses. Preparation of field blank samples consists of filling sample vials at the wellhead with Type 2-ASTM water (de-ionized, charcoal-filtered, and boiled). At least one field blank is submitted for each sample period per LLWMA, or at the rate of one blank for each 20 wells. Trip blanks, prepared in the laboratory by filling sample vials with Type 2-ASTM water, travel into the field with the empty field blank and sample containers. Both field and trip blank sample bottles are packed with ice and are transported to the laboratory for analysis along with the groundwater samples. Because wells are sampled using dedicated sampling pumps, no equipment blanks are obtained.

3.1.8 Disposal of Purgewater

Before May 1989, all purgewater generated from sampling of interim status wells was released to the ground surface in the vicinity of the well. Beginning in May 1989, purgewater has been contained initially in galvanized steel troughs located near the well head. Tanker trucks are used to collect and transport the purgewater from the troughs to a modular-tank area. The modular-tank area consists of multiple 3,785,400-liter storage tanks

constructed of double layers of HDPE with a geotextile leak detection and containment system. Collected purgewater is stored in the modular-tank area until transferred to the 200 Area Effluent Treatment Facility.

3.2 ANALYTICAL DATA

The following sections present analytical data on interim status water quality.

3.2.1 Groundwater Elevations

Groundwater elevation data have been obtained for the interim status wells since well installation. Water levels were measured weekly from December 1987 to mid-March 1988 and then at least quarterly to the present time. Table 7 presents representative water-level data for selected wells between the time of well installation and the present. Data collected is reported in the RCRA quarterly groundwater monitoring reports.

Groundwater elevations for June 1991, 1992, 1993 are shown in Figures 4 through 9. These figures are based on data from various Hanford Facility groundwater monitoring wells located near the 200 Areas. These figures have been published in annual reports (e.g., DOE/RL-93-88).

Groundwater elevations beneath both LLWMA-1 and LLWMA-2 have exhibited minor fluctuations since 1987, probably in response to variations in discharge rates to the nearby 216-B-3 Pond (B Pond) and to the decommissioning of Gable Mountain Pond. Water levels near these two LLWMAs rose an average of 23 centimeters between December 1987 to January 1989, and dropped approximately 31 centimeters per year since that time. The water table has dropped below the top of the basalt at wells 299-E34-6 and 299-E35-1 on the north and east sides of LLWMA-2. Both of these wells are completed to the top of basalt; therefore sampling is precluded at these wells.

From December 1987 to January 1989, water levels in groundwater monitoring wells near LLWMA-3 decreased an average of more than 15 centimeters, while monitoring wells located adjacent to LLWMA-4 decreased about 21 centimeters. Since 1991, water levels have decreased approximately 31 centimeters a year in monitoring wells near LLWMA-3 and LLWMA-4. Indications from the first year of measurements at LLWMA-5 are consistent with this rate of decline. These decreases probably result from the continuing dissipation of the U Pond mound.

Measured groundwater elevations reflect both present and past disposal of waste water to surface ponds and trenches. The significant groundwater mounding in the vicinity of the B Pond (east of the 200 East Area) has caused the normal regional eastward flow gradient to reverse and develop a westward flow component beneath LLWMA-1 and LLWMA-2. The water table map of June 1993 for LLWMA-1 and LLWMA-2 shows the westward flow to have a hydraulic gradient of approximately 0.00025 beneath the 200 East Area. The magnitudes and directions of the hydraulic gradients in the 200 East Area are somewhat

uncertain because of the relatively flat gradients in the area and the variable influence of the nearby disposal ponds.

Beneath the 200 West Area, the apex of the groundwater mound formed in response to disposal at the U Pond has moved to the northeast since use of the pond was discontinued in 1984 and has been reinforced by continued waste water disposal to the 216-U-14 Ditch. The continued existence of the mound (greater than 18.3 meters above pre-Hanford Site conditions) has forced the normal regional eastward groundwater flow to a more north-northeast direction beneath LLWMA-3 and LLWMA-5, and to a west-northwest direction beneath LLWMA-4. In June 1993, the hydraulic gradient was approximately 0.0015 beneath LLWMA-3 and LLWMA-5 and 0.0006 beneath LLWMA-4.

As the groundwater mound in the 200 West Area continues to decline, water levels in monitoring wells at LLWMA-3, LLWMA-4, and LLWMA-5 will continue to decline, and the regional groundwater flow direction will shift more toward the northeast and the east. Decreased disposal of waste water to the B Pond in the 200 East Area has lowered groundwater levels beneath the 200 East Area. Continued groundwater level decreases are expected in the 200 East Area following decommissioning of the B Pond in the 1990s.

3.2.2 Results of Water Quality Analyses--Predevelopment Samples

Predevelopment groundwater quality data were obtained for each of the 1987 wells at the completion of well construction and before aquifer testing. These samples were taken to determine if the groundwater geochemically was acceptable for discharge to the ground during aquifer testing and borehole development. Samples were analyzed for volatile organic compounds, gross alpha and beta radiation, gamma radiation, tritium, total strontium, plutonium, and uranium. Samples taken from wells in the 200 East Area also were analyzed for cyanide and semivolatile organics. Three wells in the 200 West Area (299-W7-3, 299-W15-17, and 299-W18-22) and one well in the 200 East Area (299-E34-2) were analyzed for the complete suite of WAC 173-303-9905 constituents. These analytical data are documented (PNL 1989a).

The predevelopment water was considered acceptable for direct ground discharge if the contaminant levels were below 10 percent of the designated WAC 173-303 dangerous waste guidelines and below 1/25 of the derived concentration guides for radionuclides (DOE 1988; PNL 1989a). The derived concentration guides are being developed to be in compliance with 40 CFR 61 Subpart H standard of 25 millirems per year for radiological exposure. Results of the water quality analyses show that water from only one well (299-E28-26) exceeded these criteria. The water obtained from that well was shown to have a mean concentration of 21.8 picocuries per liter of uranium-234, which is greater than 1/25 of the derived concentration guideline of 500 picocuries per liter that the DOE is considering establishing for this constituent. For this reason, well 299-E28-26 was not pump tested.

No other constituents analyzed during the predevelopment sampling events were shown to be in concentrations that would limit the water discharge to the

ground. However, detectable concentrations of tritium, carbon tetrachloride, chloroform, total alpha radiation, total beta radiation, and methylene chloride were observed.

3.2.3 Results of Water Quality Analyses--Quarterly and Semi-annual Samples

The first sampling event for the interim status well network was completed in September/October 1988. Sampling was continued quarterly for the first six sampling rounds. As a result of elevated values of specific conductance and TOX at LLWMA-1 and LLWMA-3 respectively, groundwater quality assessment plans were prepared (WHC 1990d and 1990e). Sampling continued quarterly at LLWMA-1 and LLWMA-3 until January of 1994 when assessment reports (WHC 1993c and 1993d) concluded the groundwater contamination was not the result of disposal practices at the LLBG. Sampling is now conducted semi-annually at LLWMA-1 and LLWMA-3. Semi-annual sampling began at LLWMA-2 and LLWMA-4 in 1989 after initial background values for contamination indicator parameters were established. Quarterly sampling began at LLWMA-5 after the initial monitoring wells were installed in 1991. Semi-annual sampling began at LLWMA-5 in 1993 (Appendix 5B). Statistical comparisons are made on the semi-annual sampling results to determine the impact, if any, of the LLBG.

Samples were analyzed for WAC 173-303-645(5) (Table 1) drinking water parameters and WAC 173-303-9905 chemical parameters, pH, specific conductivity, TOX, and TOC. These four latter parameters are the interim status contamination indicator parameters, and four replicates are obtained and analyzed from each well in each sampling round; other parameters are analyzed less frequently and no replicates are obtained. All groundwater quality data from the LLBG monitoring well network are entered into a PNNL database for permanent storage and are published in quarterly groundwater monitoring reports.

Table 8 identifies those chemical constituents that exceeded established drinking water standards (40 CFR 141) during the initial interim status groundwater sampling event (September/October 1988). At LLWMA-1, groundwater obtained from wells 299-E28-26, 299-E28-27, 299-E32-2, and 299-E32-3 exceeded established drinking water standards for tritium (20,000 picocuries per liter), and groundwater from well 299-E28-26 exceeded limits for nitrate and gross alpha radiation (45 milligrams per liter and 15 picocuries per liter, respectively). This well also was shown to have a high level of dissolved uranium (53.2 micrograms per liter). The concentration of dissolved chromium approached the drinking water standard in well 299-E33-29 (50 micrograms per liter), but the concentration might be reflective of well construction practices rather than true groundwater contamination (PNL 1989b).

In wells installed around LLWMA-2, only the concentration of dissolved chromium approached the drinking water limits (wells 299-E34-2 and 299-E34-6). The source of the dissolved chromium might be from the well installation technique, because elevated concentrations of iron and manganese (unfiltered) also were observed. An investigation into the source of the chromium is

ongoing, and the chromium concentrations are being carefully monitored and evaluated

The concentration of dissolved chromium exceeded the drinking water standard in three wells (299-W6-2, 299-W7-6, and 299-W10-14) adjacent to LLWMA-3, while nitrate exceeded 45 milligrams per liter in two wells (299-W6-2 and 299-W7-4) and approached the standard in two additional wells (299-W7-1 and 299-W7-5). Carbon tetrachloride was detected in five samples and exceeded the established drinking water standard (5 micrograms per liter) in four of the samples (299-W6-2, 299-W7-4, 299-W7-5, and 299-W10-13).

Samples obtained from wells at LLWMA-4 were shown to be above detection limit in gross alpha radiation (299-W18-21), chromium (299-W15-15, 299-W15-16, 299-W15-18, 299-W18-21, and 299-W18-23), nitrate (299-W15-16, and 299-W15-18), carbon tetrachloride (299-W15-15, 299-W15-16, 299-W15-18, 299-W18-21, 299-W18-23, and 299-W18-24), and trichloroethylene (299-W15-16). The high concentrations of carbon tetrachloride (0.13 to 8.1 milligrams per liter) observed in the samples might be reflective of constituents derived from past waste water disposal practices at the 216-Z cribs. The highest concentrations of carbon tetrachloride were observed in samples upgradient of LLWMA-4 and immediately downgradient of the waste water disposal areas and the Plutonium Finishing Plant in the 200 West Area.

3.2.4 Statistical Results

Background data were collected during the first year of sampling, from September 1988 to July 1989, and included four sampling events. These data have been published in quarterly groundwater monitoring reports (e.g., PNL 1989b). Statistical analysis of the September/October 1989 sampling results for contamination indicator parameters (pH, specific conductivity, TOC, and TOX) were calculated. Results of the statistical analysis indicated that LLWMA-1 and LLWMA-3 statistically had significant increased levels of contamination indicator parameters in a downgradient well compared to background values determined from upgradient wells. Assessment plans were delivered to Ecology for both LLWMAs (WHC 1990d; 1990e). Details of the statistical analyses are presented in the assessment plans and summarized in the following.

Interim status data from the fall 1989 sampling round were analyzed using the Average Replicate Test (EPA 1986). This methodology compares the average replicate mean for each indicator parameter at every downgradient well to a critical mean. The critical mean is a function of the mean and standard deviation of the background data, the confidence interval (0.99 in this case), the degrees of freedom in the background data, and the number of comparisons in each sampling event. The number of comparisons in each sampling event is the product of the number of indicator parameters (four in this case) and the number of downgradient wells in the LLWMA.

The assessment plan for LLWMA-1 was triggered by a statistically significant higher specific conductance in well 299-E28-26. The critical mean for specific conductance at LLWMA-1 was 492.9 micromhos per centimeter, while

the average value in 299-E28-26 was 511 micromhos per centimeter. The primary objective of the assessment plan was to determine if the elevated value was due to disposal activities at LLWMA-1, or to activities at another location, such as the 216-B-62 Crib.

An assessment report (WHC 1993c) determined that well 299-E28-26 is upgradient rather than downgradient of LLWMA-1. The most likely source of the high specific conductance was elevated nitrate associated with past disposal practices at the 216-B-55 and 216-B-62 cribs located to the south of LLWMA-1. The observed contamination therefore appears to have originated at another location. Updated critical means for the contamination indicator parameters have been calculated and LLWMA-1 has returned to detection level monitoring.

The assessment plan for LLWMA-3 was triggered by a statistically significant higher TOX in well 299-W7-4. The critical mean for TOX at LLWMA-3 was 95.5 parts per billion, and the average concentration in 299-W7-4 was 171 parts per billion. The primary purpose of the assessment plan was to determine if the elevated value was due to disposal activities at LLWMA-3, or to activities at an upgradient location, such as the 216-Z-18 Crib.

Additional upgradient groundwater monitoring wells have been installed at LLWMA-3 and analysis of the groundwater chemistry data indicates that the original upgradient wells did not adequately characterize the groundwater beneath LLWMA-3. The assessment report (WHC 1993c) issued concluded that the elevated TOX in well 299-W7-4 was a result of the extensive carbon tetrachloride contamination beneath the 200 West Area. The source of this contamination is to the south of LLWMA-3. Background levels of the contamination indicator parameters are being re-established for LLWMA-3. Quarterly samples for the contamination indicator parameters were collected from the shallow upgradient monitoring wells for four quarters and upgradient/downgradient comparison values were reestablished in May 1995. Sampling for contamination indicator parameters, interim primary drinking water parameters, water quality parameters, and site-specific parameters currently is semi-annually.

Analysis of the data from LLWMA-2, LLWMA-4, and LLWMA-5 does not indicate statistically significant increases of contamination indicator parameters in downgradient wells.

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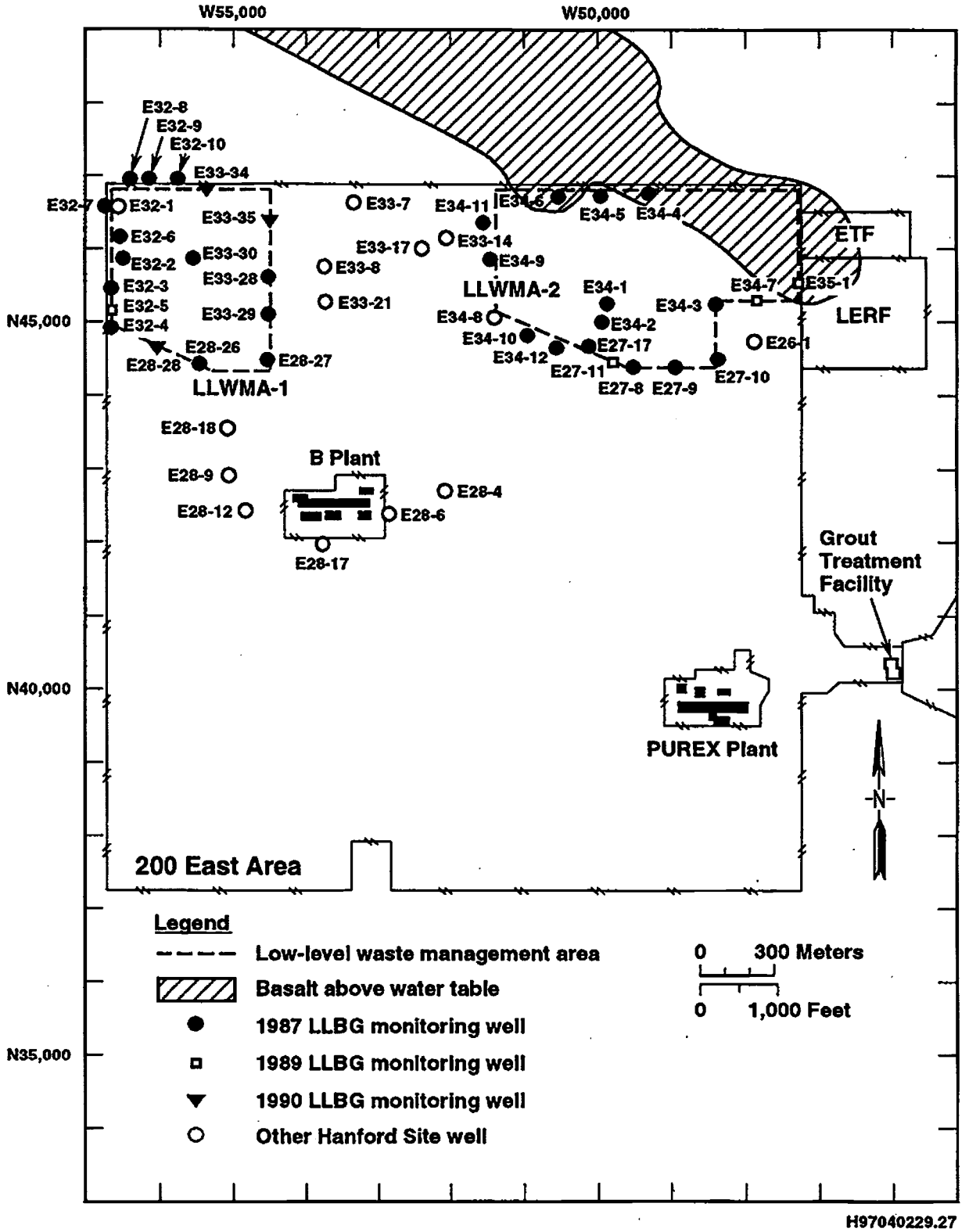

Figure 1. Locations of Interim Status Monitoring Wells in the 200 East Area.

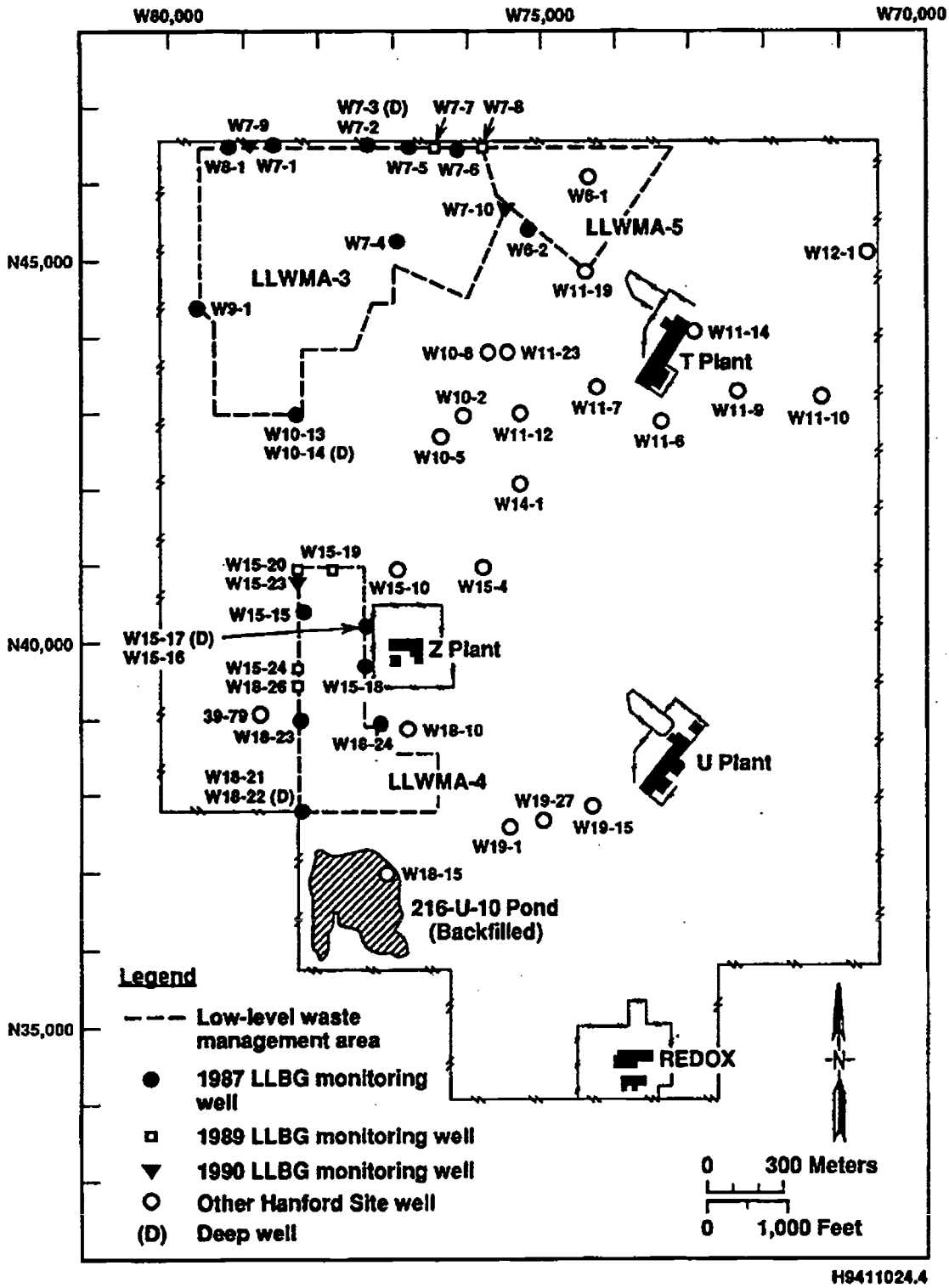

Figure 2. Locations of Interim Status Monitoring Wells in the 200 West Area.

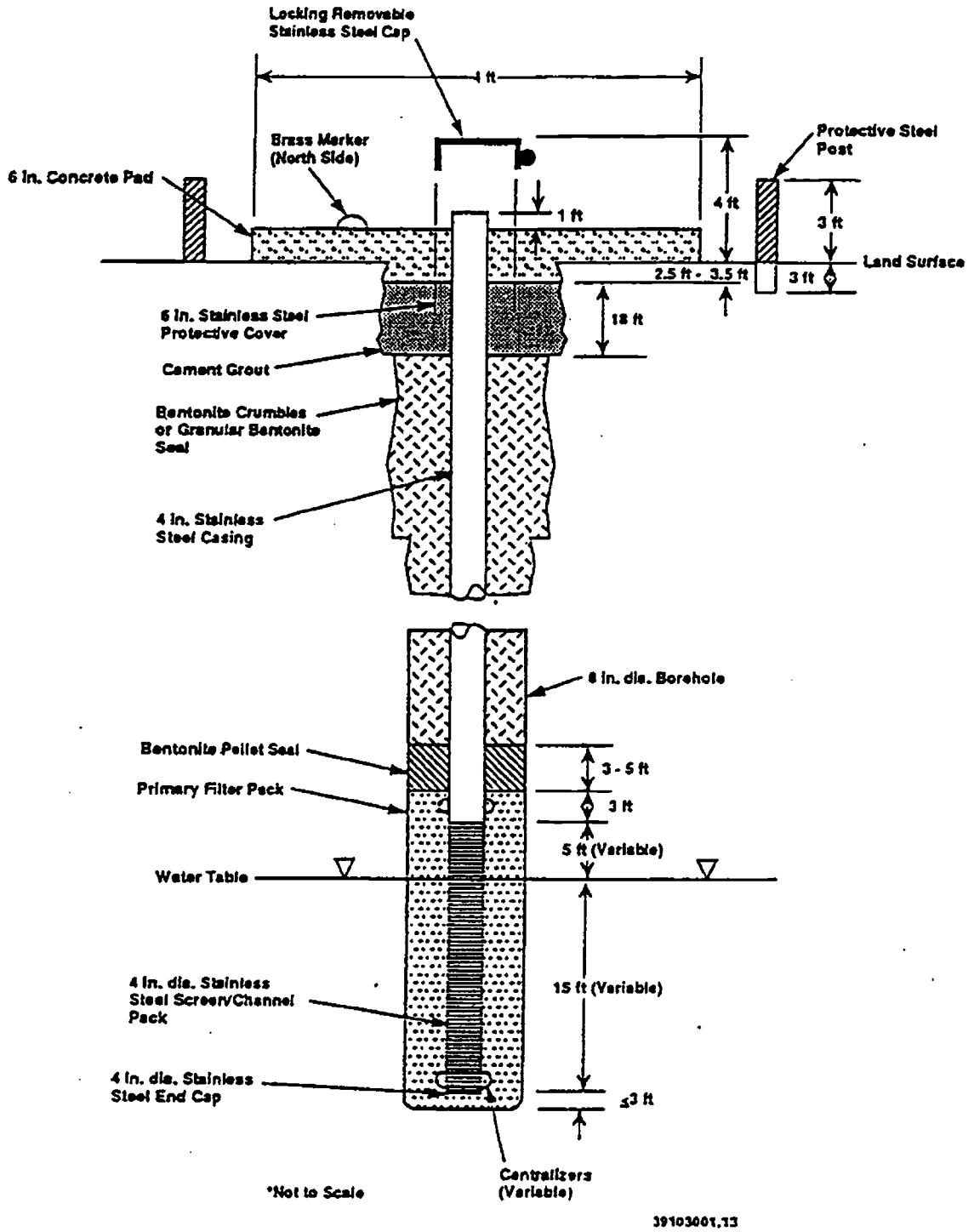

Figure 3. Schematic Design Used for Monitoring Wells Around the Low-Level Burial Grounds (stratigraphy representative of the 200 West Area) (After PNL 1989a).

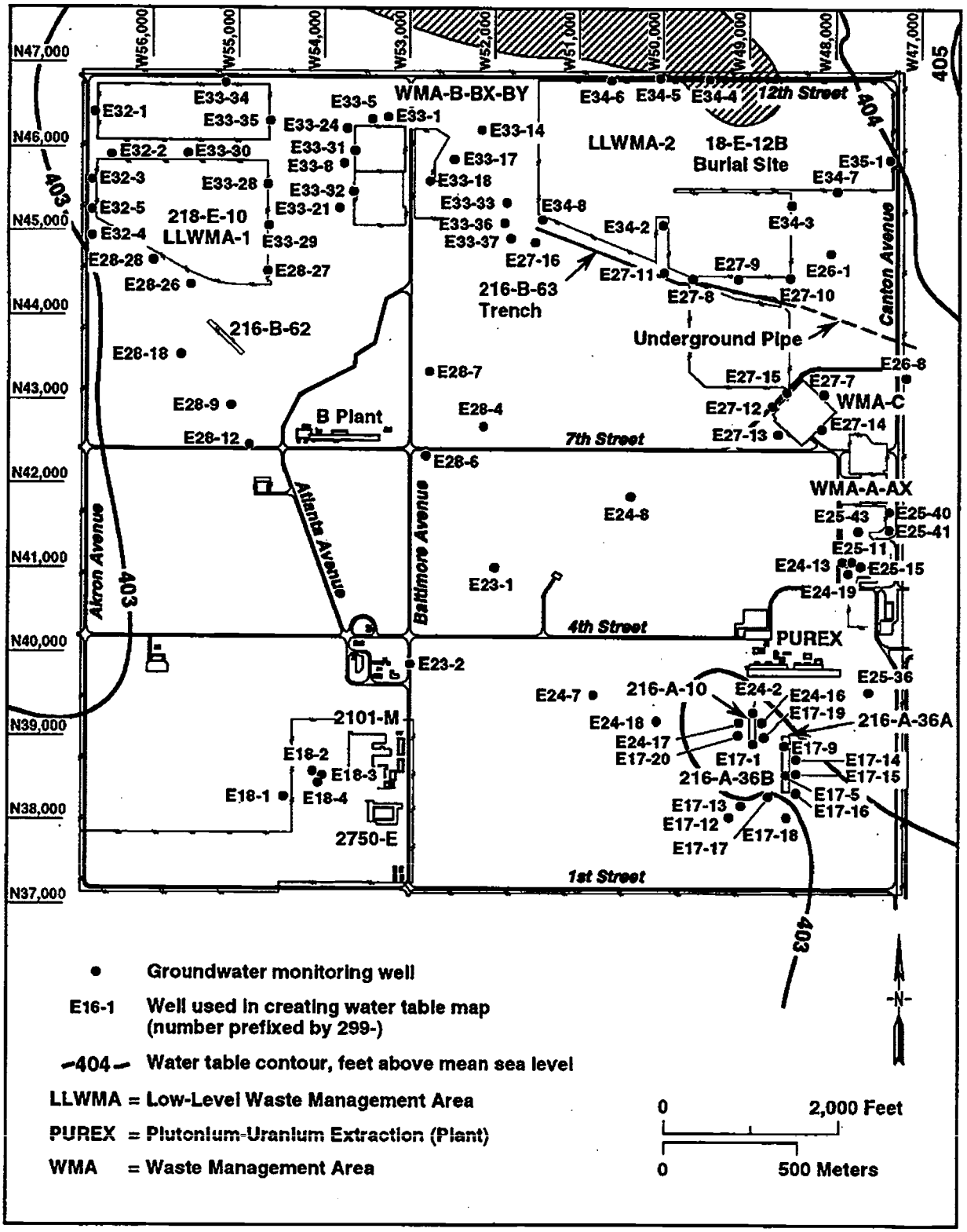

Figure 4. Water Table Beneath Low-Level Waste Management Areas 1 and 2 in the 200 East Area, June 1991.

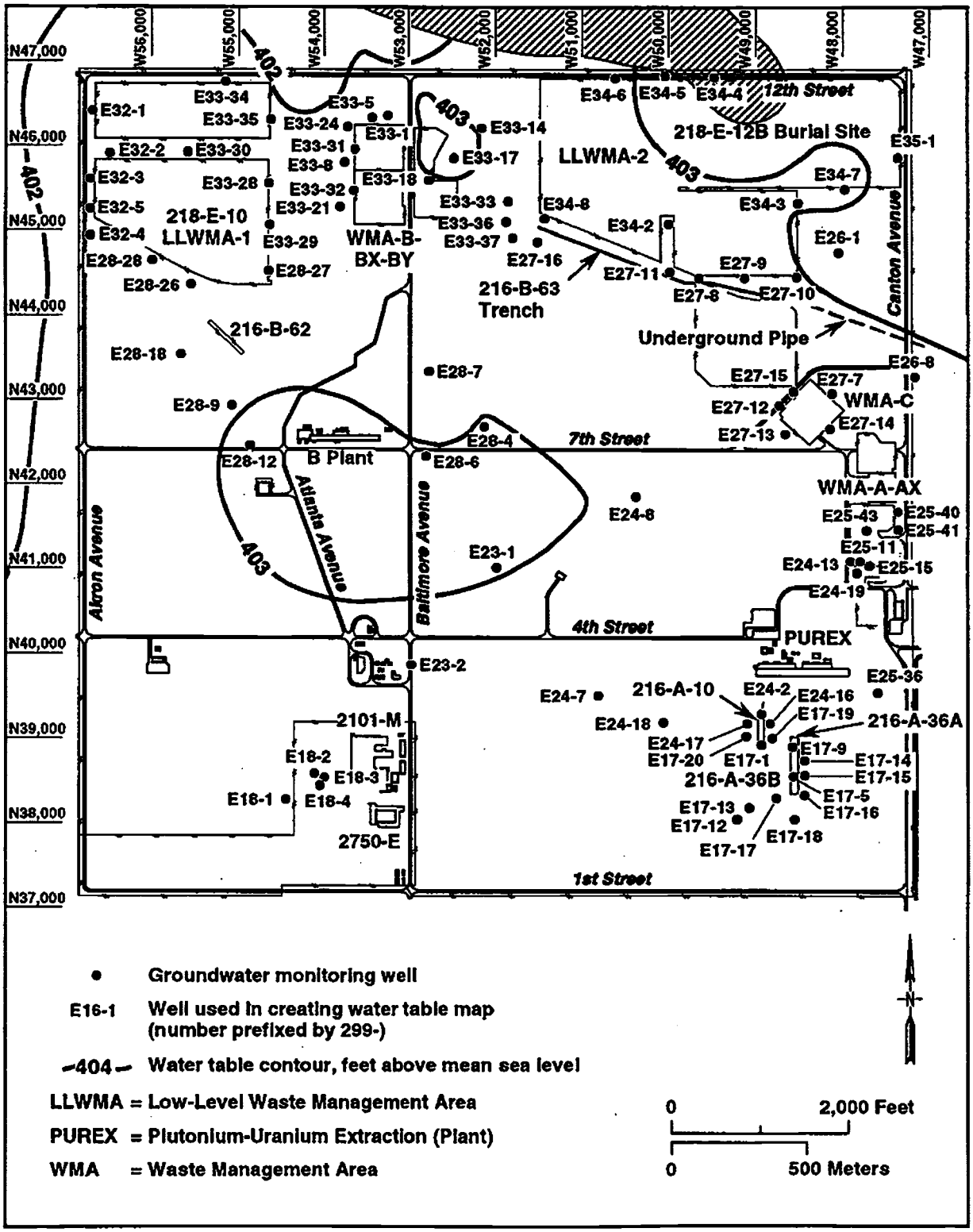

Figure 5. Water Table Beneath Low-Level Waste Management Areas 1 and 2 in the 200 East Area, June 1992.

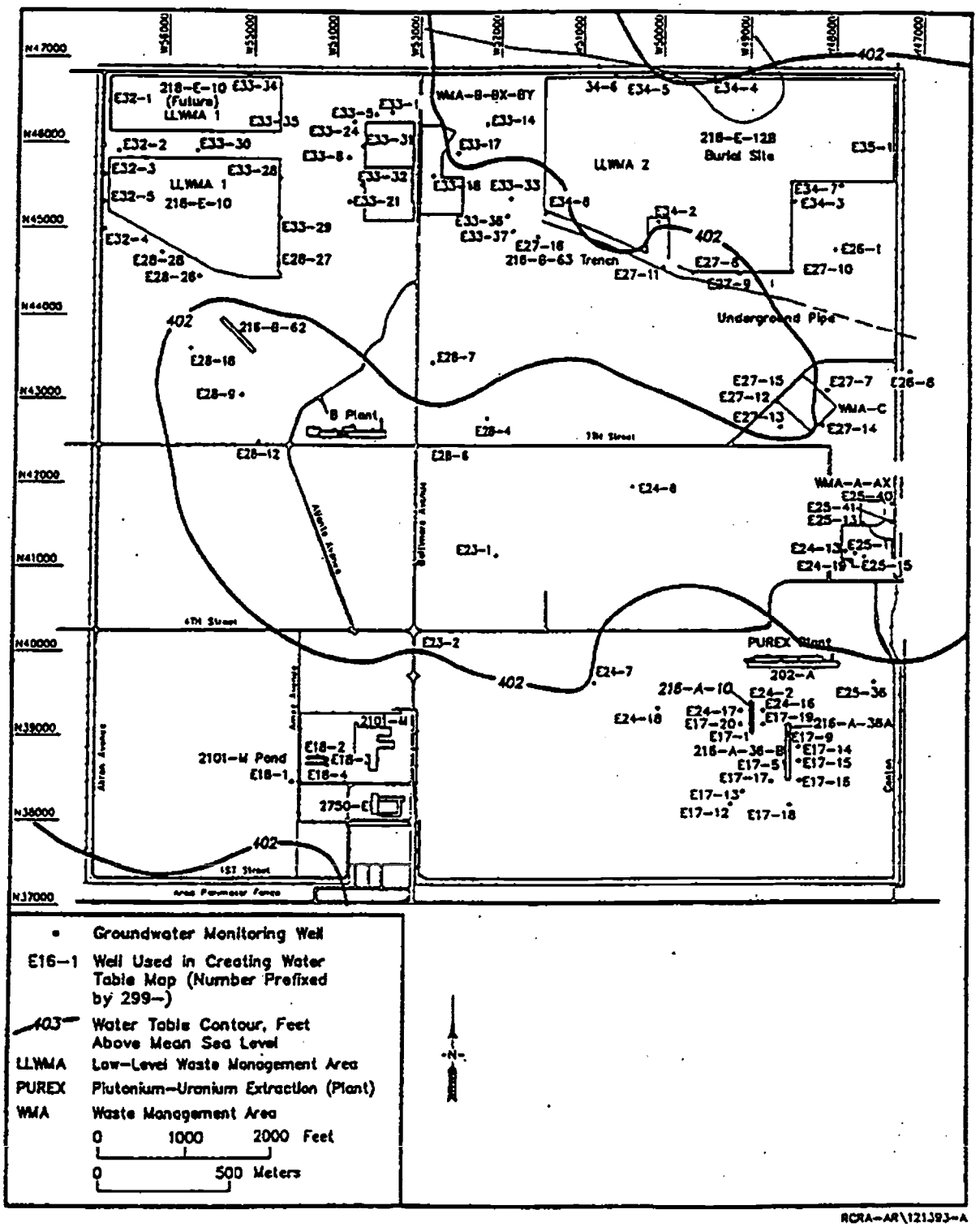

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Figure 6. Water Table Beneath Low-Level Waste Management Areas 1 and 2 in the 200 East Area, June 1993.

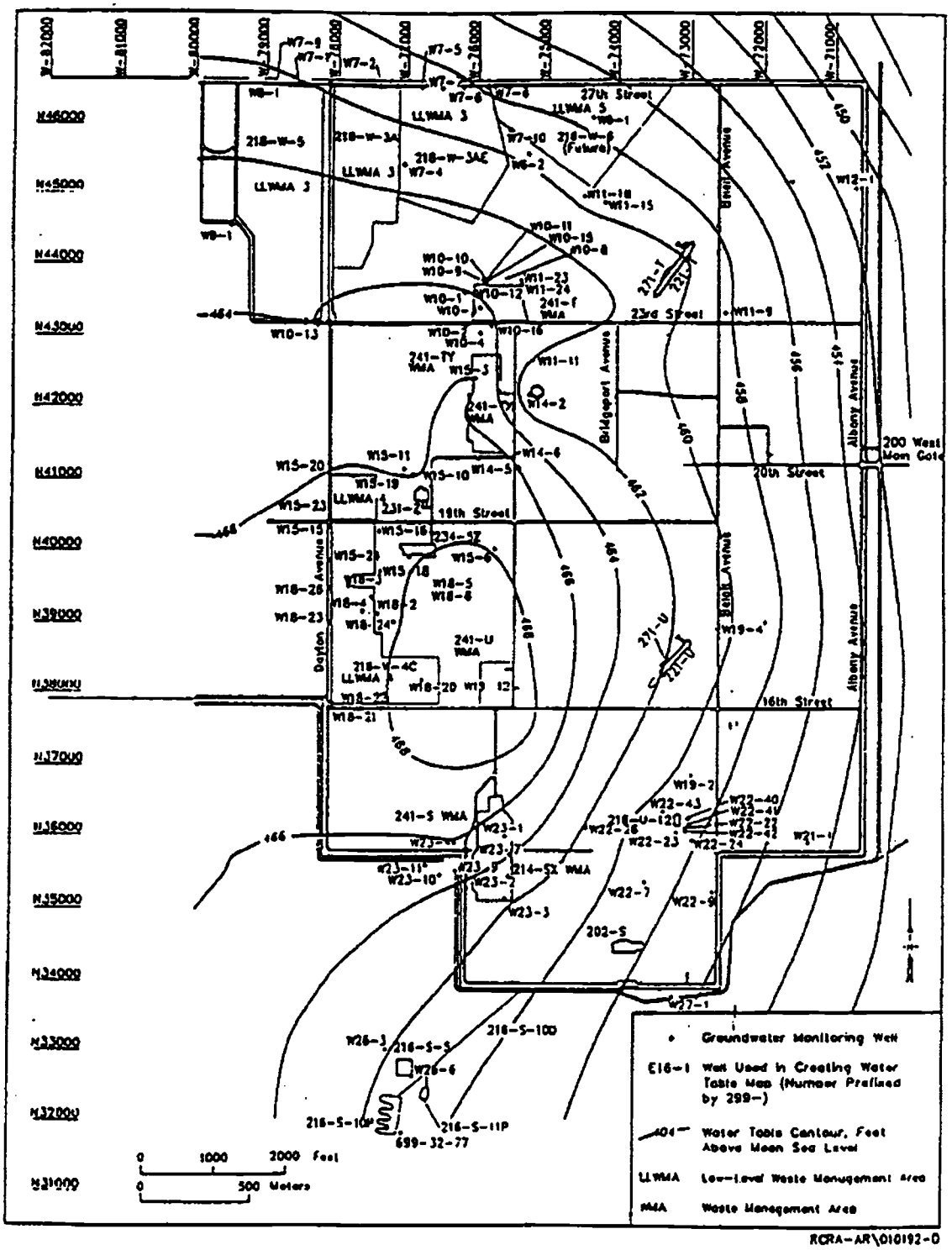

Figure 7. Water Table Beneath Low-Level Waste Management Areas 3, 4 and 5 in the 200 West Area, June 1991.

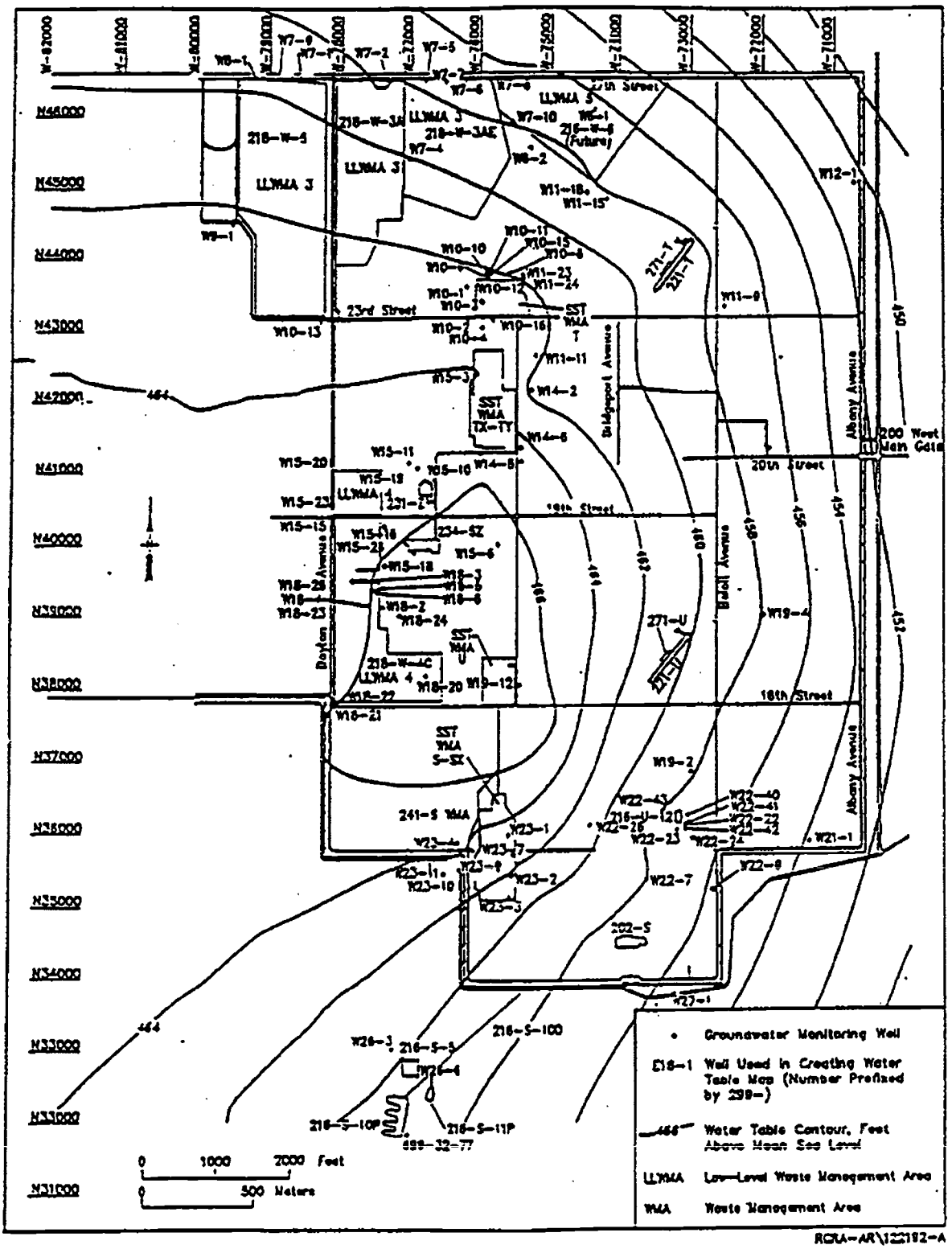

Figure 8. Water Table Beneath Low-Level Waste Management Areas 3, 4 and 5 in the 200 West Area, June 1992.

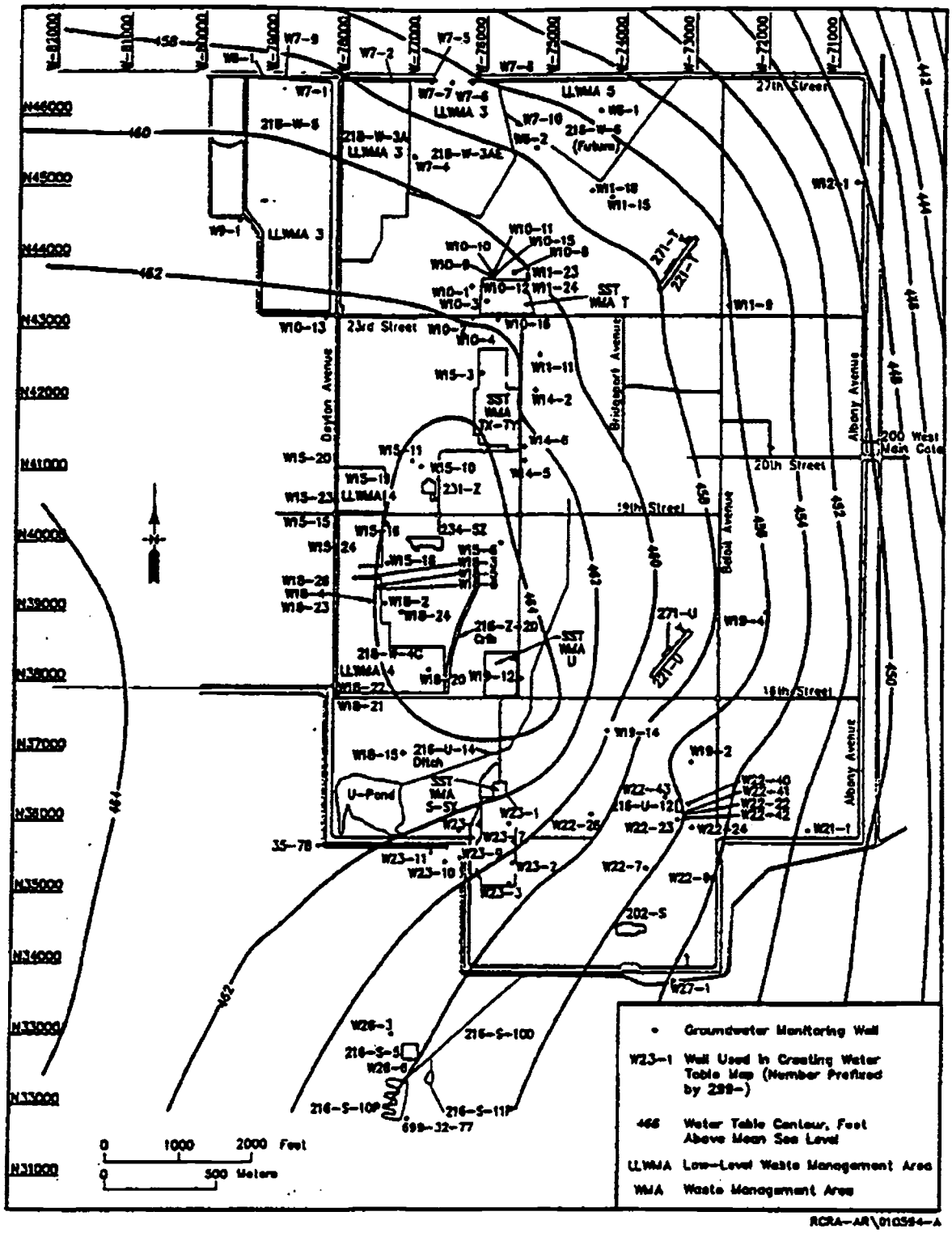

Figure 9. Water Table Beneath Low-Level Waste Management Areas 3, 4, and 5 in the 200 West Area, June 1993.

Table 1. Construction Details for Detection-Level Monitoring Wells; Low-Level Waste Management Area-1. (sheet 1 of 2)

Well	Coordinates	Top of casing elevation (meters)	Drilled depth (meters)	Screened interval (meters)
299-E28-26	N 44,446 W 55,606	209.48	100	85-91
299-E28-27	N 44,595 W 54,670	207.38	92	82-88
299-E28-28	N 44,724 W 56,056	209.32	90	84-90
299-E32-2	N 45,904 W 56,565	204.23	88	79-85
299-E32-3	N 45,631 W 56,721	206.21	93	81-87
299-E32-4	N 44,985 W 56,713	209.06	95	85-91
299-E32-5	N 45,306 W 56,725	207.92	90	83-89
299-E32-6	N 46,060 W 56,722	203.44	85	78-84
299-E32-7	N 46,493 W 56,720	200.69	83	75-81
299-E32-8	N 46,802 W 56,513	196.77	78	72-78
299-E32-9	N 46,802 W 56,081	196.09	78	70-76
299-E32-10	N 46,800 W 55,569	194.44	75	68-74
299-E33-28	N 45,596 W 54,668	202.46	85	78-84
299-E33-29	N 45,124 W 54,665	205.36	88	80-86

Table 1. Construction Details for Detection-Level Monitoring Wells; Low-Level Waste Management Area-1. (sheet 2 of 2)

Well	Coordinates	Top of casing elevation (meters)	Drilled depth (meters)	Screened interval (meters)
299-E33-30	N 45,903 W 55,660	202.29	85	78-84
299-E33-34	N 46,796 W 55,065	193.04	73	67-73
299-E33-35	N 46,351 W 54,685	195.99	76	69-76

Table 2. Construction Details for Detection-Level Monitoring Wells; Low-Level Waste Management Area-2. (sheet 1 of 2)

Well	Coordinates	Top of casing elevation (meters)	Drilled depth (meters)	Screened interval (meters)
299-E27-8	N 44,496 W 49,642	194.41	78	69-75
299-E27-9	N 44,484 W 49,122	191.78	74	67-73
299-E27-10	N 44,520 W 48,522	190.34	73	65-71
299-E27-11	N 44,558 W 49,990	196.07	81	70-76
299-E27-17	N 44,752 W 50,337	193.46	75	68-74
299-E34-2	N 45,076 W 50,048	192.27	74	67-73
299-E34-3	N 45,337 W 48,488	186.39	65	59-65
299-E34-4	N 46,791 W 49,419	179.09	54	48-54
299-E34-5	N 46,791 W 50,014	180.07	58	52-58
299-E34-6	N 46,784 W 50,609	182.22	59	53-59
299-E34-7	N 45,520 W 47,949	184.17	63	59-62
299-E34-9	N 45,765 W 51,520	191.62	71	65-71
299-E34-10	N 45,091 W 51,199	195.00	76	69-75
299-E34-11	N 46,264 W 51,551	188.35	67	63-66

Table 2. Construction Details for Detection-Level Monitoring Wells; Low-Level Waste Management Area-2. (sheet 2 of 2)

Well	Coordinates	Top of casing elevation (meters)	Drilled depth (meters)	Screened interval (meters)
299-E34-12	N 44,907 W 50,783	194.71	76	68-75
299-E35-1	N 45,870 W 47,339	182.36	59	55-58

Table 3. Construction Details for Detection-Level Monitoring Wells; Low-Level Waste Management Area-3.
(sheet 1 of 2)

Well	Coordinates	Top of casing elevation (meters)	Drilled depth (meters)	Screened interval (meters)
299-W6-2	N 45,571 W 75,302	211.06	76	68-75
299-W7-1	N 46,551 W 78,601	210.53	75	68-75
299-W7-2	N 46,519 W 77,385	205.92	72	62-68
299-W7-3	N 46,520 W 77,420	206.09	145	137-143
299-W7-4	N 45,435 W 77,040	204.73	72	62-71
299-W7-5	N 46,509 W 76,816	205.14	70	63-69
299-W7-6	N 46,509 W 76,219	206.85	74	64-70
299-W7-7	N 46,509 W 76,519	205.72	70	63-69
299-W7-8	N 46,510 W 75,880	209.50	75	67-73
299-W7-9	N 46,549 W 78,889	210.95	77	67-73
299-W7-10	N 45,921 W 75,564	210.21	74	67-73
299-W7-11	N 46,512 W 77,769	207.70	72	65-71
299-W7-12	N 46,514 W 78,246	209.68	75	67-73
299-W8-1	N 46,551 W 79,200	213.76	83	72-78
299-W9-1	N 44,508 W 79,507	224.86	90	81-87

Table 3. Construction Details for Detection-Level Monitoring Wells; Low-Level Waste Management Area-3.
(sheet 2 of 2)

Well	Coordinates	Top of casing elevation (meters)	Drilled depth (meters)	Screened interval (meters)
299-W10-13	N 43,137 W 78,297	213.07	76	69-75
299-W10-14	N 43,143 W 78,330	213.19	141	130-136
299-W10-19	N 44,545 W 77,249	208.17	72	65-72
299-W10-20	N 43,987 W 77,565	209.56	74	68-74
299-W10-21	N 44,930 W 76,466	205.45	72	64-70

Table 4. Construction Details for Detection-Level Monitoring Wells; Low-Level Waste Management Area-4.
(sheet 1 of 2)

Well	Coordinates	Top of casing elevation (meters)	Drilled depth (meters)	Screened interval (meters)
299-W15-15	N 40,330 W 78,103	212.74	78	68-77
299-W15-16	N 40,269 W 77,387	208.75	74	63-72
299-W15-17	N 40,221 W 77,387	208.68	137	129-132
299-W15-18	N 39,705 W 77,383	117.56	74	63-72
299-W15-19	N 41,041 W 77,772	210.80	75	65-72
299-W15-20	N 41,028 W 78,120	212.86	74	67-73
299-W15-23	N 40,680 W 78,119	213.20	74	67-73
299-W15-24	N 39,851 W 78,096	213.17	74	67-73
299-W18-21	N 37,794 W 78,080	203.80	69	60-69
299-W18-22	N 37,831 W 78,109	203.76	139	127-137
299-W18-23	N 38,987 W 78,120	212.39	78	67-76
299-W18-24	N 38,998 W 77,180	208.59	73	63-72
299-W18-26	N 39,477 W 78,097	213.07	76	68-74
299-W18-27	N 38,607 W 78,103	210.39	73	66-72
299-W18-28	N 38,214 W 78,096	207.26	70	63-70

Table 4. Construction Details for Detection-Level Monitoring Wells; Low-Level Waste Management Area-4.
(sheet 2 of 2)

Well	Coordinates	Top of casing elevation (meters)	Drilled depth (meters)	Screened interval (meters)
299-W18-29	N 37,952 W 76,560	205.48	46	36-41
299-W18-32	N 37,780 W 76,709	206.24	69	62-68

Table 5. Construction Details for Detection-Level Monitoring Wells; Low-Level Waste Management Area-5.

Well	Coordinates	Top of casing elevation (meters)	Drilled depth (meters)	Screened interval (meters)
299-W6-2	N 45,571 W 75,302	211.06	76	68-75
299-W6-3	N 45,399 W 74,713	213.31	134	125-128
299-W6-4	N 45,370 W 74,667	213.74	79	72-78
299-W6-5	N 46,510 W 73,477	217.64	87	80-87
299-W6-6	N 46,511 W 74,053	216.40	144	128-131
299-W6-7	N 46,512 W 74,077	216.49	84	75-81
299-W6-8	N 46,514 W 75,004	211.45	77	70-76
299-W6-9	N 45,609 W 74,997	212.78	77	70-77
299-W6-10	N 45,901 W 73,744	217.16	85	77-83
299-W6-11	N 46,500 W 74,564	214.23	85	83-85
299-W6-12	N 46,504 W 75,374	211.08	78	73-78
299-W7-10	N 45,921 W 75,564	210.21	74	67-73
299-W11-31	N 45,188 W 74,375	215.45	81	73-79

Table 6. Sample Volume and Container Type for Interim Status Groundwater Sampling Parameters.

Parameter	Recommended container[a]	Sample volume (milliliters)
pH	P, CG	25
Specific conductivity	P, CG	100
<u>Organic compounds</u>		
Volatile organic compounds	AG - Teflon[b] lined septum in cap	2-40 vials
Semi-volatile organic compounds	AG	2,000
Total organic halogen (TOX)	AG	250
Total organic carbon (TOC)	AG	250
<u>Metals</u>		
Beryllium	P	1,000
Chromium	P	1,000
Copper	P	1,000
Cadmium	P	1,000
Silver	P	1,000
Sodium	P	1,000
Mercury	G	1,000
Lead	P	1,000
<u>Inorganic anions</u>		
Chloride	P	1,000
Fluoride	P	1,000
Sulfate	P	1,000
Nitrate	P	1,000
<u>Nonmetals</u>		
Radium	P	500
Gross alpha	P	500
Gross beta	P	500
Cyanide	P	500

[a]Container types: P - plastic (PE), AG - amber glass, CG - clear glass.
[b]Teflon is a trademark of E.I. duPont de Nemours and Company, Incorporated.

Table 7. Water Level Information for Selected Low-Level Burial Grounds Groundwater Monitoring Wells.

	Well	December measurements (meters above mean sea level) 1987	1989	1991	1993
LLWMA-1					
	299-E28-26	123.40	123.28	122.86	122.31
	299-E32-2	123.32	123.21	122.79	122.29
	299-E33-28	123.40	123.28	122.84	122.36
LLWMA-2					
	299-E27-10	123.64	123.48	123.03	122.52
	299-E34-2	123.49*	123.39	122.86	122.42
	299-E34-5	123.78	123.63	123.20	122.77
LLWMA-3					
	299-W6-2	140.81	140.66	140.05	139.31
	299-W7-2	140.55	140.32	139.88	139.19
	299-W7-4	141.23	140.95	140.43	139.74
	299-W7-3d	140.17	139.90	139.55	138.87
	299-W10-14d	142.20	141.88	141.36	140.53
LLWMA-4					
	299-W15-15	143.15	142.86	142.14	141.23
	299-W15-16	143.37	143.12	142.28	141.36
	299-W18-21	143.28	142.91	142.22	141.22
	299-W15-17d	143.23	142.96	142.17	141.33
	299-W18-22d	143.05	142.63	142.00	141.09
LLWMA-5					
	299-W6-2	140.81	140.66	140.05	139.31
	299-W6-4	----	----	----	139.45
	299-W6-7	----	----	----	138.38
	299-W6-3d	----	----	----	139.27
	299-W6-6d	----	----	----	138.37

* - Measured 1/8/88.
d - Monitors bottom of unconfined aquifer.

Table 8. Chemical Constituents Exceeding Drinking Water Standards During Initial Interim Status Sampling Event (September/October 1988).

Constituent	Number of wells			
	LLWMA-1	LLWMA-2	LLWMA-3	LLWMA-4
Gross alpha (15 picocuries per liter)[a]	1	0	0	1
Carbon tetrachloride (5 parts per billion)[a]	0	0	4	6
Coliform bacteria (1 MPN)[a]	0	0	0	1
Chromium (50 parts per billion)[a]	0	0	3	5
Nitrate (45 milligrams per liter)[a]	1	0	2	2
Trichloroethylene (5 parts per billion)[a]	0	0	0	1
Tritium (20,000 picocuries per liter)[a]	5	0	0	0

[a]40 CFR 141; MPN = most probable number.

APPENDIX 5B

SUSPENSION OF GROUNDWATER SAMPLING AT LOW-LEVEL WASTE MANAGEMENT AREA 5

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

9601159

APR 3 1996

Mr. David L. Lundstrom
200 Area Section Manager
Nuclear Waste Program
State of Washington
Department of Ecology
1315 W. Fourth Avenue
Kennewick, Washington 99336-6018

Dear Mr. Lundstrom:

SUSPENSION OF GROUNDWATER SAMPLING AT LOW-LEVEL WASTE MANAGEMENT AREA 5 (LLWMA-5)

The LLWMA-5 in the 200 West Area is one of the Low-Level Burial Grounds monitored under the Resource Conservation and Recovery Act (RCRA) program on the Hanford Site. This LLWMA comprises all of the 216-W-6 burial ground in the north-central portion of 200 West. Waste has not been placed in this burial ground.

Groundwater has been monitored specifically for RCRA at this site since 1991. Background values and required statistics for the contamination indicator parameters (CIPs) were determined in 1993. Because it was not clear in 1993 when the first wastes were to be placed in LLWMA-5, semiannual sampling has continued.

A determination has now been made that the LLWMA-5 will not be needed for several years. As an economy measure, groundwater sampling for LLWMA-5 will be suspended beginning the first quarter of 1996. Sampling will be re-instituted prior to any wastes being disposed to LLWMA-5. At that time statistical evaluations will be done to determine whether the established background levels for the CIPs are still representative of groundwater conditions beneath the burial ground.

If you want to discuss this matter further or require additional information, please contact me at 373-9630.

Sincerely,

M. J. Furman, Project Manager
Groundwater Project

GWP:MJF

cc: A. Diliberto, WHC
S. Leja, Ecology
J. Schmid, WHC H6-06
D. Sherwood, EPA
J. Williams, WHC (H6-3)

APPENDIX 7A

BUILDING EMERGENCY PLAN FOR LOW-LEVEL BURIAL GROUNDS

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This plan covers the following: 200 West Area Burial Grounds, 200 East Area Burial Grounds, and the MO-223 (200 West Area Burial Ground Trailer).

Approved:

Building Emergency Director — Date 6-5-97

Environmental Compliance Officer — Date 6/6/97

Manager, Solid Waste Management — Date 6/6/97

Hanford Fire Department — Date 6/6/97

Emergency Preparedness — Date 6/6/97

This plan will be reviewed annually and updated as required by the Building Emergency Director and modified pursuant to Washington Administrative Code (WAC) 173-303-830 and in accordance with the Hanford Facility RCRA Permit. This document will be approved by the manager of Emergency Preparedness (or delegate) and the Hanford Fire Department.

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METRIC CONVERSION CHART

The following chart is provided as a tool to aid in conversion of units.

Into metric units

If you know	Multiply by	To get
Length		
inches	25.40	millimeters
inches	2.54	centimeters
feet	0.3048	meters
yards	0.914	meters
miles	1.609	kilometers
Area		
square inches	6.4516	square centimeters
square feet	0.092	square meters
square yards	0.836	square meters
square miles	2.59	square kilometers
acres	0.404	hectares
Mass (weight)		
ounces	28.35	grams
pounds	0.453	kilograms
short ton	0.907	metric ton
Volume		
fluid ounces	29.57	milliliters
quarts	0.95	liters
gallons	3.79	liters
cubic feet	0.03	cubic meters
cubic yards	0.76	cubic meters
Temperature		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius

Out of metric units

If you know	Multiply by	To get
Length		
millimeters	0.0393	inches
centimeters	0.393	inches
meters	3.2808	feet
meters	1.09	yards
kilometers	0.62	miles
Area		
square centimeters	0.155	square inches
square meters	10.7639	square feet
square meters	1.20	square yards
square kilometers	0.39	square miles
hectares	2.471	acres
Mass (weight)		
grams	0.0352	ounces
kilograms	2.2046	pounds
metric ton	1.10	short ton
Volume		
milliliters	0.03	fluid ounces
liters	1.057	quarts
liters	0.26	gallons
cubic meters	35.3147	cubic feet
cubic meters	1.308	cubic yards
Temperature		
Celsius	multiply by 9/5ths then add 32	Fahrenheit

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

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1.0 GENERAL INFORMATION

The Low-Level Burial Grounds (LLBG) are located on the Hanford Site, a 1,450-square kilometer U.S. Department of Energy (DOE) operational site in southeastern Washington State. The LLBG are located in both the 200 East and 200 West Areas near the center of the Hanford Site.

1.1 FACILITY NAME: U.S. Department of Energy Hanford Site Low-Level Burial Grounds.

1.2 FACILITY LOCATION: Benton County, Washington; within both the 200 East and 200 West Areas.

Structures covered by this plan are as follows:

- 200 East Area Burial Grounds (218-E-10 and 218-E-12B)
- 200 West Area Burial Grounds (218-W-3A, 218-W-3AE, 218-W-4B, 218-W-4C, 218-W-5, and 218-W-6)
- MO-223 Trailer.

1.3 OWNER: U.S. Department of Energy
Richland Operations Office
825 Jadwin Avenue
Richland, Washington 99352

FACILITY MANAGER: Rust Federal Services of Hanford Inc.
P.O. Box 700
Richland, Washington 99352

1.4 DESCRIPTION OF THE FACILITY AND OPERATIONS

The LLBG consist of eight burial grounds located in the 200 East Area and 200 West Area. Seven of the eight burial grounds (218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, 218-W-5, and 218-W-6) are, or will be, used for the disposal of mixed waste and are subject to WAC 173-303. One burial ground (218-W-4B) is designated as a solid waste management unit.

The 218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4B, 218-W-4C, and 218-W-6 Burial Grounds are classified as a landfill (D81) and the 218-W-5 Burial Ground is classified as a landfill (D81) and for greater-than-90-day container storage (S01). The regulated portions of the LLBG cover a total area of approximately 49 hectares.

The 218-E-10 and 218-E-12B Burial Grounds are located in the 200 East Area. The 218-W-3A, 218-W-3AE, 218-W-4B, 218-W-4C, 218-W-5, and 218-W-6 Burial Grounds are located in the 200 West Area. The LLBG consist of various sizes and depths of lined and unlined disposal trenches. All mixed waste destined for disposal will meet land disposal restriction (LDR) requirements [WAC 173-303-140 and 40 Code of Federal Regulations (CFR) 268] or other regulatory alternatives. The lined trenches have leachate collection and removal systems. The less than-90-day leachate collection tanks are operated in accordance with the generator provisions of WAC 173-303-200.

Future trench development and configuration within a burial ground are subject to change as disposal techniques improve or as waste management needs dictate and will be subject to an approved permit modification in accordance with the Hanford Facility (HF) RCRA Permit (Ecology 1994). Mixed waste is disposed in lined or in unlined trenches. Disposal of mixed waste in unlined trenches requires an exemption from the liner/leachate collection system requirements.

The following provides a brief description and identifies the generic types of waste disposed in the LLBG. An electronic database is maintained that documents each waste receipt, type of waste, and disposal location.

- The 218-E-10 Burial Ground is approximately 36.1 hectares in size and began receiving waste in 1960. Examples of waste placed in this burial ground include failed equipment, rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-E-12B Burial Ground is approximately 68 hectares in size and began receiving waste in 1967. Examples of waste placed in this burial ground include defueled reactor compartments (trench 94), low-level waste, and retrievable transuranic waste.

- The 218-W-3A Burial Ground is approximately 20.4 hectares in size and began receiving waste in 1970. Examples of waste placed in this burial ground include ion exchange resins, failed equipment, tanks, pumps, ovens, agitators, heaters, hoods, jumpers, vehicles, accessories, retrievable transuranic waste, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-W-3AE Burial Ground is approximately 20 hectares in size and began receiving waste in 1981. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-W-4B Burial Ground is approximately 3.5 hectares in size and began receiving waste in 1968. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, alpha caissons, and retrievable transuranic waste.

- The 218-W-4C Burial Ground is approximately 20 hectares in size and began receiving waste in 1978. Examples of waste placed in this burial ground include contaminated soil, decommissioned pumps, pressure vessels, post-August 19, 1987 RCRA and state-only designated mixed waste, and retrievable transuranic waste.

- The 218-W-5 Burial Ground is approximately 37.2 hectares in size and began receiving waste in 1986. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste. This burial ground currently contains double-lined mixed waste trenches (trenches 31 and 34). Trenches 31 and 34 also are

designated as a greater-than-90-day container storage. Waste to be placed in trenches 31 and 34 for storage purposes predominately will be macro-encapsulated long-length contaminated equipment and other containerized waste that has been treated to meet LDR requirements. Adjacent to the double-lined mixed waste trenches are leachate collection tanks. Examples of waste to be disposed in the double-lined mixed waste trenches include mixed waste that has been treated to meet LDR requirements (including bulk waste), macro-encapsulated long-length contaminated equipment, etc.

- The 218-W-6 Burial Ground is approximately 16 hectares in size, has not received any waste, and is reserved for future mixed waste disposal.

Leachate Collection Tanks

The LLBG mixed waste disposal trenches are supported by leachate collection tanks. Typically, leachate collection tanks are aboveground, carbon steel tanks, internally coated with an amine-cured epoxy. The leachate collection tanks are located adjacent to the disposal trenches and are provided with secondary containment. Secondary containment exists for all feed piping. The leachate collection tanks are provided with a portable enclosure to protect the tank and secondary containment from the elements (i.e., rain, snow, etc.).

The leachate collection tanks have a current design capacity of 37,850 liters; however, future leachate collection tank capacity might change to accommodate various sized lined trenches.

1.5 EVACUATION ROUTING

Figures 1 and 2 provide identification of the staging areas within the LLBG.

During an evacuation, all personnel should move a safe distance upwind of the hazard or report to the nearest staging area for accountability, as the emergency situation dictates. Responses to alarms are discussed in Section 7.0.

The Primary staging area for 200 East LLBG (218-E-10 and 218-E-12B) is in the north east corner of trench #94 (218-E-12B Burial Ground) near the telephone. The secondary staging area is the northwest corner of the MO-720 parking lot in 200 West.

The primary staging area for 200 West LLBG (218-W-3A, 218-W-3AE, 218-W-4B, 218-W-4C, 218-W-5, and 218-W-6) is near MO-223. The secondary staging area is the northwest corner of the MO-720 parking lot.

If during the emergency it becomes necessary to evacuate the primary staging area, the staging area manager or Building Emergency Director (BED) will instruct personnel to proceed to the secondary staging area. Evacuation routes and transportation will be assigned as appropriate. Means of

communicating this information include: by word of mouth, bullhorn, radios, etc.

At the staging area, personnel wearing special work permit (SWP) clothing will segregate themselves from those persons not wearing SWP clothing.

2.0 PURPOSE

This building emergency plan (plan) describes both the hazards and the basic responses to off-normal and/or emergency conditions at the LLBG. "Emergency" as used in this document includes events meeting the WAC 173-303 definition of Emergency, DOE Order 232.1, and categories of Unusual Occurrence and Emergency (DOE Orders 5500.2B and 5500.3A). These events include spills or releases as a result of waste management, fires and explosions, transportation activities, movement of materials, packaging, and natural and security contingencies. This plan, in conjunction with the "Hanford Facility Contingency Plan" (DOE/RL-93-75), is provided to the Washington State Department of Ecology (Ecology) to meet WAC 173-303 requirements.

3.0 BUILDING EMERGENCY ORGANIZATION

Building emergency organizations are discussed in the following sections.

3.1 BUILDING EMERGENCY DIRECTOR

The BED or designated alternate has overall responsibility for implementing this plan. The BED has the responsibilities of the Emergency Coordinator as discussed in WAC 173-303-360 and is responsible for LLBG related events. A listing of the primary and alternate BEDs by title, work location, and work telephone number is contained in Section 13 of the plan. The onsite emergency preparedness organization maintains a list of BED names work and home telephone numbers with Patrol Operations Center (POC) in accordance with Hanford Facility RCRA Permit Dangerous Waste Portion, General Condition II.A.4. The BEDs have the authority to commit all necessary resources (both equipment and personnel) to respond to any emergency. Additional responsibilities have been delegated to Hanford Fire Department personnel who, as the Incident Commander, are authorized to act for the BED when the BED is absent in accordance with Hanford Facility Contingency Plan (DOE/RL-93-75), Section 3.0. These Hanford Fire Department personnel have the authority to commit all necessary resources (both equipment and personnel) to respond to any emergency.

3.2 OTHER MEMBERS

As a minimum, the BED appoints and trains individuals to perform as Personnel Accountability Aides and Staging Area Managers. The accountability aides facilitate the implementation of protective actions (evacuation or take cover) and facilitate the accountability of personnel after protective actions have been implemented. Staging area managers coordinate and/or conduct activities at the staging area. In addition, the BED might identify additional support personnel [Radiological Control (RC), maintenance, engineering, hazardous material coordinators, etc.] to be part of the building emergency organization.

The building emergency organization for the LLBG is posted at MO-223 and MO-720 in the 200 West Area, and at the Emergency Operations Center in the Federal Building.

4.0 IMPLEMENTATION OF THE PLAN

To meet the requirements of WAC 173-303-360, this plan will be considered to be implemented when the BED has determined that a release, a fire, or an explosion involving dangerous waste or dangerous waste constituents that could threaten human health or the environment (WAC 173-303-360 Emergency) has occurred at the LLBG. An incident requiring evacuation of personnel or the summoning of emergency response units will not necessarily indicate that the plan has been implemented. The incident classification process is described in the Hanford Facility Contingency Plan (DOE/RL-93-75), Sections 4.0, 5.1.4, and 5.1.5.

This plan will be considered implemented whenever the BED determines that one of the incidents listed in Section 6.0 has or will occur and that the severity is or will be such that there is a potential to endanger human health or the environment. The BED will implement this plan through specific implementing procedures.

The BED must assess each incident to determine the response necessary to protect the personnel, LLBG, and the environment. If assistance from Hanford Patrol, Fire, or ambulance units is required, the Hanford Emergency Response Number 911; (373-3800 from cellular telephones) must be used to contact the Patrol Operations Center and request the desired assistance. To request other resources or assistance from outside the LLBG, the Patrol Operations Center business number is used (373-3800). The Emergency Duty Officer (EDO) is requested when making the initial 911 call.

5.0 FACILITY HAZARDS

Hazards at the LLBG potentially include industrial hazards, hazardous materials, radiological materials, radioactive and/or mixed waste, physical hazards, biological hazards, and criticality.

5.1 INDUSTRIAL HAZARDS

Industrial hazards could include incidents of transportation, accidents with moving equipment, subsidence (cave-ins), exposure to spilled waste or chemicals, or from radiological or chemical exposure from spills. Potential material handling mishaps are associated with forklift or crane operations. These include potential rupture of packages due to misalignment of the forklift tines or a load dropped during a crane operation.

5.2 HAZARDOUS MATERIALS

Hazardous materials might include (but might not be limited to) the following: spray adhesive, sorbent, diesel fuel, hydraulic oil, propane, road salt, industrial cleaner and degreaser, and unleaded gasoline.

5.3 RADIOACTIVE MATERIALS

Low-level radioactive materials are disposed or can be stored in both the 200 East and 200 West Area burial grounds. All mixed waste must meet LDR requirements for disposal.

5.4 RADIOACTIVE AND/OR MIXED WASTE

The LLBG are designed for disposal of bulk and containerized waste. Any mixed waste designated for the LLBG must meet LDR requirements.

5.5 PHYSICAL HAZARDS

Physical hazards might include (but might not be limited to) the following: tripping or falling, wind-blown sediment, falling objects (e.g., containers), etc.

5.6 BIOLOGICAL HAZARDS

Biological hazards might include (but might not be limited to) the following: snake, spider, scorpion, bees, and wasp bites or stings.

5.7 CRITICALITY

Criticality is prevented by the form or distribution of the fissionable material in the waste.

6.0 POTENTIAL EMERGENCY CONDITIONS

Potential emergency conditions could fall into one of three basic categories: operational (process upsets, fires and explosions, loss of utilities, spills, and releases), natural phenomena (earthquakes), and security contingencies (bomb threat, hostage situation, etc.).

6.1 OPERATIONAL

The following sections include a description of the 'worst-case' accident anticipated for each of the identified credible emergencies. This information typically is derived from safety analysis reports, hazards evaluations, or risk assessments.

6.1.1 Loss of Utilities

- Electrical power is required for trenches 31 and 34 of the 218-W-5 burial ground operations, however, loss of electricity does not constitute an emergency, but should be restored as soon as possible. Electricity supplies power to the sump pumps used to remove accumulated leachate from the primary and secondary liners.

- Loss of Water - N/A.

- Loss of Ventilation - N/A.

- Loss of Steam - N/A.
- Loss of Air - N/A.

6.1.2 Major Process Disruption/Loss of Plant Control

N/A.

6.1.3 Pressure Release

N/A.

6.1.4 Fire and/or Explosion

Potential fire hazards include smoke inhalation, burns, damage to equipment and/or structures, and release of hazardous materials, radioactive and/or mixed waste constituents.

6.1.5 Hazardous/Radioactive Material Spill

Low-level radioactive waste and mixed waste are placed in the LLBG. Material use, storage, disposal, and control information is available on the Solid Waste Information Tracking System (SWITS). Spills or releases could result in the following conditions.

- Spill of Hazardous Material. Hazards associated with a spill include potential exposure to radioactive and/or dangerous constituents as well as potential environmental damage. Because most waste in the LLBG is solid, spill procedures primarily are applicable to liquids that might have been improperly received.

  Any dangerous waste spills would involve accumulated leachate that would be contained within the leachate collection tank(s) and valve gallery secondary containment area, and spill procedures would be applicable (trenches 31 and 34 of the 218-W-5 Burial Ground). EXCEPTION: A pumping spray spill that could result in a release of leachate to the environment.

  During the transfer of leachate from the leachate collection tank(s) to a transport tanker, spills could result in a release of leachate to the environment.

- Toxic Fumes Hazards. Mixed waste disposed in the LLBG could produce airborne radioactive contamination. Volatilization of solids during a fire might generate toxic fumes. Plutonium, an alpha emitter, is known to generate hydrogen (H_2) gas when hydrogenous materials are present in the waste; however, catalytic recombiners are used to maintain H_2 gas concentrations below 1 percent.

  Waste acceptance criteria require that the offsite generators and onsite generating units document waste with gas-generating potential and that the requirement for gas recombiners be specified on the waste tracking forms.

- Fires or Explosions Involving Hazardous Material. A fire or chemical reaction in the LLBG could result in the release of dangerous and/or radioactive constituents to the air or soil.

- Reactive Chemical/Corrosive Material Hazards. N/A.

- Thermal Reactions/Hazards. N/A.

- Flammable Material/Liquids Hazards. Although the LLBG does not dispose of these types of materials, operating equipment requires these materials (e.g., gasoline, hydraulic fluids, oils, etc) for operation. These materials, if ignited could result in the release of dangerous and/or radioactive constituents to the air or soil.

- Asbestos Release. Asbestos might be released during tornadoes, high winds, fires, or other events that damage or destroy the packaging material.

6.1.6 Pressurized/bulging containers

The potential exists for pressurized or bulging containers to rupture resulting in a release to the air or soil.

6.1.7 Transportation and/or Packaging Incidents

Potential consequences of transportation and/or packaging incidents are spills or spread of radioactive contamination, chemical contamination, or personnel contamination. A forklift-damaged container could result in a release to the environment.

6.1.8 Unusual, Irritating, or Strong Odors

For an unusual, irritating, or strong odor, contact Industrial Hygiene (IH), who will evaluate the potential hazards through various IH methods and proceed as applicable. If necessary, the facility manager may request the Hanford Fire Department Hazardous Materials (HAZMAT) team to respond.

6.1.9 Radiological Material Release

- Gaseous Effluent Discharges (stack release) - N/A.

- Liquid Effluent Discharges - N/A.

- Significant Contamination Spread/Releases. Significant contamination spread or release might involve hazards resulting from exposure to radioactive and/or mixed waste. The major potential cause of spread or a release includes damaged containers, high winds, or a fire that might disperse contaminated airborne particles.

6.1.10 Criticality

Fissionable materials located in the LLBG exist in a form or distribution that ensures a critical mass cannot be attained.

6.1.11 Radioactive and/or Mixed Waste Not Acceptable (and cannot be transported)

Acceptable reasons for denying receipt of a radioactive and/or mixed waste transfer/shipment are as follows:

- The LLBG is not capable of managing the dangerous waste type.
- A significant discrepancy exists between the transfer/shipment and the waste listed on the manifest or tracking form.
- The waste arrives in a condition that presents an unreasonable hazard to operations or personnel.

6.2 NATURAL PHENOMENA

Natural phenomena are discussed in the following sections.

6.2.1 Seismic Event

Depending on the magnitude of the event, severe structural damage could occur resulting in serious injuries or fatalities and the release of radioactive and/or mixed waste. Damaged electrical circuits and wiring could result in the initiation of multiple fires.

6.2.2 Volcanic Eruption/Ashfall

Ashfall could cause shorts in electrical equipment powering sump pumps.

6.2.3 High Winds/Tornados

High winds or tornados might cause structural damage to systems (e.g., leachate collection tanks, trenches, etc.) containing radioactive and/or mixed waste resulting in a release to the environment. In addition, electrical power outages also could result from high winds or tornados.

6.2.4 Flood

N/A.

6.2.5 Range Fire

The hazards associated with a range fire include access restrictions and travel hazards such as poor visibility. Waste in the LLBG is either buried or packaged in materials that are fire retardant.

6.2.6 Aircraft Crash

An aircraft crash could result in the direct release of radioactive and/or mixed waste or cause a fire that could lead to the release of radioactive and/or mixed waste.

6.3 SECURITY CONTINGENCIES

Security contingencies are discussed in the following sections.

6.3.1 Bomb Threat

A bomb threat might be received by anyone who answers the telephone or receives mail. The major effect on the LLBG will be evacuation of personnel. If a bomb explodes, the effects are the same as those discussed under fire and explosion.

6.3.2 Hostage Situation

A hostage situation could pose an emergency situation if there is the potential to adversely impact the LLBG. This can be as a result of losing LLBG control (operators removed from their stations) or when the situation results in the coercion of an employee to take some malevolent action.

6.3.3 Suspicious Object

The major effect on the LLBG is that the effected burial ground would need to perform an emergency shutdown and evacuate.

7.0 INCIDENT RESPONSE

The initial response to any emergency is to immediately protect the health and safety of persons in the immediate area. Identification of released material is essential to determine appropriate protective actions. Containment, treatment, and disposal assessment will be the secondary responses.

The following sections describe the process for implementing basic protective actions as well as descriptions of response actions for the events listed in Section 6.0. The "Hanford Facility Contingency Plan" (DOE/RL-93-75) provides a description of generic incident responses, describes the process for assessing and identifying the hazardous materials and/or dangerous waste, and describes the process for categorizing and classifying an incident.

7.1 PROTECTIVE ACTIONS RESPONSES

Protective actions responses are discussed in the following sections.

7.1.1 Evacuation

If an evacuation is ordered or the evacuation siren sounds in the area of the LLBG, personnel should proceed, as follows:

Low-Level Burial Grounds Staging Areas	Area	Location
Primary staging area	200 East	Northeast corner of trench #94 (218-E-12B Burial Ground) near the pole-mounted telephone
Secondary Staging Area		NW corner of MO-720/721 parking lot
Primary staging area	200 West	Outside MO-223
Secondary staging area		NW corner of MO-720/721 parking lot

The BED or staging area manager directs evacuations; however, to ensure that evacuations can be conducted promptly and safely, all personnel should be familiar with the following:

- A Crash Alarm Telephone is located in MO-223. Personnel at MO-223 will notify personnel in the burial grounds by portable, hand-held radio, word of mouth or any other means available.

- Occupied structures on the Crash Alarm Telephone system must ensure that all nearby occupied units also are evacuating.

Area evacuations are rapid or controlled and the differences between them are pointed out in the actions listed in the following. When possible, these steps should be performed concurrently.

AREA EVACUATION PROCEDURE
Halt any operations or work and place equipment and structures in a safe condition. Use emergency shutdown procedures for rapid evacuation.
Use whatever means are available (portable radios, bullhorns, runners, etc.) to pass the evacuation information to personnel.
Evacuate personnel to the staging area; group personnel as follows: potentially contaminated protective clothing, keys immediately available for vehicles, those needing rides.
Conduct personnel accountability. Report personnel accountability results to the Emergency Operations Center (EOC) (373-3876, 373-1786, or 544-8085).
Load personnel in civilian clothes into private and government vehicles, load SWP clad persons into a separate government vehicle, if possible, and try to provide reserve transportation for people with late shutdown duties.
Relay pertinent evacuation information (routes, destination etc.) to drivers.
Dispatch vehicles as soon as the vehicles are loaded.
Report status to the EOC, request additional transportation if required, and report if any personnel remain who are performing late shutdown duties.

7.1.2 Take Cover

When the Take Cover Alarm is activated, personnel should take cover in the nearest building or trailer.

Normally, the LLBG will be alerted of an impending attack via the Area Crash Alarm Telephone System at MO-223. Portable, hand-held radios are used throughout the LLBG.

7.2 RESPONSE TO OPERATIONAL EMERGENCIES

The BED reviews the LLBG event recognition and classification procedure and, if required, classifies the event and initiates area protective actions and site emergency response organization activation.

7.2.1 Loss of Utilities

- Loss of Electricity. Electricity in the trailers is for lighting only. Loss of electricity will not impair functions or constitute an emergency.

  Electrical power is required for trenches 31 and 34 of the 218-W-5 Burial Ground operations; however, loss of electricity does not constitute an emergency, but should be restored as soon as possible. Electricity supplies power to the sump pumps used to remove accumulated leachate from the primary and secondary liners.
- Loss of Water - N/A.

- Loss of Ventilation - N/A.
- Loss of Steam - N/A.
- Loss of Air - N/A.

7.2.2 Utility Disconnect Plan

Use these steps to place the utilities in a safe and secure condition when an emergency has been declared, or when directed by the BED.

- Heating, Ventilation, and Air Conditioning (HVAC) - N/A.
- Electrical

  Trenches 31 and 34: To disconnect electricity to trench 31, open the cutout switches for the 480 VAC transformers on Panel "A" main breaker in the 218-W-5-252 Building. To disconnect electricity to trench 34, open the cutout switches for the 480 VAC transformers on Panel "A" main breaker in the 218-W-5-252A Building.
- Fire Sprinkler System - N/A.
- Sanitary Water/Sewer - N/A.
- Process Water - N/A.
- Steam - N/A.
- Telephone Service. Call 376-6322 or 376-1611 and ask the Telephone Service Contractor to disconnect service.

7.2.3 Major Process Disruption/Loss of Plant Control - N/A.

7.2.4 Pressure Release - N/A.

7.2.5 Fire and/or Explosion

Fire fighting in the LLBG is complicated by the presence of large amounts of radioactive material that might generate airborne contamination. It is extremely important to avoid breaching the containment of the containers or disturbing bulk waste in the LLBG.

In the event of a fire, the discoverer calls 911. Trained personnel could use portable fire extinguishers for small fires. Personnel should use their best judgment whether to fight a fire or to evacuate. Under no circumstances will personnel remain to fight a fire if unusual hazards exist. Because of the danger of violent container failure, fires in the vicinity of the exposed transuranic containers located in trenches 1, 20, and 29 of the 218-W-4C Burial Ground should not be extinguished by operations personnel. Rather, personnel should evacuate the trench immediately and call 911.

- On notification of a fire in the LLBG, personnel shut down equipment, secure waste ONLY if time permits.

- Personnel leave the area and proceed to the designated staging area for accountability.

- The BED proceeds directly to the MO-720 conference room, establishes an Incident Command Post and obtains all necessary information pertaining to the incident. The BED meets the Hanford Fire Department or sends a representative to meet them.

- The BED reviews the LLBG event recognition and classification procedure and, if required, classifies the event and initiates area protective actions and site emergency response organization activation.

- The BED informs the site emergency response organization as to the extent of the emergency (including estimates of mixed waste or radioactive material quantities released to the environment).

- If operations are stopped in response to a fire, the BED ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.

- Hanford Fire Department firefighters extinguish the fire.

- The BED ensures that all emergency equipment is cleaned and fit for its intended use following completion of cleanup procedures.

7.2.6 Hazardous Material, Radioactive and/or Mixed Waste Spill

Spills can result from many sources including the leachate collection tanks, container spills or leaks, damaged packages, or personnel error. Spills of mixed waste are complicated by the need to deal with the extra hazard induced by the presence of radioactive materials. The response to a spill is as follows:

The discoverer performs the following actions for a spill:

- Takes action to contain and/or to stop the spill or container leak if all of the following are true.

  - The identity of the substance(s) involved is known.

  - Appropriate protective equipment and control/cleanup supplies, e.g., absorbents, are readily available.

  - Discoverer safely can perform the action(s) without assistance, or assistance readily is available from other trained personnel.

- Notifies LLBG personnel (including BED) of discovery of spill or release.

- Initiates notifications to the Hanford Fire Department by calling 911, and provides all known information.

If any of the previous conditions are not met or if there is any doubt, evacuate the area and remain outside, upwind of the spill, pending the arrival of the BED. The discoverer remains available for consultation with the BED, Hanford Fire Department, or other emergency response personnel and restricts access to the area until the arrival of the BED.

The BED performs or arranges for the following:

- An Incident Command Post at the MO-720 conference room and coordinates further spill mitigation activities

- Obtains all available information pertaining to the incident and determines if the incident requires implementation of the contingency plan

- Reviews the LLBG event recognition and classification procedure and, if required, classifies the event and initiates area protective actions and site emergency response organization activation

- Arranges for care of any injured persons

- Maintains access control at the incident site by keeping unauthorized personnel and vehicles away from the area. Security personnel can be used to assist in site control if control of the boundary is difficult (e.g., repeated incursions). In determining controlled access areas, considers environmental factors such as wind velocity and direction

- Proper remediation of the incident after evaluation

- Remains available for fire, patrol, and other authorities on the scene, and provides all required information

- Enlists the assistance of alternate BED(s), if response activities are projected to be long term

- Ensures the use of proper protective equipment, remedial techniques, transfer procedures [including ignition source control (e.g., nonsparking tools, grounding containers, isolation of ignition sources, use of explosion-proof electrical equipment, etc.) for flammable or reactive spills], and decontamination procedures by all involved personnel, if remediation is performed by LLBG personnel

- Remains at the Incident Command Post (ICP) to oversee activities and to provide information, if remediation is performed by the Hanford Fire Department Hazardous Materials Response Team or other response teams

- Ensures proper containerization, packaging, and labeling of recovered spill materials and overpacked containers

NOTE - All containers of spill debris, recovered product, etc., are managed in the same manner as waste containers. Overpacks in use are marked with information pertaining to their contents and noted as to whether the container inside the overpack is leaking or is in good condition.

- If operations are stopped in response to the release, ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures

- Ensures decontamination (or restocking) and restoration of emergency equipment used in the spill remediation before resuming operations

- Provides required reports after the incident, in accordance with the "Hanford Facility Contingency Plan" (DOE/RL 93-75)

7.2.6.1 Transportation Incidents. In accordance with WAC 173-303-145, the discoverer or BED could take the following actions for leaks or spills resulting from a hazardous materials transportation incident if the actions can be performed without jeopardizing personnel safety, as appropriate:

- Determines the nature of incident
  - Personnel injuries
  - Hazardous material spill with fire
  - Hazardous material spill without fire

- Assists injured personnel

- Initiates notifications to the appropriate personnel by any means available (telephone, radio, passing motorist, etc.) to request assistance from the Hanford Fire Department (Emergency Coordinator/Event Commander for these type of events), Hanford Patrol, and medical personnel.

- Remains in a safe location and attempts to isolate the area to prevent inadvertent personnel access.

7.2.6.2 Receipt of Damaged or Unacceptable Shipments. In accordance with WAC 173-303-370, when a damaged shipment or transfer of radioactive and/or mixed waste arrives at the LLBG and the shipment/transfer is unacceptable for receipt, the damaged shipment/transfer should not be moved.

If a damaged shipment or transfer results in a spill, the following actions are performed:

- Notify the BED, the Hanford Fire Department, and the appropriate personnel to advise of the situation. The BED responds and assists in the evaluation of, and response to, the incident

- Notify the offsite generator or onsite generating unit of the damaged shipment/transfer, and request any information necessary to assist in responding to the spill

- Proceed with remedial action, including overpacking damaged containers, cleanup of spilled material, or other necessary actions to contain the spill

7.2.7 Unusual, Irritating, or Strong Odors

If an unusual, irritating, or strong odor is detected and the discoverer believes that the odor might be from a toxic or dangerous material, the discoverer performs the following:

- Notifies nearby personnel and evacuates the effected burial ground
- Notifies the BED

If the discoverer knows of the source and scope of the odor, this information is reported to the BED. Containment measures are described in Section 7.2.6.

If the unusual odor is detected and the source of the odor is unknown, the BED evaluates additional protective actions and notifies Industrial Hygiene.

7.2.8 Radiological Material Release

- Radioactive Gaseous Effluent Discharge. Air sampling will be performed using the appropriate equipment any time a worker is likely to be exposed to 10 percent of the isotopes Derived Air Concentration (DAC). Tritium oxide (HTO) has a DAC value of 20 microcuries per cubic meter ($\mu Ci/m^3$). For better control of personnel exposures, the following table is included.

Airborne Concentration Equal to 5 mrem Dose Equivalent			
Concentration	**Time**	**Concentration**	**Time**
10 $\mu Ci/m^3$	4 hours	150 $\mu Ci/m^3$	15 minutes
15 $\mu Ci/m^3$	2.5 hours	200 $\mu Ci/m^3$	12 minutes
20 $\mu Ci/m^3$	2 hours	250 $\mu Ci/m^3$	10 minutes
30 $\mu Ci/m^3$	1 hour, 20 min	300 $\mu Ci/m^3$	8 minutes
50 $\mu Ci/m^3$	50 minutes	350 $\mu Ci/m^3$	7 minutes
80 $\mu Ci/m^3$	30 minutes	400 $\mu Ci/m^3$	6 minutes
100 $\mu Ci/m^3$	25 minutes	450 $\mu Ci/m^3$	5 minutes

All personnel possibly exposed to HTO should have a tritium bioassay performed as soon as possible (must be within 30 days of exposure).

- Radioactive Liquid Effluent Discharge. If collected leachate is released, the liquid will be contained by secondary containment.

- Significant Contamination Spread. There are no continuous air monitors in the LLBG. Monitoring is performed by Radiological Control personnel. If monitoring reveals a significant contamination spread, stop breathing until you move out of the affected area, and notify immediate manager and the BED.

7.2.9 Criticality

Transuranic waste is present in the LLBG. Methods are in place for handling this waste type.

7.2.10 Radioactive and/or Mixed Waste Not Acceptable (and cannot be transported)

- Solid waste operations isolates the area of unacceptable waste.
- Discoverer notifies the BED. The BED responds, evaluates, and notifies appropriate personnel.
- The solid waste management group assembles an investigation team.
- The investigation team determines the circumstances and the actions to be taken.
- The solid waste management group proceeds with the actions determined by the investigation team.
- The solid waste management group submits a written report to Ecology within 15 days of the incident.

7.3 PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS, OR RELEASES

The BED, in coordination with emergency response organizations, takes the steps necessary to ensure that a secondary release, a fire, or an explosion does not occur. The following actions are taken:

- Isolates the area of the initial incident by shutting off power to sump pumps, etc., to minimize the spread of a release and/or the potential for a fire or explosion
- Inspects containment for leaks, tears, cracks, or other damage
- Inspects for toxic vapor generation
- Removes released material and waste remaining inside of containment structures (e.g., secondary containment for the leachate collection tanks) as soon as possible
- Contains and isolates residual waste material using dikes and adsorbents

- Covers or using other methods (e.g., fixatives for dust suppression), stabilizes areas where residual released materials remain to prevent migration or spread from wind or precipitation run-off
- Installs new structures, systems, or equipment to enable better management of hazardous materials or radioactive and/or mixed waste
- Reactivates operations in affected areas only after cleanup of residual waste materials is achieved.

7.4 RESPONSE TO NATURAL PHENOMENA

Response to natural phenomena are discussed in the following sections.

7.4.1 Seismic Event

The primary role of the emergency response organization in a seismic event is coordinating the initial response to injuries, fires, and fire hazards; and acting to contain or control hazardous materials and radioactive and/or mixed waste releases.

Individuals should remain calm and stay away from windows, nearby steam lines, trenches, and any nearby hazardous material, radioactive and/or mixed waste locations. Once the shaking has subsided, individuals should evacuate carefully and assist those needing help. The location of any trapped individuals is reported to the BED or is reported to 911.

The BED takes whatever actions are necessary to minimize damage and personnel injuries. The following actions include:

- Coordinating searches for personnel and potential hazardous conditions (fires, spills, etc.)
- Conducting accountability
- Securing utilities and LLBG operations
- Arranging rescue efforts, and notifying 911 for assistance
- Performing facility inspections in accordance with the post-natural phenomena hazards inspection plan and procedure
- Determining if hazardous materials, radioactive and/or mixed waste were released
- Determining current local meteorological conditions
- Warning other units and implement protective actions if the release poses a danger
- Providing personnel and resource assistance to other operations, if required and possible.

7.4.2 Volcanic Eruption/Ashfall

When notified of an impending ashfall, the BED will implement measures to minimize the impact of the ashfall, such as:

- Closing the covers over the ventilation intakes (e.g., structures covering leachate collection tanks)
- Installing filter media or protective coverings on outdoor equipment that could be adversely affected by the ash
- Shutting down some or all operations and processes
- Sealing secondary use exterior doors
- Releasing all but essential personnel to go home

If as a result of the ashfall other emergency conditions arise (e.g., fires due to electrical shorts or lightning), response is as described in other paragraphs in this section.

7.4.3 High Winds/Tornados

On notification of impending high winds, the BED takes steps necessary to secure all outdoor waste and hazardous material container locations.

7.4.4 Flood - N/A.

7.4.5 Range Fire

Responses to range fires are handled by preventive measures (i.e., keeping hazardous material and waste accumulation areas free of combustible materials such as weeds and brush). If a range fire breaches the LLBG boundaries, the response is as described in Section 7.2.5.

7.4.6 Aircraft Crash

The response to an aircraft crash is the same as that listed in Section 7.2.6.1 for responding to transportation incidents.

7.5 SECURITY CONTINGENCIES

Security contingencies are discussed in the following sections.

7.5.1 Bomb Threat

- Telephone Threat. Individuals receiving telephoned threats try to gain as much information as possible from the caller (using the bomb threat checklist if available). On conclusion of the call, notify the BED and Security via 911.

The BED evacuates the LLBG and queries personnel at the staging area regarding any suspicious objects. When Security personnel arrive, follow their instructions.

- Written Threat. Receivers of written threats handle the letter as little as possible. Notify the BED and Security. Depending on the content of the letter, the LLBG may or may not be evacuated. The letter is turned over to Security personnel, and their instructions are followed.

7.5.2 Hostage Situation/Armed Intruder

The discoverer of a hostage situation or of an armed intruder reports this to 911 and to the BED if possible. The BED, after conferring with Security personnel, could covertly evacuate areas of the LLBG not observable by the hostage taker(s)/intruder. No alarms will be sounded.

Security will determine the remaining response actions and will activate the Hostage Negotiating Team if necessary.

7.5.3 Suspicious Object

The discoverer of a suspicious object reports this to the BED and calls 911, if possible, and ensures that the object is not disturbed.

The BED will evacuate the LLBG and (based on the description provided by the discoverer) attempt to determine the identity or owner of the object. This could be done by questioning personnel at the staging area. If the identity/ownership of the object cannot be determined, Security will assume command of the incident. An Emergency Ordnance Team will be dispatched to properly dispose of the object.

8.0 TERMINATION OF EVENT, INCIDENT RECOVERY, RESTART OF OPERATIONS, AND POSTEMERGENCY EQUIPMENT MAINTENANCE AND DECONTAMINATION

Termination of event, incident recovery, restart of operations, and postemergency equipment maintenance and decontamination are discussed in the following sections.

8.1 TERMINATION OF EVENT

The BED declares the termination of an event. However, if additional emergency centers are activated, only the highest activated level of the emergency organization, in conjunction with the BED, will declare that an event has ended. If the DOE-RL Emergency Operations Center (EOC) is activated, only the DOE-RL director officially terminates the event. In all cases, however, the BED must be consulted before reentry is initiated.

8.2 INCIDENT RECOVERY AND RESTART OF OPERATIONS

A recovery plan is developed when necessary. A recovery plan is needed following an event when further risk could be introduced to personnel, the LLBG, or the environment through recovery action and/or to maximize the

preservation of evidence. Depending on the magnitude of the event and the effort required to recover from the event, recovery planning might involve personnel from DOE-RL and other contractors. If a recovery plan is required, the plan is reviewed by appropriate personnel and approved by a Recovery Manager before restart. Restart of operations is performed in accordance with the approved plan.

If this plan were implemented for a WAC 173-303-360 emergency (Section 4.0), Ecology must be notified before operations can resume. Section 9.0 of the "Hanford Facility Contingency Plan" (DOE/RL-93-75) discusses different reports to outside agencies. This notification is in addition to those required reports and must include the following statements.

- There are no incompatibility issues with the waste and released materials from the incident.
- All the equipment has been clean, fit for its intended use, and placed back into service. The notification may be made via telephone conference. Additional information that Ecology requests regarding these restart conditions might be included in the required 15-day report (DOE/RL-93-75).

For emergencies not involving activation of the EOC, the BED ensures that conditions are restored to normal before operations are resumed. If the EOC was activated and the emergency phase is complete, a special recovery organization could be appointed at the discretion of EOC to restore conditions to normal. The makeup of this organization depends on the extent of the damage and its effects.

8.3 INCOMPATIBLE WASTE

After an event, the BED or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Cleanup actions are taken by LLBG personnel or other assigned personnel. Actions to be taken might include, but are not limited to, any of the following:

- Neutralization of corrosive spills
- Chemical treatment of reactive materials to reduce hazards
- Overpacking or transfer of contents from leaking containers
- Use of sorbents to contain and/or absorb leaking liquids for containerization and storage and/or disposal
- Decontamination of solid surfaces impacted by released material, e.g., intact containers, equipment, floors, containment systems, etc.
- Disposal of contaminated porous materials that cannot be decontaminated and any contaminated soil
- Containerizing and sampling of recovered materials for classification

and determination for proper management

- Followup sampling of decontaminated surfaces to determine adequacy of cleanup techniques as appropriate

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility is performed as necessary. Incompatible waste is not placed in the same container. Containers of waste are placed in approved storage areas appropriate for their compatibility class.

If incompatibility of waste was a factor in the incident, the BED or the onsite recovery organization ensures that the cause is corrected. Examples include modification of an incompatibility chart or increased scrutiny of waste from an offsite generator or onsite generating unit when incorrectly designated waste caused or contributed to an incident.

8.4 POSTEMERGENCY EQUIPMENT MAINTENANCE AND DECONTAMINATION

All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumables and disposed materials are restocked. Fire extinguishers are recharged or replaced.

The BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished, self-contained breathing apparatus are cleaned and refilled, protective clothing is cleaned or disposed of and restocked, etc.

Factors to consider when establishing an equipment and personnel decontamination station are as follows:

- Water supplies
- Containment/catch basins and/or systems
- Personal necessary to accomplish proper decontamination
- Protective clothing
- Decontamination supplies (buckets, brushes, soap, chemicals as needed)
- Risk to personnel
- Weather conditions [i.e., severe heat, cold (current and forecasted)]
- Toxicity of material
- Porosity of equipment to be decontaminated
- Disposal requirements of decontamination rinse
- Use of controlled zones to maintain contamination control.

9.0 EMERGENCY EQUIPMENT

Hanford Site emergency resources and equipment are described and listed in the contingency plan (DOE/RL-93-75, Section 7.0).

9.1 FIXED EMERGENCY EQUIPMENT

None.

9.2 PORTABLE EMERGENCY EQUIPMENT

Low-Level Burial Ground Portable Emergency Equipment		
TYPE	**LOCATION**	**CAPABILITY**
Fire extinguishers	In motorized equipment (e.g., trucks, etc.,), nearby structures (e.g., change trailers, storage buildings, etc.,).	Use on any Class A, B, or C fires. (Note: Some are only B and C.) Do NOT use on sodium.
Eye wash and safety shower	None are located in the LLBG area. Use nearest equipment as directed by management.	Assists in flushing unwanted chemical and material from clothing and body.

9.3 COMMUNICATIONS EQUIPMENT/WARNING SYSTEMS

Communications Equipment		
TYPE	**LOCATION**	**CAPABILITY**
Hand-held radios	Portable	N/A

9.4 PERSONAL PROTECTIVE EQUIPMENT

Low-Level Burial Ground Protection Equipment		
TYPE	**LOCATION**	**CAPABILITY**
Anti-C	LLBG	Contamination protection
Supplied air	Available from Respiratory Protection	Protection from airborne hazards
Full-face respirator	MO-721 Mask Station	Protection from airborne particulates
Self-contained breathing apparatus	Available from Respiratory Protection	Breathing air supplied for work in hazardous atmospheres
SWP Clothing	MO-223 (200 West Area change trailer)	Personnel protection against exposure
Acid suit	N/A	Protection when working with caustics/acids

9.5 SPILL CONTROL AND CONTAINMENT SUPPLIES

If in the event of a nonradioactive hazardous materials spill (although highly unlikely), control equipment to be used for an emergency and/or recovery phase is identified as follows:

Burial Ground Spill Control Equipment		
TYPE	**LOCATION**	**CAPABILITY**
Absorbents	Central Waste Complex	Contain or clean up spills
Overpack containers	Central Waste Complex	Provide containment for leaking or damaged containers
Shovels	Conex by MO-223	Clean up hazardous material spills
Chemical transfer pumps	Central Waste Complex	Move hazardous materials
Spill kit	Central Waste Complex	Clean up hazardous material spills

9.6 EMERGENCY COMMAND CENTER

The Incident Command Post for the LLBG is the conference room in MO-720. The Incident Command Post could be moved at the direction of the BED.

10.0 COORDINATION AGREEMENTS

The DOE-RL has established a number of coordination agreements, or memoranda of understanding (MOU), with various agencies to ensure proper response resource availability for incidents involving the Hanford Site. A description of the agreements is contained in the contingency plan (DOE/RL-93-75, Section 8.0).

11.0 REQUIRED REPORTS

Three types of written post-incident reports are required for incidents on the Hanford Site. The reports are summarized in the contingency plan (DOE/RL-93-75).

12.0 PLAN LOCATION

Copies of this plan are maintained at the following locations:

- MO-223
- Hanford Fire Department

- Emergency Operations Center
- Hanford Local Area Network (HLAN)
- MO-720 Conference room

NOTE - In accordance with coordination agreements, the Hanford Fire Department provides direction during onsite event response and provides all needed information to support agencies that may be assisting the onsite responses. Therefore, only copies of plans for facilities where offsite agencies are the initial responders (e.g., 1163 Stores Building) will be provided to offsite support agencies.

13.0 BUILDING EMERGENCY ORGANIZATION

Building Emergency Director

	TITLE	LOCATION	PHONE
PRIMARY	Team Lead	MO-721	373-5187
ALTERNATE	Ops Engineer	MO-721	373-1737

The complete building emergency organization listing of positions, names, work locations and telephone numbers for the LLBG is maintained in a separate, internally controlled, facility document. Copies are distributed to appropriate facility locations and to Emergency Preparedness. In addition, names and work and home telephone numbers of the BEDs and alternates are available from the Patrol Operations Center (373-3800) in accordance with the Hanford Facility RCRA Permit, Dangerous Waste Portion, General Condition II.A.4.

14.0 REFERENCES

DOE Order 232.1, *"Occurrence Reporting and Processing of Operations Information"*.

DOE Order 5500.1B, *"Emergency Management Systems"*.

DOE/RL-93-75, *Hanford Facility Contingency Plan*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

NIOSH, 1996, *Pocket Guide to Chemical Hazards*, National Institute of Occupational Safety and Health, U.S. Department of Health and Human Resources, Public Health Service, Centers for Disease Control, Washington, D.C., updated periodically.

Figure 1. Burial Grounds, 200 East Area.

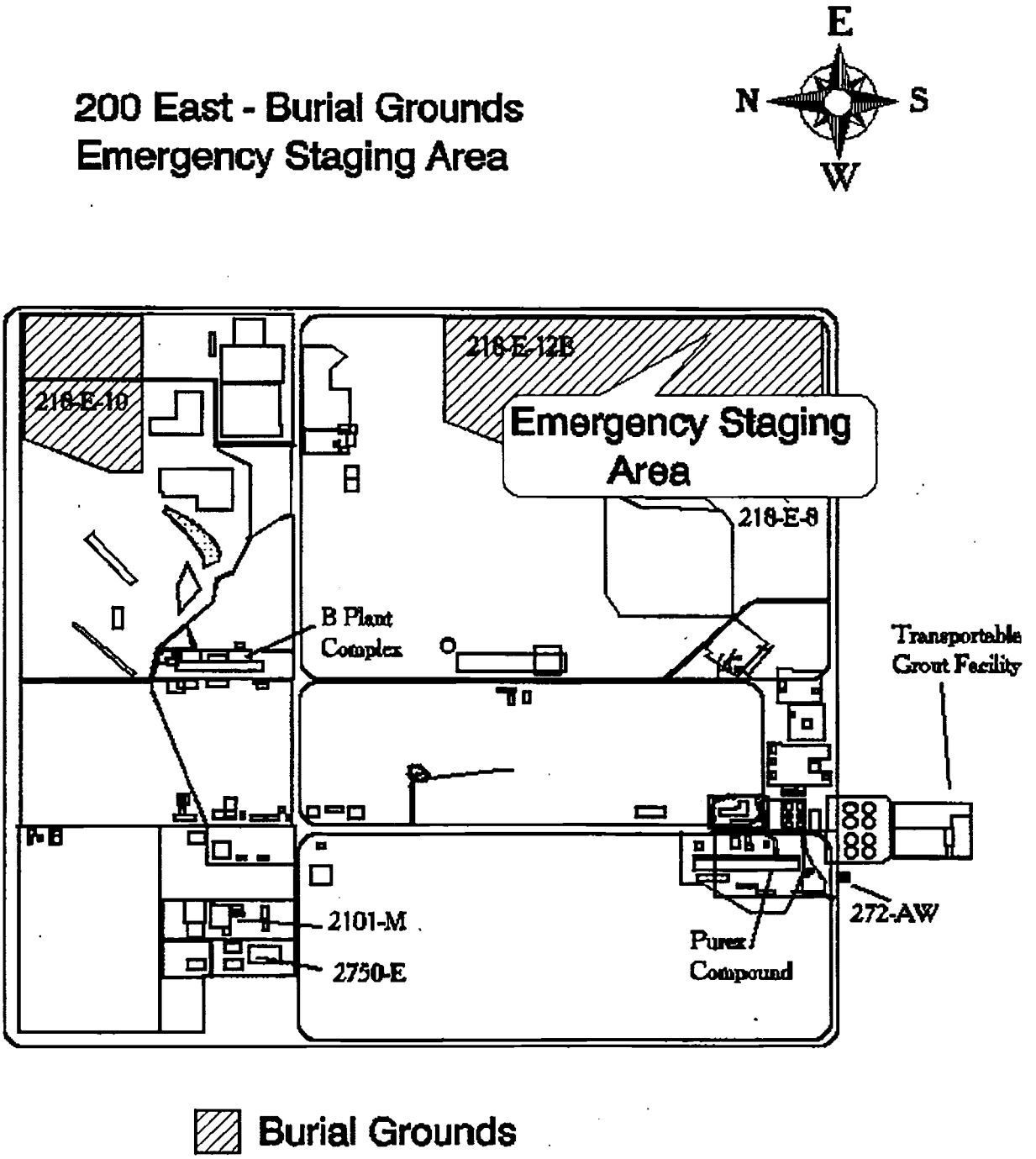
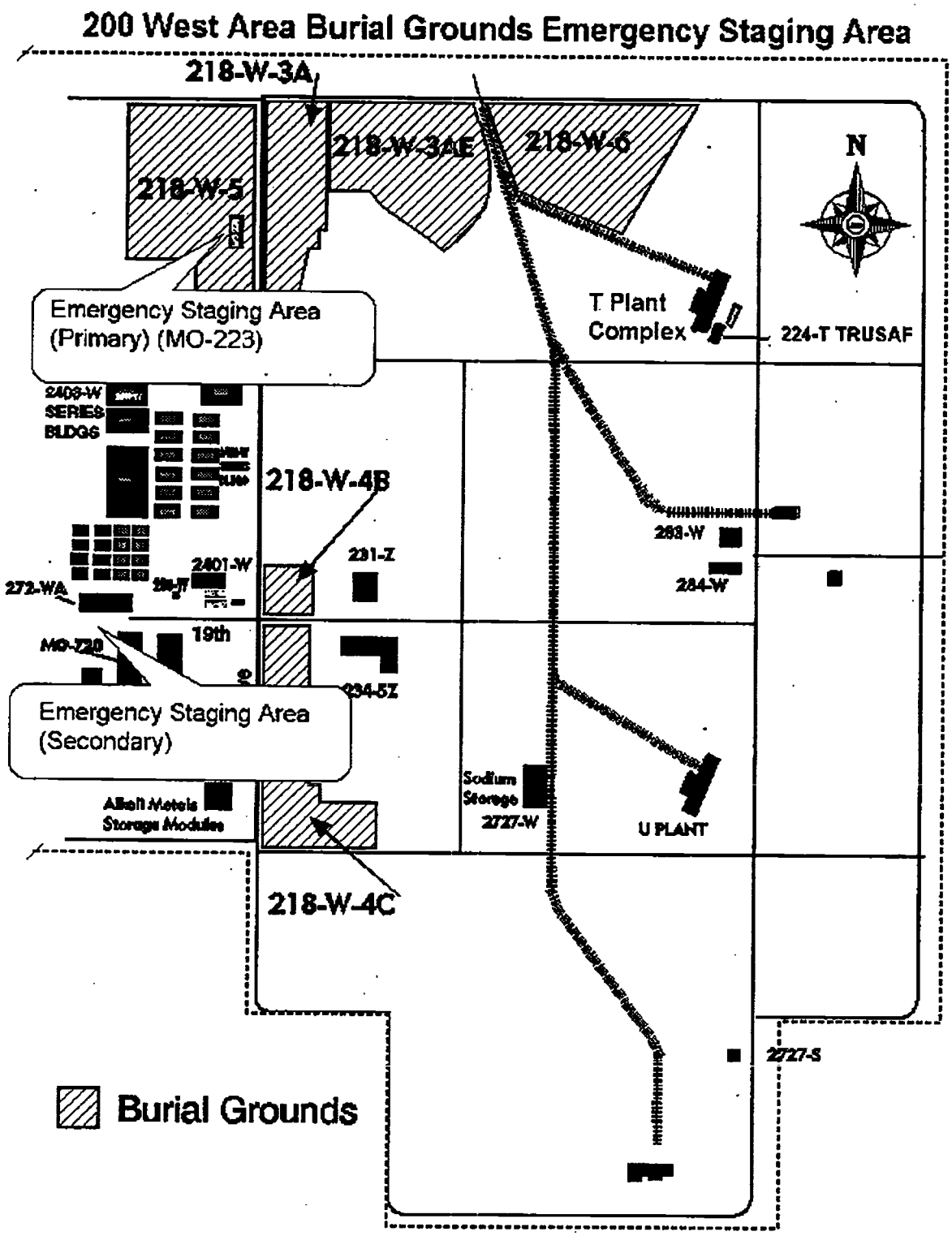


Figure 2. Burial Grounds, 200 West Area.



ATTACHMENT A

LISTING OF PROCEDURES AND GUIDES

The list is maintained by the LLBG organization and will be provided upon request.

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APPENDIX 8A

TRAINING

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R. W. Reddinger — 6/6/97
R. W. Reddinger, Manager — Date
Operations Support and Training

B S Darling — 6/6/97
B. S. Darling, Training Team Leader — Date
Operations Support and Training

R J Giroir — 6/6/97
R. J. Giroir, Manager — Date
Solid Waste Management

K M McDonald — 6/6/97
K. M. McDonald, Environmental Compliance Officer — Date
Solid Waste Management

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1.0 PURPOSE

This document outlines the Dangerous Waste Training Program (DWTP) for the Low-Level Burial Grounds (LLBG) organization. The LLBG are permitted as a treatment, storage, and/or disposal (TSD) unit on the Hanford Facility. The DWTP implements the requirements of Washington Administrative Code (WAC) 173-303-330 and Title 40 Code of Federal Regulations (CFR) 264.16 for the development of a written dangerous waste training plan.

2.0 SCOPE

This DWTP applies to personnel who perform work at, or in support of, the LLBG. The training requirements in this program are based on an assessment of employee duties and responsibilities. The LLBG DWTP ensures personnel responsible for dangerous waste management are trained to perform the job duties pertinent to the handling, treatment, storage, and/or disposal of dangerous waste. In addition, this training program ensures that personnel are familiarized with emergency equipment and/or systems and emergency procedures to safely operate and maintain the LLBG.

3.0 DEFINITIONS

NONE

4.0 RESPONSIBILITIES

4.1 Facility Manager

The LLBG Facility Manager has the overall responsibility to meet all training requirements of WAC 173-303-330 and Condition II.C of the Hanford Facility RCRA Permit (Ecology 1994). To meet the requirements in WAC 173-303-330(1)(a), the training director position is described in the *Hanford Facility Dangerous Waste Permit Application, General Information Portion* (DOE/RL-91-28, Chapter 8.0).

4.2 Training Manager

The training manager has overall responsibility for establishing, conducting, and administering the training program for the LLBG to ensure personnel are trained to meet their assigned jobs.

4.3 Facility Management

All managers are responsible for the following:

- Determining required training for all personnel assigned to the LLBG, as required by job assignment.

- Ensuring that personnel assigned to LLBG receive required initial training, continuing training, and retraining as needed to be qualified to perform their assigned duties in dangerous waste management.

- Maintaining up-to-date personnel training records for assigned personnel.

4.4 Training Personnel

All training personnel are responsible for the following:

- Reviewing training requirements whenever regulations change or annually at a minimum for adherence to regulations and to ensure the requirements reflect the current systems, procedures, and policies applicable to each position.

- Developing and conducting training on new and existing systems or equipment.

4.5 Personnel

All LLBG and support personnel are responsible for the following:

- Working with their managers to define applicable training
- Completing necessary training to gain/maintain qualifications.

5.0 TRAINING PROGRAM

The LLBG DWTP is implemented based on training requirements related to job responsibilities.

5.1 Training Requirements

Training requirements for individual personnel are tracked in the Training Matrix (TMX).

The responsible manager reviews training requirements when personnel change positions or assume new job responsibilities, when changes are identified to this training plan (other than editorial changes), or annually, as a minimum. Updates to the training requirements are made as necessary.

Personnel must meet the training requirements within 6 months of the date of hire, within 6 months of assignment to the LLBG, or within 6 months of assignment to a new position within the LLBG. Personnel in-training will not make decisions that could affect facility safety. Personnel independently can perform specific jobs or tasks for which they are qualified. Personnel performing work who do not meet all training requirements must be supervised by a qualified person.

As new requirements are identified and indicated in this training plan, LLBG personnel will comply with the new requirements within 6 months of the effective date of the requirement.

5.2 Job Titles and Descriptions

Personnel are assigned a job title and a job description. The job description includes requisite skills, work experience, education, and other qualifications, and a brief list of duties and/or responsibilities. This information is maintained by the human resources department.

5.3 Dangerous Waste Worker Position

Personnel are categorized into six worker positions: (1) All Employee, (2) General Worker, (3) Advanced General Worker, (4) General Manager, (5) General Shipper, and (6) Waste Designator.

Personnel are placed in a position based on duties and responsibilities as determined by a job analysis or management assessment. In the event personnel duties and responsibilities fall into more than one position, personnel will complete the training requirements for each position.

Duties and responsibilities of personnel associated with dangerous waste management at LLBG are listed in the following sections.

5.3.1 All Employee

Personnel included in this position are those who do not fall into one of the other five positions and have no duties or responsibilities directly associated with dangerous waste management. Typical job titles of personnel in this position include secretaries, clerks, and oversight personnel.

Most visitors, categorized as All Employee, generally tour, provide oversight, or are brought onsite for interviews. Other non-Hanford Facility personnel who gain access to the LLBG to complete work in controlled areas but do not become involved in the management of dangerous waste are categorized as All Employee.

5.3.2 General Worker

Personnel with limited dangerous waste management duties, such as activities associated with the generation of dangerous waste or facility maintenance or modification, are categorized as General Workers. Typical job titles of personnel in this position include maintenance personnel, health physics technicians, and transporters.

Personnel categorized as General Workers could be assigned duties and responsibilities for the following:

- Placing waste into pre-approved containers and filling out log sheets where applicable
- Completing radiological surveys of dangerous waste
- Moving containers or loading packaged containers onto trucks

- Responding to a spill or release of known contents where duties and responsibilities are limited to containing the spill/release, returning the container to an upright position, and/or placing the known spilled material or waste into a pre-approved container.

- Applying container markings or labels based on direction from an Advanced General Worker, General Manager, or General Shipper.

5.3.3 Advanced General Worker

Personnel whose duties exceed those of a General Worker for dangerous waste management are categorized as Advanced General Workers. The typical job title of personnel in this position is Nuclear Process Operator.

Responsibilities of an Advanced General Worker for management of dangerous waste in containers can include the following:

- Determining container markings and labels
- Preparing container log sheets
- Completing waste inventories
- Sampling of waste
- Packaging and transporting waste samples
- Responding to spills and releases of waste in accordance with approved procedures
- Performing inspections and surveillances
- Receiving transfers and/or shipments of waste.

Responsibilities of an Advanced General Worker for management of dangerous waste in a tank can include conducting daily inspections on tank systems and ancillary equipment, and transferring and/or shipping waste from the tank system.

Responsibilities of an Advanced General Worker for management of dangerous waste in a landfill can include managing leachate and precipitation run-off and receiving transfers and/or shipments of waste.

5.3.4 General Manager

Personnel identified as General Managers coordinate, direct, and oversee the work of General or Advanced General Workers in the management of dangerous waste or in the operation and control of the LLBG. Other duties could include responsibilities during emergency events requiring implementation of the building emergency plan. Typical job titles of personnel in this position include Operations Manager, Environmental Manager, Environmental Compliance Officer, Environmental Engineer/Scientist, Hazardous Material Specialist, and Building Emergency Director.

Responsibilities of a General Manager include the following:

- Directing, controlling, and coordinating the storage, transfer, and/or disposal of dangerous waste

- Maintaining operational records

- Reviewing and approving LLBG operating procedures
- Recognizing and responding to abnormal and/or emergency conditions
- Ensuring emergency and monitoring equipment, process equipment, procedures, designs, etc., comply with DOE Orders, federal and state regulations, national standards, and applicable engineering procedures and management standards
- Maintaining operating documentation, operating procedures, flowsheets, sample schedules, specifications, process test plans and procedures, operational safety requirements, etc.
- Reviewing and approving engineering design documents and drawings for compliance to applicable policies, procedures, and instructions per national standards and codes
- Providing technical assistance for hazardous material and dangerous waste spill response
- Supervising and coordinating dangerous waste transfer, storage, and/or disposal
- Providing approved storage containers and applicable markings
- Preparing and maintaining applicable waste handling documentation in accordance with DOE Orders and federal and state regulations
- Providing waste disposition instructions.

5.3.5 General Shipper

Personnel who prepare and sign waste movement documentation for both onsite or offsite shipments of dangerous waste are categorized as General Shipper.

5.3.6 Waste Designator

Personnel who perform and/or complete waste designations are categorized as a Waste Designator.

5.4 Required Training

Attachment 1 is a matrix of the classes, with brief descriptions, required for the worker positions. Training for emergency procedures, emergency equipment, and emergency systems to meet the requirements of WAC 173-330(1)(d) is included in these courses as specified in the course description. Attachment 2 provides a matrix of job titles and required training for each worker position.

Personnel who have completed training offsite are required to provide a certificate or other suitable evidence of training course(s) that meet the requirements of WAC 173-303 and this plan.

5.5 Non-Hanford Facility Personnel

Non-Hanford Facility personnel who will be performing work at the LLBG must complete the appropriate level of training determined by line management according to the tasks they will perform.

The LLBG management is responsible for ensuring that non-Hanford Facility personnel training requirements are met before granting access.

5.6 Conduct of Training

The training program uses a systematic approach to training. Training design, development, and implementation are based on learning objectives derived from the analysis of the specific job/task. Training is provided using classroom instruction, on-the-job training, required reading, computer-based training methods, and/or by providing drills. Training is developed and provided by personnel knowledgeable in dangerous waste management policies and/or procedures.

5.7 Documentation of Training

Classroom training is documented on course completion rosters, which are signed by personnel attending the course. The completion of the training is documented in an electronic data storage record.

Training record summaries are stored in the Training Records Information (TRI) system. Training records for former personnel are kept on the TRI system for 3 years from the date personnel last worked at LLBG. Original signed and dated training records are maintained by the Hanford Training Records organization. These records are transferred quarterly to the Records Holding Facility in Richland, Washington. After approximately 1 year at the Records Holding Center, the original training records are archived.

5.7.1 Training Records

When a training record is requested during an inspection, an electronic data storage record will be provided. If an electronic data storage record does not supply the requested information, a hard copy training record will be provided. Training records of former personnel might not be readily available and could require a representative from the Training Records organization to access this information.

5.7.2 Training Status

The electronic data storage training record and this training plan are used to determine the training status of personnel.

6.0 REFERENCES

DOE/RL, 1994, DOE-RL/U.S. Army Corps of Engineers to Ecology "State of Washington Department of Ecology Administrative Order No. DE94NM-063" dated April 14, 1994, items 3 and 4.

DOE/RL-91-28, *Hanford Facility Dangerous Waste Permit Application, General Information Portion*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, 1994, *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, Washington State Department of Ecology, Olympia, Washington.

7.0 ATTACHMENTS

ATTACHMENT 1. RCRA TRAINING PROGRAM COURSE DESCRIPTIONS

ATTACHMENT 2. REQUIRED TRAINING FOR LOW-LEVEL BURIAL GROUNDS PERSONNEL

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ATTACHMENT 1. RCRA TRAINING PROGRAM COURSE DESCRIPTIONS

The following constitute the RCRA training program courses as determined by (1) WAC 173-303, (2) the Hanford Facility RCRA Permit, and (3) correspondence between DOE-RL and Ecology on dangerous waste training.

Title	**000001 Hanford General Employee Training**
Description	Course covers DOE Orders and applicable policies pertaining to employer and employee rights and responsibilities, general radiation training, hazard communications, dangerous waste, fire prevention, personal protective equipment, safety requirements, emergency preparedness, accident reporting, and avenues for addressing safety concerns.
Mandating document(s)	Hanford Facility RCRA Permit, General Condition II.C.2 and II.C.4.
Target audience	All Hanford Facility personnel working on the Hanford Facility.
Frequency	Annual.

Title	**02006G Waste Management Awareness**
Description	Course introduces personnel to federal laws governing chemical safety in the work place. The course provides the hazardous material/waste worker with the basic fundamentals for safe use of hazardous materials and initial accumulation or storage of dangerous or mixed waste in containers. The concepts covered in this course instruct personnel on specific waste generation procedures and requirements, which include: (1) applicable waste management practices (i.e., waste stream identification, waste segregation practices, completing container logsheets, and housekeeping requirements), (2) proper responses to incidents pertaining to the waste in the accumulation containers, (3) proper responses to dealing with waste of unknown origins, and (4) proper responses to questions posed in the field concerning the above elements.
Mandating document(s)	WAC 173-303-330(1) Letter: DOE-RL/U.S. Army Corps of Engineers to Ecology "State of Washington Department of Ecology Administrative Order No. DE 94NM-063" dated April 14, 1994, items 3 and 4. Hanford Facility RCRA Permit, General Conditions II.C.1 and II.C.4.
Target audience	Hanford Facility personnel categorized as a General Worker, Advanced General Worker, and General Manager. Subcontractors categorized as General Workers. Other courses may provide equivalent training so that credit for this course is provided when the electronic data storage training record is generated.
Frequency	One-time only. (Annual refresher training is not required because training is adequately covered through 035110 and/or 03E044.)

Title	**020159 Advanced Course 2 - Hazardous Waste Shipper Certification**
Description	Course defines responsibilities and liabilities with regard to compliance to manifesting requirements and U.S. Department of Transportation regulations, including placarding, identifying proper shipping names, and loading requirements.
Mandating document(s)	WAC 173-303-330(1), -180, -190, and -370. Hanford Facility RCRA Permit, General Condition II.Q, as applicable
Target audience	General Shippers of dangerous or mixed waste on roadways anywhere on the Hanford Facility.
Frequency	Every 3 years.

Title	**02028B Building Emergency Director Training**
Description	Course provides an overview of the responsibilities of the Building Emergency Director, identifies the building emergency organizations and actions required during an event, discusses implementing the contingency plan, and discusses drill and exercise requirements.
Mandating document(s)	WAC 173-303-330(1), -340, -350, and -360.
Target audience	Hanford Facility personnel categorized as General Managers because they perform the responsibilities of a RCRA Emergency Coordinator through the title of Building Emergency Director or alternate (e.g., On-Call Manager).
Frequency	Initial (retrained annually by 037510 Building Emergency Director/Warden Requalification).

Title	**300025 Solid Waste Mixed Waste Land Disposal Facility Operations Certification**
Description	Qualifies nuclear process operators to operate the systems associated with the mixed waste trenches including management of waste in containers, tanks, and landfills.
Mandating document(s)	WAC 173-303-330, -630, -640, -650 Hanford Facility RCRA Permit, General Conditions.
Target audience	Operations personnel categorized as Advanced General Workers.
Frequency	Every 2 years.

Title	**300040 Solid Waste Low-Level Burial Ground Facility Operations Certification**
Description	Qualifies nuclear process operators to operate the systems associated with the mixed waste trenches including management of waste in containers, tanks, and landfills.
Mandating document(s)	WAC 173-303-330, -630, -650.
Target audience	Operations personnel categorized as Advanced General Workers.
Frequency	Every 2 years.

Title	**300590 Solid Waste Manager Certification**
Description	Course is a self-study course designed to cover management topics in order to safely operate the solid waste facilities.
Mandating document(s)	WAC 173-303-330, -630, -640, -650. Hanford Facility RCRA Permit, General Conditions.
Target audience	General Managers who are categorized because they are immediate managers of Advanced General Workers who manage dangerous or mixed waste in containers, tank systems, and/or surface impoundments.
Frequency	Every 2 years.

Title	**300700 Solid Waste Facility Orientation**
Description	Introduction to the LLBG, Central Waste Complex, 224-T Transuranic Waste Storage and Assay Facility, and 616 Nonradioactive Dangerous Waste Storage Facility including facility missions, hazards, and emergency response procedures.
Mandating document(s)	WAC 173-303-330 Hanford RCRA Permit, General Condition II.C.
Target audience	All personnel assigned to, or working at, LLBG.
Frequency	Annual.

Title	**035010 Waste Designation**
Description	Course teaches dangerous waste designation according to WAC 173-303. Class content includes section-by-section lecture on the regulations, with examples following each section. Students complete examples using a waste designation flow chart. Examples addressed include: listed waste, characteristic waste, and Washington State criteria of toxicity and persistent.
Mandating document(s)	WAC 173-303-330(1), -070, and -080 through -100.
Target audience	General Shippers and Waste Designators.
Frequency	One-time only. (Annual retrain is only required for those personnel who are required to complete 035012.)

Title	**035012 Waste Designation Qualification**
Description	Course provides qualification to be a Waste Designator.
Mandating document(s)	WAC 173-303-330(1), -070, and -080 through -100.
Target audience	Waste Designators.
Frequency	Annual.

Title	**035020 Facility Waste Sampling and Analysis**
Description	Course presents waste sampling methodologies according to U.S. Environmental Protection Agency Protocols SW-846, "Test Methods for Evaluating Solid Waste Physical/Chemical Methods". This course also covers documentation requirements in a sampling plan and/or waste analysis plan, field and laboratory quality control/assurance, the data quality objectives process, and use of actual sampling equipment as specified by WAC 173-303-110. Finally, topics on listed waste management pertaining to sample management and available onsite sampling services are covered.
Mandating document(s)	WAC 173-303-330(1), -070, -110, and -300.
Target audience	General Managers and/or General Shippers categorized because they perform responsibilities for sampling waste or effluent streams.
Frequency	One-time only.

Title	**035100 Container Waste Management - Initial**
Description	Course covers general training requirements pertaining to waste management of container in less-than-90-day accumulation areas and TSD units. The course incorporates WAC 173-303-200(1), -630, DOE Orders, and container management policy. Course includes practical exercises for hands-on experience with the packaging of dangerous or mixed waste, and preparation of packages for final destination. This course does not cover waste management aspects pertaining to other RCRA waste management units such as tank systems, surface impoundments, containment buildings, landfills, etc.
Mandating document(s)	WAC 173-303-330(1), -630, -200(1) and waste minimization.
Target audience	Advanced General Workers and General Managers categorized because they are immediate managers of or direct Advanced General Workers who manage containers of dangerous or mixed waste.
Frequency	Initial (refresher annually by 035110 Core Waste Management Training).

Title	**035110 Container Waste Management - Refresher**
Description	Refresher Course for Container Waste Management - Initial.
Mandating document	WAC 173-303-330(1), -630, -200(1), and waste minimization.
Target audience	Advanced General Workers and General Managers categorized because they are immediate managers of or direct Advanced General Workers who manage dangerous or mixed waste in containers.
Frequency	Annual.

Title	**035120 Waste Management Administration - Initial**
Description	Course is designed for personnel preparing to become shippers of dangerous and/or mixed waste. This course covers regulatory and onsite policies, forms, reports, forecasts, and plans. Topics also covered include: waste characterization, waste certification summaries, waste specification system, and solid waste storage/disposal records. In addition, students learn how these forms are used to complete shipping papers.
Mandating document(s)	WAC 173-303-330(1), -630, -200, -210, -220, -380, and -390.
Target audience	General Shippers categorized because they direct Advanced General Workers in the management of containers of dangerous and mixed waste.
Frequency	Initial (refresher annually by 035130 - Waste Management Administration).

Title	**035130 Waste Management Administration - Refresher**
Description	Refresher course for Waste Management Administration - Initial.
Mandating document(s)	WAC 173-303-330(1), -630, -200, -210, -220, -380, and -390.
Target audience	General Shippers categorized because they direct Advanced General Workers in the management of containers of dangerous and mixed waste.
Frequency	Annual.

Title	**037510 Building Emergency Director/Warden Requalification**
Description	Refresher for Building Emergency Director Training.
Mandating document(s)	WAC 173-303-330, -340, -350, and -360.
Target audience	General Managers categorized because they have the responsibilities of the RCRA Emergency Coordinator.
Frequency	Annual.

Title	**03E044 Low-Level Burial Grounds Facility Emergency and Hazard Information Checklist**
Description	Course consists of a review of specific chemical hazards associated with operating the LLBG, as covered by the LLBG Building Emergency Plan. The training is completed by the supervisor, manager, or a designated individual. Information reviewed includes hazards in the work area and emergency response requirements, including communication and alarm systems, response to groundwater contamination incidents, and response to fires.
Mandating document(s)	WAC 173-303-330(1)(d), -340, -350, and -630.
Target audience	LLBG personnel categorized as General Workers, Advanced General Workers, and General Managers.
Frequency	Annual.

ATTACHMENT 2. REQUIRED TRAINING FOR LOW-LEVEL BURIAL GROUNDS

Position	Job Title	Required Training
All Employee	All other Job Titles not specifically listed.	000001 300700
General Worker	Radiological Control Technician, Maintenance Personnel (Electrician, Instrument Technician, Insulator, Millwright, Painter, Pipefitter, Power Operator, Process Crane Operator, Rigger, Sign Painter, Truck Driver, Welder), Maintenance Manager, Radiological Control Manager.	000001 02006G 03E044 300700
Advanced General Worker	Nuclear Process Operator	000001, 02006G, 035100/035110, 03E044, 300025, 300040, 300700
General Manager	Operations Manager/Team Leader	000001, 02006G, 02028B/037510, 035100/035110, 03E044, 300590, 300700
	Environmental Manager/Team Leader	000001, 02006G, 035010, 035020, 035100/035110, 03E044, 300700
	Environmental Compliance Officer	000001, 02006G, 035010, 035020, 035100/035110, 03E044, 300700
	Environmental Engineer/Scientist Plant Engineer (Environmental)	000001, 02006G, 035010, 035020, 035100/035110, 03E044, 300700
	Hazardous Material Specialist	000001, 02006G, 035010, 035020, 035100/035110, 03E044, 300700
	Building Emergency Director	000001, 02006G, 02028B/037510, 035100/035110, 03E044, 300700

Position	Job Title	Required Training
General Shipper	Shipper	000001, 02006G, 020159, 035010, 035100/035110, 035120/035130, 03E044, 300700
Waste Designator	Waste Designator	000001, 035010, 035012, 03E044, 300700

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ATTACHMENT II

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010-7 **Inspection Start Date: 02/21/2001**

ECOLOGY FOLLOW-UP INSPECTION (2001-010) OF LLBG, REVIEWED INSP RECORDS

Media: RCRA **Agency:** Ecology **Responsible Contractor:**

Buildings: LLBG **Attendees:** Stephen Szendre **Inspectors:** Bud Derrick (Ecology)

Summary: On February 21, 2001, the State of Washington, Department of Ecology (Ecology) reviewed records with no comments from the inspectors. They went over and looked at inspection records and procedures, again with no indication of concerns. I have lined up a visit to WRAP on Friday at 9AM to observe verification. For additional information, contact the FH Inspection Point of Contact at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010-9 **Inspection Start Date: 03/21/2001**

ECOLOGY FOLLOW-UP INSPECTION (2001-010) OF LLBG, 222-S DRUM VERIFICATION

Media: RCRA **Agency:** Ecology **Responsible Contractor:**

Buildings: LLBG **Attendees:** Ed MacAlister, Paul W Martin, Stephen Szendre, Stuart Mortensen **Inspectors:** Bud Derrick (Ecology), Jeff Ayres (Ecology)

Summary: On March 21, 2001, the State of Washington, Department of Ecology (Ecology) conducted an follow-up inspection. The Ecology Inspectors observed the removal of suspect articles (small amounts of lead) that were identified during a previous LLBG Inspection. Ecology indicated that upon completion of this task, they will close out his LLBG Inspection by sending a formal letter to RL. No concerns or findings have been mentioned by the Ecology inspectors. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010 (Pictures available) **Inspection Start Date: 01/11/2001**

ECOLOGY LLBG INSPECTION

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG

Attendees: Brett Barnes, Dan Saueressig, Gregory Sinton, Paul W Martin, Stephen Szendre, Tony McKarns

Inspectors: Bud Derrick (Ecology), Jeff Ayres (Ecology)

Summary:

On January 11, 2001, the State of Washington, Department Ecology (Ecology) conducted inspection at LLBG. Facility Personnel did a excellent job of answering initial questions, and bringing the new Ecology Inspectors up to speed on LLBG history and operations. In the opening brief the inspectors indicated that they plan to come out a couple of days a week for the next few weeks. There was a short close-out brief held at the end of the day, and there were no violations, concerns, or issues mentioned by the inspectors. They said they will probably be back on Wednesday, Jan 17. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010-1 **Inspection Start Date: 01/17/2001**

ECOLOGY FOLLOW-UP INSPECTION (2001-010) OF LLBG

Media: RCRA **Agency:** Ecology **Responsible Contractor:**

Buildings: LLBG **Attendees:** Gene Grohs, Stephen Szendre **Inspectors:** Bud Derrick (Ecology), Jeff Ayres (Ecology)

Summary:

On January 17, 2001, the State of Washington, Department of Ecology (Ecology) continued their inspection of LLBG today by meeting with FH, PNNL, and RL representatives at the 2355 Steven Building to receive information on, and discuss, groundwater monitoring related to the Low Level Burial Grounds (LLBG). The Inspectors had requested this information during a previous visit to LLBG. Documentation provided on current and historical groundwater activities in, and around, the LLBG. They also answered questions the Inspectors had concerning inactive or dried wells, potential encroachment of plumes, flow direction changes of the groundwater at each burial ground, and any new wells that are proposed for LLBG. The inspectors indicated that they were satisfied that all of the groundwater information. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010-2 **Inspection Start Date: 01/18/2001**

ECOLOGY FOLLOW-UP INSPECTION (2001-010) OF LLBG, GROUNDWATER INFO FROM PNNL

Media: RCRA **Agency:** Ecology **Responsible Contractor:**

Buildings: LLBG **Attendees:** Dan Garguilo, David Watson, Tom Frazier, Walt Alaconis **Inspectors:** John Martell (WDOH), John Schmidt (WDOH)

Summary: On January 18, 2001, the State of Washington, Department of Ecology (Ecology) continued their inspection of LLBG today by meeting with FH, PNNL, and RL representatives at the 2355 Steven Building to receive information on, and discuss, groundwater monitoring related to the Low Level Burial Grounds (LLBG). The inspector had requested this information during a previous visit to LLBG. Documentation was provided on current and historical groundwater activities in, and around, the LLBG. They also answered questions the inspectors had concerning inactive or dried wells, potential encroachment of plumes, flow direction changes of the groundwater at each burial ground, and any new wells that are proposed for LLBG. The inspectors indicated that they were satisfied that all of the groundwater information. No violations or concerns were relayed by the inspectors today. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010-4 **Inspection Start Date: 02/01/2001**

ECOLOGY FOLLOW-UP INSPECTION (2001-010) OF LLBG, W/ELEFSON, AND MCKARNS

Media: RCRA **Agency:** Ecology **Responsible Contractor:**

Buildings: LLBG **Attendees:** Stephen Szendre **Inspectors:** Bud Derrick (Ecology)

Summary: On February 1, 2001, the State of Washington, Department of Ecology (Ecology) reviewed the packages ID numbers. No concerns were indicated. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010-5 **Inspection Start Date: 02/02/2001**

ECOLOGY FOLLOW-UP INSPECTION (2001-010) OF LLBG, MET TONY MCKARNS

Media: RCRA **Agency:** Ecology **Responsible Contractor:**

Buildings: LLBG **Attendees:** Stephen Szendre **Inspectors:**

Summary: On February 2, 2001, the State of Washington, Department of Ecology (Ecology) met with DOE to review historical LLBG information. Ecology wanted to know about the green islands. Ecology indicated no concerns. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010-6 **Inspection Start Date: 02/08/2001**

ECOLOGY FOLLOW-UP INSPECTION (2001-010) OF LLBG

Media: RCRA **Agency:** Ecology **Responsible Contractor:**

Buildings: LLBG **Attendees:** Stephen Szendre **Inspectors:** Bud Derrick (Ecology)

Summary: On February 08, 2001, the State of Washington, Department of Ecology (Ecology) observed some NDE verification. Completion of the month's box NDE at T Plant, and some visual verification. Next week we have no verification scheduled at this time, although we will be doing WIPP certification NDE of TRU drums; same equipment, but not the same objective. After that, we don't have any specific dates scheduled, but by next Wednesday we should have the next NDE scheduled. Ecology inspected the 218-W5 trench and the 218-E12B trench. No concerns were indicated.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010-7 **Inspection Start Date: 02/21/2001**

ECOLOGY FOLLOW-UP INSPECTION (2001-010) OF LLBG, REVIEWED INSP RECORDS

Media: RCRA **Agency:** Ecology **Responsible Contractor:**

Buildings: LLBG **Attendees:** Stephen Szendre **Inspectors:** Bud Derrick (Ecology)

Summary: On February 21, 2001, the State of Washington, Department of Ecology (Ecology) reviewed records with no comments from the inspectors. They went over and looked at inspection records and procedures, again with no indication of concerns. I have lined up a visit to WRAP on Friday at 9AM to observe verification. For additional information, contact the FH Inspection Point of Contact at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2001-010-9 **Inspection Start Date: 03/21/2001**

ECOLOGY FOLLOW-UP INSPECTION (2001-010) OF LLBG, 222-S DRUM VERIFICATION

Media: RCRA **Agency:** Ecology **Responsible Contractor:**

Buildings: LLBG **Attendees:** Ed MacAlister, Paul W Martin, Stephen Szendre, Stuart Mortensen **Inspectors:** Bud Derrick (Ecology), Jeff Ayres (Ecology)

Summary: On March 21, 2001, the State of Washington, Department of Ecology (Ecology) conducted an follow-up inspection. The Ecology Inspectors observed the removal of suspect articles (small amounts of lead) that were identified during a previous LLBG Inspection. Ecology indicated that upon completion of this task, they will close out his LLBG Inspection by sending a formal letter to RL. No concerns or findings have been mentioned by the Ecology inspectors. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2003-017 (Pictures available) **Inspection Start Date: 01/15/2003**

ECOLOGY TO INVESTIGATE ACCEPTANCE OF OFF-SITE TRU WASTE

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: CWC, LLBG, T Plant, WRAP

Attendees: Brett Barnes, Dan Saueressig, Harlan Boynton, Jim Geary, Nick Furth, Stephen Szendre

Inspectors: Jerel Yokel (Ecology), Robert Wilson (Ecology)

Summary: On January 15, 2003, the State of Washington, Department of Ecology (Ecology) conducted an inspection in response to acceptance of two off-site shipments of Transuranic (TRU) Waste on December 20, 2002. The Ecology Inspectors met with CWC Facility personnel to discuss when the shipments were received, how they were verified, where they are currently stored, and the pathway to disposal. The Inspectors were informed that some of the drums were placed in the Low Level Burial Grounds, some were stored in CWC, some were at T Plant, and 3 drums were being verified (X-rayed) at the WRAP Facility. They were also informed that some of the Waste was remote or contact handled, which would be placed in casks until their final disposal pathway could be arranged. There were no access difficulties and no concerns were indicated by the inspector during this inspection. For additional information contact the FH Inspection Point of Contact at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2003-022 **Inspection Start Date: 02/10/2003**

ECOLOGY INSPECTION AT LLBG

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG

Attendees: Dan Saueressig, Ellen Mattlin, Fred Ruck, Paul W Martin

Inspectors: Matt Mills (Ecology), Michelle Anderson-Moore (Ecology), Robert Wilson (Ecology)

Summary:

On February 10, 2003, the State of Washington, Department of Ecology (Ecology) conducted a follow-up inspection in response to acceptance of two off-site shipments of Transuranic (TRU) and Low-Level Waste on December 20, 2002. Ecology stated that this inspection was a follow-up to an inspection on 12/17/02. The Ecology Inspectors met with Central Waste Complex (CWC) Facility and Waste Services personnel to review the Low Level Burial Grounds (LLBG) Waste Analysis Plan (WAP). The WAP was taken from the applicable Permit Application. Ecology requested information showing how Waste was accepted into the CWC and LLBG. Facility personnel in the Waste Services group described the process, specifically the waste acceptance criteria. The Inspectors asked, and were informed about generator performance, in general, and what is done if a waste is found to have problems. There was discussions about when the shipments were received, how they were verified, where they are currently stored, and the pathway to disposal. There were no access difficulties and no additional documents were requested by the Inspectors. No concerns were mentioned by the Inspectors. For additional information contact the FH Inspection Point of Contact at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2003-033 **Inspection Start Date: 04/02/2003**

ECOLOGY CLOSE-OUT INSPECTION MEETING OF LLBG

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG

Attendees: Ellen Mattlin, Gene Grohs, Paul W Martin, Shelly Grohs, Stephen Szendre, Teresa Aldridge, Ty Blackford

Inspectors: Michelle Anderson-Moore (Ecology), Robert Wilson (Ecology)

Summary: On April 4, 2003, the State of Washington, Department of Ecology (Ecology) provided us with a close-out for their January 2003 LLBG Inspection. Ecology met with facility personnel in the Federal Building. Ecology informed the group that they found no violations. For additional information, contact the FH Inspection Point of Contact at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2005-010 **Inspection Start Date: 11/15/2004**

ECOLOGY MEETING AND INSPECTION OF ETF/LLBG FOR MONOLITHING WASTE CONTAINERS

Media: AIR Major Stack **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG **Attendees:** Joel Williams Jr, Paul W Martin, Richard Gurske, Roger Szelmeczka **Inspectors:** Robert Wilson (Ecology)

Summary: On November 15, 2004 a pre-briefing meeting was held with State of Washington Department of Ecology (Ecology), US Department of Energy (DOE) (DOE could not attend the meeting), and Fluor Hanford (FH) to discuss monolithing waste containers that are less than 90 percent full in accordance with WAC 173-303-665 (12). For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2005-046 **Inspection Start Date: 03/01/2005**

ECOLOGY FOLLOW-UP INSPECTION (2005-042) FOR REVIEW OF CONTAINER RECORDS FOR M-91TRU RETRIEVAL PROJECT

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG

Attendees: Cliff Clark, Cynthia Girres, Gregory Sinton, Jeff Ahlers, Joel Williams Jr, Lana Strickling, LaPriel Dayley, Mike Cahill, Paul W Martin

Inspectors: Alicia Hamar (Ecology), Robert Wilson (Ecology)

Summary: On March 1, 2005, the State of Washington, Department of Ecology (Ecology) continued their review to verify if DOE/FH has been making progress in accordance with the M-91 TRU Retrieval Project Settlement Agreement. Ecology reviewed nine (9) PIN records that were identified by Ecology during the last meeting on February 24, 2005. FH explained how the PIN records were set-up and what associated paper work was included in the records. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2005-042 (Pictures available) **Inspection Start Date: 02/23/2005**

ECOLOGY INSPECTION OF THE M-91, LOW LEVEL BURIAL GROUND (LLBG)

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG

Attendees: Cliff Clark, Cynthia Girres, Dan Saueressig, Gregg Nishimoto, Gregory Sinton, Jeff Ahlers, Joel Williams Jr, Mark French, Paul W Martin

Inspectors: Alicia Hamar (Ecology), Eric Van Mason (Ecology), Matt Mills (Ecology), Robert Wilson (Ecology)

Summary: On February 23, 2005, the State of Washington, Department of Ecology (Ecology) conducted an inspection of the M-91 at the 218-W-4C Low-Level Burial Grounds (LLBG) that is located in the 200 West Area of the Hanford Facility. This inspection included a physical walk down of the 218-W-4C burial ground, Central Waste Complex (CWC) container storage building that stored the M-91 TRU waste, and a review of container records that were chosen by Ecology. Ecology stated this inspection is a follow up to verify if DOE was making progress in TRU retrieval in accordance with the M-91-03-01 dated April 22, 2004, requirements. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2005-044 **Inspection Start Date: 02/24/2005**

ECOLOGY FOLLOW-UP INSPECTION (2005-042) OF THE M-91, LOW LEVEL BURIAL GROUND (LLBG)

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG **Attendees:** Cynthia Girres, Gregory Sinton, Joel Williams Jr, Paul W Martin **Inspectors:** Alicia Hamar (Ecology), Eric Van Mason (Ecology), Robert Wilson (Ecology)

Summary: On February 24, 2005, the State of Washington, Department of Ecology (Ecology) conducted a follow-up inspection of records review at MO-281 and the Acceptable Knowledge (AK) and designations for PFP and Babcock and Wilcox (B&W) were reviewed. A copy of the TRU WIPP program AK procedure was reviewed. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2005-051 **Inspection Start Date: 03/16/2005**

ECOLOGY M-91-40 FOLLOW-UP INSPECTION (2005-042) FOR DOCUMENT REVIEW

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG

Attendees: Cliff Clark, Cynthia Girres, David DeRosa, Joel Williams Jr, Lana Strickling, Paul W Martin, Scott Bisping

Inspectors: Alicia Hamar (Ecology), Robert Wilson (Ecology)

Summary: On March 16, 2005, the State of Washington, Department of Ecology (Ecology) performed a follow-up inspection of the M-91 TRU Retrieval Project (M-91) that Ecology began on February 23, 2005. Ecology Inspectors reviewed documentation based on the M-91 Settlement Agreement. The Ecology Inspectors also asked questions about the Transuranic (TRU) certification program and characterization of waste streams (e.g. waste type, generators, processing), including wanting our definition of Acceptable Knowledge (AK) and how AK is implemented in Fluor Hanford's (FH) programs and procedures. Ecology wanted to understand the link to the Environmental Protection Agency (EPA) Guidance Manual on Waste Analysis and how our process knowledge was confirmed, by sampling and analysis if necessary. FH Waste Services explained how the AK documents defined a waste stream and how the waste streams were reviewed by the WIPP program and Waste Services. Ecology reviewed four package identification number (PIN) files that were requested based on a letter dated December 7, 2004, from DOE to Ecology titled "Completion of Hanford Facility Agreement and Consent Order (Tri-Party Agreement) Milestone M-91-40. Requirement 1, End of Second Sentence, DOE, Shall Retrieve Retrievably Stored Waste (RSW) at the Following Rates: 1200 Cubic Meters (Cumulative) by December 31, 2004." Ecology asked that FH conduct a query of the 1200 cubic meters and inform Ecology which containers were determined to be low-level waste (LLW) or TRU, and include any updated information (e.g. validated assays). Ecology indicated no specific concerns or issues during this inspection. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2004-053 **Inspection Start Date: 07/07/2004**

ECOLOGY REQUEST FOR WASTE CONTAINER RECEIPT REPORTS

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: CWC
LLBG

Attendees: Cliff Clark
Stephen Szendre

Inspectors: Robert Wilson (Ecology)

Summary: On July 7, 2004,the State of Washington, Department of Ecology (Ecology) called requesting Receipt Reports for all waste received from PECOS (MLLW & LLW). The Receipt Reports were provided to Ecology on July 14, 2004. For additional information contact the FH Inspection Point of Contact Steve Szendre at 376-7776.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2005-056 **Inspection Start Date: 03/30/2005**

ECOLOGY M-91-40 FOLLOW-UP INSPECTION (2005-042) FOR DOCUMENT REVIEW

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG

Attendees: Cliff Clark, Cynthia Girres, Gregory Sinton, Joel Williams Jr, Lana Strickling, Paul W Martin

Inspectors: Alicia Hamar (Ecology), Robert Wilson (Ecology)

Summary: On March 30, 2005, the State of Washington Department of Ecology (Ecology) performed a follow-up inspection that Ecology began on February 23, 2005. The Ecology Inspectors reviewed documents, including review of nine (9) PIN documents for the Westinghouse Advanced Reactor Division (WARD) waste containers and five (5) PINs for the 325 Building waste containers. Before the review of the WARD and 325 PINs, FH explained how the WARD and 325Building Acceptable Knowledge (AK) packages were written along with their attached waste designation documents. The explanation helped Ecology understand what they were reviewing and where the criteria came from in order to make the decisions for the containers that were retrieved from LLBG 218-W-4C. For additional information contact the FH Inspection Point of Contact Joel F. Williams Jr. at 376-4782 or 528-7641.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2005-071 **Inspection Start Date: 05/19/2005**

ECOLOGY M-91-40 CLOSEOUT INSPECTION (2005-042)

Media: RCRA **Agency:** Ecology **Responsible Contractor:** FH

Buildings: LLBG **Attendees:** Cynthia Girres, Harlan Boynton, Joel Williams Jr, Lana Strickling, Paul W Martin, Rhonda Connolly **Inspectors:** Alicia Hamar (Ecology), Debra Singleton (Ecology), Robert Wilson (Ecology)

Summary: On May 19, 2005, the State of Washington Department of Ecology (Ecology) conducted an M-91 Close-Out Meeting at 2420 Stevens/Room 244. The meeting was very short for Ecology presented their draft inspection close-out letter that listed four (4) concerns and two (2) recommendations to address these concerns. A copy of the draft letter was provided to all parties at this meeting. Ecology stated that these concerns were not considered "violations." Ecology stated "however, if left unaddressed, concerns can evolve into violations." Ecology considers this inspection closed and stated that the formal close-out letter will be transmitted to RL/FH within two weeks. On May 19, 2005 an the inspection close-out letter was recieved from Ecology. The close-out letter listed the same four concerns as stated in the close-out meeting. DOE and Fluor Hanford plan to respond as soon as possible to the listed concerns. For additional information contact the FH Inspection Point of Contact Joel F. Williams Jr. at 376-4782 or 528-7641.

Closeout Date : 05/19/2005 **Closeout Letter No.** : 0501614

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2008-044 **Inspection Start Date: 07/17/2008**

ECOLOGY VISIT TO LOW-LEVEL BURIAL GROUNDS FOR HF RCRA PERMIT

Media: RCRA
RCRA
Permit

Agency: Ecology

Responsible Contractor: FH

Buildings: LLBG

Attendees: Brett Barnes
Joel Williams Jr
Matt Mills
Michael Collins

Inspectors: Debra Singleton (Ecology)
Jennifer Ollero (Ecology)
Oliver Wang (Ecology)

Summary:

On July 17, 2008, the Washington State Department of Ecology (Ecology) met with the U.S. Department of Energy (DOE) and Fluor Hanford (FH) to visit the Low-Level Burial Grounds (LLBG) located in the 200 East and 200 West Areas of the Hanford Site. The reason for this visit was to see the LLBGs and to gather information to help Ecology prepare the Hanford Facility Recourses, Conservation, and Restoration Act Permit (HF RCRA Permit) that is scheduled for public review by the end of calendar year 2008. Only three LLBGs are being permitted: LLBG 218-E-12B, Trench 94; and LLBG 218-W-5, Trenches 31 and 34. The remaining LLBGs will either be procedurally closed of unused areas, or closed/ post-closure of used areas under the current regulations. Ecology was shown the various LLBG sites and explanations were given as to the status of the different LLBGs. Ecology asked various questions on the different types of waste that are disposed of within the LLBGs. DOE explained how the waste is disposed of and what future plans are being made for the use of the LLBGs that will be active in the HF RCRA Permit. At the end of the visit Ecology requested that the process for procedural closure of the unused portions of the LLBG be started as soon as possible and be completed before the HF RCRA Permit is out for public review. DOE responded that this request will be looked into and Ecology will be notified if it will be worked on as part of the permitting process. Ecology thanked DOE and FH for an informative visit. There we no issues, findings, or actions during this visit.

Closeout Date : 07/17/2008 **Closeout Letter No.** : N/A

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2009-031 **Inspection Start Date: 04/14/2009**

(CHPRC) EPA/ECOLOGY INSPECTION OF WASTE MANAGEMENT PRACTICES

Media: RCRA TSD Units **Agency:** Ecology , EPA **Responsible Contractor:** CHPRC

Buildings: Trench 31, Trench 34, WRAP

Attendees: Allan Cawrse, Brett Barnes, Debbie Thomas, Gene Grohs, Harlan Boynton, Jerry Cammann, Joel Williams Jr, Julie Atwood, Lori Fritz, Mark Kerns, Norm Willis, Ray Collins, Rick Engelmann, Stuart Mortensen, Todd Goldberg, Tony McKarns, Wade Woolery

Inspectors: Eric Van Mason (Ecology), Jack Boller (EPA), Steve Szendre (Ecology), Tristen Gardner (EPA)

Summary: On Tuesday, April 14, 2009, the State of Washington Department of Ecology (Ecology), under the oversight of the U.S. Environmental Protection Agency-Region 10 (EPA), conducted an inspection of the Waste Receiving and Packaging Facility (WRAP) and mixed waste trenches 31 and 34 in the 218-W-5 Burial Ground. An inspection pre-briefing was conducted at 8:30am in the 2420 Stevens Center Building. The main purpose of the inspection was to verify management of dangerous wastes in accordance with the Resource Conservation and Recovery Act (RCRA) and Interim Status permit requirements. In addition, compliance with the Toxic Substances Control Act (TSCA) for the management of polychlorinated biphenyls (PCBs) was included. The main focus of the TSCA inspection was at the mixed waste trenches in the 218-W-5 Burial Ground waste staging area. The EPA completed TSCA paperwork for signature by the Department of Energy-Richland Operations Office. The inspection included a facilities walk-down and review of training records, container management practices, and uniform hazardous waste manifests. The inspection started at the WRAP Facility. All participants were trained to Radiation Work Permit (RWP) # 8 for tours and offsite visitors. WRAP is in an operational mode. This includes non-destructive examinations of transuranic (TRU) waste containers, repackaging of prohibited articles (e.g., aerosol cans, free liquids, etc.), waste package movement to the Central Waste Complex (CWC), and routine surveillance and maintenance activities. The

radiographers work for Areva and are subcontracted to CHPRC. Non-destructive examinations of TRU containers include "quick scans" and "real-time radiography (RTR)." Quick scans are basically still pictures of the contents of waste containers to identify suspect areas for closer examination. The RTR allows drum rotation during the X-ray scan from 0 to 90 degrees. The inspection team then moved to the 2404-WB and 2404-WC Buildings where inspected drums are stored. The inspectors noticed that the floor drain sump on the west end of the 2404-WB Building contained a small amount of liquid. The inspector was informed by facility personnel that the liquid was rainwater that entered the facility through the large roll-up doors and was not leakage from the stored drums. During the inspection of 2404-WC, the inspectors noted two drums of what appeared to be unknown liquids stored on a secondary containment pallet. Upon returning to the WRAP Facility, the inspectors noted that the doors on the south side did not appear to have the proper PCB labels indicating the presence of PCB waste in the facility. The inspectors proceeded to inspect the WRAP satellite accumulation area adjacent to the east side loading dock. The inspectors returned to the WRAP conference room and requested the following documents for review: - Copies of employee duties and training records for specific individuals, - Copy of the employee training plan, - Copies of uniform hazardous waste manifests from December 2008 to present (can be cleared and sent to Ecology later), - Copies of PCB records by building; including container numbers, location, and tracking from the Solid Waste Information and Tracking System (SWITS), - Copy of the Building Emergency Plan. Following review of requested documentation, the inspectors proceeded to the mixed waste staging area for trenches 31 and 34 at the 218-W-5 Burial Ground to inspect the PCB drums. Upon returning to the WRAP conference room, the inspectors requested documentation for two PCB drums (0026294 and 0026643) for review. The documentation included SWITS reports addressing location, tracking, and date received. Non-destructive examination scans of the two drums were also requested for review. The following statements and/or commitments were made at the close-out of the inspection: - The inspectors indicated that from a RCRA perspective things generally look good. They expressed concern with the two drums in 2404-WC that appear to contain unknown liquids and reiterated their desire to review documentation and non-destructive examination scans for these drums. - From a TSCA perspective, the inspectors reiterated the need for proper PCB markings on the building exterior to alert people that PCB waste is stored in the facility. The EPA committed to research the actual requirement for PCB marking of facilities and communicate the requirement to DOE-RL. - The inspectors noted that two PCB drums at the trench 31 and 34 staging area exceeded a 30-day temporary storage requirement. Temporary storage locations also need to have proper PCB markings. - The CHPRC representative committed to collect and clear for release all documentation requested by the inspectors. Once cleared for release, the documentation will be sent to the EPA inspector in Seattle, WA. ADDENDUM - On June 17, 2009, Ecology issued memorandum #0901375, "Notice of Non-Compliance Resulting from the Waste Receiving and Processing Facility Dangerous Waste Inspection, April 14, 2009, by the Department of Ecology" to CHPRC and DOE-RL. Ecology identified one violation and one concern based on their our observations of dangerous waste management and records review at the WRAP facility. VIOLATION: Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, Condition I.A.1 and WAC 173-303-400(3)/40 CFR 265.177(c) by reference: Separate containment for

incompatible wastes. DOE-RL and CHPRC failed to provide separate containment systems for two separate unknown liquid wastes. CONCERN: In building 2620W, universal waste lamps were accumulated in an open cardboard box. WAC 173-303-573(20)©(ii) requires universal waste lamps be accumulated in closed containers. Since 1996, Hanford's Centralized Consolidation/Recycling Center (CCRC) has been managing spent lamps according to an Ecology-approved management plan. The CCRC management plan does not explicitly state that universal waste lamps will be stored in closed containers. Consistency between the requirements of the CCRC management plan and the WAC 173-303-573 requirements for universal waste must be achieved. Ecology noted in their inspection report that CHPRC has already taken steps to correct the violation by providing separate secondary containment for containers 0026294 and 0026643 on April 14, 2009. Ecology decided to withhold formal enforcement in this case. Future noncompliance could result in an escalated enforcement response from Ecology including a Notice of Violation, Administrative Order, or Penalty. Regarding the concern, Ecology recognizes that the CCRC management plan is currently under revision with Ecology and Environmental Protection Agency involvement. When the revision to the CCRC management plan is complete, Ecology will view the management plan only as a tool that DOE and their contractors will use to ensure consistent application of WAC 173-303 universal waste rules for the Hanford Site. When Ecology conducts future compliance inspections, WAC 173-303 requirements will be the standard that generator activities are evaluated against. Questions regarding this inspection should be directed to the CHPRC regulatory agency inspection point-of-contact. Regulatory Agency Inspection Database (RAID) file 2009-030 will also contain a summary of the inspection results.

Regulatory Agency Inspection Database
Summary Report

From: Any To: Any

2009-041 **Inspection Start Date: 06/16/2009**

(CHPRC) ECOLOGY CLOSEOUT OF WRAP/LLBG INSPECTION (FOLLOW-UP TO 2009-031)

Media: RCRA TSD Units **Agency:** Ecology , EPA **Responsible Contractor:** CHPRC

Buildings: LLBG WRAP

Attendees: Allan Cawrse, Cliff Clark, Joel Williams Jr, Lori Fritz, Michael Collins, Paul Martin, Ray Swenson, Stuart Mortensen, Tom Ferns, Wayne Toebe

Inspectors: Eric Van Mason (Ecology), Michelle Mandis (Ecology), Steve Szendre (Ecology)

Summary:

On June 16, 2009 the State of Washington Department of Ecology (Ecology) held a closeout meeting of the Waste Receiving and Processing facility (WRAP) and Low-Level Burial Grounds (LLBG) treatment, storage, and/or disposal (TSD) unit inspection that was conducted on April 14, 2009. The closeout meeting was held with the U.S. Department of Energy (DOE) and CH2M Hill Plateau Remediation Company (CHPRC). The TSD inspection was jointly conducted with the U.S. Environmental Protection Agency (EPA) who performed a Toxic Substance Control Act (TSCA) and universal waste inspection at the same TSD locations. During this TSCA inspection EPA indicated that there was a EPA Headquarter memorandum on the use of signage for storage of TSCA polychlorinated biphenyl (commonly known as PCB) waste. EPA took the action to provide guidance based on this memorandum to DOE/CHPRC. There were no findings or issues were noted by the EPA and their inspection was closed that day. This closeout meeting was held to discuss the letter that Ecology is sending to DOE and CHPRC based on this TSD inspection. Ecology stated that the inspection went well and overall the two TSD units looked "great". However, Ecology did state that one violation and one concern were found during the inspection. The proposed violation had to do with two 85-gallon containers identified with unknown liquids on a spill pallet with what appeared to be two separate containment chambers to segregate the two unknown liquids from each other if there was a leak. These containers were located in the 2404-WB storage building southwest of WRAP's operations building, 2336-W. Based on Ecology questions about these two 85-gallon containers, WRAP Operations re-examined the spill pallet and found that there were small openings between the dividing compartment and therefore not providing separate containment. Operations immediately removed the containers from the spill pallet and placed the containers on two separate spill pallets. Operations tagged out the questionable spill pallet for non-use. WRAP personnel identified similar types of

pallets and removed them from service. Ecology stated that WRAP could have done a better job of identifying that this type of spill pallet was unacceptable for use as segregation for the two containers, but was pleased that WRAP responded quickly to place the containers on separate spill pallets and identify and remove similar spill pallets from service. Due to the low risk and quick actions by WRAP personnel, Ecology did not believe that a Notice of Violation was warranted. Therefore a minor enforcement letter known as a Notice of Noncompliance would be issued. DOE/CHPRC asked Ecology that since WRAP Operations quickly acted on correcting this situation that a letter as opposed to a Notice of Noncompliance was more appropriate. Ecology agreed that the violation was minor and that WRAP Operations reacted quickly, however Ecology stated that the storage of the containers on this type of spill pallet violated their regulations. Ecology also agreed that no fines or penalty would be involved with this minor enforcement action. Ecology stated that the proposed letter includes a finding about spent fluorescent tubes in the 2620-W storage building northwest of the WRAP 2336-W Building. Ecology noted that the spent fluorescent tubes were not being managed in accordance with Washington Administrative Code (WAC) 173-303-573, "Standards for Universal Waste Management" for management of spent lamps since the container was opened and not kept closed. However, Ecology recognized that there is a Hanford Site issue on universal waste between the EPA/Ecology, DOE, and Hanford Site contractors. DOE/CHPRC requested that since the spent fluorescent tubes are part of the universal waste discussion with EPA and Ecology, that the proposed violation be deleted or at least deferred to the Hanford Site universal waste issue. Ecology partially agreed that since the issue is being negotiated and that the current plan does not specifically address keeping containers closed, this proposed violation had been downgraded to a concern. At the end of the meeting Ecology stated that the letter could be issued to DOE/CHPRC by June 17, 2009. Ecology thanked all for their time, help, and cooperation during the inspection. ADDENDUM - On June 18, 2009, DOE/CHPRC received a letter from Ecology entitled "Notice of Non-Compliance Resulting from the Waste Receiving and Processing facility Dangerous Waste Inspection, April 14, 2009, by the Department of Ecology," dated June 17, 2009. DOE/CHPRC are reviewing this letter to determine if a response is necessary or not. On June 17, 2009 DOE/CHPRC received the Ecology Compliance Inspection Report that is associated with the letter that was sent on the same day.

ATTACHMENT III

DOE/RL-2002-37
Revision 0

2001 Toxic Chemical Release Inventory

Emergency Planning and Community Right-To-Know Act, Section 313

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

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

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

Approved for public release; further dissemination unlimited.

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Printed in the United States of America

DOE/RL-2002-37
Revision 0

2001 Toxic Chemical Release Inventory

Emergency Planning and Community Right-To-Know Act, Section 313

Date Published
June 2002
Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

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

Approved for public release; further dissemination unlimited.

Chris Willingham 6/24/02
Release Approval Date

2001 Toxic Chemical Release Inventory
DOE/RL-2002-37
US Department of Energy Hanford Site

ABSTRACT

Pursuant to section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA), and Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, the US Department of Energy has prepared and submitted a Toxic Chemical Release Inventory for the Hanford Site covering activities performed during calendar year 2001.

EPCRA Section 313 requires facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding established threshold levels to report total annual releases of those chemicals. During calendar year 2001, Hanford Site activities resulted in one chemical used in amounts exceeding an activity threshold. Accordingly, the Hanford Site 2001 Toxic Chemical Release Inventory, DOE/RL-2002-37, includes total annual amount of lead released to the environment, transferred to offsite locations, and otherwise managed as waste.

2001 Toxic Chemical Release Inventory
DOE/RL-2002-37
US Department of Energy Hanford Site

EXECUTIVE SUMMARY

Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA) requires covered facilities to report total annual releases of certain chemicals. The Pollution Prevention Act requires facilities covered under EPCRA section 313 to include source reduction information with their submittals. Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, extends these requirements to all federal facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding threshold levels established under EPCRA section 313.

Reporting is required for each toxic chemical that exceeds one of the established activity thresholds. The threshold for manufacturing or processing activities is 25,000 pounds. The threshold for chemicals otherwise used is 10,000 pounds. Certain chemicals identified by the Environmental Protection Agency (EPA) as being persistent and bioaccumulative have lower activity thresholds; either 100 pounds, 10 pounds if highly persistent and bioaccumulative, or 0.1 pound for dioxin and dioxin-like compounds.

During calendar year 2001, Hanford Site activities resulted in one chemical used in amounts exceeding an activity threshold. Lead, Chemical Abstract Services Registry Number 7439-92-1, was used in significant quantities as a component of ammunition used in firing range activities. Accordingly, the 2001 Toxic Chemical Release Inventory, DOE/RL-2002-37, includes total annual amount of lead released to the environment, transferred to offsite locations, and otherwise managed as waste.

Form Approved OMB Number: 2070-0093
Approval Expires: 01/31/2003

(IMPORTANT: Type or print; read instructions before completing form)

EPA
United States Environmental Protection Agency

FORM R

TOXIC CHEMICAL RELEASE INVENTORY REPORTING FORM

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

WHERE TO SEND COMPLETED FORMS: 1. EPCRA Reporting Center P.O.Box 3348 Merrifield, VA 22116-3348 ATTN: TOXIC CHEMICAL RELEASE INVENTORY	2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)	Enter "X" here if this is a revision	
		For EPA use only	

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2001

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? [ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)	2.2	Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data availble to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
Official submittal certified by Keith A. Klei n, Manager, DOE Richland Operations Office		07/01/2002

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	99352SDPRTPOBOX
Facility or Establishment Name	U.S. DOE HANFORD SITE	Facility or Establishment Name or Mailing Address (if different from street address)	U.S. DOE HANFORD SITE
Street	825 JADWIN AVENUE	Mailing Address	POST OFFICE BOX 550
City/County/State/Zip Code	RICHLAND BENTON WA 99352	City/State/Zip Code	RICHLAND WA 99352-0550
		Country (Non-US)	

4.2	This report contains information for: (Important: check a or b; check c or d if applicable)	a. [X] An entire facility	b. [ ] Part of a facility	c. [X] A Federal facility	d. [ ] GOCO
4.3	Technical Contact Name	Joel B. Hebdon	Telephone Number (include area code)	(509) 372-2400	
4.4	Public Contact Name	Marla K. Marvin	Telephone Number (include area code)	(509) 376-8230	

4.5	SIC Code (s) (4 digits)	Primary a. 9511	b. 9999	c.	d.	e.	f.

4.6	Latitude	Degrees	Minutes	Seconds	Longitude	Degrees	Minutes	Seconds
		46	30	00		119	30	00

4.7 Dun & Bradstreet Number(s) (9 digits)	4.8 EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9 Facility NPDES Permit Number(s) (9 characters)	4.10 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a. NA	a. WA7890008967	a. WA0025917	a. NA
b.	b.	b.	b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA [ ]	U.S. Department of Energy
5.2	Parent Company's Dun & Bradstreet Number	NA [X]	

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category or Generic Name
Lead

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
	7439-92-1
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
	Lead
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)
	NA

1.4 **Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.**
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

NA ☐	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)
	NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import		
If produce or import:		
c. ☐ For on-site use/processing	a. ☐ As a reactant	a. ☐ As a chemical processing aid
d. ☐ For sale/distribution	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
e. ☐ As a byproduct	c. ☐ As an article component	c. ☒ Ancillary or other use
f. ☐ As an impurity	d. ☒ Repackaging	
	e. ☐ As an impurity	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 04 (Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐	5	E	
5.2	Stack or point air emissions	NA ☐	0	O	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	COLUMBIA RIVER		0.5	M	NA
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	X		
5.4.2	Underground Injection onsite to Class II-V Wells		0	O
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills		3880	O
5.5.1.B	Other landfills		0	O
5.5.2	Land treatment/application farming	X		
5.5.3	Surface Impoundment		0	O
5.5.4	Other disposal		7600	M

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
0	O

6.1.B. 1	POTW Name	CITY OF RICHLAND WASTEWATER TREATMENT FACILITY					
POTW Address		555 LACY ROAD					
City	RICHLAND	State	WA	County	BENTON	Zip	99352
6.1.B.	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box [ ] and indicate the Part II, Section 6.1 page number in this box [ ] (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1	Off-Site EPA Identification Number (RCRA ID No.)	ID0000084970							
Off-Site Location Name	ENVIRONMENTAL OIL PROCESSING TECHNOLOGY, INCORPORATED								
Off-site Address	2801 BRANDT AVENUE								
City	NAMPA	State	ID	County	CANYON	Zip	83687	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.6	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 2	Off-Site EPA Identification Number (RCRA ID No.)	ORD089452353
Off-Site location Name	CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INCORPORATED	
Off-site Address	17629 CEDAR SPRINGS LANE	

City	ARLINGTON	State	OR	County	HANDLER	Zip	97812	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[X] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.1a	7A.1b 1 2 3 4 5 6 7 8	7A.1c	7A.1d %	7A.1e Yes [ ] No [ ]
7A.2a	7A.2b 1 2 3 4 5 6 7 8	7A.2c	7A.2d %	7A.2e Yes [ ] No [ ]
7A.3a	7A.3b 1 2 3 4 5 6 7 8	7A.3c	7A.3d %	7A.3e Yes [ ] No [ ]
7A.4a	7A.4b 1 2 3 4 5 6 7 8	7A.4c	7A.4d %	7A.4e Yes [ ] No [ ]
7A.5a	7A.5b 1 2 3 4 5 6 7 8	7A.5c	7A.5d %	7A.5e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [6]
and indicate the Part II, Section 6.2/7A page number in this box: [1] **(example: 1,2,3, etc.)**

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 3	Off-Site EPA Identification Number (RCRA ID No.)	UTD981552177
Off-Site location Name	APTUS, INCORPORATED	
Off-site Address	11600 NORTH APTUS ROAD	

City	GRANTSVILLE	State	UT	County	TOOELE	Zip	84029	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.6a	7A.6b	1		2			7A.6c	7A.6d	7A.6e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.7a	7A.7b	1		2			7A.7c	7A.7d	7A.7e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.8a	7A.8b	1		2			7A.8c	7A.8d	7A.8e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.9a	7A.9b	1		2			7A.9c	7A.9d	7A.9e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.10a	7A.10b	1		2			7A.10c	7A.10d	7A.10e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [6]
and indicate the Part II, Section 6.2/7A page number in this box: [2] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 4	Off-Site EPA Identification Number (RCRA ID No.)	CAD050806850
Off-Site location Name	SAFETY KLEEN INCORPORATED, LOS ANGELES	
Off-site Address	5756 ALBA STREET	

City	LOS ANGELES	State	CA	County	LOS ANGELES	Zip	90058	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M90
2. 0.3	2. O	2. M99
3. 31	3. O	3. M10
4. NA	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.11a	7A.11b 1 2 3 4 5 6 7 8	7A.11c	7A.11d %	7A.11e Yes [ ] No [ ]
7A.12a	7A.12b 1 2 3 4 5 6 7 8	7A.12c	7A.12d %	7A.12e Yes [ ] No [ ]
7A.13a	7A.13b 1 2 3 4 5 6 7 8	7A.13c	7A.13d %	7A.13e Yes [ ] No [ ]
7A.14a	7A.14b 1 2 3 4 5 6 7 8	7A.14c	7A.14d %	7A.14e Yes [ ] No [ ]
7A.15a	7A.15b 1 2 3 4 5 6 7 8	7A.15c	7A.15d %	7A.15e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [6]
and indicate the Part II, Section 6.2/7A page number in this box: [3] **(example: 1,2,3, etc.)**

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 5	Off-Site EPA Identification Number (RCRA ID No.)	MND981098478
Off-Site location Name	US FILTER RECOVERY SERVICES	
Off-site Address	2430 ROSE PLACE	

City	ROSEVILLE	State	MN	County	RAMSEY	Zip	55113	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M10
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.16a	7A.16b	1		2			7A.16c	7A.16d	7A.16e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.17a	7A.17b	1		2			7A.17c	7A.17d	7A.17e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.18a	7A.18b	1		2			7A.18c	7A.18d	7A.18e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.19a	7A.19b	1		2			7A.19c	7A.19d	7A.19e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.20a	7A.20b	1		2			7A.20c	7A.20d	7A.20e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [6]
and indicate the Part II, Section 6.2/7A page number in this box: [4] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 6	Off-Site EPA Identification Number (RCRA ID No.)	AZD982441263
Off-Site location Name	WESTATES CARBON-ARIZONA, INCORPORATED	
Off-site Address	2523 MUTAHAR STREET	

City	PARKER	State	AZ	County	LA PAZ	Zip	85344	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M90
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.21a	7A.21b	1		2			7A.21c	7A.21d	7A.21e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.22a	7A.22b	1		2			7A.22c	7A.22d	7A.22e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.23a	7A.23b	1		2			7A.23c	7A.23d	7A.23e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.24a	7A.24b	1		2			7A.24c	7A.24d	7A.24e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.25a	7A.25b	1		2			7A.25c	7A.25d	7A.25e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [6]
and indicate the Part II, Section 6.2/7A page number in this box: [5] **(example: 1,2,3, etc.)**

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 7	Off-Site EPA Identification Number (RCRA ID No.)	ARD040732943
Off-Site location Name	ENSCO, INCORPORATED	
Off-site Address	309 AMERICAN CIRCLE	

City	EL DORADO	State	AR	County	UNION	Zip	717306555	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 166	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.26a	7A.26b 1 2 3 4 5 6 7 8	7A.26c	7A.26d %	7A.26e Yes [ ] No [ ]
7A.27a	7A.27b 1 2 3 4 5 6 7 8	7A.27c	7A.27d %	7A.27e Yes [ ] No [ ]
7A.28a	7A.28b 1 2 3 4 5 6 7 8	7A.28c	7A.28d %	7A.28e Yes [ ] No [ ]
7A.29a	7A.29b 1 2 3 4 5 6 7 8	7A.29c	7A.29d %	7A.29e Yes [ ] No [ ]
7A.30a	7A.30b 1 2 3 4 5 6 7 8	7A.30c	7A.30d %	7A.30e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [6]
and indicate the Part II, Section 6.2/7A page number in this box: [6] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ] 4 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recyling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]
6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1	Quantity released ***	NA	11682.8	12000	12000
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	NA	NA	0	0
8.5	Quantity recycled offsite	NA	NA	4700	0
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)			0	
8.9	Production ratio or activity index			1.01	

8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.			
	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1	NA	a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.
8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one Box)			Yes [ ] No [X]

EPA Form 9350-1 (Rev. 01/2001) - Previous editions are obsolete.

*For Dioxin or Dioxin-like compounds, report in grams/year

***Report releases pursuant to EPCRA Section 329 (8) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated onsite.

2001 TOXIC CHEMICAL RELEASE INVENTORY
DOE/RL-2002-37

DISTRIBUTION

Number of Copies	REQUIRED RECIPIENTS
1	U. S. Environmental Protection Agency EPCRA Reporting Center c/o Titan Systems Corporation Suite 300 4600 North Fairvax Drive Arlington, VA 22203
1	State of Washington Department of Ecology Ms. Idell Hansen Department of Ecology Hazardous Waste/Toxics Reduction Program 300 Desmond Drive Lacey, WA 98503

DOE/RL-2002-37
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1	State of Washington Department of Ecology Ms. Michelle Y. Anderson-Moore (MSIN B5-18) 1315 W 4th Avenue Kennewick, WA 99336
1	U.S. Department of Energy, Headquarters Ms. Jane Powers (EH-413) 1000 Independence Avenue, SW Washington, DC 20585
3	U.S. Environmental Protection Agency, Region 10 Ms. Cristina Colt Office of Waste & Chemicals Management (WCM-128) 1200 Sixth Avenue Seattle, WA 98101-1128 Mr. Michael F. Gearheard Office of Environmental Cleanup (ECL-117) 1200 Sixth Avenue Seattle, WA 98101-1128 Hanford Project Office 712 Swift Boulevard, Suite 5 Richland, Washington 99352
1	Wanapum Indian Band Ms. Leanora Seelatsee Post Office Box 878 Ephrata, Washington 98823-0878
1	Yakama Nation Mr. Russell Jim Post Office Box 151 Toppenish, Washington 98948-0151

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DOE/RL-2003-18
Rev. 0

2002 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-To-Know Act, Section 313

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

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Approved for Public Release
(Upon receipt of Clearance approval)
Further Dissemination Unlimited

DOE/RL-2003-18
Rev. 0

2002 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-To-Know Act, Section 313

Fluor Hanford

July 2003

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

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Chris Willingham 6/11/03
Clearance Approval Date

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DOE/RL-2003-18
Rev. 0

For use with Technical Documents (when appropriate)	
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Project No.:	Division:
Document Type: ENV	Page Count: 16

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2002 Hanford Site Toxic Chemical Release Inventory
DOE/RL-2003-18

ABSTRACT

Pursuant to section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA), and Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, the U.S. Department of Energy has prepared and submitted a Toxic Chemical Release Inventory for the Hanford Site covering activities performed during calendar year 2002.

EPCRA Section 313 requires facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding established threshold levels to report total annual releases of those chemicals. During calendar year 2002, Hanford Site activities resulted in one chemical used in amounts exceeding an activity threshold; lead, CAS# 7439-92-1. Accordingly, the 2002 Hanford Site Toxic Chemical Release Inventory, DOE/RL-2003-18, includes total annual amounts of lead released to the environment, transferred to offsite locations, and otherwise managed as waste.

2002 Hanford Site Toxic Chemical Release Inventory
DOE/RL-2003-18

EXECUTIVE SUMMARY

Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA) requires covered facilities to report total annual releases of certain chemicals. The Pollution Prevention Act requires facilities covered under EPCRA section 313 to include source reduction information with their submittals. Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, extends these requirements to all federal facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding threshold levels established under EPCRA section 313.

Reporting is required for each toxic chemical that exceeds one of the established activity thresholds. The threshold for manufacturing or processing activities is 25,000 pounds. The threshold for chemicals otherwise used is 10,000 pounds. Certain chemicals identified by the Environmental Protection Agency (EPA) as being persistent and bioaccumulative have lower activity thresholds; either 100 pounds, 10 pounds if highly persistent and bioaccumulative, or 0.1 pound for dioxin and dioxin-like compounds.

During calendar year 2002, Hanford Site activities resulted in one chemical used in amounts exceeding an activity threshold; Lead, Chemical Abstract Services Registry Number 7439-92-1. Lead is identified as a persistent, bioaccumulation toxic chemical with a 100-pound threshold. Accordingly, the 2002 Hanford Site Toxic Chemical Release Inventory, DOE/RL-2003-18, includes total annual amounts of lead released to the environment, transferred to offsite locations, and otherwise managed as waste.

Form Approved OMB Number: 2070-0093
Approval Expires: 10/31/2003

(IMPORTANT: Type or print; read instructions before completing form)

EPA
United States Environmental Protection Agency

FORM R

TOXIC CHEMICAL RELEASE INVENTORY REPORTING FORM

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center, P.O.Box 1513, Lantham, MD 20703-1513 2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision: [ ]

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2002

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? [ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)	2.2	Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data availble to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
Official submittal certified by Keith A. Klein, Manager DOE Richland Operations Office		06/30/2003

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	99352SDPRTPOBOX
Facility or Establishment Name	U.S. DOE HANFORD SITE	Facility or Establishment Name or Mailing Address (if different from street address)	U.S. DOE HANFORD SITE
Street	825 JADWIN AVENUE	Mailing Addres	POST OFFICE BOX 550
City/County/State/Zip Code	RICHLAND BENTON W 99352	City/State/Zip Code	RICHLAND W 99352-0550
		Country (Non-U	

4.2	This report contains information for: (Important: check a or b; check c or d if applicable)	a. [X] An entire facility	b. [ ] Part of a facility	c. [X] A Federal facility	d. [ ] GOCO		
4.3	Technical Contact Name	Joel B. Hebdon			Telephone Number (include area code)	(509) 372-2400	
	Email Address	Joel_B_Hebdon@rl.gov					
4.4	Public Contact Name	Marla K. Marvin			Telephone Number (include area code)	(509) 376-8230	
4.5	SIC Code (s) (4 digits)	Primary a. 9511	b. 9999	c.	d.	e.	f.

		Degrees	Minutes	Seconds		Degrees	Minutes	Seconds
4.6	Latitude	46	30	00	Longitude	119	30	00

4.7 Dun & Bradstreet Number(s) (9 digits)	4.8 EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9 Facility NPDES Permit Number(s) (9 characters)	4.10 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a. NA	a. WA7890008967	a. WA0025917	a. NA
b.	b.	b.	b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA [ ]	U.S. Department of Energy
5.2	Parent Company's Dun & Bradstreet Number	NA [X]	

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category or Generic Name
Lead

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) 7439-92-1
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) Lead
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.) NA

1.4 Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

NA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
☐																	

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import If produce or import: c. ☐ For on-site use/processing d. ☐ For sale/distribution e. ☐ As a byproduct f. ☐ As an impurity	a. ☐ As a reactant b. ☐ As a formulation component c. ☐ As an article component d. ☒ Repackaging e. ☐ As an impurity	a. ☐ As a chemical processing aid b. ☐ As a manufacturing aid c. ☒ Ancillary or other use

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 04 (Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐	5	E	
5.2	Stack or point air emissions	NA ☐	0	O	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	COLUMBIA RIVER		0	M	NA
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		N	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite	X		
5.4.2	Underground Injection onsite		0	O
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills		8157	O
5.5.1.B	Other landfills		920000	O
5.5.2	Land treatment/application farming	X		
5.5.3	Surface Impoundment		0	O
5.5.4	Other disposal		7486	C

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
0	O

6.1.B 1	POTW Name	CITY OF RICHLAND WASTEWATER TREATMENT FACILITY					
POTW Address		555 LACY ROAD					
City	RICHLAND	State	WA	County	BENTON	Zip	99352
6.1.B	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box [ ] and indicate the Part II, Section 6.1 page number in this box [ ] (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1	Off-Site EPA Identification Number (RCRA ID No.)	ID0000084970							
Off-Site Location Name	ENVIRONMENTAL OIL PROCESSING TECHNOLOGY, INCORPORATED								
Off-site Address	2801 BRANDT AVENUE								
City	NAMPA	State	ID	County	CANYON	Zip	83687	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 1.1	1. M	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 2	Off-Site EPA Identification Number (RCRA ID No.)	CAD050806850
Off-Site location Name	SAFETY KLEEN INCORPORATED, LOS ANGELES	
Off-site Address	5756 ALBA STREET	

City	LOS ANGELES	State	CA	County	LOS ANGELES	Zip	90058	Country (Non-	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M99
2. 0.2	2. O	2. M41
3. 273.8	3. O	3. M10
4. NA	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.1a	7A.1b	1	P12	2	C46		7A.1c	7A.1d	7A.1e
W	3 C11	4	P41	5	P31		04	100 %	Yes [X] No [ ]
	6 P22	7	F83	8	NA				
7A.2a	7A.2b	1	P01	2	C09		7A.2c	7A.2d	7A.2e
W	3 P11	4	P12	5	C11		04	100 %	Yes [X] No [ ]
	6 P22	7	C46	8	P13				
7A.3a	7A.3b	1	P22	2	NA		7A.3c	7A.3d	7A.3e
W	3	4		5			03	93 %	Yes [X] No [ ]
	6	7		8					
7A.4a	7A.4b	1	G01	2	NA		7A.4c	7A.4d	7A.4e
S	3	4		5			02	0 %	Yes [ ] No [X]
	6	7		8					
7A.5a	7A.5b	1		2			7A.5c	7A.5d	7A.5e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [1] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 3 Off-Site EPA Identification Number (RCRA ID No.)	AZD982441263
Off-Site location Name	WESTATES CARBON-ARIZONA, INCORPORATED
Off-site Address	2523 MUTAHAR STREET

City	PARKER	State	AZ	County	LA PAZ	Zip	85344	Country (Non-	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M41
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.6a	7A.6b	1		2			7A.6c	7A.6d	7A.6e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.7a	7A.7b	1		2			7A.7c	7A.7d	7A.7e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.8a	7A.8b	1		2			7A.8c	7A.8d	7A.8e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.9a	7A.9b	1		2			7A.9c	7A.9d	7A.9e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.10a	7A.10b	1		2			7A.10c	7A.10d	7A.10e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [2] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 4 Off-Site EPA Identification Number (RCRA ID No.)	ARD040732943
Off-Site location Name	ENSCO, INCORPORATED
Off-site Address	309 AMERICAN CIRCLE

City	EL DORADO	State	AR	County	UNION	Zip	717306555	Country (Non-	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 121.3	1. O	1. M99
2. 427.7	2. O	2. M93
3. NA	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.11a	7A.11b 1 2 3 4 5 6 7 8	7A.11c	7A.11d %	7A.11e Yes [ ] No [ ]
7A.12a	7A.12b 1 2 3 4 5 6 7 8	7A.12c	7A.12d %	7A.12e Yes [ ] No [ ]
7A.13a	7A.13b 1 2 3 4 5 6 7 8	7A.13c	7A.13d %	7A.13e Yes [ ] No [ ]
7A.14a	7A.14b 1 2 3 4 5 6 7 8	7A.14c	7A.14d %	7A.14e Yes [ ] No [ ]
7A.15a	7A.15b 1 2 3 4 5 6 7 8	7A.15c	7A.15d %	7A.15e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [3] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 5	Off-Site EPA Identification Number (RCRA ID No.)	NA						
Off-Site location Name	PACIFIC RECYCLING							
Off-site Address	1615 CHEMICAL DRIVE							
City	KENNEWICK	State	WA	County	BENTON	Zip	99336	Country (Non-

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 4660	1. O	1. M24
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.16a	7A.16b 1 2 3 4 5 6 7 8	7A.16c	7A.16d %	7A.16e Yes [ ] No [ ]
7A.17a	7A.17b 1 2 3 4 5 6 7 8	7A.17c	7A.17d %	7A.17e Yes [ ] No [ ]
7A.18a	7A.18b 1 2 3 4 5 6 7 8	7A.18c	7A.18d %	7A.18e Yes [ ] No [ ]
7A.19a	7A.19b 1 2 3 4 5 6 7 8	7A.19c	7A.19d %	7A.19e Yes [ ] No [ ]
7A.20a	7A.20b 1 2 3 4 5 6 7 8	7A.20c	7A.20d %	7A.20e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [4] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 6	Off-Site EPA Identification Number (RCRA ID No.)	CAD066233966
Off-Site location Name	QUEMETCOCITY OF INDUSTRY	
Off-site Address	720 SOUTH SEVENTH AVENUE	

City	CITY OF INDUSTRY	State	CA	County	LOS ANGELES	Zip	91746	Country (Non-	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 5960	1. O	1. M26
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.21a	7A.21b	1		2			7A.21c	7A.21d	7A.21e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.22a	7A.22b	1		2			7A.22c	7A.22d	7A.22e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.23a	7A.23b	1		2			7A.23c	7A.23d	7A.23e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.24a	7A.24b	1		2			7A.24c	7A.24d	7A.24e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.25a	7A.25b	1		2			7A.25c	7A.25d	7A.25e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [5] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ] 4 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recyling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]
6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1	Quantity released ***	11682.8	16044.4	310000	310000
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	NA	NA	0	0
8.5	Quantity recycled offsite	NA	11047.7	2000	2000
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)			920000	
8.9	Production ratio or activity index			2.00	

8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.			
	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1	NA	a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.
8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one Box)			Yes [ ] No [X]

EPA Form 9350-1 (Rev. 03/2003) - Previous editions are obsolete.

*For Dioxin or Dioxin-like compounds, report in grams/year

***Report releases pursuant to EPCRA Section 329 (8) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated onsite.

2002 Hanford Site Toxic Chemical Release Inventory
DOE/RL-2003-18

DISTRIBUTION

REQUIRED RECIPIENTS
(diskette submittal)

State of Washington Department of Ecology
Ms. Idell Hansen
State of Washington Department of Ecology
Hazardous Waste/Toxics Reduction Program
Post Office Box 47659
Olympia, WA 98504-7659

U. S. Environmental Protection Agency
TRI Data Processing Center
c/o Computer Sciences Corporation
Suite 300
8400 Corporate Drive
New Carrollton, MD 20785

OTHER EXTERNAL RECIPIENTS

Confederated Tribes of the Umatilla Indian Reservation
Mr. Rick Gay, Grants and Contracts Officer
Post Office Box 638
Pendleton, Oregon 97801-0638

U.S. Environmental Protection Agency, Hanford Project Office
Mr. Nicholas Ceto, Hanford Project Manager
MSIN B5-01
712 Swift Boulevard, Suite 5
Richland, Washington 99352

Nez Perce Tribe
Mr. Patrick Sobotta, Director
Environmental Restoration and Waste Management
Post Office Box 365
Lapwai, Idaho 83540-0365

Wanapum Indian Band
Ms. Leanora Seelatsee
Post Office Box 878
Ephrata, Washington 98823-0878

State of Washington Department of Ecology
Ms. Michelle Y. Anderson-Moore
MSIN B5-01
1315 West Fourth Avenue
Kennewick, Washington, 99336

Yakama Nation
Mr. Russell Jim, Manager
Environmental Restoration and Waste Management Program
Post Office Box 151
Toppenish, Washington 98948-0151

U.S. Environmental Protection Agency, Region 10
Ms. Cristina Colt
Office of Waste & Chemicals Management (WCM-128)
1200 Sixth Avenue
Seattle, WA 98101-1128

DOE/RL-2003-18
DISTRIBUTION, continued

OFFSITE RECIPIENTS

U.S. Department of Energy, Headquarters
Mr. Andrew Lawrence
Deputy Assistant Secretary for Environment (acting)
EH-41/Forrestal Building
1000 Independence Avenue, SW
Washington, DC 20585

Ms. Jane Powers
1000 Independence Avenue, SW
EH-413/Forrestal Building
Washington, DC 20585

ONSITE RECIPIENTS

U.S. Department of Energy, Richland Operations Office	
J. B. Hebdon	A5-58
M. F. Jarvis (2H)	A5-15
K. A. Klein	A7-50
U.S. Department of Energy, Office of River Protection	
J. E. Rasmussen	H6-60
Bechtel Hanford, Inc.	
R. J. Landon	H0-02
CH2M HILL Hanford Group, Inc.	
S. J. Eberlein	R2-50
Pacific Northwest National Laboratory	
A. K. Ikenberry	P7-79
Fluor Hanford, Inc.	
R. H. Gurske	H8-73
D. E. Zaloudek	N1-24
Central Files (H)	B1-07
Document Processing Center (H)	H6-08
DOE Public Reading Room (H)	H2-53
Hanford Technical Library (H)	P8-55

0062144

DOE/RL-2004-20
Rev. 0

2003 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-To-Know Act, Section 313

Fluor Hanford

June 2004

RECEIVED
JUL 08 2004
EDMC

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

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Christine Willingham 6/16/04
Clearance Approval Date

N/A
Release Approval (stamp)

Approved for Public Release
(Upon receipt of Clearance approval)
Further Dissemination Unlimited

ABSTRACT

Pursuant to section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA), and Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, the U.S. Department of Energy has prepared and submitted a Toxic Chemical Release Inventory for the Hanford Site covering activities performed during calendar year 2003.

EPCRA Section 313 requires facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding established threshold levels to report total annual releases of those chemicals. During calendar year 2003, Hanford Site activities resulted in two chemicals used in amounts exceeding an activity threshold; ethylene glycol, Chemical Abstract Services Registry (CAS) Number 107-21-1 and lead, CAS Number 7439-92-1. Accordingly, the 2003 Hanford Site Toxic Chemical Release Inventory, DOE/RL-2004-20, includes total annual amounts of ethylene glycol and lead released to the environment, transferred to offsite locations, and otherwise managed as waste.

EXECUTIVE SUMMARY

Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA) requires covered facilities to report total annual releases of certain chemicals. The Pollution Prevention Act requires facilities covered under EPCRA section 313 to include source reduction information with their submittals. Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, extends these requirements to all federal facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding threshold levels established under EPCRA section 313.

Reporting is required for each toxic chemical that exceeds one of the established activity thresholds. The threshold for manufacturing or processing activities is 25,000 pounds. The threshold for chemicals otherwise used is 10,000 pounds. Certain chemicals identified by the Environmental Protection Agency (EPA) as being persistent and bioaccumulative have lower activity thresholds; either 100 pounds, 10 pounds if highly persistent and bioaccumulative, or 0.1 pound for dioxin and dioxin-like compounds.

During calendar year 2003, Hanford Site activities resulted in two chemicals used in amounts exceeding an activity threshold; ethlyene glycol, Chemical Abstract Services Registry (CAS) Number 107-21-1, and lead, CAS Number 7439-92-1. Lead is identified as a persistent, bioaccumulation toxic chemical with a 100-pound threshold. Accordingly, the 2003 Hanford Site Toxic Chemical Release Inventory, DOE/RL-2004-20, includes total annual amounts of ethylene glycol and lead released to the environment, transferred to offsite locations, and otherwise managed as waste.

This report was prepared in accordance with applicable quality assurance requirements found in Title 10, Code of Federal Regulation, Part 830, Subpart A – *Quality Assurance Requirements*, and DOE Order 414.1B, *Quality Assurance*.

CONTENTS

Form R for Ethylene Glycol 1.1

Form R for Lead 2.1

Appendix A: Reporting Codes and Definitions A-1

Distribution Distr-1

Form Approved OMB Number:2070-0093
Approval Expires: 01/31/2006

(IMPORTANT: Type or print; read instructions before completing form)

File Copy -- Do Not Submit to EPA

EPA United States Environmental Protection Agency

FORM R

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

TRI Facility ID Number	99352SDPRTPOBOX
Toxic Chemical, Category or Generic Name	Ethylene glycol

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center, P.O.Box 1513, Lanham, MD 20703-1513 2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision: [ ]

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2003

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
[ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)

2.2 Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data availble to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
OFFICIAL SUBMITTAL CERTIFIED BY KEITH A. KLEIN, MANAGER DOE RICHLAND OPERATI		06/30/2004

SECTION 4. FACILITY IDENTIFICATION

4.1

TRI Facility ID Number	99352SDPRTPOBOX
Facility or Establishment Name	U.S. DOE HANFORD SITE
Facility or Establishment Name or Mailing Address (if different from street address)	U.S. DOE HANFORD SITE
Street	825 JADWIN AVENUE
Mailing Address	POST OFFICE BOX 550
City/County/State/Zip Code	RICHLAND BENTON WA 99352
City/State/Zip Code	RICHLAND WA 99352-0550
Country (Non-US)	

4.2 This report contains information for: (Important: check a or b; check c or d if applicable) a. [X] An entire facility b. [ ] Part of a facility c. [X] A Federal facility d. [ ] GOCO

4.3	Technical Contact Name	JOEL B. HEBDON	Telephone Number (include area code): (509) 372-2400
	Email Address	JOEL_B_HEBDON@RL.GOV	
4.4	Public Contact Name	JOSEPH D. VOICE	Telephone Number (include area code): (509) 376-5363

4.5	SIC Code (s) (4 digits)	Primary					
		a. 9511	b. 9999	c.	d.	e.	f.

4.6		Degrees	Minutes	Seconds		Degrees	Minutes	Seconds
	Latitude	46	30	00	Longitude	119	30	00

4.7 Dun & Bradstreet Number(s) (9 digits)	4.8 EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9 Facility NPDES Permit Number(s) (9 characters)	4.10 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a. NA	a. WA7890008967	a. WA0025917	a. NA
b.	b.	b.	b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA [ ]	U.S. Department of Energy
5.2	Parent Company's Dun & Bradstreet Number	NA [X]	

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EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number
99352GDPRTPOBOX
Toxic Chemical, Category or Generic Name
Ethylene glycol

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) 107-21-1
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) Ethylene glycol
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.) NA

1.4 Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

NA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
☐																	

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import		
If produce or import:	a. ☐ As a reactant	a. ☐ As a chemical processing aid
c. ☐ For on-site use/processing	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
d. ☐ For sale/distribution	c. ☐ As an article component	c. ☒ Ancillary or other use
e. ☐ As a byproduct	d. ☒ Repackaging	
f. ☐ As an impurity	e. ☐ As an impurity	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	05	(Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐	250	O	
5.2	Stack or point air emissions	NA ☐	0	O	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	COLUMBIA RIVER		0	O	NA
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPCTPOBOX
Toxic Chemical, Category, or Generic Name
Ethylene glycol

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	X		
5.4.2	Underground Injection onsite to Class II-V Wells		0	O
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills		19	O
5.5.1.B	Other landfills		0	O
5.5.2	Land treatment/application farming	X		
5.5.3A	RCRA Subtitle C Surface Impoundments	X		
5.5.3B	Other surface impoundments		0	O
5.5.4	Other disposal		0	O

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
0	O

6.1.B. 1	POTW Name	CITY OF RICHLAND WASTEWATER TREATMENT FACILITY					
POTW Address		555 LACY ROAD					
City	RICHLAND	State	WA	County	BENTON	Zip	99352
6.1.B.	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box [ ] and indicate the Part II, Section 6.1 page number in this box [ ] (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1 Off-Site EPA Identification Number (RCRA ID No.)	CAD050806850							
Off-Site Location Name	CLEAN HARBORS LOS ANGELES							
Off-site Address	5756 ALBA STREET							
City	LOS ANGELES	State	CA	County	LOS ANGELES	Zip	90058	Country (Non-US)

Is location under control of reporting facility or parent company? [ ] Yes [X] No

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Ethylene glycol

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M94
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 2	Off-Site EPA Identification Number (RCRA ID No.)	CAD059494310
Off-Site location Name	CLEAN HARBORS SAN JOSE LLC	
Off-site Address	1021 BERRYESSA ROAD	

City	SAN JOSE	State	CA	County	SANTA CLARA	Zip	95112	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 17	1. O	1. M94
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[X] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.1a	7A.1b	1		2			7A.1c	7A.1d	7A.1e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.2a	7A.2b	1		2			7A.2c	7A.2d	7A.2e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.3a	7A.3b	1		2			7A.3c	7A.3d	7A.3e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.4a	7A.4b	1		2			7A.4c	7A.4d	7A.4e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.5a	7A.5b	1		2			7A.5c	7A.5d	7A.5e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [2]
and indicate the Part II, Section 6.2/7A page number in this box: [1] **(example: 1,2,3, etc.)**

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Ethylene glycol

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 3 Off-Site EPA Identification Number (RCRA ID No.) ORD980975692

Off-Site location Name: FUEL PROCESSORS INCORPORATED

Off-site Address: 4150 NORTH SUTTLE ROAD

City	PORTLAND	State	OR	County	MULTNOMAH	Zip	97217	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 62840	1. O	1. M20
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.6a	7A.6b 1 2 3 4 5 6 7 8	7A.6c	7A.6d %	7A.6e Yes [ ] No [ ]
7A.7a	7A.7b 1 2 3 4 5 6 7 8	7A.7c	7A.7d %	7A.7e Yes [ ] No [ ]
7A.8a	7A.8b 1 2 3 4 5 6 7 8	7A.8c	7A.8d %	7A.8e Yes [ ] No [ ]
7A.9a	7A.9b 1 2 3 4 5 6 7 8	7A.9c	7A.9d %	7A.9e Yes [ ] No [ ]
7A.10a	7A.10b 1 2 3 4 5 6 7 8	7A.10c	7A.10d %	7A.10e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [2]
and indicate the Part II, Section 6.2/7A page number in this box: [2] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Ethylene glycol

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recyling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	0	19	20	20
8.1b	Total other on-site disposal or other releases	480	250	400	400
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	0	0	0	0
8.1d	Total other off-site disposal or other releases	151	17	100	100
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	0	NA	0	0
8.5	Quantity recycled offsite	6228	62840	5000	5000
8.6	Quantity treated onsite	0	NA	0	0
8.7	Quantity treated offsite	1	0	100	100
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with productionprocesses (pounds/year)			0	
8.9	Production ratio or activity index			4.81	

8.10 Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1	NA	a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.

8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one Box)	Yes [ ]	No [X]

*For Dioxin or Dioxin-like compounds, report in grams/year

Form Approved OMB Number:2070-0093
Approval Expires: 01/31/2006

(IMPORTANT: Type or print; read instructions before completing form)

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EPA United States Environmental Protection Agency

FORM R

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Lead

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center, P.O.Box 1513, Lanham, MD 20703-1513 2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision: [ ]

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2003

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
[ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)

2.2 Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data availble to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
OFFICIAL SUBMITTAL CERTIFIED BY KEITH A. KLEIN, MANAGER DOE RICHLAND OPERATI		06/30/2004

SECTION 4. FACILITY IDENTIFICATION

4.1 TRI Facility ID Number: 99352SDPRTPOBOX

Facility or Establishment Name	Facility or Establishment Name or Mailing Address (if different from street address)
U.S. DOE HANFORD SITE	U.S. DOE HANFORD SITE
Street: 825 JADWIN AVENUE	Mailing Address: POST OFFICE BOX 550
City/County/State/Zip Code: RICHLAND BENTON WA 99352	City/State/Zip Code: RICHLAND WA 99352-0550
	Country (Non-US):

4.2 This report contains information for: (Important: check a or b; check c or d if applicable) a. [X] An entire facility b. [ ] Part of a facility c. [X] A Federal facility d. [ ] GOCO

4.3	Technical Contact Name: JOEL B. HEBDON	Telephone Number (include area code): (509) 372-2400
	Email Address: JOEL_B_HEBDON@RL.GOV	
4.4	Public Contact Name: JOSEPH D. VOICE	Telephone Number (include area code): (509) 376-5363

4.5 SIC Code (s) (4 digits)	Primary a. 9511	b. 9999	c.	d.	e.	f.

4.6	Degrees	Minutes	Seconds		Degrees	Minutes	Seconds
Latitude	46	30	00	Longitude	119	30	00

4.7 Dun & Bradstreet Number(s) (9 digits)	4.8 EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9 Facility NPDES Permit Number(s) (9 characters)	4.10 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a. NA	a. WA7890008967	a. WA0025917	a. NA
b.	b.	b.	b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA [ ]	U.S. Department of Energy
5.2	Parent Company's Dun & Bradstreet Number	NA [X]	

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EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category or Generic Name
Lead

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
	7439-92-1
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
	Lead
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)
	NA

1.4 **Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.**
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

NA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)
	NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. [ ] Produce b. [ ] Import		
If produce or import:	a. [ ] As a reactant	a. [ ] As a chemical processing aid
c. [ ] For on-site use/processing	b. [ ] As a formulation component	b. [ ] As a manufacturing aid
d. [ ] For sale/distribution	c. [ ] As an article component	c. [X] Ancillary or other use
e. [ ] As a byproduct	d. [X] Repackaging	
f. [ ] As an impurity	e. [ ] As an impurity	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 [04] (Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA [ ]	5	E	
5.2	Stack or point air emissions	NA [ ]	0	O	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	COLUMBIA RIVER		0	M	NA
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box [ ]
and indicate the Part II, Section 5.3 page number in this box. [ ] **(example: 1,2,3, etc.)**

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	X		
5.4.2	Underground Injection onsite to Class II-V Wells		0	O
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills		633000	O
5.5.1.B	Other landfills		5500	O
5.5.2	Land treatment/application farming	X		
5.5.3A	RCRA Subtitle C Surface Impoundments		0	O
5.5.3B	Other surface impoundments		0	M
5.5.4	Other disposal		7954	C

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
0	O

6.1.B. 1	POTW Name	CITY OF RICHLAND WASTEWATER TREATMENT FACILITY					
POTW Address		555 LACY ROAD					
City	RICHLAND	State	WA	County	BENTON	Zip	99352
6.1.B.	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box [ ] and indicate the Part II, Section 6.1 page number in this box [ ] (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1	Off-Site EPA Identification Number (RCRA ID No.)	ARD040732943							
Off-Site Location Name	ENSCO, INCORPORATED								
Off-site Address	309 AMERICAN CIRCLE								
City	EL DORADO	State	AR	County	UNION	Zip	717306555	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99152SCPITPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 4.4	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 2 Off-Site EPA Identification Number (RCRA ID No.) CAD050806850

Off-Site location Name: CLEAN HARBORS LOS ANGELES

Off-site Address: 5756 ALBA STREET

City	LOS ANGELES	State	CA	County	LOS ANGELES	Zip	90058	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M99
2. 0	2. O	2. M94
3. NA	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.1a	7A.1b	1	P12	2	C46		7A.1c	7A.1d	7A.1e
W	3 C11	4	P41	5	P31		04	100 %	Yes [X] No [ ]
	6 P22	7	F83	8	NA				
7A.2a	7A.2b	1	P01	2	C09		7A.2c	7A.2d	7A.2e
W	3 P11	4	P12	5	C11		04	99 %	Yes [X] No [ ]
	6 P22	7	C46	8	P13				
7A.3a	7A.3b	1	P22	2	NA		7A.3c	7A.3d	7A.3e
W	3	4		5			03	93 %	Yes [X] No [ ]
	6	7		8					
7A.4a	7A.4b	1	G01	2	NA		7A.4c	7A.4d	7A.4e
S	3	4		5			02	0 %	Yes [ ] No [X]
	6	7		8					
7A.5a	7A.5b	1		2			7A.5c	7A.5d	7A.5e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [1] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 2/2004) - Previous editions are obsolete.

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
95152SDPLTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 3 Off-Site EPA Identification Number (RCRA ID No.) CAD059494310

Off-Site location Name: CLEAN HARBORS SAN JOSE LLC

Off-site Address: 1021 BERRYESSA ROAD

City	SAN JOSE	State	CA	County	SANTA CLARA	Zip	95112	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 29.1	1. O	1. M99
2. 165.6	2. O	2. M94
3. NA	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.6a	7A.6b	1		2			7A.6c	7A.6d	7A.6e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.7a	7A.7b	1		2			7A.7c	7A.7d	7A.7e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.8a	7A.8b	1		2			7A.8c	7A.8d	7A.8e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.9a	7A.9b	1		2			7A.9c	7A.9d	7A.9e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.10a	7A.10b	1		2			7A.10c	7A.10d	7A.10e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [2] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
98525DPLTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 4 Off-Site EPA Identification Number (RCRA ID No.) ORD980975692

Off-Site location Name: FUEL PROCESSORS INCORPORATED

Off-site Address: 4150 NORTH SUTTLE ROAD

City	PORTLAND	State	OR	County	MULTNOMAH	Zip	97217	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. M	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.11a	7A.11b 1 2 3 4 5 6 7 8	7A.11c	7A.11d %	7A.11e Yes [ ] No [ ]
7A.12a	7A.12b 1 2 3 4 5 6 7 8	7A.12c	7A.12d %	7A.12e Yes [ ] No [ ]
7A.13a	7A.13b 1 2 3 4 5 6 7 8	7A.13c	7A.13d %	7A.13e Yes [ ] No [ ]
7A.14a	7A.14b 1 2 3 4 5 6 7 8	7A.14c	7A.14d %	7A.14e Yes [ ] No [ ]
7A.15a	7A.15b 1 2 3 4 5 6 7 8	7A.15c	7A.15d %	7A.15e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [3] **(example: 1,2,3, etc.)**

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R

PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
98152SDPLTPOBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 5 Off-Site EPA Identification Number (RCRA ID No.)	TXD055141378
Off-Site location Name	CLEAN HARBORS DEER PARK LP
Off-site Address	2027 BATTLEGROUND ROAD

City	DEER PARK	State	TX	County	HARRIS	Zip	77536	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 623.6	1. O	1. M94
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.16a	7A.16b 1 2 3 4 5 6 7 8	7A.16c	7A.16d %	7A.16e Yes [ ] No [ ]
7A.17a	7A.17b 1 2 3 4 5 6 7 8	7A.17c	7A.17d %	7A.17e Yes [ ] No [ ]
7A.18a	7A.18b 1 2 3 4 5 6 7 8	7A.18c	7A.18d %	7A.18e Yes [ ] No [ ]
7A.19a	7A.19b 1 2 3 4 5 6 7 8	7A.19c	7A.19d %	7A.19e Yes [ ] No [ ]
7A.20a	7A.20b 1 2 3 4 5 6 7 8	7A.20c	7A.20d %	7A.20e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [4] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R

PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99152SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 6 Off-Site EPA Identification Number (RCRA ID No.) TNR000005397

Off-Site location Name: PERMAFIX ENVIRONMENTAL

Off-site Address: HIGHWAY 58 AT BUILDING K1005

City	OAK RIDGE	State	TN	County	ANDERSON	Zip	37830	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 47.7	1. O	1. M94
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.21a	7A.21b 1 2 3 4 5 6 7 8	7A.21c	7A.21d %	7A.21e Yes [ ] No [ ]
7A.22a	7A.22b 1 2 3 4 5 6 7 8	7A.22c	7A.22d %	7A.22e Yes [ ] No [ ]
7A.23a	7A.23b 1 2 3 4 5 6 7 8	7A.23c	7A.23d %	7A.23e Yes [ ] No [ ]
7A.24a	7A.24b 1 2 3 4 5 6 7 8	7A.24c	7A.24d %	7A.24e Yes [ ] No [ ]
7A.25a	7A.25b 1 2 3 4 5 6 7 8	7A.25c	7A.25d %	7A.25e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [5] **(example: 1,2,3, etc.)**

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352WPRTPO577X
Toxic Chemical, Category, or General Name
Lead

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recyling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	8257	633000	1300000	1300000
8.1b	Total other on-site disposal or other releases	7491	7959	8000	8000
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	0	0	0	0
8.1d	Total other off-site disposal or other releases	395.2	502	600	700
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	0	NA	0	0
8.5	Quantity recycled offsite	11047.7	NA	40050	20000
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with productionprocesses (pounds/year)			5868.4	
8.9	Production ratio or activity index			1.85	
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1	NA	a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.

8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one Box)	Yes [ ]	No [X]

*For Dioxin or Dioxin-like compounds, report in grams/year

APPENDIX A
Reporting Codes and Definitions

Section 4. Maximum Amount of the Toxic Chemical On-Site at Any Time During the Calendar Year

Weight Range in Pounds		
Range Code	From...	To...
01	0	99
02	100	999
03	1,000	9,999
04	10,000	99,999
05	100,000	999,999
06	1,000,000	9,999,999
07	10,000,000	49,999,999
08	50,000,000	99,999,999
09	100,000,000	499,999,999
10	500,000,000	999,999,999
11	1 billion	over 1 billion

Section 5. Quantity of the Toxic Chemical Entering Each Environmental Medium Onsite and Section 6. Transfers of the Toxic Chemical in Wastes to Off-Site Locations

Basis of Estimate

M: Estimate is based on monitoring data or measurements for the EPCRA section 313 chemical as transferred to an off-site facility.

C: Estimate is based on mass balance calculations, such as calculation of the amount of the EPCRA section 313 chemical in waste streams entering and leaving process equipment.

E: Estimate is based on published emission factors, such as those relating release quantity to through-put or equipment type (e.g., air emission factors).

O: Estimate is based on other approaches such as engineering calculations (e.g., estimating volatilization using published mathematical formulas) or best engineering judgment.

Section 6. Transfers of the Toxic Chemical in Wastes to Off-Site Locations

Type of Waste Disposal/Treatment/Energy Recovery/Recycling

M10	Storage Only	M66	Subtitle C Surface Impoundment
M20	Solvents/Organics Recovery	M67	Other Surface Impoundments
M24	Metals Recovery	M69	Other Waste Treatment
M26	Other Reuse or Recovery	M73	Land Treatment
M28	Acid Regeneration	M79	Other Land Disposal
M40	Solidification/Stabilization	M81	Underground Injection to Class I Wells
M41	Solidification/Stabilization-Metals and Metal Category Compounds only	M82	Underground Injection to Class II-V Wells
M50	Incineration/Thermal Treatment	M90	Other Off-Site Management
M54	Incineration/Insignificant Fuel Value	M92	Transfer to Waste Broker — Energy Recovery
M56	Energy Recovery	M93	Transfer to Waste Broker — Recycling
M61	Wastewater Treatment (Excluding POTW)	M94	Transfer to Waste Broker — Disposal
M62	Wastewater Treatment (Excluding POTW) -- Metals and Metal Category Compounds only	M95	Transfer to Waste Broker — Waste Treatment
M64	Other Landfills	M99	Unknown
M65	RCRA Subtitle C Landfills		

Section 7A. On-Site Waste Treatment Methods and Efficiency

General Waste Stream	
A:	Gaseous (gases, vapors, airborne particulates)
W:	Wastewater (aqueous waste)
L:	Liquid waste streams (non-aqueous waste)
S:	Solid waste streams (including sludges and slurries)

Range of Influent Concentration	
1=	Greater than 10,000 parts per million (1 percent)
2=	100 parts per million (0.01 percent) to 10,000 parts per million (1 percent)
3=	1 part per million (0.0001 percent) to 100 parts per million (0.01 percent)
4=	1 part per billion to 1 part per million
5=	Less than 1 part per billion

Waste Treatment Methods

Biological Treatment
- B11 Biological Treatment - Aerobic
- B21 Biological Treatment - Anaerobic
- B31 Biological Treatment - Facultative
- B99 Biological Treatment - Other

Chemical Treatment
- C01 Chemical Precipitation - Lime or Sodium Hydroxide
- C02 Chemical Precipitation - Sulfide
- C09 Chemical Precipitation - Other
- C11 Neutralization
- C21 Chromium Reduction
- C31 Complexed Metals Treatment (other than pH Adjustment)
- C41 Cyanide Oxidation - Alkaline Chlorination
- C42 Cyanide Oxidation - Electrochemical
- C43 Cyanide Oxidation - Other
- C44 General Oxidation (Includes Disinfection) – Chlorination
- C45 General Oxidation (Includes Disinfection) – Ozonation
- C46 General Oxidation (Includes Disinfection) - Other
- C99 Other Chemical Treatment

Incineration/Thermal Treatment
- F01 Liquid Injection
- F11 Rotary Kiln with Liquid Injection Unit
- F19 Other Rotary Kiln
- F31 Two Stage
- F41 Fixed Hearth
- F42 Multiple Hearth
- F51 Fluidized Bed
- F61 Infra-Red
- F71 Fume/Vapor
- F81 Pyrolytic Destructor
- F82 Wet Air Oxidation
- F83 Thermal Drying/Dewatering
- F99 Other Incineration/Thermal Treatment

Physical Treatment
- P01 Equalization
- P09 Other Blending
- P11 Settling/Clarification
- P12 Filtration
- P13 Sludge Dewatering (Non-thermal)
- P14 Air Flotation
- P15 Oil Skimming
- P16 Emulsion Breaking - Thermal
- P17 Emulsion Breaking - Chemical
- P18 Emulsion Breaking - Other
- P19 Other Liquid Phase Separation
- P21 Adsorption - Carbon
- P22 Adsorption - Ion Exchange (Other than for recovery/reuse)
- P23 Adsorption - Resin
- P29 Adsorption - Other
- P31 Reverse Osmosis (Other than for recovery/reuse)
- P41 Stripping - Air
- P42 Stripping - Steam
- P49 Stripping - Other
- P51 Acid Leaching (Other than for recovery/reuse)
- P61 Solvent Extraction (Other than for recovery/reuse)
- P99 Other Physical Treatment

Solidification/Stabilization
- G01 Cement Processes (Including Silicates)
- G09 Other Pozzolonic Processes (Includes Silicates)
- G11 Asphaltic Processes
- G21 Thermoplastic Techniques
- G99 Other Solidification Processes

DISTRIBUTION

Required Offsite Recipients:

U. S. Environmental Protection Agency
TRI Data Processing Center
c/o Computer Sciences Corporation
Suite 300
8400 Corporate Drive
Landover, MD 20785

State of Washington Department of Ecology
Hazardous Waste/Toxics Reduction Program
Post Office Box 47659
Olympia, WA 98504-7659
Ms. Idell Hansen

Other Offsite Recipients:

Department of Energy
Office of Pollution Prevention
and Resource Conservation, EH-43
1000 Independence Avenue, SW
Washington, DC 20585
Ms. Jane Powers

Required Onsite Recipients:

D. A. Isom, Administrative Record (2)	H6-08
Central Files	B1-07
Document Processing Center	H6-08
DOE Reading Room	H2-53
Hanford Technical Library	P8-55
U.S. Department of Energy, Richland Operations Office	
J. B. Hebdon	A5-15
M. F. Jarvis	A5-15
Bechtel Hanford Inc.	
R. J. Landon	H9-03
Bechtel National, Inc.	
J. P. Henschel	H4-02
CH2M HILL Hanford Group, Inc.	
S. J. Eberlein	R2-50
Hanford Environmental Health Foundation	
S. M. McInturff, HEHF EP Coordinator	H1-51
Pacific Northwest National Laboratory	
A. K. Ikenberry	P7-79
Fluor Hanford	
L. P. Diediker	H8-13
R. H. Gurske	H8-12
D. E. Zaloudek	H8-13

REPORT CERTIFICATION

I hereby certify that I have reviewed the enclosed documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

6/24/01

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

Date

DOE/RL-2005-12
Revision 0

2004 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-To-Know Act, Section 313

D. E. Zaloudek
Fluor Hanford, Inc.

Date Published
June 2005

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 6/10/2005
Release Approval Date

Approved for Public Release;
Further Dissemination Unlimited

ABSTRACT

Pursuant to section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA), and Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, the U.S. Department of Energy has prepared and submitted a Toxic Chemical Release Inventory for the Hanford Site covering activities performed during calendar year 2004.

EPCRA Section 313 requires facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding established threshold levels to report total annual releases of those chemicals. During calendar year 2004, Hanford Site activities resulted in two chemicals used in amounts exceeding an activity threshold; lead, Chemical Abstract Services Registry (CAS) Number 7439-92-1 and propylene, CAS Number 115-07-1. Accordingly, the 2004 Hanford Site Toxic Chemical Release Inventory, DOE/RL-2005-12, includes total annual amounts of lead and propylene released to the environment, transferred to offsite locations, and otherwise managed as waste.

EXECUTIVE SUMMARY

Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA) requires covered facilities to report total annual releases of certain chemicals. The Pollution Prevention Act requires facilities covered under EPCRA section 313 to include source reduction information with their submittals. Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, extends these requirements to all federal facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding threshold levels established under EPCRA section 313.

Reporting is required for each toxic chemical that exceeds one of the established activity thresholds. The threshold for manufacturing or processing activities is 25,000 pounds. The threshold for chemicals otherwise used is 10,000 pounds. Certain chemicals identified by the Environmental Protection Agency (EPA) as being persistent and bioaccumulative have lower activity thresholds; either 100 pounds, 10 pounds if highly persistent and bioaccumulative, or 0.1 pound for dioxin and dioxin-like compounds.

During calendar year 2004, Hanford Site activities resulted in two chemicals used in amounts exceeding an activity threshold; lead, Chemical Abstract Services Registry (CAS) Number 7439-92-1 and propylene, CAS Number 115-07-1. Lead is identified as a persistent, bioaccumulation toxic chemical with a 100-pound threshold. Accordingly, the 2004 Hanford Site Toxic Chemical Release Inventory, DOE/RL-2005-12, includes total annual amounts of lead and propylene released to the environment, transferred to offsite locations, and otherwise managed as waste.

CONTENTS

Form R for Lead 1-1

Form R for Propylene 2-1

Appendix A: Reporting Codes and Definitions A-1

Distribution Distr-1

Form Approved OMB Number:2070-0093
Approval Expires: 01/31/2006

(IMPORTANT: Type or print; read instructions before completing form)

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EPA United States Environmental Protection Agency

FORM R

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Lead

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center, P.O.Box 1513, Lanham, MD 20703-1513 2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision: [ ]

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2004

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
[ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)

2.2 Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
OFFICIAL SUBMITTAL CERTIFIED BY KEITH A. KLEIN, MANAGER DOE RICHLAND OPERATI		07/01/2005

SECTION 4. FACILITY IDENTIFICATION

4.1 TRI Facility ID Number: 99352SDPRTPOBOX

Facility or Establishment Name: U.S. DOE HANFORD SITE

Facility or Establishment Name or Mailing Address (if different from street address): U.S. DOE HANFORD SITE

Street: 825 JADWIN AVENUE

Mailing Address: POST OFFICE BOX 550

City/County/State/Zip Code: RICHLAND BENTON WA 99352

City/State/Zip Code: RICHLAND WA 99352-0550

Country (Non-US):

4.2 This report contains information for: (Important: check a or b; check c or d if applicable) a. [X] An entire facility b. [ ] Part of a facility c. [X] A Federal facility d. [ ] GOCO

4.3 Technical Contact Name: LORI A. HUFFMAN — Telephone Number (include area code): (509) 376-0104

Email Address: Lori_A_Huffman@orp.doe.gov

4.4 Public Contact Name: LORI A. HUFFMAN — Telephone Number (include area code): (509) 376-0104

4.5 SIC Code (s) (4 digits)	Primary					
	a. 9999	b. 9511	c.	d.	e.	f.

4.6	Degrees	Minutes	Seconds		Degrees	Minutes	Seconds
Latitude	46	30	00	Longitude	119	30	00

4.7 Dun & Bradstreet Number(s) (9 digits)	4.8 EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9 Facility NPDES Permit Number(s) (9 characters)	4.10 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a. NA	a. WA7890008967	a. WA0025917	a. NA
b.	b.	b.	b.

SECTION 5. PARENT COMPANY INFORMATION

5.1 Name of Parent Company: NA [ ] U.S. Department of Energy

5.2 Parent Company's Dun & Bradstreet Number: NA [X]

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EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number
99352SLP 0POBOX
Toxic Chemical, Category or Generic Name
Lead

SECTION 1. TOXIC CHEMICAL IDENTITY

(Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
	7439-92-1
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
	Lead
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)
	NA

1.4 **Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.**
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

NA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

SECTION 2. MIXTURE COMPONENT IDENTITY

(Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)
	NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY

(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. [ ] Produce b. [ ] Import		
If produce or import:	a. [ ] As a reactant	a. [ ] As a chemical processing aid
c. [ ] For on-site use/processing	b. [ ] As a formulation component	b. [ ] As a manufacturing aid
d. [ ] For sale/distribution	c. [ ] As an article component	c. [X] Ancillary or other use
e. [ ] As a byproduct	d. [X] Repackaging	
f. [ ] As an impurity	e. [ ] As an impurity	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 [04] (Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA	6	E	
5.2	Stack or point air emissions	NA	0	O	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	COLUMBIA RIVER		0	M	NA
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box [ ] and indicate the Part II, Section 5.3 page number in this box. [ ] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
99352SDPCTPOBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	X		
5.4.2	Underground Injection onsite to Class II-V Wells		0	M
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills		82600	O
5.5.1.B	Other landfills		759600	O
5.5.2	Land treatment/application farming	X		
5.5.3A	RCRA Subtitle C Surface Impoundments		0	O
5.5.3B	Other surface impoundments		0.4	M
5.5.4	Other disposal		9586	C

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
0	O

6.1.B. 1	POTW Name	CITY OF RICHLAND WASTEWATER TREATMENT FACILITY					
POTW Address		555 LACY ROAD					
City	RICHLAND	State	WA	County	BENTON	Zip	99352
6.1.B.	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box [ ] and indicate the Part II, Section 6.1 page number in this box [ ] (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1 Off-Site EPA Identification Number (RCRA ID No.)	ARD040732943							
Off-Site Location Name	TERIS LLC FORMERLY ENSCO, INCORPORATED							
Off-site Address	309 AMERICAN CIRCLE							
City	EL DORADO	State	AR	County	UNION	Zip	717306555	Country (Non-US)
Is location under control of reporting facility or parent company?						Yes	X	No

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
92652SDPITPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 192.7	1. O	1. M99
2. 52.2	2. O	2. M24
3. NA	3.	3.
4.	4.	4.

6.2. 2	Off-Site EPA Identification Number (RCRA ID No.)	CAD066233966
Off-Site location Name	QUEMETCO CITY OF INDUSTRY	
Off-site Address	720 SOUTH SEVENTH AVENUE	

City	CITY OF INDUSTRY	State	CA	County	LOS ANGELES	Zip	91746	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 43000	1. O	1. M24
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.1a	7A.1b	1	P12	2	C46		7A.1c	7A.1d	7A.1e
W	3 C11	4	P41	5	P31		04	100 %	Yes [X] No [ ]
	6 P22	7	F83	8	NA				
7A.2a	7A.2b	1	P01	2	C09		7A.2c	7A.2d	7A.2e
W	3 P11	4	P12	5	C11		04	94 %	Yes [X] No [ ]
	6 P22	7	C46	8	P13				
7A.3a	7A.3b	1	P22	2	NA		7A.3c	7A.3d	7A.3e
W	3	4		5			03	93 %	Yes [X] No [ ]
	6	7		8					
7A.4a	7A.4b	1	G01	2	NA		7A.4c	7A.4d	7A.4e
S	3	4		5			01	0 %	Yes [ ] No [X]
	6	7		8					
7A.5a	7A.5b	1		2			7A.5c	7A.5d	7A.5e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [1] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
93252SDPRTPOBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 3	Off-Site EPA Identification Number (RCRA ID No.)	ORD980975692
Off-Site location Name	OIL REREFINING COMPANY INC	
Off-site Address	4150 NORTH SUTTLE ROAD	

City	PORTLAND	State	OR	County	Multnomah	Zip	97217	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.6a	7A.6b	1		2			7A.6c	7A.6d	7A.6e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.7a	7A.7b	1		2			7A.7c	7A.7d	7A.7e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.8a	7A.8b	1		2			7A.8c	7A.8d	7A.8e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.9a	7A.9b	1		2			7A.9c	7A.9d	7A.9e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				
7A.10a	7A.10b	1		2			7A.10c	7A.10d	7A.10e
	3		4		5			%	Yes [ ] No [ ]
	6		7		8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [2] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
89052SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 4 Off-Site EPA Identification Number (RCRA ID No.) UTD981552177

Off-Site Location Name: CLEAN HARBORS ARAGONITE LLC

Off-site Address: 11600 NORTH APTUS ROAD

City	ARAGONITE	State	UT	County	Tooele	Zip	84029	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M41
2. 0.4	2. O	2. M99
3. 3362.6	3. O	3. M94
4. NA	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.11a	7A.11b 1 2 3 4 5 6 7 8	7A.11c	7A.11d %	7A.11e Yes [ ] No [ ]
7A.12a	7A.12b 1 2 3 4 5 6 7 8	7A.12c	7A.12d %	7A.12e Yes [ ] No [ ]
7A.13a	7A.13b 1 2 3 4 5 6 7 8	7A.13c	7A.13d %	7A.13e Yes [ ] No [ ]
7A.14a	7A.14b 1 2 3 4 5 6 7 8	7A.14c	7A.14d %	7A.14e Yes [ ] No [ ]
7A.15a	7A.15b 1 2 3 4 5 6 7 8	7A.15c	7A.15d %	7A.15e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [3] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
89452SDPBTPOBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 5 Off-Site EPA Identification Number (RCRA ID No.)	UTD991301748
Off-Site location Name	CLEAN HARBORS GRASSY MOUNTAIN LLC
Off-site Address	EXIT 41 OFF I80 3 MILES NORTH KNOLLS

City	GRASSY MOUNTAIN	State	UT	County	Tooele	Zip	84029	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 36.6	1. O	1. M94
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence (enter 3-character code(s))						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.16a	7A.16b	1		2			7A.16c	7A.16d	7A.16e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.17a	7A.17b	1		2			7A.17c	7A.17d	7A.17e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.18a	7A.18b	1		2			7A.18c	7A.18d	7A.18e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.19a	7A.19b	1		2			7A.19c	7A.19d	7A.19e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					
7A.20a	7A.20b	1		2			7A.20c	7A.20d	7A.20e
	3	4		5				%	Yes [ ] No [ ]
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]

and indicate the Part II, Section 6.2/7A page number in this box: [4] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
99352SDPRTPOBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 6	Off-Site EPA Identification Number (RCRA ID No.)	WAR000010355
Off-Site Location Name	PACIFIC ECOSOLUTIONS LLC	
Off-site Address	2025 BATTELLE BOULEVARD	

City	RICHLAND	State	WA	County	Benton	Zip	99354	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.2	1. O	1. M99
2. 43.4	2. O	2. M94
3. 0.5	3. O	3. M41
4. NA	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.21a	7A.21b 1 2 3 4 5 6 7 8	7A.21c	7A.21d %	7A.21e Yes [ ] No [ ]
7A.22a	7A.22b 1 2 3 4 5 6 7 8	7A.22c	7A.22d %	7A.22e Yes [ ] No [ ]
7A.23a	7A.23b 1 2 3 4 5 6 7 8	7A.23c	7A.23d %	7A.23e Yes [ ] No [ ]
7A.24a	7A.24b 1 2 3 4 5 6 7 8	7A.24c	7A.24d %	7A.24e Yes [ ] No [ ]
7A.25a	7A.25b 1 2 3 4 5 6 7 8	7A.25c	7A.25d %	7A.25e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
and indicate the Part II, Section 6.2/7A page number in this box: [5] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 2/2004) - Previous editions are obsolete.

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART III: CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
99353SLPR(POBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recyling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]
6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	633000	82600	160000	160000
8.1b	Total other on-site disposal or other releases	7959	9592.4	11000	13000
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	0	0	0	0
8.1d	Total other off-site disposal or other releases	502	3636.4	3600	3600
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	NA	NA	NA	NA
8.5	Quantity recycled offsite	0	43052.2	39000	40000
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)	759600			
8.9	Production ratio or activity index	0.77			
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1	NA	a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.

		Yes	No
8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one Box)	[ ]	[X]

EPA Form 9350-1 (Rev. 2/2004) - Previous editions are obsolete.

*For Dioxin or Dioxin-like compounds, report in grams/year

Form Approved OMB Number:2070-0093
Approval Expires: 01/31/2006

(IMPORTANT: Type or print; read instructions before completing form)

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EPA United States Environmental Protection Agency

FORM R

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Propylene

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center, P.O.Box 1513, Lanham, MD 20703-1513 2. APPROPRIATE STATE OFFICE (See Instructions in Appendix F)

Enter "X" here if this is a revision: [ ]

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2004

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
[ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)

2.2 Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
OFFICIAL SUBMITTAL CERTIFIED BY KEITH A. KLEIN, MANAGER DOE RICHLAND OPERATI		07/01/2005

SECTION 4. FACILITY IDENTIFICATION

4.1 TRI Facility ID Number: 99352SDPRTPOBOX

Facility or Establishment Name: U.S. DOE HANFORD SITE

Facility or Establishment Name or Mailing Address (if different from street address): U.S. DOE HANFORD SITE

Street: 825 JADWIN AVENUE

Mailing Address: POST OFFICE BOX 550

City/County/State/Zip Code: RICHLAND BENTON WA 99352

City/State/Zip Code: RICHLAND WA 99352-0550

Country (Non-US):

4.2 This report contains information for: (Important: check a or b; check c or d if applicable) a. [X] An entire facility b. [ ] Part of a facility c. [X] A Federal facility d. [ ] GOCO

4.3 Technical Contact Name: LORI A. HUFFMAN — Telephone Number (include area code): (509) 376-0104

Email Address: Lori_A_Huffman@orp.doe.gov

4.4 Public Contact Name: LORI A. HUFFMAN — Telephone Number (include area code): (509) 376-0104

4.5 SIC Code (s) (4 digits)

Primary					
a. 9999	b. 9511	c.	d.	e.	f.

4.6

Latitude	Degrees	Minutes	Seconds	Longitude	Degrees	Minutes	Seconds
	46	30	00		119	30	00

4.7 Dun & Bradstreet Number(s) (9 digits)	4.8 EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9 Facility NPDES Permit Number(s) (9 characters)	4.10 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a. NA	a. WA7890008967	a. WA0025917	a. NA
b.	b.	b.	b.

SECTION 5. PARENT COMPANY INFORMATION

5.1 Name of Parent Company: NA [ ] U.S. Department of Energy

5.2 Parent Company's Dun & Bradstreet Number: NA [X]

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EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number
99352SCPRT-OBOX
Toxic Chemical, Category or Generic Name
Propylene

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
	115-07-1
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
	Propylene
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)
	NA

1.4 Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NA																

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)
	NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. [ ] Produce b. [ ] Import	a. [ ] As a reactant	a. [ ] As a chemical processing aid
If produce or import:	b. [ ] As a formulation component	b. [ ] As a manufacturing aid
c. [ ] For on-site use/processing	c. [ ] As an article component	c. [X] Ancillary or other use
d. [ ] For sale/distribution	d. [ ] Repackaging	
e. [ ] As a byproduct	e. [ ] As an impurity	
f. [ ] As an impurity		

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 [03] (Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA	80	E	
5.2	Stack or point air emissions	NA	0	O	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	NA				
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box [ ]
and indicate the Part II, Section 5.3 page number in this box. [ ] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA Form 9350-1 (Rev. 2/2004) - Previous editions are obsolete.

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EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
98525DPLTPOBOX
Toxic Chemical, Category, or Generic Name
Propylene

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	X		
5.4.2	Underground Injection onsite to Class II-V Wells	X		
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills	X		
5.5.1.B	Other landfills	X		
5.5.2	Land treatment/application farming	X		
5.5.3A	RCRA Subtitle C Surface Impoundments	X		
5.5.3B	Other surface impoundments	X		
5.5.4	Other disposal	X		

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
NA	

6.1.B. 1	POTW Name	NA					
POTW Address							
City		State		County		Zip	
6.1.B.	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box [ ] and indicate the Part II, Section 6.1 page number in this box [ ] (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1	Off-Site EPA Identification Number (RCRA ID No.)	NA							
Off-Site Location Name	NA								
Off-site Address									
City		State		County		Zip		Country (Non-US)	
Is location under control of reporting facility or parent company?						Yes		No	

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R

PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
99352SDPRTPOBOX	
Toxic Chemical, Category, or Generic Name	
Propylene	

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. Off-Site EPA Identification Number (RCRA ID No.)	
Off-Site Location Name	
Off-site Address	

City		State		County		Zip		Country (Non-US)	

Is location under control of reporting facility or parent company? ☐ Yes ☐ No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

X	Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.1a	7A.1b	1		2			7A.1c	7A.1d	7A.1e
	3	4		5				%	Yes ☐ No ☐
	6	7		8					
7A.2a	7A.2b	1		2			7A.2c	7A.2d	7A.2e
	3	4		5				%	Yes ☐ No ☐
	6	7		8					
7A.3a	7A.3b	1		2			7A.3c	7A.3d	7A.3e
	3	4		5				%	Yes ☐ No ☐
	6	7		8					
7A.4a	7A.4b	1		2			7A.4c	7A.4d	7A.4e
	3	4		5				%	Yes ☐ No ☐
	6	7		8					
7A.5a	7A.5b	1		2			7A.5c	7A.5d	7A.5e
	3	4		5				%	Yes ☐ No ☐
	6	7		8					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box ☐
and indicate the Part II, Section 6.2/7A page number in this box: ☐ (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R
PART II: CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
09[illegible]SUPRIPOB[illegible]
Toxic Chemical, Category, or Generic Name
Propylene

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

X	Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1		2		3	

SECTION 7C. ON-SITE RECYCLING PROCESSES

X	Not Applicable (NA) - Check here if no on-site recyling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1		2		3		4		5	
6		7		8		9		10	

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1b	Total other on-site disposal or other releases	30	80	80	90
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1d	Total other off-site disposal or other releases	NA	NA	NA	NA
8.2	Quantity used for energy recovery onsite	0	NA	0	0
8.3	Quantity used for energy recovery offsite	0	NA	0	0
8.4	Quantity recycled onsite	0	NA	0	0
8.5	Quantity recycled offsite	0	NA	0	0
8.6	Quantity treated onsite	0	NA	0	0
8.7	Quantity treated offsite	0	NA	0	0
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)			0	
8.9	Production ratio or activity index			1.71	

8.10 Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1	NA	a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.

		Yes	No
8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one Box)		X

EPA Form 9350-1 (Rev. 2/2004) - Previous editions are obsolete.

*For Dioxin or Dioxin-like compounds, report in grams/year

APPENDIX A
Reporting Codes and Definitions

Section 4. Maximum Amount of the Toxic Chemical On-Site at Any Time During the Calendar Year

Weight Range in Pounds		
Range Code	From...	To...
01	0	99
02	100	999
03	1,000	9,999
04	10,000	99,999
05	100,000	999,999
06	1,000,000	9,999,999
07	10,000,000	49,999,999
08	50,000,000	99,999,999
09	100,000,000	499,999,999
10	500,000,000	999,999,999
11	1 billion	over 1 billion

Section 5. Quantity of the Toxic Chemical Entering Each Environmental Medium Onsite and Section 6. Transfers of the Toxic Chemical in Wastes to Off-Site Locations

Basis of Estimate

M: Estimate is based on monitoring data or measurements for the EPCRA section 313 chemical as transferred to an off-site facility.

C: Estimate is based on mass balance calculations, such as calculation of the amount of the EPCRA section 313 chemical in waste streams entering and leaving process equipment.

E: Estimate is based on published emission factors, such as those relating release quantity to through-put or equipment type (e.g., air emission factors).

O: Estimate is based on other approaches such as engineering calculations (e.g., estimating volatilization using published mathematical formulas) or best engineering judgment.

Section 6. Transfers of the Toxic Chemical in Wastes to Off-Site Locations

Type of Waste Disposal/Treatment/Energy Recovery/Recycling

M10	Storage Only	M66	Subtitle C Surface Impoundment
M20	Solvents/Organics Recovery	M67	Other Surface Impoundments
M24	Metals Recovery	M69	Other Waste Treatment
M26	Other Reuse or Recovery	M73	Land Treatment
M28	Acid Regeneration	M79	Other Land Disposal
M40	Solidification/Stabilization	M81	Underground Injection to Class I Wells
M41	Solidification/Stabilization-Metals and Metal Category Compounds only	M82	Underground Injection to Class II-V Wells
M50	Incineration/Thermal Treatment	M90	Other Off-Site Management
M54	Incineration/Insignificant Fuel Value	M92	Transfer to Waste Broker — Energy Recovery
M56	Energy Recovery	M93	Transfer to Waste Broker — Recycling
M61	Wastewater Treatment (Excluding POTW)	M94	Transfer to Waste Broker — Disposal
M62	Wastewater Treatment (Excluding POTW) -- Metals and Metal Category Compounds only	M95	Transfer to Waste Broker — Waste Treatment
M64	Other Landfills	M99	Unknown
M65	RCRA Subtitle C Landfills		

Section 7A. On-Site Waste Treatment Methods and Efficiency

General Waste Stream	
A:	Gaseous (gases, vapors, airborne particulates)
W:	Wastewater (aqueous waste)
L:	Liquid waste streams (non-aqueous waste)
S:	Solid waste streams (including sludges and slurries)

Range of Influent Concentration	
1=	Greater than 10,000 parts per million (1 percent)
2=	100 parts per million (0.01 percent) to 10,000 parts per million (1 percent)
3=	1 part per million (0.0001 percent) to 100 parts per million (0.01 percent)
4=	1 part per billion to 1 part per million
5=	Less than 1 part per billion

Waste Treatment Methods

Biological Treatment
- B11 Biological Treatment - Aerobic
- B21 Biological Treatment - Anaerobic
- B31 Biological Treatment - Facultative
- B99 Biological Treatment - Other

Chemical Treatment
- C01 Chemical Precipitation - Lime or Sodium Hydroxide
- C02 Chemical Precipitation - Sulfide
- C09 Chemical Precipitation - Other
- C11 Neutralization
- C21 Chromium Reduction
- C31 Complexed Metals Treatment (other than pH Adjustment)
- C41 Cyanide Oxidation - Alkaline Chlorination
- C42 Cyanide Oxidation - Electrochemical
- C43 Cyanide Oxidation - Other
- C44 General Oxidation (Includes Disinfection) – Chlorination
- C45 General Oxidation (Includes Disinfection) – Ozonation
- C46 General Oxidation (Includes Disinfection) - Other
- C99 Other Chemical Treatment

Incineration/Thermal Treatment
- F01 Liquid Injection
- F11 Rotary Kiln with Liquid Injection Unit
- F19 Other Rotary Kiln
- F31 Two Stage
- F41 Fixed Hearth
- F42 Multiple Hearth
- F51 Fluidized Bed
- F61 Infra-Red
- F71 Fume/Vapor
- F81 Pyrolytic Destructor
- F82 Wet Air Oxidation
- F83 Thermal Drying/Dewatering
- F99 Other Incineration/Thermal Treatment

Physical Treatment
- P01 Equalization
- P09 Other Blending
- P11 Settling/Clarification
- P12 Filtration
- P13 Sludge Dewatering (Non-thermal)
- P14 Air Flotation
- P15 Oil Skimming
- P16 Emulsion Breaking - Thermal
- P17 Emulsion Breaking - Chemical
- P18 Emulsion Breaking - Other
- P19 Other Liquid Phase Separation
- P21 Adsorption - Carbon
- P22 Adsorption - Ion Exchange (Other than for recovery/reuse)
- P23 Adsorption - Resin
- P29 Adsorption - Other
- P31 Reverse Osmosis (Other than for recovery/reuse)
- P41 Stripping - Air
- P42 Stripping - Steam
- P49 Stripping - Other
- P51 Acid Leaching (Other than for recovery/reuse)
- P61 Solvent Extraction (Other than for recovery/reuse)
- P99 Other Physical Treatment

Solidification/Stabilization
- G01 Cement Processes (Including Silicates)
- G09 Other Pozzolonic Processes (Includes Silicates)
- G11 Asphaltic Processes
- G21 Thermoplastic Techniques
- G99 Other Solidification Processes

DISTRIBUTION

Required Offsite Recipients:

U. S. Environmental Protection Agency
TRI Data Processing Center
c/o Computer Sciences Corporation
Suite 300
8400 Corporate Drive
Landover, MD 20785-2294

State of Washington Department of Ecology
Hazardous Waste/Toxics Reduction Program
Post Office Box 47659
Olympia, WA 98504-7659
Ms. Idell Hansen

Other Offsite Recipients:

Department of Energy
Office of Pollution Prevention
and Resource Conservation, EH-43
1000 Independence Avenue, SW
Washington, DC 20585
Ms. Jane Powers

Required Onsite Recipients:

D. A. Isom, Administrative Record (2)	H6-08
Document Processing Center	H6-08
DOE Reading Room	H2-53
Hanford Technical Library	P8-55
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L. L. Fritz	H8-44
D. E. Zaloudek	H8-13

DOE/RL-2006-38
Revision 0

2005 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-to-Know Act, Section 313

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

DOE/RL-2006-38
Revision 0

2005 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-to-Know Act, Section 313

R. E. Johnson
Fluor Hanford, Inc.

Date Published
June 2006

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

Release Approval Date 6/7/2006

Approved for Public Release;
Further Dissemination Unlimited

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ABSTRACT

Pursuant to section 313 of the *Emergency Planning and Community Right-To-Know Act of 1986* (EPCRA), and Executive Order 13148, *Greening the Government Through Leadership in Environmental Management,* the U.S. Department of Energy has prepared and submitted a Toxic Chemical Release Inventory for the Hanford Site covering activities performed during calendar year 2005.

EPCRA Section 313 requires facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding established threshold levels to report total annual releases of those chemicals. During calendar year 2005, Hanford Site activities resulted in two chemicals used in amounts exceeding an activity threshold; lead, Chemical Abstract Services Registry (CAS) Number 7439-92-1 and propylene, CAS Number 115-07-1. Accordingly, the *2005 Hanford Site Toxic Chemical Release Inventory,* DOE/RL-2006-38, Revision 0, includes total annual amounts of lead and propylene released to the environment, transferred to offsite locations, and otherwise managed as waste.

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EXECUTIVE SUMMARY

Section 313 of the *Emergency Planning and Community Right-To-Know Act of 1986* (EPCRA) requires covered facilities to report total annual releases of certain chemicals. The Pollution Prevention Act requires facilities covered under EPCRA section 313 to include source reduction information with their submittals. Executive Order 13148, *Greening the Government Through Leadership in Environmental Management,* extends these requirements to all federal facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding threshold levels established under EPCRA section 313.

Reporting is required for each toxic chemical that exceeds one of the established activity thresholds. The threshold for manufacturing or processing activities is 25,000 pounds. The threshold for chemicals otherwise used is 10,000 pounds. Certain chemicals identified by the Environmental Protection Agency (EPA) as being persistent and bioaccumulative have lower activity thresholds; either 100 pounds, 10 pounds if highly persistent and bioaccumulative, or 0.1 pound for dioxin and dioxin-like compounds.

During calendar year 2005, Hanford Site activities resulted in two chemicals used in amounts exceeding an activity threshold; lead, Chemical Abstract Services Registry (CAS) Number 7439-92-1 and propylene, CAS Number 115-07-1. Lead is identified as a persistent, bioaccumulation toxic chemical with a 100-pound threshold. Propylene is identified as an otherwise used chemical with a 10,000-pound threshold. Accordingly, the *2005 Hanford Site Toxic Chemical Release Inventory,* DOE/RL-200-38, Revision 0, includes total annual amounts of lead and propylene released to the environment, transferred to offsite locations, and otherwise managed as waste.

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CONTENTS

Form R for Lead 1

Form R for Propylene 15

Distribution Distr-1

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Form Approved OMB Number: 2070-0093
Approval Expires: 1/31/2008

(IMPORTANT: Type or print; read instructions before completing form)

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EPA
United States Environmental Protection Agency

FORM R

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Lead

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center, P.O.Box 1513, Lanham, MD 20703-1513 2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision: [ ]

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2005

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret? [ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)

2.2 Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
OFFICIAL SUBMITTAL CERTIFIED BY KEITH A. KLEIN, MANAGER DOE RICHLAND OPERATI		06/30/2006

SECTION 4. FACILITY IDENTIFICATION

4.1 TRI Facility ID Number: 99352SDPRTPOBOX

Facility or Establishment Name	Facility or Establishment Name or Mailing Address (if different from street address)
U.S. DOE HANFORD SITE	U.S. DOE HANFORD SITE
Street: 825 JADWIN AVENUE	Mailing Address: POST OFFICE BOX 550
City/County/State/Zip Code: RICHLAND BENTON WA 99352	City/State/Zip Code: RICHLAND WA 99352-0550
	Country (Non-US):

4.2 This report contains information for: (Important: check a or b; check c or d if applicable) a. [X] An entire facility b. [ ] Part of a facility c. [X] A Federal facility d. [ ] GOCO

4.3	Technical Contact Name	JOEL B. HEBDON	Telephone Number (include area code): (509) 372-3468
	Email Address	Joel_B_Hebdon@rl.gov	
4.4	Public Contact Name	JOEL B. HEBDON	Telephone Number (include area code): (509) 372-3468

4.5	SIC Code (s) (4 digits)	Primary a. 9999	b. 9511	c.	d.	e.	f.

4.7	Dun & Bradstreet Number(s) (9 digits)	a. NA
		b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA [ ]	U.S. Department of Energy
5.2	Parent Company's Dun & Bradstreet Number	NA [X]	

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EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number
99352SLPRTPOBOX
Toxic Chemical, Category or Generic Name
Lead

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) 7439-92-1
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) Lead
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.) NA

1.4 Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

NA ☐	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import		
If produce or import:	a. ☐ As a reactant	a. ☐ As a chemical processing aid
c. ☐ For on-site use/processing	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
d. ☐ For sale/distribution	c. ☐ As an article component	c. ☒ Ancillary or other use
e. ☐ As a byproduct	d. ☒ Repackaging	
f. ☐ As an impurity	e. ☐ As an impurity	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	04	(Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐	4	E	
5.2	Stack or point air emissions	NA ☐	0	O	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	COLUMBIA RIVER		0	M	NA
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds

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PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
99352BDPRTPOBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	X		
5.4.2	Underground Injection onsite to Class II-V Wells		0	M
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills		32700	O
5.5.1.B	Other landfills		1570000	O
5.5.2	Land treatment/application farming	X		
5.5.3A	RCRA Subtitle C Surface Impoundments		0	O
5.5.3B	Other surface impoundments		0.1	M
5.5.4	Other disposal		7084	C

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
0	O

6.1.B. 1	POTW Name	CITY OF RICHLAND WASTEWATER TREATMENT FACILITY					
POTW Address		555 LACY ROAD					
City	RICHLAND	State	WA	County	BENTON	Zip	99352
6.1.B.	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box [ ] and indicate the Part II, Section 6.1 page number in this box [ ] (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1	Off-Site EPA Identification Number (RCRA ID No.)	ARD040732943						
Off-Site Location Name	TERIS LLC FORMERLY ENSCO, INCORPORATED							
Off-site Address	309 AMERICAN CIRCLE							
City	EL DORADO	State	AR	County	UNION	Zip	717306555	Country (Non-US)

Is location under control of reporting facility or parent company? [ ] Yes [X] No

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
Toxic Chemical, Category, or Generic Name	Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 53	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 2	Off-Site EPA Identification Number (RCRA ID No.)	CAD066233986
Off-Site location Name	QUEMETCO CITY OF INDUSTRY	
Off-site Address	720 SOUTH SEVENTH AVENUE	

City	CITY OF INDUSTRY	State	CA	County	LOS ANGELES	Zip	91746	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 34000	1. O	1. M24
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.1a	7A.1b	1	H123	2	H075		7A.1d
W	3 H121	4	H083	5	H129		E3
	6 H082	7	H122	8	NA		
7A.2a	7A.2b	1	H129	2	H077		7A.2d
W	3 H123	4	H121	5	H082		E5
	6 H075	7	H101	8	NA		
7A.3a	7A.3b	1	H111	2	NA		7A.3d
S	3	4		5			E6
	6	7		8			
7A.4a	7A.4b	1		2			7A.4d
	3	4		5			
	6	7		8			
7A.5a	7A.5b	1		2			7A.5d
	3	4		5			
	6	7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [6] and indicate the Part II, Section 6.2/7A page number in this box: [1] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
98525DPRTPOBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 3 Off-Site EPA Identification Number (RCRA ID No.): ORD980975692

Off-Site location Name: OIL REREFINING COMPANY INC

Off-site Address: 4150 NORTH SUTTLE ROAD

City	PORTLAND	State	OR	County	Multnomah	Zip	97217	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]							d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.6a	7A.6b	1		2				7A.6d
	3		4		5			
	6		7		8			
7A.7a	7A.7b	1		2				7A.7d
	3		4		5			
	6		7		8			
7A.8a	7A.8b	1		2				7A.8d
	3		4		5			
	6		7		8			
7A.9a	7A.9b	1		2				7A.9d
	3		4		5			
	6		7		8			
7A.10a	7A.10b	1		2				7A.10d
	3		4		5			
	6		7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: [5]
and indicate the Part II, Section 6.2/7A page number in this box: [2] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
84529UTRTOBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 4	Off-Site EPA Identification Number (RCRA ID No.)	UTD981552177
Off-Site location Name	CLEAN HARBORS ARAGONITE LLC	
Off-site Address	11600 NORTH APTUS ROAD	

City	GRANTSVILLE	State	UT	County	Tooele	Zip	84029	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.1	1. O	1. M99
2. 850	2. O	2. M94
3. 0	3. O	3. M41
4. NA	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]							d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.11a	7A.11b	1		2				7A.11d
	3		4		5			
	6		7		8			
7A.12a	7A.12b	1		2				7A.12d
	3		4		5			
	6		7		8			
7A.13a	7A.13b	1		2				7A.13d
	3		4		5			
	6		7		8			
7A.14a	7A.14b	1		2				7A.14d
	3		4		5			
	6		7		8			
7A.15a	7A.15b	1		2				7A.15d
	3		4		5			
	6		7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [8] and indicate the Part II, Section 6.2/7A page number in this box: [3] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number: 99352PHTPO6HX

Toxic Chemical, Category, or Generic Name: Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 5 Off-Site EPA Identification Number (RCRA ID No.): WAR000010355

Off-Site location Name: PACIFIC ECOSOLUTIONS LLC

Off-site Address: 2025 BATTELLE BOULEVARD

City	RICHLAND	State	WA	County	Benton	Zip	99353	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 12.4	1. O	1. M99
2. 8317.9	2. O	2. M94
3. 5895.6	3. O	3. M41
4. NA	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.16a	7A.16b	1		2			7A.16d
	3	4		5			
	6	7		8			
7A.17a	7A.17b	1		2			7A.17d
	3	4		5			
	6	7		8			
7A.18a	7A.18b	1		2			7A.18d
	3	4		5			
	6	7		8			
7A.19a	7A.19b	1		2			7A.19d
	3	4		5			
	6	7		8			
7A.20a	7A.20b	1		2			7A.20d
	3	4		5			
	6	7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: [5]

and indicate the Part II, Section 6.2/7A page number in this box: [4] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number: 00[illegible]TCOBOX

Toxic Chemical, Category, or Generic Name: Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 6	Off-Site EPA Identification Number (RCRA ID No.)	TNR000005397
Off-Site location Name	PERMA FIX MATERIALS AND ENERGY CORP.	
Off-site Address	2010 HWY 58 SUITE 120 BLDG K1005	

City	OAK RIDGE	State	TN	County	Roane	Zip	37830	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.3	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence (enter 3-character code(s))							d. Waste Treatment Efficiency Estimate (enter 2 character code)
7A.21a	7A.21b	1		2				7A.21d
	3		4		5			
	6		7		8			
7A.22a	7A.22b	1		2				7A.22d
	3		4		5			
	6		7		8			
7A.23a	7A.23b	1		2				7A.23d
	3		4		5			
	6		7		8			
7A.24a	7A.24b	1		2				7A.24d
	3		4		5			
	6		7		8			
7A.25a	7A.25b	1		2				7A.25d
	3		4		5			
	6		7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: [5]
and indicate the Part II, Section 6.2/7A page number in this box: [5] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
89352BDPCTPOBOX	
Toxic Chemical, Category, or Generic Name	
Lead	

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 7	Off-Site EPA Identification Number (RCRA ID No.)	AZD982441263
Off-Site location Name	WESTATES CARBON ARIZONA INC	
Off-site Address	2523 MUTAHAR STREET	

City	PARKER	State	AZ	County	La Paz	Zip	85344	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.1	1. O	1. M09
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]							d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.26a	7A.26b		1		2			7A.26d
	3		4		5			
	6		7		8			
7A.27a	7A.27b		1		2			7A.27d
	3		4		5			
	6		7		8			
7A.28a	7A.28b		1		2			7A.28d
	3		4		5			
	6		7		8			
7A.29a	7A.29b		1		2			7A.29d
	3		4		5			
	6		7		8			
7A.30a	7A.30b		1		2			7A.30d
	3		4		5			
	6		7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [6]
and indicate the Part II, Section 6.2/7A page number in this box: [6] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 1/2006) - Previous editions are obsolete.

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number: 88220NCTPOBOX

Toxic Chemical, Category, or Generic Name: Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 8	Off-Site EPA Identification Number (RCRA ID No.)	NM4890139088
Off-Site location Name	WESTINGHOUSE TRU SOLUTIONS LLC FOR US DOE	
Off-site Address	30 MILE E OF CARLSBAD ON JAL HIGHWAY	

City	CARLSBAD	State	NM	County	Eddy	Zip	88221	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 10.9	1. O	1. M99
2. 4594.4	2. O	2. M79
3. 5.6	3. O	3. M41
4. NA	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence (enter 3-character code(s))							d. Waste Treatment Efficiency Estimate (enter 2 character code)
7A.31a	7A.31b	1		2				7A.31d
	3		4		5			
	6		7		8			
7A.32a	7A.32b	1		2				7A.32d
	3		4		5			
	6		7		8			
7A.33a	7A.33b	1		2				7A.33d
	3		4		5			
	6		7		8			
7A.34a	7A.34b	1		2				7A.34d
	3		4		5			
	6		7		8			
7A.35a	7A.35b	1		2				7A.35d
	3		4		5			
	6		7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [8] and indicate the Part II, Section 6.2/7A page number in this box: [7] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number: 38525DPSTPOBOX

Toxic Chemical, Category, or Generic Name: Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 9	Off-Site EPA Identification Number (RCRA ID No.)	TND982109142							
Off-Site location Name	DIVERSIFIED SCIENCES AND SERVICES INC								
Off-site Address	657 GALLAHER								
City	KINGSTON	State	TN	County	Roane	Zip	37763	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0	1. O	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]							d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.36a	7A.36b	1		2				7A.36d
	3		4		5			
	6		7		8			
7A.37a	7A.37b	1		2				7A.37d
	3		4		5			
	6		7		8			
7A.38a	7A.38b	1		2				7A.38d
	3		4		5			
	6		7		8			
7A.39a	7A.39b	1		2				7A.39d
	3		4		5			
	6		7		8			
7A.40a	7A.40b	1		2				7A.40d
	3		4		5			
	6		7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: [8]
and indicate the Part II, Section 6.2/7A page number in this box: [8] (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 1/2006) - Previous editions are obsolete.

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R PART III. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 99352BPRTPOBOX Toxic Chemical, Category, or Generic Name Lead

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recyling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	82600	32700	50000	50000
8.1b	Total other on-site disposal or other releases	9592.4	7084.1	10000	10000
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1d	Total other off-site disposal or other releases	3636.4	19549.8	25000	30000
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	0	NA	0	0
8.5	Quantity recycled offsite	43052.2	34000	40000	40000
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)	1570000			
8.9	Production ratio or activity index	2.10			
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				
	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)			
8.10.1	NA	a.	b.	c.	
8.10.2		a.	b.	c.	
8.10.3		a.	b.	c.	
8.10.4		a.	b.	c.	
8.11	If you wish to submit additional optional information on source reduction, recycling, or pollution control activities with this report, check "Yes."			Yes [X]	

EPA Form 9350-1 (Rev. 1/2005) - Previous editions are obsolete.

*For Dioxin or Dioxin-like compounds, report in grams/year

TRI Facility ID Number
99352SDPRPPBOX
Toxic Chemical Category or Generic Name
Lead

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SECTION 8.11. Submit additional optional information on source reduction, recycling, or pollution control activities.

Disposal of 32,700 pounds of lead in LDR-compliant waste in RCRA trenches 31 and 34 (reported in Section 8.1a), disposal of 1,570,000 pounds of lead in LDR-compliant remediation waste in the CERCLA ERDF trench (reported in Section 8.8), transfer of 19,549.8 pounds to offsite TSD facilities for treatment and/or disposal (reported in Section 8.1d), and 34,000 pounds of lead sent offsite for reclamation (reported in Section 8.5), all seem to be huge quantities of lead released to the environment. However, all of this lead was properly disposed of in permitted facilities that were in full compliance with LDR requirements for lead.

The only significant release of lead to the environment that was not into a permitted facility was the 7084 pounds of lead from ammunition fired at the Hanford Patrol firing range (reported in Section 8.1b).

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Form Approved OMB Number: 2070-0093
Approval Expires: 1/31/2008

(IMPORTANT: Type or print; read instructions before completing form)

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EPA United States Environmental Protection Agency

FORM R

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

TRI Facility ID Number: 99352SOPRTPOBOX

Toxic Chemical, Category or Generic Name: Propylene

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center, P.O.Box 1513, Lanham, MD 20703-1513 2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision: [ ]

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2005

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
[ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)

2.2 Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
OFFICIAL SUBMITTAL CERTIFIED BY KEITH A. KLEIN, MANAGER DOE RICHLAND OPERATI		06/30/2006

SECTION 4. FACILITY IDENTIFICATION

4.1 TRI Facility ID Number: 99352SOPRTPOBOX

Facility or Establishment Name	Facility or Establishment Name or Mailing Address (if different from street address)
U.S. DOE HANFORD SITE	U.S. DOE HANFORD SITE
Street: 825 JADWIN AVENUE	Mailing Address: POST OFFICE BOX 550
City/County/State/Zip Code: RICHLAND BENTON WA 99352	City/State/Zip Code: RICHLAND WA 99352-0550
	Country (Non-US):

4.2 This report contains information for: (Important: check a or b; check c or d if applicable) a. [X] An entire facility b. [ ] Part of a facility c. [X] A Federal facility d. [ ] GOCO

4.3 Technical Contact Name: JOEL B. HEBDON — Telephone Number (include area code): (509) 372-3468
Email Address: Joel_B_Hebdon@rl.gov

4.4 Public Contact Name: JOEL B. HEBDON — Telephone Number (include area code): (509) 372-3468

4.5 SIC Code (s) (4 digits): Primary a. 9999 b. 9511 c. d. e. f.

4.7 Dun & Bradstreet Number(s) (9 digits): a. NA b.

SECTION 5. PARENT COMPANY INFORMATION

5.1 Name of Parent Company: NA [ ] U.S. Department of Energy

5.2 Parent Company's Dun & Bradstreet Number: NA [X]

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EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION	TRI Facility ID Number 98152SLPRT-OBUX Toxic Chemical, Category or Generic Name Propylene

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) 115-07-1
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) Propylene
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.) NA

1.4 Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

NA ☐	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import If produce or import: c. ☐ For on-site use/processing d. ☐ For sale/distribution e. ☐ As a byproduct f. ☐ As an impurity	a. ☐ As a reactant b. ☐ As a formulation component c. ☐ As an article component d. ☐ Repackaging e. ☐ As an impurity	a. ☐ As a chemical processing aid b. ☐ As a manufacturing aid c. ☒ Ancillary or other use

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	03	(Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐	60	E	
5.2	Stack or point air emissions	NA ☐	0	O	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	NA				
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐
and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 1/2006) - Previous editions are obsolete.

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
69352DPRTPOBOX
Toxic Chemical, Category, or Generic Name
Propylene

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	X		
5.4.2	Underground Injection onsite to Class II-V Wells	X		
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills	X		
5.5.1.B	Other landfills	X		
5.5.2	Land treatment/application farming	X		
5.5.3A	RCRA Subtitle C Surface Impoundments	X		
5.5.3B	Other surface impoundments	X		
5.5.4	Other disposal	X		

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
NA	

6.1.B. 1	POTW Name	NA					
POTW Address							
City		State		County		Zip	
6.1.B.	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box [ ] and indicate the Part II, Section 6.1 page number in this box [ ] (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1	Off-Site EPA Identification Number (RCRA ID No.)	NA							
Off-Site Location Name	NA								
Off-site Address									
City		State		County		Zip		Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [ ] No

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 1/2006) - Previous editions are obsolete.

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R

PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number	
98528DPSTFOBOX	
Toxic Chemical, Category, or Generic Name	
Propylene	

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2.	Off-Site EPA Identification Number (RCRA ID No.)								
Off-Site location Name									
Off-site Address									
City		State		County		Zip		Country (Non-US)	

Is location under control of reporting facility or parent company? ☐ Yes ☐ No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

☒ Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]						d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.1a	7A.1b	1		2			7A.1d
	3		4		5		
	6		7		8		
7A.2a	7A.2b	1		2			7A.2d
	3		4		5		
	6		7		8		
7A.3a	7A.3b	1		2			7A.3d
	3		4		5		
	6		7		8		
7A.4a	7A.4b	1		2			7A.4d
	3		4		5		
	6		7		8		
7A.5a	7A.5b	1		2			7A.5d
	3		4		5		
	6		7		8		

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 6.2/7A page number in this box: ☐ (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 1/2006) - Previous editions are obsolete.

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

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EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352BLPRYPOBOX
Toxic Chemical, Category, or Generic Name
Propylene

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recyling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1b	Total other on-site disposal or other releases	60	60	100	120
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1d	Total other off-site disposal or other releases	NA	NA	NA	NA
8.2	Quantity used for energy recovery onsite	0	NA	0	0
8.3	Quantity used for energy recovery offsite	0	NA	0	0
8.4	Quantity recycled onsite	0	NA	0	0
8.5	Quantity recycled offsite	0	NA	0	0
8.6	Quantity treated onsite	0	NA	0	0
8.7	Quantity treated offsite	0	NA	0	0
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)	0			
8.9	Production ratio or activity index	0.71			
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				
	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)			
8.10.1	NA	a.	b.	c.	
8.10.2		a.	b.	c.	
8.10.3		a.	b.	c.	
8.10.4		a.	b.	c.	
8.11	If you wish to submit additional optional information on source reduction, recycling, or pollution control activities with this report, check "Yes."			Yes [ ]	

EPA Form 9350-1 (Rev. 1/2006) - Previous editions are obsolete.

*For Dioxin or Dioxin-like compounds, report in grams/year

TRI Facility ID Number
99352SOPGRPGBOX
Toxic Chemical Category or Generic Name
Propylene

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SECTION 8.11. Submit additional optional information on source reduction, recycling, or pollution control activities.

DISTRIBUTION

Required Offsite Recipients:

U.S. Environmental Protection Agency
TRI Data Processing Center
c/o Computer Sciences Corporation
Suite 150
8400 Corporate Drive
Landover, MD 20785-2294

State of Washington Department of Ecology
Hazardous Waste/Toxics Reduction Program
Post Office Box 47659
Olympia, WA 98504-7659
Ms. Idell Hansen

Other Offsite Recipients:

Department of Energy
Office of Pollution Prevention and Resource Conservation, EH-43
1000 Independence Avenue SW
Washington, DC 20595
Ms. Jane Powers

DISTRIBUTION

Required Onsite Recipients:

DOE Reading Room	H2-53
DPC	H6-08
EDMC (2)	H6-08
Environmental Portal (file: EPCRA TRI Report)	H6-08
Hanford Technical Library	P8-55
U.S. Department of Energy, Richland Operations Office	
J. B. Hebdon	A5-15
M. F. Jarvis	A5-15
U.S. Department of Energy, Office of River Protection	
G. M. Neath	H6-06
U.S. Department of Energy, Pacific NW Science Office	
T. L. Aldridge	K9-42
AdvanceMed Hanford	
S. M. McInturff	H1-51
ATLII	
C. R. Neff	T6-52
Bechtel National, Inc.	
B. L. Curn	H4-20
J. P. Henschel	H4-20
J. S. Hill	H4-20
CH2M HILL Hanford Group, Inc.	
P. C. Miller	R1-51
Pacific Northwest National Laboratory	
A. K. Ikenberry	J2-25
Washington Closure Hanford, LLC	
L. A. D'amato	H9-01
R. J. Landon	H9-03
Fluor Hanford, Inc.	
R. H. Engelmann	H8-12
L. L. Fritz	H8-12
R. E. Johnson	H8-13
J. O. Skolrud	H8-13

DOE/RL-2007-12
Revision 0

2006 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-to-Know Act, Section 313

R. E. Johnson
Fluor Hanford, Inc.

Date Published
June 2007

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

Release Approval 06/06/2007
Date

Approved for Public Release:
Further Dissemination Unlimited

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EPA FORM R PART III CHEMICAL SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 99352SDPRYPOBOX Toxic Chemical, Category, or Generic Name Lead Compounds

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recyling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 [ ] 2 [ ] 3 [ ]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	32700	35300	40000	40000
8.1b	Total other on-site disposal or other releases	7084.1	9012.9	9000	9000
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1d	Total other off-site disposal or other releases	19549.8	27946.7	30000	30000
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	NA	NA	NA	NA
8.5	Quantity recycled offsite	34000	27000	50000	50000
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)			899000	
8.9	Production ratio or activity index			0.57	
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				
	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)			
8.10.1	NA	a.	b.	c.	
8.10.2		a.	b.	c.	
8.10.3		a.	b.	c.	
8.10.4		a.	b.	c.	
8.11	If you wish to submit additional optional information on source reduction, recycling, or pollution control activities with this report, check "Yes."			Yes [X]	

EPA Form 9350-1 (Rev. 8/2006) - Previous editions are obsolete.

*For Dioxin or Dioxin-like compounds, report in grams/year

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category, or Generic Name
Lead Compounds

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SECTION 8.11. Submit additional optional information on source reduction, recycling, or pollution control activities.

In prior years, lead has been reported on a Form R. In 2006, both lead and lead compounds exceeded the PBT threshold of 100 pounds, and a combined report for lead compounds is being submitted, per EPA guidance. Less than 3% of the lead reported in Section 8.1 (a-d) was listed specifically as a lead compound.

Disposal of 35,300 pounds of lead in LDR-compliant waste in RCRA trenches 31 and 34 (reported in Section 8.1a), disposal of 899,000 pounds of lead in LDR-compliant remediation waste in the CERCLA ERDF trench (reported in Section 8.8), disposal of 0.9 pounds of lead in a Treated Effluent Disposal Facility (permit concentrations were not exceeded, included in section 8.1b), transfer of 27,946.6 pounds to offsite TSD facilities for treatment and/or disposal (reported in Section 8.1d), and 27,000 pounds of lead sent offsite for reclamation (reported in Section 8.5), all seem to be huge quantities of lead released to the environment. However, all of this lead was properly disposed of in permitted facilities that were in full compliance with LDR requirements for lead.

The only significant release of lead to the environment that was not into a permitted facility was the 9012 pounds of lead from ammunition fired at the Hanford Patrol firing range (reported in Section 8.1b).

Although the 899,000 pounds of lead from CERCLA remediation waste are shown as a "release to the environment" reported in Section 8.8, the actual situation is that this quantity of lead was cleaned up from the environment, and placed into a permanent compliant disposal facility.

DOE/RL-2008-16
Revision 0

2007 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-to-Know Act, Section 313

R. E. Johnson
Fluor Hanford, Inc.

Date Published
June 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

S. D. Aardal 07/29/2008
Release Approval Date

Approved for Public Release
Further Dissemination Unlimited

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Waste Treatment Method(s) Sequence #13:H122
Waste Treatment Efficiency Estimate:E6

General Waste Stream:S
Waste Treatment Method(s) Sequence #14:H111
Waste Treatment Efficiency Estimate:E6

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

No on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

SECTION 7C. ON-SITE RECYCLING PROCESSES

No on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

8.1a

Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills
Prior Year (pounds/year):35300
Current Reporting Year (pounds/year):14900
Following Reporting Year (pounds/year):30000
Second Following Reporting Year (pounds/year):30000

8.1b

Total other on-site disposal or other releases
Prior Year (pounds/year):9012.9
Current Reporting Year (pounds/year):9137.3
Following Reporting Year (pounds/year):9100
Second Following Reporting Year (pounds/year):9100

8.1c

Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills
Prior Year (pounds/year): NA
Current Reporting Year (pounds/year):0
Following Year (pounds/year): NA
Second Following Year (pounds/year): NA

8.1d

8.7

Quantity treated offsite:
Prior Year (pounds/year): NA
Current Reporting Year (pounds/year): NA
Following Year (pounds/year): NA
Second Following Year (pounds/year): NA

8.8

Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year):2130000

8.9

Production ratio or activity index:0.81

8.10.1

Source Reduction Activity Code:NA
Methods to Identify Activities:

8.11

Wish to submit additional optional information on source reduction, recycling, or pollution control activities?:Yes

Additional optional information on source reduction, recycling, or pollution control activities: In prior years, lead has been reported on a Form R. In 2006, both lead and lead compounds exceeded the PBT threshold of 100 pounds, and a combined report for lead compounds was submitted, per EPA guidance. In 2007, lead exceeded the threshold, but lead compounds did not. Disposal of 14,900 pounds of lead in LDR-compliant waste in trenches 31 and 34 (reported in Section 8.1a), disposal of 2,130,000 pounds of lead in LDR-compliant remediation waste in the CERCLA ERDF trench (reported in Section 8.8), disposal of 0.3 pounds of lead in a treated effluent disposal facility (permit concentrations were not exceeded, included in 8.1b), transfer of 41443.5 pounds of lead to offsite TSD facilities for treatment and/or disposal (reported in Section 8.1d) and 64,232.6 pounds of lead sent offsite for reclamation (reported in Section 8.5), all seem to be huge quantities of lead released to the environment. However, all of this lead was properly disposed of in permitted facilities that were in full compliance with LDR requirements for lead. The only significant release of lead to the environment that was not into a permitted facility was the 9,136 pounds of lead from ammunition fired at the Hanford Patrol Firing Range (reported in Section 8.1b). Although the 2,130,000 pounds of lead from CERCLA remediation waste are shown as a "release to the environment" reported in Section 8.8, the actual situation is that this quantity of lead was cleaned up from the environment, and placed into a permanent compliant disposal facility.

DOE/RL-2009-07
Revision 0

2008 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-to-Know Act, Section 313

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

DOE/RL-2009-07
Revision 0

2008 Hanford Site Toxic Chemical Release Inventory

Emergency Planning and Community Right-to-Know Act, Section 313

R. E. Johnson
Fluor Hanford, Inc.

Date Published
June 2009

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EXECUTIVE SUMMARY

Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA) requires covered facilities to report total annual releases of certain chemicals. The Pollution Prevention Act requires facilities covered under EPCRA Section 313 to include source reduction information with their submittals. Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, extends these requirements to all federal facilities that manufacture, process, or otherwise use listed toxic chemicals in quantities exceeding threshold levels established under EPCRA Section 313.

Electronic reporting is required for each toxic chemical that exceeds one of the established activity thresholds. The threshold for manufacturing or processing activities is 25,000 pounds. The threshold for chemicals otherwise used is 10,000 pounds. Certain chemicals identified by the Environmental Protection Agency (EPA) as being persistent and bioaccumulative have lower activity thresholds; either 100 pounds, 10 pounds if highly persistent and bioaccumulative, or 0.1 pound for dioxin and dioxin-like compounds.

During calendar year 2008, Hanford Site activities resulted in two chemicals used in amounts exceeding a reporting threshold: lead, Chemical Abstract Services Registry (CAS) Number 7439-92-1; and propylene, CAS Number 115-07-1. Accordingly, the *2008 Hanford Site Toxic Chemical Release Inventory*, DOE/RL-2009-07, includes total annual amounts of lead and propylene released to the environment, transferred to offsite locations, and otherwise managed as waste.

Electronic submittal and certification is now performed on the EPA website, TRIMEweb, found at https://cdx.epa.gov/SSL/CDX/epa_home.asp, after registering at EPA's Central Data Exchange (CDX). For calendar year 2007, it was not possible to print Form Rs with the TRIMEweb software. That flaw has been corrected, and the validated draft Form Rs, which will be certified by the U.S. Department of Energy, Richland Operations Office (DOE-RL) through the CDX, may be printed from the software. This report contains the validated Form R data for lead and propylene, ready for certification by DOE-RL.

CONTENTS

TRIME Form R Data for Lead 1

TRIME Form R Data for Propylene 10

Appendix A - Reporting Codes and Definitions A-1

Form Status: Available for Editing
Validation Status: Passed with Possible Errors

(IMPORTANT: Type or print; read instructions before completing form)

Form Approved OMB Number: 2070-0093
Approval Expires: 03/31/2011

EPA United States Environmental Protection Agency	**FORM R** Section 313 of the Emergency Planning and Community Right-to-know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act.	TRI Facility ID Number **99352SDPRTPOBOX** Toxic Chemical, Category or Generic Name **Lead**

WHERE TO SEND COMPLETED FORMS:	1. TRI Data Processing Center P.O.Box 1513 Lanham, MD 20703-1513 ***** Draft Form Only: Do Not Submit to EPA *****	2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

This section only applies if you are revising or withdrawing a previously submitted form, otherwise leave blank:	Revision (enter up to two code(s)) [ ][ ]	Withdrawal (enter up to two code(s)) [ ][ ]

Important: See Instructions to determine when "Not Applicable (NA)" boxes should be checked.

Part I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR : **2008**

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret? [ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)	2.2 Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
Draft Form : Do Not Send to EPA		

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	**99352SDPRTPOBOX**
Facility or Establishment Name **U.S. DOE HANFORD SITE**		Facility or Establishment Name or Mailing Address(if different from street address) **U.S. DOE HANFORD SITE**	
Street **825 JADWIN AVE**		Mailing Address **POST OFFICE BOX 550**	
City/County/State/Zip Code **RICHLAND / Benton / WA / 99352**		City/State/Zip Code **RICHLAND / WA / 99352**	Country (Non-US)

4.2	This report contains information for : (Important: check a or b; check c or d if applicable)	a. [X] An Entire facility	b. [ ] Part of a facility	c. [X] A Federal facility	d. [ ] GOCO

4.3	Technical Contact name	**DALE E. JACKSON**	Email Address **DALE_E_JACKSON@RL.GOV**	Telephone Number (include area code) **5093768086**
4.4	Public Contact name	**DALE E. JACKSON**	Email Address **DALE_E_JACKSON@RL.GOV**	Telephone Number (include area code) **5093768086**

4.5	NAICS Code (s) (6 digits)	a. **924110 (Primary)**	b.	c.	d.	e.	f.

4.7	Dun and Bradstreet Number(s) (9 digits)

a. **NA**

b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA [ ]	**U.S. DEPARTMENT OF ENERGY**
5.2	Parent Company's Dun & Bradstreet Number	NA [X]	

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Lead

SECTION 1. TOXIC CHEMICAL IDENTITY (Important DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
	7439921
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
	Lead
1.3	Generic Chemical Name (Important: Complete only if Part I, Section 2.1 is checked "yes". Generic Name must be structurally descriptive).
	NA

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, spaces, and punctuation.)
	NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. [ ] Produce b. [ ] Import		
If produce or import: c. [ ] For on-site use/processing d. [ ] For sale/distribution e. [ ] As a byproduct f. [ ] As an impurity	a. [ ] As a reactant b. [ ] As a formulation component c. [ ] As an article component d. [X] Repackaging e. [ ] As an impurity	a. [ ] As a chemical processing aid b. [ ] As a manufacturing aid c. [X] Ancillary or other use

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 [05] (Enter two-digit code from instruction package.)

SECTION 5.QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA [ ]	6	E1	
5.2	Stack or point air emissions	NA [ ]	1	E2	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3. 1	COLUMBIA RIVER		0	M2	NA

*For Dioxin and Dioxin-like Compounds, report in grams/year
**Range Codes: A=1-10 pounds; B=11-499 pounds; C=500-999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category or Generic Name
Lead

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I wells	[X]		
5.4.2	Underground Injection onsite to Class II-V wells	[ ]	0	M2
5.5	Disposal to land onsite			
5.5.1.A	RCRA subtitle C landfills	[ ]	19900	O
5.5.1.B	Other landfills	[ ]	2200157	O
5.5.2	Land treatment/application farming	[X]		
5.5.3A	RCRA Subtitle C surface impoundments	[ ]	0	O
5.5.3B	Other surface impoundments	[ ]	0.1	M2
5.5.4	Other disposal	[ ]	9611	C

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1 Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
0	O

6.1.B. 1 POTW Name	CITY OF RICHLAND WASTEWATER TREATMENT FACILITY						
POTW Address	555 LACY ROAD						
City	RICHLAND	State	WA	County	Benton	Zip	99352

*For Dioxin and Dioxin-like Compounds, report in grams/year

**Range Codes: A=1-10 pounds; B=11-499 pounds; C=500-999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2.1 Off-Site EPA Identification Number (RCRA ID No.)	TNR000005397
Off-Site Location Name	PERMA-FIX M&EC EAST TENNESSEE TECHNOLOGY PARK
Off-Site Address	2010 HWY 58, SUITE 120 BLDG K-1005

City	State	County	Zip	Country (Non-US)
OAK RIDGE	TN	Roane	37830	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . .2	1 . O	1 . M41
2 . 72.6	2 . O	2 . M99
3 . .8	3 . O	3 . M94

6.2.2 Off-Site EPA Identification Number (RCRA ID No.)	ILD098642424
Off-Site Location Name	VEOLIA ES TECHNICAL SOLUTIONS
Off-Site Address	7 MOBILE AVENUE

City	State	County	Zip	Country (Non-US)
SAUGET	IL	St Clair	62201	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . .4	1 . O	1 . M99

6.2.3 Off-Site EPA Identification Number (RCRA ID No.)	ORD089452353
Off-Site Location Name	CHEM WASTE MANAGEMENT OF NW
Off-Site Address	17629 CEDAR SPRINGS LANE

City	State	County	Zip	Country (Non-US)
ARLINGTON	OR	Gilliam	97812	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 214.5	1 . O	1 . M99

6.2.4 Off-Site EPA Identification Number (RCRA ID No.)	UTD981552177
Off-Site Location Name	CLEAN HARBORS ARAGONITE LLC
Off-Site Address	11600 NORTH APTUS ROAD

City	State	County	Zip	Country (Non-US)
GRANTSVILLE	UT	Tooele	84029	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 6.3	1 . O	1 . M24
2 . 1243.2	2 . O	2 . M79
3 . 418.6	3 . O	3 . M94
4 . 237.9	4 . O	4 . M99
5 . 57.6	5 . O	5 . M41

6.2.5 Off-Site EPA Identification Number (RCRA ID No.)	ARD069748192
Off-Site Location Name	CLEAN HARBORS EL DORADO
Off-Site Address	309 AMERICAN CIRCLE

City	EL DORADO	State	AR	County	Union	Zip	71730	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 25.6	1 . O	1 . M99
2 . 0	2 . O	2 . M94

6.2.6 Off-Site EPA Identification Number (RCRA ID No.)	ID4890008952
Off-Site Location Name	IDAHO NATIONAL ENGINEERING & ENVIRONMENTAL LABORATORY
Off-Site Address	RWMC

City	SCOVILLE	State	ID	County	Butte	Zip	83415	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 0	1 . O	1 . M94

6.2.7 Off-Site EPA Identification Number (RCRA ID No.)	TND982086969
Off-Site Location Name	TOXCO MATERIAL MANAGEMENT CNTR
Off-Site Address	109 FLINT ROAD

City	OAK RIDGE	State	TN	County	Roane	Zip	37830	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 5274.6	1 . O	1 . M24

6.2.8 Off-Site EPA Identification Number (RCRA ID No.)	AZ0000337360
Off-Site Location Name	VEOLIA ES TECHNICAL SOLUTIONS
Off-Site Address	5736 W. JEFFERSON ST.

City	PHOENIX	State	AZ	County	Maricopa	Zip	85043	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 571	1 . O	1 . M24

6.2.9 Off-Site EPA Identification Number (RCRA ID No.)	NM4890139088
Off-Site Location Name	WESTINGHOUSE TRU SOLUTIONS LLC FOR US DOE
Off-Site Address	30 MILE E OF CARLSBAD ON JAL HIGHWAY

City	CARLSBAD	State	NM	County	Eddy	Zip	88221	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 6257.6	1 . O	1 . M79

6.2.10 Off-Site EPA Identification Number (RCRA ID No.)	COD980591184
Off-Site Location Name	VEOLIA ENVIRONMENTAL SERVICES, LLC
Off-Site Address	9131 EAST 96TH AVENUE

City	HENDERSON	State	CO	County	Adams	Zip	80640	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 263.8	1 . O	1 . M99

6.2.11 Off-Site EPA Identification Number (RCRA ID No.)	WAR000010355
Off-Site Location Name	PERMA-FIX NORTHWEST
Off-Site Address	2025 BATELLE BLVD

City	RICHLAND	State	WA	County	Benton	Zip	99352	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 3119.4	1 . O	1 . M41
2 . 44	2 . O	2 . M94
3 . 651.1	3 . O	3 . M99

6.2.12 Off-Site EPA Identification Number (RCRA ID No.)	ORD980975692
Off-Site Location Name	OIL REREFINING COMPANY INC
Off-Site Address	4150 NORTH SUTTLE ROAD

City	PORTLAND	State	OR	County	Multnomah	Zip	97217	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 0	1 . O	1 . M99

6.2.13 Off-Site EPA Identification Number (RCRA ID No.)	WAD020257945
Off-Site Location Name	BURLINGTON ENVIRONMENTAL INC
Off-Site Address	1701 EAST ALEXANDER AVENUE

City	TACOMA	State	WA	County	Pierce	Zip	98421	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 37.4	1 . O	1 . M94
2 . 43.8	2 . O	2 . M41

6.2.14 Off-Site EPA Identification Number (RCRA ID No.)	CAD066233966
Off-Site Location Name	QUEMETCO CITY OF INDUSTRY
Off-Site Address	720 SOUTH SEVENTH AVENUE

City	CITY OF INDUSTRY	State	CA	County	Los Angeles	Zip	91746	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 37000	1 . O	1 . M24

6.2.15 Off-Site EPA Identification Number (RCRA ID No.)	TNR000005397
Off-Site Location Name	PERMA-FIX ENVIRONMENTAL
Off-Site Address	HWY 58 AT BLDG K1005

City	OAK RIDGE	State	TN	County	Roane	Zip	37830	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 23.2	1 . O	1 . M41
2 . 0	2 . O	2 . M94

6.2.16 Off-Site EPA Identification Number (RCRA ID No.)	UTD982598898
Off-Site Location Name	ENERGYSOLUTIONS; CLIVE DISPOSAL SITE
Off-Site Address	INTERSTATE 80, EXIT 49

City	CLIVE	State	UT	County	Tooele	Zip	84029	Country (Non-US)	

Is location under control of reporting facility or parent company?	[ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 291.5	1 . O	1 . M41

6.2.17 Off-Site EPA Identification Number (RCRA ID No.)	TND982109142
Off-Site Location Name	DIVERSIFIED SCIENCES AND SERVICES INC
Off-Site Address	657 GALLAGHER ROAD

City	KINGSTON	State	TN	County	Roane	Zip	37763	Country (Non-US)	

Is location under control of reporting facility or parent company?	[ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1 . 4.9	1 . O	1 . M99
2 . .3	2 . O	2 . M41

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	d. Waste Treatment Efficiency Estimate
7A. 1 a	7A. 1 b	7A. 1 d
W	1 : H129 2 : H077 3 : H123 4 : H121 5 : H082 6 : H075 7 : H101	E6
7A. 2 a	7A. 2 b	7A. 2 d
W	1 : H123 2 : H075 3 : H121 4 : H083 5 : H129 6 : H082 7 : H122	E6
7A. 3 a	7A. 3 b	7A. 3 d
S	1 : H111	E6

*For Dioxin and Dioxin-like Compounds, report in grams/year

**Range Codes: A=1-10 pounds; B=11-499 pounds; C=500-999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Lead

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	14900	19900	25000	25000
8.1b	Total other on-site disposal or other releases	9137.3	9618.1	9500	9500
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	0	0	0	0
8.1d	Total other off-site disposal or other releases	41443.5	13008.4	30000	30000
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	NA	NA	NA	NA
8.5	Quantity recycled offsite	64232.6	42851.9	50000	50000
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)		2200157		
8.9	Production ratio or activity index		1.63		
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10. 1	NA			
8.11	If you wish to submit additional optional information on source reduction, recycling, or pollution control activities, check "Yes."	Yes [X]		

*For Dioxin and Dioxin-like Compounds, report in grams/year

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category or Generic Name
Lead

Additional optional information on source reduction, recycling, or pollution control activities.
DISPOSAL OF 19,900 POUNDS OF LEAD IN LDR-COMPLIANT WASTE IN TRENCHES 31 AND 34 (REPORTED IN SECTION 8.1A), DISPOSAL OF 2,200,000 POUNDS OF LEAD IN LDR-COMPLIANT REMEDIATION WASTE IN THE CERCLA ERDF TRENCH (REPORTED IN SECTION 8.8), DISPOSAL OF 0.1 POUNDS OF LEAD IN A TREATED EFFLUENT DISPOSAL FACILITY (PERMIT CONCENTRATIONS WERE NOT EXCEEDED, INCLUDED IN 8.1B), TRANSFER OF 13,008 POUNDS OF LEAD TO OFFSITE TSD FACILITIES FOR TREATMENT AND/OR DISPOSAL (REPORTED IN SECTION 8.1D) AND 42,852 POUNDS OF LEAD SENT OFFSITE FOR RECLAMATION (REPORTED IN SECTION 8.5), ALL SEEM TO BE HUGE QUANTITIES OF LEAD RELEASED TO THE ENVIRONMENT. HOWEVER, ALL OF THIS LEAD WAS PROPERLY DISPOSED OF IN PERMITTED FACILITIES THAT WERE IN FULL COMPLIANCE WITH LDR REQUIREMENTS FOR LEAD. THE ONLY SIGNIFICANT RELEASE OF LEAD TO THE ENVIRONMENT THAT WAS NOT INTO A PERMITTED FACILITY WAS THE 9,611 POUNDS OF LEAD FROM AMMUNITION FIRED AT THE HANFORD PATROL FIRING RANGE (REPORTED IN SECTION 8.1B). ALTHOUGH THE 2,200,000 POUNDS OF LEAD FROM CERCLA REMEDIATION WASTE ARE SHOWN AS A "RELEASE TO THE ENVIRONMENT" REPORTED IN SECTION 8.8, THE ACTUAL SITUATION IS THAT THIS QUANTITY OF LEAD WAS CLEANED UP FROM THE ENVIRONMENT, AND PLACED INTO A PERMANENT COMPLIANT DISPOSAL FACILITY.

Form Status: Available for Editing
Validation Status: Passed with Possible Errors

(IMPORTANT: Type or print; read instructions before completing form)

Form Approved OMB Number: 2070-0093
Approval Expires: 03/31/2011

EPA United States Environmental Protection Agency	**FORM R** Section 313 of the Emergency Planning and Community Right-to-know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act.	TRI Facility ID Number **99352SDPRTPOBOX** Toxic Chemical, Category or Generic Name **Propylene**

WHERE TO SEND COMPLETED FORMS:	1. TRI Data Processing Center P.O.Box 1513 Lanham, MD 20703-1513 ***** Draft Form Only: Do Not Submit to EPA *****	2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

This section only applies if you are revising or withdrawing a previously submitted form, otherwise leave blank:	Revision (enter up to two code(s)) [ ][ ]	Withdrawal (enter up to two code(s)) [ ][ ]

Important: See Instructions to determine when "Not Applicable (NA)" boxes should be checked.

Part I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR : 2008

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret? [ ] Yes (Answer question 2.2; Attach substantiation forms) [X] NO (Do not answer 2.2; Go to Section 3)	2.2 Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
Draft Form : Do Not Send to EPA		

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	**99352SDPRTPOBOX**
Facility or Establishment Name **U.S. DOE HANFORD SITE**		Facility or Establishment Name or Mailing Address(if different from street address) **U.S. DOE HANFORD SITE**	
Street **825 JADWIN AVE**		Mailing Address **POST OFFICE BOX 550**	
City/County/State/Zip Code **RICHLAND / Benton / WA / 99352**		City/State/Zip Code **RICHLAND / WA / 99352**	Country (Non-US)

4.2	This report contains information for : (Important: check a or b; check c or d if applicable)	a. [X] An Entire facility	b. [ ] Part of a facility	c. [X] A Federal facility	d. [ ] GOCO

4.3	Technical Contact name	**DALE E. JACKSON**	Email Address **DALE_E_JACKSON@RL.GOV**	Telephone Number (include area code) **5093768086**
4.4	Public Contact name	**DALE E. JACKSON**	Email Address **DALE_E_JACKSON@RL.GOV**	Telephone Number (include area code) **5093768086**

4.5	NAICS Code (s) (6 digits)	a. **924110 (Primary)**	b.	c.	d.	e.	f.

4.7	Dun and Bradstreet Number(s) (9 digits)
a. **NA**	
b.	

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA [ ]	**U.S. DEPARTMENT OF ENERGY**
5.2	Parent Company's Dun & Bradstreet Number	NA [X]	

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Propylene

SECTION 1. TOXIC CHEMICAL IDENTITY (Important DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) 115071
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) Propylene
1.3	Generic Chemical Name (Important: Complete only if Part I, Section 2.1 is checked "yes". Generic Name must be structurally descriptive). NA

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, spaces, and punctuation.) NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. [ ] Produce b. [ ] Import		
If produce or import: c. [ ] For on-site use/processing d. [ ] For sale/distribution e. [ ] As a byproduct f. [ ] As an impurity	a. [ ] As a reactant b. [ ] As a formulation component c. [ ] As an article component d. [ ] Repackaging e. [ ] As an impurity	a. [ ] As a chemical processing aid b. [ ] As a manufacturing aid c. [X] Ancillary or other use

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 [04] (Enter two-digit code from instruction package.)

SECTION 5.QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA [ ]	B	E1	
5.2	Stack or point air emissions	NA [X]			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	NA				

*For Dioxin and Dioxin-like Compounds, report in grams/year
**Range Codes: A=1-10 pounds; B=11-499 pounds; C=500-999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Propylene

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I wells	[X]		
5.4.2	Underground Injection onsite to Class II-V wells	[X]		
5.5	Disposal to land onsite			
5.5.1.A	RCRA subtitle C landfills	[X]		
5.5.1.B	Other landfills	[X]		
5.5.2	Land treatment/application farming	[X]		
5.5.3A	RCRA Subtitle C surface impoundments	[X]		
5.5.3B	Other surface impoundments	[X]		
5.5.4	Other disposal	[X]		

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1 Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
NA	

*For Dioxin and Dioxin-like Compounds, report in grams/year

**Range Codes: A=1-10 pounds; B=11-499 pounds; C=500-999 pounds.

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 99352SDPRTPOBOX Toxic Chemical, Category or Generic Name Propylene

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2.1 Off-Site EPA Identification Number (RCRA ID No.)									
Off-Site Location Name					NA				
Off-Site Address									
City		State		County		Zip		Country (Non-US)	
Is location under control of reporting facility or parent company?						[ ] Yes [ ] No			

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

[X] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	d. Waste Treatment Efficiency Estimate

*For Dioxin and Dioxin-like Compounds, report in grams/year

**Range Codes: A=1-10 pounds; B=11-499 pounds; C=500-999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number: 99352SDPRTPOBOX

Toxic Chemical, Category or Generic Name: Propylene

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1b	Total other on-site disposal or other releases	250	250	250	250
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1d	Total other off-site disposal or other releases	NA	NA	NA	NA
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	NA	NA	NA	NA
8.5	Quantity recycled offsite	NA	NA	NA	NA
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)		0		
8.9	Production ratio or activity index		1.72		
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10. 1	NA			
8.11	If you wish to submit additional optional information on source reduction, recycling, or pollution control activities, check "Yes."	Yes [X]		

*For Dioxin and Dioxin-like Compounds, report in grams/year

TRI Facility ID Number
99352SDPRTPOBOX
Toxic Chemical, Category or Generic Name
Propylene

Additional optional information on source reduction, recycling, or pollution control activities.
PROPYLENE WAS REPORTED IN 2004 AND 2005, BUT NOT REPORTED IN 2006, AS THE ANCILLARY USE HAD DROPPED BELOW THE REPORTING THRESHOLD OF 10,000 POUNDS. THE THRESHOLD WAS EXCEEDED AGAIN IN 2007 AND 2008. THE ACTIVITY INDEX WAS REPORTED BASED ON COMPARISON OF LABOR HOURS EXPENDED IN 2008 COMPARED TO 2007.

APPENDIX A

REPORTING CODES AND DEFINITIONS

APPENDIX A
Reporting Codes and Definitions

Section 4. Maximum Amount of the Toxic Chemical On-Site at Any Time During the Calendar Year

Weight Range in Pounds		
Range Code	From...	To...
01	0	99
02	100	999
03	1,000	9,999
04	10,000	99,999
05	100,000	999,999
06	1,000,000	9,999,999
07	10,000,000	49,999,999
08	50,000,000	99,999,999
09	100,000,000	499,999,999
10	500,000,000	999,999,999
11	1 billion	over 1 billion

Section 5. Quantity of the Toxic Chemical Entering Each Environmental Medium Onsite and Section 6. Transfers of the Toxic Chemical in Wastes to Off-Site Locations

Basis of Estimate

M1:	Estimate is based on continuous monitoring data or measurements for the EPCRA section 313 chemical as transferred to an off-site facility.
M2:	Estimate is based on periodic or random monitoring data or measurements for the EPCRA section 313 chemical as transferred to an off-site facility.
C:	Estimate is based on mass balance calculations, such as calculation of the amount of the EPCRA section 313 chemical in waste streams entering and leaving process equipment.
E1:	Estimate is based on published emission factors, such as those relating release quantity to through-put or equipment type (e.g., air emission factors).
E2:	Estimate is based on site-specific emission factors, such as those relating release quantity to through-put or equipment type (e.g., air emission factors).
O:	Estimate is based on other approaches such as engineering calculations (e.g., estimating volatilization using published mathematical formulas) or best engineering judgment.

Section 6. Transfers of the Toxic Chemical in Wastes to Off-Site Locations

Type of Waste Disposal/Treatment/Energy Recovery/Recycling

		Disposal	
M10	Storage Only	M73	Land Treatment
M41	Solidification/Stabilization-Metals and Metal Category Compounds only	M79	Other Land Disposal
M62	Wastewater Treatment (Excluding POTW) -- Metals and Metal Category Compounds only	M81	Underground Injection to Class I Wells
M64	Other Landfills	M82	Underground Injection to Class II-V Wells
M65	RCRA Subtitle C Landfills	M90	Other Off-Site Management
M66	Subtitle C Surface Impoundment	M94	Transfer to Waste Broker — Disposal
M67	Other Surface Impoundments	M99	Unknown

Type of Waste Disposal/Treatment/Energy Recovery/Recycling (continued)

M40 Solidification/Stabilization
M50 Incineration/Thermal Treatment
M54 Incineration/Insignificant Fuel Value

M56 Energy Recovery

M20 Solvents/Organics Recovery
M24 Metals Recovery
M26 Other Reuse or Recovery

Treatment
M61 Wastewater Treatment (Excluding POTW)
M69 Other Waste Treatment
M95 Transfer to Waste Broker — Waste Treatment

Energy Recovery
M92 Transfer to Waste Broker — Energy Recovery

Recycling
M28 Acid Regeneration
M93 Transfer to Waste Broker — Recycling

Section 7A. On-Site Waste Treatment Methods and Efficiency

General Waste Stream

A: Gaseous (gases, vapors, airborne particulates)
W: Wastewater (aqueous waste)
L: Liquid waste streams (non-aqueous waste)
S: Solid waste streams (including sludges and slurries)

Waste Treatment Efficiency Range Codes

E1= Greater than 99.9999 %
E2= Greater than 99.99%, but less than 99.9999 %
E3= Greater than 99%, but less than 99.99 %
E4= Greater than 95%, but less than 99 %

E5= Greater than 50%, but less than 95 %
E6= Equal or greater than 0%, but less than or equal to 50%

Waste Treatment Methods

Air Emissions Treatment
A01 Flare
A02 Condenser
A03 Scrubber
A04 Absorber
A05 Electrostatic Precipitator
A06 Mechanical separation
A07 Other Air Emission Treatment

Chemical Treatment
H040 Incineration – thermal destruction other than use as a fuel
H071 Chemical reduction with or without precipitation
H073 Cyanide destruction with or without precipitation
H075 Chemical oxidation
H076 Wet air oxidation
H077 Other chemical precipitation with or without pre-treatment

Biological Treatment
H081 Biological treatment with or without precipitation

Physical Treatment
H082 Adsorption
H083 Air or steam stripping
H101 Sludge treatment and/or dewatering
H103 Absorption
H111 Stabilization or chemical fixation prior to disposal
H112 Macro-encapsulation prior to disposal
H121 Neutralization

H122 Evaporation
H123 Settling or clarification
H124 Phase separation
H129 Other treatment

DISTRIBUTION

Required Offsite Recipients (Electronic Submittal Only)

U. S. Environmental Protection Agency
TRI Data Processing Center
c/o Computer Sciences Corporation
Suite 300
8400 Corporate Drive
Landover, MD 20785-2294

State of Washington, Department of Ecology
Hazardous Waste/Toxics Reduction Program
Post Office Box 47659
Olympia, WA 98504-7659
Ms. Idell Hansen

Other Offsite Recipients

U. S. Department of Energy
Office of Nuclear Safety and Environmental Policy, HS-21
1000 Independence Avenue, SW
Washington, DC 20585
Ms. Jane Powers

Required Onsite Recipients	MSIN
U.S. Department of Energy, Office of River Protection	
G. M. Neath	H6-60
U.S. Department of Energy, Pacific Northwest Site Office	
T. L. Aldridge	K9-42
U.S. Department of Energy, Richland Operations Office	
R. J. Corey	A5-14
D. E. Jackson	A5-15
S. R. Weil	A5-15
DOE Public Reading Room	H2-53
Advanced Technologies and Laboratories International, Inc.	
A. K. Biggs	T6-50
J. Hwang	T6-10
C. R. Neff	T6-50

AdvanceMed Hanford	
C. J. Harrington	G3-70
Bechtel National, Inc.	
O. L. Bostic	H4-02
W. S. Elkins	H4-02
CH2M HILL Plateau Remediation Company	
R. H. Engelmann	H8-45
S. L. Moore	H8-45
Fluor Hanford, Inc.	
D. S. Garrison	E6-28
R. E. Johnson	E6-28
K. A. Peterson	E6-28
Lockheed Martin Services, Inc.	
DPC	H6-08
Administrative Records (2)	H6-08
Environmental Portal	A3-95
Pacific Northwest National Laboratory	
E. G. Damberg	J2-25
R. W. Wilson	J2-25
Hanford Technical Library	P8-55
Washington Closure Hanford, LLC	
R. J. Landon	H4-21
M. A. Wise	H4-21
Washington River Protection Solutions, LLC	
J. A. Nielsen	R1-51
C. M. Spadoni	T6-03

Date Received for Clearance Process (MM/DD/YYYY)

04/10/2008

INFORMATION CLEARANCE FORM

S

A. Information Category

- [ ] Abstract
- [ ] Journal Article
- [ ] Summary
- [ ] Internet
- [ ] Visual Aid
- [ ] Software
- [ ] Full Paper
- [ ] Report
- [x] Other Environmental

B. Document Number HNF-5841, Revision 4

C. Title Low-Level Burial Grounds Complex Waste Analysis Plan

D. Internet Address N/A

E. Required Information (MANDATORY)

1. Is document potentially Classified? (•) No ( ) Yes

R.D. Greenwell R.D. 3/27/08
Manager Required (Print and Sign)

If Yes _____
ADC Required (Print and Sign) (•) No ( ) Yes Classified

2. Official Use Only (•) No ( ) Yes Exemption No. ____
3. Export Controlled Information (•) No ( ) Yes OUO Exemption No. 3
4. UCNI (•) No ( ) Yes
5. Applied Technology (•) No ( ) Yes
6. Other (Specify) N/A

7. Does Information Contain the Following:

a. New or Novel FH (Patentable) Subject Matter? (•) No ( ) Yes
If "Yes", OUO Exemption No. 3
If "Yes", Disclosure No.: _____

b. Commercial Proprietary Information Received in Confidence, Such as Proprietary and/or Inventions?
(•) No ( ) Yes If "Yes", OUO Exemption No. 4

c. Corporate Privileged Information? (•) No ( ) Yes
If "Yes", OUO Exemption No. 4

d. Government Privileged Information? (•) No ( ) Yes
If "Yes", Exemption No. 5

e. Copyrights? (•) No ( ) Yes If "Yes", Attach Permission.

f. Trademarks? (•) No ( ) Yes If "Yes", Identify in Document.

8. Is Information requiring submission to OSTI? ( ) No ( ) Yes

9. Release Level? (•) Public ( ) Limited

F. Complete for a Journal Article

1. Title of Journal N/A

G. Complete for a Presentation

1. Title for Conference or Meeting N/A
2. Group Sponsoring N/A
3. Date of Conference N/A
4. City/State N/A
5. Will Information be Published in Proceedings? (•) No ( ) Yes
6. Will Material be Handed Out? (•) No ( ) Yes

H. Information Owner/Author/Requestor

Brett M. Barnes, CHMM Brett M Barnes
(Print and Sign)

Responsible Manager

Doug Greenwell Doug Greenwell
(Print and Sign)

Approval by Direct Report to FH President (Speech/Articles Only) N/A
(Print and Sign)

I. Reviewers	Yes	Print	Signature	Public Y/N (If N, complete J)
General Counsel	[x]	S.B. Cherry	S.B. Cherry	(Y) / N
Office of External Affairs	[ ]			Y / N
DOE-RL	[ ]			Y / N
Other	[x]	T. D. Aardal	Janis Aardal	(Y) / N
Other	[ ]			Y / N

J. Comments

If Additional Comments, Please Attach Separate Sheet

Information Clearance Approval

APPROVED FOR RELEASE
OFFICIAL DOCUMENT
Date 04/10/2008

A-6001-401 (REV 1)

ADMINISTRATIVE DOCUMENT PROCESSING AND APPROVAL

DOCUMENT TITLE: Low-Level Burial Grounds Waste Analysis Plan

OWNING ORGANIZATION/FACILITY: Solid Waste Storage and Disposal

Document Number: HNF-5841

Revision/Change Number: 4

DOCUMENT TYPE *(Check Applicable)*

☐ Plan ☐ Report ☐ Study ☐ Description Document ☒ Other Environmental

DOCUMENT ACTION ○ New ◉ Revision ○ Cancellation

RESPONSIBLE CONTACTS

	Name	Phone Number
Author:	Brett M. Barnes	376-3640
Manager:	Doug Greenwell	372-1123

DOCUMENT CONTROL

Does document contain scientific or technical information intended for public use? ◉ Yes ☒ No

Does document contain controlled-use information? ○ Yes ◉ No

("Yes" requires information clearance review in accordance with HNF-PRO-184)

DOCUMENT REVISION SUMMARY

NOTE: Provide a brief description or summary of the changes for the document listed.

This Waste Analysis Plan (WAP) was updated as a result of negotiations with the Washington State Department of Ecology. This interim status WAP, where possible, mirrors the final status WAP to facilitate to a final status treatment, storage, and disposal unit.

REVIEWERS **Others**

Name *(print)*	Organization
Judith A. Nielsen	Waste Acceptance
Amanda J. Rameriz	Waste Acceptance
Darrin E. Faulk	Solid Waste Storage and Dis.

APPROVAL SIGNATURES

Author: Brett M Barnes, cttmm	3/27/08	RELEASE / ISSUE
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Responsible Manager: R.D. Greenwell	3/27/08	DATE:
Name: (Print) Doug Greenwell	Date	STA: 15 HANFORD RELEASE ID: 65
Other:		
Name: (Print)	Date	

HNF-5841
Revision 4

Low-Level Burial Grounds Waste Analysis Plan

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

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

FLUOR
P.O. Box 1000
Richland, Washington

Approved for Public Release;
Further Dissemination Unlimited

HNF-5841
Revision 4

Low-Level Burial Grounds Waste Analysis Plan

Date Published

March 2008

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

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

FLUOR.

P.O. Box 1000
Richland, Washington

A. D. Aardal 04/10/2008
Release Approval Date

Approved for Public Release;
Further Dissemination Unlimited

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EXECUTIVE SUMMARY

The Low-Level Burial Grounds provides disposal, storage, and/or treatment, and confirmation of dangerous waste, and/or mixed waste from onsite generators, onsite Solid Waste Operations Complex-generated waste units, Low-Level Burial Grounds-generated waste, or offsite generators (hereafter referred to as the 'generator' unless otherwise denoted in this waste analysis plan). The Solid Waste Operations Complex treatment, storage, and/or disposal units consist of Central Waste Complex, Waste Receiving and Processing Facility, Low-Level Burial Grounds, and T Plant Complex. This waste analysis plan provides processes to obtain information on the chemical, biological, and physical characteristics of the waste managed to meet the requirements of Washington Administrative Code 173-303-300, *General Waste Analysis*.

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ACRONYMS

ALARA	as low as reasonably achievable
AOAC	Association of Official Analytical Chemists
APHA	American Public Health Association
ASNT	American Society for Nondestructive Testing
ASTM	American Society for Testing and Materials
CAP	corrective action plan
CCW	constituent concentrations in waste
CCWE	constituent concentrations in waste extract
COLIWASA	composite liquid waste sampler
CFR	Code of Federal Regulations
CWC	Central Waste Complex
DOE-RL	U.S. Department of Energy, Richland Operations Office
DQO	data quality objectives
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
HNF	Hanford Nuclear Facility (document identifier)
LDR	land disposal restriction
LLBG	Low-Level Burial Grounds
MSDS	material safety data sheet
NDA	nondestructive assay
NDE	nondestructive examination
NIOSH	National Institute for Occupational Safety and Health
PCB	polychlorinated biphenyl
PES	performance evaluation system
pH	negative logarithm of the hydrogen-ion concentration
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RCRA	*Resource Conservation and Recovery Act of 1976*
RCW	Revised Code of Washington
SAP	sampling and analysis plan
SWOC	Solid Waste Operations Complex
T Plant	T Plant Complex
TCLP	toxicity characteristic leaching procedure
TPA or Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TSCA	*Toxic Substances Control Act of 1976*

TSD	treatment, storage, and/or disposal
UHC	underlying hazardous constituents
WAC	Washington Administrative Code
WAP	waste analysis plan
WRAP	Waste Receiving and Processing (Facility)
WRP	Waste Retrieval Project

METRIC CONVERSION CHART

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	25.40	millimeters	millimeters	0.03937	inches
inches	2.54	centimeters	centimeters	0.393701	inches
feet	0.3048	meters	Meters	3.28084	feet
yards	0.9144	meters	Meters	1.0936	yards
miles (statute)	1.60934	kilometers	kilometers	0.62137	miles (statute)
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.09290304	square meters	square meters	10.7639	square feet
square yards	0.8361274	square meters	square meters	1.19599	square yards
square miles	2.59	square kilometers	square kilometers	0.386102	square miles
acres	0.404687	hectares	hectares	2.47104	acres
Mass (weight)			**Mass (weight)**		
ounces (avoir)	28.34952	grams	Grams	0.035274	ounces (avoir)
pounds	0.45359237	kilograms	kilograms	2.204623	pounds (avoir)
tons (short)	0.9071847	tons (metric)	tons (metric)	1.1023	tons (short)
Volume			**Volume**		
ounces (U.S., liquid)	29.57353	milliliters	milliliters	0.033814	ounces (U.S., liquid)
quarts (U.S., liquid)	0.9463529	liters	Liters	1.0567	quarts (U.S., liquid)
gallons (U.S., liquid)	3.7854	liters	Liters	0.26417	gallons (U.S., liquid)
cubic feet	0.02831685	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.7645549	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Energy			**Energy**		
kilowatt hour	3,412	British thermal unit	British thermal unit	0.000293	kilowatt hour
kilowatt	0.94782	British thermal unit per second	British thermal unit per second	1.055	kilowatt
Force/Pressure			**Force/Pressure**		
pounds (force) per square inch	6.894757	Kilopascals	kilopascals	0.14504	pounds per square inch

06/2001

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Third Ed., 1990, Professional Publications, Inc., Belmont, California.

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LOW-LEVEL BURIAL GROUNDS WASTE ANALYSIS PLAN

1.0 UNIT DESCRIPTION

The purpose of this waste analysis plan (WAP) is to document the waste acceptance process, sampling methodologies, analytical techniques, and overall processes that are undertaken for waste accepted for treatment, storage, and/or disposal at the Low-Level Burial Grounds (LLBG). For a detailed description of the LLBG refer to LLBG, Chapter 1.0, "Part A Form", Chapter 2.0, "Facility Description and General Provisions", Chapter 4.0, "Process Information" (DOE/RL-88-20). Activities may be performed by the LLBG operating organization or its delegated representative.

1.1 Description of Unit Processes and Activities

The LLBG are a land-based unit consisting of two burial grounds located in the 200 East Area and 200 West Area (for locations refer to Chapter 1.0, Part A). Mixed waste is and has been received from onsite generating units and from offsite generators and is and will be disposed in mixed waste trenches. Leachate collected from lined trenches in 218-W-5 Burial Ground is transferred to leachate collection tanks that are located in proximity to the lined trenches.

The 218-E-12B Burial Grounds are classified as a landfill (D81) and the 218-W-5 Burial Ground is classified as a landfill (D81), greater-than-90-day container storage (S01), and other treatment (T04). The regulated portions of the LLBG cover a total area of approximately 49 hectares.

The 218-E-12B Burial Ground is located in the 200 East Area and 218-W-5 Burial Ground is located in the 200 West Area. All mixed waste destined for disposal meets land disposal restriction (LDR) requirements (WAC 173-303-140, 40 CFR 268, and RCW-70.105) or other regulatory alternatives as described in Chapter 3.0, Waste Analysis Plan. The lined trenches (trenches 31 and 34 in the 218-W-5 Burial Ground) have leachate collection and removal systems. The leachate collection tanks are operated in accordance with the generator provisions of WAC 173-303-200.

Disposal of mixed waste in unlined trenches requires an exemption from the liner/leachate collection system requirements. This documentation includes an exemption request for trench 94 for the disposal of U.S. Navy defueled reactor compartments (refer to Chapter 4.0, Process Information).

The following provides a brief description and identifies the generic types of waste disposed in the LLBG. An electronic database is maintained that documents each waste receipt, type of waste, and disposal location.

- The 218-E-12B Burial Ground, trench 94 is approximately 68 hectares in size (Chapter 1.0) and receives reactor compartments from the U.S. Navy.

- The 218-W-5 Burial Ground, trenches 31 and 34 is approximately 37.2 hectares in size Chapter 1.0) and began receiving waste in 1986. Trenches 31 and 34 also are designated as a greater-than-90-day container storage, and treatment unit. Adjacent to the double-lined mixed waste trenches are leachate collection tanks. Examples of waste to be placed in the double-lined mixed waste trenches include mixed waste that has been treated to meet LDR requirements (including bulk waste), and macro-encapsulated long-length contaminated equipment, and mixed waste that can be treated within the trench.

1.1.1 Waste Acceptance, Movement, Processing, and Management

The LLBG uses waste tracking processes to ensure that the waste received at the LLBG matches the manifest or transfer papers, to ensure that the waste is tracked through the LLBG to final disposition, and to maintain the information required in WAC 173-303-380. Waste is tracked through processing such as segregation, repackaging, treatment, and/or intra-TSD unit transfers. The waste tracking process provides a mechanism to track waste through a uniquely identified container (refer to Figure 1-3). The unique identifier is a barcode (or equivalent) that is recorded in an electronic data tracking system. This mechanism encompasses waste acceptance, movement, processing, and management of waste. When a new container is used, identification numbers are assigned and maintained as the waste moves through LLBG. The container identification number allows the LLBG to link to hard copy or electronic copy of records that are maintained as part of the operating record to retain information on the location, quantity, and physical and chemical characteristics of the waste.

The following sections and Figure 1-1 and Figure 1-2 describe the process for waste acceptance and different types of information and knowledge reviewed/required during the acceptance process. The process for management of waste is described in Chapter 4.0.

1.1.1.1 Narrative Process Descriptions

Waste that meets applicable LDR requirements, as specified WAC 173-303-140, which incorporates by reference 40 CFR 268, is stored at the LLBG. Mixed waste that does not meet LDR requirements, as specified in 40 CFR 268 and WAC 173-303-140, is stored until the waste is processed for repackaging or further treatment at the LLBG or another approved location. The LLBG operating record contains information necessary to meet LDR requirements (Sections 2.1.3.2 and 7.3). Containerized waste that is not fully characterized or is awaiting analytical results can be stored at the LLBG as well. The Hanford Facility is required to test certain mixed wastes when treatment standards are expressed as a concentration to ensure that the waste or treatment residues are in compliance with applicable LDR requirements (Section 2.1.3.2 and 7.3). Such testing is performed according to the frequency specified in this WAP, as specified in 40 CFR 268.7(b), incorporated by reference by WAC 173-303-140.

1.1.1.2 Waste Acceptance Process

The waste acceptance process for the LLBG consists of following activities:

- Waste Stream Approval. The generator provides information concerning each waste stream on a waste profile sheet. The waste stream information is reviewed against the LLBG waste acceptance criteria. If the waste stream information is sufficient and meets the applicable acceptance criteria, the waste stream is approved. In addition, the initial verification frequency for the waste is determined in accordance with the requirements found in the performance evaluation system (PES) program (Section 1.1.1.3). For a more complete description of the waste stream approval process, refer to Section 2.1.1.

- Waste Shipment/Transfer Approval. The generator provides specific data for each waste container on the container data sheet. The container data are reviewed against the waste profile sheet data and the LLBG acceptance criteria before being approved for shipment/transfer. In addition, the LLBG determines if any of the containers require verification based on the verification frequency as determined by the PES. For a more complete description of the waste shipment/transfer approval process, refer to Section 2.1.2.

- Verification. All waste streams are subject to receipt inspection during the waste shipment acceptance process. The percentage of the waste stream selected for physical and/or chemical screening is determined in accordance with the requirements found in the PES program (Section 1.1.1.3). Containers are opened and verified visually or by NDE. Of those containers subjected to physical screening, a percentage is subject to chemical screening via field or laboratory analysis. All information and data are evaluated to confirm that the waste matches the waste profile and container data/information supplied by the generator.

1.1.1.2.1 Waste Acceptance Process Between Solid Waste Operations Complex TSD Units

Waste transfers between Solid Waste Operations Complex (SWOC) TSD units could be necessary to support Hanford Site goals. In these instances a waste stream profile, or other approved processes that already has been developed, may be used to support these activities. A container may be transferred between SWOC facilities to accommodate the verification activities. A documented review is required to ensure compliance with the LLBG waste acceptance criteria. All waste transfers and containers are subject to receipt inspection. For waste that has not been accepted at CWC, LLBG, WRAP, or T Plant Complex TSD units; physical and or chemical screening will be completed as described in Sections 3.1, 3.2, and 3.3. The individual container data, inclusive of all knowledge obtained on the waste is compared to the LLBG waste acceptance requirements. Previously accepted waste that has not been considered for verification will be verified prior to transfer between SWOC TSD units. For a more complete description of the transfer process, refer to Section 2.3.

1.1.1.2.2 Types of Knowledge

When collecting documentation on a waste stream or container, the LLBG must determine if the information provided by the generator meets the definition of knowledge in WAC 173-303-040. Knowledge requirements are met by sampling and analysis, and/or process knowledge. Process knowledge consists of detailed information from existing published or documented waste analysis data or studies on processes similar to those that generated the waste, including but not limited to the following:

- Mass balance from a controlled process that has a specified input for a specified output
- Material safety data sheets (MSDSs) on unused chemical products
- Test data from a surrogate sample
- Analytical data on the waste or a waste from a similar process.
- Interview information
- Logbooks
- Procurement records
- Qualified analytical data
- Processes and/or methods
- Process flow charts
- Inventory sheets
- Vendor information
- Mass balance from an uncontrolled process (e.g., spill cleanup)
- Mass balance from a process with variable inputs and outputs (e.g., washing/cleaning methods).

This information will be sufficient to quantify constituents and characteristics to safely manage in compliance with LLBG acceptance criteria and WAC 173-303. The LLBG acceptance criteria is defined as the requirements found in this WAP and the associated LLBG dangerous waste permit application Part A.

1.1.1.3 Description of Performance Evaluation System (PES)

The PES acting as an agent of LLBG determines the initial physical screening frequency of each waste stream. PES provides a periodic status of an individual generator's performance for waste received. PES provides a mechanism for determining corrective actions, resolving waste acceptance issues, and physical screening frequency adjustments when a conformance issue has been discovered for newly generated waste.

1.1.1.3.1 Initial Physical Screening Frequency Determination

The initial physical screening frequency is determined based on the following process.

- Personnel responsible for waste receipt at the LLBG review the generator waste profile information to determine the relative potential for misdesignation or inappropriate segregation based on all relevant information, including any previous experience with the generator. Based on this review, any concerns are identified associated with the following criteria:
  - documented waste management program
  - waste stream characterization information
  - potential for inappropriate segregation.

- Based on the identification of concerns during the review, an initial physical screening frequency is established for the new generator's waste stream based on the following criteria:
  - Initial physical screening frequency of, at a minimum, 20 percent: No concerns identified (e.g., cleanup of contaminated soil where the soil has been well characterized and no other waste generation processes are occurring at that location)
  - Initial physical screening frequency of, at a minimum, 50 percent: Concern(s) identified in one criterion
  - Initial physical screening frequency of 100 percent: Concerns identified in two or more criteria.

1.1.1.3.2 Performance Evaluation

A performance evaluation is used to trend a generator's waste acceptance performance and is used to adjust the generator's overall physical screening frequency. This evaluation, identified as an integral part of the QA program, is objective and considers the conformance issues documented during the Preshipment Review and Verification functions. The PES maintains processes that: (1) perform evaluations based on conformance issues identified, (2) evaluate unsatisfactory performance for corrective actions, and (3) adjust physical screening rates accordingly.

The performance evaluation is conducted and subsequently accepted by PES team, and the documentation maintained in accordance with Section 8.0. Performance evaluation frequency is based on the generators historical performance and the waste stream in involved.

1.1.1.3.3 Conformance Issue Resolution

Conformance issues could result in a waste container that does not meet the LLBG waste acceptance criteria. A conformance issue is any discrepancy identified during the confirmation process with waste package documentation, a waste package, or a shipment. Discrepancies can be identified during preshipment reviews of waste streams during the verification process. If a possible conformance issue is identified, the following actions are taken to resolve the issue.

- The PES compiles all information concerning the possible conformance issue(s).

- The generator is notified and requested to supply additional knowledge that may assist in the resolution of the concern(s). If the generator supplies information that resolves the concern(s) identified, no further action is required.

- On determination that a conformance issue has been identified during verification, the LLBG personnel and the generator discuss the conformance issue and identify the appropriate course of action to resolve the container in question, e.g., pick another sample set, return the container, divert the container to another TSD unit that can accept the container and resolve the issue, or the generator resolves the issue at the LLBG. If the conformance issue(s) results in a waste stream failure, the physical screening frequency for all waste streams that have the potential to exhibit a similar conformance issue from the generator are adjusted to 100 percent for the next shipment until the issue(s) can be adequately addressed.

- The LLBG requests the generator to provide a corrective action plan (CAP) that clearly states the reason for the failure and describes the actions to be completed to prevent recurrence. The generator could request a reduction in verification of unaffected streams. This request must be accompanied by a justification that identifies why this stream(s) would not exhibit the same conformance issue.

- The LLBG reviews the CAP and stream justification for adequacy. If the CAP is inadequate, the generator remains at a physical screening rate of 100 percent. If the stream justification is adequate, the LLBG could provide an alternative frequency as denoted in Section 1.1.1.3.2.

1.1.1.3.4 Process for Reducing the Physical Screening Frequency

Physical screening (Section 2.2.2) rate frequencies and changes to those frequencies could be applied to a specific waste stream, to a specific contractor, or to a specific offsite generator based on the circumstances surrounding the conformance issue. After the initial physical screening frequency for a given waste stream has been established or increased, the physical screening frequency can be reduced in accordance with the following process.

The physical screening frequency is reduced in three steps. Reduction for all steps is based on the ability to demonstrate that five containers from the waste stream in question pass verification. In addition, reduction to the minimum frequency requires that the LLBG documents an acceptable evaluation of the corrective action plan. At no time will the physical screening frequency be reduced below 5 percent for waste generated onsite or below 10 percent for offsite generators.

Step 1) Reduce frequency by up to 66 percent after five containers from the waste stream in question pass verification.

Step 2) Reduce frequency established in Step 1 by up to 50 percent or to the minimum allowable whichever results in a greater frequency after five containers from the waste stream in question pass verification.

Step 3) Reduce frequency established in Step 2 to the minimum allowable after five containers from the waste stream in question pass verification. The LLBG documents an acceptable evaluation of the corrective action plan.

The physical screening rate reduction is established during periodic PES team evaluations, and the documentation is maintained according to Section 8.0 of this WAP. The percentage of the reduction is based on the evaluation of the relative severity of the original conformance issue, the status of the

corrective action plan, any interim actions taken by the generator, the generator's performance for this waste stream before this reduction, and/or other factors deemed relevant.

1.1.2 Operating Conditions

The LLBG shall ensure that all waste management operations are conducted in accordance with design and engineering requirements of waste management structures and equipment, and with all equipment manufacture specifications and operating processes. Before treatment and/or storage of waste, the LLBG shall have processes in place to ensure safe management of the waste. These processes shall consider actual or potential risks posed by the waste and treatment and/or storage equipment. The LLBG shall conduct all waste treatment and/or storage according to these processes and comply with labeling, container management, and inspection requirements of WAC 173-303-630.

1.2 Identification and Classification of Waste

Waste is accepted for disposal (mixed waste) and/or storage (mixed and dangerous) in LLBG except for the following waste types:

- Waste is not accepted for disposal when the waste contains free-standing liquid unless all free-standing liquid:
  - Has been removed by decanting or other methods
  - Has been mixed with sorbent or stabilized (solidified) so that free-standing liquid is no longer observed
  - Has been otherwise eliminated
  - Container is very small, such as an ampoule
  - Container is a labpack and is disposed in accordance with WAC 173-303-161 or 40 CFR 264.316
  - Container is designed to hold free liquids for use other than storage, such as a battery or capacitor.

There could be cases in which small amounts of residual liquids are present in mixed waste containers because condensate has formed following packaging or free liquids remain in debris items (e.g., pumps, tubing) even after draining. When it is not practical to remove this residual liquid or impossible to sample to determine if liquids are present, the liquid must be eliminated to the maximum extent practical by draining and placing a quantity of sorbent sufficient to sorb all residual liquids in the bottom of the container or dispersed among the waste.

Free liquid is determined by SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Method*, Method 9095 (Paint Filter Liquids Test) [WAC 173-303-140(4)(b) and 40 CFR 264.314(d)] only for waste that has the potential for free liquid formation.

- Gaseous waste is not accepted for disposal if the waste is packaged at a pressure in excess of 1.5 atmospheres at 20°C.

- Pyrophoric waste is not accepted for disposal. Waste containing less than 1 weight percent pyrophoric material partially or completely dispersed in each package is not considered pyrophoric for the purposes of this requirement.

- Solid acid waste is not accepted for disposal [WAC 173-303-140(4)(c)].

- Untreated extremely hazardous waste is not accepted for disposal. Extremely hazardous waste that has been treated could be disposed and/or stored in accordance with Revised Code of Washington (RCW) 70.105.050(2), "Hazardous Waste Management".

- Untreated organic/carbonaceous waste is not accepted for disposal [WAC 173-303-140(4)(d)] except as allowed by WAC 173-303-140(4)(d)(iii).

- Waste not meeting the applicable treatment standards is not accepted for disposal [40 CFR 268 and WAC 173-303-140(4)].

- Mixed waste that is incompatible with the liner system is not accepted in this TSD unit. Table 1-2 provides a list of chemicals that have been shown to be incompatible with the liner material in concentrated form. In general, mixed waste that meets federal and state treatment standards is compatible with the TSD unit liner system. Waste streams are evaluated during pre-transfer/pre-shipment review to ensure that the waste streams do not contain constituents incompatible with the liner system in concentration sufficient to degrade the liner.

Table 1-1. Chemicals Incompatible With the High-Density Polyethylene Liner (in concentrated form).

Chemical	CAS Number
Amyl chloride	543-59-9
Aqua regia	8007-56-5
Bromic acid	15541-45-4
Bromobenzene	108-86-1
Bromoform	75-25-2
Calcium bisulfite	13780-03-5
Calcium sulfide	20548-54-3
Diethyl benzene	25340-17-4
Diethyl ether	60-29-7
Bromine	7726-95-6
Chlorine	7782-50-5
Fluorine	7782-41-4
Ethyl chloride	75-00-3
Ethylene trichloride	79-01-6
Nitrobenzene	98-95-3
Perchlorobenzene	118-74-1
Propylene dichloride	78-87-5
Sulfur trioxide	7446-11-9
Sulfuric acid (fuming)	8014-95-7
Thionyl chloride	7719-09-7
Vinylidene chloride	75-35-4

CAS = Chemical Abstracts Service

The Part A, Form 3, permit application for this TSD unit identifies dangerous waste numbers, quantities, and design capacity (DOE/RL-88-21, *Hanford Facility Dangerous Waste Part A Permit Application*).

Refer to Section 7.2 for precautions taken when ignitable, reactive, or incompatible waste is stored.

LLBG manages waste that has been treated to meet LDR. In addition to the waste received at LLBG for disposal and/or storage, mixed and dangerous waste. This waste material consists of items such as but not limited to personal protective equipment (PPE), rags, and spent equipment contaminated with dangerous cleaning agents, lubricants, paints, or other dangerous materials. Process knowledge, field screening, or sampling and analysis are used as appropriate to characterize these waste materials. Field screening and sampling are in accordance with this WAP and occur at the point of waste generation or at the location where the waste materials are stored.

Biological waste received from generators could consist of animal remains that were used for experiments. This type of waste can be analyzed using NDE or visual examination.

1.2.1 Dangerous Waste Numbers, Quantities, and Design Capacity

The LLBG Part A identifies dangerous waste numbers, quantities, and design capacity.

Waste is designated pursuant to WAC 173-303 using manufacturer's product information, MSDS, laboratory analysis, and reference material such as *Registry of Toxic Effects of Chemical Substances* (NIOSH). Waste also is characterized in accordance with the requirements of 40 CFR 761.

Designation for Waste Types Reprocessed at LLBG:

Number	References
U and P numbers	WAC 173-303-9903-9904
F numbers	WAC 173-303-9904
WPCB	WAC 173-303-9904
D001	WAC 173-303-090(5)
D002	WAC 173-303-090(6)
D003	WAC 173-303-090(7)
D004 through D043	WAC 173-303-090(8)
WT01 and WT02	WAC 173-303-100 and 104
WP01, WP02, and WP03	WAC 173-303-100 and 104
WSC2 (excluding acid)	WAC 173-303-090(6)/104

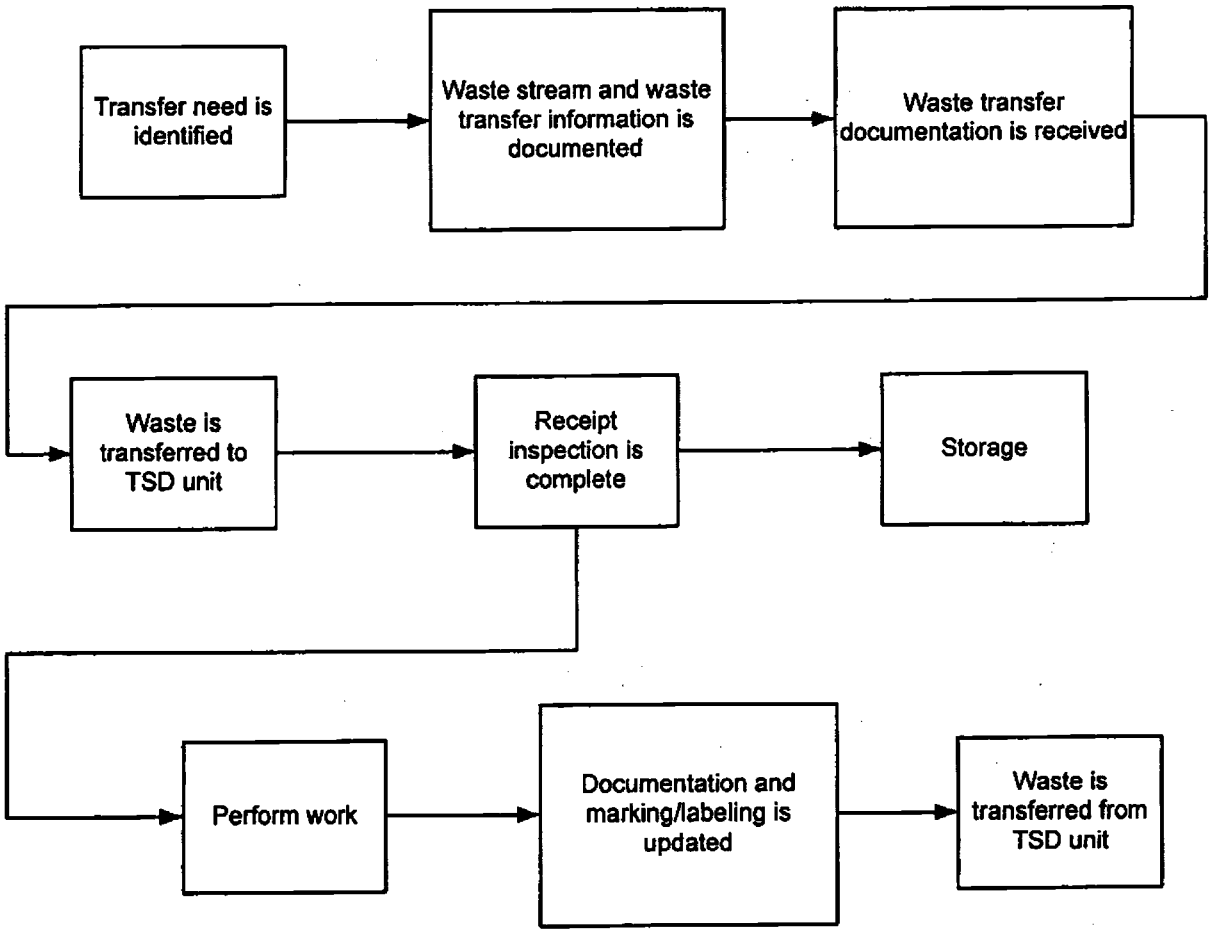
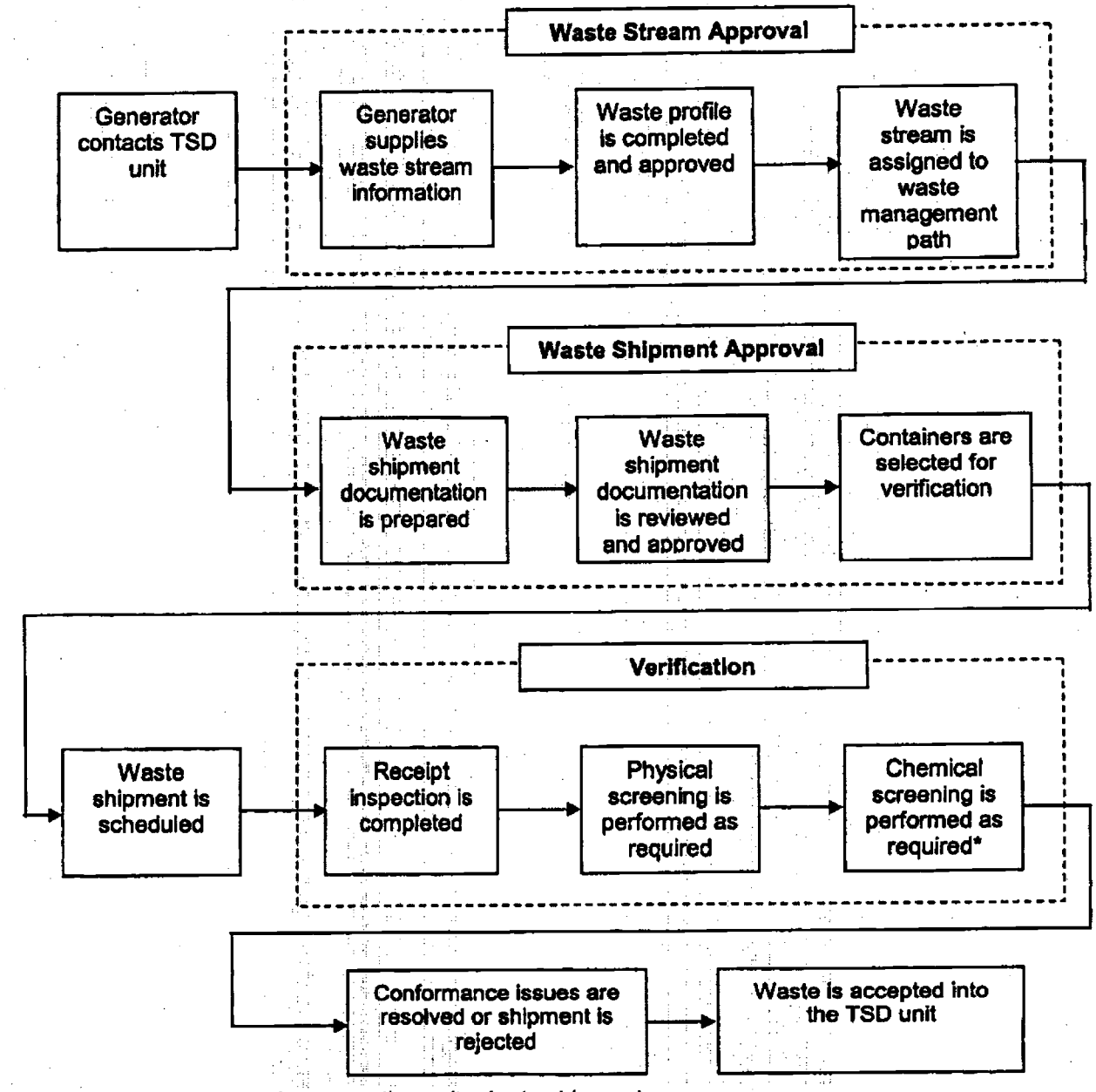


Figure 1-1. Waste Transfers Between Solid Waste Operations Complex TSD Units.



*Verification can occur at the generating unit prior to shipment

Figure 1-2. Waste Confirmation and Acceptance Process for Newly Generated Waste.

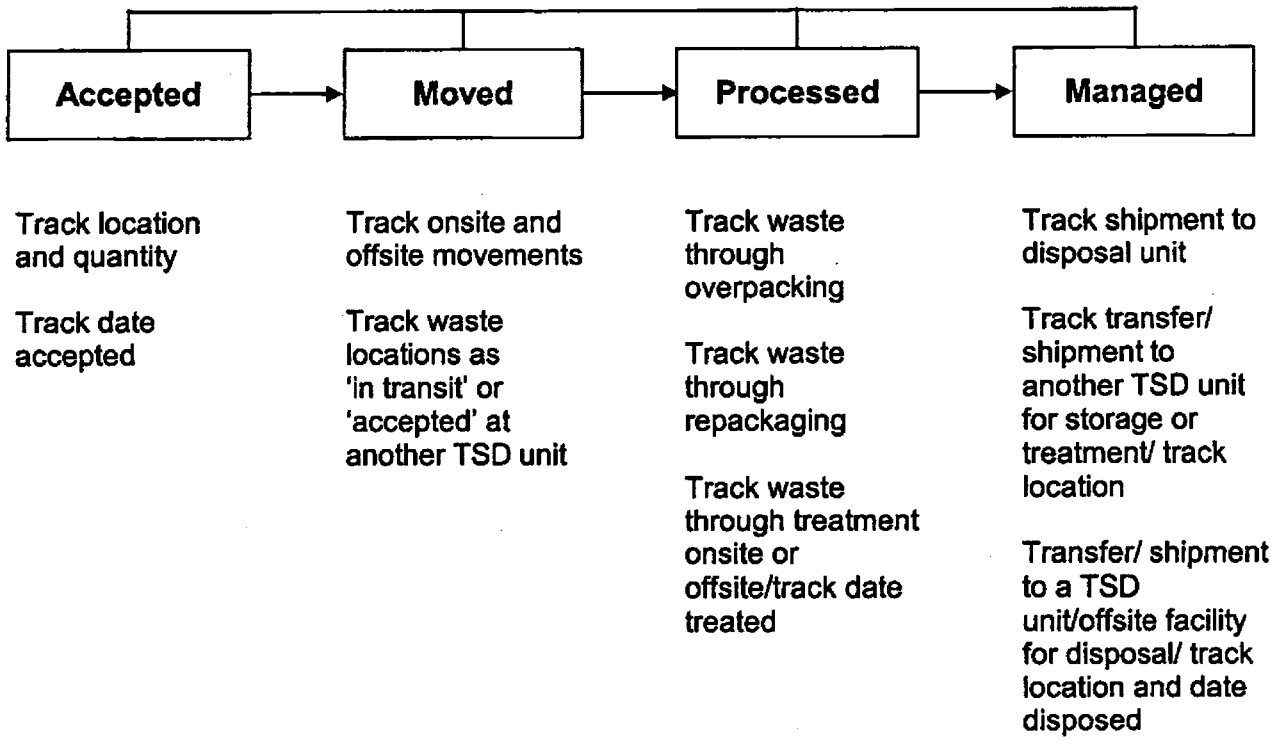


Figure 1-3. Waste Tracking.

2.0 CONFIRMATION PROCESS

The confirmation process used to meet WAC 173-303-300 requirements includes completing appropriate pre-shipment reviews and verification steps and/or parameters as described in this section and indicated on Figure 2-1. The confirmation process for onsite generators and offsite generators is detailed in Section 2.1 and 2.2 for SWOC-generated waste is detailed in Section 2.8, WRP waste is detailed in Section 2.6.1 and for LLBG-generated waste is detailed in Section 2.8.

2.1 Pre-Shipment Review

Pre-shipment review takes place before waste can be scheduled for transfer or shipment to LLBG. The review focuses on whether the waste stream is defined accurately, meets the LLBG waste acceptance criteria, and the LDR status is determined correctly (for mixed waste subject to LDR treatment standards refer to Section 7.3.1). Only waste determined to be acceptable for storage and/or treatment is scheduled. This determination is based on the information provided by the generator. The pre-shipment review consists of the waste stream approval and waste shipment approval process. The following sections discuss the pre-shipment review process. The information obtained from the generator during the pre-shipment review, at a minimum, includes all information necessary to safely store and/or treat the waste. The pre-shipment review ensures the waste has been characterized for purposes of evaluation against the LLBG waste acceptance criteria, and that the data provided qualify as 'knowledge' (Section 2.1.3).

2.1.1 Waste Stream Approval Process

The waste stream approval process consists of reviewing waste stream information supplied on a waste stream profile or other approved processes and attached analysis. At a minimum, the waste stream profile or other approved processes requests the following information:

- Generator information (e.g., name, address, point-of-contact, telephone number)
- Waste stream name
- Waste generating process description
- Chemical characterization information (e.g., characterization method(s), chemicals present, concentration ranges)
- Designation information
- For mixed and dangerous waste (WRP waste is excluded) LDR information including identification of underlying hazardous constituents (UHCs) if applicable
- Waste type information (e.g., physical state, absorbents used, inert materials, stabilizing agents used)
- Packaging information (e.g., container type, maximum weight, size)
- Attachments could consist of container drawings, process flow information, analytical data, etc.

This information is reviewed against the LLBG waste acceptance criteria to ensure the waste is acceptable for receipt. If conformance issues are found during this review, additional information is requested that

could include analytical data or a sample to be analyzed. If the waste cannot be received, the LLBG will pursue acceptance of the waste at an alternative TSD unit or request the generator to pursue acceptance at an offsite facility or another approved facility.

On determination that the waste is acceptable for receipt at the LLBG, the LLBG assigns the waste on the profile or other approved processes to a waste management path and establishes a waste verification frequency based on the PES requirements found in Sections 1.1.1.3 and 2.2.3.1.

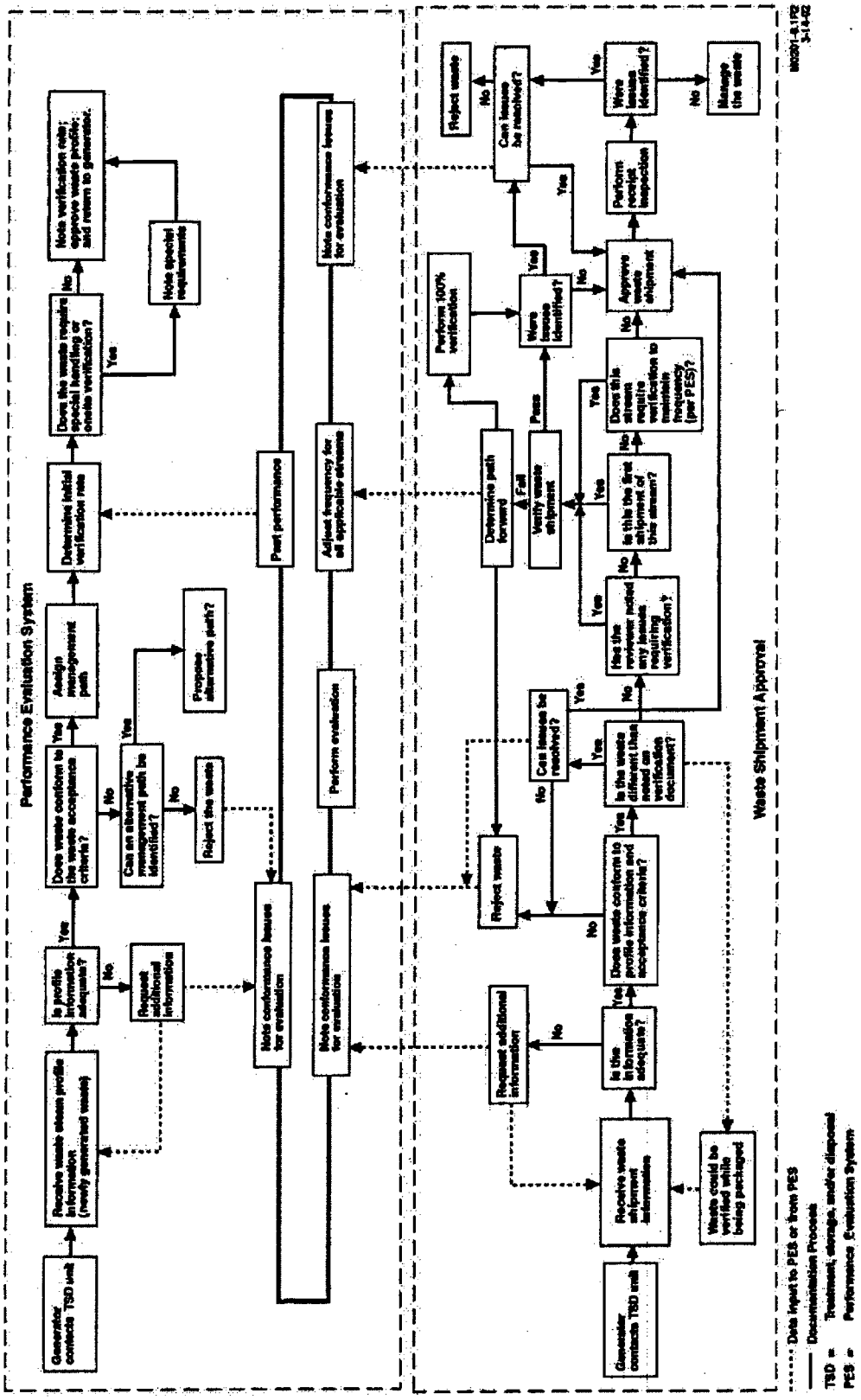


Figure 2-1. Waste Acceptance Process.

2.1.2 Waste Shipment Approval Process

For each waste transfer or shipment that is a candidate for storage and/or treatment, the generator provides the following information:

- Container identification number
- Profile number or other approved processes (except for waste transfers of previously accepted waste)
- Waste description
- Generator information (e.g., name, address, point-of-contact, telephone number)
- Container information (e.g., type, size, weight)
- Waste numbers
- Designation as extremely hazardous waste or dangerous waste
- Waste composition
- Packaging materials and quantities.

The pertinent information is entered into a solid waste information tracking system.

Where potential conformance issues exist in the information provided, (e.g., waste characteristics do not match the waste profile information, LLBG waste acceptance criteria, or additional constituents are expected to be present that do not appear on the documentation), the generator is contacted (if available) by the LLBG for resolution. Refer to Section 6.0 for discussion on repeat and review frequency.

For each container, a technical review is performed. WRP waste containers will follow an approved process (Section 2.6.1). Other reviews such as physical screening determination and chemical screening determination are defined in Section 2.2.2 and 2.2.3. Technical review is as follows:

- **Technical review.** The individual container data are compared to the waste profile or other approved process data to ensure the waste to be shipped to the LLBG is as described by the waste profile. Every transfer is reviewed to ensure the waste meets the LLBG waste acceptance criteria.

  Based on waste identification information provided, the waste designation is reviewed to ensure compliance with waste designations per WAC 173-303-070 through -100, as well as evaluating whether the waste meets the LLBG waste acceptance criteria.

  If the transfer or shipment information is found to be acceptable, the LLBG determines if any of the waste containers will be physically or chemically screened. WRP waste will be physically and/or chemically screened as determined by the WRP Program.

2.1.3 Knowledge Requirements

The LLBG ensures that all information used to make waste management decisions will be based on the requirements found in the following sections. Information determined to be 'knowledge' must meet the definition of 'knowledge' provided by WAC 173-303-040.

2.1.3.1 General Knowledge Requirements

Adequate knowledge requires (1) general waste knowledge requirements, (2) LDR waste knowledge requirements, and/or (3) waste knowledge exceptions.

(1) **General Waste Knowledge Requirements for Designation and Waste Management.** At a minimum, the generator supplies enough information for the waste to be treated and/or stored at LLBG. The minimum level of knowledge consists of designation data where the constituents or knowledge of the waste's generating source (in the case of wastes potentially from listed sources) causing a dangerous waste number to be assigned are quantified, and that data addresses any LLBG operational parameters necessary for proper management of the waste.

When process knowledge indicates that constituents, which if present in the waste might cause the waste to be regulated, are input to a process but not expected to be in the waste, sampling and analysis can be performed to ensure the constituents do not appear in the waste above applicable regulatory levels. This requirement can be met through chemical screening. This sampling and analysis is required only for initial characterization of the waste stream.

When the available information does not qualify as knowledge or is not sufficient to characterize a waste for management, the sampling and testing methods outlined in WAC 173-303-110 are used to determine whether a waste designates as ignitable, corrosive, reactive, and/or toxic, and the sampling and testing methods will be used as applicable to determine whether the waste contains free liquids. If the analysis is performed to complete characterization after acceptance of the waste by the LLBG, then this WAP governs the sampling and testing requirements.

(2) **Waste Knowledge Requirements for LDR Compliance.** Waste is stored at the LLBG while awaiting analytical results for LDR requirements. The LLBG portion of the operating record contains all information required to document that the appropriate treatment standards have been met or the treatment required to meet the LDR treatment standards, unless otherwise specified in this section.

For the purposes of this WAP, a representative sample is required to demonstrate compliance with a concentration-based treatment standard (refer to Section 4.0). Corroborative testing for the sample could be accomplished in the following manner.

- Generators could use onsite laboratories or other laboratories to obtain data that could be used as basis to certify that the waste meets concentration-based LDR treatment standards. For waste that must meet method based LDR treatment standards, information must be supplied on the treatment methods necessary to meet LDR requirements and comply with WAC 173-303-380(1)(j),-(k),-(n), and -(o).

- The LLBG uses these analytical data to meet applicable requirements found in WAC 173-303-140(4).

(3) **Waste Knowledge Exceptions.** The LLBG is designed to provide information necessary to further disposition the waste (e.g., repackage, designate, segregate, sample, and analyze). The LLBG shall ensure sufficient information is available (D001, D002, D003, and incompatibility) and operation safeguards are in place to safely process waste. If sufficient information is not available, the waste will enter the discrepant container management process described in Section 2.5 in order to obtain the necessary information.

2.1.3.2 Methodology to Ensure Compliance with Land Disposal Restrictions Requirements for Mixed and Dangerous Waste

All generators of mixed and dangerous waste are subject to LDR requirements and are required to submit all information notifications and certifications described in WAC 173-303-380(1)(j),-(k),-(n), and -(o). Mixed and dangerous waste not meeting the treatment standards, but meeting the LLBG waste acceptance

criteria, can be stored at the LLBG (refer to Section 1.1.1.1). The following are general requirements for offsite notifications or onsite information and supporting documentation.

- The waste is subject to LDR and the generator has treated the waste. The generator supplies the appropriate LDR certification information (WAC 173-303-140).

- The waste is subject to LDR and the generator has determined that the waste meets the LDR for disposal. The generator develops the certification based on process knowledge and/or analytical data and supplies the appropriate LDR certification information necessary to demonstrate compliance with the LDR treatment standards of WAC 173-303-140. State-only LDRs do not require this type of certification.

- The waste is subject to LDR and requires further treatment to meet applicable treatment standard.
  - The generator supplies additional information concerning the waste and details any treatment necessary to meet applicable treatment standards.
  - If waste is treated to meet state-only or federal LDRs at the LLBG, the LLBG prepares information necessary to meet WAC 173-303-380(1)(k) (refer to Section 7.3).

A representative sample of the waste must be submitted for analysis to ensure that concentration-based LDR treatment standards are met. This sample could be taken by the LLBG or the generator, and is required to comply with the treatment standards contained in 40 CFR 268.40 and 268.48 for UHCs.

2.2 Verification

Verification is an assessment performed by the LLBG to substantiate that the waste stream received at the LLBG is the same as represented by the analysis supplied by the generator for the pre-shipment review. Verification is performed on waste received by the LLBG. Verification includes container receipt and inspection. In addition, select containers could be subject to physical screening, and chemical screening. Waste is not accepted by the LLBG for storage and/or treatment until the required elements of verification have been completed, including evaluation of any data obtained from verification activities. Documentation reviewed as part of verification activities could include manifest or onsite shipment document, container inventory documentation, a container listing report, visual verification records, screening analyses, and the waste profile.

All conformance issues identified during the verification process are resolved in accordance with Section 1.1.1.3.3.

Containers previously used to hold non-acute dangerous waste will be evaluated to determine if they are empty by using the following criteria: A container or inner liner is "empty" when all wastes in it have been taken out that can be removed using practices commonly employed to remove materials from that type of container or inner liner (e.g., pouring, pumping, aspirating, etc.) and, no more than one inch of waste remains at the bottom of the container or inner liner, or the volume of waste remaining in the container or inner liner is equal to three percent or less of the container's total capacity, or, if the container's total capacity is greater than one hundred ten gallons, the volume of waste remaining in the container or inner liner is no more than 0.3 percent of the container's total capacity.

The presence of free liquids which readily separate from the solid waste portion of dangerous waste may be determined by either the paint filter test or through NDE results.

2.2.1 Container Receipt Inspection

Container receipt inspection is a mandatory element of the verification process. Therefore, 100 percent of each shipment (including onsite transfers) is inspected at the LLBG for possible damage or leaks, complete labeling, and if present, tamper-resistant seals are intact (Sections 2.2.2 and 2.2.3). This is to ensure that the shipment: (1) is received at the LLBG in good condition, (2) is the waste indicated on the transfer or shipping papers, (3) has not been opened after physical and/or chemical screening was performed, and (4) is complete. When a conformance issue exists, a case-by-case determination is performed and the appropriate action is taken based on the severity of the issue. One of the following actions may be taken as appropriate, in response to a conformance issue:

- Implementation of the contingency plan (DOE/RL-94-02) per the *Building Emergency Plan for Low-Level Burial Grounds* (HNF-IP-0263-LLBG).
- Conformance issues where additional information is needed to safely manage the waste are resolved before verification continues.
- Continuation of verification for waste with conformance issues not meeting the above criteria.

2.2.2 Physical Screening Process

Physical screening is used as a verification element. This section describes the requirement pertaining to methods, frequency, and exceptions concerning the use of physical screening as a verification activity. Physical screening could be performed before the waste is shipped to the LLBG. When physical screening is performed at a location not within the SWOC TSD units, tamper-resistant seals are applied to each container when examined. Upon receipt at the LLBG, tamper-resistant seals are verified as intact to ensure that no changes could have occurred to the waste content. The requirements for adding and/or removing tamper-resistant seals are maintained through an established program. Documentation shall be maintained in the LLBG operating record.

Selection and interpretation of the appropriate physical screening method(s) are conducted by personnel who are trained as required by the *LLBG Dangerous Waste Training Plan* (HNF-1221). Each physical screening method is performed by trained personnel according to *LLBG Dangerous Waste Training Plan* (HNF-1221).

2.2.2.1 Physical and Chemical Screening Determination

Processes must be maintained describing the activities for selecting containers for physical/chemical screening. Authoritative/directive means of selecting containers for physical/chemical screening are used based on the pre-shipment and/or waste stream review process. The selection is based on the contents listed in the associated shipment/waste stream documentation, the variation within and experience with the specific waste type.

Two criteria are used in making the selection. The first criterion is based on whether pre-shipment review activities (document and characterization review) identify areas of potential concern. The second criterion is reviewing the current physical screening percentage (calculated according to Section 2.2.2.3) of containers offered for receipt from said waste stream from said generator that have been offered over the past 12 months or the date of the last physical screening adjustment, whichever occurs last. The rate will be applied as compared to those that have been physically screened. This criterion ensures that the minimum physical screening rates required by this WAP are met.

The number of containers selected for physical screening per waste stream is determined by comparing the calculated percentage rate which is then adjusted according to the PES. This selected group of containers constitutes a sample set.

On determining whether the waste container(s) will be verified, the container(s) is scheduled for shipment.

2.2.2.2 Physical Screening Methods

The following physical screening methods, comply with the requirement to verify a waste.

1. Visual inspection (opening the container)
2. NDE.

Refer to Section 2.2.5 for QC pertaining to physical screening. (Refer to Section 3.1 for the criteria and rationale for choosing a physical screening method.)

Waste packaging that is witnessed by the LLBG or its representative at a non-SWOC location is considered to have met the physical screening requirements denoted in this WAP, provided that the program meets the requirements of WAC 173-303 and the witness is qualified to determine the waste meets acceptance requirements. On closure of the container, tamper-resistant seals must be applied to ensure the integrity of the contents.

2.2.2.3 Physical Screening Frequency

The minimum physical screening frequency is 5 percent for onsite generators, applied per waste stream per generator per year. For offsite generators, the minimum physical screening frequency is 10 percent per waste stream per generator per year. The LLBG adjusts the physical screening frequency for generators based on objective performance criteria (refer to Section 1.1.1.3.1).

If a container fails verification, the waste stream physical screening frequency will be raised to 100 percent with the next containers offered. Subsequent containers offered will be evaluated through the PES for verification rates, as described in Section 1.1.1.3 of this WAP.

2.2.2.4 Physical Screening Exceptions

The following are exceptions to the physical screening process outlined previously.

- Shielded, classified, and remote-handled mixed waste are not required to be physically screened; however, the LLBG performs a more rigorous documentation review and obtains the raw data used to characterize the waste (less than 1 percent of current waste receipts). For classified waste, it is necessary to have an appropriate U.S. Department of Energy security clearance and a need to know the information as defined by the classifying organization or agency.

- Waste that physically cannot be screened at the LLBG or an associated screening facility must be physically screened at the generator location [e.g., large components, containers that can not be opened, for as low as reasonably achievable (ALARA) purposes, or does not fit into a NDE unit]. Physical screening at the generator location consists of observing the packaging of the waste. If no location can be found to perform the physical screening, no screening is required.

- Waste that is packaged by a trained LLBG -delegated representative(s) is considered to have met the physical screening requirements as denoted within this WAP.

- Waste that has been packaged and physically screened at a SWOC TSD unit.

2.2.3 Chemical Screening Process

Chemical screening is used as a verification element. This section describes methods, frequency, and exceptions for chemical screening. Chemical screening could be performed before the waste is shipped to the LLBG. When screening is performed at a location not within the SWOC TSD units, tamper-resistant seals are applied to each container examined and, on receipt at LLBG, verified as acceptable to ensure that no changes could have occurred to the waste content. Processes are maintained by the LLBG detailing the requirements for adding and/or removing tamper-resistant seals. Documentation shall be maintained in the LLBG operating record.

Qualified personnel conduct selection and interpretation of chemical screening methods. Unless otherwise noted, tests are qualitative, not quantitative. The objective of screening is to obtain reasonable assurance that the waste generally consistent with the description on the shipping documentation. The following tests are selected depending on the waste matrix and the applicability of the method.

- pH
- Peroxide
- Oxidizer
- Water reactivity
- HOC (chlor-n-oil/water/soil)
- Headspace
- Sulfide
- Cyanide
- Paint filter.

Refer to Section 2.2.5 for QC information for chemical screening. Processes are maintained by the LLBG that define the basis for selecting screening tests.

2.2.3.1 Chemical Screening Frequency

At a minimum, 10 percent of the mixed or dangerous waste containers verified by physical screening (Section 2.2.2) must be screened chemically. LLBG obtains a representative sample, which could be a grab sample.

Small containers of waste (labpacks), not otherwise identified in the exceptions and packaged in accordance with 40 CFR 264.316, 40 CFR 265.316, and WAC 173-303-161 are screened chemically in accordance with the chemical screening frequency of the waste stream as determined by the PES team (Section 1.1.1.3). Inner containers are segregated by physical appearance. At least one container from each group (or three containers if all are similar) are screened chemically.

2.2.3.2 Chemical Screening Exceptions

The following are cases in which chemical screening is not required.

- Small containers of waste in overpacked containers (labpacks) packaged in accordance with WAC 173 303-161 and not prohibited under LDR specified in WAC 173-303-140

- Waste exempted from the physical screening requirements (Section 2.2.2.4)

- Commercial chemical products in the original product container(s) (e.g., off-specification, outdated, or unused products)

- Chemical containing equipment removed from service, (e.g., ballasts, batteries)

- Waste containing asbestos

- Waste, environmental media, and/or debris from the cleanup of spills or release of single substance or commercial product or otherwise known material (e.g., material for which an MSDS can be provided)

- Confirmed noninfectious waste (e.g., xylene, acetone, ethyl alcohol, isopropyl alcohol) generated from laboratory tissue preparation, slide staining, or fixing processes

- Hazardous debris as defined in WAC 173-303-040

- Other special cases could be exempted on a case-by-case basis.

2.2.4 Sampling for Confirmation Screening

Sampling is performed in accordance with WAC 173-303-110(2). A representative sample is obtained for chemical screening. The chemical screening methods described in Section3.0 do not require any sample preservation methods because the screening tests are performed at the time and location of sampling, or as soon as possible thereafter. During the interim period, the samples are stored in a manner that maintains chain of custody and protects the sample composition.

2.2.5 Quality Assurance and Quality Control for Confirmation Process

The following QA and QC elements are used by the LLBG to ensure confirmation activities provide sufficient data to provide an indication that waste received is as described in the shipping documentation. Physical/chemical screening methods shall have sufficient performance levels to yield valid decisions when considering method variability (precision and accuracy). Data quality objectives have been established with Ecology in accordance with TPA Action Plan Section 6.5 (Ecology et al. 2003) and have been documented and reflected in this WAP. In addition, all screening equipment requiring calibrations shall be checked before use to ensure calibration dates are current and equipment is functioning properly. This check will be documented in equipment log books. Personnel performing screening activities are properly trained and current certifications are on record. During screening activities strict compliance with applicable industrial hygiene and safety standards is mandatory.

2.2.5.1 Physical Screening Quality Control

This section describes the QC used by LLBG to ensure that quality data are obtained when performing physical screening methods identified in Section 2.2.2, except visual inspection. Physical screening QC is used only to ensure that quality data are obtained when performing NDE. Visual inspection does not consist of the use of instrumentation or chemical tests. QC objectives for visual inspection are obtained through the appropriate training.

The following QC elements apply to NDE used for physical screening:

- A penetration test is performed when image data generating components are changed to document system capability has not changed.

- A resolution test is performed at the beginning of a shift. A shift ends when shutdown activities are performed. A shift can be up to 24-hours.

- A radiographer is qualified per SNT-TC-IA, Level II certification of American Society of Nondestructive Testing training.

- Examination must cover 100 percent of the waste in the container.

- At minimum annually, a capability demonstration is performed on a training drum.

2.2.5.2 Chemical Screening Quality Control

The following QC elements are used when performing chemical screening.

- Appropriate sample containers and equipment are used.
  - Containers and equipment of the appropriate size that are chemically compatible with the waste and testing reagents shall be used.

- Reagent checks
  - Water that is reagent grade and from a documented source shall be used.
  - Chemicals and test kits must be labeled so that these are traceable and documented in the LLBG operating record.
  - QC checks shall be performed on each lot of test kit and associated reagents and documented in the LLBG operating record, unless a more frequent period is specified in the test kit instructions.
  - Personnel performing chemical screening are adequately trained and current qualifications/certifications are on record.

2.3 Waste Transfers Between Solid Waste Operations Complex TSD Units

Transfers from the SWOC TSD units to the LLBG may be necessary to perform verification, obtain additional knowledge to support treatment/disposal, to make the waste amenable for long-term storage, or to perform treatment. A technical review is required to ensure compliance with the LLBG waste acceptance criteria. For waste that is being transferred from the SWOC TSD units TSD units to the LLBG, the following requirements apply.

2.3.1 Waste Stream Approval Process

The waste stream must already have been approved using the process described in Section 2.1.1. Waste knowledge exceptions apply as described in Section 2.1.3.1.

For retrieval of suspect-mixed waste streams from the LLBG, sufficient information must be available to further disposition the waste. Mixed waste containers are transferred out of the LLBG to another TSD unit and ultimately received at WRAP or another approved TSD unit for packaging and/or treatment. The amount and type of data that exists for a given waste package vary widely and depend on the documentation requirements in effect when the waste was generated. The SWOC TSD unit is required to supply specific information about the waste package contents. A technical review of the records is performed as described in Section 2.3.2 and suspect dangerous waste items are identified. Suspect mixed

or dangerous waste will be evaluated and managed for safe storage until a waste designation can be completed. Additionally, a visual inspection is performed on the containers before transfer.

2.3.2 Waste Transfer Approval Process

A technical review of documentation associated with each waste container in the shipment is performed to ensure the waste meets the LLBG waste acceptance criteria. The individual container data, inclusive of all knowledge obtained on the container is compared to the LLBG's waste acceptance requirements. If necessary, the waste management path (waste specification record) previously assigned to the waste stream is updated and re-labeling/remarking is completed before the transfer. Waste is tracked through processing at the LLBG in accordance with Section 1.1.1. When characteristics of the waste change as a result of treatment or other processing, documentation will be entered into the unit-specific operating record. As new information is obtained on the waste, the container is managed to any new requirements. Updates to container data during transfer and subsequent processing activities are reflected in solid waste information tracking system, documented, and maintained in accordance with Section 8.0.

2.3.3 Verification

For container receipt inspection, 100 percent of each transfer is inspected for damage and to ensure the waste containers are those indicated on the documentation. This activity is a mechanism for identifying any document conformance issues or damaged containers before receipt/acceptance. Conformance issues identified during receipt are managed as described in Section 2.2.1.

For physical/chemical screening, once waste has been verified, additional physical/chemical screening is not required.

2.3.4 Performance Evaluation System

The performance of the generator is evaluated and documented in accordance with the PES as described in Section 1.1.1.3. The PES is used to determine physical screening frequency and determine corrective actions for conformance issues. The performance evaluation considers all newly-generated waste accepted at SWOC TSD units.

2.4 Waste Acceptance

Initial acceptance of waste occurs only after the confirmation process described in Section 3.2.0 is complete. Conformance issues identified during the confirmation process are documented and managed in accordance with Section 1.1.1.3.3. Conformance issues that must be corrected before waste acceptance include:

- Waste does not match approved profile documentation,
- Designation, physical, and/or chemical characterization discrepancy,
- Incorrect LDR paperwork,
- Packaging discrepancy,
- Manifest discrepancies as described in WAC 173-303-370(4)(a) [for offsite shipments unless Permit Conditions II.P.2 can be utilized (Ecology 2004)].

Waste that does not meet the LLBG waste acceptance criteria can be accepted when that waste is scheduled for discrepancy resolution. The discrepancy resolution activities will be tracked to completion (refer to Section 2.5).

2.5 Discrepant Container Management

During the waste acceptance process at the LLBG or another SWOC TSD unit (e.g., T Plant, WRAP, or CWC), an issue can arise where a container will be identified with a discrepant item(s) and will be called a 'discrepant container.' When a discrepant container is identified that would affect the management of the container, the following processes will be initiated:

- Liquids discovered in nonempty containers will be placed in secondary containment that meets the requirements of WAC 173-303-630(7)(a). For combination packages[1], if the liquids are only present within inner containers and no free liquids are present in the outer container, the external container will serve as secondary containment, provided that the combination package can be managed in a manner that meets the requirements of WAC 173-303-630(7)(a) and the compatibility requirements in WAC 173-303-395(1).
- An evaluation will be performed to ensure the compatibility with the other materials in the container and with the outer container in accordance with WAC 173-303-395(1)(b) and will be documented in accordance with WAC 173-303-395(1)(c). Liquids not determined to be compatible with the waste contents or the container will be segregated and placed on separate spill containment.
- If adequate information is unavailable to determine the liquids constitute an imminent hazard, the container will be segregated and placed on separate spill containment and placed as a priority for discrepancy resolution.
- For waste where the generator can be contacted, the generator will be requested to provide additional information. The container will be dispositioned by either returning it to the generator (provided it can be transported safely and compliantly) or by resolving the discrepancy on the container at a SWOC TSD unit.
- For project waste an evaluation will be performed on available historical data. In addition, interviews could be performed with project points-of-contact, NDE personnel, etc.
- Based upon the evaluation of information (hazards identified) the container will be managed in a safe configuration.
- The container will be scheduled for discrepancy resolution.

2.6 Sampling and Analysis Plans

A sampling and analysis plan (SAP) can be developed outside the WAP to support characterization of waste for various projects. A SAP will provide sufficient detail to ensure that sampling personnel and the analytical laboratory correctly implement the data quality objectives (DQOs) and quality assurance project plan requirements pursuant to TPA Action Plan Section 6.5 (Ecology et al. 2003). Sampling and analysis plans can utilize existing process knowledge and/or analytical data in combination with sampling requirements as identified in the SAP to sufficiently characterize a waste stream for acceptance into a SWOC unit.

[1] A combination package is any configuration where dangerous and/or mixed wastes are confined within (inner) containers, which are in turn stored within secondary, external (outer) containers. Examples include labpacks, certain overpacks, portable spill pallets, or any container configuration that has an outer container with one or more inner containers.

2.7 Waste Stream Approval Process for WRP Waste

The waste stream approval process consists of reviewing stream information supplied on a knowledge document and attached analysis (if available). At a minimum, the knowledge documentation or other approved processes requests the following information:

- Generator information (e.g., name, address, point-of-contact, telephone number)
- Waste stream name
- Waste generating process description
- Chemical characterization information (e.g., characterization method(s), chemicals present, concentration ranges)
- Designation information
- Waste type information (e.g., physical state, absorbents used, inert materials, stabilizing agents used)
- Packaging information (e.g., container type, maximum weight, size)
- Attachments could consist of container drawings, process flow information, analytical data, etc.

This information is developed on a waste stream basis and applied to individual containers prior to transfer. If conformance issues are found during this review, additional information is requested that could include analytical data or a sample to be analyzed.

2.8 Generated Waste

Waste generated by LLBG is considered accepted at LLBG when the waste is generated. Knowledge concerning the generated waste will be entered into the LLBG operating record.

3.0 SELECTING WASTE ANALYSIS PARAMETERS

Physical/chemical screening parameters for verification must be chosen from those in Sections 3.1 and 3.2. Parameters for waste designation and to meet LDR requirements are addressed in Section 3.3. Each physical/chemical screening result must be in agreement with the shipping documentation to determine the acceptability of the result. Conformance issues identified during the confirmation process are documented and managed in accordance with Section 1.1.1.3. Parameters, methods, and rationale for physical/chemical screening parameters are provided in Table 3-1.

Table 3-1. Parameters and Rationale for Physical and Chemical Screening.

Parameter	Method[a]	Rationale for Selection
Physical Screening		
Visual inspection	Field method – observe phases, presence of solids in waste	Confirm consistency between waste and shipping documentation.
Nondestructive evaluation	Field method	Confirm consistency between waste and shipping documentation.
Chemical Screening		
Ignitability and/or headspace volatile organic compound screening	Organic vapor monitor, colorimetric gas sampling tubes, or a lower explosive level meter	Confirm consistency between waste and shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Peroxide	Field peroxide test paper	Confirm consistency between waste and shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Liquids	SW-846, Method 9095, Paint Filter Liquids Test	Confirm consistency between waste and shipping documentation.
pH	Field pH screen (pH paper method)	Confirm consistency between waste and shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Oxidizer	Field potassium iodide test paper	Confirm consistency between waste and shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Water reactivity	Field water mix screen	Confirm consistency between waste and shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Cyanides	Field cyanide screen	Confirm consistency between waste and shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Sulfides	Field sulfide screen	Confirm consistency between waste and shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Halogenated Organic Carbons	Screening test method for PCBs in transformer oil (SW-846, Method 9079)	Confirm consistency between waste and shipping documentation.

[a] Processes based on manufacturer's recommended methodology for test kit or testing equipment, unless otherwise noted. When regulations require a specific method, the method shall be followed.

3.1 Physical Screening Parameters

The following methods are approved for use in performing physical screening.

(1) Visual inspection (preferred method for physical screening):

Rationale. This method meets the requirement to ensure consistency between waste containers and the accompanying waste stream documentation.

Method: The container is opened and the contents are removed as needed for visual examination. Homogenous loose solids are probed to determine the presence of material not documented on the waste stream documentation, or for improperly absorbed liquids. Visual observations are compared with the applicable profile information and the container specific information in the waste stream documentation.

Failure criteria: A container fails inspection for any of the following reasons; (a) undocumented, improperly packaged, or inadequately absorbed liquids; (b) discovery of prohibited articles or materials listed in Section 1.2; (c) discovery of material not consistent with the applicable waste stream documentation ; and (d) variability greater than 25 percent by volume in listed constituents (e.g., paper, plastic, cloth, metal).

(2) NDE:

Rationale. This method meets the requirement to ensure consistency between waste containers and the accompanying waste stream documentation. This method also is subject to the QA requirements listed in Section 2.2.5. Containers that are not easily amenable to visual inspection because of physical or radiological content, or facility availability can be examined safely and economically.

Method: The container is scanned with a NDE system. Data are observed on a video monitor and captured and recorded. Personnel experienced with the interpretation of NDE imagery record their observations. These observations are compared to the contents listed on the waste stream documentation.

Failure criteria: A container fails the inspection for any of the following reasons; (a) undocumented, improperly packaged, or inadequately absorbed liquids; (b) discovery of prohibited articles listed in Section 1.2; (c) image data not consistent with the applicable waste stream documentation; and (d) variability greater than 25 percent by volume in listed constituents (e.g., paper, plastic, cloth, metal).

3.2 Chemical Screening Parameters

The following methods are approved for use in performing chemical screening tests. Chemical screening is used to verify that incoming waste is consistent with waste stream documentation. Failure of a chemical screening test is defined as a chemical screening result that is inconsistent with the associated waste stream documentation.

(1) Ignitability and/or headspace volatile organic compound screening:

Rationale: To determine the potential ignitability and the presence or absence of volatile organic compounds in waste, and to ensure that personnel are adequately protected. This method is used when containers are opened for inspection. This method can be applied to any matrix.

Method: A sample of the headspace gases in a container is analyzed by one or more of the following types of portable instrumentation: organic vapor monitor, colorimetric gas sampling tubes, or a lower explosive level meter.

Failure criteria: High organic vapor readings in matrices not documented as having volatile organic content constitutes failure.

(2) Peroxide screening:

Rationale: To determine the presence of organic peroxides in solvent wastes, to alert personnel to potential hazards, to ensure safe segregation and storage of incompatible wastes, and to confirm consistency with the waste stream documentation. The test is sensitive to low parts per million ranges.

Method: A peroxide test strip is dampened with a pipet sample of liquid waste. Solids are tested by first wetting the test strip with water and contacting a small sample of the waste. A blue color change indicates a positive reaction. The color change can be compared with a chart on the packaging to determine an approximate organic peroxide concentration.

Failure criteria: Peroxide concentrations greater than 20 parts per million in liquid waste constituents that are known organic peroxide formers not documented as having been stabilized constitutes failure. Results that are not consistent with documented constituents fails verification.

(3) Paint filter liquids test:

Rationale: To verify the presence or absence of free liquid in solid or semisolid material.

Method: To a standard paint filter, 100 cubic centimeters or 100 grams of waste are added and allowed to settle for 5 minutes. Any liquid passing through the filter signifies failure of the test. The required method for the paint filter liquids test is method 9095 in the U.S. Environmental Protection Agency (EPA), SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (the most recently promulgated version) (EPA 1986).

Failure criteria: Failure of the test in waste matrices not documented as having free liquids constitutes failure of the container. Small quantities of condensate trapped in inner plastic liner folds are acceptable.

(4) pH screen:

Rationale: To identify the pH and corrosive nature of an aqueous or solid waste, to ensure safe segregation and storage of incompatible waste, and to confirm consistency with the waste stream documentation.

Method: pH measurement is performed in accordance with SW-846. Processes are maintained by the LLBG and conform to the requirements of Section 2.2.5, Quality Assurance and Quality Control for Confirmation Process.

Failure criteria: If the pH of a matrix exceeds regulatory limits (less than or equal to 2.0 or greater than or equal to 12.5) in waste not documented as being regulated for this property, the container fails verification.

(5) Oxidizer screen:

Rationale: To determine if a waste exhibits oxidizing properties, to ensure safe segregation and storage of incompatible waste, and to confirm consistency with the waste stream documentation. This test can be applied to waste liquids, solids, and semisolids.

Method: 1 or 2 drops of 3N HCl acid is added to the Oxidizer test paper (potassium iodide, starch). The test paper is touched to a pea size sample of the waste to be tested. A black, blue/black, or purple color change determines a positive oxidizer test. Processes are maintained by the LLBG and conform to the requirements of Section 2.2.5, Quality Assurance and Quality Control for Confirmation Process.

Failure criteria: A positive indication in a waste that is not consistent with documented constituents fails verification.

(6) Water reactivity screen:

Rationale: To determine if the waste has the potential to vigorously react with water to form gases or other reaction products. This information is used to ensure safe segregation and storage of incompatible waste, and to confirm consistency with the waste stream documentation.

Method: 2 or 3 drops of distilled water is added to an oxidizer test paper strip. The test paper is touched to a pea size sample of the waste to be tested. The observance of effervescence, a violent reaction, flaming or boiling indicates a positive test. Processes are maintained by the LLBG and conform to the requirements of Section 2.2.5, Quality Assurance and Quality Control for Confirmation Process.

Failure criteria: A positive indication in a waste that is not consistent with documented constituents fails verification.

(7) Cyanide screen:

Rationale: To indicate if waste could release hydrogen cyanide on acidification near pH 2. This information is used to ensure safe segregation and storage of incompatible waste and to confirm consistency with the waste stream documentation.

Method: A pea size sample of the waste to be tested is dissolved in a small quantity of water. A mixture of ferrous ammonium sulfate and ferrous ammonium citrate is added to the stoppered test tube. The sample is then shaken and 3N HCl is added to the solution. A dark Prussian blue color change indicates the presence of the acid. Processes are maintained by the LLBG and conform to the requirements of Section 2.2.5, Quality Assurance and Quality Control for Confirmation Process.

Failure criteria: A positive indication in a waste that is not consistent with documented constituents fails verification.

(8) Sulfide screen:

Rationale: To indicate if the waste could release hydrogen sulfide on acidification near pH 2. This information is used to ensure safe segregation and storage of incompatible wastes and to confirm consistency with the waste stream documentation.

Method: 5 drops of 3N HCl acid is added to a pea size sample of the waste to be tested. Lead acetate test paper is touched to the sample. A brown or black color change of paper indicates a positive test. Processes are maintained by the LLBG and conform to the requirements of Section 2.2.5, Quality Assurance and Quality Control for Confirmation Process.

Failure criteria: A positive indication in a waste that is not consistent with documented constituents fails verification.

(9) Halogenated Organic Carbons screen:

Rationale: To indicate whether PCBs or other chlorinated solvents are present in the waste. This information is used to confirm consistency with the waste stream documentation and to determine if additional information/data are needed to properly store and treat the waste.

Methods: Field organic chlorine tests appropriate to the matrix, such as those offered by the Dexsil Corporation (e.g., Chlor-N-Oil, Chlor-N-Soil), are used. These screening tests are available with several detection limits that enable the verification to be performed in the concentration range applicable to the proposed management path of the waste.

Failure criteria: A positive indication of chlorinated organics in a waste that is not documented as having chlorinated organic content constitutes failure.

3.3 Other Analysis Parameters

Parameters needed to meet designation, characterization, and LDR requirements for mixed and dangerous waste stored and/or treated at the LLBG are identified in Table 3-2. The most recent promulgated method for SW-846 shall be used.

In determining the characteristic of ignitability, either the Pensky-Martens (method 1010) or the Setaflash (method 1020), must be employed when testing. The characteristic of corrosivity also requires a specific test method. When testing the pH of a given waste stream, method 9040 or method 9045 must be used in accordance with WAC 173-303-090(6).

Compliance with LDR for mixed and dangerous waste that have a treatment standard expressed as constituent concentrations in wastes (CCW) (40 CFR 268.40, incorporated by reference by WAC 173-303-140) can be shown using any appropriate method. If the waste treatment standard is expressed as constituent concentrations in waste extracts (CCWE) (40 CFR 268.40, incorporated by reference by WAC 173-303-140), then the Toxicity Characteristic Leaching Procedure (TCLP) EPA SW-846 Method 1311, which is specifically referenced in 40 CFR 268.41(a), must be performed. Following that, however, any appropriate method may be used to determine concentrations of hazardous constituents in the extract and to show compliance with LDR. Both Cyanides (Total) and Cyanides (Amenable) for nonwastewaters are to be analyzed using Method 9010 or 9012, as incorporated by reference in 40 CFR 260.11. UHCs will be evaluated as required by 40 CFR 268.48.

For other parameters or methods not otherwise specified, the following are acceptable sources of testing methods (standard methods):

- Analytical methods cited in WAC 173-303.
- The most recently promulgated version of *Test Method for Evaluating Solid Waste: Physical/ Chemical Methods*, SW-846, U.S. Environmental Protection Agency, EPA, Office of Solid Waste.

- Other current U.S. EPA methods, as applicable to the matrix under evaluation.

- *Standard Methods for the Examination of Water and Wastewater, American Public Health Association* (APHA), American Water Works Association, Water Environment Federation.

- *Annual Book of ASTM Standards, American Society for Testing and Materials.*

- *AOAC Official Methods of Analysis*, AOAC (Association of Official Analytical Chemists), International.

Appropriate QA/QC documentation is required to be maintained per Section 5.0, regardless of the method used.

Table 3-2. Analytical Parameters, Methods, and Rationale for Waste Received at Low-Level Burial Grounds.

Parameter		Analytical method[a]	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
General chemistry					
Flashpoint		1010/1020	Liquid	To provide documentation for safe storage conditions	To determine regulatory status as D001 waste, to provide proper waste designation and applicability of LDR requirements
pH	Liquid	9040	Liquid, sludge	To indicate the degree of corrosivity for safe handling; to provide for proper waste designation; and to identify waste that might compromise container integrity	To determine regulatory status as D002 waste, to provide proper waste designation, applicability of LDR requirements and state-only requirements.
	Solid	9045	Solid		
Hydroxide		9040	Liquid	To provide documentation for safe treatment and storage conditions; and to comply with the LLBG waste acceptance criteria.	To provide proper waste designation and applicability of LDR requirements.
Water reactivity		Field method	Liquid, sludge	To determine whether the waste has a potential to violently react with water to form gases or generate heat; to provide documentation for safe treatment and/or storage conditions for waste designation; and to comply with the LLBG is waste acceptance criteria.	To provide proper waste designation; safe storage and management.
Free liquids		9095	Liquid, sludge, solid	To determine applicability of LDRs and for characterization of appropriate treatment	To determine appropriate state-only LDR status of the waste.

Table 3-2. Analytical Parameters, Methods, and Rationale for Waste Received at Low-Level Burial Grounds.

Parameter	Analytical method[a]	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Cyanide	9010/9012	Liquid, sludge, solid	For safe storage; for proper waste designation; applicability of LDR; and characterization of appropriate treatment	To provide proper waste designation and applicability of LDR requirements.
Sulfide	9030	Liquid, sludge, solid	For safe storage; for proper waste designation; applicability of LDR; and characterization of appropriate treatment	To provide proper waste designation and applicability of LDR requirements.
Organic analyses				
PCBs	8082	Liquid, sludge, solid	To determine proper waste designation for management of waste in accordance with the *Toxic Substance Control Act (TSCA) of 1976* and WAC 173-303.	To provide proper waste designation and to meet TSCA and LDR requirements.
Total organic carbon	9060	Liquid, sludge, solid	To determine applicability of LDR and applicability to state-only requirements.	To provide proper waste designation and applicability to state-only requirements, to meet LDR requirements, and comply with the LLBG waste acceptance criteria.
Total organic halides	9020/9021/9022	Liquid, sludge	To determine proper waste designation and applicability to state-only requirements.	To provide proper waste designation and applicability to state-only requirements.
Persistent constituents	9075/9076/9077/ 9211/9212/9214/ 9250/9251/9253			
Total suspended solids	160.2[b]	Liquid, sludge	To determine applicability of LDR and status as a wastewater	To provide applicability of LDR and status as a wastewater.

Table 3-2. Analytical Parameters, Methods, and Rationale for Waste Received at Low-Level Burial Grounds.

Parameter	Analytical method[a]	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Volatile organic compounds	1311/8260	Liquid, sludge, solid	To determine proper waste designation, applicability of LDRs, and characterization of appropriate treatment.	To provide proper waste designation, regulatory status, and applicability of LDR requirements.
Semi volatile organic compounds	1311/8270	Liquid, sludge, solid	To determine proper waste designation, applicability of LDRs, and characterization of appropriate treatment.	To provide proper waste designation, regulatory status, and applicability of LDR requirements.
Chlorinated herbicides	8151	Liquid	Not applicable	To provide proper waste designation and applicability to state-only requirements.
Inorganic analyses				
Arsenic	1311/6010 200.7[b]	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Barium	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Cadmium	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Chromium	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.

Table 3-2. Analytical Parameters, Methods, and Rationale for Waste Received at Low-Level Burial Grounds.

Parameter	Analytical method[a]	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Lead	1311/6010 200.7[b]	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Mercury	1311/7470/6020	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Silver	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Selenium	1311/6010 200.7[b]	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Antimony	6010	Liquid sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Beryllium	6010	Liquid sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Nickel	6010	Liquid, sludge, solid	To determine applicability of LDRs, and for characterization of appropriate treatment.	To meet LDR requirements.

Table 3-2. Analytical Parameters, Methods, and Rationale for Waste Received at Low-Level Burial Grounds.

Parameter	Analytical method[a]	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Thallium	6010	Liquid sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.

[a] Procedures based on EPA SW-846, unless otherwise noted. When regulations require a specific method, the method shall be followed.
[b] EPA-600/4-79/020 (EPA 1983), unless otherwise noted.
LDR = land disposal restriction.
PCB = polychlorinated biphenyls.

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4.0 SELECTING SAMPLING PROCESSES

Specific sampling processes and techniques depend on both the nature of the material and the type of packaging. Waste samples are handled and preserved as necessary to protect the sample. For treatment, preservation techniques, and holding times the LLBG shall utilize the processes and techniques recommended in SW-846. This section describes the sampling methodology used to obtain representative samples. DQOs have been established with Ecology in accordance with TPA Action Plan Section 6.5 (Ecology et al. 2003) and have been documented and reflected in this WAP.

4.1 Sampling Strategies

Table 4-1 contains waste forms and sample equipment used to sample referenced waste. Sampling of these waste forms is performed in accordance with Table 4-1.

4.2 Sampling Methods

Samples are processed at one of several laboratories qualified to perform analysis of waste samples (refer to Section 5.0). Sampling methods are those described in WAC 173-303 110(2) and incorporated by reference into this plan.

The basic sampling sequence includes the following:

- Obtain a unique sample number and complete the sample tag before sampling
- Obtain a precleaned sampler and sample bottles
- Attach sample label to sample bottles
- For sampling liquid waste, use a sampler or pipet to sample for two phase liquids. Homogeneous liquids in small containers will be poured into a sample bottle
- For sampling solid waste, use a scoop, trier, or hand auger to obtain a sample of the waste. For large containers of waste, composite several augers or scoops to ensure samples are representative
- Fill sample containers in the following sequence: volatile organics, semivolatile organics, metals, ignitability, pH (corrosivity)
- For solid waste, wipe the exterior surfaces of the sample bottles with a dry rag
- Attach sample labels to outer plastic bags
- Place samples in an appropriate receptacle for transfer to the laboratory
- Complete the chain-of-custody forms
- Seal and mark the receptacle in accordance with WAC 173-303-071(3)(1)
- Transfer receptacle to the analytical laboratory, as appropriate to meet sample holding times

- Properly clean and decontaminate nondisposable sampling equipment or package for return to central sampling equipment decontamination area according to onsite requirements.

4.3 Selecting Sampling Equipment

Sampling equipment selection is detailed in Table 4-1. Sampling equipment needed to sample waste is maintained and decontaminated as necessary by the LLBG to ensure representative samples according to SW-846.

4.4 Sample Preservation

Sample preservation follows SW-846 protocol; however, other approved preservation methods can be used.

4.5 Establishing Quality Assurance and Quality Control For Sampling

This WAP incorporates the requirements of Permit Condition II.E, for QA/QC. Sample collectors prepare a permanent log of sampling activities in accordance with SW-846, Chapter 9.0. Records are maintained in accordance with Section 8.0 of this WAP. Log entries include as appropriate: date of collection, time of collection, location, batch number, sample number, tank number, copy of the chain-of-custody form, sampling methodology, container description, waste matrix (liquid), description of generating process (e.g., decontamination activities), number and volume of samples, field observations, field measurements (e.g., pH, percent lower explosive limit), laboratory destination and laboratory number, and signature. These log entries are made by the appropriate personnel while the sampling is performed. The logs or copies of logs are maintained in the LLBG operating record after completion of sampling activities.

A chain-of-custody record accompanies samples at all times. The LLBG shall maintain written chain-of-custody processes to ensure accountability of waste sample handling and to ensure sample integrity. All samples are labeled with a unique identifier.

During all sampling activities, strict compliance with applicable industrial hygiene and safety standards is mandatory. Appropriate sampling and decontamination processes are used.

The following QA/QC elements are used by the LLBG to ensure sampling activities for designation purposes result in acceptable laboratory data:

- Representative sampling methods as defined by WAC 173-303-110(2); 40 CFR 261 Appendix I; and/or SW-846 Chapter 9.0
- Appropriate sample containers and equipment
- Samples numbered
- Traceable labeling system
- Field QA/QC samples (applicable SAP)
- Equipment calibration (current as appropriate)
- Chain-of-custody.

Table 4-1. LLBG Chemical Screening Sampling Equipment.

Waste form	Reference in SW-846, Chapter 9.0	
	Waste type	Equipment*
Liquids	Free-flowing liquids and slurries	COLIWASA, glass thief or pipet
Solidified liquids	Sludges	Trier, scoops and shovels
Sludges	Sludges	Trier, scoops and shovels
Soils	Sand or packed powders and granules	Auger, scoops and shovels
Absorbents	Large-grained solids	Large trier, scoops and shovels
Wet absorbents	Moist powders or granules	Trier, scoops and shovels
Process solids and salts	Moist powders or granules	Trier, scoops and shovels
	Dry powders or granules	Thief, scoops and shovels
	Sand or packed powders and granules	Auger, scoops and shovels
	Large-grained solids	Large trier, scoops and shovels
Ion exchange resins	Moist powders or granules	Trier, scoops and shovels
	Dry powders or granules	Thief, scoops and shovels
	Sand or packed powders and granules	Auger, scoops and shovels

COLIWASA = composite liquid waste sampler.
* other ASTM-approved equipment could be used to collect samples.

The equipment requirements of Table 4-1, as amended by any Permit conditions, apply to sampling for chemical screening. In addition, the following sampling equipment may be used in sampling for chemical screening: (1) For liquids and slurries – dip, tank, bomb, and bailer samplers, as well as tube-type samplers (e.g., thin-walled Shelby tubes, split spoons, probes); and (2) For sludges and solids – tube-type samplers and augers; for small containers, a spoon may be used in place of a scoop.

5.0 LABORATORY SELECTION AND QUALITY ASSURANCE/QUALITY CONTROL

The selection of any laboratory shall be based on the ability of the laboratory to demonstrate compliance to this section with experience and capability in the following major categories:

- Comprehensive written QA/QC program
- Technical analytical expertise
- Effective information management systems.

The QA and QC requirements outlined in this section are applicable to laboratory activities governed by this WAP.

5.1 Evaluation of Laboratories

All laboratories providing analytical support to the LLBG are required to have a current, laboratory approved QA plan. The laboratory QA plan shall be submitted to the LLBG, and if necessary to Ecology in accordance with TPA Action Plan Section 6.5 (Ecology et al. 2003), for review and acceptance before commencement of analytical work. The QA plan shall, at a minimum, address the following elements:

- Sample custody and management practices (also refer to Section 4.0)
- Sample preservation protocols
- Sample preparation and analytical process requirements
- Instrument maintenance and calibration requirements
- Internal QC measures, e.g., method blanks, spikes
- Corrective action process.

Each laboratory shall be audited periodically by an independent organization to evaluate the effective implementation of the laboratory's QA/QC program. QA personnel and a technical expert shall evaluate the laboratory through onsite observations and/or reviews of the following documentation: copies of the QA/QC documents; records of surveillances/inspections; audits; non-conformances, and corrective actions. The LLBG shall ensure independent organizations; QA personnel and technical experts are qualified to perform these evaluations.

5.2 Quality Assurance/Quality Control Objectives

The overriding goal of the analytical program is to support the accurate designation of waste and/or demonstrate compliance to LDR standards. Laboratory QA/QC programs shall be designed to meet the following objectives.

- Minimize errors. Errors could be introduced during preparative, analytical, and/or reporting phases of work. QC program elements include analysis of samples to written and approved processes and certification of the laboratory.

- Provide information. The designation of waste relies on a combination of knowledge and data. QA/QC programs that ensures accurate, precise, reliable, and reproducible data.

Key QA program elements are designed to provide objective evidence that waste analysis methods meet the performance specifications of the LLBG. QA activities and implementation responsibilities are as follows:

- Activity based laboratory inspections. Inspections are performed by the LLBG. Inspections verify that specific guidelines, specifications, or processes for the activities are completed successfully.

- Laboratory analyses. Analyses are performed by onsite or offsite laboratories on samples of waste using written and approved processes.

- Development of inspection checklists. Checklists are required for laboratory inspections and are designed to ensure that the inspected activity is consistently addressed. Checklists are completed during the inspection to document results.

- Instrument calibration and calibration verification. These activities are performed by the laboratory and are required for ensuring data of known accuracy and precision. Calibration data are maintained and stored to ensure traceability to reported results.

5.3 Laboratory Quality Assurance/Quality Control

All analytical work shall be defined and controlled by a statement of work, work order, or other work authorizing documentation. These authorizations documents shall include QA performance requirements. Samples will be handled according to approved, written and controlled laboratory processes. The accuracy, precision, and limitations of analytical data are evaluated through QC performance.

As needed, the LLBG will conducts analyses to determine completeness of information and whether waste meets the acceptance criteria for treatment, storage, or disposal at one of the Hanford Facility TSD units or those of a chosen offsite TSD facility. Testing and analytical methods will depend on the type of analysis sought and the reason for needing the information. For parameters or methods not otherwise specified in Section 3.0, the following are acceptable sources of testing methods (standard methods).

- Analytical methods cited in WAC 173-303;

- The most recently promulgated version of *Test Method for Evaluating Solid Waste: Physical/ Chemical Methods*, SW-846, U.S. Environmental Protection Agency, EPA, Office of Solid Waste;

- Other current U.S. EPA methods, as applicable to the matrix under evaluation;

- *Standard Methods for the Examination of Water and Wastewater, American Public Health Association* (APHA), American Water Works Association, Water Environment Federation;

- *Annual Book of ASTM Standards, American Society for Testing and Materials*;

- *AOAC Official Methods of Analysis*, AOAC (Association of Official Analytical Chemists), International.

Other laboratory approved, written and controlled analytical methods, proprietary methods, and non-standard methods may be needed to develop operational and safety related information.

5.4 Data Assessment

Data used for decision making need to be scientifically sound, of known quality, and thoroughly documented. Data validation is not required; however, the LLBG is responsible to ensure that data assessment or evaluation is completed. Data are assessed to determine compliance with quality standards approved by Ecology and established by this Permit in Section 5.3 are as follows.

Precision – The overall precision shall be the agreement among the collected samples (duplicates) for the same parameters, at the same location, subjected to the same preparative and analytical techniques. Analytical precision shall be the agreement among individual test portions taken from the same sample, for the same parameters, subjected to the same preparative and analytical techniques.

Accuracy – Accuracy of the measurement system shall be evaluated by use of various kinds of QA samples, including, but not limited to, certified standards, in-house standards, and performance evaluation samples.

Representativeness – Representativeness addresses the degree to which the data accurately and precisely represent a real characterization of the waste stream, parameter variation at a sampling point, sampling conditions, and the environmental condition at the time of sampling. The issue of representativeness is addressed for the following points:

- Based on the generating process, the waste stream, and its volume, an adequate number of sampling locations are selected;
- The representativeness of selected media has been defined accurately;
- The sampling and analytical methodologies are appropriate;
- The environmental conditions at the time of sampling are documented.

Completeness – Completeness is the amount of usable data obtained from a measurement system compared to the total amount of data requested.

Comparability – Comparability is the confidence with which one data set can be compared to another. This usually is accomplished by application of statistical methods.

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6.0 SELECTING WASTE RE-EVALUATION FREQUENCIES

The waste profile and supporting data and documentation shall be re-evaluated at least annually, or more often, if the generator has informed the LLBG of a change in the waste generation process, or if waste received at the LLBG C or the description on the shipping documentation does not match the waste profile. If the generator has informed the LLBG of a change in the waste generation process, the waste re-enters the waste stream approval process described in Section 2.1.1. The LLBG will evaluate verification data against the waste profile to identify any waste streams for which a change in waste generation process is suspect. If a waste stream is suspect, that waste stream will re-enter the approval process described in Section 2.1.1.

When a waste profile is re-evaluated, the LLBG could request the generator to do one or more of the following:

- Verify accuracy of current waste profile;
- Supply a new waste profile;
- Submit a sample to confirm the waste is still within the profile parameters.

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7.0 SPECIAL WASTE ANALYSIS PROCEDURAL REQUIREMENTS

This section discusses any special process requirements for receiving mixed waste at the LLBG.

7.1 Processes for Receiving Onsite and Offsite Waste

The processes for receiving waste are described in Section 2.0. In general, mixed waste received from onsite generators is managed the same as waste received from offsite generators. Differences include, but are not limited to the following: (1) physical/chemical screening frequencies for verification [minimum percentages of 5 percent for waste from onsite generators and 10 percent for waste from offsite generators (note that chemical screening frequency depends on the physical screening frequency)], (2) shipping documentation (Uniform Hazardous Waste Manifests are used for waste from offsite generators and shipping documents are used for waste from onsite generators), and (3) LDR documentation requirements for mixed or dangerous waste (notification for waste from offsite generators and equivalent information from onsite generators).

7.2 Processes for Ignitable, Reactive, and Incompatible Waste

The LLBG accepts ignitable, reactive, or incompatible waste (refer to Section 1.2). Pre-shipment review and/or chemical screening requirements in Section 2.0 are used to identify whether the waste is ignitable, reactive, or incompatible. The LLBG waste acceptance criteria identifies certain management requirements for ignitable, reactive, and incompatible waste, ensuring the waste is stored in a safe manner. Precautions are taken when ignitable, reactive, or incompatible waste is stored within the LLBG.

7.3 Provisions for Complying With Federal and State Land Disposal Restriction Requirements

State-only and federal LDR requirements restrict the land disposal of certain types of waste subject to *Resource Conservation and Recovery Act* (RCRA) *of 1976* and the *Hazardous Waste Management Act of 1976*. Waste managed on the Hanford Facility falls within the purview of these LDRs per 40 CFR 268 and WAC 173-303-140. Waste constituents that are subject to LDRs are identified in 40 CFR 268.40 and referenced by WAC 173-303-140. Waste must meet certain treatment standards, as specified in 40 CFR 268 and/or WAC 173-303-140, if the waste is to be land disposed.

Generators determine if LDRs apply to the mixed or dangerous waste based on knowledge or testing [40 CFR 268.7(a)]. Each waste is analyzed for those LDR constituents contained in the listed and characteristic waste numbers identified by the generator, including any UHC identified by 40 CFR 268.2(i), if the knowledge of the generator is not sufficient to make a determination. If the LDR waste does not meet the applicable treatment standards, the generator provides waste information with each shipment stating so in accordance with WAC 173-303-380(1)(j),-(k),-(l),-(m),-(n), or -(o). If the waste meets the LDR standards, the generator must send a certification that the waste meets the treatment standards.

7.3.1 Waste Treatment

Waste is treated to meet LDR as specified in 40 CFR 268 and WAC 173-303-140 with the exception of mixed waste designated by the Secretary of Energy for a disposal facility pursuant to the *Land Withdrawal Act*, as amended.[2] Mixed waste is treated to the applicable standards required by the disposal facility or

[2] Subject to "*State of Washington v. Bodman,*" presently on appeal before the United States Court of Appeals for the Ninth Circuit, No. 06-35227.

other applicable requirements. The LLBG potentially can partially treat or pre-treat certain waste before shipment to a permitted offsite facility that could perform full treatment of the specific waste to meet LDR treatment requirements. Waste requiring treatment other than what the LLBG can provide is repackaged, labeled, and transferred to a TSD unit for storage pending identification or development of an appropriate treatment. Prior to treatment of waste, the LLBG will have in place processes to ensure safe waste treatment as defined in Section 1.1.3 of this WAP. When characteristics of the waste are changed as a result of treatment or other processing, documentation will be entered into the unit-specific operating record. Dangerous waste is shipped to an offsite TSD for treatment.

When evaluating the treatability of certain characteristic waste, consideration must be given to any additional UHCs that might be found in certain characteristic waste. The treatment standards, for the most part, are concentration-based. When the concentration-based standards are used, the constituent concentrations for the waste must fall below those specified in 40 CFR 268.40 and/or 268.48 for UHCs and in WAC 173-303-140 for land disposal without treatment. If the concentrations exceed these limits, the waste must be treated before disposal. The alternative treatment standards for hazardous debris as specified in 40 CFR 268.45 or for contaminated soil as specified in 40 CFR 268.49, or for labpacks in 40 CFR 268.42(c) could also be used.

Treatment is performed in the LLBG as described in the Part A. Treatment of mixed waste within the trench cannot be performed directly on the working surface. Concrete pads, blocks, or other approved methods can be utilized to elevate the mixed waste off of the working surface.

Treatment of state-only extremely hazardous waste (WT01, WP01, and WP03) is performed in accordance with Revised Code of Washington (RCW) 70.105.050(2) for mixed waste and/or WAC 173-303-140(4)(a) for dangerous waste as applicable.

Waste managed at the LLBG is treated to meet either concentration-based treatment standards or technology-based standards. The alternative treatment standards for hazardous debris as specified in 40 CFR 268.45 or for contaminated soil as specified in 40 CFR 268.49 also could be used. When dealing with multiple dangerous waste numbers, both standards could apply, requiring a treatment train for ultimate compliance to LDR. In most cases, stabilization treatment is at the end of the treatment train. In some instances, as with the cementing process, treatability studies could be performed to ensure that when the waste is treated, LDR requirements are met.

Grab samples are collected on each batch of concentration-based treated waste to ensure that the treatment process was successful. For specified technologies, the LLBG operating record contains information to demonstrate the treatment process was well designed and well operated.

7.3.2 Sampling and Analytical Methods

Section 3.3 defines the parameters and methods needed to demonstrate compliance to LDR treatment standards. It is recognized that ALARA concerns may warrant modifications to the methods to ensure appropriate protection of personnel health and safety without impact to the method or sample integrity. Waste analyzed using SW-846 methods modified to address ALARA protection concerns are considered acceptable provided applicable data quality objectives can be met.

Samples of waste are transferred to the sample management area for packaging and transferred to an onsite laboratory or shipped offsite to a laboratory for analysis. Samples are collected in accordance with SW-846 and as described in Section 4.0. Storage is provided for waste containers while waiting laboratory analysis results.

7.3.3 Land Disposal Restriction Certification of Treatment

When LDR treatment has been completed and analytical results (if applicable per 40 CFR 268.40 and WAC 173-303-140) have verified the LDR treatment is successful, certification of the LDR treatment is required by the LLBG. The certification statement is prepared by the unit in accordance with 40 CFR 268.7b, d, and e. A copy of the certification is placed in the LLBG operating record.

When a LDR waste does not meet the applicable treatment standards set forth in 40 CFR 268.40 and WAC 173-303-140, or exceeds the application prohibition levels set forth in 40 CFR 268.32 or Section 3004(d) of RCRA, this information is placed in the LLBG operating record, in accordance with WAC 173-303-380(1)(k), (n), and -(o).

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8.0 RECORDKEEPING

Recordkeeping requirements applicable to this WAP are described in the *Hanford Facility RCRA Permit*, Attachment 33, General Information Portion, Table 12.1 (Ecology 2004) and this WAP.

The LLBG maintains the waste stream documentation or other approved processes, supporting documentation, and associated QA/QC data described in this WAP in accordance with the requirements in Permit Condition II.I (Ecology 2004).

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ATTACHMENT IV

HNF-EP-0063
Revision 14 (reissue)

Hanford Site Solid Waste Acceptance Criteria

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

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

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HNF-EP-0063
Revision 14 (reissue)

Hanford Site Solid Waste Acceptance Criteria

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HANFORD SITE SOLID WASTE ACCEPTANCE CRITERIA

1.0 INTRODUCTION

U.S. Department of Energy (DOE) Order 435.1, *Radioactive Waste Management*, requires that each treatment, storage, and/or disposal facility (referred to in this document as a treatment, storage and/or disposal [TSD] unit) that manages low-level or transuranic (TRU) waste (including mixed waste and *Toxic Substances Control Act of 1976* [TSCA] polychlorinated biphenyl [PCB] waste) maintain waste acceptance criteria. This requirement is implemented through DOE/RL-2000-25, *Contracts Requirement Document 435.1, Radioactive Waste Management Plan*. The waste acceptance criteria for U.S. Department of Energy, Richland Operations Office (RL) TSD units are provided, including criteria for the Low-Level Burial Grounds (LLBG), the Central Waste Complex (CWC), the T Plant, and the Waste Receiving and Processing (WRAP) Facility.

1.1 PURPOSE AND SCOPE

The criteria for each TSD unit are established in this document to ensure that newly generated waste accepted can be managed within the operating requirements of the unit, including, but not limited to, environmental regulations, DOE Orders, permits, technical safety requirements (HNF-11724, Section 9.1; HNF-15280, Section 5.6.12), waste analysis plans, and performance assessments. The requirements of DOE O 435.1 and DOE M 435.1-1 are implemented through DOE/RL-2000-25. Revisions to the acceptance criteria document require an Unreviewed Safety Question review to document that the changes are consistent with current applicable safety analyses.

Acceptance criteria apply to the following RL TSD units.

- The lined trenches in the LLBG
- The CWC
- The WRAP Facility
- The T Plant Complex

Waste from all generators, including Hanford Site and offsite facilities, must comply with these criteria. Exceptions can be granted as provided in Section 1.6.

Specific waste streams could have additional requirements based on the identified TSD pathway. These requirements are communicated in the waste specification records (WSRd) and/or waste stream profile sheet approvals.

The Hanford Site manages nonradioactive waste through direct shipments to offsite contractors. The waste acceptance requirements of the offsite TSD facility must be met for these

nonradioactive wastes. This document does not address the acceptance requirements of these offsite facilities.

Selection of specific storage locations and container movements within a TSD unit are outside the scope of these acceptance criteria.

1.2 ROADMAP TO THE WASTE ACCEPTANCE CRITERIA

Chapter 1.0 provides introductory information and describes general administrative requirements that apply to generators.

Chapter 2.0 identifies requirements that generally apply to waste sent to any of the TSD units. These criteria relate primarily to overall characterization and segregation methods used by generators. In addition, acceptance criteria that are the same for all units are provided in this chapter.

Chapters 3.0 through 6.0 communicate the unit-based criteria for acceptance of waste. Each of these chapters contains a general description of the unit functions followed by identification of prohibited waste, physical/chemical acceptance criteria, radiological acceptance criteria, and packaging criteria. These TSD units and the general functions follow.

- Chapter 3.0: The lined trench portion (trenches 31 and 34) of the 218-W-5 Burial Ground is a *Resource Conservation and Recovery Act of 1976* (RCRA-) permitted disposal unit for certain mixed waste and low-level waste that meets federal and state land disposal restrictions (LDR). The unit may also dispose of certain types of TSCA polychlorinated biphenyl (PCB) waste.

- Chapter 4.0: The CWC is a storage unit for low-level mixed waste, low-level TSCA PCB waste, TRU waste, TRU mixed waste, TRU TSCA PCB waste, and other waste types that must be stored pending treatment and/or disposal.

- Chapter 5.0: The T Plant Complex is a multipurpose unit for storage, repackaging, treatment, and decontamination of radioactive waste. The T Plant Complex can accept low-level and TRU waste, including mixed and TSCA PCB waste.

- Chapter 6.0: The WRAP is a multipurpose unit for processing and treating low-level and TRU waste, including mixed and TSCA PCB waste. The WRAP can perform nondestructive assay (NDA) and nondestructive examination (NDE) of waste containers. The WRAP is the primary unit for repackaging and processing TRU waste for certification for disposal at the Waste Isolation Pilot Plant (WIPP).

Chapter 7.0 lists references for all chapters except the appendices. Each appendix has its own reference section.

Appendix A provides radiological calculation methods.

3.0 ACCEPTANCE CRITERIA FOR DISPOSAL IN THE LOW-LEVEL BURIAL GROUNDS

This chapter outlines the criteria necessary in order to comply with the regulatory, permitting, safety, environmental, and operational requirements for the low-level and low-level mixed waste treatment, storage, and disposal in the LLBG.

3.1 FACILITY DESCRIPTION AND FUNCTION

Trenches 31 and 34 of the 218-W-5 Burial Ground are RCRA-compliant units for treatment, storage, and disposal of certain low-level mixed waste. Currently, only low-level waste and low-level mixed waste originally designated with RCRA characteristic numbers D001 through D043, certain listed, discarded chemical product waste numbers (U- and P- listed waste), certain F-listed waste F001 through F012, F019, F028, and F039 (derived from F001 through F012, F019 and F028), and Washington state-only dangerous waste (except waste number WSC2-acid) are accepted in trenches 31 and 34. Waste accepted for disposal at trenches 31 and 34 must meet the LDR treatment standards of 40 CFR 268 and WAC 173-303-140 as applicable. There also are safety-based limits on the radionuclide concentrations of waste received.

Table 3-1. LLBG Dangerous Waste Numbers.

Characteristic Waste "D" Series	Nonspecific Source "F" Series	Discarded Chemical Product "U" Series	Discarded Chemical Product "P" Series	Washington State-Only "W" Series
D001–D043	F001	U001–U012	P001–P006	WT01
	F002	U014–U039	P008–P018	WT02
	F003	U041–U053	P020–P024	WP01
	F004	U055–U064	P026–P031	WP02
	F005	U066–U099	P033	WP03
	F006	U101–U103	P034	WSC2*
	F007	U105–U138	P036–P051	WPCB
	F008	U140–U174	P054	
	F009	U176–U194	P056–P060	
	F010	U196	P062–P078	
	F011	U197	P081	
	F012	U200–U211	P082	
	F019	U213–U223	P084	
	F028	U225–U228	P085	
	F039	U231–U240	P087–P089	
		U243–U244	P092–P099	
		U246–U249	P101–P106	
		U271	P108–P116	
		U278–U280	P118–P123	
		U328	P127	
		U353	P128	
		U359	P185	
		U364	P188–P192	
		U367	P194	
		U372	P196–P199	
		U373	P201–P205	
		U375		
		U387		
		U389		
		U394		
		U395		
		U401–U404		
		U407		
		U409–U411		

*See Section 3.2
*Acceptable dangerous waste numbers may be added or deleted at any time due to changes in regulations. See the currently approved Dangerous Waste Permit Application, Part A Form, Section XIV, "Description of Dangerous Waste", to verify the dangerous waste numbers acceptable at the LLBG.

3.2 PROHIBITED WASTE

The following types of waste are not disposed in trenches 31 and 34.

- Waste designated with WSC2-acid (Hanford Facility RCRA Permit, WA7 89000 8967, Unit Name Part A Form).
- TSCA-regulated PCB waste, except as specifically authorized by 40 CFR 761.

- *Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)* waste shipped directly from the generator, unless the U.S. Environmental Protection Agency (EPA) has specifically approved (e.g., a Record of Decision, Offsite Dertermination) management of the waste at the LLBG.
- Waste that does not comply with the requirement of DOE M 435.1-1, Chapter IV, G.1.d.1. Low-level waste must contribute to and not detract from achieving long-term stability of the facility, minimizing the need for long-term active maintenance, minimizing subsidence, and minimizing contact of water with waste. Void spaces within the waste and, if containers are used, between the waste and its container shall be reduced to the extent practical (DOE M 435.1-1, Chapter IV, G.1.d.1).

- Waste that does not comply with the requirement of DOE M 435.1-1, Chapter IV, G.1.d.2. Liquid low-level waste or low-level waste containing free liquid must be converted into a form that contains as little freestanding liquid as is reasonably achievable, but in no case shall the liquid exceed 1 percent of the waste volume when the low-level waste is in a disposal container, or 0.5 percent of the waste volume after it is processed to a stable form (DOE M 435.1-1, Chapter IV, G.1.d.2).

- Waste that does not comply with the requirement of DOE M 435.1-1, Chapter IV, G.1.d.3. Low-level waste must not be readily capable of detonation or of explosive decomposition or reaction at anticipated pressures and temperatures, or of explosive reaction with water. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable (DOE M 435.1-1).

- Waste that does not comply with the requirement of DOE M 435.1-1, Chapter IV, G.1.d.4. Low-level waste must not contain, or be capable of generating by radiolysis or biodegradation, quantities of toxic gases, vapors, or fumes harmful to the public or workers or disposal facility personnel, or harmful to the long-term structural stability of the disposal site (DOE M 435.1-1). Additional requirements related to these criteria are listed in Section 2.11.4.

- Waste that does not comply with the requirement of DOE M 435.1-1, Chapter IV, G.1.d.5. Low-level waste in a gaseous form must be packaged such that the pressure does not exceed 1.5 atmospheres absolute at 20 degrees Celsius (68 degrees Fahrenheit) (DOE M 435.1-1). Additional requirements related to these criteria are listed in Section 2.11.4.

- Waste that does not meet all applicable treatment standards of 40 CFR 268 and WAC 173-303-140.

- Transuranic waste and waste that exceeds other radiological limits of Section 3.4.

- Waste that is incompatible with the trench liner, as defined in Section 3.3.3 (40 CFR 264.301; WAC 173-303-665; HNF-5841).

3.3 PHYSICAL AND CHEMICAL CRITERIA

The following are the physical and chemical criteria for acceptance of waste in the LLBG.

3.3.1 Liquids and Liquid-Containing Waste

All free liquids must be absorbed or stabilized in accordance with Appendix E, or otherwise removed from the waste, except when specifically allowed as follows.

- Containerized free liquids are allowed in the following situations, but cannot exceed 1 percent of the volume of the waste (40 CFR 264.314, HNF-5841).
  - Free liquids in a very small container, such as an ampule.
  - Small articles that contain free liquids required for the article to function (e.g., batteries or capacitors).
- For liquid-containing waste where condensate could form in inner plastic packaging (e.g., bags) subsequent to packaging, the condensate shall be eliminated to the maximum extent practical by placing sorbents within the inner plastic packaging (HNF-5841). The type and amount of sorbent required shall be in accordance with Appendix E. In any case, the amount of liquid may not exceed 1 percent of the volume of the waste or 0.5 percent of waste processed to a stable form (DOE M 435.1-1).
- Residual liquids in large debris items shall be sorbed or removed. In cases where it is not practical to remove suspected liquids and it is impossible to sample to determine if liquids are present, the liquids shall be removed to the maximum extent possible by draining suspected liquids at low points and placing an adequate amount of sorbent around each item (HNF-5841). In any case, the amount of liquid cannot exceed 1 percent of the volume of the waste (DOE M 435.1-1).

3.3.2 Land Disposal Restrictions

All waste subject to RCRA LDR (40 CFR 268) and/or the Washington State LDR (WAC 173-303-140) must be demonstrated to meet all applicable treatment standards and requirements. For waste that has concentration-based treatment standards for specific hazardous constituents under 40 CFR 268, the waste must be tested at a Hanford Site laboratory or another independent laboratory in accordance with 40 CFR 268. For waste that has treatment standards that are not concentration-based, the generator and/or treatment facility must demonstrate that the waste meets the applicable treatment standards using process knowledge and/or by waste analysis, as required by the applicable sections of 40 CFR 268 and WAC 173-303-140 (HNF-5841).

3.3.3 Compatibility of Waste With Liner

All waste disposed in the LLBG must be compatible with the landfill liner system (HNF-5841). A variety of chemical constituents have been evaluated for compatibility with the liner system, and it is believed that waste that meets LDR requirements and the other acceptance criteria of

this chapter will be compatible (HNF-5841, WHC-SD-WM-TI-714). An assessment will be performed by the WSD Project acceptance organization on each waste stream to confirm the compatibility of the waste with the liner. In cases where a waste contains constituents that have not been evaluated previously for liner compatibility, testing by Method 9090 of SW-846 could be required.

NOTE: Table 3-2 lists certain chemical constituents, in concentrated form, that have been evaluated and determined to be incompatible with the liner.

3.3.4 Gas Generation

Radioactive animal carcasses must be packaged as follows.

- The waste must be packaged in an inner and outer metal package, where the outer package has a capacity at least 40 percent greater than that of the inner package. The outer package must be a metal container that meets applicable transportation requirements for shipment to the LLBG.

- The inner package shall be lined with a minimum 4-mil plastic liner. The animal carcass(es) in the inner package must be surrounded with slaked lime. The plastic liner and inner package must be sealed.

- A minimum of 7.6 centimeters (3 inches) of mineral sorbent must be placed in the bottom of the outer package. The inner package must be placed into the outer package, and the void space filled between the two packages with additional mineral sorbent.

- The outer package must be sealed.

3.4 RADIOLOGICAL CRITERIA

The following are the radiological criteria for acceptance of waste in the LLBG.

3.4.1 Radiological Concentration Limits

The methodology for classification of the radionuclide content of waste according to the various limits listed in the following sections is provided in Appendix A. A waste must meet all of the following conditions to be disposed in the LLBG.

- TRU content limit. TRU content (as calculated by method A1.1 of Appendix A) shall not exceed 100 nanocuries (3,700 becquerels) per gram of waste (DOE M 435.1-1).

- Waste category (as calculated by methods A1.4 and A1.5 of Appendix A) shall not exceed Category 3, except with an analysis coordinated by the WSD Project acceptance organization demonstrating that the LLBG performance assessment conditions are met (WHC-EP-0645, WHC-SD-WM-TI-730).

- Category 3 waste (as calculated by methods A1.4 and A1.5 of Appendix A) can be disposed of only if the waste meets one of the following waste form stability criteria (WHC-EP-0645, WHC-SD-WM-TI-730).

  - Packaging in a high-integrity container (HIC) that is procured through WHC-S-0486 specification.

  - Packaging in a HIC approved by the WSD Project acceptance organization.

    NOTE: A list of approved HICs is available on the *Hanford Site Solid Waste Acceptance Program* Internet web site (http://www.hanford.gov/?page=527&parent=524).

  - Placement in a monolith in the LLBG.

  - Stabilization in concrete or other stabilization agents. The stabilized waste must meet the leach index and compression strength criteria of the U.S. Nuclear Regulatory Commission (NRC) *Technical Position Paper on Waste Form*, Section C.2 and Appendix A (NRC 1991). Several Hanford-approved concrete mix formulas have been developed that can be used to meet the stabilization criteria. Contact the WSD Project acceptance organization for information on use of these formulas.

  - Inherently stable waste that meets the stability requirements of 10 CFR 61.56 and the NRC *Technical Position Paper on Waste Form* (NRC 1991).

- Mobile radionuclides. If the concentration of any mobile radionuclide exceeds the Mobile Radionuclide Reporting Limit of Appendix A, Table A-2, stabilization could be required (WHC-EP-0645, WHC-SD-WM-TI-730). The WSD Project acceptance organization will perform a case-by-case evaluation based on the LLBG performance assessment (WHC-EP-0645, WHC-SD-WM-TI-730) to determine whether the waste requires stabilization to meet the groundwater pathway dose criteria. Stabilization normally would consist of placing the waste container in a HIC, but additional stabilization might be required based on a number of factors such as waste form and radionuclide content. The WSD Project acceptance organization will coordinate this evaluation.

3.4.2 Criticality Safety Limits

The fissile and fissionable material limits are provided in Appendix B. Note that fissile waste packages can be accepted only with an approved criticality safety evaluation (refer to Footnote 1 of Table B-3 in Appendix B).

3.4.3 Package Dose Rate Limits

Containers with dose rates less than or equal to 2 milliSieverts per hour (200 millirem per hour) at contact and less than 1 milliSievert per hour (100 millirem per hour) at 30 centimeters

(11.8 inches) are acceptable at the LLBG. Contact-handled containers (see definitions) exceeding these limits require container-specific review and approval.

Remote-handled waste is acceptable at the LLBG if approved through both a waste stream profile sheet and a container-specific shipment. Remote-handled waste shall meet the applicable dose rate restrictions of DOT or an approved package-specific safety document. Remote-handled waste shall be configured for unloading such that personnel exposures are maintained as low as reasonably achievable (ALARA).

3.5 PACKAGING CRITERIA

The following are packaging criteria for acceptance in the LLBG.

3.5.1 Package Construction

Containers must meet one of the following criteria to ensure compliance with HNF-21239, *Solid Waste Operations Complex Fire Hazard Analysis*.

- Constructed of metal, concrete, or masonry.
- Constructed of wood that is either (1) pre-treated wood having the Underwriters Laboratories FR-S stamp, or (2) painted with a fire-retardant paint that has been approved by Underwriters Laboratories or Factory Mutual.
- Constructed of rigid plastic that has a maximum flame spread rating of 25 when tested by a nationally recognized testing laboratory to American Society for Testing of Materials (ASTM) Standard Test Method for Surface Burning Characteristics of Building Materials (ASTM E-84, most current version). These containers will only be accepted if approved by WSD Project Fire Protection Engineering.
- Constructed of flexible plastic packaging provided the waste matrix is limited to soils, metals, concrete, or masonry. Incidental amounts of organic material such as personal protective equipment are allowed in flexible packaging.
- Other containers as authorized under the LLBG Fire Hazards Analysis and approved by WSD Project Fire Protection Engineering.

Sacrificial rigging shall not contain regulated materials, such as lead.

Containers shall be compatible with the waste and maintain containment during handling and storage before disposal. Where required, an appropriate combination of protective coatings and liners shall be used to prevent loss of container integrity.

3.5.2 Handling of Packages

All packages must be configured for safe unloading by forklift or crane. Alternate means of unloading could be allowed with approval from the TSD unit manager or designee. Packages that must be unloaded by crane shall be equipped with a lifting system designed to safely lift the fully loaded package. All slings and lifting devices shall meet the requirements of the most current version of DOE/RL-92-36. For packages that have special unloading requirements, information must be provided to the WSD Project acceptance organization concerning the methods for unloading before the shipment is scheduled. Sacrificial rigging shall be provided for remote-handled waste packages. Rigging shall not contain regulated materials, such as lead.

3.5.3 Minimization of Subsidence

All waste shall be packaged in a form that minimizes settling and subsidence to the maximum extent feasible (DOE M 435.1-1, WHC-EP-0645, and WHC-SD-WM-TI-730). All waste accepted for disposal in the LLBG must meet one of the following minimization of subsidence criteria at the time of disposal:

- Packaged in a HIC that is procured through the WHC-S-0486 specification.
- Packaged in a HIC approved by the Fluor Hanford WSD Project.
- Compactable waste that has been compacted to a minimum pressure of 3.52 kilograms per square centimeter (50 pounds per square inch).
- A solid with a minimum "confined" compressive strength of 3.52 kilograms per square centimeter (50 pounds per square inch).
- Placed in a Hanford-provided in-trench structural monolith meeting the requirements of HNF-1981 specification for concrete encasements (allowed by WSD on a case-by-case basis).

All containerized waste must be at least 90 percent full when placed in the disposal unit (WAC 173-303-665).

3.5.4 Labeling

Bulk waste and remote-handled waste containers that are removed from reusable overpacks are exempt from labeling requirements at the LLBG. For unusual waste forms, special labeling provisions can be arranged with the WSD Project acceptance organization.

3.5.5 Bulk (Noncontainerized) Waste

Bulk waste can be disposed in the LLBG, on a case-by-case basis. Waste shall meet the following requirements to be considered.

Certain types of waste can be disposed in bulk rather than packaging in containers. This includes soil, vegetation, building rubble, and other homogeneous waste having relatively low concentrations of radionuclides and hazardous chemical constituents. To avoid unnecessary conservatism, universally applicable limits have not been developed for the LLBG acceptance criteria. Instead, a case-by-case evaluation will be performed on request to determine whether a given waste stream can be disposed in bulk. Any mitigating measures required to meet the conditions of the safety basis will also be determined on a case-by-case basis.

Waste types that are not surface contaminated with readily dispersible radiological or hazardous chemical contamination, such as activated metal or internally contaminated equipment may be considered containerized. As such, they are subject to the radionuclide and chemical concentration requirements for containerized waste rather than the bulk waste requirements.

Table 3-2. Chemical Constituents Known To Be Incompatible With Liner System.

Chemical Constituent	Chemical Abstract Service Number(s)
Aqua regia	8007-56-5
Bromic acid	7789-31-3
Bromine (elemental)	7726-95-6
Bromobenzene	108-86-1
Bromoform	75-25-2
Calcium bisulfite	13780-03-5
Calcium sulfide	20548-54-3
Chlorine (elemental)	7782-50-5
1-Chloropentane (amyl chloride)	543-59-9
1,1-Dichloroethylene (vinylidene chloride)	75-35-4
1,2-Dichloropropane (propylene dichloride)	78-87-5
Diethyl benzene	105-05-5, 135-01-3, 141-93-5
Diethyl ether	60-29-7
Chloroethane (ethyl chloride)	75-00-3
Fluorine (elemental)	7782-41-4
Nitrobenzene	98-95-3
Sulfur trioxide	7446-11-9
Sulfuric acid, fuming	8014-95-7
Tetrachloroethylene	127-18-4
Thionyl chloride	7719-09-7
Trichloroethylene	79-01-6, 52037-46-4

Source: WHC-SD-WM-TI-714, 1995, *High-Density Polyethylene Liner Chemical Compatibility for Radioactive Mixed Waste Trenches*, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT V

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P.O. Box 550
Richland, Washington 99352

MAY 05 1995

95-PCA-294

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MAY 09 1995
CORRESPONDENCE CONTROL

Mr. David L. Lundstrom
Section Manager, 200 Areas
Nuclear Waste Program
State of Washington
Department of Ecology
1315 West Fourth Avenue
Kennewick, Washington 99336

Dear Mr. Lundstrom:

NOTICE OF INTENT (NOI) FOR EXPANSION UNDER INTERIM STATUS FOR THE HANFORD FACILITY LOW-LEVEL BURIAL GROUNDS (LLBG) (WA7890008967) (TSD: D-2-9)

In accordance with Washington Administrative Code (WAC) 173-303-281, the U.S. Department of Energy, Richland Operations Office (RL) and Westinghouse Hanford Company (WHC) are submitting the enclosed NOI for Expansion Under Interim Status for the LLBG. The LLBG will be expanded to (1) add greater-than-90-day tank storage for multi-source leachate and (2) redefine the process design capacity for disposal of mixed waste at the LLBG. The specific information required under WAC 173-303-281 for expansion under interim status is provided in the NOI.

Should you have any questions regarding the NOI, please contact Mr. C. E. Clark of RL on (509) 376-9333 or Mr. R. C. Bowman of WHC on (509) 376-4876.

Sincerely,

James E. Rasmussen, Director
Environmental Assurance, Permits,
and Policy Division
DOE Richland Operations Office

EAP:CEC

William T. Dixon, Manager
Environmental Services
Westinghouse Hanford Company

Enclosure

cc w/encl.
EDMC, H6-08
R. Bowman, WHC
D. Duncan, EPA
R. Jim, YIN
F. Ma, Ecology
D. Powaukee, NPT
S. Price, WHC
J. Wilkinson, CTUIR

cc w/o encl.
W. Dixon, WHC

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
J. E. Rasmussen, RL W. T. Dixon, WHC (G. D. Cummins, WHC)	D. L. Lundstrom, Ecology	Incoming 9502296 Xref 9552067D

Subject: NOTICE OF INTENT FOR EXPANSION UNDER INTERIM STATUS FOR THE HANFORD FACILITY LOW-LEVEL BURIAL GROUNDS (WA7890008967) (TSD: D-2-9)

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*The enclosure to this letter is the same as the attachment to Letter number 9552067D

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CORRESPONDENCE CONTROL

NOTICE OF INTENT FOR EXPANSION UNDER INTERIM STATUS

HANFORD FACILITY, LOW-LEVEL BURIAL GROUNDS

U.S. DEPARTMENT OF ENERGY,
RICHLAND OPERATIONS OFFICE
APRIL 1995

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METRIC CONVERSION CHART

The following conversion chart is provided to the reader as a tool to aid in conversion.

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
square miles	259	hectares	hectares	0.00391	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

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1.0 INTRODUCTION

The Washington State Department of Ecology (Ecology) *Dangerous Waste Regulations*, Washington Administrative Code (WAC) 173-303-281, require that dangerous waste facility owners and/or operators submit a Notice of Intent (NOI) before submittal of a permit application for new or expanded dangerous waste treatment, storage, and/or disposal (TSD) units on the Hanford Facility. The following information for this NOI is being filed with Ecology by the U.S. Department of Energy, Richland Operations Office (DOE-RL), the owner and operator.

This document is to serve notice of the intent to (1) add greater-than-90-day tank storage for multi-source leachate (leachate) and (2) redefine the process design capacity for disposal of mixed waste at the Low-Level Burial Grounds (LLBG) located in the 200 East Area and 200 West Area of the Hanford Facility, Richland, Washington.

The ability to store mixed waste in tanks and the modified process design capacity for disposal of mixed waste in a landfill is being added to ensure compliance with requirements of WAC 173-303 and the *Resource Conservation and Recovery Act* (RCRA) *of 1976*, as amended.

The following identifies the owner and operator of the Hanford Facility and the primary contact.

Owner and Operator: U.S. Department of Energy,
Richland Operations Office

Manager, Richland Operations Office: Mr. John D. Wagoner

Richland Operations Office Contact: Mr. J. E. Rasmussen

Address: U.S. Department of Energy
Richland Operations Office
Post Office Box 550
Richland, Washington 99352

Telephone: (509) 376-5441

2.0 FACILITY DESCRIPTION AND GENERAL PROVISIONS

The Hanford Facility is a single RCRA facility identified by the U.S. Environmental Protection Agency (EPA)/State Identification Number WA7890008967 that consists of over 60 TSD units conducting dangerous waste management activities. These TSD units are included in the *Hanford Facility Dangerous Waste Part A Permit Application* (DOE-RL 1988). The Hanford Facility consists of all contiguous land, and structures, other appurtenances, and

improvements on the land, used for recycling, reusing, reclaiming, transferring, storing, treating, or disposing of dangerous waste, which, for the purposes of the RCRA, are owned by the U.S. Government and operated by the DOE-RL, excluding land owned by Washington State.

The following sections provide a description of the LLBG, along with other general provisions specified in WAC 173-303-281.

2.1 LOCATION OF PROPOSED EXPANSION

The LLBG are located in the 200 Areas of the Hanford Facility, Benton County, Washington. Small-scale maps depicting the Hanford Facility and the location of the LLBG are provided in Figures 1 through 3. Large-scale maps and topographic maps, which meet the 2.54-centimeter equals-not-more-than-61-meter requirement, are provided in Appendix A and include the following:

- General Overview of Hanford Site (H-6-958)
- Topographic map of the 200 East Area LLBG (H-13-000195), including surrounding 305 meters. There are no existing or planned injection wells or existing or planned withdrawal wells in the vicinity of the 200 East Area. There are no barriers planned for drainage or for flood control at the LLBG.
- Topographic map of the 200 West Area LLBG (H-13-000196) wells, including surrounding 305 meters with planned injection and withdrawal wells in the vicinity of the 218-W-4C Burial Ground. There are no barriers planned for drainage or flood control at LLBG.

2.2 DESCRIPTION OF UNIT TO BE EXPANDED

The LLBG are classified as a landfill and cover a total area of approximately 225.0 hectares. The landfill is divided into eight burial grounds. Six burial grounds are located in the 200 West Area and two burial grounds are located in the 200 East Area (Appendix A):

200 West Area	200 East Area
218-W-3A	218-E-10
218-W-3AE	218-E-12B
218-W-4B	
218-W-4C	
218-W-5	
218-W-6	

The LLBG consists of both lined and unlined trenches. Mixed waste is disposed in lined trenches or in unlined trenches that are exempt from the liner/leachate collection system requirements.

2.3 DESCRIPTION OF EXPANSION

The proposed expansion consists of the addition of greater-than-90-day tank storage of leachate and increased process design capacity for disposal of mixed waste within the LLBG.

Each lined trench is and will be supported by an aboveground leachate storage tank. Currently, trenches 31 and 34 of the 218-W-5 Burial Ground have leachate collection tanks that are 2.5 meters in diameter and 7.2 meters long, each with a design capacity of approximately 37,854 liters (Figure 4). The storage tanks are located in close proximity to the lined trenches so that feed piping remains within the confines of the lined trenches.

Each leachate storage tank is and will be protected by secondary containment. Leak detection is and will be provided by visual inspection of the secondary containment. The collected leachate is and will be stored and sampled before transfer via tanker truck to an onsite TSD unit.

The leachate storage tanks constructed for the mixed waste trenches at the LLBG have a projected total tank storage process design capacity of 1,135,620 liters. No single leachate storage tank will exceed 378,540 liter volume. The leachate storage tank volumes will vary depending on trench configuration and construction requirements.

The proposed change in the process design capacity from 117 hectare meters to 3,428 hectare meters does not extend the physical lateral boundaries of the LLBG, only the total amount of mixed waste that could be disposed. The RCRA-compliant mixed waste trenches within the boundaries of the LLBG will vary in size, shape, and depth in accordance with future construction requirements. All waste accepted for disposal in the new mixed waste trenches will meet land disposal restriction requirements.

2.4 COMPLIANCE WITH STATE ENVIRONMENTAL POLICY ACT

The *State Environmental Policy Act* (SEPA) *of 1971* Environmental Checklist was submitted December 1989 with the *Low-Level Burial Grounds Dangerous Waste Permit Application*, DOE/RL-88-20 (DOE-RL 1989).

2.5 COMPLIANCE WITH SITING STANDARDS

Demonstration of compliance with the siting criteria as required under WAC 173-303-282(6) and (7) is addressed in the following sections.

2.5.1 Criteria for Elements of the Natural Environment

The following section addresses measures in place at the LLBG to provide protection of the natural environment. Each element of the criteria identified in WAC 173-303-282(6) is addressed.

2.5.1.1 Earth. This section addresses the potential for the release of dangerous waste into the environment because of structural damage resulting from conditions of the earth at the LLBG.

2.5.1.1.1 Seismic Risk. The design of the LLBG for seismic considerations is in accordance with the *Hanford Plant Standards*, Standard Design Criteria - 4.1 for seismic considerations (KEH 1993). This Plant Standard provides seismic load criteria specific for the Hanford Site and is more restrictive than the *Uniform Building Code*.

No active faults, or evidence of a fault that has had displacement during Holocene times, have been found at the Hanford Site (DOE 1988; WHC 1991). The youngest faults recognized at the Hanford Site occur on Gable Mountain, over 12.1 kilometers northeast of the 200 West Area and 3.2 kilometers north of the 200 East Area. These faults are of Quaternary age and are considered 'capable' by the Nuclear Regulatory Commission (NRC 1982).

2.5.1.1.2 Subsidence. The LLBG are located in the 200 East and 200 West Areas of the Hanford Facility. These areas of the Hanford Facility are not considered areas subject to subsidence (PNL 1992).

2.5.1.1.3 Slope or Soil Instability. The LLBG are not located in areas of slope or soil instability, or located in areas affected by unstable slope or soil conditions (PNL 1992).

2.5.1.2 Air. The LLBG are not an incineration unit. Discussion of measures taken to reduce air emissions resulting from incineration is not applicable.

2.5.1.3 Water. This section addresses the potential for contaminating water of the state in the event of a release of mixed and/or dangerous waste.

2.5.1.3.1 Surface Water. The following addresses considerations for the protection of surface water.

2.5.1.3.1.1 Flood, Seiche, and Tsunami Protection. Three sources of potential flooding of the area were considered: (1) the Columbia River, (2) the Yakima River, and (3) storm-induced run-off in ephemeral streams draining the Hanford Facility. No perennial streams occur in the central part of the Hanford Facility. The 200 East and 200 West Areas are not within the 100-year floodplain or 500-year floodplain (ERDA 1976).

2.5.1.3.1.2 Perennial Surface Water Bodies. The LLBG are a land-based facility as defined in WAC 173-303-282(3)(h). The WAC 173-303-282(6)(c)(i)(B)(II) requires that land-based facilities be located at least 0.4 kilometer from any perennial surface water body. The LLBG are over 8 kilometers from the Columbia River, the closest perennial water body.

2.5.1.3.1.3 Surface Water Supply. The LLBG are not located within an area designated as a watershed nor located within 0.4 kilometer of a surface water intake for domestic water.

2.5.1.3.2 Groundwater. The following addresses consideration for the protection of groundwater. The LLBG are a land-based unit as defined by WAC 173-303-282(3)(h); therefore, compliance with the contingent groundwater protection program, WAC 173-303-806(4)(a)(xxi), is required and is implemented.

2.5.1.3.2.1 Depth to Groundwater. The LLBG are located in the 200 East and 200 West Areas of the Hanford Facility. The depth to groundwater in the 200 East Area and 200 West Area is over 79 meters.

2.5.1.3.2.2 Sole Source Aquifer. The LLBG are not located over an area designated as a 'sole source aquifer' under section 1424(e) of the *Safe Drinking Water Act of 1974*.

2.5.1.3.2.3 Groundwater Management Areas and Special Protection Areas. The proposed expansion involves the addition of tank storage for leachate and increased mixed waste trench disposal capacity at the LLBG. The addition of RCRA-compliant storage tanks and mixed waste disposal capacity in RCRA-compliant trenches is not expected to result in an increased potential for release of mixed waste to groundwater or to a special protection area.

2.5.1.3.2.4 Groundwater Intakes. The LLBG are not located within 0.4 kilometer of a groundwater intake for domestic water.

2.5.1.4 Plants and Animals. The following sections address considerations given to reduce the potential for mixed waste contaminating plant and animal habitat in the event of a release of mixed waste. The LLBG are over 0.4 kilometer from any of the following.

2.5.1.4.1 Wetlands. The LLBG are not located near any wetlands.

2.5.1.4.2 Designated Critical Habitat. The LLBG are not located in an area designated as critical habitat for federally listed threatened or endangered species as defined by the *Endangered Species Act of 1973*.

2.5.1.4.3 State Designated Habitat. The LLBG are not located in an area designated by the Washington State Department of Wildlife as habitat essential to the maintenance or recovery of any state listed threatened or endangered species.

2.5.1.4.4 Natural Area Preserves. The LLBG are not located in any natural area acquired or voluntarily registered or dedicated under Chapter 79.70 Revised Code of Washington.

2.5.1.4.5 Wildlife Refuge, Preserve, or Bald Eagle Protection Area. The LLBG are not located in a state or federally designated wildlife refuge, preserve, or bald eagle protection area.

2.5.1.5 Precipitation. The LLBG are not located in an area having a mean annual precipitation level of greater than 254 centimeters (DOE 1987).

2.5.2 Criteria for Elements of the Built Environment

The following sections address the locational factors affecting protection of the built environment. Each element of the criteria for land-based units identified in WAC 173-303-282(7) is addressed.

2.5.2.1 Adjacent Land Use. This section addresses the setback criteria for adjacent land use.

Land-Based Facilities. The closest LLBG dangerous waste management unit boundary is located approximately 13 kilometers from the Hanford Facility property line.

2.5.2.2 Special Land Uses. This section addresses setback criteria for special land uses.

2.5.2.2.1 Wild and Scenic Rivers. The closest LLBG dangerous waste management unit boundary is located in the 200 East Area approximately 8 kilometers from the Columbia River, which has been proposed as a Wild and Scenic River. The LLBG are not within the viewshed of users of the Columbia River.

2.5.2.2.2 Parks, Recreation Areas, National Monuments. The LLBG are situated at least 0.4 kilometer from the nearest state or federally designated park, recreation area, or national monument.

2.5.2.2.3 Wilderness Areas. The LLBG are located at least 0.4 kilometer from any Wilderness Areas as defined by the *Wilderness Act of 1964*.

2.5.2.2.4 Farmland. The LLBG are at least 0.4 kilometer from any commercial or private prime farmland.

2.5.2.3 Residences and Public Gathering Places. This section discusses factors affecting residences and public gathering places. The LLBG are located at least 0.4 kilometer from residences and public gathering places.

2.5.2.3.1 Incineration. Incineration is not a process used at the LLBG. Therefore, this criterion is not applicable.

2.5.2.3.2 Land Use Compatibility. The Hanford Facility conforms with local land use zoning designation requirements.

2.5.2.3.3 Archeological Sites and Historic Sites. No places or objects listed on, or proposed for, national, state, or local preservation registers are known to be on or next to the LLBG. There are no known archaeological, historical, or Native American religious sites on or next to the LLBG.

3.0 TEN-YEAR COMPLIANCE HISTORY

Appendix C summarizes Notice of Compliance Violations and the associated responses. This summary and the correspondence associated with notices of compliance violations can be obtained by contacting the following:

Public Access Room H6-08
Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352
(509) 372-3411.

4.0 JUSTIFICATION OF NEED

In May 1989, the U.S. Department of Energy along with Ecology and the EPA formally entered into an agreement known as the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) (Ecology et al. 1994) for the purpose of the Hanford Facility gaining compliance with federal, state, and local laws concerning the management of waste. The operation of the LLBG supports Tri-Party Agreement milestone M-20-06 by providing a means to store and dispose of mixed waste.

The need for greater-than-90-day tank storage for LLBG leachate collection tanks is twofold. One, it could take greater than 90 days to accumulate enough leachate to fill a transport tanker. Two, availability of tankers and TSD waste sampling confirmation could delay shipments for greater than 90 days.

This NOI does not change the surface area boundaries of the LLBG. However, this NOI does reflect the need for an administrative change in reporting design capacities. Previously, the design capacity was reported on the basis of projected waste receipts instead of on the total design capacity within the surface boundaries of the LLBG (as identified in the Part A). This administrative change more accurately represents the process design capacity available for mixed waste in the LLBG.

5.0 IMPACT ON OVERALL CAPACITY AT THE HANFORD FACILITY AND THE STATE OF WASHINGTON

The current capacity for storing and/or disposing of mixed waste is limited within Washington State and the Hanford Facility. The expansion of the LLBG (i.e., tank storage of leachate and modified process design capacity) will allow for tank storage and disposal of mixed waste from waste management activities, and will comply with WAC 173-303 regulations on mixed waste. This

expansion for storage and disposal capacity supports the current onsite mission of waste management and environmental restoration and remediation.

6.0 REFERENCES

DOE, 1987, *Final Environmental Impact Statement: Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes*, Vol. 1-5, DOE/EIS-0113, U.S. Department of Energy, Washington, D.C.

DOE, 1988, *Site Characterization Plan, Consultation Draft*, DOE/RW-0164, Vol. 1, U.S. Department of Energy, Washington, D.C.

DOE-RL, 1988, *Hanford Facility Dangerous Waste Part A Permit Application*, Vols. 1 through 3, DOE/RL 88-21, U.S. Department of Energy-Richland Operations Office, Richland, Washington.

DOE-RL, 1989, *Low-Level Burial Grounds Dangerous Waste Permit Application* DOE/RL-88-20, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, EPA, and DOE, 1994, *Hanford Federal Facility Agreement and Consent Order*, Washington State Department of Ecology, U.S. Environmental Protection Agency, U.S. Department of Energy, Olympia, Washington.

ERDA, 1976, *Evaluation of Impact of Potential Flooding Criteria on the Hanford Project*, RLO-76-4, U.S. Energy Research and Development Administration-Richland Operations Office, Richland, Washington.

ICBO, 1991, *Uniform Building Code*, International Conference of Building Officials, Whittier, California.

KEH, 1993, "Design Load for Structures," HPS-SDC-4.1, Revision 11, *Hanford Plant Standards*, Kaiser Engineers Hanford Company, Richland, Washington.

NRC, 1982, *Safety Evaluation Report (Related to the Operation of WPPSS Nuclear Project) No. 2*, NUREG-0892 Supplement No. 1, U.S. Nuclear Regulatory Commission, Washington, D.C.

PNL, 1992, *Hanford Site National Environmental Policy Act (NEPA) Characterization*, PNL-6415, Revision 5, Pacific Northwest Laboratory, Richland, Washington.

WHC, 1991, *Geology and Hydrology of the Hanford Site: A Standardized Text for Use in Westinghouse Hanford Company Documents and Reports*, WHC-SD-ER-TI-003, Westinghouse Hanford Company.

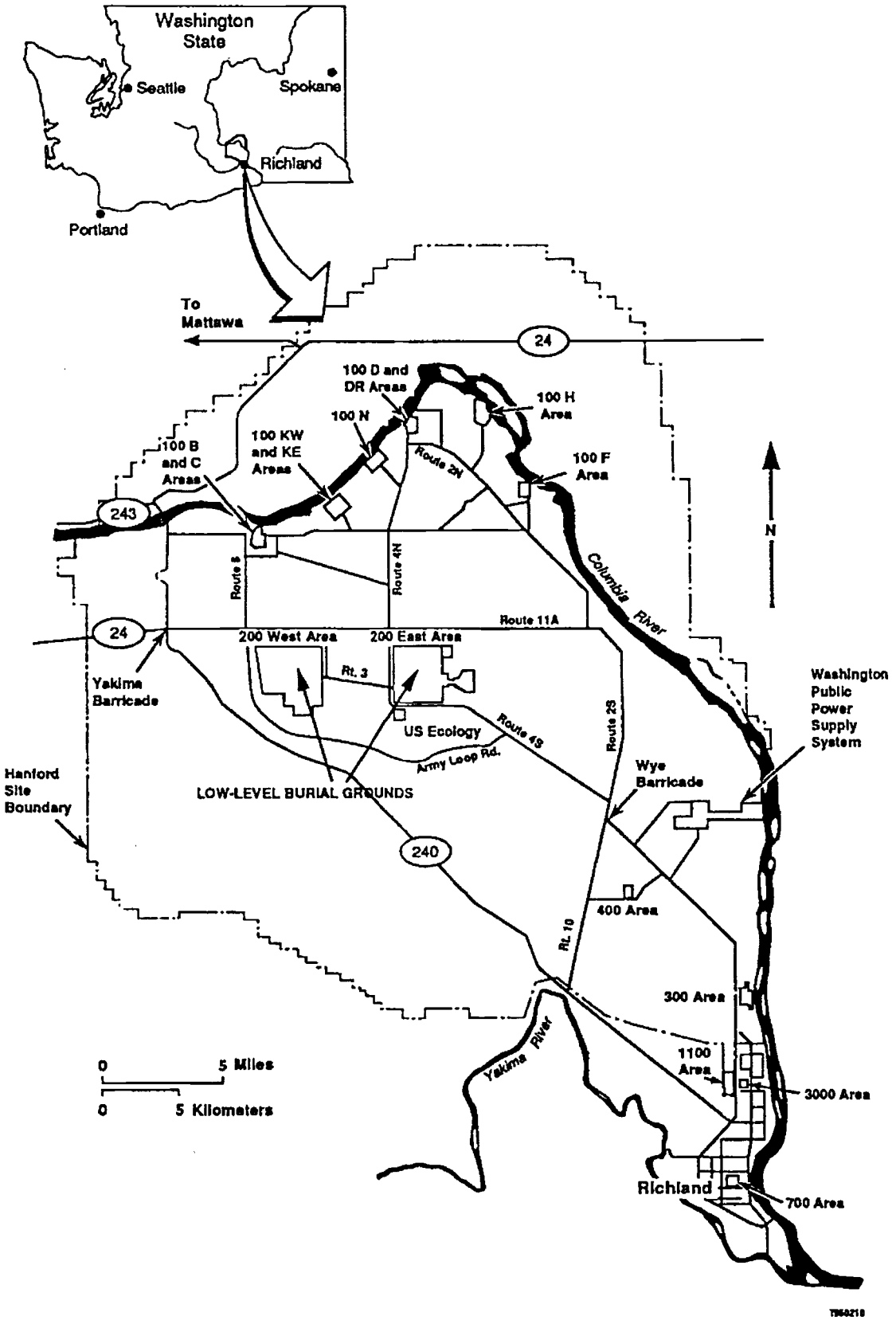

Figure 1. Hanford Site Map.

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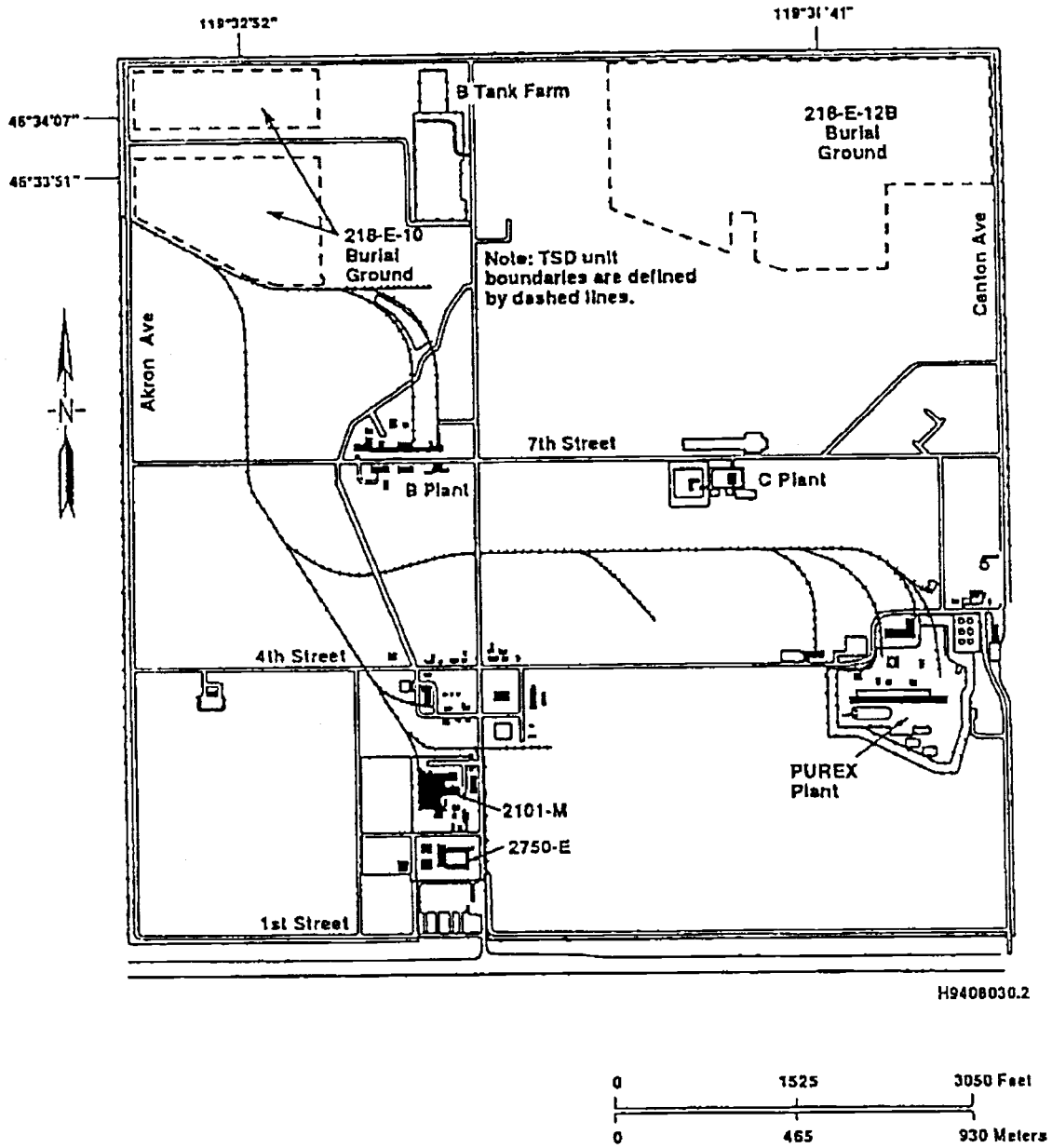

200 East Area
Low Level Burial
Grounds

Figure 2. Locations of Burial Grounds in the 200 East Area.

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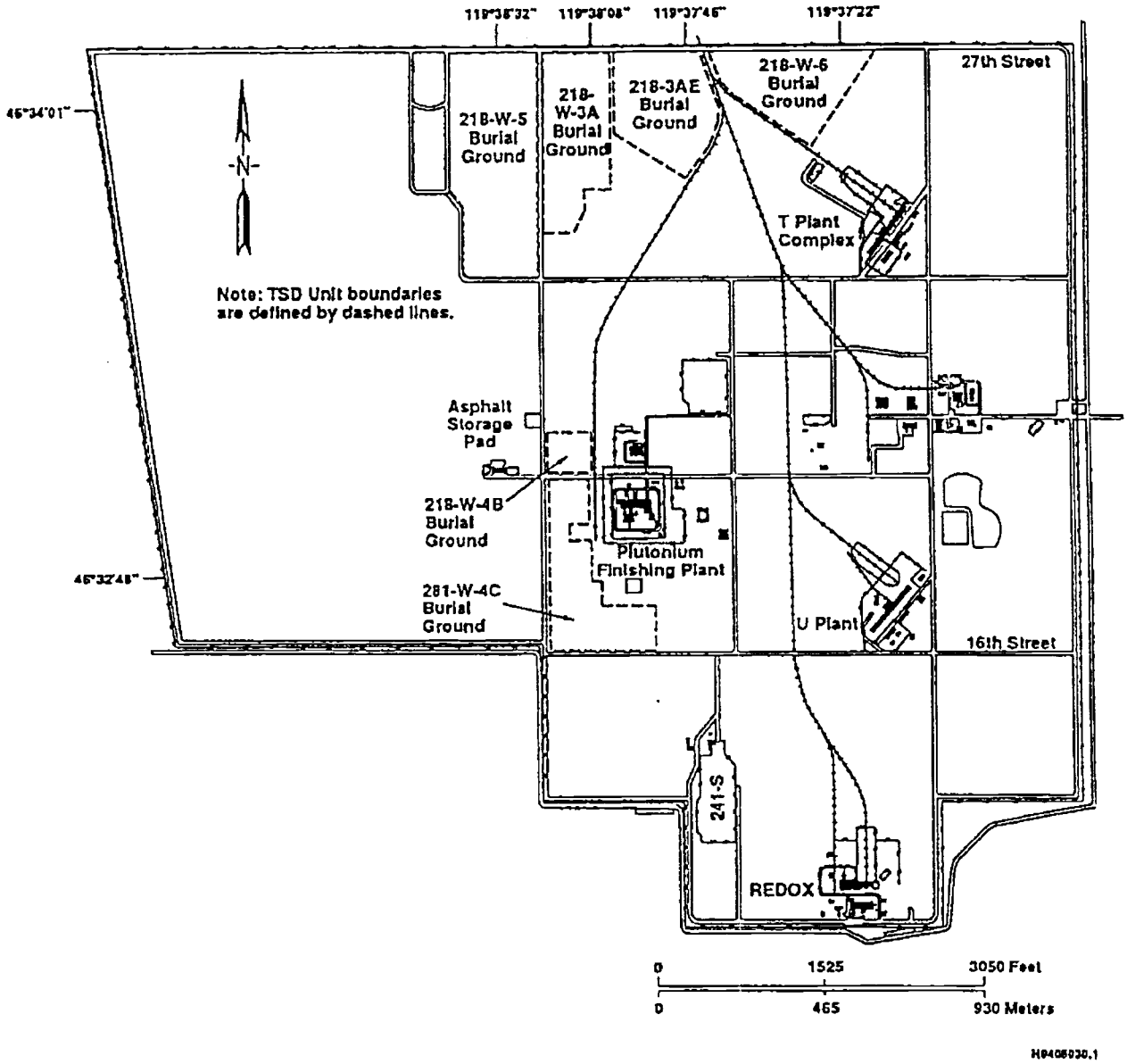

200 West Area
Low Level Burial
Grounds

Figure 3. Locations of Burial Grounds in the 200 West Area.

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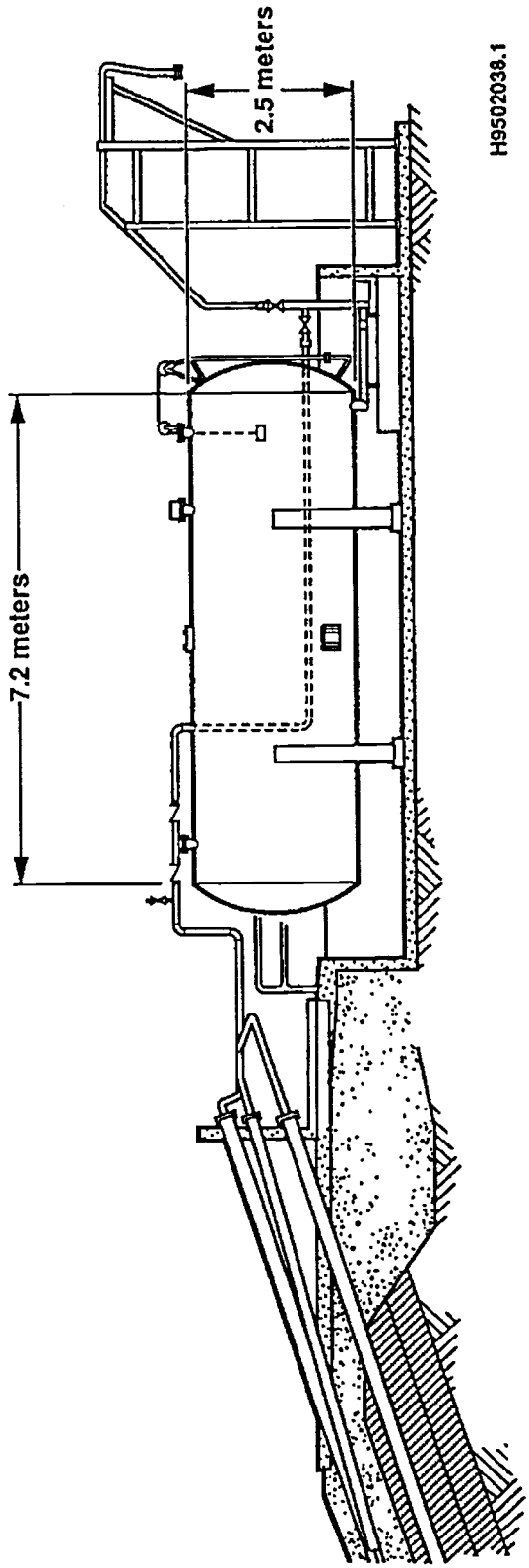

Figure 4. Typical Leachate Storage Tank for Trenches 31 and 34.

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APPENDICES

A LOCATION MAPS

B STATE ENVIRONMENTAL POLICY ACT ENVIRONMENTAL CHECKLIST

C SUMMARY OF NOTICES OF COMPLIANCE VIOLATIONS AND THE U.S. DEPARTMENT OF ENERGY, RICHLAND OPERATIONS OFFICE RESPONSES

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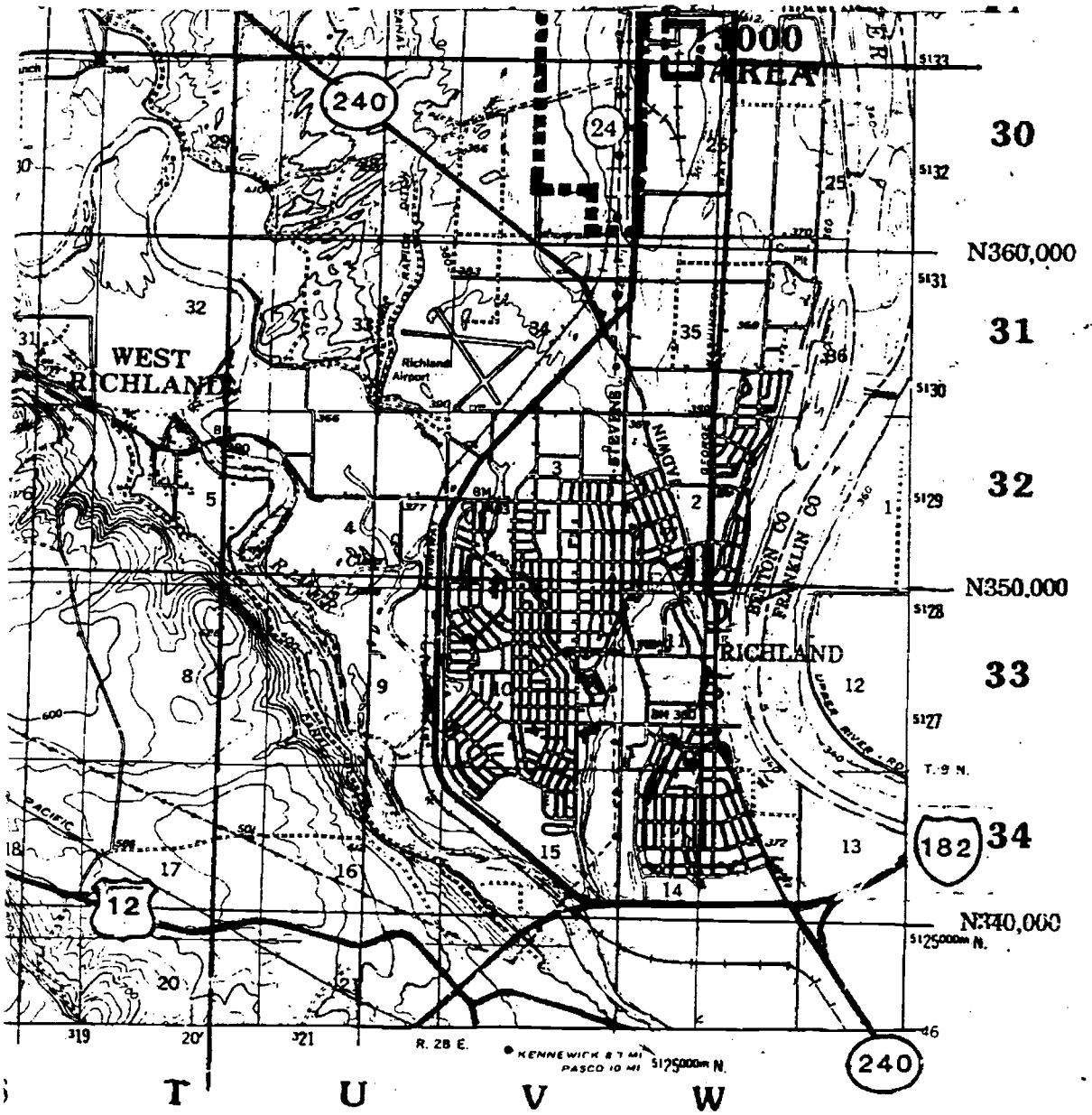
APPENDIX A

LOCATION MAPS

APPENDIX A

CONTENTS

H-6-958	General Overview of Hanford Site.
H-13-000195	200 East Area Low-Level Burial Grounds Topographic Map.
H-13-000196	200 West Area Low-Level Burial Grounds Topographic Map.



DRAWING APPROVALS	DATE
APPD FOR QUALITY ASSURANCE	
APPD	3/89
APPD	13 Mar 89
APPD	
RESPONSIBLE ENGINEER R.L. MARTELL	3/89
DRAFTING APPD	
CHECKED	3/31/89
DRAWN K.D. JUNT	3/89

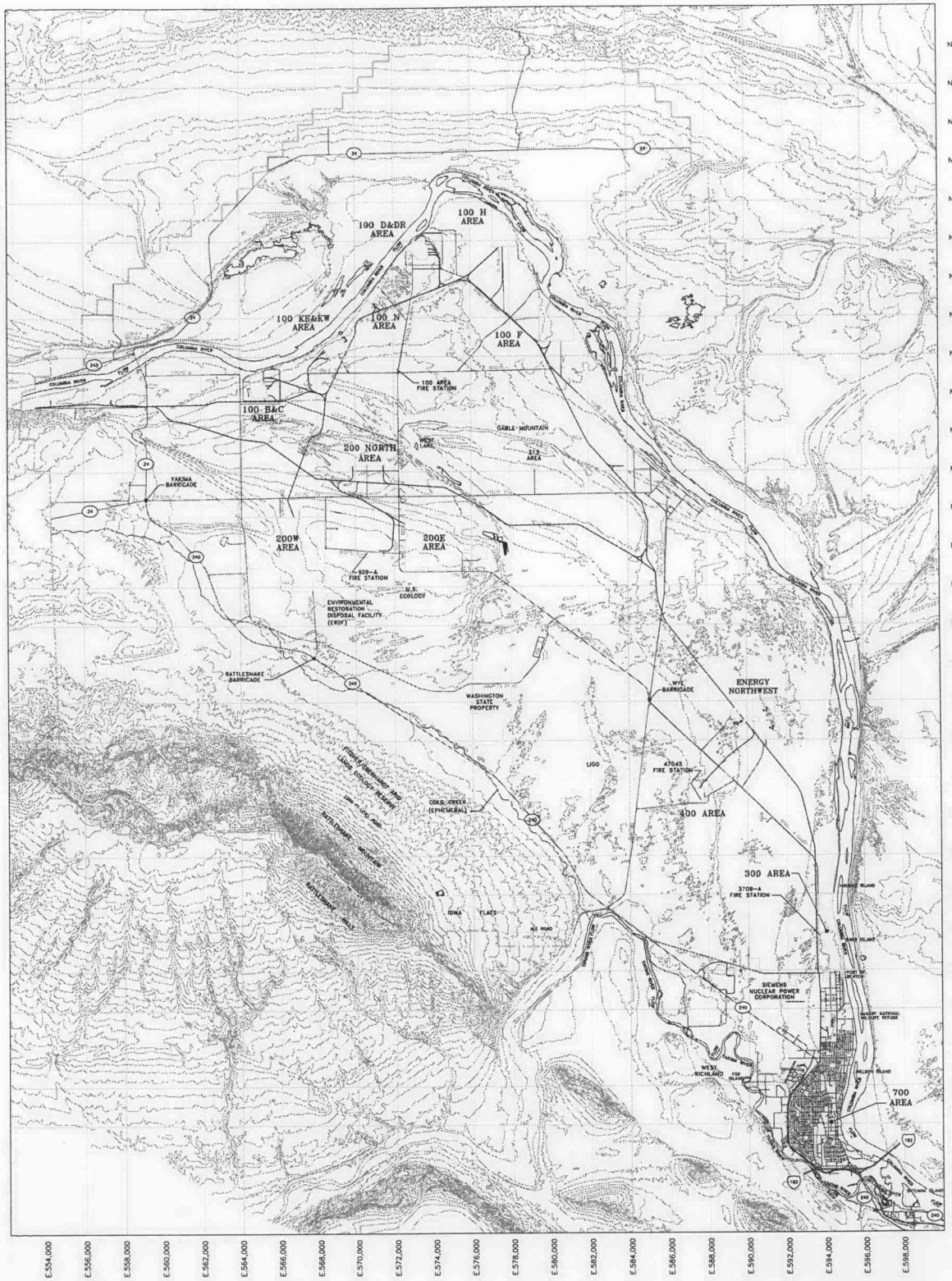
U. S. Department of Energy
Richland Operations Office

Westinghouse Hanford Company

GENERAL OVERVIEW OF HANFORD SITE

SCALE	DWG NO	INDEX NO.
AS SHOWN	600 GEN	0100

CLASSIFICATION	BY	DRAWING NO	SHEET NO.	SHEETS
NONE	NOT REQ'D	H-6-958	1	1



LEGEND

MAJOR ROADS	
DIRT ROADS	
RAILROADS	
HANFORD SITE BOUNDARY	
INTERSTATE ROUTE	182
WASHINGTON STATE ROUTE	240
WASHINGTON STATE GRID (METERS)	E.550,000 , N.105,000
CONTOURS	
COLD CREEK (EPHEMERAL)	

SITE PLAN

SCALE: 1:85000
1 cm = 850 meters

0 850 1700 3400 5100 6800 METERS

0 3000 12000 24000 36000 48000 FEET

0 1 3 5 10 MILES

GENERAL NOTES

1. AREA WITHIN HANFORD SITE THAT IS NOT SPECIFICALY IDENTIFIED IS CONSIDERED THE 600 AREA.
2. PERMISSION AND APPROVAL TO CHANGE THIS MAP MUST BE OBTAINED BECAUSE THIS MAP WAS SUBMITTED WITH HANFORD FACILITY PERMITS TO THE WASHINGTON STATE DEPARTMENT OF ECOLOGY.

THIS MAP IS TO BE USED FOR REFERENCE PURPOSES ONLY. DO NOT USE THIS MAP FOR CONSTRUCTION PURPOSES.

REV NO	DESCRIPTION	REV DATE	DWN DATE	DFTG APVD DATE	COD ENGR	OTHER	OTHER
7	DIRECT REVISION PER ECN-656622.	BAM 5/00					

REVISIONS

CADFILE | CADCODE

		DATE
DRAWN	K.D. JUNT	3/89
CHECKED	D.R. COWEN	3/3/89
DFTG APVD	R.L. MARTELL	3/89
COD ENGR	D.S. ARMSTRONG	3/89
APVD	M.M. MCCARTHY	3/13/89
APVD	S.M. PRICE	3/17/89
APVD		
APVD		
APVD		
APVD		

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
Fluor Daniel Northwest

GENERAL OVERVIEW OF HANFORD SITE

SIZE F | BLDG NO | INDEX NO | DWG NO H-6-958 | REV 7
SCALE SHOWN | CDF 101111 | SHEET 1 OF 1

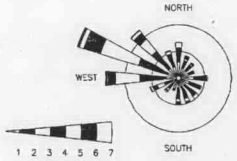
DWG NO | TITLE | REFERENCES
DRAWING TRACEABILITY LIST | REF NUMBER | TITLE | NEXT USED ON | END ITEM

DWG PRINT DATE | COMMENT PRINT DATE

H-6-958

WIND ROSE FOR: 200E AREA
% CALM WINDS = .9

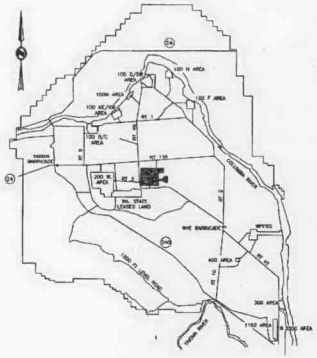
PERIOD COVERED
12/01/85 - 12/31/87
STATION NO. 6



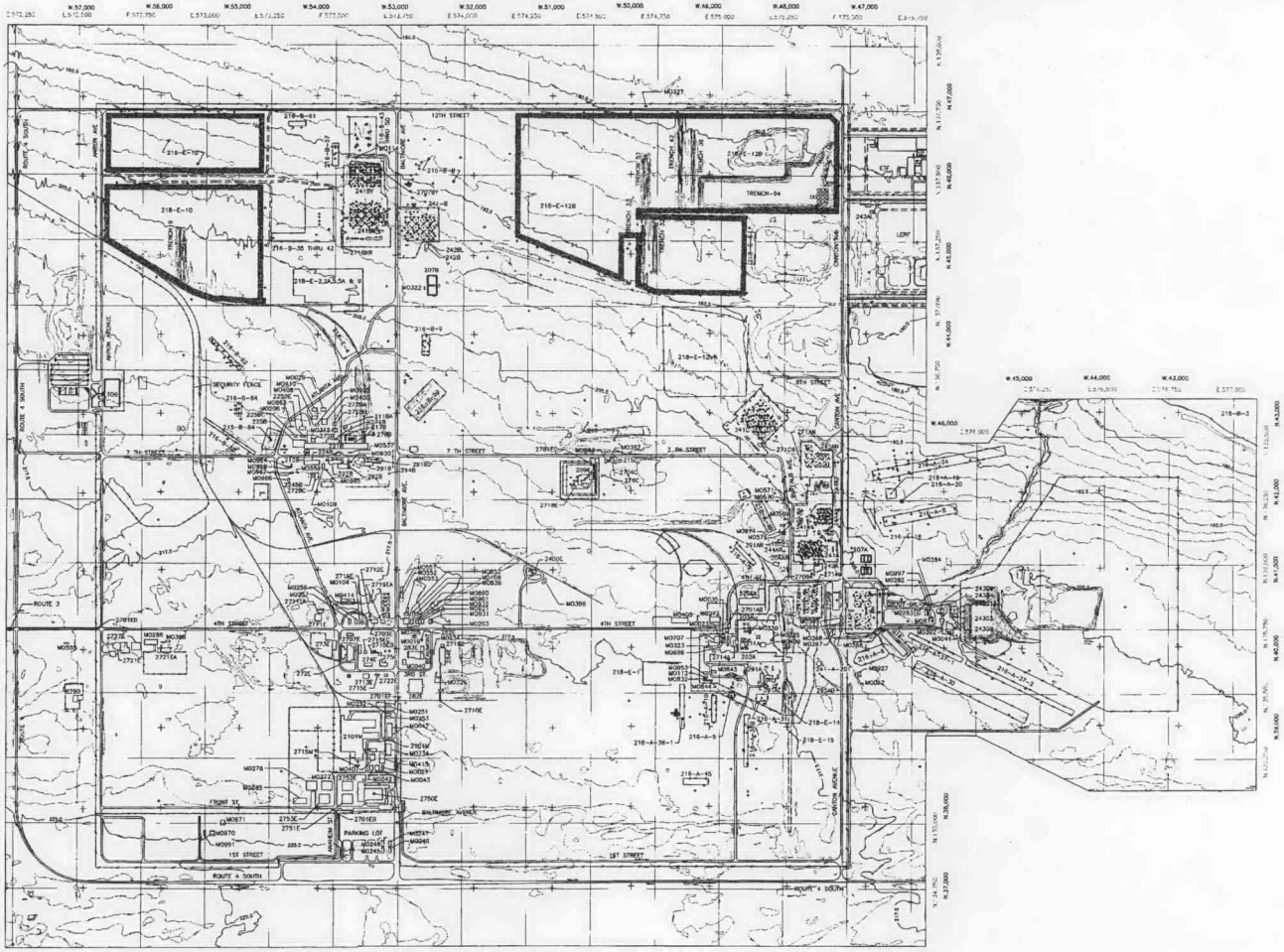
PADDLES INDICATE DIRECTION WIND IS COMING FROM.
RADIAL GRIDS REPRESENT 5.0% AND 10.0% OCCURRENCE.

WIND CLASS	MILES/HOUR
1	>1.0 - 3.0
2	4.0 - 7.0
3	8.0 - 12.0
4	13.0 - 18.0
5	19.0 - 24.0
6	25.0 - 31.0
7	32.0 +

WIND ROSE



KEY PLAN
SCALE: NONE



LEGEND

- W 47,000 / N 43,000 — HANFORD PLANT COORDINATES (FEET)
- E 576,250 / N 136,000 — WASHINGTON STATE COORDINATES (METERS)
- INDEX CONTOUR (METERS)
- IMPROVED ROAD
- UNIMPROVED ROAD
- DIRT ROAD
- SIDEWALKS\PARKING LOTS
- RAILROADS
- RETAINING WALL
- BUILDINGS/STRUCTURES & TOWERS
- 242-A — BUILDING NUMBER
- MOBILE OFFICES
- SECURITY,WARNING,MISC FENCES
- POST & CHAIN (CRIB,BURIAL GROUND FENCES)
- PERIMETER FENCES
- WELL
- TANKS
- 216-A-42 — CRIB
- 218-E-10 — BURIAL GROUND

GENERAL NOTES

1. THIS MAP IS BASED ON AERIAL PHOTOGRAPHY FLOWN ON 6-24-89. THE ORIGINAL TOPOGRAPHIC MAP WAS PREPARED BY MERRICK & COMPANY AND CERTIFIED TO MEET NATIONAL MAP ACCURACY STANDARDS. OFFICIAL COPIES OF THE MERRICK MAPS THAT SHOW THE CERTIFICATE ARE LOCATED IN THE WESTINGHOUSE ENGINEERING FILES AS DRAWING NUMBERS H-2-79476 SHEET 1 AND H-2-79477 SHEET 1 THRU 37. NAMES OF ADDITIONAL FEATURES AND THE TITLE BLOCK WERE ADDED BY WESTINGHOUSE HANFORD COMPANY.

2. WASHINGTON STATE PLANE COORDINATE SYSTEM: THE OFFICIAL COORDINATE SYSTEM AS DEFINED BY THE REVISED CODE OF WASHINGTON (RCW). THE HANFORD SITE LIES WITHIN THE WASHINGTON COORDINATE SYSTEM, SOUTH ZONE. THIS GRID COVERS THE ENTIRE SITE AND USES X (EASTINGS) AND Y (NORTHINGS) COORDINATES.

   HORIZONTAL DATUM: NAD-83 LAMBERT PROJECTION. WASHINGTON STATE PLANE COORDINATES ARE SHOWN IN METERS.

   CONTOUR INTERVAL: 2.5 METERS.

3. HANFORD PLANT GRID: A LOCAL GRID SYSTEM WITH ITS INITIAL POINT NORTHEAST OF THE 400 AREA. IT COVERS 200 EAST AND 200 WEST AREA AS WELL AS GENERAL SITE WORK SUCH AS WELLS AND BURIAL GROUNDS. HANFORD COORDINATES ARE SHOWN IN FEET.

4. THE 200 AREA TOPOGRAPHIC MAPS ARE SCHEDULED TO BE REVISED JUNE, 1995. THIS MAP IS PROVIDED IN PRELIMINARY FORMAT UNTIL THE REVISED IS COMPLETED.

SITE PLAN
SCALE: 1:7000

0 70 140 280 420 560
1 cm = 70 meters

THIS MAP IS TO BE USED FOR REFERENCE PURPOSES ONLY. DO NOT USE THIS MAP FOR CONSTRUCTION PURPOSES.

DWG NO	TITLE
H-13-000205 THRU H-13-000207	200 AREA TOPOGRAPHIC MAP
H-13-000213 THRU H-13-000218	200 AREA TOPOGRAPHIC MAP
H-13-000221 THRU H-13-000224	200 AREA TOPOGRAPHIC MAP
H-13-000229 THRU H-13-000231	200 AREA TOPOGRAPHIC MAP

DRAWING TRACEABILITY LIST — REF NUMBER / TITLE — REFERENCES

REV NO	DESCRIPTION	REV BY DATE	CHK BY DATE	APPD DATE	COG ENGR	OTHER	OTHER
					APPROVALS BY/DATE		

REVISIONS

NEXT USED DN: H-13-000200 | CADFILE: N000195A | CADCODE: D05:6.0:AD2:12:0:SS

DRAWN	RAFAEL TORRES	4-12-95
CHECKED		4-13-95
DPTG APVD		4-17-95
CGE ENGR		4/18/95
APVD		4-12-95
APVD		
APVD		
APVD		
APVD		

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
Westinghouse Hanford Company

200 EAST AREA LOW-LEVEL BURIAL GROUND TOPOGRAPHIC MAP

SIZE	BLDG NO	INDEX NO	DWG NO	REV
F	200G	0103	H-13-000195	0

SCALE: SHOWN FILE: 811705 SHEET 1 OF 1

CONC FINAL ☐ DATE — COMMENT FINAL ☐ DATE

54-6000-027(5/89)

DWG NO H-13-000195 1 = 1 "0

SITE PLAN

SCALE: 1:7500

0 75 150 300 450 600

1 cm = 75 meters

GENERAL NOTES

1. THIS MAP IS BASED ON AERIAL PHOTOGRAPHY FLOWN ON 6-24-89. THE ORIGINAL TOPOGRAPHIC MAP WAS PREPARED BY MORRICK & COMPANY AND CERTIFIED TO MEET NATIONAL MAP ACCURACY STANDARDS. OFFICIAL COPIES OF THE MERRICK MAPS THAT SHOW THE CERTIFICATE ARE LOCATED IN THE WESTINGHOUSE ENGINEERING FILES AS DRAWING NUMBERS H-2-79476 SHEET 1 AND H-2-79477 SHEET 1 THRU 37. NAMES OF ADDITIONAL FEATURES AND THE TITLE BLOCK WERE ADDED BY WESTINGHOUSE HANFORD COMPANY.

2. WASHINGTON STATE PLANE COORDINATE SYSTEM. THE OFFICIAL COORDINATE SYSTEM AS DEFINED BY THE REVISED CODE OF WASHINGTON (RCW). THE HANFORD SITE LIES WITHIN THE WASHINGTON COORDINATE SYSTEM, SOUTH ZONE. THIS GRID COVERS THE ENTIRE SITE AND USES X (EASTINGS) AND Y (NORTHINGS) COORDINATES.

   HORIZONTAL DATUM: NAD-83 LAMBERT PROJECTION. WASHINGTON STATE PLANE COORDINATES ARE SHOWN IN METERS.

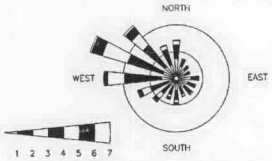
   CONTOUR INTERVAL: 2.5 METERS.

3. HANFORD PLANT GRID. A LOCAL GRID SYSTEM WITH ITS INITIAL POINT NORTHEAST OF THE 400 AREA. IT COVERS 200 EAST AND 200 WEST AREA AS WELL AS GENERAL SITE WORK SUCH AS WELLS AND BURIAL GROUNDS. HANFORD COORDINATES ARE SHOWN IN FEET.

4. THE 200 AREA TOPOGRAPHIC MAPS ARE SCHEDULED TO BE REVISED JUNE, 1995. THIS MAP IS PROVIDED IN PRELIMINARY FORMAT UNTIL THE REVISED IS COMPLETED.

WIND ROSE FOR: 200E AREA
% CALM WINDS = .3

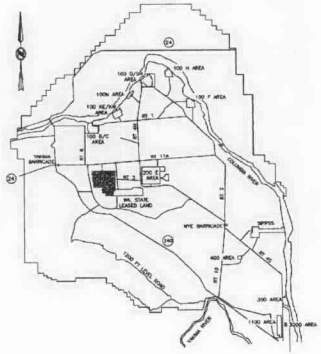
PERIOD COVERED
12/01/85 – 12/31/87
STATION NO. 21



PADDLES INDICATE DIRECTION WIND IS COMING FROM.
RADIAL GRIDS REPRESENT 5.0% AND 10.0% OCCURRENCE.

WIND CLASS	MILES/HOUR
1	>1.0 – 3.0
2	4.0 – 7.0
3	8.0 – 12.0
4	13.0 – 18.0
5	19.0 – 24.0
6	25.0 – 31.0
7	32.0 +

WIND ROSE



KEY PLAN

SCALE: NONE

LEGEND

- X 47,000 / Y 12,000 — HANFORD PLANT COORDINATES (FEET)
- E 576,250 / N 135,000 — WASHINGTON STATE COORDINATES (METERS)
- INDEX CONTOUR (METERS)
- IMPROVED ROAD
- UNIMPROVED ROAD
- DIRT ROAD
- SIDEWALKS\PARKING LOTS
- RAILROADS
- RETAINING WALL
- INJ. 1 — INJECTION WELL
- BUILDINGS/STRUCTURES & TOWERS
- 242-A — BUILDING NUMBER
- MOBILE OFFICES
- SECURITY,WARNING,MISC FENCES
- POST & CHAIN (CRIB,BURIAL GROUND FENCES)
- PERIMETER FENCES
- WELL
- TANKS
- 216-A-42 — CRIB
- 218-W-10 — BURIAL GROUND
- 218-W-10 — BURIAL GROUND

APR 13 1995

THIS MAP IS TO BE USED FOR REFERENCE PURPOSES ONLY.
DO NOT USE THIS MAP FOR CONSTRUCTION PURPOSES.

REF NUMBER	TITLE
H-13-000201 THRU H-13-000230	200 AREA TOPOGRAPHIC MAP
H-13-000206 THRU H-13-000211	200 AREA TOPOGRAPHIC MAP
H-13-000217 THRU H-13-000218	200 AREA TOPOGRAPHIC MAP
H-13-000225 THRU H-13-000227	200 AREA TOPOGRAPHIC MAP
H-13-000233	200 AREA TOPOGRAPHIC MAP
H-13-000234	200 AREA TOPOGRAPHIC MAP

DWG NO — TITLE — REFERENCES
DRAWING TRACEABILITY LIST — NEXT USED ON H-13-003200

REV NO	REV DATE	DESCRIPTION	REV CHKD	REV APPD	CSR DATE	CSR APPD	CSE DATE	CSE APPD	OTHER	OTHER
REVISIONS										

APPROVALS BY/DATE

CADFILE N000196A — CADCODE D25-E.0.AC02.12.0.SS

DRAWN RAFAEL TORRES 4-12-95
CHECKED 4-13-95
SYS. APPD. 4-17-95
CAE RDB 4/19/95
APPD. 4-13-95
APPD.
APPD.
APPD.
APPD.
APPD.

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
Westinghouse Hanford Company

200 WEST AREA LOW-LEVEL BURIAL GROUND TOPOGRAPHICAL MAP

SIZE	BLDG. NO	INDEX NO	DWG NO	REV
F	200G	0103	H-13-000196	0

SCALE SHOWN — EDF 611704 — SHEET 1 OF 1

DWG NO H-13-000196 REV 0

54-8000-027(5/89)

APPENDIX B

STATE ENVIRONMENTAL POLICY ACT ENVIRONMENTAL CHECKLIST

The SEPA Environmental Checklist was submitted December 1989 with the *Low-Level Burial Grounds Dangerous Waste Permit Application*, DOE/RL-88-20 (DOE-RL 1989).

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APPENDIX C

SUMMARY OF NOTICES OF COMPLIANCE VIOLATIONS AND THE U.S. DEPARTMENT OF ENERGY, RICHLAND OPERATIONS OFFICE RESPONSES

This summary is prepared and maintained by Westinghouse Hanford Company - Environmental Services.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
Hanford	5/03/84	RCRA	Formal	Closed	Ecology	State Order DE 84-267 required the U.S. Department of Energy (DOE) to allow the state to access the Hanford Site to conduct formal compliance assessments of nonradioactive hazardous waste facilities.	The first comprehensive compliance inspection of Hanford by the State of Washington occurred on June 11-14, 1985. Since then, Ecology has conducted numerous formal compliance assessments of the nonradioactive hazardous waste facilities.
Hanford	12/26/84	RCRA	Formal	Closed	Ecology	State Order DE 84-720 covered several interim status compliance actions associated with nonradioactive hazardous waste facilities.	The action to achieve compliance with this order is complete. Part A applications for the facilities in question were submitted in July 1985. This date met the schedule specified in the order.
Hanford	1/29/85	SWPCA	Formal	Closed	Ecology	State Order DE 85-130 covered alleged violations of state water quality statute Revised Code of Washington (RWC) 90.48 related to Plutonium Finishing Plant (PFP) chemical sewer releases.	DOE did not acknowledge the applicability of state statutes to its activities at that time. Therefore, no specific steps were taken in response to the order, although a discussion of the circumstances was provided as a matter of comity.
Hanford	1/15/86	--	Formal	Closed	Ecology	State Order DE 85-677 covered alleged violations of state water quality statute RCW 90.48 related to Plutonium Uranium Extraction (PUREX) chemical sewer releases.	By May 1, 1986, all facility modifications and procedural changes specified in the order were in place.
Hanford	2/06/86	--	Formal	Closed	Ecology/EPA	State Orders DE 86-132 and DE 86-133 and EPA Order 1085-10-07-3008 (followed by Consent Order with the State, DE 86-133) covered RCRA waste accumulation, groundwater monitoring, and interim status closure plans.	DOE, Richland Operations Office (RL), submitted a plan to Ecology on March 7, 1986, assuring that the storage of dangerous wastes was conducted in accordance with state regulations. Groundwdater monitoring networks were installed at various facilities. The groundwater sampling programs associated with these groundwater monitoring networks are in compliance with RCRA. The required closure/post-closure plans were submitted to Ecology in November 1985.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
Hanford	11/21/86	TSCA	Formal	Closed	EPA	A Complaint and Notice of Opportunity for Negotiation was issued against RL alleging violations of provisions for use of hydraulic systems in the PCB regulations. The complaint followed a May 21, 1986, inspection by the U.S. Environmental Protection Agency (EPA) that was conducted to determine whether activities were in compliance with PCB regulations.	RL responded to the Complaint on January 7, 1987, with verification that the 3760 Building reservoir was drained and refilled with new, non-PCB hydraulic oil on December 4, 1986. RL stated in the letter that they believed no further action or documentation was required.
Hanford	10/30/87	RCRA	Formal	Closed	Ecology	State Order DE 87-295 covered state dangerous waste releases (mixed waste) to the 216-A-36B Crib.	All discharges were stopped and the crib was permanently closed to use. Wells drilled in accordance with dates set forth in the order (June 1, 1986) and regular sampling are ongoing. The part A permit for the facility was submitted February 2, 1988.
Hanford (WHC)	4/11/89	RCRA	Formal	Closed	Ecology	Ecology notified RL and Westinghouse Hanford Company (WHC) of a Notice of Violation within three areas based on their April 10-11, 1989, inspection of B Pond and the Nonradioactive Dangerous Waste Landfill.	Three findings were identified: (1) the need to construct at least a continuous single-strand rope fence with warning signs around B Pond and each of the three associated lobes; (2) the need to repair a 25-foot breach in the security fence surrounding the Nonradioactive Dangerous Waste Landfill; and (3) the need to evaluate the wooden pier over the 216-A-29 Ditch for stability and to establish load limits for its use. The single-strand rope fence with appropriate warning signs has been installed around B Pond and its three lobes. The fence at the Nonradioactive Dangerous Waste Landfill has been repaired. The wooden pier over the 216-A-29 Ditch has been taken out of service. "DANGER - KEEP OFF" signs have been posted, and the structures have been barricaded.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
Hanford (WHC)	6/12/89	RCRA	Formal	Closed	Ecology	Ecology notified RL and WHC of a Notice of Violation within two areas based on their June 12, 1989, inspection of the 183-H Basins and 216-S-10 Pond and Ditch.	Two findings were identified: (1) the need to construct at least a continuous single-strand rope fence with appropriate warning signs around the 216-S-10 Pond and Ditch before August 15, 1989; and (2) the need to stabilize two corroded and leaking drums containing mixed waste located at the 183-H Basins. A single-strand barrier rope was installed with the appropriate warning signs around the 216-S-10 Pond and Ditch. The contents of the leaking drums were removed and repackaged in appropriately prepared drums. An inspection was conducted on the other drums containing dangerous waste at the 183-H facility and no other irregularities were noted. The Central Waste Complex, which receives 183-H dangerous waste drums, was inspected and no irregularities were noted. An analysis also was conducted on the probable cause of the corrosive material found on the drums. The results were presented to Ecology.
Hanford (WHC)	7/20/89	RCRA	Formal	Closed	Ecology	Ecology notified RL and WHC of a Notice of Violation within three areas based on their July 20, 1989, inspection of the 216-A-29 Ditch, 216-B Pond, and the Central Waste Complex.	Three findings were identified: (1) the need to construct, at a minimum, a continuous single-strand chain fence with appropriate warning signs around the 216-A Ditch by September 30, 1989; (2) four radiation warning signs were found unsecured on the ground near the 216-A-29 Ditch and 216-B Pond facilities; and (3) 10 waste drums at Central Waste Complex were found to have exceeded the 90-day accumulation period while at the generating facility.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
							A continuous single-strand barrier was installed around the 216-A-29 Ditch and 216-B Pond. The unsecured signs have been reposted. Periodic inspections will be conducted to identify necessary corrective actions such as unsecured signs. The 10 waste drums that exceeded the 90-day accumulation period were identified as originating from PFP. These drums were partially characterized and transferred to the Central Waste Complex for proper storage. A letter identifying the dangerous and mixed waste satellite and less-than-90-day accumulation areas on the Hanford Site was transmitted to Ecology.
Hanford (WHC)	4/25/90	HMTA	Formal	Closed	DOT	On April 25, 1990, the Department of Transportation issued a Federal Railroad Administration Probable Notice of Violation against WHC for violating the Hazardous Materials Transportation Act, and fined WHC $3,000.	The procedures were corrected to the satisfaction of DOT and, after negotiations, the fine was reduced to $2,100, which was paid by WHC.
Hanford (WHC)	12/10/90	RCRA	Formal	Closed	Ecology	On December 10, 1990, Ecology notified RL and WHC of a Notice of Noncompliance for returning 68 problem drums from the Central Waste Complex to the generator, the 183-H Basins. Ecology did not take any formal action, but requested that the 68 drums be repackaged and returned to the Central Waste Complex before December 25, 1990.	RL received concurrence from Ecology to extend the deadline to January 15, 1991. The repackaging of the drums was initiated on December 18, 1990; however, this effort was hampered by unfavorable weather conditions. Eight additional working days were lost due to high winds, snow, and rain. All 68 of the problem drums were subsequently repackaged and returned to the Central Waste Complex by January 25, 1991. Ecology was both verbally notifed by WHC and officially notifed by RL of this additional delay.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
Hanford (WHC)	10/07/91	CAA	Informal	Closed	DOH	DOH conducted a technical review of radioactive air emissions from PFP July 16-18, 1991. One finding and five observations were identified.	A letter from DOH to RL on September 19, 1994, formally closed this item.
Hanford (WHC)		NPDES	Informal	Closed	Fisheries	In March 1991, RL began construction of a new filter backwash pond in the 300 Area. A component of this construction project was a new outfall to the Columbia River. Army Corps of Engineers' approval was secured for the outfall. An NPDES permit has been applied for, and all the necessary NEPA documentation is in place; however, RL failed to apply for the necessary hydraulic project permit approval from the Washington State Department of Fisheries (Fisheries) and for a temporary water quality modification permit from Ecology before construction of the outfall.	Fisheries performed an inspection of the construction project in June 1991. As a result of the inspection, Fisheries recorded this activity as a violation because a portion of the construction was performed below the high-water mark on the Columbia River without a permit. RL was instructed by Fisheries to do the following: (1) place a screen on the outlet of the outfall to prevent fish from trying to swim up the pipe; (2) repair the damage to the vegetation that occurred during construction; and (3) contact Ecology on whether a water quality modification permit should be applied for after construction is complete. A screen was placed on the outfall in December. A new hydraulic project permit has been received to allow for new trees to be planted. Trees were planted to replace the damaged vegetation during March. Ecology has indicated construction of the outfall has already occurred. Although this was considered a violation, no citation was issued to RL or its contractors. Fisheries also stated that there was no significant environmental impact due to the construction of this outfall.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
Hanford (WHC)	5/14/92	RCRA	Informal	Open	Ecology	Ecology issued an inspection report for Tank 241 -SY-101 that alleges RL was in violation of State Dangerous Waste Regulations (WAC 173-303). These violations included the failure to inspect monitoring systems, failure to provide and operate adequate leak detection, failure to allow inspectors access to training records, and failure to properly identify personnel in the training plan.	RL has issued three responses to the state regarding the alleged violations according to the schedule in the inspection report. RL has completed all corrective actions as required by Ecology. No formal notification indicating satisfactory completion of the corrective actions has been received by Ecology. Correspondence from Ecology in October 1994 indicated this item would remain open until a followup inspection could occur.
Hanford (WHC)	7/16/92	RCRA	Informal	Closed	Ecology	Ecology issued an inspection report for an overflow of PUREX tank F18. The primary violations that were alleged included lack of spill reporting, failure to inspect monitoring systems, and lack of adequate secondary containment and overfill prevention controls.	A letter was sent April 28, 1993, from Ecology to RL and WHC stating formal closure of this item.
Hanford (WHC)	8/05/92	CAA	Informal	Open	DOH	DOH conducted an audit of 200 East Area Tank Farms during March and April 1992 and identified 21 findings, 10 observations, and 9 best management practices related to airborne radioactive emissions from the tank farms.	The primary findings centered around potential shortcomings in compliance with the reasonably available control technology engineering standard. RL has completed corrective actions to close these findings. A response was sent to DOH in November 1992 (corresondence number 9205905R1). On September 2, 1994, DOH sent a letter to RL indicating that 10 findings were still open, and that the remaining observations (now called findings Level IV) and BMPs were closed. The letter requested that the remaining open items be completed by November 1, 1994. Tank farms personnel met with DOH on November

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
							8, 1994, to discuss the original responses and were unable to close any of the items at that time. They met again on November 22, 1994, to discuss a closure plan. Tank farms personnel agreed to submit responses by January 31, 1995. On March 3, 1995, DOH sent RL a letter closing three findings. The letter stated DOH was unsatisfied with the other responses to the findings, and provided additional guidance to respond to these items.
Hanford (WHC)	9/22/92	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for T Plant that alleges RL and WHC were in violation of WAC 173-303. These violations included failure to meet waste generator and accumulation standards such as recordkeeping inspections, use and management of containers, waste designation, and spills and discharges.	RL and WHC have issued a response according to the schedule described in the inspection report. Most corrective actions have been completed. Ecology has noted T Plant's efforts to resolve their violations and has officially closed this enforcement action.
Hanford (WHC)	9/29/92	CAA	Informal	Closed	DOH	DOH issued a report detailing 15 action items from an investigation concerning an unresolved safety question at the B Plant main stack ventilation system.	These action items included providing a response to the following: improper notification of DOH for emission control system modifications, potentially inadequate emission control system, and improper ventilation sealing systems. A response was provided by RL within the designated 45-day time period. Five of the action items have been completed to the satisfaction of DOH. Closure of the remaining 10 action items will occur after completion of corrective actions and ongoing negotiations with DOH. A followup inspection occurred on June 22, 1994, and on September 16, 1994, DOH sent a letter to RL formally closing this inspection.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
Hanford (WHC)	10/06/92	CAA	Informal	Closed	DOH	DOH issued a report for an audit performed at the Uranium Trioxide Facility that identified five minor findings.	These findings were related to sampling data collection, data reporting, and monitoring equipment calibration. RL issued a response within the designated 45-day time period. Two of the findings have been closed to the satisfaction of DOH. DOH sent a letter to RL (correspondence #9401923) dated February 11, 1994, to close the remaining items idetified during the surveillance.
Hanford (WHC)	10/23/92	TSCA	Formal	Closed	EPA	The EPA issued a Notice of Noncompliance based on an inspection conducted in September 1991. One violation related to the cleanup of a PCB spill was identified.	On November 13, 1992, RL responded to the Notice of Noncompliance. RL stated in the response that the cleanup of the PCB spill was completed on September 28, 1991, not October 1, 1991, as alleged in the Notice of Noncompliance. RL also outlined corrective actions to ensure that cleanup of PCB spills are initiated and completed within the required 48 hours. On November 25, 1992, EPA sent a letter to RL stating they were satisfied with RL's response and corrective actions and closed the issue.
Hanford (KEH)	10/27/92	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter to RL and Kaiser Engineers Hanford (KEH) alleging violations of WAC 173-303. These violations included failure to meet the waste generator and accumulation standards such as waste designation, personnel training, recordkeeping, and the use of a management of containers.	RL and KEH issued a response within the designated time period. A letter mailed on January 14, 1993, from Ecology to RL formally closed this item.
Hanford (PNL)	10/30/92	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for the 305-B storage facility alleging RL and Pacific Northwest Laboratory (PNL) are in violation of	The violations included improper waste designation, an inadequate contingency plan, an inadequate waste inventory, improper

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
						WAC 173-303.	container labeling, and improper storage of waste according to their fire code. RL and PNL issued a response that disputed all findings. These findings were resolved in a letter sent from Ecology to RL on April 7, 1993.
Hanford (WHC)	11/12/92	RCRA	Informal	Closed	Ecology	Ecology issued a letter alleging that RL and WHC are in violation of WAC 173-303. These violations included leak detection, lack of secondary containment, delayed notification and reporting, and inadequate personnel training at the single-shell tanks.	Ecology also prepared a Tri-Party Agreement change control form establishing enforceable milestones to address the violations. RL and WHC have issued a response requesting that negotiations begin to address the proposed milestones.
Hanford (WHC)	1/15/93	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for issues related to the storage of mixed waste in the 241 -SY-101 Tank Farm.	The violations noted included exceeding the waste accumulation limit of 120 days, and compliance problems associated with generator waste storage. RL and WHC have issued a formal response. No additional actions are necessary.
Hanford (WHC)	2/02/93	CAA	Formal	Closed	DOH	DOH issued a Notice of Violation (NOV) for radioactive air emission issues related to the proposed fuel encapsulation activities at the 100-KE fuel storage basins.	The NOV stated that RL and WHC have initiated work that directly supports fuel encapsulation without approval of DOH. The NOV formally directed RL and WHC to stop all work at the 100-KE Basins immediately. RL and WHC formally responded to the NOV, and a Notice of Construction permit was issued in the fall of 1993.
Hanford (WHC)	2/03/93	CAA	Formal	Superce	EPA	EPA issued a Compliance Order to RL and its contractors alleging noncompliance with the National Emission Standards for Hazardous Air Pollutants for radionuclides.	EPA and RL negotiated a Federal Facility Compliance Agreement (FFCA) on February 7, 1994, to allow RL to confirm compliance or meet the compliance requirements of 40 CFR 61, Subpart H. The FFCA superseded the compliance order and this will no longer be tracked as an open item.

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Hanford (WHC)	3/10/93	RCRA	Formal	Closed	Ecology	Ecology issued an Order and Notice of Penalty Incurred and Due for failure to adequately designate approximately 2,000 containers of solid waste.	The Notice of Penalty stipulated a penalty of $100,000. RL disputed portions of the Order and Notice of Penalty. RL and Ecology have agreed to resolutions to the disputed portions, and these resolutions have been agreed to by the Washington State Pollution Control Hearing Board, which issued a settlement agreement modifying the Order and Notice of Penalty. The settlement agreement for the Compliance Order required submittal of a Waste Analysis Plan (WAP) to confirm or complete the designation of the waste in question. Extensive negotiations regarding the content of the WAP occurred between RL and Ecology, and final approval was granted by Ecology on November 1, 1993. Confirmation or completion of the waste designation, following the process established by the WAP, must be completed by September 1, 1994. Negotiations regarding an alternative to the payment of the $100,00 penalty resulted in an agreement that allows RL to set up an Environmental Protection Scholarship in the amount of $40,000 at Columbia Basin College, and payment to PNL and the Washington Department of Wildlife to plan for and carry out a sagebrush revegetation effort on the Hanford Arid Lands Ecology Reserve. On August 24, 1994, RL transmitted a package to Ecology that completed the actions required by the Order.

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Hanford (WHC)	5/12/93	RCRA	Informal	Open	Ecology	Ecology issued a compliance letter for alleged violations related to a spill of ethylene glycol at the 309-E Building to the 300 Area Process Trench.	The alleged violations were related to immediate reporting of the incident and access to information. RL prepared a response to this incident within the required time period and considered that all corrective actions required by Ecology were completed. Since then, Ecology indicated that they believed further information was required for them to close this item. On Feb. 10, 1995, RL was provided a letter to transmit to Ecology. The letter provided answers to two questions posed by Ecology regarding the ethylene glycol spill at the 309 Building. No formal notice of closure has been received from Ecology.
Hanford (WHC)	5/24/93	RCRA	Informal	Open	Ecology	Ecology issued a compliance letter for alleged violations of various regulations related to tank system compliance at Tank 241-BX-111.	RL has prepared responses to the letter and has committed to pumping the remaining liquids from the tank. Liquid pumping was initiated in October 1993 and initially was expected to be completed in January 1994. This date was extended to April 30, 1994. After all the liquid was believed to be pumped, pictures were taken and a pool of free liquid was found to be remaining. This was pumped, and it amounted to about 5,000 gallons of supernatant. As of July 12, 1994, all the supernatant liquid had been removed and pumping was continuing on the interstitial liquid. WHC expected this last stage of pumping to be done by the end of July. New photographs were taken after this final pumping, and again liquid (estimate

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							approximately 10,000 gallons) was seen in the tank. Additional pumping is planned to occur after further integrity testing of the transfer line. In March 1995, this tank was declared interim stabilized.
Hanford (WHC)	7/09/93	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for alleged violations of the generator accumulation standards of WAC 173-303-200 at T Plant.	These alleged violations occurred during the repackaging of unknown containers that were generated in Tank Farms. RL has completed all corrective actions as required by Eoclogy. Additional correspondence from Ecology requested more information related to six repackaged waste containers. On December 2, 1993, RL submitted this information to Ecology, and Ecology has indicated satisfaction wth this response.
Hanford (WHC)	8/24/93	RCRA	Informal	Closed	Ecology	Ecology was notified on August 12, 1993, of a request to extend the 90-day accumulation period for T Plant waste because of the Tank Farms safety stand down. Ecology denied the extension because they believed the necessary requirements were not satisfied in a letter they received August 18, 1993, from RL.	On September 22, 1993, approval of the 30-day extension was received. The tank car was shipped on September 17, 1994, as agreeed to with Ecology. This item is now closed.
Hanford (WHC)	10/15/93	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for alleged violations of the transporter requirements of WAC 173-303-190 at the PUREX Facility.	These alleged violations occurred while the waste was being stored in a tank trailer pending approval from Idaho to accept the waste. RL transmitted a letter to Ecology on June 28, 1994 (9404281), stating that items in the compliance letter are closed. RL now considers this item closed.
Hanford (WHC)	10/18/93	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for alleged violations of the treatment, storage, and disposal requirements of WAC 173-303 at PUREX.	The primary violations involved not removing liquid from secondary containment within 24 hours and storing wastes in a unit not permitted for storage. These alleged

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
							violations occurred while waste was being stored in Tank F18 and Tank F16. Transfer of waste from Tank F16 and Tank F18 to Tank Farms was initiated on October 22, 1993. A total of six transfers were required to remove the waste from Tank F16. The final transfer from Tank F16 was completed on November 1, 1993. RL provided Ecology with a letter on December 14, 1993, to document that Tank F16 was emptied. The letter stated that "with the removal of waste from Tank F16 completed, RL considers this action closed."
Hanford (WHC)	10/18/93	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for alleged violations of the generator accumulation requirements of WAC 173-303-200.	The violations resulted from a reclassification of four process tanks at the Plutonium Reclamation Facility (PRF) as waste accumulation tanks. Ecology required the implementation of a waste tracking system, that tanks be labeled as hazardous waste accumulation tanks, and providing direction to PRF Operations regarding the regulatory status of PRF waste tanks. The first item has been completed. RL sent a letter to Ecology in late November 1993, which requested information on two exclusions in WAC 173-303-071(3) that may allow reclassification of PRF waste tanks to non-RCRA status. On January 13, 1994, Ecology responded with a letter that stated the above-mentioned tanks were process tanks and, therefore, not subject to generator waste accumulation requirements under the WAC.

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Hanford (WHC)	10/26/93	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for alleged violations of the generator accumulation requirements of WAC 173-303-200.	The compliance letter resulted from a Hanford -wide inspection of temporary storage and satellite accumulation areas. Several findings and recommended corrective actions were noted in the inspection. WHC has completed these corrective actions. At the 1164 Facility, one finding was identified regarding container records. On November 5, 1993, a copy of the records was filed at the facility. The final report to close this item was issued on December 16, 1993. A letter from Ecology on February 17, 1994, formally closed this item. At the 1713-H satellite storage area, three findings were identified, and two findings at the 321 Facility were identified. With regard to the 1713-H Facility, RL sent a letter to Ecology on November 15, 1993, listing the corrective actions taken and stating that RL believed these actions "fully resolve the inspection findings." With regard to the 321 Facility, this was a temporary facility that has been closed, thereby eliminating this issue.
Hanford (WHC)	10/27/93	CAA	Informal	Open	DOH	DOH issued a compliance letter after an inspection of the 201-U-1 stack monitoring system on October 1, 1993.	The letter identified two observations. A response was provided to RL on January 20, 1995. No formal acceptance has been received from DOH.
Hanford (WHC)	10/29/93	CAA	Informal	Closed	DOH	DOH issued a report of a surveillance conducted at PUREX during August 1993 that identified one finding related to a lack of auditable procedures and three best managment practices (BMP), one related to tracking sampling	The finding was issued because the health physics procedure document, WHC-IP-0718, which had recently replaced WHC-IP-0692, did not contain PUREX-specific procedures. PUREX Health Physics implemented a field change on

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						instrument serial numbers by location, and two related to clarifying sampling procedures.	November 9, 1993, to incorporate the PUREX-specific procedures into the -0718 document. A followup inspection scheduled for July 18, 1994, to determine resolution of this issue was canceled since DOH had indicated they were satisfied with the corrective action.
Hanford (WHC)	11/17/93	RCRA	Informal	Closed	Ecology	On November 17, 1993, Ecology issued a compliance letter alleging inadequate controls for preventing nonroutine releases of hazardous sustances to the environment from WHC-managed facilities in the 300 Area. The subject letter was received following a release of ethylene glycol to the 300 Area Process Sewer from the 309 Building in October 1993.	Closure of this finding was documented in a telephone memorandum on October 17, 1994. RL requested WHC to submit a written response to the subject letter by December 22, 1993 (this date was amended to December 30, 1993). On December 30, 1993, WHC responded to RL with a letter that provided an assessment of the potential for non-routine releases of hazardous substances to the environment from the 300 Area WHC- and KEH-managed facilities. Where hazardous materials were present, the control systems for preventing releases to the environment were evaluated. If the control systems were found to be inadequate, plans and schedules to upgrade the systems were developed. The planned upgrades are scheduled for completion before the start of the 300 Area Treated Effluent Disposal Facility, projected for December 1994. The assessment provided to RL included descriptions of each affected facility and the action required to correct the situation. Ecology has said this issue was satisfied with the submittal of RL's corrective

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							actions, but indicated a followup inspection to verify compliance could occur.
Hanford (WHC)	11/17/93	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for alleged violations in implementing the WAP.	On November 17, 1993, Ecology met with RL to discuss alleged deviations from Section 1.4 of the WAP, which requires RL and Ecology to approve changes. Also discussed was a concern regarding waste management training, a request for desk instructions, and a list of responsible persons. The information originally was requested for December 1, 1993. Ecology agreed to delay the response until December 8, 1993, and RL issed the response on that date. The response states that all proposed changes to the WAP will be communicated to Ecology as requested. The letter also addressed the other concerns Ecology had, and made recommendations to assemble a technical team to deal with issues surrounding implementation of the WAP before they became concerns.
Hanford (WHC)	12/06/93	CAA	Informal	Open	DOH	DOH issued a compliance letter following a surveillance on October 6, 1993, at the Fast Flux Text Facility (FFTF), which identified two findings and two BMPs. The letter requested a response from RL within 45 days.	On January 5, 1994, Ecology closed this item. One of the findings was that calibration tags were not on monitoring instrumentation, and the other finding noted that some monitoring instruments had difficulty remaining in calibration because of vender problems. One BMP stated that the Reactor Service Building had limited control and monitoring technologies to detect or control a release. The other BMP stated that the sampler flow measurement equipment and procedures created uncertainty in the accuracy of the measurement. Recommended corrective actions were provided in the compliance letter.

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							RL provided DOH a response to the findings and BMPs on March 2, 1994. A new response was provided to RL on January 17, 1995. No formal acceptance has been received from DOH.
Hanford (WHC)	12/07/93	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for allegations that improvements (target actions) to be performed at T Plant as part of the Dangerous Waste Part A Permit Application were found to be either incomplete or unsatisfactory during a December 2, 1993, inspection.	This target action, "Implement Periodic Visual Inspection and Static Leak Test Program for 2706-T and 211-T Tanks," was to be completed by October 1993. Ecology has required implementation of effective visual inspection and leak test programs for the 2706-T and 211-T sumps by December 15, 1993. Ecology also required the completion of three corrective actions by January 15, 1994; specifically, repair of the backflow preventer leaking to the 2706-T sump, repair of the leak detection device for 2706-T, and report on the progress of installing or instituting leak detection for the 211-T sump. This item was put on hold while the alleged violations were investigated. On November 7, 1994, Ecology transmitted a letter to RL and WHC that followed a followup inspection on October 18, 1994. No violations were noted. RL considers this item closed.
Hanford (WHC)	12/13/93	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for an inspection conducted November 18-22, 1993, at the Transuranic Waste Storage and Assay Facility (TRUSAF) to determine compliance with interim status requirements under WAC 173-303, and to status current activities with respect to the	Alleged violations included (1) failure to maintain emergency equipment in accordance with the facility contingency and emergency plan, (2) failure to maintain operating records in a manner sufficient to locate wastes within the facility, (3) failure to

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						Dangerous Waste Part B Permit Application.	label containers with hazardous waste labels or in a manner to adequately identify major risks associated with the contents of the containers, and (4) failure to store containers within a compliant secondary containment system. The compliance letter stated that RL and WHC needed to correct these findings by March 18, 1994. On February 4, 1994, RL sent a letter to Ecology providing a status of the four corrective actions. RL considers the first two items closed. RL requested an extension to April 30, 1994, for the third item, and stated that the fourth item would be completed by March 14, 1994. A unit managers' meeting was held on June 1, 1994, which provided information indicating the final two items have been completed. On October 10, 1994, Ecology sent a letter to RL formally closing this item.
Hanford (WHC/PNL)	12/17/93	CAA	Informal	Open	DOH	DOH conducted an audit of air monitoring instrumentation adequacy and calibration on June 28 - July 2, 1993. DOH believes past audits and surveillances have identified instrumentation out of calibration.	The audit revealed two findings, five observations, and five BMPs. DOH requested RL's response, including a corrective action plan, by February 20, 1994. On February 16, 1994, WHC provided RL with a response to DOH (#9451044D). The response stated that one finding would be resolved by March 18, 1994, and the other by April 30, 1994. Completion dates were provided for the

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
							findings and BMPs not already resolved. On September 5, 1994, DOH sent a letter to RL stating closeout of all the open items but one finding. DOH is requesting response to this last item by November 1, 1994. WHC told RL on November 14, 1994, that this deadline could not be met, and RL agreed to inform DOH that a response would be submitted by January 31, 1995. On January 20, 1995, a response was submitted to RL. No formal acceptance has been received from DOH.
Hanford (WHC)	1/07/94	CAA	Informal	Open	DOH	DOH issued a compliance letter that followed an inspection of the 242-S Evaporator and SY Tank Farm emission units on November 30 and December 1, 1993.	Three observations and one BMP were identified. RL submitted a response to DOH on January 25, 1995. No formal acceptance has been received from DOH.
Hanford (WHC)	1/27/94	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter for alleged violations identified during an inspection on December 9, 1993, at the Hanford Fire Department to determine compliance with contingency plan requirements under WAC 173-303 for hazardous and/or mixed waste facilities.	The sections of the WAC that RL and WHC were alleged to be out of compliance with are 173-303-350(2), -350(3), and -350 (4). The compliance letter stated that contingency plans for 2715EA, 1177, 321, 384, and 284W did not incorporate the WAC requirements. Additionally, the letter stated that copies of contingency plans for 284E, 284W, and 2715EA were not kept at the Hanford Fire Department as required, and they were not on the Hanford Local Area Network (HLAN). The compliance letter requested corrective actions to be complete by April 15, 1994. On March 23, 1994, WHC provided RL with a letter for Ecology in response to these allegations, and RL sent the letter to

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							Ecology on March 28, 1994. The letter presents a revised RL/WHC contingency planning program, and outlines the corrective actions RL will take by May 31, 1994, to close this item. WHC/RL completed corrective actions as planned according to schedule. Correspondence from Ecology in October 1994 stated that this item was closed.
Hanford (WHC/PNL)	2/01/94	CAA	Informal	Open	DOH	DOH officials conducted an audit on August 23, 1993, of the 300 Area emission units.	The audit resulted in three observations (now referred to as findings level IV): (1) carbon absorber units inspected (Building 340) did not have test ports or indication (tags) of efficiency test performance; (2) the electric pre-heater upstream of the main filter bank for the 340 Building was not operating to limit humidity; and (3) calibration was not indicated (tags) on gauges used to monitor performance of HEPA filters (WHC and PNL facilities). Corrective actions were included in the letter report. RL provided a letter to DOH on December 1, 1994, responding to the three items. Corrective actions also were provided. Another response letter containing additional requested information was sent to DOH on December 9, 1994. No formal acceptance has been received from DOH.
Hanford (WHC)	2/23/94	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter alleging violations of facility recordkeeping requirements for the Backlog Waste Program.	The alleged violations are summarized below. 1) RL and WHC "failed to make training records available for inspection...to verify

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						The alleged violations resulted from an Ecology inspection on February 18, 1994, when Ecology requested copies of training records.	that employees involved in the backlog waste program have received training...." 2) RL and WHC "failed to make training records required by Chapter 173-303-330 WAC available for inspection at all reasonable times per Chapter 173-303-380(3[a])." Ecology's corrective actions stated in the "voluntary compliance letter" involve providing the requested training records to Ecology and then maintaining the appropriate training records in the 200 West Area, and keeping them available for future inspections. On April 14, 1994, Ecology sent a letter to RL and WHC stating that their investigation of training record accessibility for the Backlog Waste Program was completed and the issue has been closed.
Hanford (RL/COE)	3/09/94	RCRA	Formal	Closed	Ecology	Ecology issued an Order (No. DE 94NM-063) and Notice of Penalty incurred and due (No. DE 94NM-062) against the U.S. Army Corps of Engineers (COE) for disposing dangerous waste at the Richland Landfill, and against DOE for not providing adequate dangerous waste training to COE employees.	Ecology has assessed a penalty of $9,500 against DOE and a $6,000 penalty against COE. The fines stem from the accidental dumping of dangerous waste at the landfill as part of the cleanup activity ongoing at the North Slope. The incident occurred late in 1993. On April 15, 1994, Ecology sent a letter to RL and COE stating satisfaction that the corrective items identified in the order had been completed, and approved the restart of dangerous waste management work on the North Slope. Ecology also requested in the letter that before the generation or potential

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							generation of hazardous or mixed waste at identified past-practice waste sites, that Waste Control Plans be submitted to them for approval. Ecology stated that the "letter serves as a notice of completion of Order requirements," except for the ongoing requirements of the Waste Control Plans, and stated that the "entire case will be resolved upon payment" of the Penalty.
Hanford (WHC)	4/07/94	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter to RL and WHC alleging noncompliance with WAC 173-303-330, Personnel Training.	The allegations followed an inspection conducted at tank farms March 17-18, 1994, to determine compliance with generator requirements. The inspector stated that at the time of the inspection, a random sample of training records was selected and that approximately half of those were found to be deficient. The action item in the letter called for RL and WHC to review the training of tank farms personnel by July 1, 1994, and to complete and document all required training. On June 29, 1994, RL sent Ecology a letter (9404279) stating that 95 percent of the tank farms personnel had completed the required training, and that all remaining personnel would be limited to work not directly affecting dangerous waste management activities until their training was completed. Ecology conducted a follow-up inspection on July 19, 1994, and indicated satisfaction with this issue and said they consider this closed.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
Hanford (WHC)	4/14/94	RCRA	Informal	Open	Ecology	Ecology issued a compliance letter to RL and WHC on April 14, 1994, which followed an inspection conducted on February 7-8, 1994, to assess completion of Miletones 21, 22, and 23 of the Tri-Party Agreement. The compliance letter alleged seven violations of WAC 173-303: (1) WAC 173-303-300, General Waste Analysis; (2) -380, Facility Recordkeeping; (3) -310, Security; (4) -630, Use and Management of Containers; (5) -320, General Inspection; (6) -350, Contingency Plan and Emergency Procedures; and (7) -640, Tank Systems.	Ecology's concerns were centered around RCRA interim status requirements being relaxed on the facilities that were inpsected, which are scheduled for closure or are undergoing a change in mission. Ecology's concerns are that relaxed mangement of hazardous waste during these periods may cause a threat to human health or the environment. Five corrective actions were included in the letter, three to be completed within 30 days, two within 60 days, and one within 180 days. On July 26, 1994, Ecology sent a letter to RL stating that four of the five items had been satisfactorily completed. The fifth item, to construct a barrier around 100-D Ponds, was discussed at the unit managers' meetings in July. Ecology stated in the letter referenced in this paragraph that the barrier was dependent on the hazard posed by contamination within the active portion of the facility. If RL/WHC can demonstrate that contamination would not occur if the area were disturbed, then the barrier requirement would be waived. Ecology states "if data can be collected, analyzed, and independently validated in a timely manner," they would consider deferring the compliance date of October 10, 1994, to construct the barrier, until the sampling and analytical results were complete. On November 4, 1994, Ecology sent a letter to RL stating that enforcement to construct a barrier would be deferred until June 5, 1995.

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							when validated data is received.
Hanford (WHC)	4/20/94	CAA	Informal	Open	DOH	DOH issued a compliance letter that followed an inspection at T Plant on March 16, 1994.	One finding and two observations were identified during the audit. An initial response was prepared but was not submitted. A new response is now being prepared by T Plant.
Hanford (WHC)	5/18/94	RCRA	Informal	Open	Ecology	Ecology issed a compliance letter to RL and WHC on May 18, 1994, that followed a dangerous waste compliance assessment of the PUREX and UO3 facilities. The assessment was conducted to "determine current compliance with interim status requirements...and to review applicability and appropriateness of requirements for currently permitted vessels, and those vessels that will be added to the PUREX Part A Permit Application." The letter identified 7 findings, 5 observations, and 11 requirements.	The letter states that "this investigation was performed under the guise of an environmental assessment rather than a compliance inspection. However, failure to correct the deficiencies may result in a compliance action pursuant to the authorities granted to Ecology by RCW-70-105." Because of this language, RL/WHC decided to handle this letter like a voluntary compliance letter. On June 27, 1994, RL issued a letter that responded to the findings, observations, and requirements. The letter's responses either disputed the findings, etc., or agreed with them and provided corrective actions with completion dates. No formal notification of closure has been received from Ecology.
Hanford (PNL)	8/05/94	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter to RL and PNL on August 5, 1994, that followed a dangerous waste compliance assessment of the 325 Shielded Analytical Laboratory (SAL) on April 12 and 21, 1994.	Four areas of noncompliance with WAC 173-303 were identified: (1) inadequate closure of containers in storage; (2) facility recordkeeping; (3) interim status permit violations; and (4) the absence of tracking dangerous waste volumes after small quantities of liquid wastes were mixed with large quantities of water in the RMW sewer. Corrective actions and dates for completion were provided by Ecology.

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							The first two items were completed on schedule. The second two items were put on hold until after the facility was restarted, when systems were in place to fully comply with the requirements identified during the inspection. This has occurred and RL considers this closed. No formal notice of closure has been received from Ecology.
Hanford (WHC)	9/02/94	CAA	Informal	Open	DOH	DOH conducted a sitewide quality assurance audit from August 15-19, 1994, which focused on the overall QA program of RL, WHC, PNL, and BHI. Four findings and two BMPs were identified.	DOH stated in their letter that a new category of findings, finding level IVs, would be created to replace the former category of observations, which in the past had not been responded to, and that all formerly identified observations from past audits would be changed to finding level IVs as well. The letter did not provide a date for completion of the former observations. On December 7, 1994, RL provided a response to DOH. This submittal did not include responses to previous audit findings. A letter of clarification committing to a January 31, 1995, response date was provided to RL on December 23, 1994. On January 20, 1995, WHC transmitted a letter to RL responding to two DOH audit findings that resulted from an October 6, 1993, inspection at FFTF. WHC considers these two findings resolved. On January 24, 1995, a letter was transmitted to RL with responses to all remaining open items, with the exception of one (1992 200 East Area Tank Farms), which will be

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
							responded to in a separate transmittal. Formal notification of acceptance has not been received from DOH.
Hanford (WHC)	10/18/94	RCRA	Informal	Open	Ecology	Ecology issued a compliance letter on October 18, 1994, to RL and WHC that followed an inspection on August 3, 4, 15, and 29, 1994, at the 204-AR Waste Transfer Facility. This facility is operating as an interim status facility under a revised Part A permit.	There were three violations noted: (1) emergency procedures were not in place; (2) the contingency plan was not adequate; and (3) transfer operation procedures were inadequate. Additionally, three concerns were noted. RL responded to the violations in a letter dated November 21, 1994. Tank Farms is revising the procedures, and is expected to be done by May 30, 1995.
Hanford (WHC)	11/03/94	CAA	Informal	Open	DOH	DOH issued a compliance letter to RL on November 3, 1994, that followed an inspection at the 200 West Tank Farms on October 19, 1994. The inspection identified three findings and one BMP.	During the inspection, stack monitoring systems for five stacks in the 200 West tank farms were examined. The findings identified during the inspection are as follows: (1) paper tape on the rotometers can lead to inaccurate flow readings and inaccurate calculations in determining doses; (2) sample flow rate data for two stacks is low, which is in violation of emission monitoring procedures and could lead to under reporting emissions; and (3) several instruments were found to be out of calibration. Corrective actions for the findings, and a recommendation to correct the BMP, were provided in the letter, and a response was requested by December 22, 1994. On December 16, 1994, a response was provided to DOH. DOH has said they will conduct a follow-up inspection to verify compliance.

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Hanford (BHI)	11/15/94	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter to RL and Bechtel Hanford, Inc. (BHI), on November 15, 1994, that followed an inspection on November 3, 1994, of dangerous waste generator facilities.	Three facilities were inspected and violations were identified at the 271-U 90-day accumulation area. These are as follows: (1) the spill kit did not contain all the required equipment (WAC 173-303-340); (2) the waste inventory log sheet did not correspond to the labeling on the container (WAC 173-303-210); and (3) the weekly inspection log for the facility indicated no problems were found with any safety and emergency equipment; however, safety and emergency equipment was found to be missing, damaged, or out of certification. Ecology provided corrective actions in the compliance letter and asked RL to provide a "certificate of compliance" indicating closure of the findings. RL transmitted a response to Ecology on January 29, 1995. RL considers this item closed.
Hanford (ICF KH)	12/08/94	RCRA	Informal	Closed	Ecology	Ecology issued a compliance letter on December 8, 1994, to RL and ICF KH that followed an inspection on November 3, 1994, of satellite accumulation areas in the 200 East and West Areas. These areas are in support of Project W-049H.	The letter alleged three violations: WAC 173-303-200(2)(a), the accumulation containers were not under the control of the operator or secured; WAC 173-303-950(2), paint materials in the buckets at the area were left to air dry, which constituted nonpermitted treatment and disposal; and WAC 173-303-145(3)(a)(ii), it did not appear that spilled materials were mitigated or prevented. Additionally, five areas of concern were noted in the letter. The corrective actions were to be completed within 24 hours of receipt of the letter, and Ecology requested verification be submitted to them by December 30, 1994.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
							On December 23, 1994, RL transmitted a letter to Ecology to inform them of completion of the corrective actions. On February 8, 1995, Ecology transmitted a letter to RL closing this item.
Hanford (PNL)	2/16/95	RCRA	Informal	Open	Ecology	Ecology issued a voluntary compliance letter to PNL on February 16, 1995, that followed an inspection on January 23-25, 1995, at the 324 Building's Radiochemical Engineering Cells (REC) and High-Level Vault (HLV) tanks. This inspection was conducted to support resolution of a dispute between the Tri-Parties.	Facility transition negotiations that started in July 1994 have included discussions on the various compliance violations at the 324 Building. On February 7, 1995, the Dispute Resolution Committee agreed that Ecology should issue the voluntary compliance letter to document the areas of noncompliance associated with the 324 REC and HLV tanks, and to restart negotiations of the Tri-Party Agreement milestones to resolve them and close the activities that are noncompliant. The milestones, if agreed to by the three parties, will satisfy the regulatory enforcement options for the areas of noncompliance in the 324 Building. The five violations are as follows: (1) failure to ship waste offsite within 90 days of accumulating 55 gallons or more; (2) failure to store radioactive mixed waste in containers or tanks in accordance with WAC 173-303-200(1)(b); (3) failure to meet tank requirements in accordance with WAC 173-303-640(2) & (6); (4) failure to apply for interim status and failure to meet interim status facility standards in accordance with WAC 173-303-400; and (5) failure to prepare land disposal restriction notifications for shipments of radioactive mixed waste offsite

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
							in accordance with WAC 173-303-140(2)(a) and 40 CFR 268.7(a)(1). On March 8, 1995, RL transmitted a response to Ecology outlining the measures RL and PNL will take to resolve the compliance issues associated with the 324 Building.
Hanford (WHC)	3/28/95	WCAA	Informal	Closed	BCCAA	The Benton County Clean Air Authority issued a Notice of Violation to WHC on March 28, 1995.	The NOV stated WHC was in violation of WAC 173-425-070(4), which allows local air authorities to restrict conditions for burning. On February 25, 1995, burning at the 1250 Building (as a training exercise assumed by the Hanford Fire Department) continued past the time authorized by the Special Burning Permit. The NOV requires a response in 30 days. On April 24, 1995, the BCCAA transmitted a letter to WHC's Hanford Fire Department that stated further enforcement action would not be required. This item is now closed.
Hanford (WHC)	4/20/95	CAA	Informal	Open	DOH	On April 20, 1995, RL received a compliance letter from DOH that followed an inspection at the Waste Sampling Characterization Facility (WSCF) on April 3, 1995. The letter identified two findings.	The first finding was a violation of WAC 246-247-075, Quality Assurance. Two compliance air samples from an unplanned release did not contain chain of custody requirements, and correct procedures were not followed for the two samples. The second finding also was a violation of WAC 246-247-075. There was no air sample procedure for unplanned releases. DOH provided suggested actions the facility could take to correct the violations. The date that RL needed to respond by was not provided.

Facility	Date Received	Subject	Category	Status	Agency	Summary	Comments
Hanford (WHC)	4/21/95	CAA	Informal	Open	DOH	On April 21, 1995, RL received a compliance letter from DOH that followed an inspection at T Plant on March 16, 1994. DOH stated that the inspection identified three findings, and that they needed a response from RL to close the inspection.	The information on this inspection is in an earlier entry in this report. See the DOH inspection entry for 4/20/94.

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START

0041482

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

95-PCA-353

Letter Dated 6-9-1995

Mr. David L. Lundstrom
Section Manager, 200 Areas
Nuclear Waste program
State of Washington
Department of Ecology
1315 West Fourth Avenue
Kennewick, Washington 99336

Dear Mr. Lundstrom:

NOTICE OF INTENT (NOI) FOR EXPANSION UNDER INTERIM STATUS FOR THE HANFORD FACILITY LOW-LEVEL BURIAL GROUNDS (LLBG) (WA7890008967) (TSD: D-2-9)

Reference: Letter, J. E. Rasmussen, RL, and W. T. Dixon, WHC, same subject as above, 95-PCA-294, dated May 5, 1995.

The referenced letter contained a NOI for Expansion Under Interim Status for the LLBG. The NOI added greater-than-90-day tank storage for multi-source leachate and redefined the process design capacity for disposal of mixed waste at the LLBG. As discussed with your staff at the LLBG Unit Manager Meeting (UMM) on May 24, 1995, the number given in the NOI for the process design capacity is being recalculated. The revised number and methodology will be added as a topic of discussion at the next LLBG UMM.

We would like to thank Norm Hepner of you staff for bringing this to our attention. Should you have any questions regarding this, please contact Mr. C. E. Clark, of my staff, on (509) 376-9333.

Sincerely,

James E. Rasmussen, Director
Environmental Assurance, Permits
and Policy Division

EAP:CEC

cc:
EDMC, H6-08
R. Bowman, WHC
D. Duncan, EPA
R. Jim, YIN
F. Ma, Ecology
D. Powaukee, NPT
S. Price, WHC
J. Wilkinson, CTUIR
W. Dixon, WHC

JUN 1995
RECEIVED
EDMC

9513383.2209

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START

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

May 24, 1995
10:30 a.m. - 11:00 a.m.

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

Date: 10/6/95
Clifford E. Clark, Unit Manager, RL

Date: 9/12/95
Daniel L. Duncan, RCRA Program Manager, EPA Region 10

Date: 7/20/95
Norman T. Hepner, Unit Manager, Washington State Department of Ecology

---

Low-Level Burial Grounds, WHC Concurrence

Date: 8/29/95
Richard D. Pierce, Contractor Representative, WHC
(Represented by Brett M. Barnes, 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 - Status of Pump and Treat

OCT 1995
RECEIVED
EDMC

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Attachment 1

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting (Videoconference)
Federal Building, Room 784B
2704HV Building, Room 213
Richland, Washington
Lacey, Washington

May 24, 1995
10:30 a.m. - 11:00 a.m.

AGENDA

1. **PREVIOUS MEETING MINUTES**
   - April 27, 1995 Meeting Minutes
2. **PROGRAM STATUS**
   - Status of Mixed Waste Trench Readiness
     - Performance Assessments
3. **PERMIT APPLICATION STATUS**
4. **RCRA TOPICS**
   - Discussion of 4-9-93 NOD Response Table
5. **GENERAL TOPICS**
   - Status of Pump and Treat (R. Mercer)
   - Past Action Items
     - 10-27-93:1 Pump and Treat Status
   - New Action Items
6. **SCHEDULE NEXT MEETING**
   - Tentative Date
   - Proposed Topics

9513383.2211

Attachment 2

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

May 24, 1995
10:30 a.m. - 11:00 a.m.

Summary of Discussion and Commitments/Agreements

1. PREVIOUS MEETING MINUTES

The April 27, 1995 Unit Manager Meeting minutes are currently being reviewed by Ecology and EPA.

2. PROGRAM STATUS

- **Status of Mixed Waste Trench Readiness**

Ms. A. Crowell (RL) stated that RL/WHC are working on the safety evaluation report (SER), which documents DOE's approval of the interim safety basis (ISB) for Trench 31. The safety evaluation report is the major item remaining to be completed before start-up of Trench 31.

Mr. N. Hepner (Ecology) inquired about a projected start-up date for Trench 31. Ms. Crowell responded that Trench 31 will be ready to receive waste next fiscal year (October 1995), and it is dependent upon when Bechtel Hanford, Inc., prepares a schedule for sending waste.

Performance Assessments

Ms. Crowell reported that the 200 West Area Performance Assessment (PA) is still in DOE-Headquarters' review.

3. PERMIT APPLICATION STATUS

Mr. C. Clark (RL) stated that RL/WHC are seeking further clarification from Ecology regarding the Engineer Performance Plan (EPP). Mr. Hepner stated that Ecology is prepared to discuss the issue and make a decision based on the information presented by the Navy. Mr. M. French (RL) agreed to provide Mr. Hepner a briefing on the EPP outside of the Unit Manager Meeting.

Mr. Hepner inquired about the accuracy of the trench capacity included in the Notice of Intent (NOI). Ms. G. Cummins (WHC) responded by asking Mr. Hepner if he had read the justification of need, which provides a description of how the total capacity was calculated. Mr. Hepner indicated that he had reviewed it. Mr. Clark explained that it is the total volume within the

boundaries of the Burial Grounds down to 70 feet, whether or not it would be used for waste disposal.

Mr. Hepner noted his concern regarding the information provided to the public, which indicated that the Environmental Restoration Disposal Facility (ERDF) was needed because the capacity was not available at the Burial Grounds, and now the Burial Grounds will be permitted for 1 1/2 times the capacity of ERDF. Ms. Crowell agreed with Mr. Hepner's concern, and stated that the intent is to revise the capacity in the NOI. Mr. Hepner suggested that the number be based on a forecast. Ms. Crowell responded that the treatment plans for each of the federal facilities are for only five years. Mr. Clark noted the continual changes occurring in all the programs on site and at other DOE facilities, and that went beyond expressed little confidence with a forecast of five years. Ms. Cummins stated that the original intent of the capacity in the NOI was to maintain flexibility, and Ms. Crowell added that RL/WHC wanted to avoid the cost of revising the Part A permit application every year if the capacity volume needed to be revised.

4. RCRA TOPICS

- **Discussion of 4-9-93 NOD Response Table**

Ms. Cummins stated that RL/WHC are reviewing the draft issue paper that Ecology provided at the last Unit Managers Meeting. Mr. B. Cordts (Ecology) stated that he would formally transmit the issue paper to RL/WHC.

5. GENERAL TOPICS

- **Status of Pump and Treat**

Mr. R. Mercer (WHC) provided an update on the pump and treat operation (Attachment 5). Mr. Mercer stated that Bechtel's pilot pump and treat program at the 218-W-4C Burial Ground is ongoing. A pump test was performed on the injection well located west of the burial ground last week, and the results are not available. The carbon steel casing on extraction Well No. 2 separated during drilling, and Bechtel decided to redrill it. Mr. Mercer stated that start-up of the pump and treat operation is scheduled for October 1995.

Ms. Crowell inquired about RL/WHC performing RCRA monitoring during the pump and treat activity. Mr. Mercer responded that Bechtel is preparing a paper on the impacts of the pump and treat, and WHC has a proposed outline for RCRA monitoring during the pump and treat. However, Mr. Mercer indicated that in an effort to avoid duplication, he is waiting for the results of Bechtel's study before completing his proposal for RCRA monitoring.

- **Past Action Items**

  Action item 10-27-93:1, schedule a technical issues meeting for RCRA/CERCLA integration and discussion of pump and treat evaluations.

  WHC is continuing to provide pump and treat information to Ecology. This action item was left open.

- **New Action Items**

  There were no new action items generated during the meeting.

6. SCHEDULE NEXT MEETING

- **Tentative Date**

  The next Unit Managers Meeting was scheduled for videoconference on July 12, 1995.

- **Proposed Topics**

  There were no new proposed topics for discussion.

9513383.2214

Attachment 3

LOW LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

May 24, 1995
10:00 a.m. - 11:00 a.m.

Attendance List

A stenographer is present to take detailed notes on the proceedings of this meeting. These notes will be used for the sole purpose of preparing unit manager meeting minutes. After these unit manager meeting minutes are finalized, the detailed notes will be discarded. If any attendee has objections with this approach, they should voice these objections at this time.

Name	Organization	Phone #
Kathy Knox	WHC	372-3596
Brett M. Barnes	WHC	376-3640
Clifford E. Clarke	DOE-RL EAP	376-9333
Mark French	DOE-RL WPD	373-9863
R B Mercer	WHC	376-8945
RC Bowman	WHC	376-4876
Michael Cimmerer	Barnes & Moore / GSSC	946-3681
Gloria D. Cummins	WHC	372-2484
Sarah F Campbell	WHC	372-0667
Norm Hepner	Ecology	736-3048
Dean Powell	WHC	373-9240
Dan Duncan	EPA	(206) 553-6693
Bob Cordts	Ecology	(360) 407-7142

9513383.2215

Attachment 4

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

May 24, 1995
10:30 a.m. - 11:00 a.m.

Action Items

Action Item	Description
10-27-93:1	Schedule a technical issues meeting for RCRA/CERCLA integration and discussion of pump and treat evaluations. **OPEN**
09-01-94:1	RL/WHC will provide the Yakama Indian Nation a copy of all the notice of deficiencies (NODs), including a description of the NODs that have been resolved and the NODs that remain open. ACTION: A. Crowell (RL) **CLOSED**
10-18-94:1	RL will provide Ecology (Mr. R. Cordts) a preview of the engineering change notices (ECNs) on Trench 31 and 34. ACTION: A. Crowell (RL) **CLOSED**

9513383.2216

Attachment 5

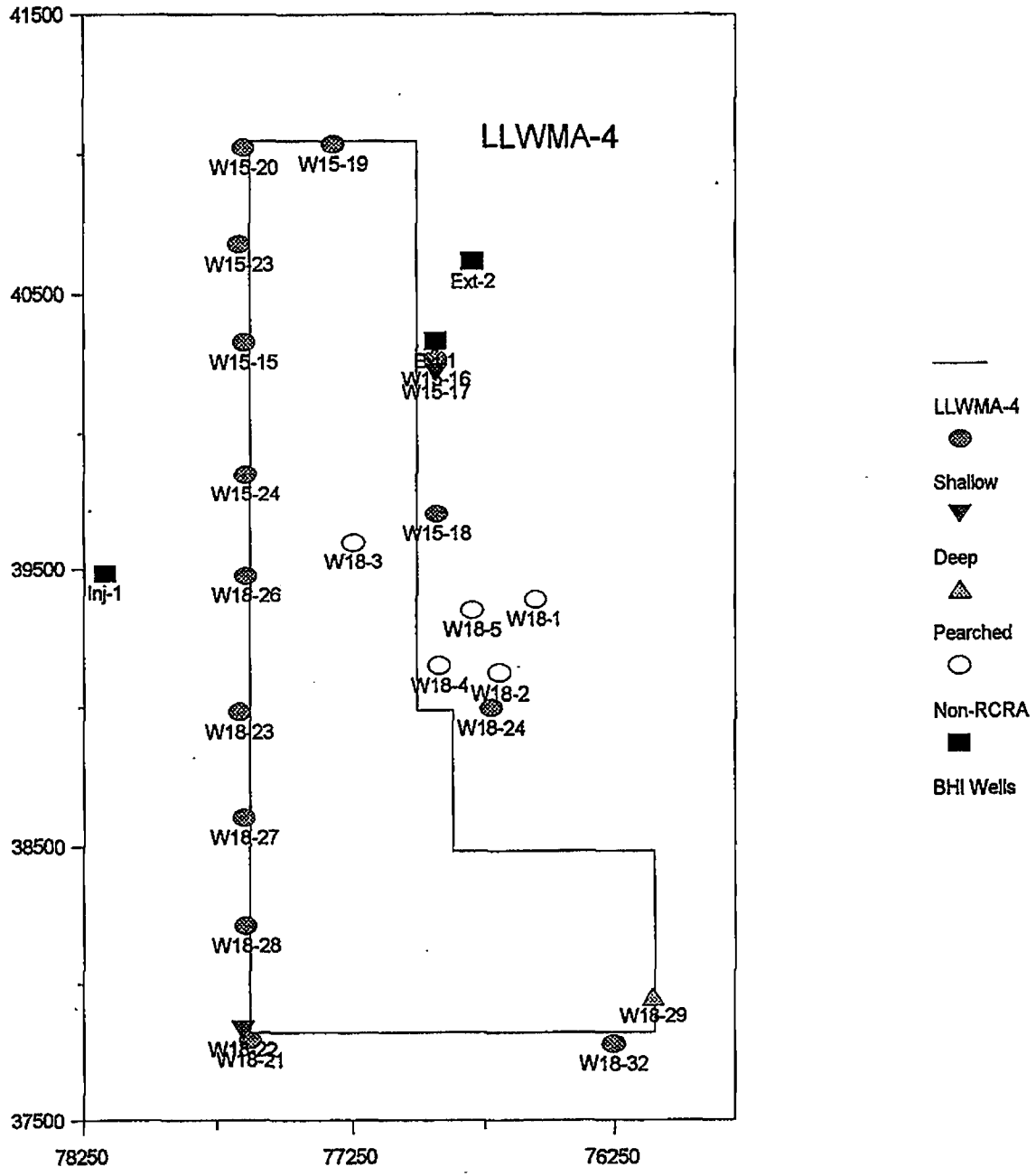
LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

May 24, 1995
10:30 a.m. - 11:00 a.m.

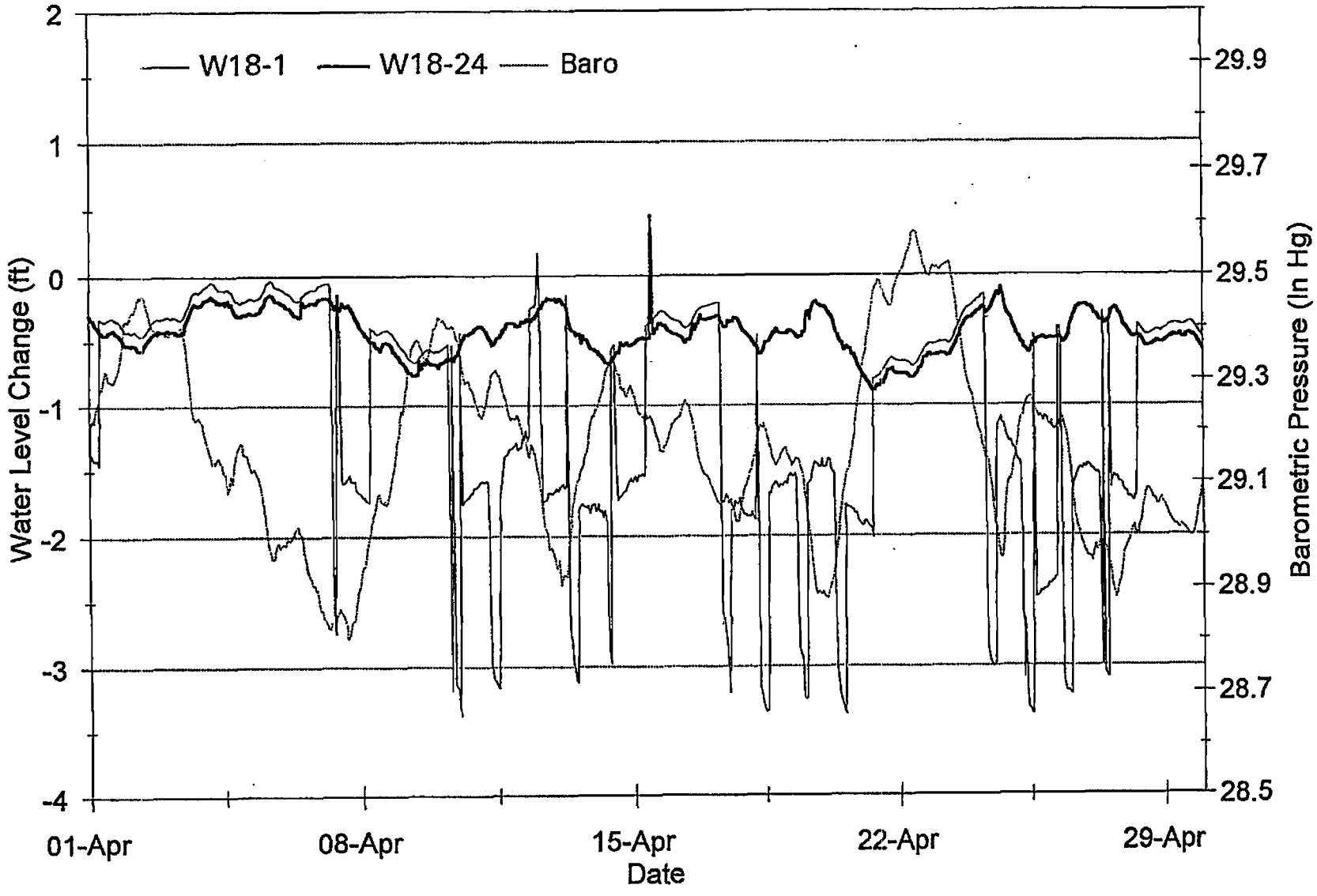
STATUS OF PUMP AND TREAT

LLBG
5-24-95

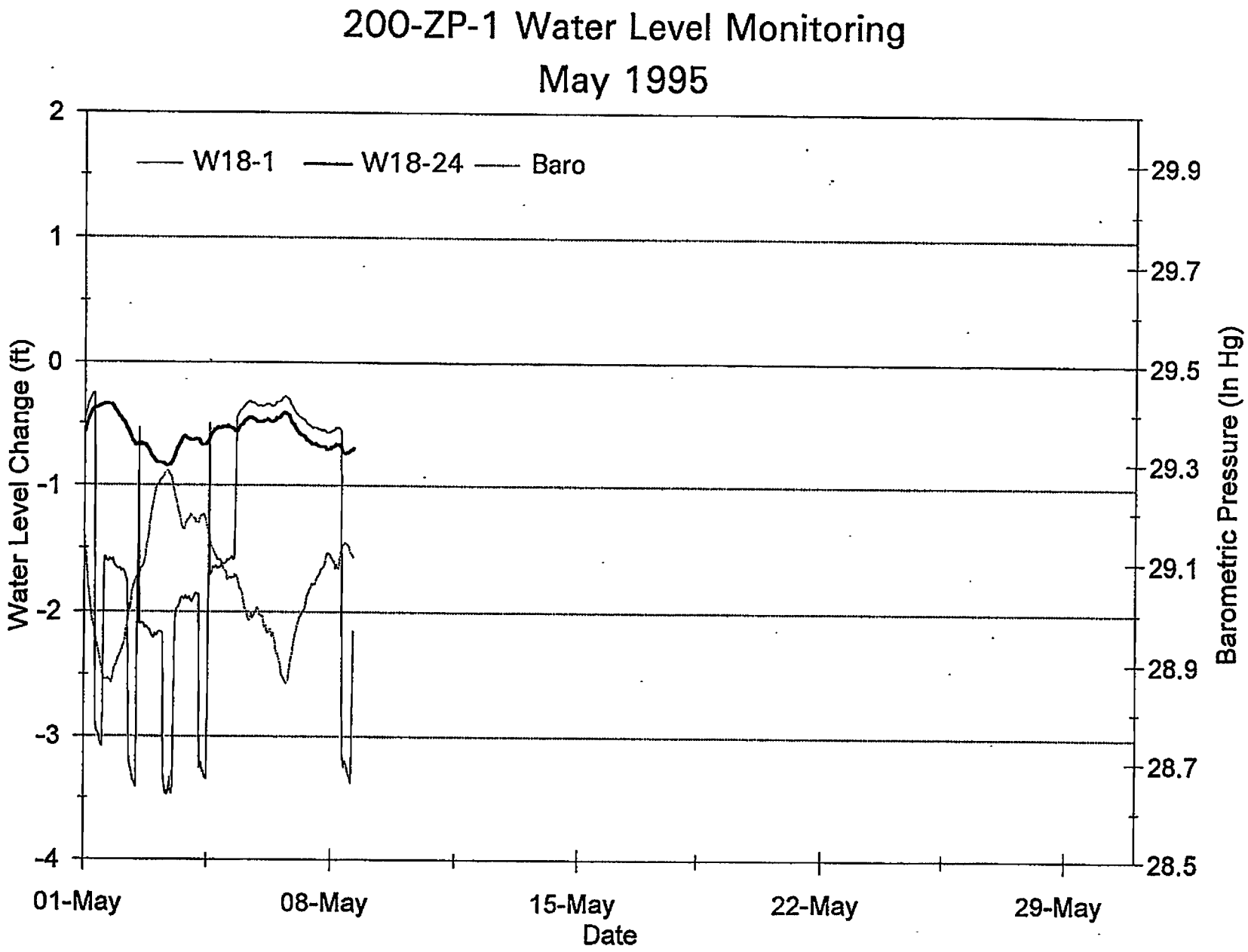
9513383.2217



200-ZP-1 Water Level Monitoring
April 1995



9513383.2218



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Distribution:

L. D. Arnold	WHC	B2-35
B. M. Barnes	WHC	T3-04
R. C. Bowman	WHC	H6-24
B. J. Broomfield	WHC	T3-04
S. E. Campbell	WHC	T4-05
R. M. Carosino	RL	A4-52
C. E. Clark	RL	A5-15
R. E. Cordts	Ecology	Lacey
A. K. Crowell	RL	S7-55
G. D. Cummins	WHC	H6-24
D. L. Duncan	EPA	HW-106
D. Dunning	ODOE	
N. P. Emerson	WHC	T4-03
M. S. French	RL	S7-55
R. J. Giroir	WHC	T4-05
R. F. Guercia	RL	S7-55
P. L. Hapke	WHC	T4-05
G. D. Hendricks	GSSC	B1-42
N. T. Hepner	Ecology	B5-18
M. N. Jaraysi	Ecology	B5-18
G. H. Landeen	WHC	H6-23
S. Leja	Ecology	B5-18
D. R. Lucas	WHC	G3-15
P. J. Mackey	WHC	B3-15
R. D. Pierce	WHC	T3-04
D. B. Powell	WHC	T4-03
D. A. Pratt	WHC	T4-03
S. M. Price	WHC	H6-23
L. T. St. Georges	WHC	H6-20
H. T. Tilden	PNL	P7-79

ADMINISTRATIVE RECORD: Low-Level Burial Grounds, D-2-9
[Care of EDMC, WHC (H6-08)]

Washington State Department of Ecology Nuclear and Mixed Waste Library, P.O. Box 47600, Olympia, Washington 98504-7600

Environmental Protection Agency Region 10, Seattle, Washington 98101, Mail Stop HW-074

Please send comments on distribution list to K. E. Knox, WHC (H6-23), (509) 372-3596

START 9513383.2394

0042284

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

July 20, 1995
11:00 a.m. - 12:00 p.m.

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

Clifford E. Clark, Unit Manager, RL — Date: 10/6/95

Daniel L. Duncan, RCRA Program Manager, EPA Region 10 — Date: 10/16/95

Norman T. Hepner, Unit Manager, Washington State Department of Ecology — Date: 10/4/95

Low-Level Burial Grounds, WHC Concurrence

Richard D. Pierce, Contractor Representative, WHC (Represented by Brett M. Barnes, WHC) — Date: Oct 4, 1995

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 - Hanford Facility Permit Low-Level Burial Grounds (LLBG) Proposed Unit Inclusion Schedule for Mod C
Attachment 6 - Presentation on the Disposal of Bulk Waste in the Low-Level Burial Grounds for the Washington State Department of Health
Attachment 7 - Status of Pump and Treat

OCT 1995 RECEIVED EDMC

9513383.2395

Attachment 1

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting (Videoconference)
Federal Building, Room 784B/2704HV Room E213
Richland, Washington
Lacey, Washington

Thursday, July 20, 1995
11:00 a.m. - 12:00 p.m.

AGENDA

1. **PREVIOUS MEETING MINUTES**
   - April 27, 1995 and May 24, 1995 Meeting Minutes
2. **PROGRAM STATUS**
   - Status of Mixed Waste Trench Readiness
3. **PERMIT APPLICATION STATUS**
4. **RCRA TOPICS**
   - Discussion of 4-9-93 NOD Response Table
5. **GENERAL TOPICS**
   - Status of Pump and Treat (R. Mercer)
   - Past Action Items
     - 10-27-93:1 Pump and Treat Status
   - New Action Items
6. **SCHEDULE NEXT MEETING**
   - Tentative Date
   - Proposed Topics

Attachment 2

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

July 20, 1995
11:00 a.m. - 12:00 p.m.

Summary of Discussion and Commitments/Agreements

1. PREVIOUS MEETING MINUTES

Mr. D. Duncan (EPA) conferred signature approval to Mr. R. Bowman (WHC) via the videoconference for the May 24, 1995 Unit Manager Meeting minutes. Mr. Duncan was not present during the April 27, 1995 Unit Manager Meeting. Mr. R. Cordts (Ecology) was not present at today's meeting, and his approval of the April 27, 1995 Unit Manager Meeting minutes will be obtained at a later time. Mr. N. Hepner (Ecology) approved the May 24, 1995 Unit Manager Meeting minutes.

2. PROGRAM STATUS

- **Status of Mixed Waste Trench Readiness**

Ms. A. Crowell (RL) stated that the Response Action Plan for Trench 31 and 34 was transmitted to the regulators on July 19, 1995.

The safety evaluation report (SER) has not been finalized, and it is the remaining item to be completed before start-up of Trench 31. The concrete load-out pad for Trench 34 has been poured, and the epoxy coating will be poured within two weeks.

Mr. Hepner stated his understanding was that budgeting was not available to operate the trenches in 1996. Ms. Crowell responded that the trenches are budgeted for fiscal year 1996. Ms. Crowell explained that there is a question whether money will be available in 1997 for the leachate, and therefore operating in 1996 would not be practical.

Ms. Crowell inquired about the schedule for the Notice of Deficiency (NOD) workshops. Ms. G. Cummins (WHC) provided Mr. Hepner a proposed unit inclusion schedule for Mod C (Attachment 5), which was prepared approximately three months ago. The proposed schedule includes a NOD workshop period from 10-15-95 to 8-8-96. Mr. Hepner accepted the schedule, and suggested that the parties initiate the NOD workshops as soon as possible.

3. PERMIT APPLICATION STATUS

Ms. Cummins stated that the Notice of Intent (NOI) is in the 150-day public review. RL/WHC have received comments from Ecology, and WHC is incorporating the comments into the Part A permit application. The revised Part A will be submitted to Ecology for review following the 150-day public review.

Mr. Hepner inquired about the revised number for trench capacity. Mr. C. Clark (RL) responded that the new number is 1,414 hectare meters. Ms. Cummins stated that the revised Part A will reflect the new numbers, following agreement among RL/WHC and Ecology. Ms. Cummins noted that the capacity available for mixed waste in the burial grounds is provided in the process design capacity and is not based on forecast. Mr. Hepner stated his preference for the forecast approach to determine trench process design capacity. Ms. Cummins reiterated RL/WHC's preference to avoid the cost of revising the Part A yearly because of the changes in waste receipt. A meeting was scheduled with RL/WHC and Ecology on July 25, 1995, to discuss the process design capacity for the Low-Level Burial Grounds and how the new numbers were calculated.

Mr. Hepner asked if RL is preparing a State of Washington Environmental Policy Act (SEPA) checklist. Mr. Clark pointed out that the revised trench process design capacity number is not an expansion of lateral boundaries in the Low-Level Burial Grounds. Mr. Hepner stated that his SEPA point of contact had indicated the revised trench process design capacity was significant enough to possibly require a new SEPA checklist.

Ms. Cummins distributed a handout (Attachment 6) pertaining to the disposal of bulk waste disposal at the mixed waste trenches. This handout is a copy of the presentation given to Mr. A. Conklin (Department of Health) in May 1995.

4. RCRA TOPICS

- **Discussion of 4-9-93 NOD Response Table**

Ms. Cummins stated that RL/WHC received a letter from Ecology addressing the remaining NODs. RL/WHC will provide a response to Ecology in the near future.

5. GENERAL TOPICS

- **Status of Pump and Treat**

Mr. R. Mercer (WHC) provided an update on the pump and treat operation (Attachment 7). Bechtel Hanford, Inc. (BHI) is continuing with the pump and treat pilot project, and WHC has not observed any effects in the burial ground wells. Mr. Mercer reported that BHI is not getting the anticipated production from the two extraction wells. BHI plans to redevelop the extraction wells in an effort to raise production; and if redevelopment of

the wells does not raise production, BHI may drill more wells. Construction of a pipeline is scheduled to begin in October 1995, and the official start-up is scheduled for March 1996. BHI plans to drill four extraction wells, two injection wells, and two monitoring wells in 1996. If the 1996 well drilling is successful, BHI plans to drill the same amount of new wells in 1997.

- **Past Action Items**

  Action item 10-27-93:1, schedule a technical issues meeting for RCRA/CERCLA integration and discussion of pump and treat evaluations.

  WHC is continuing to provide pump and treat information to Ecology. This action item was left open.

- **New Action Items**

  There were no new action items generated during the meeting.

6. SCHEDULE NEXT MEETING

- **Tentative Date**

  The next Unit Managers Meeting was scheduled for videoconference on September 6, 1995.

- **Proposed Topics**

  There were no new proposed topics for discussion.

9513383.2399

Attachment 3

Unit Managers Meeting
for
Low-Level Burial Grounds

Date: July 20, 1995

Attendance List

Name	Organization	Phone #
Kathy Knox	WHC	372-3596
Dan Duncan	EPA	(206) 553-6693
Rich Mercer	WHC	376-8945
NORM HEPNER	ECOLOGY	736-3048
Tony McKarns	DOE	376-8281
GLORIA CUMMINS	WHC	372-2484
Gerry Hendricks	GSSC	946-3687
Roger Bowman	WHC	376-4876
Sarah Campbell	WHC	372-0667
Alison Crowell	RL	372-2346
Brett Barnes	WHC	376-3640
Cliff Clark	RL	376-9333

9513383.2400

Attachment 4

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

July 20, 1995
11:00 a.m. - 12:00 p.m.

Action Items

Action Item	Description
10-27-93:1	Schedule a technical issues meeting for RCRA/CERCLA integration and discussion of pump and treat evaluations. **OPEN**
10-18-94:1	RL will provide Ecology (Mr. R. Cordts) a preview of the engineering change notices (ECNs) on Trench 31 and 34. ACTION: A. Crowell (RL) **CLOSED**

9513383.2401

Attachment 5

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

July 20, 1995
11:00 a.m. - 12:00 p.m.

HANFORD FACILITY PERMIT
LOW-LEVEL BURIAL GROUNDS (LLBG)
PROPOSED UNIT INCLUSION SCHEDULE FOR MOD C

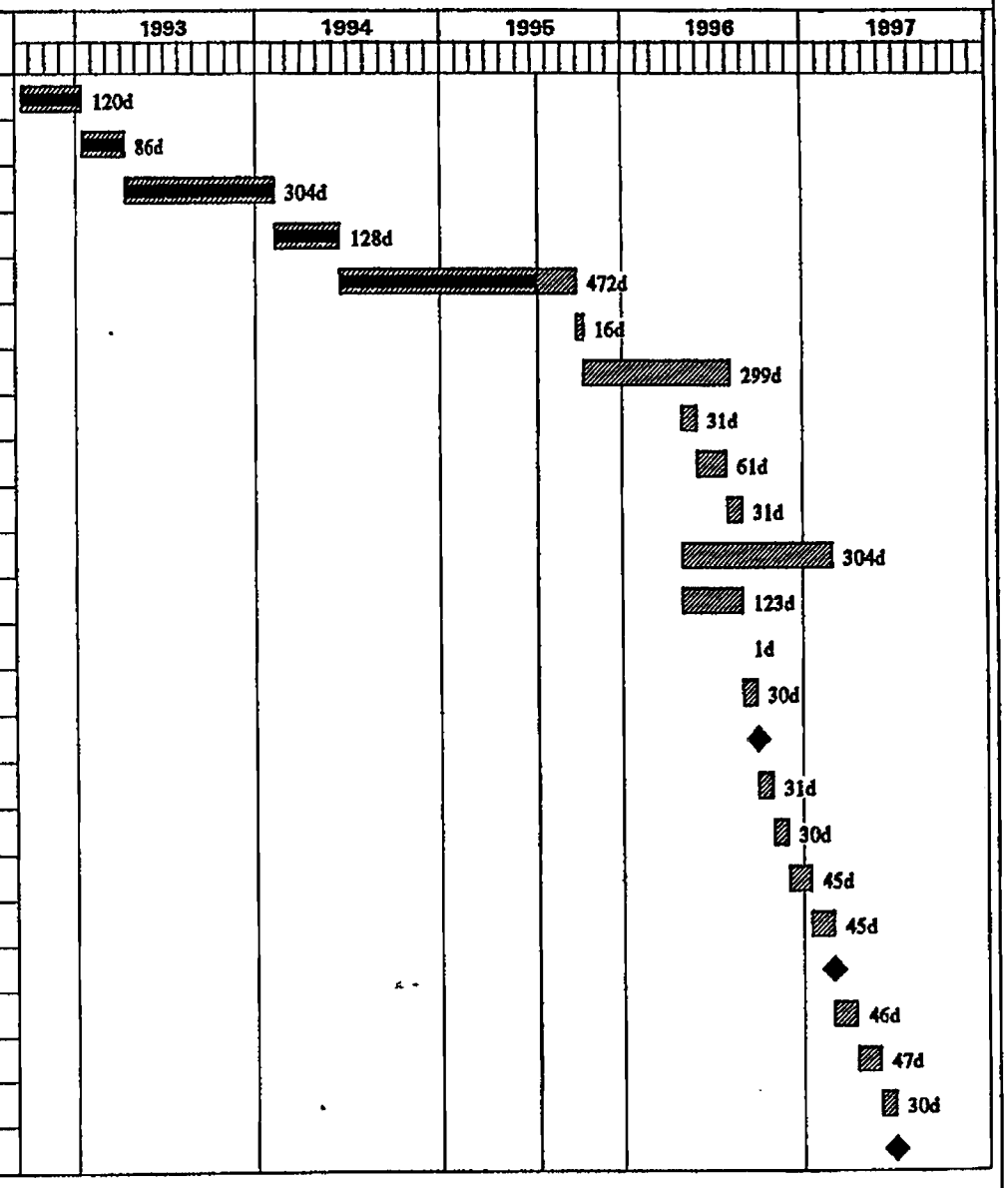
LLBG 7-20-95

Hanford Facility Permit

Low-Level Burial Grounds (LLBG)

Proposed Unit Inclusion Schedule for Mod C

Name	Start	Finish	Duration
Ecology Review of NOD	9/16/92	1/13/93	120d
DOE-RL Response (4th NOD Response Table)	1/14/93	4/9/93	86d
Ecology Review (Review 4th NOD Response Table)	4/10/93	2/7/94	304d
UMM to resolve issues (Incorporate NOD Comments)	2/8/94	6/15/94	128d
WHC/DOE-RL Revise Document (Rev. 1 Working Draft)	6/16/94	9/30/95	472d
DOE-RL Approval (Submit Working Draft)	9/30/95	10/15/95	16d
Ecology Review (Review Rev. 1 Working Draft) & Workshop Meeting	10/15/95	8/8/96	299d
Revise Working Draft	5/1/96	5/31/96	31d
Stakeholder Review	6/1/96	7/31/96	61d
Incorporate Stakeholder Comments/Prepare for Approval	8/1/96	8/31/96	31d
Draft Permit Modification Preparation	5/1/96	2/28/97	304d
Prepare Modification package (revise/assemble per workshop)	5/1/96	8/31/96	123d
Submit to RL for Approval	9/1/96	9/1/96	1d
Pre-certification WHC/RL Concurrent Review of Mod Pkg.	9/1/96	9/30/96	30d
Submit Advance Copy to Ecology	10/1/96	10/1/96	
Advance Ecology Review of Mod Pkg. - issue completeness letter	10/2/96	11/1/96	31d
Compile Comments	11/2/96	12/1/96	30d
Prepare Mod. pkg. for Public Review (duplication, notices, etc.)	12/2/96	1/15/97	45d
Certification Process (WHC - 2 wks, RL - 4 wks)	1/16/97	3/1/97	45d
Submit Modification Package to Ecology	3/1/97	3/1/97	
Public Review/Comment	3/1/97	4/15/97	46d
Comment Incorporation & Page Changes	4/16/97	6/1/97	47d
30-Day Waiting Period/Appeal Submittal	6/2/97	7/1/97	30d
Mod C Effective Date	7/1/97	7/1/97	



File: LLBG-B1.MPW
Date: 7/12/95
Permitting Lead: G. D. Cummins

Scheduled Completed Milestone

9513383.2402

9513383.2403

Attachment 6

LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

July 20, 1995
11:00 a.m. - 12:00 p.m.

PRESENTATION ON THE DISPOSAL OF BULK WASTE IN THE LOW-LEVEL BURIAL GROUNDS
FOR THE WASHINGTON STATE DEPARTMENT OF HEALTH

ZLBG
7-20-95

PRESENTATION ON THE DISPOSAL OF BULK WASTE IN THE LOW-LEVEL BURIAL GROUNDS FOR THE WASHINGTON STATE DEPARTMENT OF HEALTH

MAY 1995

BY
BARBARA J. BROOMFIELD

9513383.2404

THE FOLLOWING DESCRIBED HOW PARTICULATES WILL BE REDUCED AND/OR ELIMINATED DURING DISPOSAL OF BULK WASTE AT THE LOW-LEVEL BURIAL GROUNDS TRENCH 31 AND 34.

THE FOLLOWING WILL BE PERFORM ON INCOMING BULK WASTE SHIPMENTS

- The transport vehicle loaded with bulk waste will be positioned into the trench and unloaded. The transport vehicle will be responsible for proper containment of bulk waste while in transport (e.g., closed and clamped cover, etc.,).

- A radiological control technician (RCT) upon receipt will survey the truck prior to entry into the trench area.

9513383.2405

- The bulk waste will be moved by the dedicated front-loader and can either be used for backfill if applicable or be placed for disposal.

- Radiological and hazardous constituent air monitoring will be available to provide definition of personnel exposure due to possible airborne contamination.

- Dust suppression spray equipment will be placed to spray fixative agents on loose bulk waste to contain dust emissions during unloading.

- An RCT and a industrial hygiene (IH) will determine if air monitoring is necessary. If necessary, the RCT and HI will be responsible for setting up the appropriate air monitoring equipment.

9513383.2406

- While unloading the bulk waste, spray equipment will be used to contain dust. Turn off spray dust control equipment as soon as the bulk waste is unloaded and dust has settled.

- Bulk waste will not be unloaded or moved when wind speeds are in excess of 24 km/hr (15 mph), the RCT or IH determine through monitoring, or other discrepancies are observed (e.g., broken tamper seals, etc.,). Bulk waste will not be accepted if it does not meet the waste acceptance criteria.

- Bulk waste disposal operations will cease and fixatives will be applied as needed to stop the spread of waste material if wind speed exceeds 24 km/hr (15 mph) or bulk waste will be covered with 0.61 meters (2 feet) of clean backfill.

9513383.2407

- Bulk waste will be covered with 0.61 meters (2 feet) of clean soil prior to end of shift, or before ceasing operations for the day if not sprayed with fixatives.

- Bulk waste will be compacted in its final location(s) after a 0.61 meters (2 feet) clean soil cover as been added. Compaction will be accomplished by running a loader over the clean soil cover.

- No more than one bulk waste shipment will be off-loaded at anyone time.

- Loose placement of bulk waste in the burial ground will be allowed for earth (minimum moisture content for soils is 3 percent), vegetation, building rubble and other homogeneous waste. Equipment, piping and other forms of non-homogeneous waste should be containerized

9513383.2408

- The maximum surface-radiation dose rate for bulk waste shall not exceed 200 mrem/hr at any point on the surface of the transport vehicle.

- Bulk waste that exceeds the following limits (perform sum of the fractions calculations for mixtures) will be packaged in single use containers and is not acceptable for bulk unloading:

Radionuclide	Limit (curies per gram)	
	21 m^3 Case	128 m^3 Case
^{14}C	6.16 E-05	8.56 E-06
^{22}Na	1.85 E-05	2.57 E-06
^{40}K	1.23 E-05	1.71 E-06
^{60}Co	6.16 E-07	8.56 E-08
^{90}Sr	1.23 E-07	1.71 E-08
^{99}Tc	1.85 E-05	2.57 E-06
^{137}Cs	4.31 E-06	5.99 E-07

9513383.2409

Radionuclide	Limit (curies per gram)	
	21 m^3 Case	128 m^3 Case
^{152}Eu	6.16 E-07	8.56 E-08
^{154}Eu	4.92 E-07	6.85 E-08
^{155}Eu	2.46 E-06	3.42 E-07
^{226}Ra	1.85 E-08	2.57 E-09
^{228}Th	2.46 E-10	3.42 E-11
^{232}Th	3.08 E-11	4.28 E-12
$^{233}U/^{234}U$	1.23 E-09	1.71 E-10
^{235}U	1.23 E-09	1.71 E-10
^{238}U	1.23 E-09	1.71 E-10
^{238}Pu	1.85 E-10	2.57 E-11
$^{239}Pu/^{240}Pu$	1.23 E-10	1.71 E-11
^{241}Am	1.23 E-10	1.71 E-11

9513383.2410

9513383.2411

Attachment 7

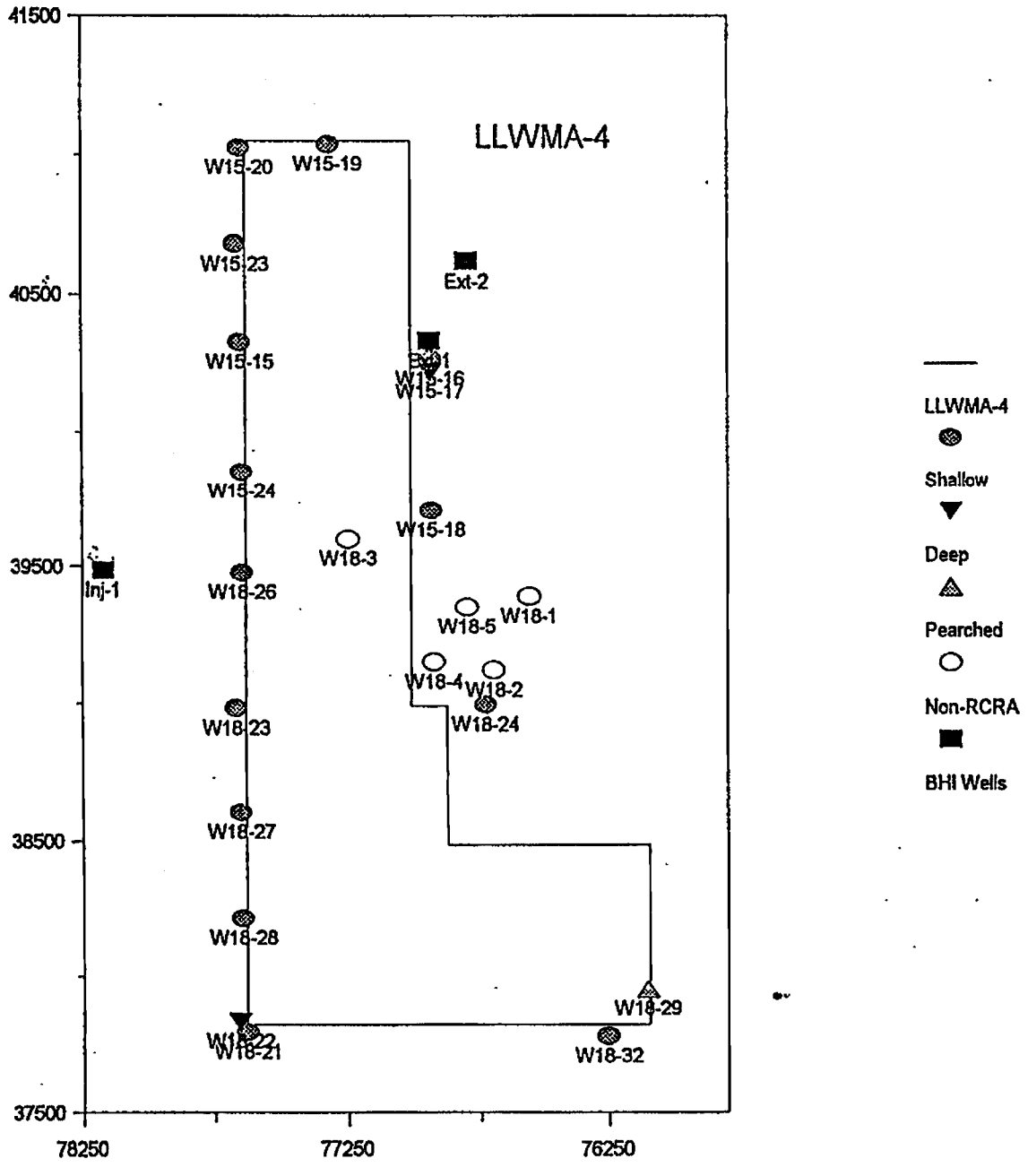
LOW-LEVEL BURIAL GROUNDS
Unit Managers Meeting
Federal Building, Room 784B
Richland, Washington

July 20, 1995
11:00 a.m. - 12:00 p.m.

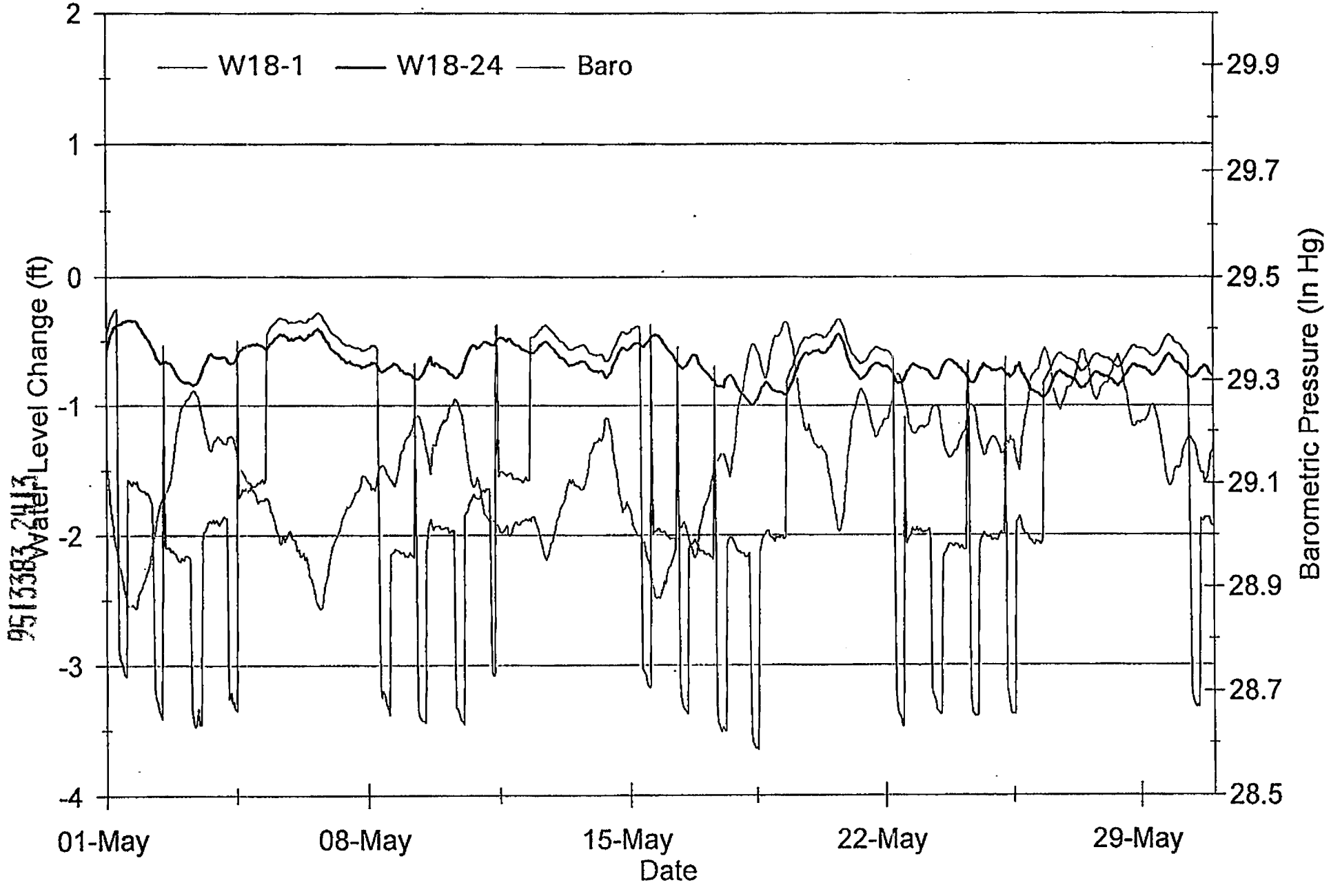
STATUS OF PUMP AND TREAT

LLBG
7-20-95

9513383.2412



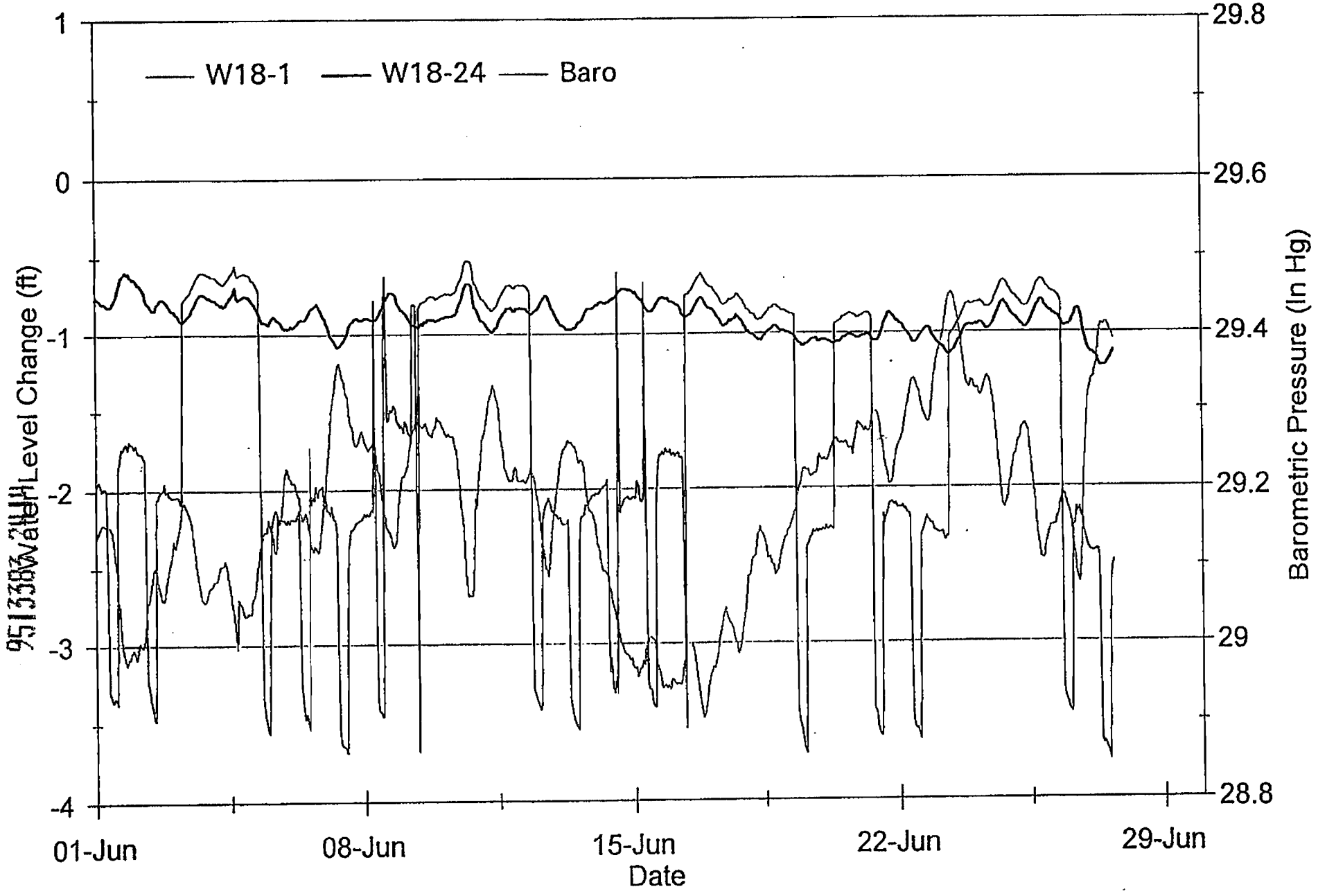
200-ZP-1 Water Level Monitoring
May 1995



Rev 11-Jul-95

Graphed by R S Edington

200-ZP-1 Water Level Monitoring
June 1995



Rev 11 Jul-95

Graphed by R S Edington

9513383.2415

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RCRA Files	WHC	H6-23

ADMINISTRATIVE RECORD: Low-Level Burial Grounds, D-2-9
[Care of EDMC, WHC (H6-08)]

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Environmental Protection Agency Region 10, Seattle, Washington 98101, Mail Stop HW-074

Please send comments on distribution list to G. D. Cummins, WHC (H6-24), (509) 372-2484

D19713167

0045110

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

AUG 30 1996

96-EAP-343

Mr. Moses N. Jaraysi
200 Area Unit Supervisor
Nuclear Waste Program
State of Washington
Department of Ecology
1315 West Fourth Avenue
Kennewick, Washington 99336-6018

Mr. Joseph J. Witczak
Unit Supervisor
Regulatory and Technical Support
Nuclear Waste Program
State of Washington
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Dear Messrs. Jaraysi and Witczak:

ADDENDUM TO THE NOTICE OF INTENT (NOI) FOR EXPANSION UNDER INTERIM STATUS FOR THE LOW-LEVEL BURIAL GROUNDS (WA7890008967) (TSD: D-2-9)

Enclosed is an Addendum to the NOI for Expansion Under Interim Status for the Low-Level Burial Grounds. The NOI addendum addresses the need for the addition of greater-than-90-day container storage capability within the 218-W-5 Burial Ground mixed waste trenches (Trenches 31 and 34). The need for container storage capability in Trenches 31 and 34 is due to the need to place large containers (e.g., macroencapsulated long-length contaminated equipment, large boxes, etc.) in a Resource Conservation and Recovery Act (RCRA) compliant storage area other than the Central Waste Complex (CWC).

The placement of these containers in Trenches 31 and 34 will eliminate the need to construct a mixed waste storage pad at the CWC and would eliminate the need for repeated transfers of the same item prior to disposal. The process design capacity for storage of containers in Trenches 31 and 34 is estimated to be 10,000,000 liters.

SEP 1996
RECEIVED
EDMC

The original NOI was submitted by the U.S. Department of Energy, Richland Operations Office (RL) and the Westinghouse Hanford Company (WHC) to the State of Washington Department of Ecology (Ecology) on April 28, 1995, in accordance with Washington Administrative Code (WAC) 173-303-281. The WAC 173-303-281 requires that a NOI be submitted 150 calendar days before the revised Dangerous Waste Part A Permit Application (Part A) is submitted to Ecology. The WAC 173-303-281 does not specifically address addendums to the NOI process; however, in order to add container storage capability at the Low-Level Burial Grounds without submitting a new NOI, an addendum to the existing NOI has been prepared. This approach has been used for other NOIs previously processed by Ecology (e.g., T Plant and 325 Hazardous Waste Treatment Units). Public notification will be placed in the local daily newspaper notifying the public of the addendum to the NOI.

Should you have any questions regarding the addendum to the NOI, please contact Tony McKarns, RL on (509) 376-8981, or Glen C. Triner, WHC on (509) 372-0771.

Sincerely,

James E. Rasmussen

James E. Rasmussen, Director
Environmental Assurance, Permits,
and Policy Division
DOE Richland Operations Office

EAP:ACM

W H Hamilton Jr.

William H. Hamilton, Jr., Director
Solid Waste Disposal
Projects and Site Services
Westinghouse Hanford Company

Enclosure:
Addendum to NOI for the
Low-Level Burial Grounds

cc w/encl:
EDMC, H6-08
R. Bowman, WHC
W. Hamilton, Jr., WHC
R. Jim, YIN
R. Pierce, WHC
D. Powaukee, NPT
S. Price, WHC
G. Triner, WHC
J. Wilkinson, CTUIR

cc w/o encl:
W. Dixon, WHC
D. Sherwood, EPA

9653617D

ENCLOSURE I

Addendum to the Notice of Intent
for Expansion Under Interim Status
Low-Level Burial Grounds
(WA7890008967) (TSD: D-2-9)

Consisting of 3 pages,
including cover page

ADDENDUM TO THE NOTICE OF INTENT FOR EXPANSION UNDER INTERIM STATUS FOR THE LOW-LEVEL BURIAL GROUNDS

The following is an addendum to the *Notice of Intent For Expansion Under Interim Status - Low-Level Burial Grounds, Hanford Facility, Richland, Washington* that was submitted to the State of Washington Department of Ecology on April 28, 1995.

This addendum is to serve notice of intent to add greater-than-90-day container storage for mixed waste within the 218-W-5 Burial Ground mixed waste trenches (Trenches 31 and 34) in the Low Level Burial Grounds (LLBG).

2.3 DESCRIPTION OF EXPANSION

Add the following statements after Page 3 line 24:

The need for greater-than-90-day container storage capability in the mixed waste trenches is due to the need to place large containers of treated mixed waste (e.g., macroencapsulated long-length contaminated equipment, large boxes, etc.,) in a Resource Conservation and Recovery Act (RCRA) compliant storage area other than the Central Waste Complex. The placement of these containers in Trenches 31 and 34 would eliminate the need to construct a mixed waste storage pad and repeated transfers of the same item prior to disposal. The process design capacity for storage of containers is estimated to be 10,000,000 liters.

Replace Page 3 Lines 25 through 31 with the following statement:

The proposed change in process design capacity for disposal of mixed waste from 117 hectare-meters to 174 hectare-meters does not expand the physical lateral boundaries of the LLBG, only the total amount of mixed waste that could be disposed. The mixed waste trenches within the boundaries of the LLBG will vary in size, shape, and depth in accordance with future construction requirements. All waste accepted for disposal in the new mixed waste trenches will comply with WAC 173-303 regulations.

2.5 COMPLIANCE WITH SITING STANDARDS

Replace Section 2.5.1.3.2.3 with:

The proposed expansion involves the addition of container and disposal process design capacity in RCRA compliant trenches. The additions are not expected to result in an increased potential for release of mixed waste to groundwater or to a special protection area.

3.0 JUSTIFICATION OF NEED

Add the following statements to Page 7 after line 30:

The need for greater-than-90-day container storage capability in Trenches 31 and 34 is due to the need to place large containers of treated mixed waste in a RCRA compliant storage area other than the Central Waste Complex. The placement of these containers in Trenches 31 and 34 would eliminate the need to construct a mixed waste storage pad and repeated transfers of the same item prior to disposal.

4.0 IMPACT ON OVERALL CAPACITY AT THE HANFORD FACILITY AND THE STATE OF WASHINGTON

Replace paragraph on page 7 lines 46 through 50 and page 8 lines 1 and 2 with the following statement:

The current capacity for storing and/or disposing of mixed waste is limited within Washington State and the Hanford Facility. The expansion of the LLBG will allow for storage and treatment of mixed waste from waste management activities, and will comply with WAC 173-303 regulations. This expansion supports the current onsite mission of waste management.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
1315 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

March 6, 1997

Mr. James E. Rasmussen
U.S. Department of Energy
P.O. Box 550, MSIN: A5-15
Richland, WA 99352

Dear Mr. Rasmussen:

Re: Approval of Low-Level Burial Ground (LLBG) Part A, Revision 9

The Washington State Department of Ecology (Ecology) has received the LLBG Part A, Revision 9, dated March 4, 1997. It is Ecology's understanding that there is an urgent need for storage of bulky and long-length mixed waste awaiting disposal at Hanford. Trench 34 provides the necessary safeguards and the most affordable option to safely manage this waste form at Hanford.

Based on the above considerations, Ecology is approving the LLBG Part A, Revision 9. If you have any questions concerning this approval, please contact me at (509) 736-3048.

Sincerely,

for Norman T. Hepner, PE
Nuclear Waste Program

NH:sb
Enclosure

cc: Cliff Clark, USDOE
William Adair, FDH
Sue Price, FDH
Mary Lou Blazek, ODOE
Administrative Record: LLBG

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 character/inch).

FORM **3**

DANGEROUS WASTE PERMIT APPLICATION

I. EPA/STATE I.D. NUMBER: W A 7 8 9 0 0 0 8 9 6 7

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED *(mo., day, & yr.)*	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

MO. 0 3 | DAY 2 2 | YR. 4 3 * FOR EXISTING FACILITIES, PROVIDE THE DATE *(mo., day, & yr.)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

* The date construction of the Hanford Facility commenced

☐ 2. NEW FACILITY *(Complete item below)*

MO. | DAY | YR. FOR NEW FACILITIES, PROVIDE THE DATE *(mo., day, & yr)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Section I above)*

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT

☒ 2. FACILITY HAS A FINAL PERMIT

III. PROCESSES - CODES AND CAPACITIES

A. PROCESS CODE - Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the *(Section III-C)*.

B. PROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process.

1. AMOUNT - Enter the amount.

2. UNIT OF MEASURE - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D82	*ACRES OR HECTARES*
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	Q
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING SECTION III *(shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons.* The facility also has an incinerator that can burn up to 20 gallons per hour.

LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	D 8 1	174	F		7				
2	S 0 1	10,000,000	L		8				
3					9				
4					10				

CONTINUE ON REVERSE

Continued from the front.

III. PROCESSES (continued)

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

Refer to the following page.

IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER - Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER - Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.

2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.

3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2			T 0 3 D 8 0	Included with above

 CONTINUE ON PAGE 3

FORM 3 DANGEROUS WASTE PERMIT APPLICATION
U.S. ENVIRONMENTAL PROTECTION AGENCY/STATE IDENTIFICATION NUMBER WA7890008967

Section III.C., Description of Process Codes listed in Section III.a.

D81

The Low-Level Burial Grounds (LLBG) began waste management operations in January of 1960. The LLBG comprise a landfill disposal unit (D81) and cover a total area of approximately 225 hectares (556 acres). The landfill is divided into eight burial grounds. Six burial grounds are located in the 200 West Area and two in the 200 East Area, as depicted on the attached drawings. The LLBG consist of lined and unlined trenches of various sizes and depths. All mixed waste destined for disposal in lined trenches will meet land disposal restriction requirements. The lined trenches consist of a double-liner leachate collection and removal system.

The process design capacity for mixed waste in the LLBG is 174 hectare-meters (2,275,819 cubic yards) of which 150 hectare-meters (1,961,913 cubic yards) is dedicated solely for the disposal of reactor compartment disposal packages.

S01

The greater-than-90-day container storage capability in mixed waste Trenches 31 and 34 of Burial Ground 218-W-5 provides a location to store various size containers of treated mixed waste in a Resource Conservation and Recovery Act (RCRA) compliant manner other than the Central Waste Complex. The placement of these containers in Trenches 31 and 34 eliminates the need to construct a mixed waste storage pad. This capability also reduces the need to transfer this waste prior to disposal. The process design capacity for storage of containers is estimated to be 10,000,000 liters (2,641,700 gallons).

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER *(entered from page 1)*: WA7890008987

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(If a code is not entered in D(1))*
1	D001	160,000,000	K	D81	Disposal
2	through				
3	D043				
4	WT01				
5	WT02				
6	WP01				
7	WP02				
8	WP03				
9	F001				
10	through				
11	F005				
12	F028				
13	F039				
14	W001				
15	U001				
16	through				
17	U012				
18	U014				
19	through				
20	U039				
21	U041				
22	through				
23	U053				
24	U055				
25	through				
26	U064				

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER *(entered from page 1)*: WA7890008967

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	U066		K	D81	Disposal (Continued)
2	through				
3	U099				
4	U101				
5	through				
6	U103				
7	U105				
8	through				
9	U174				
10	U176				
11	through				
12	U194				
13	U196				
14	U197				
15	U200				
16	through				
17	U223				
18	U225				
19	through				
20	U228				
21	U232				
22	through				
23	U240				
24	U243				
25	through				
26	U249				

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER *(entered from page 1)*: W A 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(If a code is not entered in D(1))*
1	U328		K	D81	Disposal (Continued)
2	U353				
3	U359				
4	P001				
5	through				
6	P018				
7	P020				
8	through				
9	P024				
10	P026				
11	through				
12	P031				
13	P033				
14	P034				
15	P036				
16	through				
17	P051				
18	P054				
19	P056				
20	through				
21	P060				
22	P062				
23	through				
24	P078				
25	P081				
26	P082				

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER *(entered from page 1)*: W A 7 8 9 0 0 0 8 9 8 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	P084		K	D81	Disposal (Continued)
2	P085				
3	P087				
4	through				
5	P089				
6	P092				
7	through				
8	P099				
9	P101				
10	through				
11	P116				
12	P118				
13	through				
14	P123				Included With Above
15	D004	10,000,000	K	S01	Storage-Container
16	through				
17	D043				
18	WT01				
19	WT02				
20	WP01				
21	WP02				
22	WP03				
23	W001				
24	F001				
25	through				
26	F005				

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER *(entered from page 1)*: WA7890009967

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	F028		K	S01	Storage-Container (Continued)
2	U001				
3	through				
4	U012				
5	U014				
6	through				
7	U039				
8	U041				
9	through				
10	U053				
11	U055				
12	through				
13	U064				
14	U066				
15	through				
16	U099				
17	U101				
18	through				
19	U103				
20	U105				
21	through				
22	U174				
23	U176				
24	through				
25	U194				
26	U196				

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER *(entered from page 1)*: WA7890008987

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U197		K	S01	Storage-Container (Continued)
2	U200				
3	through				
4	U223				
5	U225				
6	through				
7	U228				
8	U232				
9	through				
10	U240				
11	U243				
12	through				
13	U249				
14	U328				
15	U353				
16	U359				
17	P001				
18	through				
19	P018				
20	P020				
21	through				
22	P024				
23	P026				
24	through				
25	P031				
26	P033				

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER *(entered from page 1)*: W A 7 8 9 0 0 0 8 9 8 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	P034		K	S01	Storage-Container (Continued)
2	P036				
3	through				
4	P051				
5	P054				
6	P056				
7	through				
8	P060				
9	P062				
10	through				
11	P078				
12	P081				
13	P082				
14	P084				
15	P085				
16	P087				
17	through				
18	P089				
19	P092				
20	through				
21	P099				
22	P101				
23	through				
24	P116				
25					
26					

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER *(entered from page 1)*: W A 7 8 9 0 0 0 8 9 8 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				D. PROCESSES 2. PROCESS DESCRIPTION *(If a code is not entered in D(1))*
1	P118		K	S01				Storage-Container (Continued)
2	through		↓	↓				↓
3	P123		↓	↓				Included With Above
4								
5								
6								
7								
8								
9								
10								
11								
12								
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24								
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26								

Continued from the front.

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

The mixed waste disposed in the LLBG will consist of toxicity characteristic waste (D001 through D043), state-only waste (WT01, WT02, WP01, WP02, WP03, and W001), and listed waste from nonspecific sources (F001 through F005 and F039). Currently there is no mechanism in place to treat collected leachate with listed waste numbers other than F001 through F005. However, regulatorily acceptable alternatives for leachate management will allow for the disposal of other listed waste that include all "U," "P," and other "F" dangerous waste numbers. The reactor compartments in the 218-E-12B Burial Ground contain shielding constructed of metallic lead (state-only D008). Mixed waste could consist of up to 25 percent debris; however, this estimate could fluctuate as waste management needs dictate.

The mixed waste stored in the LLBG will consist of toxicity characteristic waste (D004 through D043), state-only waste (WT01, WT02, WP01, WP02, WP03, and W001), and listed waste from nonspecific sources (F001 through F005 and F028). Other waste that may be stored at the LLBG include all "U" and "P" dangerous waste numbers.

V. FACILITY DRAWING Refer to attached drawing(s).

All existing facilities must include in the space provided on page 6 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS Refer to attached photograph(s).

All existing facilities must include photographs *(aerial or ground-level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION This information is provided on the attached drawing(s) and photograph(s).

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
John D. Wagoner, Manager U.S. Department of Energy Richland Operations Office	John D. Wagoner	3/4/97

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

 CONTINUE ON PAGE 5

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

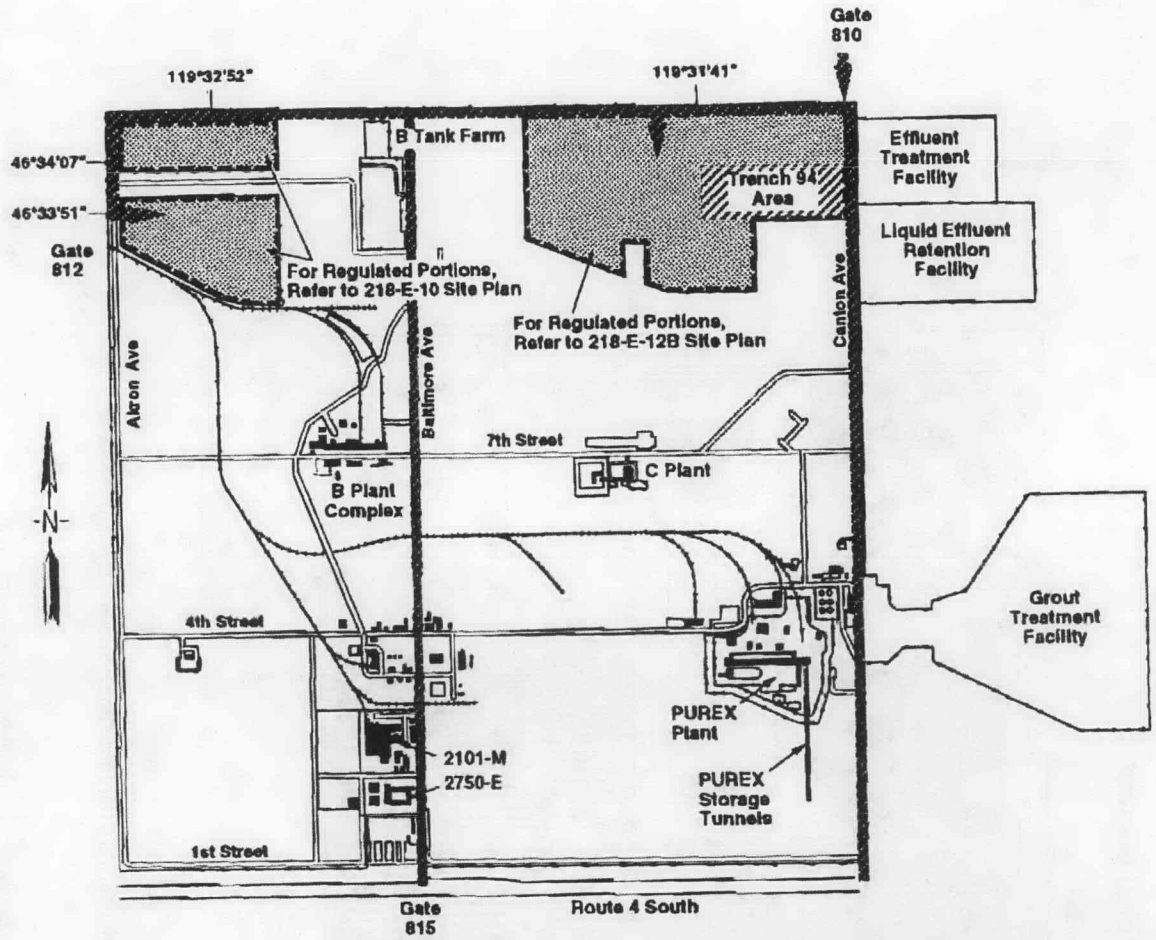
John D. Wagoner

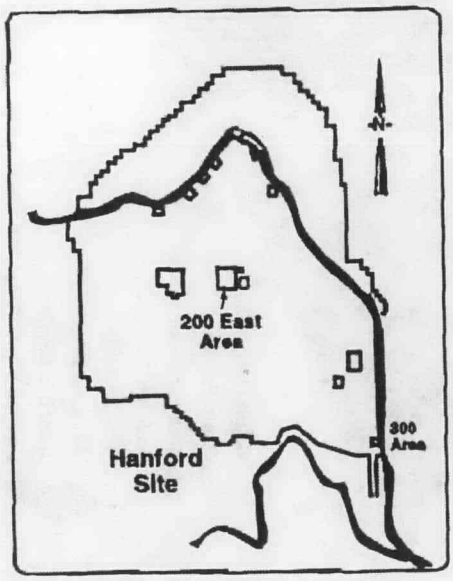
Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

3/4/97
Date

Co-operator
H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford, Inc.

3/3/97
Date





Regulated Burial Grounds

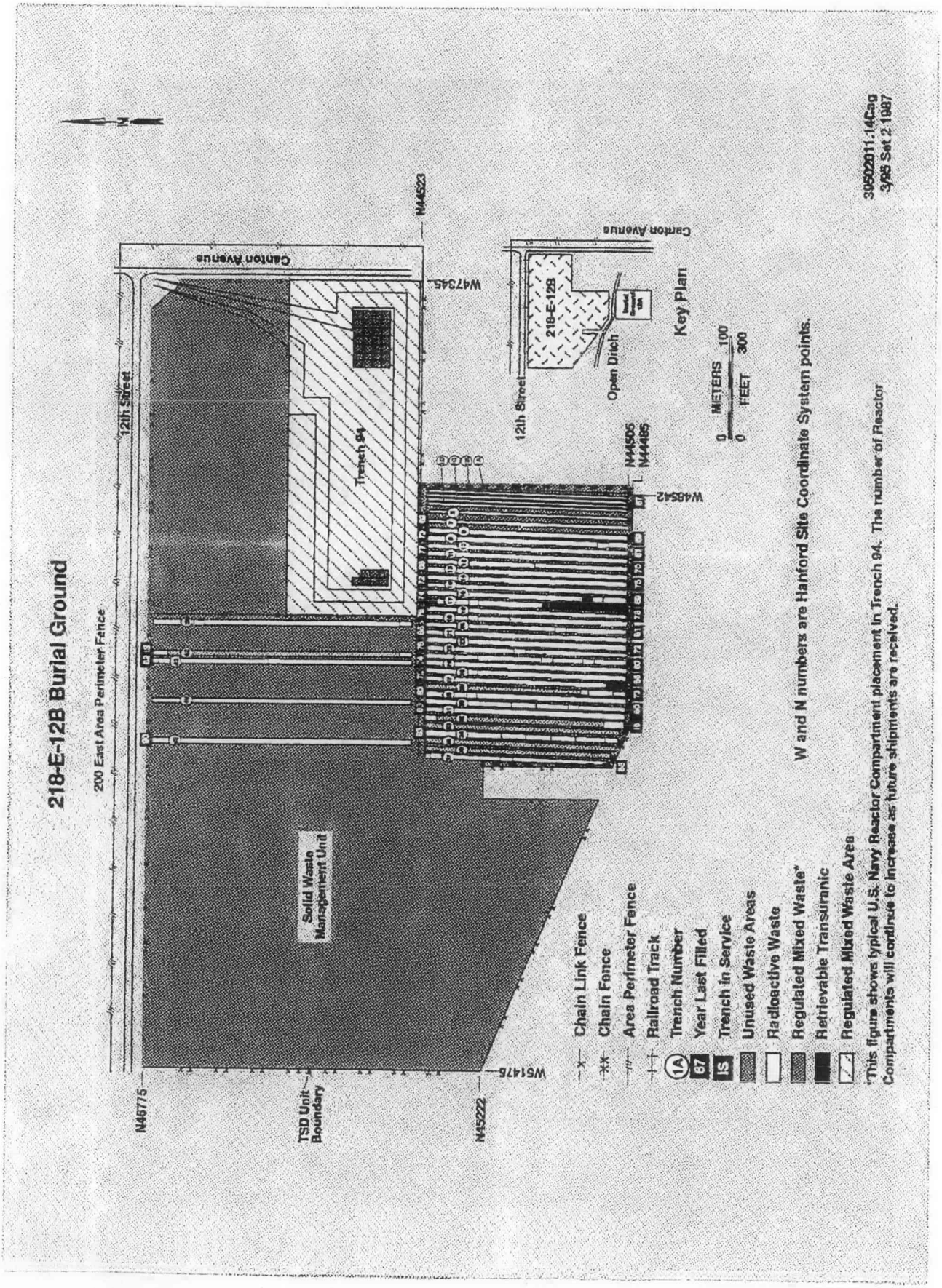
SWMU (Solid Waste Management Unit)

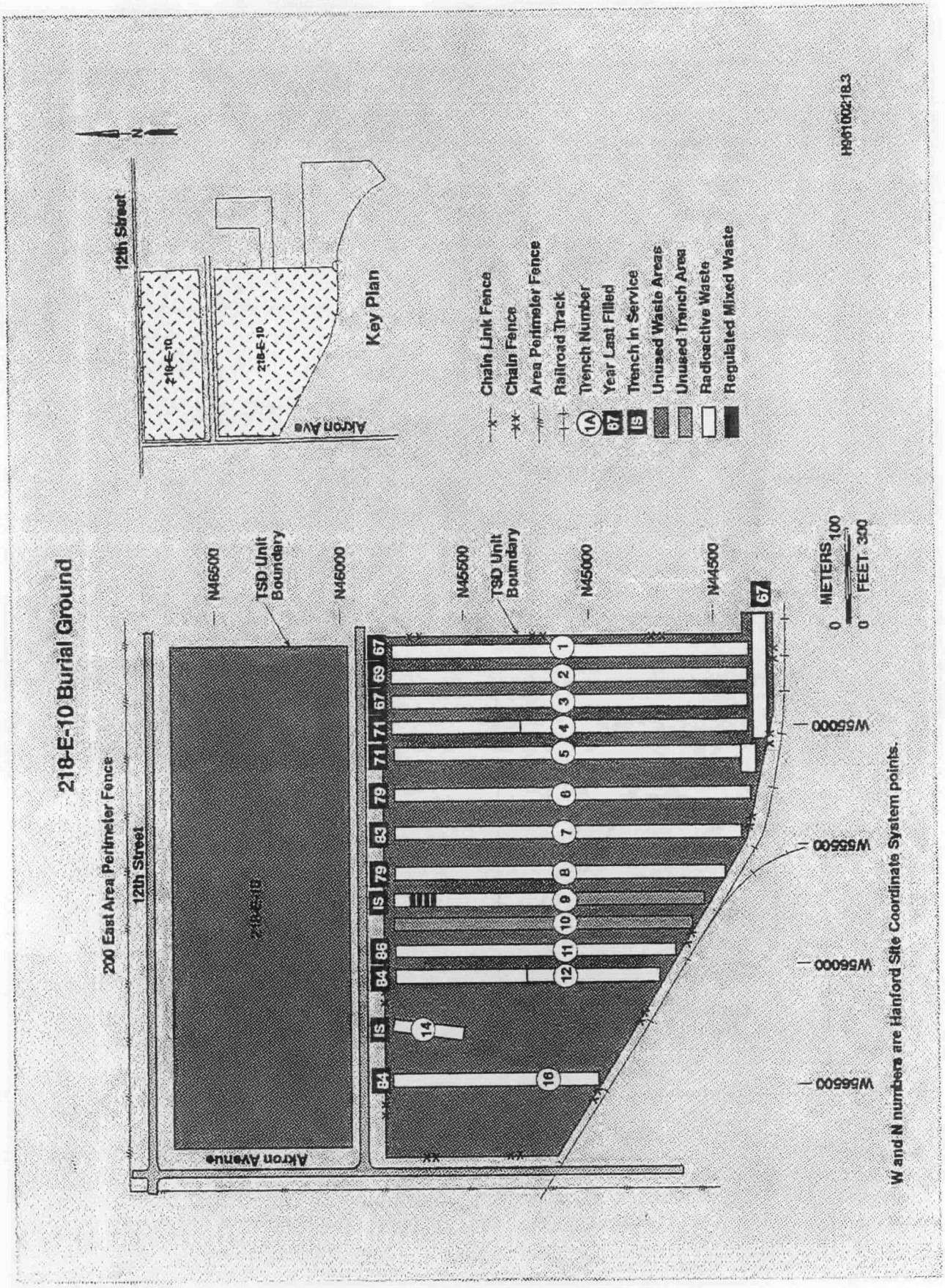
Waste Routes

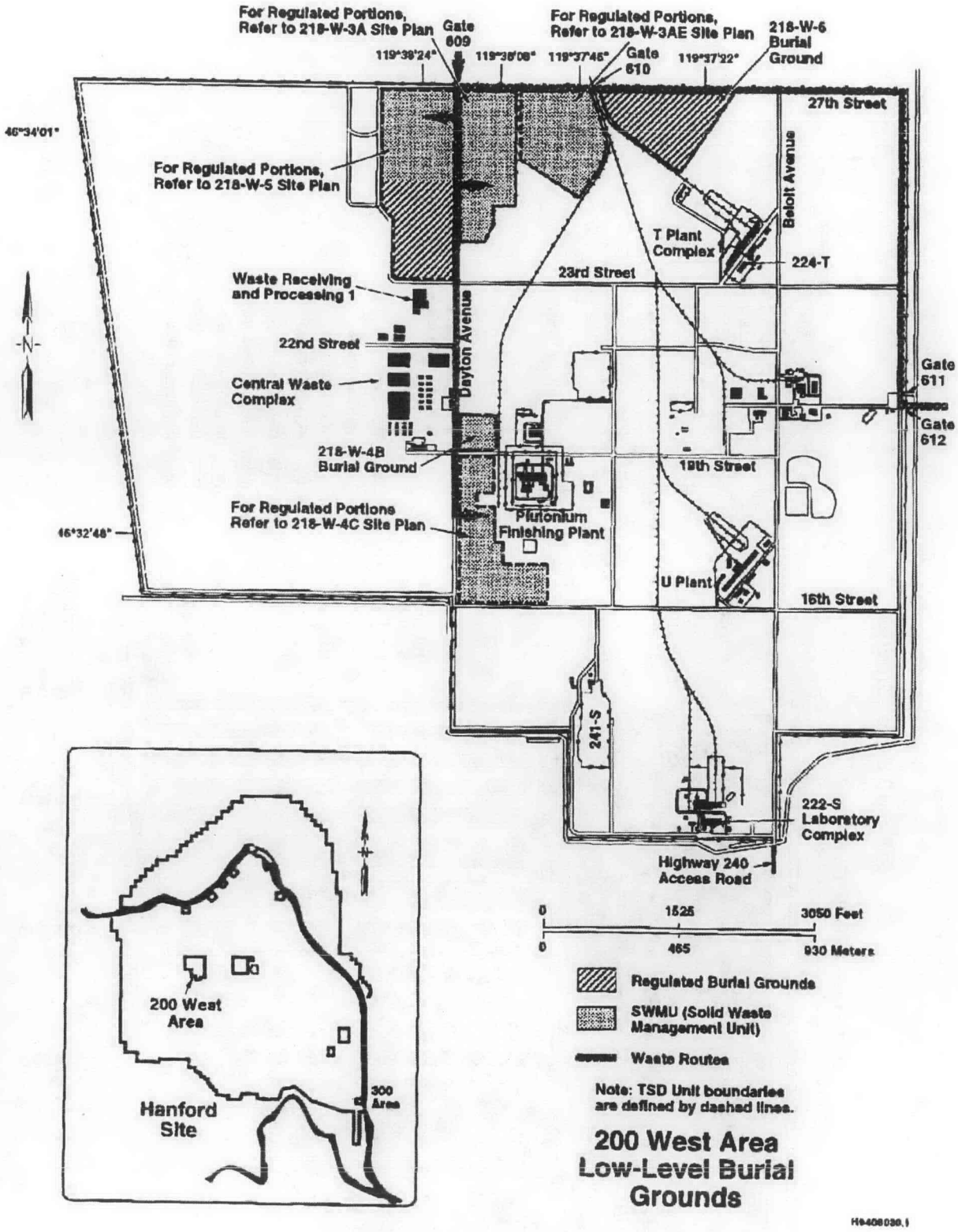
Note: TSD Unit boundaries are defined by dashed lines.

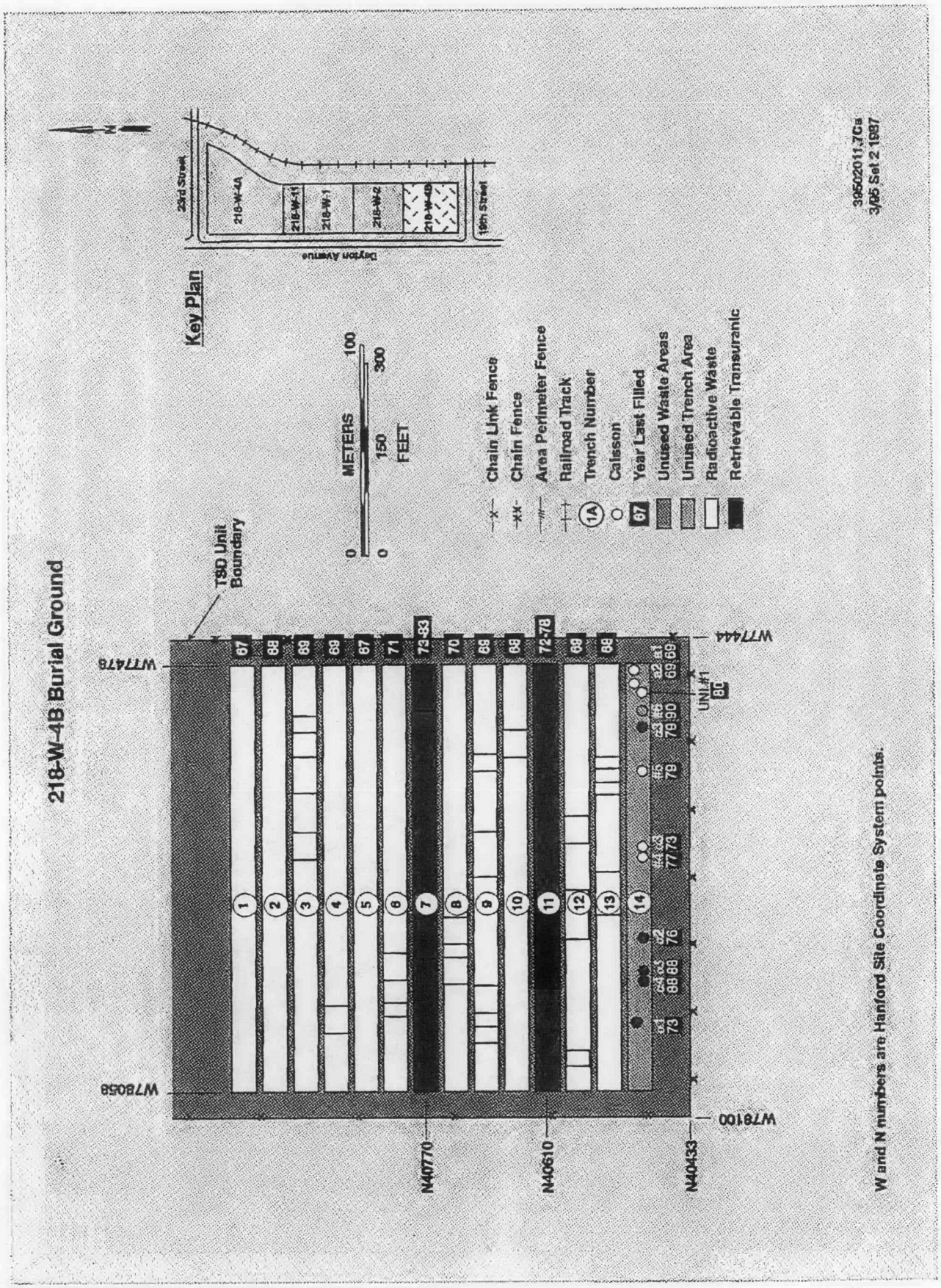
200 East Area Low-Level Burial Grounds

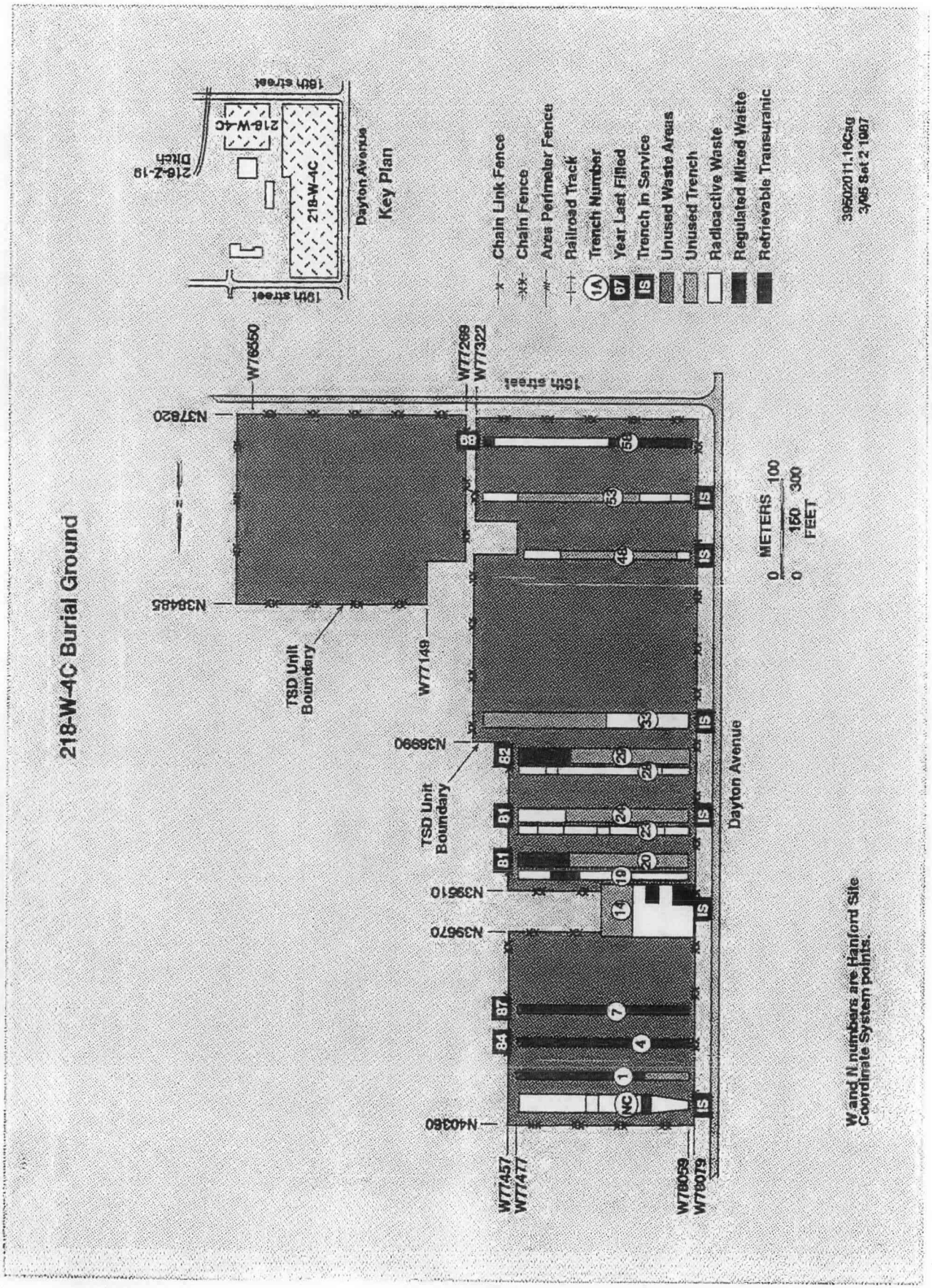
39407118.4

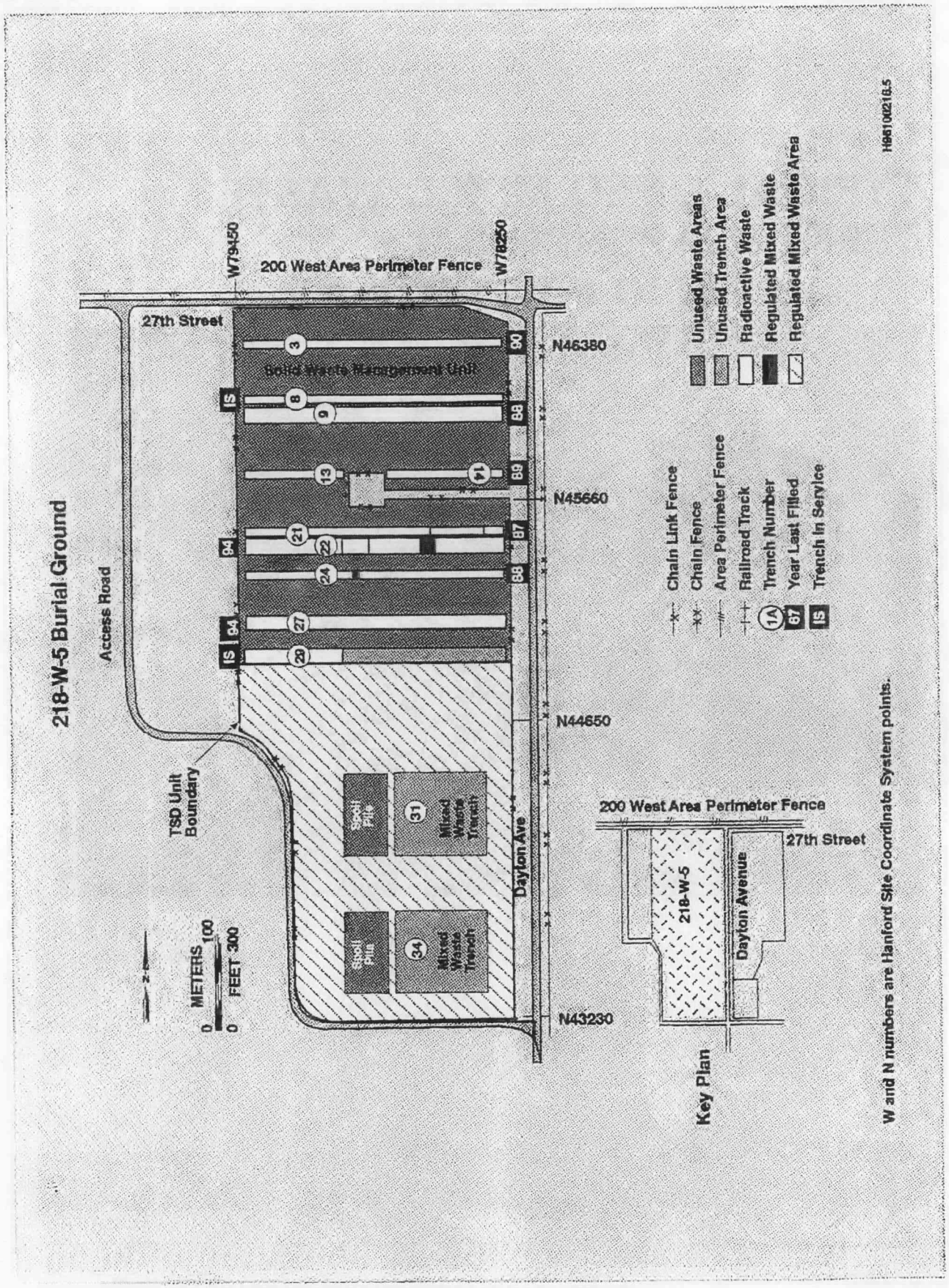

218-E-12B Burial Ground
200 East Area Perimeter Fence
12th Street
Canton Avenue
Trench 94
Solid Waste Management Unit
N46775
TSD Unit Boundary
N45222
W51475
W47345
N44523
W48542
N44505
N44485
Key Plan
218-E-12B
Open Ditch
0 METERS 100
0 FEET 300
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench in Service
Unused Waste Areas
Radioactive Waste
Regulated Mixed Waste*
Retrievable Transuranic
Regulated Mixed Waste Area
W and N numbers are Hanford Site Coordinate System points.
*This figure shows typical U.S. Navy Reactor Compartment placement in Trench 94. The number of Reactor Compartments will continue to increase as future shipments are received.
39502011.14Cag
3/25 Set 2 1987


218-E-10 Burial Ground
200 East Area Perimeter Fence
12th Street
Akron Avenue
218-E-10
TSD Unit Boundary
N46500
N46000
N45500
N45000
N44500
W55000
W55500
W56000
W56500
Key Plan
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench In Service
Unused Waste Areas
Unused Trench Area
Radioactive Waste
Regulated Mixed Waste
METERS 0 100
FEET 0 300
W and N numbers are Hanford Site Coordinate System points.
H9610021B-3

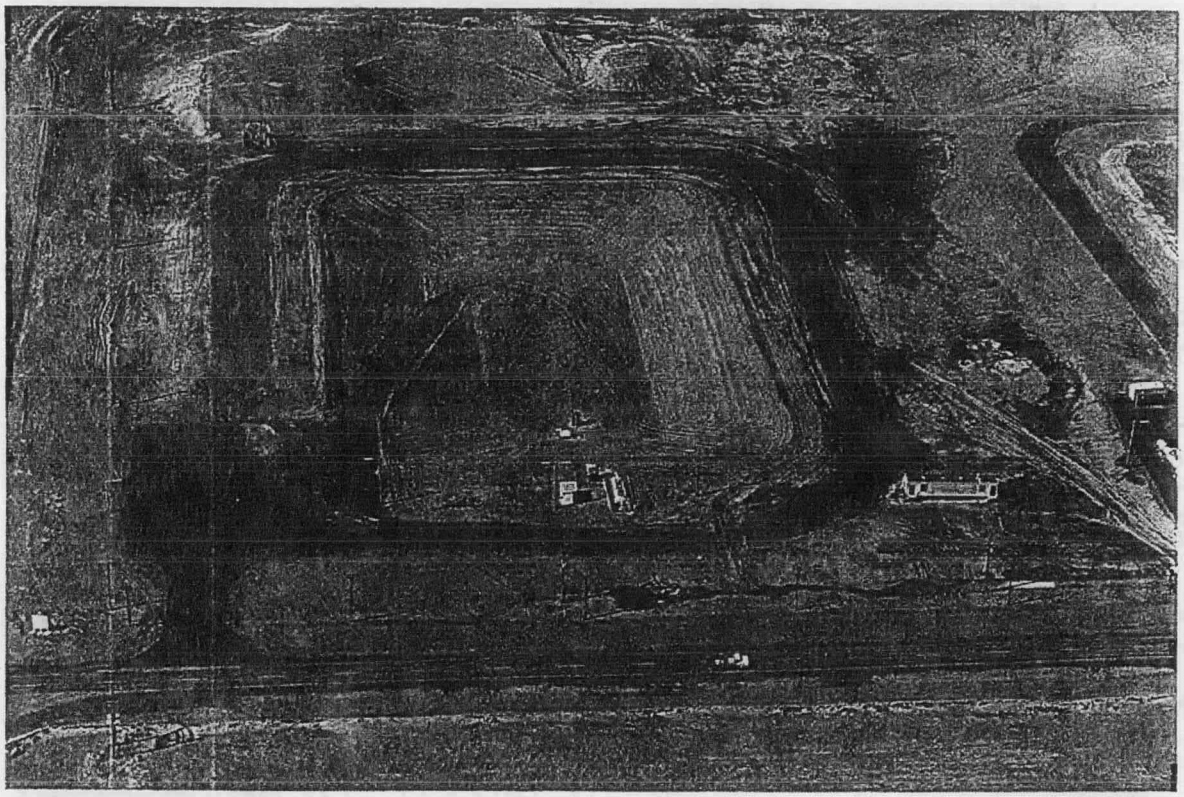

For Regulated Portions, Refer to 218-W-3A Site Plan
Gate 609
For Regulated Portions, Refer to 218-W-3AE Site Plan
218-W-6 Burial Ground
119°39'24"
119°38'08"
119°37'46"
Gate 610
119°37'22"
46°34'01"
27th Street
For Regulated Portions, Refer to 218-W-5 Site Plan
Belolt Avenue
T Plant Complex
224-T
23rd Street
Waste Receiving and Processing 1
Dayton Avenue
22nd Street
Central Waste Complex
Gate 611
Gate 612
218-W-4B Burial Ground
19th Street
For Regulated Portions Refer to 218-W-4C Site Plan
Plutonium Finishing Plant
46°32'48"
U Plant
16th Street
241-S
222-S Laboratory Complex
Highway 240 Access Road
0
1525
3050 Feet
0
465
930 Meters
Regulated Burial Grounds
SWMU (Solid Waste Management Unit)
Waste Routes
Note: TSD Unit boundaries are defined by dashed lines.
200 West Area
Low-Level Burial Grounds
200 West Area
Hanford Site
300 Area


218-W-4B Burial Ground
TSD Unit Boundary
Key Plan
23rd Street
Dayton Avenue
19th Street
218-W-4A
218-W-11
218-W-1
218-W-2
218-W-4B
N
METERS
0
100
150
300
FEET
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Caisson
Year Last Filled
Unused Waste Areas
Unused Trench Area
Radioactive Waste
Retrievable Transuranic
W78058
W77478
W77444
W78100
N40770
N40610
N40433
UNI #1
BL
39502011.7Ca
3/05 Sat 2 1997
W and N numbers are Hanford Site Coordinate System points.


218-W-4C Burial Ground
Key Plan
218-Z-19 Ditch
218-W-4C
16th Street
Dayton Avenue
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench in Service
Unused Waste Areas
Unused Trench
Radioactive Waste
Regulated Mixed Waste
Retrievable Transuranic
W76550
W77269
W77322
N37820
N38485
TSD Unit Boundary
W77149
N38990
N39610
N39670
N40360
W77457
W77477
W78059
W78079
0 METERS 100
0 150 300 FEET
W and N numbers are Hanford Site Coordinate System points.
39502011.16Cag
3/05 Sat 2 1997


218-W-5 Burial Ground
Access Road
27th Street
200 West Area Perimeter Fence
W79450
W78250
N46380
N45660
N44650
N43230
Solid Waste Management Unit
3
8
9
13
14
21
22
24
27
28
31
34
90
88
89
87
88
94
94
15
15
TSD Unit Boundary
Soil Pile
Mixed Waste Trench
Soil Pile
Mixed Waste Trench
Dayton Ave
N
METERS 0 100
FEET 0 300
Unused Waste Areas
Unused Trench Area
Radioactive Waste
Regulated Mixed Waste
Regulated Mixed Waste Area
Chain Link Fence
Chain Fence
Area Perimeter Fence
Railroad Track
Trench Number
Year Last Filled
Trench In Service
1A
87
15
H961002165
200 West Area Perimeter Fence
27th Street
218-W-5
Dayton Avenue
Key Plan
W and N numbers are Hanford Site Coordinate System points.

TYPICAL LINED MIXED WASTE TRENCH (TRENCH 34) 218-W-5/200 WEST AREA

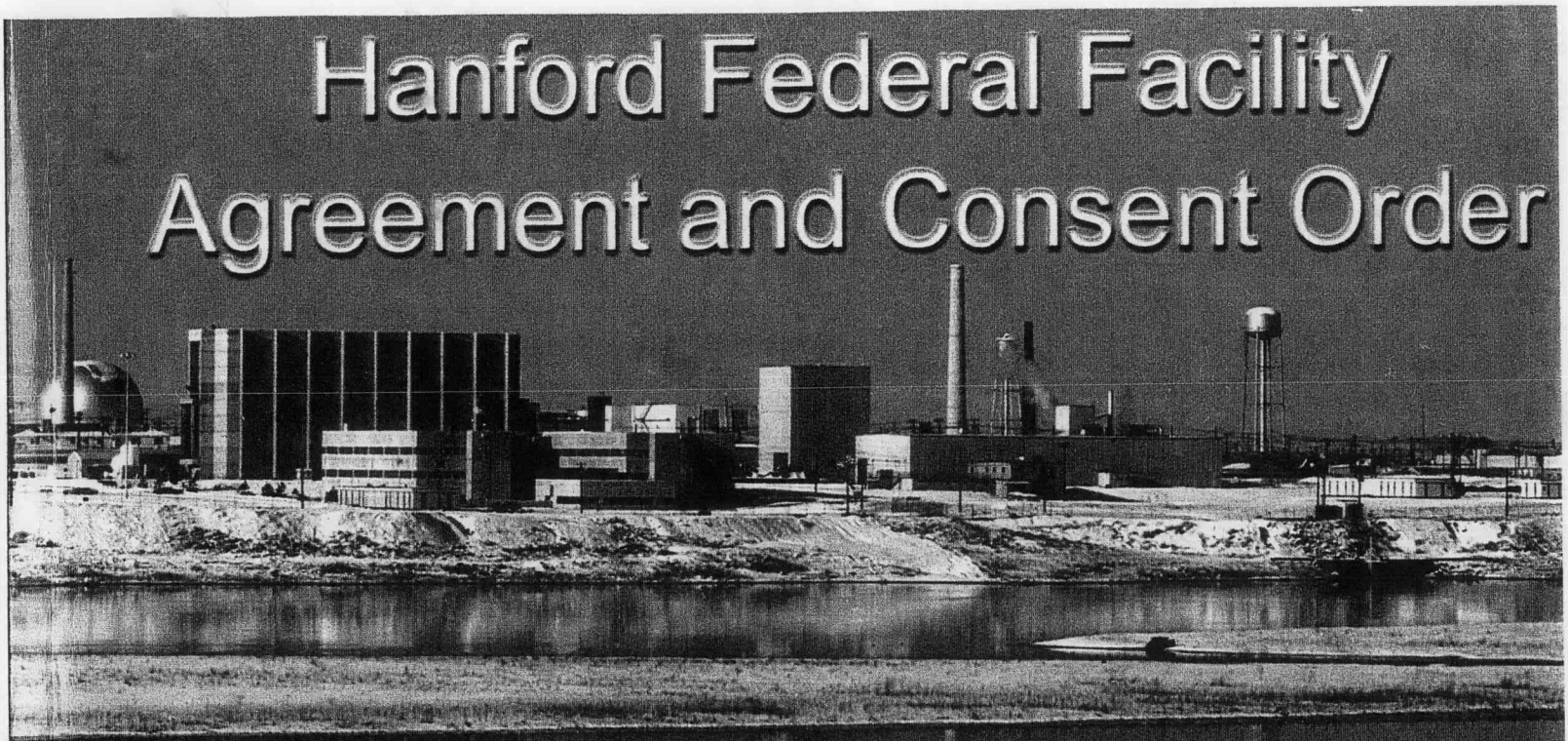


46°33'36"
119°38'24"

95030469-44CN
(PHOTO TAKEN 1995)

ATTACHMENT VI

Hanford Federal Facility Agreement and Consent Order



TRI-PARTY AGREEMENT

DEPARTMENT OF ENERGY · UNITED STATES OF AMERICA

WASHINGTON STATE DEPARTMENT OF ECOLOGY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

89-10 Rev. 7

July 23, 2007

PART TWO

PERMITTING/CLOSURE OF TSD UNITS/GROUPS

ARTICLE VI. FINDINGS AND DETERMINATIONS

23. The following paragraphs of this Article constitute a summary of the facts upon which EPA and Ecology are proceeding for purposes of Part Two of this Agreement. None of the facts related herein shall be considered admissions by any Party. This Article contains findings by EPA and Ecology, and shall not be used by any person related or unrelated to this Agreement for purposes other than determining the basis of this Agreement.

A. In and/or before 1943, the United States acquired approximately 560 square miles of land, now known as the Hanford Reservation. The DOE and its predecessors have operated Hanford continuously since 1943, mainly for the production of special nuclear materials for the national defense.

B. On or about August 14, 1980, DOE submitted a Notice of Hazardous Waste Activity to EPA pursuant to Section 3010 of RCRA, identifying DOE as a generator, transporter and owner and operator of a TSD Facility. On or about November 1980, DOE submitted Part A of its permit application to EPA qualifying for interim status pursuant to Section 3005 of RCRA. DOE's Part A has been modified by DOE and submitted to EPA and/or Ecology on several occasions. A revised Part A application submitted on May 20, 1988, related to activities involving Mixed Waste.

2.4 RCRA AND HWMA OPERATING REQUIREMENTS

This category addresses those actions necessary to satisfy RCRA requirements and obtain a final operating permit for all TSD units on the Hanford Site. It also addresses closure of those TSD units that are not being closed in conjunction with past-practice units. The goal of these milestones is to achieve compliance with all RCRA and State Dangerous Waste Program requirements.

- Hazardous substances identification and concentration
- Toxicity or health effects of the hazardous substances
- Potential for migration to receptors via all environmental pathways.

In addition, the following factors are used to determine priority:

- Available technology to investigate or remediate the operable unit
- Operation consideration (e.g., timing of decommissioning activities)
- Consideration to those operable units that include TSD units.

Based on criteria listed above, and to focus resources on waste sites near the river, the operable units in the 100 and 300 Area have been given high priority and investigations are nearing completion. The first six operable units to be investigated in the 200 Area have been determined based on the criteria listed above. Subsequent 200 Area operable units will be prioritized based on the above criteria as well as on information gained during the initial investigations. Prioritization of investigations of 200 Area operable units is outlined in the work schedule located in Appendix D. Closure of the single-shell tanks is not addressed under the past-practice process and will be addressed under the RCRA closure program (see Appendix B).

3.4.2 Prioritization of Treatment, Storage, and Disposal Units

All TSD groups/units are subject to a permitting and/or closure process described in Section 6.0. Those TSD groups/units assigned to an operable unit will be prioritized in conjunction with past-practice priorities for purposes of investigation. The order in which permit applications or closure plans will be developed for the remaining TSD groups/units is based on consideration of the following criteria.

- Environmental Risk. The risk to public health and environment is the most important consideration. Any action that will significantly reduce the risk to public health and/or the environment will be considered the highest priority.

- Waste Minimization. Waste minimization is central to the goal of reducing environmental risks and bringing about environmental compliance for continuing operations and for new units at the Hanford Site. Therefore, the parties agree that Ecology's "Priority Waste Management Policy" (Ecology 86-07), established pursuant to CH. 70.105.150 RCW, shall be adhered to as guidance for purposes of establishing permitting priorities, in addition to evaluating proposed changes in operational procedures, and for the development and implementation of new waste management strategies. This policy defines the following prioritized actions: (1) waste reduction, (2) recycling, (3) treatment, (4) stabilization, and (5) land disposal.

- Permit Application Dates Required by Law. The Hazardous and Solid Waste Amendments of 1984 (HSWA) mandated dates for submittal of Part B permit

applications. The dates for submitting dangerous waste (excluding mixed waste units) Part B permit applications were as follows:

- Land disposal units: November 8, 1985 (all required Part B applications were submitted prior to this date)

- Incineration units: November 8, 1986 (not applicable for the Hanford Site)

- Treatment and storage units: November 8, 1988.

Part A permit applications for all mixed waste units that will be operating under interim status were due by May 23, 1988 (this date was met for all such known units). Part B permit applications for the disposal of mixed waste to land disposal units were due by November 23, 1988 (this date was met for all such known units), including the certification statement required by Section 3005(e)(2) of RCRA, that the unit is in compliance with the interim status groundwater monitoring requirements. There are no statutory Part B permit application dates for mixed waste treatment and storage units.

- Operational Requirements. Some operational considerations are important for maintaining or achieving environmental compliance, continuation of Hanford Site operations, or achieving cleanup in a cost-effective manner. Examples of such operational considerations include permitting a treatment unit for operation or accelerating closure actions to complement decontamination and decommissioning of related structures.

3.5 WASTE INFORMATION DATA SYSTEM/ WASTE MANAGEMENT UNITS REPORT

The Waste Information Data System (WIDS) is the electronic database of waste site information for the Hanford Site. The WIDS identifies all waste management units on the Hanford Site, and describes the current status of each unit (e.g., active/inactive, TSD, CERCLA past-practice or RCRA past-practice), and includes other descriptive information (e.g., location, waste types.) The system is maintained by the DOE in accordance with the WIDS change control system, which documents and traces all additions, deletions and/or other changes dealing with the status of waste management units.

The information in WIDS reflects Appendix C, which contains the official list of waste sites and/or releases which require remedial investigation or action under § 120 of CERCLA.

A waste management report, in a format agreed upon by the Parties, shall be generated annually by the DOE in January of each year, and posted electronically for regulator and public access. This report shall reflect all changes made in waste management unit status during the previous year.

- RCRA Section 3004(u). Section 3004(u) of RCRA provides authority for corrective action at solid waste management units at a facility seeking a RCRA permit. This includes units that received any solid waste, as defined in 40 CFR Part 261.2, including RCRA hazardous wastes or hazardous constituents, at any time. Hazardous constituents are those that are listed in 40 CFR Part 261 Appendix VIII. Those waste management units that will be addressed as RPP units under Section 3004(u) are so designated in Appendix C.

- RCRA Section 3004(v). RCRA Section 3004(v) specifies that corrective action to address releases from a RCRA facility will extend beyond the physical boundaries of the Site, to the extent necessary to protect human health and the environment. Section 3004(v) does not apply to releases within the boundary of the Hanford Site.

- RCRA Section 3008(h). RCRA Section 3008(h) is a broad corrective action authority that is applicable to the Hanford Site as long as RCRA interim status is maintained. It is more expansive than RCRA Section 3004(u), in that it can be used to address corrective action for any release of RCRA hazardous waste or constituents, including single-spill incidents, and can be used to address releases that migrate offsite.

5.2.3 CERCLA Past-Practice Unit

The CPP units include units that have received hazardous substances, as defined by CERCLA, irrespective of the date such hazardous substances were placed at the unit. Those waste management units that will be addressed as CPP units are so designated in Appendix C.

For the purposes of this action plan, it is necessary to distinguish between a CPP unit, a RPP unit, and a TSD unit. Any TSD unit, as defined in Section 5.2.1, will be classified as a TSD unit, rather than a CERCLA unit, even if it is investigated in conjunction with CPP units. The CPP and RPP units will be distinguished in accordance with Section 5.4.

5.3 MANAGEMENT OF TREATMENT, STORAGE, AND DISPOSAL UNITS

As previously stated, TSD units are identified in Appendix B. Any additional TSD units that are subsequently identified shall be added to Appendix B in accordance with the process described in Section 12.2.

Unless closed in accordance with Sections 6.3.1 or 6.3.3, TSD units shall be permitted for either operation or postclosure care pursuant to the authorized State Dangerous Waste Program (173-303 WAC) and HSWA. Prior to permitting or closure of TSD units, DOE shall achieve (in accordance with the work schedule contained in Appendix D) and maintain compliance with applicable interim status requirements. All TSD units that undergo closure, irrespective of permit status, shall be closed pursuant to the authorized State Dangerous Waste Program in accordance with 173-303-610 WAC.

6.0 TREATMENT, STORAGE, AND DISPOSAL UNIT PROCESS

6.1 INTRODUCTION

This section discusses the requirements of RCRA and the State of Washington Hazardous Waste Management Act, Chapter 70.105 RCW, and pertains to all units that were used to store, treat, or dispose of RCRA hazardous waste and hazardous constituents after November 19, 1980; State-only hazardous waste after March 12, 1982; and units at which such wastes will be stored, treated, or disposed in the future, except as provided by 173-303-200 WAC.

A list of these units, or grouping of units, is provided in Appendix B. Section 3.0 identifies the criteria by which these units will be scheduled for permitting and closure actions.

Some of the TSD groups/units (primarily land disposal units) have been included in operable units, as discussed in Section 3.3. The information necessary for performing RCRA closures within an operable unit will be provided in coordination with various RFI/CMS documents. These documents will include a coordinated past-practice site investigation/RCRA closure/RCRA corrective action approach in order to implement applicable regulations as discussed in Section 5.5.

Some of the TSD groups/units (primarily those located within large processing facilities) will be integrated with the disposition of the facility, and therefore closed in accordance with the process defined in Section 8.0. These units are those that have physical closure actions that need to be done in conjunction with the physical disposition actions in the facility (e. g. removal of structural components). Even though TSD units are closed in accordance with Section 8.0, applicable requirements defined in this section still apply (e.g. 6.5 Quality Assurance).

Currently identified actions necessary to bring TSD units into compliance with Federal and State laws are identified in the work schedule (see Appendix D) including necessary interim milestones. These interim milestones are consistent with the major milestones for achieving interim status compliance requirements specified in Section 2.4. A schedule for completing interim status compliance actions is provided as part of Appendix D.

The RCRA land disposal restrictions (LDR) require that established treatment requirements be met prior to land disposal of hazardous wastes. While treatment capacity generally exists for the nonradioactive hazardous wastes which are subject to LDR, treatment is currently not available for the mixed wastes subject to LDR which require storage at the Hanford Site.

Ecology has received authorization from EPA to implement certain LDR provisions of RCRA pursuant to Section 3006 of RCRA. Accordingly, these authorized state provisions are effective in lieu of the Federal requirements. Both EPA and Ecology anticipate that Ecology will receive authorization for the additional LDR provisions in the future. EPA and Ecology intend to use the LDR provisions under M-26 and other HSWA provisions which have comparable state analogs that have not yet been authorized as an example of regulatory streamlining at the Hanford Site, by designating Ecology as the lead regulatory agency for those provisions under applicable state law.

This includes review and approval of LDR annual reports, plans, and schedules for compliance with M-26-00. While EPA must retain legal authority over portions of the LDR which are not yet authorized to the state, EPA will not assign staff to oversee the routine completion of activities related to M-26-00. In the event that EPA involvement in a specific matter is requested by Ecology or is otherwise necessary, Ecology staff will brief EPA and EPA will become involved to the extent necessary to help resolve that specific matter. EPA and Ecology intend that such involvement on the part of EPA will be the exception, rather than the rule.

In accordance with Milestone M-26-00, DOE has submitted the "Hanford Land Disposal Restrictions Plan for Mixed Wastes," (LDR Plan) to Ecology, as the lead regulatory agency. This plan describes a process for managing mixed wastes subject to LDR at the Hanford Site and identifies actions which will be taken by DOE to achieve full compliance with LDR requirements.

These actions will be taken in accordance with approved schedules specified in the LDR Plan and in the Work Schedule (Appendix D). The DOE will submit annual reports which shall update the LDR Plan and the prior annual report, including plans and schedules. The annual report will also describe activities taken to achieve compliance and describe the activities to be taken in the next year toward achieving full compliance. The LDR Plan and annual reports are primary documents, subject to review and approval by Ecology. Ecology also has approval authority for schedules in the LDR Plan and annual reports. Changes to approved final schedules must be made in accordance with the Change Control System described in Section 12.0.

6.2 TREATMENT, STORAGE, AND DISPOSAL PERMITTING PROCESS

The Hanford Site has been assigned a single identification number for use in State Dangerous Waste Program/RCRA permitting activity. Accordingly, the Hanford Site is considered to be a single RCRA facility, although there are numerous unrelated units spread over large geographic areas on the Site.

Since all of the TSD groups/units cannot be permitted simultaneously, Ecology and the EPA will issue the initial permit for less than the entire facility. This permit will eventually grow into a single permit for the entire Hanford Site. The Federal authority to issue a permit at a facility in this manner is found in 40 CFR 270.1(c)(4). Any units that are not included in the initial permit will normally be incorporated through a permit modification. At the discretion of Ecology and EPA, the permit revocation and reissuance process may be used.

The process of permit modification is specified in 173-303-830 WAC and 40 CFR 270.41. A permit modification does not affect the term of the permit (a permit is generally issued for a term of 10 years). Proposed modifications are subject to public comment, except for minor modifications as provided in 173-303-830(4) WAC and 40 CFR 270.42.

The process of revocation and reissuance is specified in 173-303-830 WAC and 40 CFR 270.41. Revocation and reissuance means that the existing permit is revoked and an entirely new permit is issued, to include all units permitted as of that date. In this case, all conditions of the permit to be reissued would be open to public comment and a new term (10 years in most cases) would be specified for the reissued permit.

Figure 6-1 depicts a flowchart for processing all operating permits for TSD groups/units and for processing postclosure permits for TSD groups/units that will close with hazardous wastes or constituents left in place. The permitting process applies to existing units, expansion of units under interim status, and new units (units that do not have interim status and must have a permit prior to construction).

Ecology shall normally be responsible for drafting permit conditions, including those related to HSWA requirements. Until the HSWA provisions have been delegated from EPA to Ecology through the authorization process, EPA will maintain final approval rights for those permit conditions pursuant to HSWA authority that have not been delegated. Therefore, certain conditions of the joint permit will be enforceable by Ecology, others will be enforceable by EPA, and some conditions will be enforceable by both agencies. The permit will identify which conditions are enforceable by each agency.

Disputes concerning any HWMA requirements, will be addressed in accordance with Article VIII of the Agreement.

Ecology will have the responsibility for drafting the permit and permit modifications for all TSD groups/units, ensuring that the Part B permit application is complete, and preparing the Notices of Deficiency (NOD) to the DOE.

The Part B permit application is a primary document, as defined in Section 9.1. The review procedures, as specified in Section 9.2.2, will be followed. In the event that issues cannot be resolved through the NOD process, the appropriate dispute resolution process can be invoked.

Section 3004(u) of RCRA requires that all solid waste management units be investigated as part of the permit process. The statute provides that the timing for investigation of such units may be in accordance with a schedule of compliance specified in the permit. The parties have addressed the statutory requirement through the preliminary identification and assignment of all known past-practice units to specific operable units (see Section 3.0). These operable units have been prioritized and scheduled for investigation in accordance with the work schedule (Appendix D). It is the intent of all parties that this requirement be met through incorporation of applicable portions of this action plan into the RCRA permit. This will include reference to specific schedules for completion of investigations and corrective actions.

Ecology, the EPA, and DOE will follow all current versions of applicable Federal and State statutes, regulations, guidance documents, and written policy determinations that pertain to the permitting process, including postclosure permits, for TSD groups/units. Public participation requirements for permitting TSD groups/units will be met and are addressed in Section 10.0.

11.0 WORK SCHEDULE, WORK PLANS, AND ASSOCIATED REPORTS

11.1 INTRODUCTION

This section describes the format and content of the work schedule, supporting plans and reports, and the process for updates and other revisions. This section also identifies those primary documents that contain other schedules that directly support the work schedule.

The work schedule is contained in Appendix D. It includes the major and interim milestones and associated target dates that support the accomplishment of the milestones described in Section 2.0. Both major and interim milestones are enforceable under the Agreement. Dates specified as target dates are incorporated in the work schedule for the purpose of tracking progress toward meeting milestones, and are not enforceable. Plans and reports prepared in support of Appendix D (milestone) requirements will specify more detailed work elements and interfaces between Hanford site programs and projects over time (See Sections 11.4 through 11.7).

Milestones and target dates will be incorporated into the Agreement via the change process defined in Section 12.0, upon issuance of the approved work plan (including Project Management (work) Plan), or report, and incorporated into the work schedule as part of the update process. The work schedule will indicate actions required within each major milestone heading, and at each operable unit identified in Appendix C, or TSD group identified in Appendix B. Such actions include, but are not limited to, the following:

- Permitting activities
- Closures
- Groundwater monitoring
- Achieving compliance with interim status requirements
- Ceasing disposal of contaminated liquids to the soil column
- Investigations and characterization
- Remedial and corrective actions
- Technology improvements
- Acquisition of new facilities, and/or modification of facilities as necessary, e.g., to enhance operations and eliminate long-term storage
- Land disposal restriction requirements

11.2 WORK SCHEDULE

A listing of major and interim milestones, and associated target dates, current as of the last Agreement update, is provided in Appendix D.

Permit Number: WA7 89000 8967
Revision Number: 8C

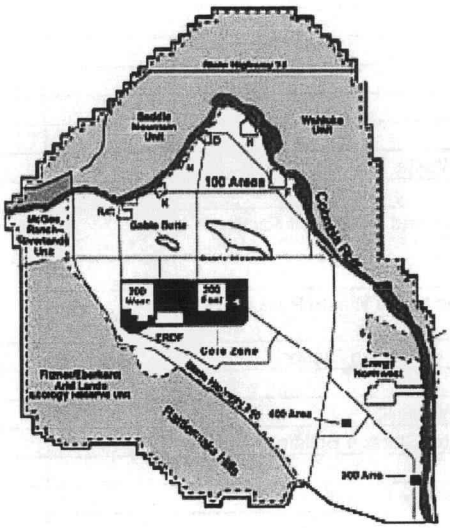
Class 1 Modification
December 31. 2008

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Hanford Facility
Resource Conservation and Recovery Act Permit, Dangerous Waste Portion

Revision 8C

For the Treatment, Storage, and Disposal of Dangerous Waste



Washington State Department of Ecology
Nuclear Waste Program

December 2008

PART VI, POSTCLOSURE UNITS			
183-H Solar Evaporation Basin	Rev 4		
300 Area Process Trenches	Rev 3		
PROCEDURALLY CLOSED			
216-U-12 Crib	N/A	N/A	Closed, 7/19/07
221-T Test Facility	N/A	N/A	Closed, 2/22/99
2727-WA SRE Sodium Storage Bldg	N/A	N/A	Closed, 2/22/99
324 Pilot Plant	N/A	N/A	Closed, 6/9/97
332 Storage Facility	N/A	N/A	Closed, 4/21/97
437 Maintenance and Storage Facility	N/A	N/A	Closed, 9/11/03
Biological Treatment Test Facilities	N/A	N/A	Closed,12/10/96
Physical/Chemical Treatment Test Facilities	N/A	N/A	Closed, 5/13/96
Sodium Storage/Sodium Reaction	N/A	N/A	Closed, 9/17/03
Thermal Treatment Test Facilities	N/A	N/A	Closed, 5/13/96
TO BE INCORPORATED			
1706-KE Waste Treatment System			
207-A South Retention Basin			
216-A-10 Crib			
216-A-29 Ditch			
216-A-36B Crib			
216-A-37-1 Crib			
216-B-3 Main Pond			
216-B-63 Trench			
216-S-10 Pond & Ditch			
222-S Dangerous & Mixed Waste TSD Unit			
241-CX Tank System			
600 Area Purgewater Storage and Treatment Facility (Modu Tanks)			
Central Waste Complex			
Contact Handled Transuranic Mixed Waste Packaging and Interim Storage Facility			
DST System/204-AR Waste Unloading Station			
Grout Treatment Facility			
Hexone Storage & Treatment Facility			
IHLW Interim Storage/Canister Storage Building			
Low-Level Burial Grounds			
Nonradioactive Dangerous Waste Landfill			
Single-Shell Tank System			
T Plant Complex			
Waste Encapsulation and Storage Facility			
Waste Receiving and Processing Facility			
TRANSITION UNDER HFFACO ACTION PLAN, SECTION 8 (Will not be incorporated into Permit)			
B Plant Complex			
PUREX Plant			

PART I STANDARD CONDITIONS

I.A EFFECT OF PERMIT

The Permittees are authorized to treat, store, and dispose of dangerous waste in accordance with the Conditions of this Permit and in accordance with the applicable provisions of Chapter 173-303 WAC (including provisions of the Chapter as they have been applied in the HFFACO). Any treatment, storage, or disposal of dangerous waste by the Permittees at the Facility that is not authorized by this Permit, or by WAC 173-303-400 (including provisions of this regulation as they have been applied in the HFFACO), for those TSD units not subject to this Permit, and for which a Permit is required by Chapter 173-303 WAC, is prohibited.

TSD units operating or closing under interim status will maintain interim status until that TSD unit is incorporated into Part III, V, and/or VI of this Permit, or until interim status is terminated under WAC 173-303-805(8). Interim status units will be incorporated into this Permit through the Permit modification process.

The Conditions of this Permit will be applied to the Facility as defined by the Permit Applicability Matrix (Permit Attachment 3).

I.A.1 USDOE is responsible for activities which include, but are not limited to, the overall management and operation of the Facility.

FH is identified as a Permittee for activities subject to the Conditions of this Permit where its agents, employees, or subcontractors have operational and/or management responsibilities and control.

PNNL is identified as a Permittee for activities subject to the Conditions of this Permit where its agents, employees, or subcontractors have operational and/or management responsibilities and control.

WCH is identified as a Permittee for activities subject to the Conditions of this Permit where its agents, employees, or subcontractors have operational and/or management responsibilities and control.

CHPRC is identified as a Permittee for activities subject to the Conditions of this Permit where its agents, employees, or subcontractors have operational and/or management responsibilities and control.

BNI is identified as a Permittee for activities subject to the Conditions of this Permit where its agents, employees, or subcontractors have operational and/or management responsibilities and control.

WRPS is identified as a Permittee for activities subject to the Conditions of this Permit where its agents, employees, or subcontractors have operational and/or management responsibilities and control.

I.A.2 Coordination with the HFFACO

Each TSD unit will have an application for a final status Permit or closure/post-closure plan submitted to Ecology in accordance with the schedules identified in the HFFACO Milestone M-20-00 or in accordance with WAC 173-303-830. After completion of the Permit application or closure/post-closure plan review, a final Permit decision will be made pursuant to WAC 173-303-840. Specific Conditions for each TSD unit will be incorporated into this Permit in accordance with the Class 3 Permit modification procedure identified in Permit Condition I.C.3.

PART I									
CONDITION		**CATEGORY**							**QUALIFIERS**
PART	**TITLE**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	
I.A.	EFFECT OF PERMIT								
I.A.1.		*	*	*	*	*	*	*	
I.A.2.		*	*	*	*	*	*	*	
I.A.3.		*	*		*	*	*	*	
I.A.4.	Coordination with the FFACO		*		*	*	*	*	
I.B.	PERSONAL AND PROPERTY RIGHTS		*		*	*	*	*	
I.C.	PERMIT ACTIONS								
I.C.1.	Modification, Revocation, Reissuance, or Termination		*		*	*	*	*	
I.C.2.	Filing of a Request		*		*	*	*	*	
I.C.3.	Modifications		*		*	*	*	*	
I.D.	SEVERABILITY								
I.D.1.	Effect of Invalidation		*		*	*	*	*	
I.D.2.	Final Resolution		*		*	*	*	*	
I.E.	DUTIES AND REQUIREMENTS								
I.E.1.	Duty to Comply		*		*	*	*	*	
I.E.2.	Compliance Not Constituting Defense		*		*	*	*	*	
I.E.3.	Duty to Reapply		*		*	*	*	*	
I.E.4.	Permit Expiration & Continuation		*		*	*	*	*	
I.E.5.	Need to Halt or Reduce Activity Not a Defense		*		*	*	*	*	
I.E.6.	Duty to Mitigate		*		*	*	*	*	
I.E.7.	Proper Operation & Maintenance		*			*	*	*	
I.E.8.	Duty to Provide Information		*		*	*	*	*	
I.E.9.	Inspection & Entry		*		*	*	*	*	
I.E.10.	Monitoring & Records								
I.E.11.	Reporting Planned Changes		*			*	*	*	
I.E.12.	Certification of Construction or Modification		*				*		
I.E.13.	Anticipated Noncompliance		*		*	*	*	*	
I.E.14.	Transfer of Permits		*			*	*	*	
I.E.15.	Immediate Reporting		*		*	*	*	*	
I.E.16.	Written Reporting		*		*	*	*	*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post-Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

1 – For Category B, Part I Conditions only apply if future TSD activities are begun on the North Slope or ALE.
2 – For Category C, all Part I Conditions apply to activities subject to Conditions II.U. and II.V.
3 – For Category D, Part I Conditions only apply to activities subject to Conditions II.A., II.C., II.D.4., II.G., II.I., II.L.3., II.O., II.Q., II.S., II.T., II.X., and II.Y.

PART I									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
I.E.17.	Manifest Discrepancy Report								
I.E.17.a			*			*	*	*	
I.E.17.b			*		*	*	*	*	
I.E.18.	Unmanifested Waste Report		*			*	*	*	
I.E.19.	Other Noncompliance		*		*	*	*	*	
I.E.20.	Other Information		*		*	*	*	*	
I.E.21.	Reports, Notifications, & Submissions		*		*	*	*	*	
I.E.22.	Annual Report		*		*	*	*	*	
I.F.	SIGNATORY REQUIREMENT		*		*	*	*	*	
I.G.	CONFIDENTIAL INFORMATION		*		*	*	*	*	
I.H.	DOCUMENTS TO BE MAINTAINED AT FACILITY SITE		*		*	*	*	*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post-Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

1 – For Category B, Part I Conditions only apply if future TSD activities are begun on the North Slope or ALE.
2 – For Category C, all Part I Conditions apply to activities subject to Conditions II.U. and II.V.
3 – For Category D, Part I Conditions only apply to activities subject to Conditions II.A., II.C., II.D.4., II.G., II.I., II.L.3., II.O., II.Q., II.S., II.T., II.X., and II.Y.

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online voter registration

WACs > Title 173 > Chapter 173-303 > Section 173-303-805

173-303-804 << 173-303-805 >> 173-303-806

WAC 173-303-805 Agency filings affecting this section

Interim status permits.

(1)(a) Applicability. This section applies to all facilities eligible for an interim status permit. When a facility is owned by one person but is operated by another person, it is the operator's duty to qualify for interim status, except that the owner must also sign an interim status application. Prior to submittal of an interim status permit application the requirements of WAC 173-303-281 must be met.

(b) Any person who owns or operates an "existing dangerous waste TSD facility" or a facility in existence on the effective date of statutory or regulatory amendments under the Hazardous Waste Management Act or RCRA that renders the facility subject to the requirement to have a dangerous waste permit will have interim status and will be treated as having been issued a permit to the extent he or she has:

(i) Complied with the requirements of WAC 173-303-060 pertaining to notification of dangerous waste activity.

(Comment: Some existing facilities may not be required to file a notification under WAC 173-303-060. These facilities may qualify for interim status by meeting (b)(ii) of this subsection.)

(ii) Complied with the requirements of WAC 173-303-803 governing submission of part A applications.

(c) This subsection (1) will not apply to any facility that has been previously denied a final facility permit or if authority to operate the facility under the Hazardous Waste Management Act has been previously terminated.

(2) Failure to qualify for interim status. If the department has reason to believe upon examination of a Part A application that it fails to provide the required information, it will notify the owner or operator in writing of the apparent deficiency. Such notice will specify the grounds for the department's belief that the application is deficient. The owner or operator will have thirty days from receipt to respond to such a notification and to explain or cure the alleged deficiency in his Part A application. If, after such notification and opportunity for response, the department determines that the application is deficient it may take appropriate enforcement action.

(3) Interim status for facilities under RCRA interim status. Any existing facility operating under interim status gained under section 3005 of RCRA will be deemed to have an interim status permit under this chapter provided that the owner/operator complies with the applicable requirements of WAC 173-303-400 and this section.

(4) Interim status for facilities managing state-designated (non-RCRA) dangerous wastes. Any existing facility which does not satisfy subsection (3) of this section, but which is only managing dangerous wastes that are not hazardous wastes under 40 CFR Part 261, will be deemed to have an interim status permit provided that the owner/operator of the facility has complied with the notification requirements of WAC 173-303-060 by May 11, 1982 and has submitted Part A of his permit application by August 9, 1982. If an existing facility becomes subject to this chapter due to amendments to this chapter and the facility was not previously subject to this chapter, then the owner/operator of an existing facility may qualify for an interim status permit by complying with the notification requirements of WAC 173-303-060 within three months, and submitting Part A of his permit application within six months, after the adoption date of the amendments which cause the facility to be subject to the requirements of this chapter. Facilities qualifying for interim status under this subsection will not be deemed to have interim status under section 3005 of RCRA, and may only manage non-RCRA wastes until they either qualify separately for interim status under section 3005 of RCRA or receive a final status facility permit allowing them to manage RCRA wastes.

(5) Maintaining the interim status permit.

(a) Timely notification and submission of a Part A application qualifies the owner/operator of the existing TSD facility for the interim status permit, until the department terminates interim status pursuant to subsection (8) of this section.

(b) Interim status for the existing TSD facility will be maintained while the department makes final administrative disposition of a final facility permit pursuant to WAC 173-303-806 if:

(i) The owner/operator has submitted his final facility permit application (as described in WAC 173-303-806) within six months of the written request by the department to submit such application; and

(ii) Grounds for terminating interim status (as described in subsection (8) of this section) do not exist.

(c) The owner/operator of an interim status facility must update his Part A whenever he is managing wastes that are newly regulated under this chapter, and as necessary to comply with subsection (7) of this section. Failure to comply with this updating requirement is a violation of interim status.

(6) Prohibitions for interim status permits. Facilities with an interim status permit must not:

(a) Treat, store, or dispose of dangerous waste not specified in Part A of the permit application;

(b) Employ processes not specified in Part A of the permit application; or

(c) Exceed the design capacities specified in Part A of the permit application.

(7) Changes during interim status.

(a) Except as provided in (b) of this subsection, the owner or operator of an interim status facility may make the following changes at the facility:

(i) Treatment, storage, or disposal of new dangerous wastes not previously identified in Part A of the permit application (and, in the case of newly listed or identified wastes, addition of the units being used to treat, store, or dispose of the dangerous wastes on the effective date of the listing or identification) if the owner or operator submits a revised Part A permit application prior to such treatment, storage, or disposal (along with a justification detailing the equipment and process or processes that the owner or operator will use to treat, store, or dispose of the new dangerous wastes) and if the department does not explicitly deny the changes within sixty days of receipt of the revised application;

(ii) Increases in the design capacity of processes used at the facility if the owner or operator submits a revised Part A permit application prior to such a change (along with a justification explaining the need for the change), the requirements of WAC 173-303-281 are met, and the department approves the changes because:

(A) There is a lack of available treatment, storage, or disposal capacity at other dangerous waste management facilities; or

(B) The change is necessary to comply with a federal, state, or local requirement.

(iii) Changes in the processes for the treatment, storage, or disposal of dangerous waste or addition of processes if the owner or operator submits a revised Part A permit application prior to such change (along with a justification explaining the need for the change) and the department approves the change because:

(A) The change is necessary to prevent a threat to human health and the environment because of an emergency situation; or

(B) The change is necessary to comply with a federal, state, or local requirement.

(iv) Changes in the ownership or operational control of a facility if the new owner or operator submits a revised Part A permit application no later than ninety days prior to the scheduled change. When a transfer of operational control of a facility occurs, the old owner or operator must comply with the interim status financial requirements of 40 CFR Part 265, Subpart H (as referenced in WAC 173-303-400), until the new owner or operator has demonstrated to the department that he is complying with the financial requirements. Upon demonstration to the department by the new owner or operator of compliance with the interim status financial requirements, the department will notify the old owner or operator in writing that he no longer needs to comply with the interim status financial requirements as of the date of demonstration. The new owner or operator must demonstrate compliance with the financial requirements within six months of the date of the change in ownership or operational control of the facility. All other interim status duties are transferred effective immediately upon the date of the change in ownership or operational control of the facility.

(v) Changes made in accordance with an interim status corrective action order issued by EPA under section 3008(h) of RCRA or other federal authority, including an order or consent decree issued pursuant to WAC 173-303-64620 or 173-303-64630, by the department under chapter 70.105 RCW or other state authority, or by a court in a judicial action brought by EPA or by the department. Changes under this subsection (7)(a)(v) are limited to the treatment, storage, or disposal of solid waste from releases that originate within the boundary of the facility.

(vi) Addition of newly regulated units for the treatment, storage, or disposal of dangerous waste if the owner or operator submits a revised Part A permit application on or before the date on which the unit becomes subject to the new requirements.

(b) Except as specifically allowed under this subsection (7)(b), changes listed under (a) of this subsection may not be made if they amount to reconstruction of the dangerous waste management facility. Reconstruction occurs when the capital investment in the changes to the facility exceeds fifty percent of the capital cost of a comparable entirely new dangerous waste management facility. If all other requirements are met, the following changes may be made even if they amount to a reconstruction:

(i) Changes made solely for the purposes of complying with the requirements of WAC 173-303-640(4) for tanks and ancillary equipment.

(ii) If necessary to comply with federal, state, or local requirements, changes to an existing unit, changes solely involving tanks or containers, or addition of replacement surface impoundments that satisfy the standards of section 3004(o) of RCRA.

(iii) Changes that are necessary to allow owners or operators to continue handling newly listed or identified dangerous wastes that have been treated, stored, or disposed of at the facility prior to the effective date of the rule establishing the new listing or identification.

(iv) Changes during closure of a facility or of a unit within a facility made in accordance with an approved closure plan.

(v) Changes necessary to comply with an interim status corrective action order issued by EPA under section 3008(h) or other federal authority, by the department under chapter 70.105 RCW or other state authority, or by a court in a judicial proceeding brought by EPA or an authorized state, provided that such changes are limited to the treatment, storage, or disposal of solid waste from releases that originate within the boundary of the facility.

(vi) Changes to treat or store, in tanks, containers, or containment buildings hazardous wastes subject to land disposal restrictions imposed by 40 CFR Part 268 or RCRA section 3004, provided that such changes are made solely for the purpose of complying with 40 CFR Part 268 or RCRA section 3004.

(vii) Addition of newly regulated units under (a)(vi) of this subsection.

(viii) Changes necessary to comply with standards under 40 CFR part 63, subpart EEE -- National Emission Standards for Hazardous Air Pollutants From Hazardous Waste Combustors, which are incorporated by reference at WAC 173-400-075 (5)(a).

(8) Termination of interim status permit. The following are causes for terminating an interim status permit, or for denying a revised permit application:

(a) Final administrative disposition of a final facility permit application is made pursuant to WAC 173-303-806;

(b) When the department on examination or reexamination of a Part A application determines that it fails to meet the applicable standards of this chapter, it may notify the owner or operator that the application is deficient and that the interim status permit has been revoked. The owner or operator will then be subject to enforcement for operating without a permit;

(c) Failure to submit a requested Part B application on time, or to provide in full the information required in the Part B application;

(d) Violation of applicable interim status standards;

(e) A determination that the permit applicant has failed to satisfy the performance standards of WAC 173-303-283;

(f) For owners or operators of each land disposal facility which has been granted interim status prior to November 8, 1984, interim status terminated on November 8, 1985, unless:

(i) The owner or operator submits a Part B application for a permit for such facility prior to that date; and

(ii) The owner or operator certifies that such facility is in compliance with all applicable ground water monitoring and financial responsibility requirements.

(g) For owners or operators of each land disposal facility which is in existence on the effective date of statutory or regulatory amendments under the Hazardous Waste Management Act that render the facility subject to the requirement to have a final facility permit and which is granted interim status, interim status terminates twelve months after the date on which the facility first becomes subject to such permit requirement unless the owner or operator of such facility:

(i) Submits a Part B application for a final facility permit for such facility before the date twelve months after the date on which the facility first becomes subject to such permit requirement; and

(ii) Certifies that such facility is in compliance with all applicable ground water monitoring and financial responsibility requirements.

(h) For owners or operators of any land disposal unit that is granted authority to operate under subsection (7)(a)(i), (ii) or (iii) of this section, interim status terminates on the date twelve months after the effective date of such requirement, unless the owner or operator certifies that such unit is in compliance with all applicable ground water monitoring and financial responsibility requirements;

(i) For owners and operators of each incinerator facility which achieved interim status prior to November 8, 1984, interim status terminated on November 8, 1989, unless the owner or operator of the facility

submitted a Part B application for a final facility permit for an incinerator facility by November 8, 1986; or

(j) For owners or operators of any facility (other than a land disposal or an incinerator facility) which has achieved interim status prior to November 8, 1984, interim status terminated on November 8, 1992, unless the owner or operator of the facility submitted a Part B application for a final facility permit for the facility by November 8, 1988.

(9) Reserve.

[Statutory Authority: Chapters 70.105, 70.105D, and 15.54 RCW and RCW 70.105.007. 04-24-065 (Order 03-10), § 173-303-805, filed 11/30/04, effective 1/1/05; 00-11-040 (Order 99-01), § 173-303-805, filed 5/10/00, effective 6/10/00. Statutory Authority: Chapters 70.105 and 70.105D RCW. 98-03-018 (Order 97-03), § 173-303-805, filed 1/12/98, effective 2/12/98; 95-22-008 (Order 94-30), § 173-303-805, filed 10/19/95, effective 11/19/95; 94-01-060 (Order 92-33), § 173-303-805, filed 12/8/93, effective 1/8/94. Statutory Authority: Chapters 70.105 and 70.105D RCW, 40 CFR Part 271.3 and RCRA § 3006 (42 U.S.C. 3251). 91-07-005 (Order 90-42), § 173-303-805, filed 3/7/91, effective 4/7/91. Statutory Authority: Chapter 70.105 RCW. 89-02-059 (Order 88-24), § 173-303-805, filed 1/4/89; 88-18-083 (Order 88-29), § 173-303-805, filed 9/6/88; 88-07-039 (Order 87-37), § 173-303-805, filed 3/11/88; 87-14-029 (Order DE-87-4), § 173-303-805, filed 6/26/87; 86-12-057 (Order DE-85-10), § 173-303-805, filed 6/3/86; 84-09-088 (Order DE 83-36), § 173-303-805, filed 4/18/84. Statutory Authority: Chapter 70.105 RCW and RCW 70.95.260. 82-05-023 (Order DE 81-33), § 173-303-805, filed 2/10/82.]

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