

COMPLETE

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 630744

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2. ECN Category (mark one) <input type="checkbox"/> Supplemental Direct Revision Change ECN <input type="checkbox"/> Temporary Standby <input checked="" type="checkbox"/> Supersedure <input type="checkbox"/> Cancel/Void <i>4-22-96</i>	3. Originator's Name, Organization, MSIN, and Telephone No. J. G. Adler, WHC/PSO/ES, H6-23, 376-7513	3a. USQ Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4. Date 4/19/96	
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12. Description of Change  
 Minor text revisions to the 105-DR LARGE SODIUM FIRE FACILITY CLOSURE ACTIVITIES EVALUATION REPORT, WHC-SD-EN-EV-034. Correction of typographical errors and clarify text.

13a. Justification (mark one)

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As-Found <input type="checkbox"/>	Facilitate Const <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	Design Error/Omission <input type="checkbox"/>

13b. Justification Details

14. Distribution (include name, MSIN, and no. of copies)  
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16. Cost Impact

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17. Schedule Impact (days)

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18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

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Functional Design Criteria	<input type="checkbox"/>	Stress/Design Report	<input type="checkbox"/>	Health Physics Procedure	<input type="checkbox"/>
Operating Specification	<input type="checkbox"/>	Interface Control Drawing	<input type="checkbox"/>	Spares Multiple Unit Listing	<input type="checkbox"/>
Criticality Specification	<input type="checkbox"/>	Calibration Procedure	<input type="checkbox"/>	Test Procedures/Specification	<input type="checkbox"/>
Conceptual Design Report	<input type="checkbox"/>	Installation Procedure	<input type="checkbox"/>	Component Index	<input type="checkbox"/>
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Const. Spec.	<input type="checkbox"/>	Engineering Procedure	<input type="checkbox"/>	Human Factor Consideration	<input type="checkbox"/>
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OM Manual	<input type="checkbox"/>	Operational Safety Requirement	<input type="checkbox"/>	ICRS Procedure	<input type="checkbox"/>
FSAR/SAR	<input type="checkbox"/>	IEFD Drawing	<input type="checkbox"/>	Process Control Manual/Plan	<input type="checkbox"/>
Safety Equipment List	<input type="checkbox"/>	Cell Arrangement Drawing	<input type="checkbox"/>	Process Flow Chart	<input type="checkbox"/>
Radiation Work Permit	<input type="checkbox"/>	Essential Material Specification	<input type="checkbox"/>	Purchase Requisition	<input type="checkbox"/>
Environmental Impact Statement	<input type="checkbox"/>	Fac. Proc. Samp. Schedule	<input type="checkbox"/>	Tickler File	<input type="checkbox"/>
Environmental Report	<input type="checkbox"/>	Inspection Plan	<input type="checkbox"/>		<input type="checkbox"/>
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19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
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20. Approvals

Signature	Date	Signature	Date
<u>OPERATIONS AND ENGINEERING</u>		<u>ARCHITECT-ENGINEER</u>	
Cog. Eng. J. G. Adler <i>JG Adler</i>	<u>4/18/96</u>	PE	_____
Cog. Mgr. F. A. Ruck III <i>FARuck</i>	<u>4/19/96</u>	QA	_____
QA	_____	Safety	_____
Safety	_____	Design	_____
Environ. F. A. Ruck III <i>FARuck</i>	<u>4/19/96</u>	Environ.	_____
Other	_____	Other	_____
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	_____		_____
	_____	<u>DEPARTMENT OF ENERGY</u>	_____
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	_____		_____
	_____	<u>ADDITIONAL</u>	_____
	_____		_____
	_____		_____

# 105-DR LARGE SODIUM FIRE FACILITY CLOSURE ACTIVITIES EVALUATION REPORT

**J. G. Adler**

Westinghouse Hanford Co., Richland, WA 99352  
U.S. Department of Energy Contract DE-AC06-87RL10930

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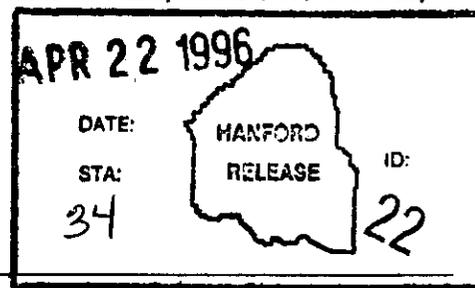
Abstract: This report evaluates the closure activities at the 105-DR Large Sodium Fire Facility. The evaluation compares these activities to the regulatory requirements and closure plan requirements. The report concludes that the areas identified in the closure plan can be clean closed.

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*Chris Shillingford* 4-22-96  
Release Approval Date



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# 105-DR Large Sodium Fire Facility Closure Activities Evaluation Report

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



**Westinghouse**  
**Hanford Company** Richland, Washington

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

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**105-DR LARGE SODIUM FIRE FACILITY CLOSURE ACTIVITIES  
EVALUATION REPORT**

**EXECUTIVE SUMMARY**

This report summarizes and evaluates the closure activities conducted at the 105-DR Large Sodium Fire Facility. The evaluation assesses the dangerous waste contamination for the purpose of partially clean closing the 105-DR Large Sodium Fire Facility as described in the *105-DR Large Sodium Fire Facility Closure Plan*, DOE/RL-90-25 (DOE-RL 1995a).

The introduction outlines the regulatory background, provides general information about the 105-DR Large Sodium Fire Facility, and outlines the closure strategy. The next sections specify the action levels for the closure activities and the performance standards to be reached by the closure activities. The sampling section outlines the chronology, identifies the sample locations, and discusses how the samples were collected.

The closure activities section discusses the following topics: the closure activities for the structures, equipment, soil, and gravel scrubber; decontamination methods; materials made available for recycling or reuse; and waste management. The conclusion evaluates the results of the sampling and closure activities. The report determines that the areas addressed by the closure activities meet the performance standards and can be clean closed.

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GLOSSARY

1		
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3		
4	CERCLA	Comprehensive Environmental Response and Liability Act
5	CFR	Code of Federal Regulations
6		
7	DOE	U.S. Department of Energy
8	DQO	Data Quality Objective
9		
10	Ecology	Washington State Department of Ecology
11	EII	Environmental Investigation Instruction
12	EPA	U.S. Environmental Protection Agency
13		
14	HEPA	high-efficiency particulate air
15		
16	IRIS	Integrated Risk Information System
17		
18	LSFF	Large Sodium Fire Facility
19		
20	MTCA	<i>Model Toxics Control Act</i>
21		
22	psi	pounds per square inch
23		
24	QA/QC	quality assurance/quality control
25		
26	RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
27		
28	TCLP	Toxicity Characteristic Leaching Procedure
29	Tri-Party	
30	Agreement	Hanford Federal Facility Agreement and Consent Order
31	TSD	treatment, storage, and/or disposal
32		
33	WAC	Washington Administrative Code

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## 105-DR LARGE SODIUM FIRE FACILITY CLOSURE ACTIVITIES EVALUATION REPORT

### 1.0 INTRODUCTION

This report summarizes and evaluates the closure activities performed in support of partial closure of the 105-DR Large Sodium Fire Facility (LSFF). This evaluation will be used in assessing the condition of the 105-DR LSFF for the purpose of meeting the partial clean closure conditions described in the *105-DR Large Sodium Fire Facility Closure Plan* (DOE-RL 1995). Based on the evaluation of the decontamination activities, sampling activities, and sample data, it has been determined that the partial clean closure conditions for the 105-DR LSFF have been met.

#### 1.1 REGULATORY BACKGROUND

The U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (Ecology) jointly administer the *Resource Conservation and Recovery Act of 1976* (RCRA) in the state of Washington. The EPA retains the oversight authority and delegates to Ecology the enforcement of a state program that is consistent with or more stringent than the corresponding Federal program. The implementing regulations are found in Title 40, *Code of Federal Regulations* (CFR), Parts 260 to 270 and the *Washington Administrative Code* (WAC) 173-303, "Dangerous Waste Regulations." Ecology's authorization includes administering the closure of dangerous waste treatment, storage, and/or disposal (TSD) units.

The U.S. Department of Energy (DOE), the EPA, and Ecology have entered into an agreement called the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1996). This agreement affects environmental regulation of the Hanford Facility. One purpose of this agreement is to ensure that environmental impacts associated with past activities are investigated and appropriate response actions are taken, as necessary, to protect human health and the environment. The agreement seeks to promote this goal, in part, by identifying TSD units, identifying which units will undergo closure, and promoting compliance with relevant RCRA permitting requirements.

#### 1.2 TREATMENT/STORAGE UNIT INFORMATION

The 105-DR LSFF is classified as a RCRA treatment unit. A fully detailed description of the unit and its history are included in the *105-DR Large Sodium Fire Facility Closure Plan* (DOE-RL 1995).

1 **1.2.1 Treatment, Storage, and/or Disposal Unit Location**  
2

3 The 105-DR LSFF is located in the southeast corner of the 100-D Area.  
4 The 105-DR LSFF is integral with the 105-DR Reactor. Schematics of the  
5 Hanford Site, the 100-D Area, and the 105-DR Reactor and the 105-DR LSFF prior  
6 to the start of the closure activities are shown in Figures 1, 2, and 3,  
7 respectively.  
8  
9

10 **1.2.2 Facility Description**  
11

12 The 105-DR LSFF primarily occupies the former supply fan room of the  
13 105-DR Reactor Facility. The 105-DR LSFF also used parts of the  
14 105-DR Reactor exhaust ducts and stack. A schematic of the 105-DR LSFF  
15 (including the 105-DR Reactor Building) is shown in Figure 3. A schematic of  
16 the 105-DR LSFF exhaust system prior to closure is shown in Figure 4.  
17

18 The 105-DR Reactor Facility was designed and built in the 1950's and  
19 ceased operation in 1964. The 105-DR Reactor Building is a non-airtight  
20 industrial structure built of reinforced concrete in the lower portions and  
21 concrete block in the upper portions. The roof is constructed of reinforced  
22 concrete or precast concrete roof tile, depending on the specific roof area.  
23 Installation of the 105-DR LSFF into the 105-DR Reactor Building was completed  
24 in 1972. A new submerged gravel scrubber, blower, and duct work connecting  
25 the new submerged gravel scrubber to the 105-DR Reactor exhaust system was  
26 installed in 1982 (Figures 3 and 4).  
27  
28

29 **1.2.3 Operation as a Treatment, Storage,  
30 and/or Disposal Unit**  
31

32 The 105-DR LSFF was established to provide a means of investigating fire  
33 and safety aspects associated with sodium or other metal alkali fires in the  
34 liquid metal fast breeder reactor facilities. The 105-DR LSFF initially was  
35 used only for engineering-scale alkali metal reaction studies. Additionally,  
36 the Fusion Safety Support Studies program sponsored intermediate-size safety  
37 reaction tests in the 105-DR LSFF with lithium and lithium lead compounds.  
38

39 The facility also has been used to store and treat alkali metal waste,  
40 specifically, metallic sodium and lithium waste with the characteristic of  
41 reactivity, and is assigned the dangerous waste number D003. Thermal  
42 treatment (burning) was used as the treatment method for addressing the  
43 characteristic of reactivity.  
44  
45

46 **1.2.4 Dangerous Waste Constituents of Concerns**  
47

48 The dangerous waste treated and stored at the 105-DR LSFF was metallic  
49 sodium and metallic lithium. Both of these are reactive metals that  
50 spontaneously react with the moisture in the air to produce sodium bicarbonate  
51 and lithium carbonate. Also, the combustion of metallic sodium and metallic  
52 lithium produce these same carbonates. Because of the their reactivity, no  
53 metallic sodium or metallic lithium will be found at the 105-DR LSFF. Sodium  
54 bicarbonate and lithium carbonate are considered to be the waste residue from

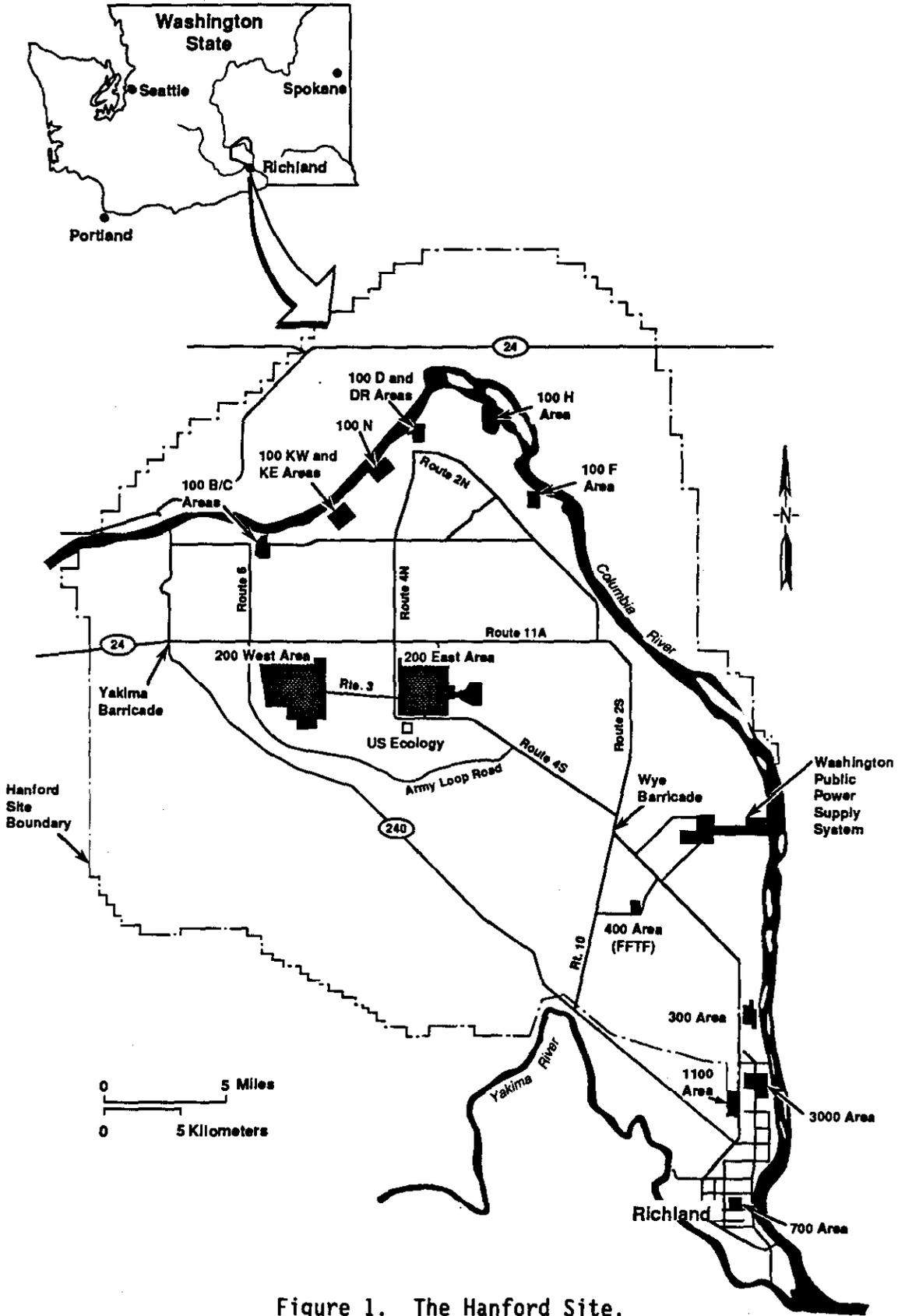
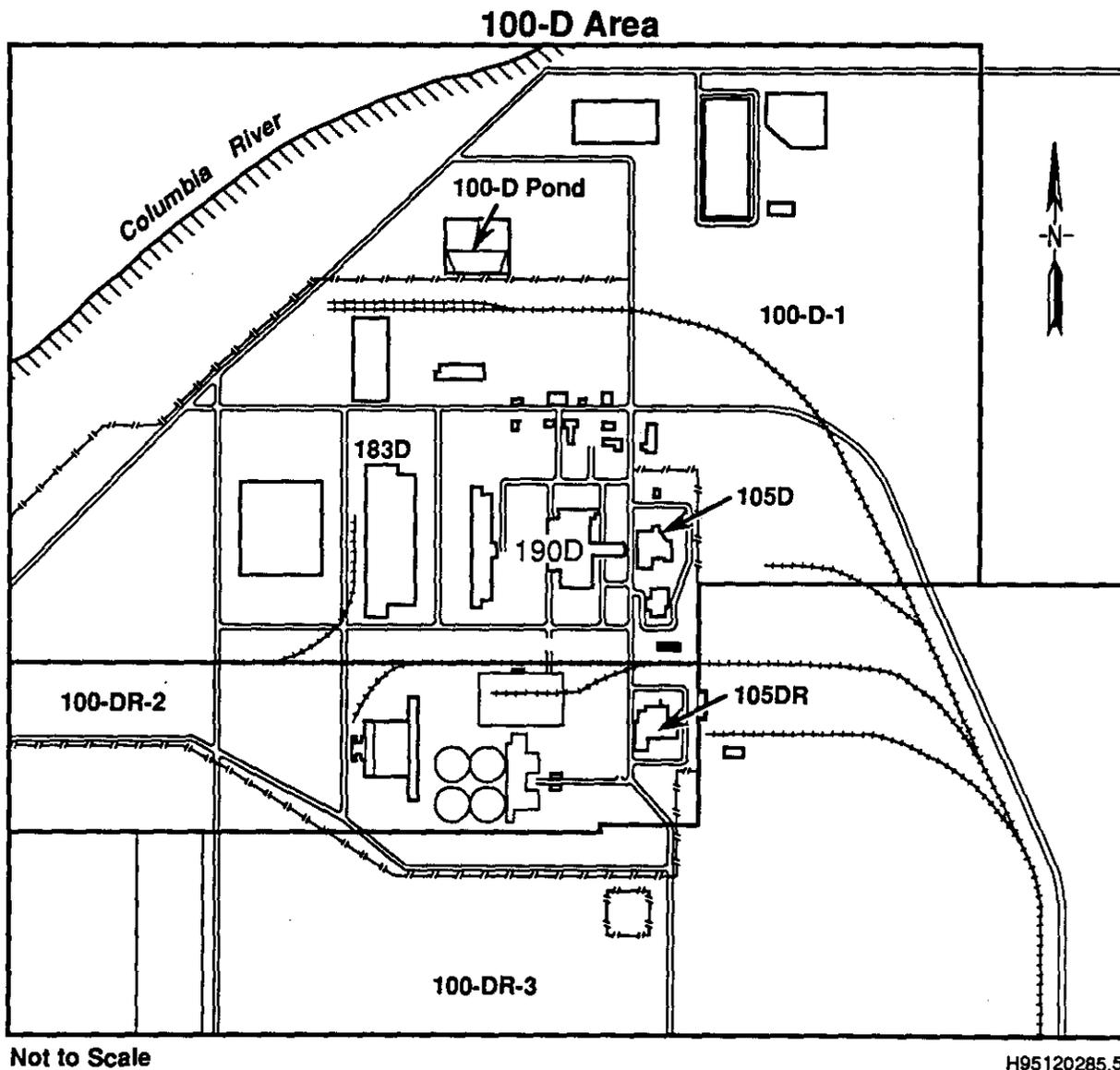


Figure 1. The Hanford Site.

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Figure 2. The 100-D Area of the Hanford Site.

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### 105-DR Large Sodium Fire Facility

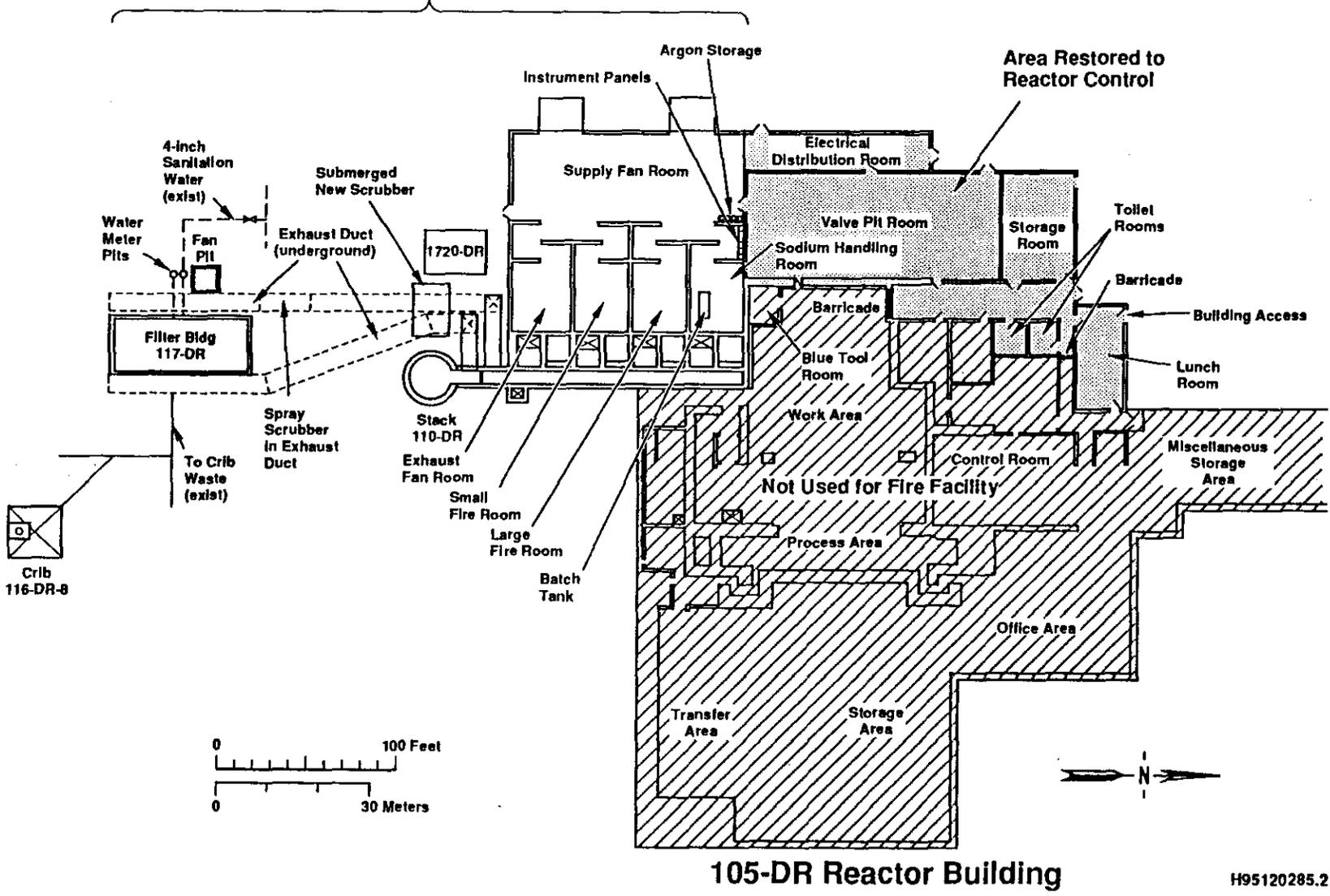
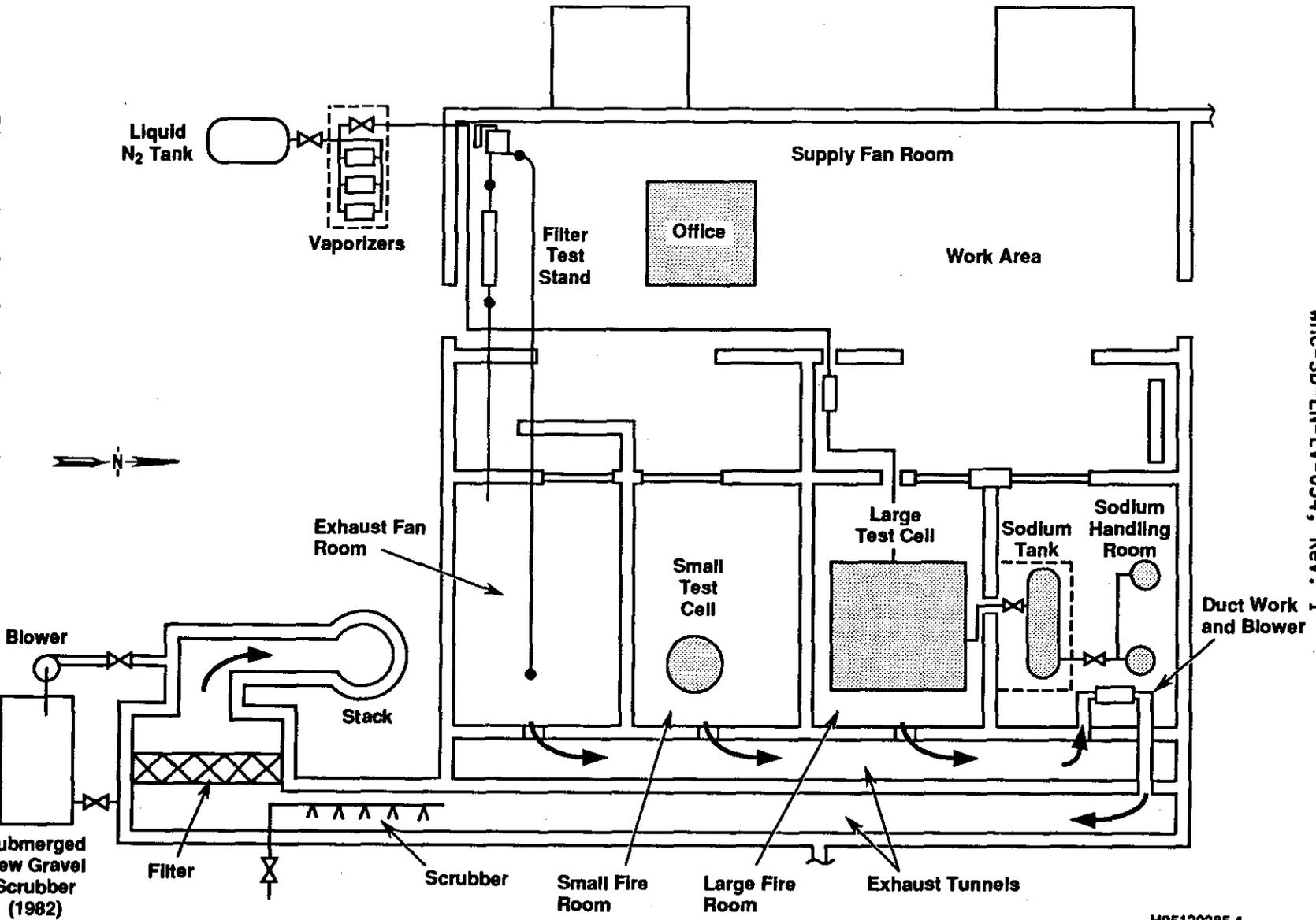


Figure 3. A Schematic of the 105-DR Reactor Building Including the Large Sodium Fire Facility Prior to the Start of Closure Activities.

5

1  
2

Figure 4. A Schematic of the Overall Large Sodium Fire Facility Exhaust System as Used During Operations.



1 the operation of the 105-DR LSFF. Therefore, sodium bicarbonate and lithium  
2 carbonate are considered to be the constituents of concern.

3  
4 Note that sodium bicarbonate and lithium carbonate are not hazardous  
5 wastes regulated by RCRA. They are regulated as dangerous wastes under  
6 WAC 173-303.

7  
8 A lithium-lead alloy is known to have been burned at the 105-DR LSFF.  
9 Lead is regulated by both RCRA and WAC 173-303 and also is subject to the Land  
10 Disposal Restrictions in 40 CFR 268. The burning of the lead-lithium alloy  
11 may have occurred in one of two pressure vessels: the Small Test Cell in the  
12 Small Fire Room or in an instrumented pressure vessel from the Large Fire  
13 Room's Large Test Cell. Because of the burning of the alloy, there is a  
14 potential for lead contamination in the Small Test Cell and in the  
15 instrumented pressure vessel. Therefore, lead is an additional constituent of  
16 concern for the Small Test Cell and the instrumented pressure vessel.

17  
18  
19 **1.2.5 Potentially Contaminated Media**

20  
21 Potentially contaminated media at the 105-DR LSFF included the concrete  
22 building structure and the equipment used to contain the sodium and lithium  
23 fires, and the exhaust system. The exhaust system consisted of steel piping,  
24 steel ducting, and concrete ducts. Specific structures associated with the  
25 exhaust system include the 110-DR Stack, the 117-DR Filter Building, the  
26 116-DR-8 Crib, and the new submerged gravel scrubber. Areas of potential soil  
27 contamination included the area immediately south of the reactor building out  
28 to about the south end of the 117-DR Filter Building (see Figures 3 and 4).

29  
30  
31 **1.2.6 Radiological Contamination**

32  
33 No radiologically contaminated material was burned during the operation  
34 of the 105-DR LSFF. However, parts of the 105-DR Reactor exhaust system are  
35 either known or suspected to be radiologically contaminated from operation of  
36 the 105-DR Reactor. The areas that are known or suspected to be  
37 radiologically contaminated are: the concrete duct work from the  
38 105-DR Building to the 117-DR Filter Building, the 117-DR Filter Building, the  
39 concrete duct work from the Filter Building to and including the 110-DR Stack,  
40 and the 116-DR-8 Crib (see Figures 3 and 4).

41  
42  
43 **1.3 CLOSURE STRATEGY**

44  
45 The closure strategy for the 105-DR LSFF is to divide the closure into  
46 two parts as follows:

- 47  
48 1. Partial clean closure of the 105-DR LSFF under  
49 WAC 173-303-610(b) as specified in the *105-DR Large Sodium*  
50 *Fire Facility Closure Plan* (DOE-RL 1995). Partial clean  
51 closure addresses those areas of the 105-DR LSFF that are  
52 not radiologically contaminated.  
53

- 1           2. Final closure of the radiologically contaminated portion  
2           of the 105-DR LSFF as part of the decontamination and  
3           decommissioning of the 105-DR Reactor. Overall  
4           remediation of the 105-DR Reactor will occur under the  
5           *Comprehensive Environmental Response and Liability Act of*  
6           *1980* (CERCLA) remedial action process. The WAC 173-303  
7           closure requirements will be integrated into the CERCLA  
8           remedial action process.

9  
10 This report only addresses the partial clean closure of the 105-DR LSFF.  
11 The scope and timetable for the final closure are beyond the scope of this  
12 report.

### 13 14 15 **1.3.1 Strategy for Partial Clean Closure**

16  
17           The strategy for partial clean closure is specified in Chapters 6 and 7  
18 of the *105-DR Large Sodium Fire Facility Closure Plan* (DOE-RL 1995).  
19 The strategy for partial clean closure is summarized as follows:

- 20  
21           1. Decontaminate or remove the structures and equipment as specified in  
22           the closure plan.  
23  
24           2. Dispose of decontamination residues and contaminated equipment in  
25           accordance with applicable regulations as determined by sampling.  
26  
27           3. Sample soil to determine if sodium and lithium are below dangerous  
28           waste levels.  
29  
30           4. Evaluate the soil data for quality assurance/quality control (QA/QC)  
31           reliability and significant contamination levels in comparison with  
32           the soil action levels.  
33  
34           5. Conduct additional decontamination of the 105-DR LSFF, as required.  
35  
36           6. Certify that closure activities were completed in accordance with  
37           the approved closure plan.  
38  
39

### 40 **1.3.2 Subdivision of the 105-DR Large Sodium Fire Facility**

41  
42           The 105-DR LSFF has been subdivided into seven distinct areas.  
43 The following is a description of each area prior to the start of closure  
44 activities. Areas 1, 3, and 7 have been addressed by these closure  
45 activities. The blower and duct work that is part of Area 2 has also been  
46 addressed by these closure activities.  
47

48 **1.3.2.1 Area 1.** Area 1 consists of the Exhaust Fan Room, the Large Fire  
49 Room, the Small Fire Room, the Sodium Handling Room, and an office/work area.  
50

51           The Exhaust Fan Room contained several burn pans, a ceiling mounted  
52 hoist, and various utility fixtures. The sodium and lithium burns occurred in  
53 open, large, shallow steel pans. Before the start of the closure activities,  
54 the sump in the Exhaust Fan Room contained about 4 liters (1 gallon) of crusty  
55 powder and reaction by-products from past burns. Old burn pans stored in this

1 room still contained residues. There also was a carbonate coating on the  
2 walls, light fixtures, and other equipment.

3  
4 The Small Fire Room contained the Small Test Cell. There also was a duct  
5 work running from the Small Test Cell to the reactor exhaust tunnel.  
6 The Small Test Cell was a cylindrical, steel pressure vessel used for various  
7 burn tests. In addition to sodium and lithium metal, lithium-lead compounds  
8 may have been burned in this test cell. Before the start of the closure  
9 activities, the Small Test Cell had a thin coating of carbonate on the  
10 internal surfaces.

11  
12 The Large Fire Room contained the Large Test Cell. The Large Test Cell  
13 was a large, square steel chamber. Associated with this test cell was a  
14 small, instrumented pressure vessel. This instrumented pressure vessel was a  
15 1.8-meter (6-foot) tall, cylindrical steel pressure vessel. In addition to  
16 sodium and lithium metal, lithium-lead compounds may have been burned in the  
17 instrumented pressure vessel. There was duct work running from the Large Test  
18 Cell into the reactor exhaust tunnel. Before the start of closure activities,  
19 there was carbonate on the internal surfaces of this cell as well as on the  
20 top.

21  
22 The Sodium Handling Room contained an insulated stainless steel sodium  
23 storage tank. The Area 2 duct work and blower that connects the upper and  
24 lower exhaust tunnels was physically located in this room. Before the start  
25 of closure activities, the sodium storage tank was empty and there was  
26 carbonate coating the interior surfaces of the ducts.

27  
28 The office/work area of the Fan Supply Room is considered to be clean.  
29 However, this area contained the Filter Test Stand and the associated piping  
30 between the test stand, the Large Test Cell, and the Exhaust Fan Room. This  
31 equipment was expected to be contaminated with carbonates.

32  
33 Area 1 was fully addressed by these closure activities.

34  
35 1.3.2.2 Area 2. Area 2 consisted of the upper and lower exhaust tunnel, the  
36 blower and associated duct work that moved 105-DR LSFF exhaust from the lower  
37 to the upper tunnel, and the exterior underground tunnel to the 117-DR Filter  
38 Building (south of the 105-DR LSFF). These tunnels had low but measurable  
39 radioactivity when sampled in 1987. The tunnels were not addressed by these  
40 closure activities. Closure of the tunnels will be deferred until remediation  
41 of the 105-DR Reactor.

42  
43 The blower and associated duct work were included as part of the closure  
44 activities. They were located in the Sodium Handling Room (Figure 4) within  
45 the boundaries of Closure Area 1. Including the blower and associated duct  
46 work in the closure activities allowed the tunnel to be isolated and removed  
47 carbonate contaminated equipment from within the physical boundaries of  
48 Closure Area 1.

49  
50 1.3.2.3 Area 3. Area 3 consisted of the new submerged (1982) gravel  
51 scrubber, blower, ducts, scrubber housing, and the gravel. Operation of the  
52 new submerged gravel scrubber, blower, and ducts occurred 16 years after the  
53 105-DR Reactor ceased operations; consequently, no radioactivity is expected.  
54 This area was addressed by these closure activities.

55

1 1.3.2.4 Area 4. Area 4 consists of the 117-DR Filter Building and the  
 2 downstream tunnel to the reactor stack. The original high-efficiency  
 3 particulate air (HEPA) filters from the 105-DR Reactor reportedly were  
 4 replaced for the operation of the LSFF. This area is considered to be  
 5 radiologically contaminated. Closure will be deferred until remediation of  
 6 the 105-DR Reactor.  
 7

8 1.3.2.5 Area 5. Area 5 consists of the reactor exhaust stack. This area is  
 9 considered to be radiologically contaminated. Closure will be deferred until  
 10 remediation of the 105-DR Reactor.  
 11

12 1.3.2.6 Area 6. Area 6 consists of the 116-DR-8 Crib. The 116-DR-8 Crib  
 13 originally was used from 1960 to 1964 to percolate low-level radioactive waste  
 14 drainage from the 117-DR Building seal pits. When used for the 105-DR LSFF,  
 15 the 116-DR-8 Crib received only water from the gravel scrubbers. The *105-DR*  
 16 *Large Sodium Fire Facility Closure Plan* (DOE-RL 1995) has reported that the  
 17 water sent to the 116-DR-8 Crib was not corrosive (i.e., the pH level of the  
 18 water was less than 12.5).  
 19

20 The 116-DR-8 Crib is radiologically contaminated. The 116-DR-8 Crib also  
 21 is part of the 100-HR-3 Ground Water Operable Unit and the 100-DR-2 Operable  
 22 Unit (Ecology et al. 1996). Closure will be deferred until remediation of  
 23 these operable units.  
 24

25 1.3.2.7 Area 7. Area 7 consists of the soil area to the north and west of  
 26 the 117-DR Filter Building. The burn pans used in the alkali metal fires were  
 27 sometimes stored in this area. This area will be addressed by these closure  
 28 activities.  
 29

30 In summary, the closure will be limited to Area 1, Area 3, and Area 7.  
 31 Also addressed is the Area 2 blower and duct work that is physically located  
 32 in Area 1.  
 33  
 34  
 35

## 36 2.0 ACTION LEVELS

37  
 38  
 39 Action levels are concentrations of the constituents of concern that  
 40 prompt an action, such as removal/disposal, treatment, or further evaluation.  
 41 The action levels for these closure activities were based on the requirements  
 42 of the *105-DR Large Sodium Fire Facility Closure Plan* (DOE-RL 1995) and the  
 43 Data Quality Objective (DQO) meetings held with Ecology during the first half  
 44 of 1995.  
 45  
 46

### 47 2.1 DEFINITION OF ACTION LEVELS FOR 48 STRUCTURES AND EQUIPMENT

49  
 50 The initial action level for the structures and equipment was the visible  
 51 presence of carbonates. If carbonates were visible, then the structure or  
 52 equipment either was decontaminated or dismantled for disposal.  
 53  
 54

1 **2.2 DEFINITION OF ACTION LEVELS FOR THE SOIL**  
 2

3 The initial action levels for the soil were the greater of two levels for  
 4 sodium and lithium: Sitewide Soil Background values defined in *Hanford Site*  
 5 *Background: Part 1, Soil Background for Nonradioactive Analytes* (DOE-RL 1994)  
 6 or *Model Toxics Control Act* (MTCA) cleanup values defined in the *Model Toxics*  
 7 *Control Act Cleanup Regulations* (WAC 173-340). If concentrations of the  
 8 constituents of concern in the soil exceeded initial action levels, then the  
 9 requirements of WAC 173-340-610 would be invoked to assess the action levels.  
 10

11  
 12 **2.3 DEFINITION OF ACTION LEVELS FOR THE**  
 13 **NEW SUBMERGED GRAVEL SCRUBBER**  
 14

15 The duct work, blowers, and housing of the new submerged gravel scrubber  
 16 are considered to be equipment. Therefore, they used the structures and  
 17 equipment action level (Section 2.1).  
 18

19 The gravel in the new submerged gravel scrubber used action levels based  
 20 on the Toxicity Characteristic Leaching Procedure (TCLP) metals analysis (*Test*  
 21 *Methods for the Evaluation of Solid Waste: Physical/Chemical Methods*  
 22 [EPA 1986]) and on corrosivity. The concern of the TCLP metals analysis was  
 23 to determine if the gravel contains sufficient metals to designate as a  
 24 dangerous waste.  
 25

26 The corrosivity initial action level for the gravel was a pH less than or  
 27 equal to 2 and equal to or greater than 12.5. A pH between 2 and 12.5 was  
 28 nondangerous.  
 29

30 The TCLP metal initial action level for the gravel was the greater of the  
 31 Sitewide Soil Background values or MTCA cleanup values. The Sitewide Soil  
 32 Background concentrations are defined in *Hanford Site Background: Part 1,*  
 33 *Soil Background for Nonradioactive Analytes* (DOE-RL 1994). The MTCA cleanup  
 34 values are defined in the *Model Toxics Control Act Cleanup Regulations* (WAC  
 35 173-340).  
 36

37 If concentrations of the constituents of concern in the gravel had  
 38 exceeded the initial action levels, then the gravel would have been considered  
 39 to be a dangerous waste and disposed according to the requirements of  
 40 WAC 173-303.  
 41

42  
 43  
 44 **3.0 PERFORMANCE STANDARDS**  
 45

46  
 47 The specific performance standards to be used for the closure of the  
 48 105-DR LSFF were defined by the requirements of the *105-DR Large Sodium Fire*  
 49 *Facility Closure Plan* (DOE-RL 1995), the *105-DR Large Sodium Fire Facility*  
 50 *Decontamination, Sampling, and Analysis Plan* (WHC 1995), and the DQO meetings  
 51 held with Ecology during the first half of 1995.  
 52  
 53

1 **3.1 PRIMARY PERFORMANCE STANDARDS FOR**  
2 **STRUCTURES AND EQUIPMENT**  
3

4 The performance standard for the structures and equipment with only  
5 carbonate contamination was a visually clean surface with no carbonate  
6 present.  
7

8  
9 **3.2 PERFORMANCE STANDARDS FOR EQUIPMENT WITH**  
10 **LEAD/CARBONATE CONTAMINATION**  
11

12 The performance standard for equipment with suspected lead and carbonate  
13 contamination was the "clean debris surface" specified in 40 CFR 268. A clean  
14 debris surface is defined in 40 CFR 268.45, Table 1 as:  
15

16 "'Clean debris surface' means the surface, when viewed without  
17 magnification, shall be free of all visible contaminated soil and  
18 hazardous waste except that residual staining from soil and waste  
19 consisting of light shadows, slight streaks, or minor  
20 discolorations, and soil and waste in cracks, crevices, and pits,  
21 may be present provided that such staining and waste and soil in  
22 cracks, crevices, and pits shall be limited to no more than 5  
23 percent of each square inch of surface area."  
24  
25

26 **3.3 PERFORMANCE STANDARDS FOR THE GRAVEL SCRUBBER**  
27

28 The equipment portion of the gravel scrubber used the performance  
29 standard defined in Section 3.1. The performance standard for the gravel from  
30 the gravel scrubber was designation or nondesignation as dangerous waste.  
31 The criteria for designation is discussed in Section 1.4.3. If designated as  
32 dangerous waste, the gravel would have been managed as a dangerous waste per  
33 the requirements of WAC 173-303. If it did not designate as dangerous waste,  
34 the gravel would have been disposed of as a nonregulated solid waste or  
35 reused/recycled.  
36  
37

38 **3.4 PERFORMANCE STANDARDS FOR THE SOIL**  
39

40 The performance standard for the soil was concentrations of sodium and  
41 lithium concentrations that are higher than one of two levels: Sitewide Soil  
42 Background values or MTCA cleanup values. The Sitewide Soil Background  
43 concentrations are defined in *Hanford Site Background: Part 1, Soil*  
44 *Background for Nonradioactive Analytes* (DOE-RL 1994). The MTCA cleanup values  
45 are defined in the *Model Toxics Control Act Cleanup Regulations* (WAC 173-340).  
46 Note that the performance standard was the same as the action levels defined  
47 in Section 2.2.  
48  
49  
50

1  
2  
3  
4 **4.0 SAMPLING**

5 Sample collection occurred at the 105-DR LSFF during July 1995. The soil  
6 samples from Area 7 were collected on July 18, 1995. The samples from the new  
7 submerged gravel scrubber (Area 3) were collected on July 20, 1995. Sampling  
8 was conducted in accordance with the *105-DR Large Sodium Fire Facility*  
9 *Decontamination, Sampling, and Analysis Plan* (WHC 1995), except as noted.  
10 This plan is the implementing document for the Chapter 6 and Chapter 7  
11 requirements of the *105-DR Large Sodium Fire Facility Closure Plan*  
12 (DOE-RL 1995).  
13

14 **4.1 GENERAL SAMPLING INFORMATION**

15  
16 The sample locations at the 105-DR LSFF were finalized during informal  
17 DQO meetings held between Ecology and DOE during the first half of 1995.  
18 The sampling locations are documented in the *105-DR Large Sodium Fire Facility*  
19 *Decontamination, Sampling, and Analysis Plan* (WHC 1995).  
20

21 All sampling equipment used at the 105-DR LSFF were decontaminated in the  
22 1706 KE Laboratory in accordance with Environmental Investigation Instruction  
23 (EII) 5.5, "1706 KE Laboratory Cleaning of RCRA/CERCLA Sampling Equipment"  
24 (*Environmental Investigations and Site Characterization Manual* [WHC 1988]).  
25 All sampling equipment (shovel, spoons, bowls, grain sampler) were made from  
26 stainless steel.  
27

28  
29 **4.2 SAMPLING CHRONOLOGY**

30  
31 The following lists the chronology of critical events associated with the  
32 sampling at the 105-DR Large Sodium Fire Facility:  
33

- 34 • May 25, 1995 Ecology approves use of the draft decontamination,  
35 sampling, and analysis plan
- 36  
37 • Jun 5, 1995 *105-DR Large Sodium Fire Facility Decontamination,*  
38 *Sampling, and Analysis Plan* (WHC 1995) issued
- 39  
40 • Jul 18, 1995 Area 7 Soil sampling started and completed
- 41  
42 • Jul 20, 1995 Area 3 Scrubber gravel sampling started and  
43 completed.  
44  
45

46 **4.3 AREA 7 SOIL SAMPLING**

47  
48 The Area 7 soil samples were fully evaluated in the *105-DR Large Sodium*  
49 *Fire Facility Soil Sampling Data Evaluation Report* (WHC 1996). The results of  
50 this report will be summarized.  
51

1 There are a total of 5 soil sample locations in Area 7: 2 random and  
 2 3 authoritative. Figure 5 shows the general locations of the soil samples.  
 3 The specific locations of the Area 7 random samples are shown on Figure 6.  
 4 A total of 6 soil samples were collected: 2 random soil samples, 1 random  
 5 duplicate soil sample, and 3 authoritative soil samples.

6  
 7  
 8 **4.3.1 Soil Sample Collection**

9  
 10 At each location, the top 150 millimeters (6 inches) of soil was removed  
 11 with a clean shovel. The sample was then mixed in a clean bowl and placed  
 12 into vendor-certified clean bottles using clean spoons.

13  
 14  
 15 **4.3.2 Soil Sampling Data Evaluation**  
 16 **Report Errata**

17  
 18 There are two known typographical errors in the *105-DR Large Sodium Fire*  
 19 *Facility Soil Sampling Data Evaluation Report* (WHC 1996). Both are located on  
 20 page F3, Figure 3. The first is "Authoritative Sample 3 (BOG984)" should read  
 21 "Authoritative Sample 3 (BOG982)." The second is "Authoritative Sample 2  
 22 (BOG985)" should read "Authoritative Sample 2 (BOG984)."

23  
 24  
 25 **4.4 AREA 3 GRAVEL SCRUBBER SAMPLING**

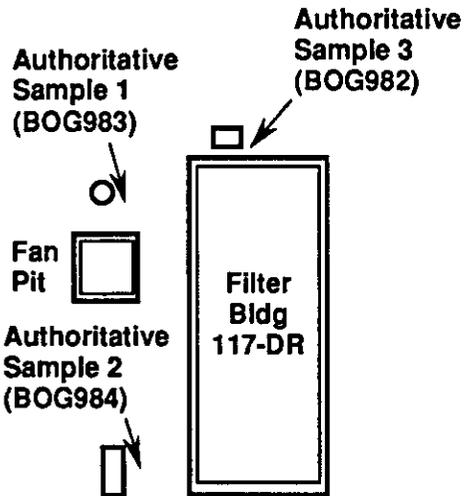
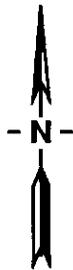
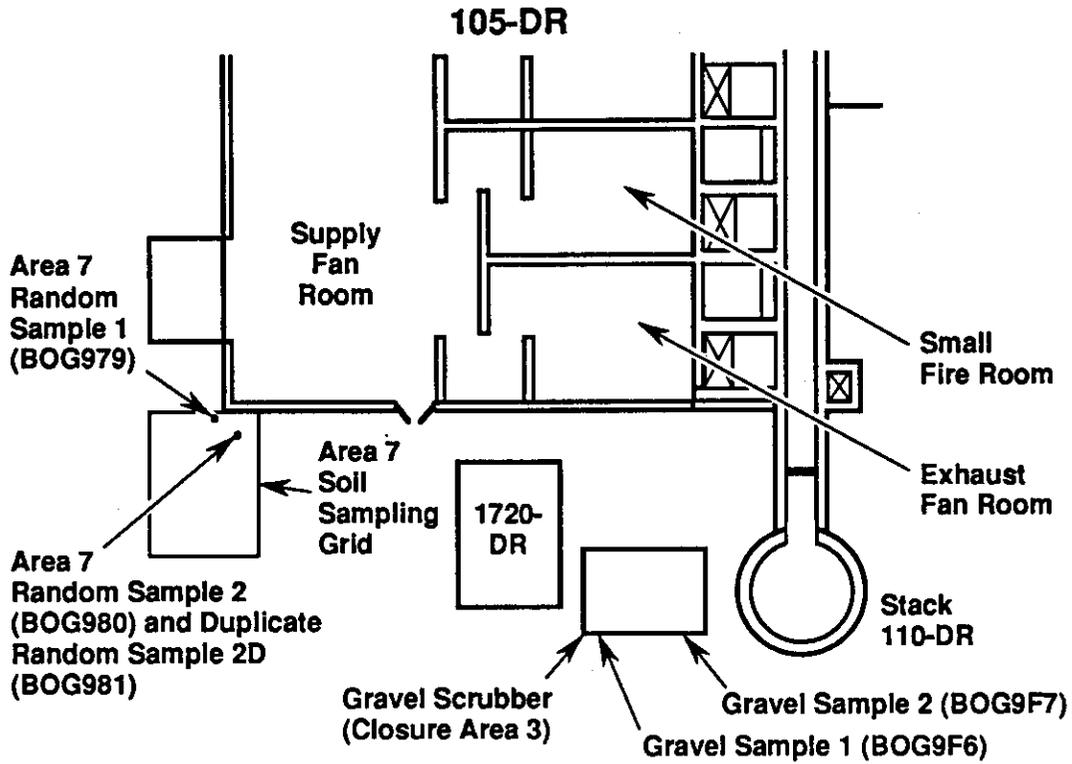
26  
 27 The Area 3 gravel scrubber samples were evaluated fully in Appendix A.  
 28 The results of this appendix will be summarized. There are a total of  
 29 2 gravel scrubber sample locations. These locations are shown in Figure 5.

30  
 31  
 32 **4.4.1 Gravel Scrubber Sample Collection**

33  
 34 Two entry holes were cut into the south side of the gravel scrubber with  
 35 an acetylene torch. One entry hole was orientated toward the west side of the  
 36 scrubber with the other being oriented toward the east side. The torch also  
 37 was used to cut holes in the screen covering the gravel. A grain sampler was  
 38 inserted into the gravel bed as far as possible. The gravel sample was  
 39 composited in a clean bowl and placed into vender certified clean bottles  
 40 using clean spoons.

41  
 42  
 43 **4.4.2 Gravel Scrubber Sampling Deviation**  
 44 **From Sampling Plan**

45  
 46 There was one deviation from the approved *105-DR Large Sodium Fire*  
 47 *Facility Decontamination, Sampling, and Analysis Plan* (WHC 1995). Section 4.0  
 48 of the *105-DR Large Sodium Fire Facility Decontamination, Sampling, and*  
 49 *Analysis Plan* (WHC 1995) states that "These samples will be obtained as the  
 50 gravel is removed from the scrubber." The need to designate the gravel prior



0 50 Feet

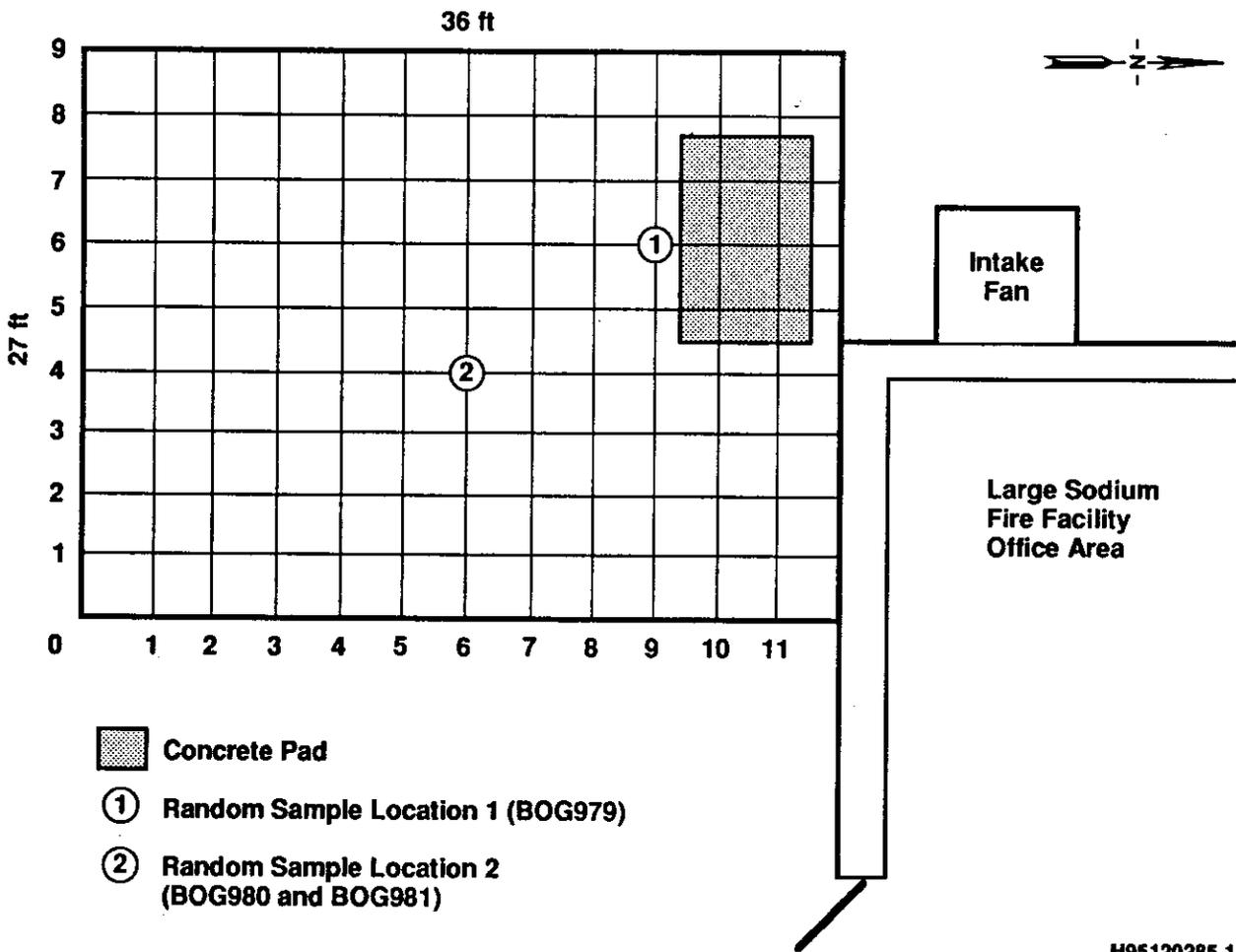
0 20 Meters

H9508018.1

1  
2

Figure 5. Sampling Locations at the 105-DR Large Sodium Fire Facility.

1 Figure 6. Soil Random Sample Locations for Closure Area 7.



1 to removal prevented the samples from being taken during removal. During the  
2 July 18, 1995, meeting with Ecology, the following deviation was agreed on:

- 3
- 4 1. Sample the gravel in place
- 5 2. Analyze the gravel sample
- 6 3. Evaluate the results
- 7 4. Dispose of the gravel appropriately.
- 8

9 The gravel sample to support closure was collected on July 20, 1995. Removal  
10 started on March 4, 1996, and was completed by March 13, 1996. This deviation  
11 did not have any adverse affects on the results of either the sampling or the  
12 closure activities. A copy of the July 18, 1995, meeting minutes are  
13 presented in Appendix B.  
14  
15

#### 16 4.5 FIELD QUALITY ASSURANCE AND QUALITY CONTROL

17

18 Per the *105-DR Large Sodium Fire Facility Decontamination, Sampling, and*  
19 *Analysis Plan* (WHC 1995), field and trip blanks were not used because no  
20 volatile organic samples were collected. Equipment blanks were not required  
21 because field decontamination of sampling equipment was not used.  
22  
23  
24

### 25 5.0 CLOSURE ACTIVITIES

26  
27

28 The closure activities followed the requirements of the *105-DR Large*  
29 *Sodium Fire Facility Closure Plan* (DOE-RL 1995). Several aspects of the  
30 closure activities from Chapters 6 and 7 of the closure plan are identified in  
31 greater detail in *105-DR Large Sodium Fire Facility Decontamination, Sampling,*  
32 *and Analysis Plan* (WHC 1995). This document was reviewed and approved by  
33 Ecology prior to the start of the closure activities.  
34  
35

#### 36 5.1 CHRONOLOGY OF CLOSURE ACTIVITIES

37

38 The closure activities started in July 1995 with the sampling of the soil  
39 and the gravel scrubber. The other activities that occurred from July 1995 to  
40 the end of September 1995 were equipment procurement and setup.  
41 Decontamination efforts started in earnest during October 1995 with the start  
42 of the new fiscal year. The closure activities were completed in March 1996.  
43  
44

#### 45 5.2 HANDLING OF DECONTAMINATION RESIDUES

46

47 To ensure proper handling of decontamination residues, a less-than-90-day  
48 storage area and satellite accumulation areas were established in the  
49 105-DR LSFF. The decontamination residues and any other wastes (e.g., light  
50 ballasts) were handled according to the requirements of WAC 173-303.  
51  
52

### 1 5.3 CLOSURE ACTIVITIES FOR STRUCTURES AND EQUIPMENT

2  
3 For the structures and equipment, the action level was the visible  
4 presence of carbonate (Section 2.1). When visible carbonates were present,  
5 the structure and equipment were decontaminated to the appropriate performance  
6 standard. The decontamination method and performance standard was dependant  
7 on the suspected presence of lead. A more rigid decontamination method and  
8 performance standard was used for the two pieces of equipment that were  
9 suspected to have lead contamination. Additional detail on the  
10 decontamination of the structures and equipment is given in Section 5.6.

#### 11 12 13 5.3.1 Primary Decontamination Method for Structures and Equipment

14  
15 The primary decontamination method for structures and equipment began by  
16 removing any bulk carbonate using physical methods (e.g., scrapping). A mild  
17 nonhazardous acetic acid solution was used to remove any remaining carbonate.  
18 The mild nonhazardous acetic acid solution consisted of 1 percent acetic acid  
19 and 99 percent water.

20  
21 If the building structure was being decontaminated, then it was subjected  
22 to a pressure wash using the mild acetic acid solution. As needed, limited  
23 areas of the building structure were decontaminated using hand methods (e.g.,  
24 scrub brushes and the mild acetic acid solution).

25  
26 The main method of decontamination for the equipment was by hand using  
27 scrub brushes in the mild acetic acid solution. This method was used on the  
28 equipment from Area 1 and Area 3. Equipment being decontaminated also may  
29 have required the use of the pressure wash.

30  
31 The performance standard for structures and equipment with only carbonate  
32 contamination is discussed in Section 3.1.

#### 33 34 35 5.3.2 Decontamination Method for Lead/Carbonate 36 Contamination

37  
38 The Small Test Vessel and the instrumented pressure vessel from the Large  
39 Test Cell may have had lead contamination. Lead requires a more stringent  
40 treatment technology than the carbonate. To address the lead contamination  
41 while avoiding costly sampling, it was decided to use the "Debris Rule"  
42 treatment technologies listed in 40 CFR 268. The *105-DR Large Sodium Fire*  
43 *Facility Decontamination, Sampling, and Analysis Plan* (WHC 1995), identified  
44 that wet sandblasting would be used for the carbonate/lead decontamination.

45  
46 Because of concerns related to minimizing waste handling when using the  
47 garnet wet sandblasting, a high pressure (40,000 pounds per square inch [psi])  
48 water blasting was used for the decontamination. Both technologies are on the  
49 Debris Rule (40 CFR 268) list of approved treatment technologies, are  
50 equivalent for the intended use, and have the same performance standard  
51 (Section 3.2). Ecology was informed of the change prior to the start of the  
52 decontamination. The change and Ecology's consent was documented in the Unit  
53 Manager's Meeting Minutes dated January 18, 1996 (Appendix B).

1 The performance standard for structures and equipment with only carbonate  
2 and lead contamination is discussed in Section 3.2.

#### 5.4 CLOSURE ACTIVITIES FOR THE GRAVEL SCRUBBER

7 During closure activities, the gravel scrubber (Area 3) was subdivided  
8 into two parts. The first part was the equipment: the ducts, the blower, and  
9 the scrubber housing. The second part was the gravel inside the scrubber  
10 housing. The ducts, blower, and housing were treated as equipment and handled  
11 according to the general closure activities outlined in Section 5.3.1.  
12 Additional detail on the decontamination and dismantling of the gravel  
13 scrubber is given in Section 5.6.

15 There was one deviation from the *105-DR Large Sodium Fire Facility*  
16 *Decontamination, Sampling, and Analysis Plan* (WHC 1995). This deviation is  
17 associated with sampling the gravel and is discussed in Section 4.4.2. This  
18 deviation did not have any adverse affects on the results of either the  
19 sampling or the closure activities.

21 Evaluation of the gravel sampling (Appendix A) determined that the gravel  
22 performance standards (Section 3.3) were met. Therefore, the gravel did not  
23 require disposal as a dangerous waste and was available for reuse.

#### 5.5 CLOSURE ACTIVITIES FOR THE SOIL

28 Evaluation of the soil sampling (*105-DR Large Sodium Fire Facility Soil*  
29 *Sampling Data Evaluation Report* [WHC 1996]) determined that the soil  
30 performance standards (Section 3.4) were met. Therefore, the soil was clean  
31 and did not contain any contamination. No closure activities were needed for  
32 the soil.

#### 5.6 DISCUSSION OF CLOSURE ACTIVITIES

37 Closure activities started on October 3, 1995, and were completed on  
38 March 15, 1996.

##### 5.6.1 Overview of Closure Activities

43 As decontamination of each part of the 105-DR LSFF proceeded, loose  
44 equipment was gathered and moved as necessary to alleviate any safety  
45 (e.g., tripping) hazards. Then, any other safety concerns (e.g., isolation of  
46 electrical systems) were addressed.

48 Equipment was then disassembled as required and decontaminated.  
49 Decontamination continued until the equipment met the performance standard  
50 requirements of Section 3.1. Solid carbonate was collected into satellite  
51 drums, then a water and mild acid solution was used to decontaminate the  
52 equipment to a visually clean surface. The liquid waste was collected in

1 drums. Then, the clean equipment was stockpiled for either recycle  
2 (e.g., scrap metal) or reuse (various types of equipment).  
3

4 The interiors of the Small Test Cell and the instrumented pressure vessel  
5 from the Large Test Cell were decontaminated to remove lead and carbonate  
6 contamination using a high pressure (40,000 psi) water blast. After  
7 decontamination, the interiors of both pieces of equipment met the performance  
8 standard requirements of Section 3.2. Verification of the decontamination is  
9 included in Appendix C.  
10

11 As part of the closure, all penetrations from the Exhaust Fan Room, Small  
12 Fire Room, Large Fire Room, and Sodium Handling Room into the reactor exhaust  
13 tunnels system were sealed. This isolated Closure Area 1 from any carbonate  
14 or radiological cross-contamination from Closure Area 2.  
15

16 The Exhaust Fan Room, Small Fire Room, Large Fire Room, and Sodium  
17 Handling Room also were washed down using the pressure washing equipment and  
18 the water and mild acid solution. This removed any carbonate remaining on the  
19 walls. The spraying was conducted using the minimum amount of liquid  
20 possible. The waste liquid was collected and drummed during the spraying  
21 operations to prevent a buildup of liquid. Several complete washing  
22 evolutions per room were required to remove the carbonate and to obtain a  
23 visually clean surface that met the performance requirements of Section 3.1.  
24

25 Also decontaminated at this time were the burn pans and other equipment  
26 that had been stored outside in Area 7. The filter test stand and its  
27 associated duct work were disassembled and decontaminated. Minor  
28 decontamination and major dismantling work was required for the control room  
29 outside the Small Fire Room; the temperature, instrumentation, and gas flow  
30 control equipment outside the Large Fire Room; and the Sodium Handling Room.  
31

32 The duct work to and from the gravel scrubber and the associated blower  
33 were dismantled and decontaminated. This equipment was very clean and  
34 required only a minimum of decontamination. The penetrations into the reactor  
35 exhaust system were then sealed. This will prevent any carbonate or  
36 radiological contamination from spreading out of Closure Area 2 and  
37 Closure Area 4.  
38

39 The gravel from the new submerged gravel scrubber initially was placed  
40 into drums and handled as a potentially dangerous waste. Once the internal  
41 waste designation process confirmed that the gravel did not designate as  
42 dangerous waste under WAC 173-303, it was made available for reuse.  
43  
44

#### 45 5.6.2 Results of Visual Inspections 46

47 The performance standards of Section 3.0 require that the equipment and  
48 structure pass a visual inspection. Decontamination of the dismantled  
49 equipment continued until each passed visual inspection per Section 3.1.  
50 The Small Test Cell and the instrumented pressure vessel from the Large Test  
51 Cell passed the 'debris rule' visual inspection per Section 3.2. The four  
52 rooms (the Exhaust Fan Room, the Small Fire Room, the Large Fire Room, and the  
53 Sodium Handling Room) were washed down until they passed visual inspection per

1 Section 3.1. The gravel scrubber was dismantled with the equipment portion  
 2 being decontaminated until it passed visual inspection per Section 3.3 and  
 3 Section 3.1. The closure activities successfully decontaminated the equipment  
 4 and structures of the 105-DR LSFF.

5  
 6 If a piece of equipment did not pass inspection or, for some reason,  
 7 decontamination was not possible, then that piece of equipment was placed in  
 8 the satellite drum to be managed as a dangerous waste. Only a small volume of  
 9 equipment failed and none of the larger pieces failed.

10  
 11  
 12 **5.6.2.1 Presence of Calcium Carbonate after Meeting the Visual Standard**

13  
 14 The final wash down of the Exhaust Fan Room was completed in late  
 15 February 1996. At this time the walls, floor, and ceiling of the Exhaust Fan  
 16 Room meet the cleanup performance standard of a visually clean surface. About  
 17 two weeks later (mid-March 1996), a white powder had formed on the walls and  
 18 ceiling. At that time, it was not known if this white powder was sodium  
 19 carbonate or if it was some other material.

20  
 21 An informal consultation with Ecology was held on March 26, 1996. This  
 22 discussion identified one possible source of the white powder as calcium  
 23 carbonate leaching out of the concrete. It was decided to use a field  
 24 characterization test to determine if the white powder contained sodium,  
 25 calcium, or both.

26  
 27 The field characterization testing was conducted on March 29, 1996.  
 28 The test resulted in a positive result for the presence of calcium. Sodium  
 29 was not detected. The test report is included as Appendix E.

30  
 31 Based on the results of the field tests, the white powder is not the  
 32 sodium carbonate dangerous waste residue but calcium carbonate. Calcium  
 33 carbonate is not one of the constituents of concern. No additional  
 34 decontamination is required.

35  
 36  
 37 **5.6.3 Materials Made Available for Recycle**  
 38 **or Reuses**

39  
 40 The closure activities produced over 62 tonnes/62,042 kilograms (kg) (68  
 41 tons/136,799 pounds [lbs]) of material for recycling and reuse. This material  
 42 can be broken down into the following categories:

43  
 44

45	1. Scrap stainless steel	12,825 kg ( 28,280 lbs)
46	2. Miscellaneous scrap steel	26,898 kg ( 59,309 lbs)
47	3. Recyclable equipment/hardware	1,710 kg ( 3,770 lbs)
48	4. Mixed scrap stainless steel, scrap steel, and equipment	6,975 kg ( 15,380 lbs)
49	5. Scrap copper (mainly wire)	934 kg ( 2,060 lbs)
50	6. Reusable scrubber gravel	12,700 kg ( 28,000 lbs)
51		
52	Total	62,042 kg (136,799 lbs)

53

1 The scrap metals and recyclable equipment/hardware have been sent offsite for  
 2 recycling. The gravel was used onsite for surfacing a parking area at the  
 3 105-DR Reactor Building.

4  
 5 Additionally, most of the asbestos insulation removed from the sodium  
 6 storage tank in the Sodium Handling Room was recycled. About 3.4 cubic meters  
 7 (4.5 cubic yards) of asbestos insulation was recycled into bricks. The total  
 8 mass of insulations is not available.

9  
 10  
 11 **5.6.4 Addressing Problems Found During**  
 12 **Closure Activities**

13  
 14 No significant unexpected problems or findings occurred during the  
 15 closure activities. No conditions were discovered that were outside of the  
 16 scope of the closure plan. Examples of problems that were expected but did  
 17 not occur include: radiological contamination in the ducts to and from the  
 18 reactor exhaust tunnels and carbonate contamination on the gravel from the  
 19 gravel scrubber.

20  
 21 Of the problems that were expected during equipment disassembly, only one  
 22 occurred: previously unidentified asbestos insulation was found on the sodium  
 23 storage tank in the Sodium Handling Room. The asbestos was found during a  
 24 routine pre-disassembly test of the insulation on the sodium storage tank.  
 25 The asbestos insulation was removed by an asbestos remediation crew.  
 26 The asbestos that contained waste was either disposed of through the onsite  
 27 Asbestos Conversion Project or disposed of at the Pasco Landfill (offsite).

28  
 29 One minor unexpected problem was that lead paint caused a safety concern  
 30 when using a cutting torch. Before disassembly of the Large Test Cell, an  
 31 analysis of the paint on the inside surface of the cell tested positive for  
 32 lead. The concentration of lead was not high enough to result in a dangerous  
 33 waste designation under WAC 173-303. However, it was a potential safety  
 34 concern when using a cutting torch on the painted steel panels. Additional  
 35 safety equipment (e.g., a mask and additional protective clothing) was  
 36 required during the cutting operation.

37  
 38 The need to safely isolate the electrical systems used in the 105-DR LSFF  
 39 required the removal of much more electrical conduit than expected. While  
 40 this did not directly affect the closure activities, it did increase the cost.  
 41 The primary driver for removal was the requirement to safely remove and  
 42 isolate the electrical systems that entered into the four rooms in the  
 43 105-DR LSFF.

44  
 45  
 46 **5.6.5 Waste Management**

47  
 48 Use of satellite collection areas for the waste residues was effective.  
 49 The satellites were moved around so they were located next to the current work  
 50 areas. Use of the less-than-90-day storage pad allowed for the drums to be  
 51 stored pending an analysis of their contents for disposal purposes. Some of

1 the carbonate-containing drums did designate as dangerous waste because of the  
2 presence of lead and chromium. It is believed that the sources are lead paint  
3 and stainless steel, respectively. Lead paint and stainless steel exist  
4 extensively in the 105-DR Reactor Building and the components of the  
5 105-DR LSFF.  
6  
7

#### 8 5.6.6 Cracks in the Floors and Walls 9

10 During implementation of the closure activities, some cracks were noted  
11 in the sump and on the floor of the Exhaust Fan Room and on the floor of the  
12 Small Fire Room. There were two concerns about cracks in or near the floor:  
13 The first was that the cracks may have allowed carbonate to penetrate to the  
14 soil during past operations of the 105-DR LSFF. The second was that the  
15 cracks could allow liquid decontamination residue to penetrate to the soil  
16 during the closure activities. After being examined, none of the cracks were  
17 considered large enough to be a concern. This was a subjective judgement  
18 since there were no rigid criteria for cracks.  
19

20 As a precaution, some of the cracks in the Exhaust Fan Room floor and  
21 sump were sealed. The Exhaust Fan Room was chosen as the staging and  
22 decontamination area for the disassembled equipment. Sealing the cracks  
23 ensured that the decontamination residues could not penetrate into the cracks.  
24 The good housekeeping practices of using the minimum volume of mild acid  
25 solution and collecting any free liquid also helped reduce any potential for  
26 decontamination residues to penetrate a crack and enter the soil.  
27

28 Relatively large cracks were noted at some of the joints between the  
29 walls, especially in the Exhaust Fan Room and Small Fire Room. These cracks  
30 were not concerns because of their location away from the floor and potential  
31 pathways to the soil. The general washdown completed in all rooms of the  
32 105-DR LSFF was considered to have adequately removed any carbonate from these  
33 cracks.  
34  
35

#### 36 5.6.7 Decontamination of the Area 2 37 Duct Work and Blower 38

39 As noted in the description of Area 2, there is duct work and a blower  
40 connecting the upper and lower parts of the reactor exhaust tunnels  
41 (Figure 4). This equipment is located physically within the Closure Area 1  
42 Sodium Handling Room. The internal portions of the duct work and blower were  
43 heavily coated with carbonate.  
44

45 Leaving the Area 2 duct work and blower in place was unacceptable because  
46 carbonate-contaminated equipment would remain in Closure Area 1 after the  
47 clean closure of Area 1. Therefore, the blower and duct work were dismantled  
48 and decontaminated. After decontamination, the dismantled duct work and  
49 blower met the equipment performance standard specified in Section 3.1.  
50 The penetrations into the reactor exhaust tunnel were then sealed.  
51  
52

1 5.6.8 Radiological Aspects Related to  
2 the Closure Activities  
3

4 Before the start of closure activities, Closure Area 1 of the 105-DR LSFF  
5 had been radiologically surveyed. Closure Area 1 was found to be  
6 uncontaminated. This survey allowed the radiological protection zone to be  
7 moved from the entry door on the south side of the building to the door into  
8 the 105-DR Reactor Valve Pit Room (Figure 3).  
9

10 Spot checks and surveys of equipment and personnel were done throughout  
11 the closure activities. Extra care was taken when the potential for  
12 radiological contamination was suspected. An example is the Area 2 duct work  
13 and blower located in the Sodium Handling Room. No radiological contamination  
14 was found during the closure activities.  
15  
16  
17

18 6.0 CONCLUSIONS  
19  
20

21 The closure activities were successful in meeting the requirements for  
22 clean closing Closure Area 1, Closure Area 3, and Closure Area 7.  
23 The equipment and building structure from Closure Area 1 were decontaminated  
24 to meet the performance standards in Sections 3.1 and 3.2. The analysis of  
25 the gravel from Closure Area 3 showed that the gravel met the performance  
26 standards in Section 3.3. The equipment from Closure Area 3 met the  
27 performance standards of Section 3.3. The analysis of the soil from  
28 Closure Area 7 showed that the soil met the performance standards in  
29 Section 3.4. Appendix D contains before and after photographs of the four  
30 rooms and of the gravel scrubber.  
31

32 The Closure Area 2 blower and associated duct work were included as part  
33 of the closure activities and were decontaminated successfully to meet the  
34 performance standards in Section 3.1. Including the blower and associated  
35 duct work allowed the exhaust tunnel to be isolated and removed carbonate  
36 contaminated equipment from within the physical boundaries of Closure Area 1.  
37

38 The closure activities generated over 62 tonnes (68 tons) of material for  
39 recycle or reuse. This includes 12.8 tonnes (14 tons) of scrap stainless  
40 steel; 26.9 tonnes (29.7 tons) of miscellaneous scrap steel; 0.9 tonnes (1  
41 ton) of scrap copper/copper wire; 1.7 tonnes (1.9 tons) of recyclable  
42 equipment; 6.7 tonnes (7.7 tons) of mixed scrap stainless steel, scrap steel,  
43 and equipment; and 12.7 tonnes (14 tons) of gravel. A total of  
44 3.4 cubic meters (4.5 cubic yards) of asbestos waste was recycled into bricks.  
45  
46

47 In summary, clean closure was achieved for Closure Area 1,  
48 Closure Area 3, and Closure Area 7. The partial clean closure goals of the  
49 *105-DR Large Sodium Fire Facility Closure Plan* (DOE-RL 1995) have been met.  
50 Additionally, Closure Area 2 has been reduced to only the reactor exhaust  
51 tunnels.

7.0 REFERENCES

7.1 DOCUMENTS

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- WHC, 1995, *105-DR Large Sodium Fire Facility Decontamination, Sampling, and Analysis Plan*, WHC-SD-EN-AP-186, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1996, *105-DR Large Sodium Fire Facility Soil Sampling Data Evaluation Report*, WHC-SD-EN-TI-307, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

7.2 CODE OF FEDERAL REGULATIONS

- 40 CFR 260, "Hazardous Waste Management System-General," as amended.
- 40 CFR 261, "Identification and Listing of Hazardous Waste," as amended.
- 40 CFR 262, "Standards Applicable to Generators of Hazardous Waste," as amended.
- 40 CFR 263, "Standards Applicable to Transporters of Hazardous Waste," as amended.
- 40 CFR 264, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," as amended.

- 1 40 CFR 264, Subpart F (Sections 90 through 101), 1992, "Releases from Solid  
2 Waste Management Units," as amended.  
3  
4 40 CFR 264, Subpart X (Sections 600 through 603), "Miscellaneous Units,"  
5 as amended.  
6  
7 40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous  
8 Waste Treatment, Storage, and Disposal Facilities," as amended.  
9  
10 40 CFR 266, "Standards for the Management of Specific Hazardous Wastes and  
11 Specific Hazardous Waste Management Facilities," as amended.  
12  
13 40 CFR 267, "Interim Standards for Owners and Operators of New Hazardous Waste  
14 Land Disposal Facilities," as amended.  
15  
16 40 CFR 268, "Land Disposal Restrictions," as amended.  
17  
18 40 CFR 270, "EPA Administered Permit Programs: The Hazardous Waste Permit  
19 Program," as amended.  
20  
21

### 22 7.3 FEDERAL AND STATE ACTS

- 23  
24 *Comprehensive Environmental Response and Liability Act of 1980*, as amended,  
25 42 USC 9601 et seq.  
26  
27 *Resource Conservation and Recovery Act of 1976*, as amended, 42 USC 6901  
28 et seq.  
29  
30

### 31 7.4 REVISED CODE OF WASHINGTON AND WASHINGTON 32 ADMINISTRATIVE CODE

- 33  
34 WAC 173-303, *Dangerous Waste Regulations*, Washington State Department of  
35 Ecology, Olympia, Washington.  
36  
37 WAC 173-340, *The Model Toxics Control Act Cleanup Regulation*, Washington State  
38 Department of Ecology, Olympia, Washington.

1

2  
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4

**APPENDIX A**  
**EVALUATION OF THE GRAVEL**  
**SAMPLING DATA**

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6  
7  
8  
9

TABLE

10  
11  
12  
13  
14 A-1 Analytical Results for the 105-DR LSFF Gravel Samples . . . . . TA-1  
15

LIST OF TERMS

1		
2		
3		
4	CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
5		
6	DQO	Data Quality Objective
7	EII	Environmental Investigations Instruction
8	HEIS	Hanford Environmental Information System
9	LSFF	Large Sodium Fire Facility
10	MTCA	Model Toxics Control Act
11	RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
12	TCLP	Toxic Characteristics Leaching Procedure
13	WAC	<i>Washington Administrative Code</i>

1  
2  
3  
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105-DR LARGE SODIUM FIRE FACILITY  
SOIL SAMPLING DATA EVALUATION REPORT

A1.0 INTRODUCTION

This report summarizes and evaluates the sampling of the gravel from Closure Area 3 and subsequent gravel sample analysis performed in support of the closure of the 105-DR Large Sodium Fire Facility (LSFF). The evaluation will be used to determine if the gravel must be designated as a dangerous waste or if the gravel is sufficiently clean to allow for reuse. The evaluation is based on the validated data included in the data validation packages (*105-DR Large Sodium Fire Facility Closure Plan* [DOE-RL 1995b]) for the 105-DR LSFF. The results of this evaluation will be used in support of the closure activities at the 105-DR LSFF as described in the DOE/RL-90-25 (*105-DR Large Sodium Fire Facility Closure Plan* [DOE-RL 1995b]).

This evaluation does not address analytical methodology, nor does it provide raw analytical data or the sampling validation report. The sampling plan is presented in the *105-DR Large Sodium Fire Facility Closure Plan* (DOE-RL 1995b). The sampling plan was discussed and agreed to by all parties during the Data Quality Objective (DQO) process meetings held during the first half of 1995. All analytical data were validated according to *Data Validation Procedures for Chemical Analysis* (WHC 1993). The data validation packages (DOE-RL 1995) already have been transmitted to Washington State Department of Ecology (Ecology).

A1.1 SUMMARY OF RESULTS

Two samples of gravel from 105-DR LSFF Closure Area 3 were analyzed for Toxic Characteristics Leaching Procedure (TCLP) metals (arsenic, barium, cadmium, chromium, lead, silver, selenium, and mercury) and for corrosivity. The analytical result were evaluated against a set of performance standards based upon the Washington Administrative Code (WAC) Chapter 173-340 "Model Toxics Control Act Cleanup Regulations" and the *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes* (DOE 1994). This evaluation determined that there were no constituents of concern above the specified values. Therefore, the gravel was determined not to be a dangerous waste and that the gravel could be reused.

A2.0 SAMPLING

Gravel sampling was performed on July 20, 1995, following the sampling and analysis plan described in *105-DR Large Sodium Fire Facility Closure Plan* (DOE-RL 1995b) and as modified by the 105-DR Large Sodium Fire Facility Unit Manager Meeting Minutes dated July 18, 1995 (WHC 1995a).

1 **A2.1 SAMPLE LOCATIONS CLOSURE AREA 3**

2  
3 Closure Area 3 is south of the 105-DR Reactor Building and adjacent to  
4 the 110-DR Stack. A total of two gravel samples were collected at the LSFF as  
5 follows: one from the south-west corner of the scrubber and one from the  
6 south-east corner. Figure A-1 shows the locations of the gravel samples.

7  
8  
9 **A2.2 SAMPLE COLLECTION**

10  
11 The two samples collected on July 20, 1995, were assigned Hanford  
12 Environmental Information System (HEIS) numbers BOG2F6 and BOG2F7. BOG2F6 was  
13 collected at the south-west corner and BOG2F7 was collected at the south-east  
14 corner (Figure A-1).

15  
16 The gravel samples were collected using clean hand tools. Samples were  
17 taken using a grain sampler inserted into the gravel bed. Each sample was  
18 labeled and placed into a certified clean bottle. All samples were cooled to  
19 4 °C during storage and transportation to the offsite laboratory. All samples  
20 were analyzed within the holding time requirement.

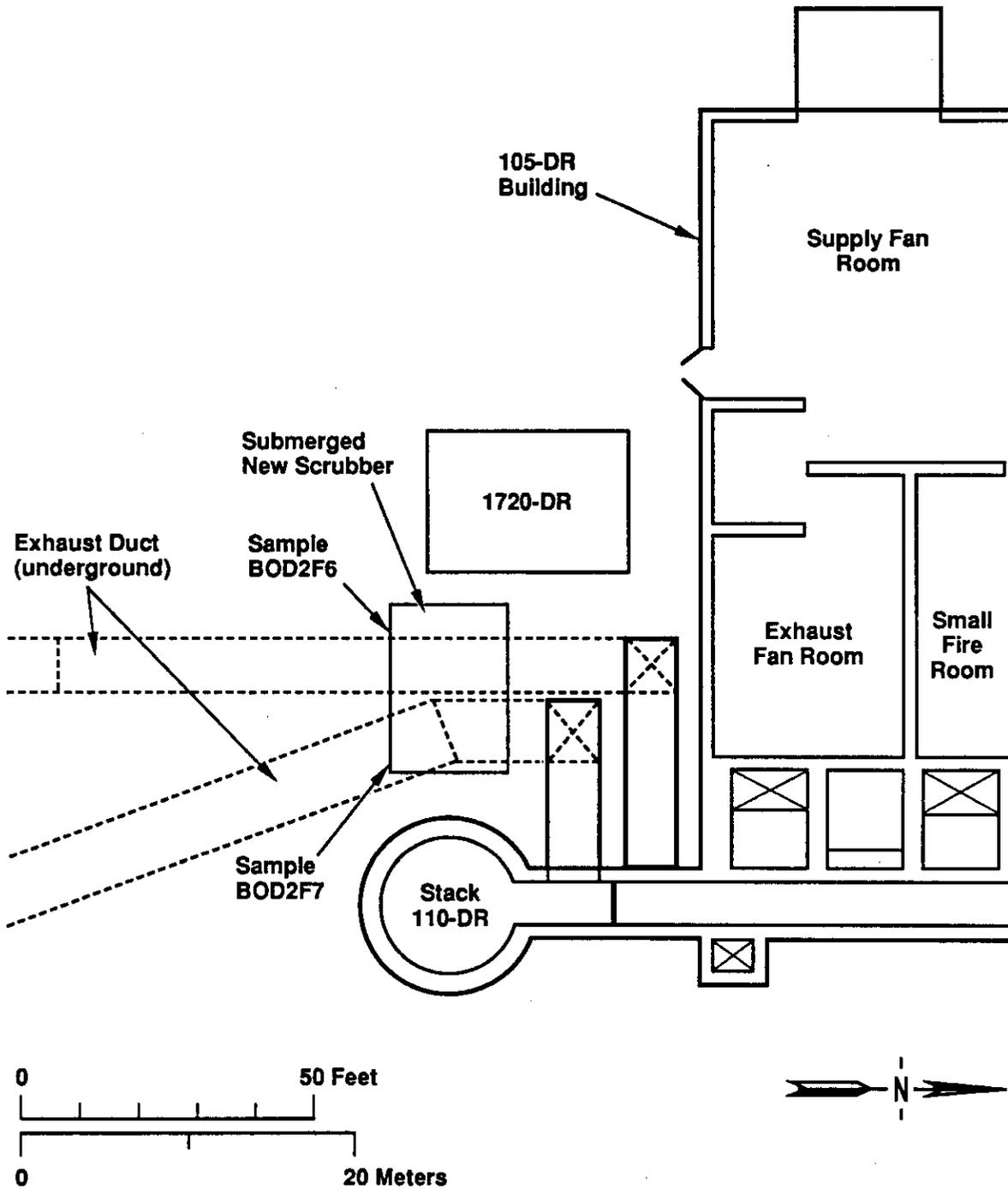
21  
22 The sampling equipment was cleaned and decontaminated before use at the  
23 1706 KE Laboratory in accordance with Environmental Investigation Instruction  
24 (EII) 5.5, "Laboratory Cleaning of *Resource Conservation and Recovery Act of*  
25 *1976 (RCRA)/Comprehensive Environmental Response, Compensation, and Liability*  
26 *Act of 1980 (CERCLA) Sampling Equipment*" (WHC 1988). There was no equipment  
27 decontamination in the field.

28  
29  
30 **A2.2 DEVIATION FROM SAMPLING PLAN**

31  
32 There was one deviation from the approved *105-DR Large Sodium Fire*  
33 *Facility Decontamination, Sampling, and Analysis Plan* (WHC 1995a).  
34 Section 4.0 of the *105-DR Large Sodium Fire Facility Decontamination,*  
35 *Sampling, and Analysis Plan* (WHC 1995a) states that "These samples will be  
36 obtained as the gravel is removed from the scrubber." The need to designate  
37 the gravel before removal prevented the samples from being taken during  
38 removal. During the July 18, 1995, meeting with Ecology, the following  
39 deviation was agreed upon:

- 40  
41 1. Sample the gravel in place  
42 2. Analyze the gravel sample  
43 3. Evaluate the results  
44 4. Dispose of the gravel appropriately.

45  
46 This agreement is documented in the 105-DR Large Sodium Fire Facility Unit  
47 Manager Meeting Minutes dated July 18, 1995 (WHC 1995b). This deviation did  
48 not have any adverse affects the results of either the sampling or the closure  
49 activities.



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1  
2

Figure A-1. Gravel Sampling Location at the 105-DR Large Sodium Fire Facility.

### A3.0 PERFORMANCE STANDARDS

1  
2  
3  
4 The performance standards for closure of the 105-DR LSFF are defined in  
5 Chapter 6 of the closure plan and are based on the requirements of  
6 WAC 173-303-610(2)(b). The performance standard for the gravel from the  
7 gravel scrubber is designation or non-designation as dangerous waste. If  
8 designated, the gravel will be managed as a dangerous waste per the  
9 requirements of WAC 173-303. If it does not designate, it will be disposed of  
10 as a non-regulated solid waste or reused/recycled. The designation procedure  
11 for closure is based on the DQO process meetings held with Ecology during the  
12 first half of 1995.  
13  
14

#### A3.1 METHODOLOGY AND CONSTITUENTS OF CONCERN

15  
16  
17 Designation for closure purposes will be based on the *Test Methods for*  
18 *the Evaluation of Solid Waste: Physical/Chemical Methods* (EPA 1986) TCLP  
19 metals analysis and corrosivity (pH) analysis in comparison with the  
20 requirements of WAC 173-303-610(2)(b). The metals constituents of concern are  
21 arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.  
22 The corrosivity will be measured as pH.  
23  
24

#### A3.2 CORROSIVITY PERFORMANCE STANDARD

25  
26  
27 The corrosivity performance standards for designations purposes are  
28 pH equal to or less than 2 and equal to or greater than 12.5 is considered to  
29 be a dangerous waste. A pH value in the range between 2 and 12.5 will not  
30 result in designation of the gravel as dangerous waste.  
31  
32

#### A3.3 METALS PERFORMANCE STANDARD

33  
34  
35 The TCLP metals performance standard for designation purposes are the  
36 greater of the: sitewide soil background values or *Model Toxics Control Act*  
37 *Cleanup Regulations* (MTCA). The sitewide soil background concentrations are  
38 defined in *Hanford Site Background: Part 1, Soil Background for*  
39 *Nonradioactive Analytes* (DOE-RL 1994). The MTCA values are defined in the  
40 WAC 173-340, *Model Toxics Control Act Cleanup Regulations*.  
41

42 A review of the sitewide soil background values against the MTCA values  
43 indicated that all of the MTCA values were higher. Therefore, only the MTCA  
44 values will be used as the metals performance standards. MTCA Method B values  
45 are used for arsenic, barium, cadmium, mercury, selenium, and silver. No MTCA  
46 Method B values exist for chromium or lead. The more restrictive Method A  
47 values are used instead. These values are presented on Table A-1.

Table A-1. Analytical Results for the 105-DR LSFF Gravel Samples.

CONSTITUENT	SAMPLE BOG2F6 ( $\mu\text{g/L}$ or ppb)	SAMPLE BOG2F7 ( $\mu\text{g/L}$ or ppb)	MTCA PERFORMANCE STANDARD ( $\mu\text{g/kg}$ or ppb)
Arsenic	58.2 U	58.2 U	60,000
Barium	198.0 B	378.0	5,600,000
Cadmium	3.1 U	3.1 U	40,000
Chromium	2.8 U	2.8 U	100,000
Lead	41.3 U	41.3 U	250,000
Mercury	0.20 U	0.20 U	24,000
Selenium	43.3 U	43.3 U	400,000
Silver	28.4 B	2.2 U	400,000
CORROSIVITY	SAMPLE BOG2F6	SAMPLE BOG2F7	CORROSIVITY RANGE FOR DESIGNATION
pH	9.83	9.99	pH $\leq 2$ or pH $\geq 12.5$

ppb = Parts per billion  
 $\mu\text{g/kg}$  = Micrograms per kilogram  
 $\mu\text{g/L}$  = Micrograms per liter  
 MTCA = Model Toxics Control Act  
 LSFF = Large Sodium Fire Facility

U Indicates the analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

B Indicates that the analyte concentration is less than the contract required detection limit, but greater than the instrument detection limits.

Note: pH is a unitless measure.

Note: For dilute solutions  $\mu\text{g/L}$  is approximately equal to  $\mu\text{g/kg}$ .

## A4.0 ANALYSES

1  
2  
3  
4 The corrosivity (pH) analysis used Method 9045 "Solid and Waste pH"  
5 (EPA 1986). Samples for metals analysis were prepared using Method 1311  
6 "Toxicity Characteristic Leaching Procedure" (EPA 1986). Method 6010,  
7 "Inductively Coupled Plasma-Atomic Emission Spectroscopy" (EPA 1986) was used  
8 to analyze the samples for arsenic, barium, cadmium, chromium, lead, silver,  
9 and selenium. Method 7470 "Mercury in Liquid Waste Manual Cold-Vapor  
10 Technique" (EPA 1986). Use of Methods 1311, 6010, 7470 and 9045 had been  
11 established during the DQO process for the 105-DR LSFF. All samples were sent  
12 to Quantera Incorporated in St. Louis, Missouri, for chemical analysis. All  
13 analytical data were validated according to *Data Validation Procedures for*  
14 *Chemical Analysis* (WHC 1993) (refer to Section 5.0). The analytical data are  
15 presented in Table A-1.  
16  
17  
18

## A5.0 DATA VALIDATION

19  
20  
21  
22 Data validation was performed by Los Alamos Technical Associates, Inc.,  
23 in accordance with Level D as defined in *Data Validation Procedures for*  
24 *Chemical Analysis* (WHC 1993). Level D validation includes evaluation and  
25 qualification of results based on analytical holding times, method blank  
26 results, matrix spikes and duplicates, surrogate recoveries, and analytical  
27 method blanks.  
28

29 The criteria and limits for the validation procedures are listed in the  
30 source document. Results of the data validators' review of the quality  
31 control that was applied in this sampling event were transmitted to the  
32 regulators with the validated data packages (DOE-RL 1995c).  
33

34 The data analytical laboratory assigned the following qualifier and  
35 definition to describe the barium and silver data in sample BOG9F6:  
36

37 B Indicates that the analyte concentration is less than the contract  
38 required detection limit, but greater than the instrument detection  
39 limits.  
40

41 The reason for assigning this qualifier to the barium and sodium data is given  
42 in the definition of the qualifier.  
43  
44  
45

## A6.0 DATA EVALUATION

46  
47  
48  
49 The analytical data values for arsenic, barium, cadmium, chromium, lead,  
50 mercury, selenium, and silver are summarized and compared to the MTCA-based  
51 performance standards in Table A-1. One sample (BOG2F9) reported the barium  
52 and silver data qualified with a 'B' by the laboratory. This indicates that

1 these values are less than the contract required detection limit but greater  
 2 than the instrument detection limit.

3  
 4 Only barium and silver were detected in the analysis. The detected  
 5 concentrations of both barium and silver are well below the MTCA-based  
 6 performance standards. All other constituents of concern were, if present, in  
 7 concentrations below the sample quantitation limit. The quantitation limits  
 8 for arsenic, cadmium, chromium, lead, mercury, and selenium are all well below  
 9 the MTCA-based performance standards.

10  
 11 The analytical data values for pH are presented in Table A-1. The pH  
 12 values for the gravel samples were between pH 2 and pH 12.5.

13  
 14 Based on the data evaluation, none of the performance standards were  
 15 exceeded. The gravel does not designate as dangerous waste.

16  
 17  
 18  
 19 **A7.0 CONCLUSIONS**  
 20  
 21

22 The analytical results for the 105-DR LSFF scrubber gravel verify that no  
 23 constituents are present in concentrations that would result in a dangerous  
 24 waste designation for the gravel. The pH of the gravel is neither high enough  
 25 or low enough to be designated as a dangerous waste on that basis. Therefore,  
 26 the gravel would not designate as a dangerous waste. The scrubber gravel can  
 27 either be disposed of as a non-regulated solid waste or reused.

28  
 29  
 30  
 31 **A8.0 REFERENCES**  
 32  
 33

34 **A8.1 DOCUMENTS**  
 35

36 DOE-RL, 1995a, Letter, J. E. Rasmussen, RL, and W. T. Dixon, WHC, to  
 37 M. N. Jaraysi, Ecology, and J. J. Witczak, Ecology, "Submittal of  
 38 Validated Data for the 105-DR Large Sodium Fire Facility Sampling  
 39 (T-1-1)," dated December 13, 1995, 95-PCA-054, U.S. Department of Energy,  
 40 Richland Operations Office, Richland, Washington.

41  
 42 DOE-RL, 1995b, *105-DR Large Sodium Fire Facility Closure Plan*, DOE/RL-90-25,  
 43 Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland,  
 44 Washington.

45  
 46 DOE-RL, 1995c, *Hanford Site Background: Part 1, Soil Background for*  
 47 *Nonradioactive Analytes*, DOE/RL-92-24, Rev. 3, U.S. Department of Energy,  
 48 Richland Operations Office, Richland, Washington.

49  
 50 EPA, 1986, *Test Methods for the Evaluation of Solid Waste: Physical/Chemical*  
 51 *Methods*, SW-846, as amended, U.S. Environmental Protection Agency,  
 52 Washington, D.C.

- 1 WHC, 1988, *Environmental Investigations and Site Characterization Manual*,  
2 WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.  
3  
4 WHC, 1993, *Data Validation Procedures for Chemical Analyses*,  
5 WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, Richland,  
6 Washington.  
7  
8 WHC, 1995, 105-DR Large Sodium Fire Facility Unit Managers Meeting Minutes,  
9 dated July 18, 1995, Westinghouse Hanford Company, Richland, Washington.  
10

11  
12 **A8.2 FEDERAL AND STATE ACTS**  
13

14 None.  
15

16  
17 **A8.3 FEDERAL AND STATE ACTS**  
18

19 *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*,  
20 as amended, 42 USC 9601 et seq.  
21

22 *Resource Conservation and Recovery Act of 1976*, 42 USC 6901 et seq.  
23  
24  
25

26 **A8.4 REVISED CODE OF WASHINGTON AND WASHINGTON ADMINISTRATIVE CODE**  
27

28 WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*,  
29 as amended.  
30

31 WAC 173-340, "The Model Toxics Control Act Cleanup Regulations," *Washington*  
32 *Administrative Code*, as amended.

1

**APPENDIX B**

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**UNIT MANAGERS MEETING MINUTES:  
JULY 18, 1995 AND JANUARY 18, 1996**

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WHC-SD-EN-EV-034, Rev. 1  
Meeting Minutes Transmittal - Approved

Unit Managers Meeting  
105-DR LARGE SODIUM FIRE FACILITY  
Federal Bldg., Rm 784-B  
Richland, Washington

Meeting Held July 18, 1995  
From 2:00 pm to 3:30 pm

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

Ellen Mattlin Date: 8/28/95  
Ellen M. Mattlin, Unit Manager, RL

Not Present Date: \_\_\_\_\_  
Daniel L. Duncan, RCRA Program Manager, EPA Region 10

Scott E. McKinney Date: 8-10-95  
Scott E. McKinney, Unit Manager, Washington State Department of Ecology

105-DR LSFF, WHC Concurrence

Fred A. Ruck III Date: 8/23/95  
Fred A. Ruck III, Contractor Representative, WHC

Purpose: Discuss Permitting Process

Meeting Minutes are attached. The minutes are comprised of the following:

- Attachment 1 - Agenda
- Attachment 2 - Summary of Discussion and Commitments/Agreements
- Attachment 3 - Attendance List
- Attachment 4 - Action Items

Attachment 1

Unit Managers Meeting  
105-DR LARGE SODIUM FIRE FACILITY  
Federal Bldg., Rm 784-B  
Richland, Washington

Meeting Held July 18, 1995  
From 2:00 pm to 3:30 pm

Agenda

1. Approval of Past UMM Minutes
2. Status Action Items
3. Status Closure Activities
  - Status of Sampling and Analysis Activities
4. New Business
5. Set Next Meeting Date

Attachment 2

Unit Managers Meeting  
105-DR LARGE SODIUM FIRE FACILITY  
Federal Bldg., Rm 784-B  
Richland, Washington

Meeting Held July 18, 1995  
From 2:00 pm to 3:30 pm

Summary of Discussion and Commitments/Agreements

1. Approval of Past UMM Minutes

Unit Managers Meeting minutes for May 24, 1995, have been approved and are awaiting signatures. The June 20, 1995, minutes are out for review.

2. Status Action Items

No open action items.

3. Status Closure Activities

-Status of Sampling and Analysis Activities

WHC (ZC Knaus) stated that sampling activities are progressing well. Soil samples were taken on the morning of July 18, 1995. Two soil samples for closure determination were obtained, as well as three authoritative samples at the WHC Field Team Leader's (RC Roos) discretion. He felt that the three authoritative samples would add to the information gained from the other soil locations.

It had been planned to sample the gravel scrubber on this day as well. A portable saw was to be used to gain access into the gravel scrubber. However; the walls of the scrubber were too thick for the portable saw, so the work was stopped. It was decided to use a welder to cut the steel walls of the scrubber. Work was planned to continue on July 20, 1995, to allow for time to rewrite the Radiation Work Permit to include a welder and also to organize all extra equipment necessary to complete the welding job.

Other closure activities: the procurement process for ordering equipment necessary to remove carbonates is continuing. Work on carbonate removal will begin after the arrival of this equipment, which is are anticipated to begin sometime in August or September, 1995. Sandblasting of the vessel that was used to burn the lithium-lead alloy is scheduled to begin the first or second week of September, 1995.

4. New Business

Deviations from the Sampling and Analysis Plan

ZC Knaus reported that there would be a deviation from the activities discussed in Section 4.0, Waste Sampling and Removal. The text of the

Sampling and Analysis Plan states that the gravel will be sampled as it is removed from the scrubber. A different approach will be taken as follows: 1.) the gravel will be sampled in place, 2.) analyze gravel samples, 3.) evaluate results, 4.) dispose of gravel appropriately. Ecology (SE McKinney) did not have any problems with this deviation from the Sampling and Analysis Plan.

**5. Set Next Meeting Date**

The next UMM will be held via video conference on August 10, 1995, Federal Bldg., Richland, Washington.



Attachment 4

Unit Managers Meeting  
105-DR LARGE SODIUM FIRE FACILITY  
Federal Bldg., Rm 784-B  
Richland, Washington

Meeting Held July 18, 1995  
From 2:00 pm to 3:30 pm

Action Items

Action Item #

Description

no open action items

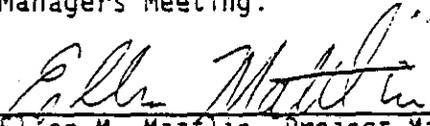
Meeting Minutes Transmittal - Approved

Project Managers Meeting  
105-DR LARGE SODIUM FIRE FACILITY  
Federal Building., Rm 784-B  
Richland, Washington

Meeting Held February 29, 1996  
From 2:00 pm to 3:00 pm

Via video teleconference

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

  
\_\_\_\_\_  
Ellen M. Mattlin, Project Manager, RL Date: 3/26/96

Not Present  
\_\_\_\_\_  
RCRA Program Manager, EPA Region 10 Date: \_\_\_\_\_

  
\_\_\_\_\_  
Scott E. McKinney, Project Manager, Washington State Department of Ecology Date: 3-26-96

105-DR LSFF, WHC Concurrence

  
\_\_\_\_\_  
Fred A. Ruck III, Contractor Representative, WHC Date: 3/27/96

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 Item

Attachment 1

Project Managers Meeting  
105-DR LARGE SODIUM FIRE FACILITY  
Federal Building., Rm 784-B  
Richland, Washington

Meeting Held January 18, 1996  
From 8:00 am to 9:00 am

Via video teleconference

Agenda

1. Approval of Past UMM Minutes
2. Status Action Items
  - None
3. Status Closure Activities
  - Status of Sampling and Analysis Activities
  - Status of Decontamination Activities
  - Change in Decontamination Method
4. New Business
5. Summary of Actions/Decisions
6. Set Next Meeting Date

Attachment 2

Project Managers Meeting  
105-DR LARGE SODIUM FIRE FACILITY  
Federal Building., Rm 784-B  
Richland, Washington

Meeting Held January 18, 1996  
From 8:00 am to 9:00 am

Via video teleconference

Summary of Discussion and Commitments/Agreements

1. Approval of Past UMM Minutes

Project Managers Meeting minutes for September 12, 1995, October 12, 1995, and November 30, 1995 have been reviewed, approved, and issued.

As previously agreed, there was no project manager's meetings during December 1995.

2. Status Action Items

None.

3. Status of Sampling and Analysis Activities

- Status of Sampling and Analysis Activities

WHC (J. G. Adler) stated that the validated data had been transmitted to Ecology. Ecology (S. E. McKinney) stated that the data had been received. WHC also stated that the data evaluation report for the soil sampling was in the final stages of preparation and should be transmitted to Ecology in late January or early February

- Status of Decontamination Activities

WHC (J. G. Adler) stated that the decontamination activities are moving along very smoothly. The sodium storage tank in the Sodium Handling Room has had the asbestos containing insulation removed. About 45 cubic yards (yd<sup>3</sup>) of asbestos containing insulation will be recycled into glass bricks. About 10 yd<sup>3</sup> will be disposed of in Hanford's landfill. Ecology asked how the recycling process works. WHC (P. C. Miller) reported that it is a portable system mounted in a semi-trailer. The material is wetted with a borax-soda mixture, shredded by machine, melted in a high temperature oven (about 2000 degree F), and then quenched. The exhaust from the oven is scrubbed using sodium hydroxide to remove organics from the exhaust. The final product is a non-hazardous form of asbestos that can be used beneficially.

WHC (J. G. Adler) continued: Two semi-trailer loads of scrap metal, about 10 tons worth, have been shipped off-site for recycling. At least one additional semi-trailer load of scrap metal is expected.

The duct work in the Sodium Handling Room has been removed. No problems occurred and no radiological contamination was found. The steel chamber in the Large Fire Room will be cut-up. This is required in order to access the top and the area between the east wall and the steel chamber for decontamination. Currently, the remaining out-of-service electrical utilities are being removed from the Large Fire Room.

Work has started on the duct work between the gravel scrubber and the exhaust stacks. Work will start at the scrubber and work toward the stacks. There is a potential for radiological contamination in this area. The remaining work at 105-DR is: Dismantle the steel chamber and complete clean-out of the Large Fire Room; Dismantle the duct work between the stack and the scrubber; remove the gravel from the scrubber; and address the scrubber itself.

Ecology asked what will happen to the gravel in the scrubber. WHC (P. C. Miller) responded that, if it designates as a non-dangerous waste, it can be used for fill. Ecology also asked what was the expected completion date for the decontamination. WHC (J. G. Adler, P. C. Miller, and F. A. Ruck) responded that the March 1996 completion date still held. More work has been needed than was expected but the work has also proceeded faster than was expected. It is possible that the decontamination activities will be completed sooner.

- Change in Decontamination Method

WHC (J. G. Adler) reported that the change in the decontamination method for the two potentially lead contaminated vessels needs to be documented. The *105-DR Large Sodium Fire Facility Decontamination, Sampling, and Analysis Plan*, WHC-SD-EN-AP-186, specifically identified that wet sandblasting would be used. As discussed at previous meeting, high pressure (40,000 psi) water blasting was used instead. Both technologies are on the Debris Rule (40 CFR 268) list of approved treatment technologies and both have the same performance standard. WHC asked if Ecology acknowledged the change and agree that the water blast was equivalent to the wet sandblasting. Ecology (S. E. McKinney) acknowledged the change and agreed that water blasting was an appropriate technology.

4. New Business

None.

5. Summary of Actions/Decisions

1. Closure activities to be completed around March 1996.
2. The replacement of the wet sandblasting by high pressure water blasting was acknowledged and accepted by the RL and WHC.

No numbered action items were assigned at this meeting.

6. **Set Next Meeting Date**

Instead, the next UMM will be held via video conference on February 29, 1996, at the Federal Building, Richland, Washington.



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APPENDIX C

VERIFICATION OF COMPLETION

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## VERIFICATION OF COMPLETION

A. Treatment/Storage/Disposal Unit: 105-DR Large Sodium Fire Facility

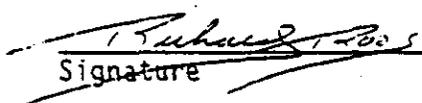
Component(s): Small Fire Vessel; Vessel from the Large Test Cell

B. Decontamination Method<sup>1</sup>: High Pressure Water Spray

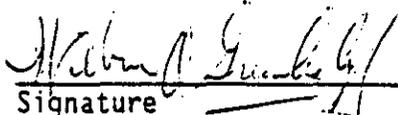
Method Parameter(s) (as applicable):

<input type="checkbox"/>	Temperature	_____
<input type="checkbox"/>	Propellant	_____
<input type="checkbox"/>	Solid Media (e.g., shot, grit, beads)	_____
<input checked="" type="checkbox"/>	Pressure	<u>40,000 psi</u>
<input type="checkbox"/>	Residence time	_____
<input checked="" type="checkbox"/>	Surfactant(s)	<u>none used</u>
<input checked="" type="checkbox"/>	Detergents	<u>none used</u>
<input type="checkbox"/>	Grinding/striking media (e.g., wheels, piston heads)	_____
<input type="checkbox"/>	Depth of surface layer removal	_____

C. The decontamination of the above identified component(s) has been completed using the specified treatment method.


1/22/96  
 Signature Date

D. The above identified component(s) have undergone decontamination in accordance with Table 1, Alternative Treatment Standards for Hazardous Debris, 40 CFR 268.45, and have achieved a clean debris surface<sup>2</sup> as verified by visual inspection.


2/22/96  
 Signature Date

**Notes:**

1. Physical or chemical extraction method from Table 1. Alternative Treatment Standards for Hazardous Debris, 40 CFR 268.45.
2. Clean debris surface: Surface, when viewed without magnification, is free of all visible contaminated soil and dangerous waste, except allowed as follows:
  - a) Residual staining from soil and waste consisting of light shadows, slight streaks and minor discoloration
  - b) Soil and waste in cracks, crevices and pits limited to no more than 5% of each square inch of surface area

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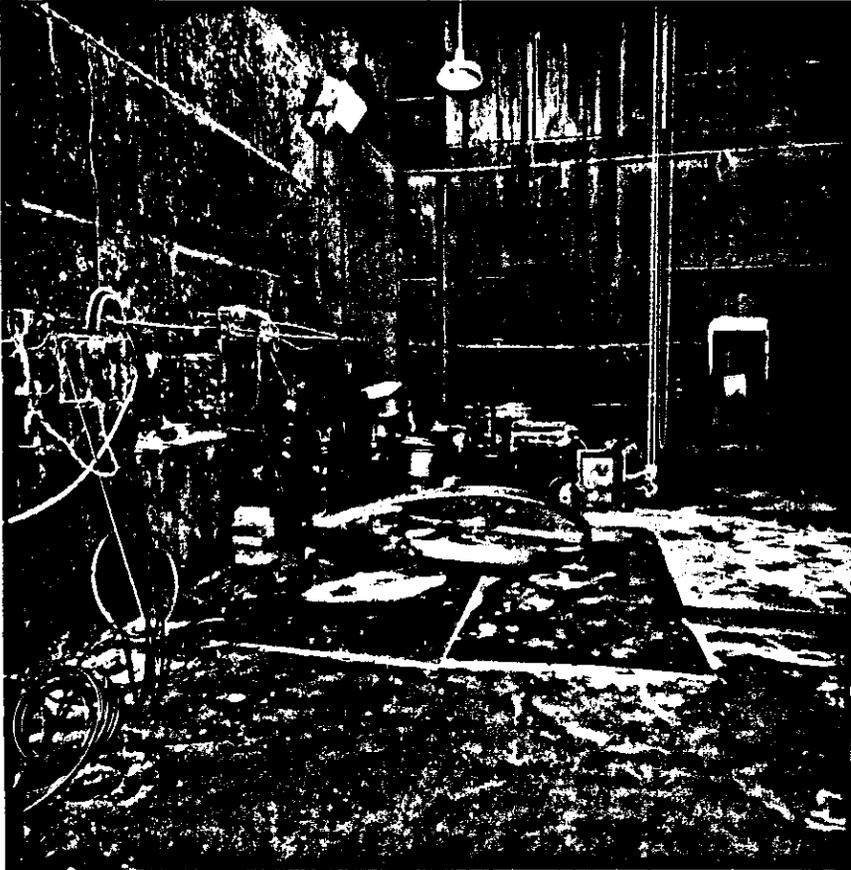
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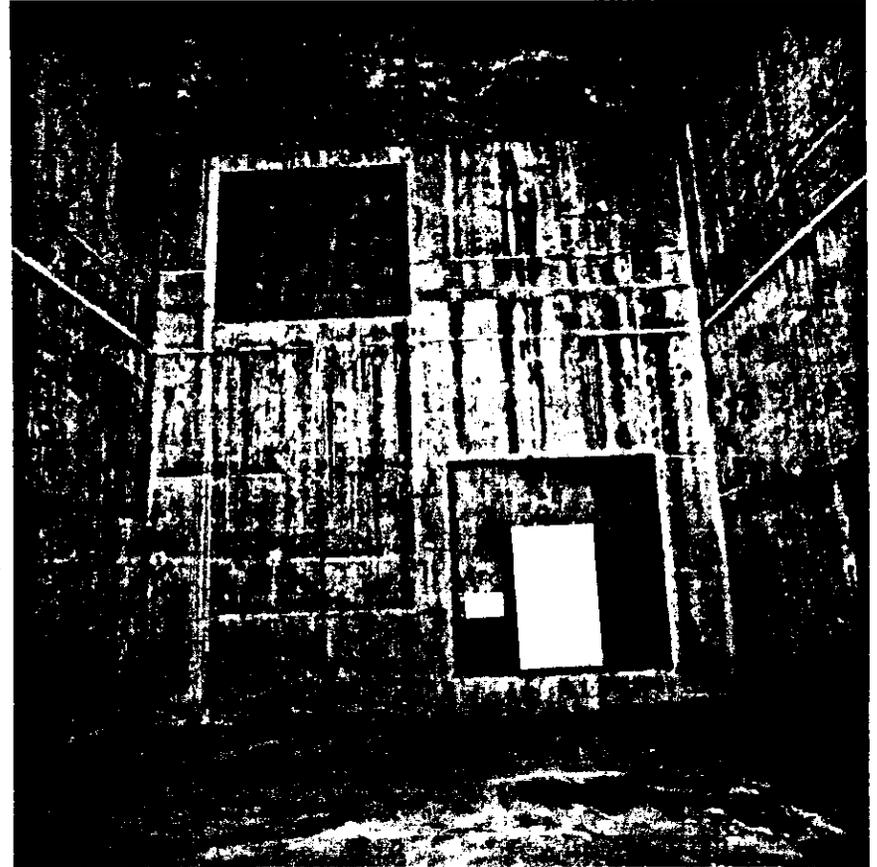
**APPENDIX D**  
**BEFORE AND AFTER PHOTOGRAPHS**

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90030939-25CN  
(Photo taken 1990)



96030030-31CN  
(Photo taken 1996)

Figure D-1. 105-DR Large Sodium Fire Facility: Exhaust Fan Room During 1990 and After Completion of Closure Activities in March 1996.

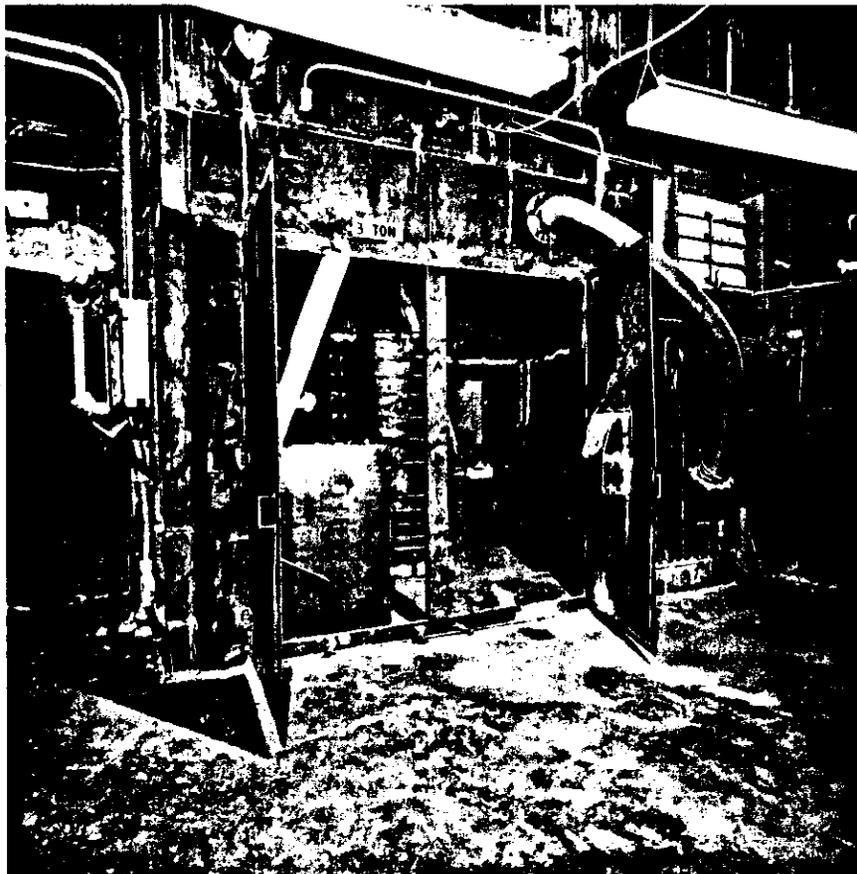


90030939-24CN  
(Photo taken 1990)

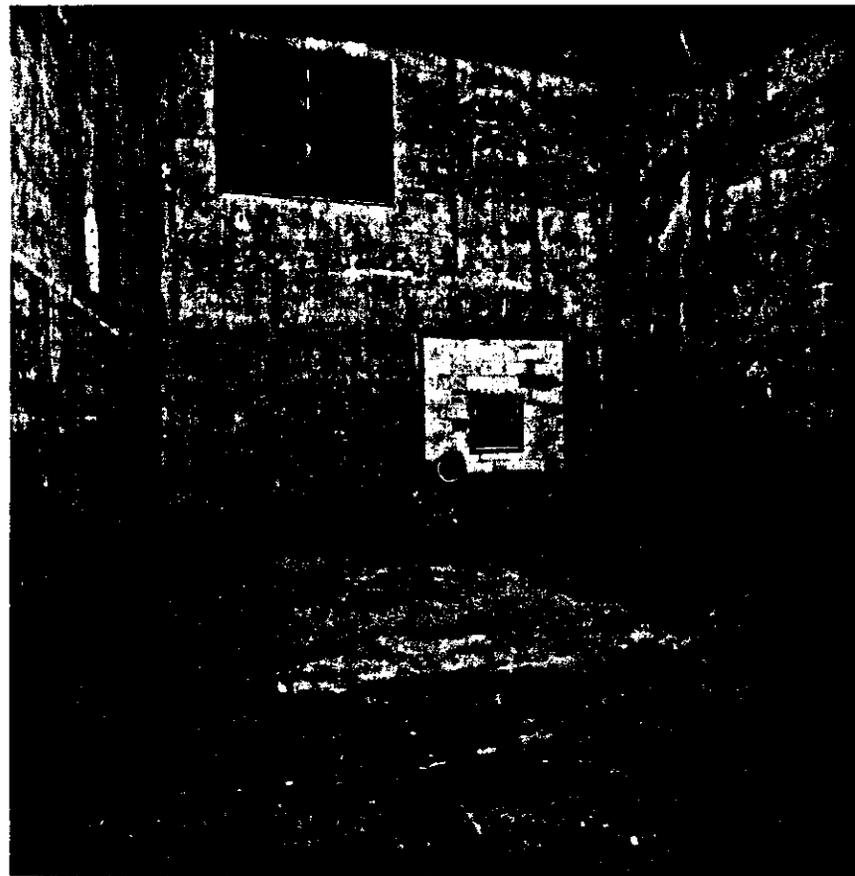


96030030-39CN  
(Photo taken 1996)

Figure D-2. 105-DR Large Sodium Fire Facility: Small Fire Room During 1990 and After Completion of Closure Activities in March 1996.

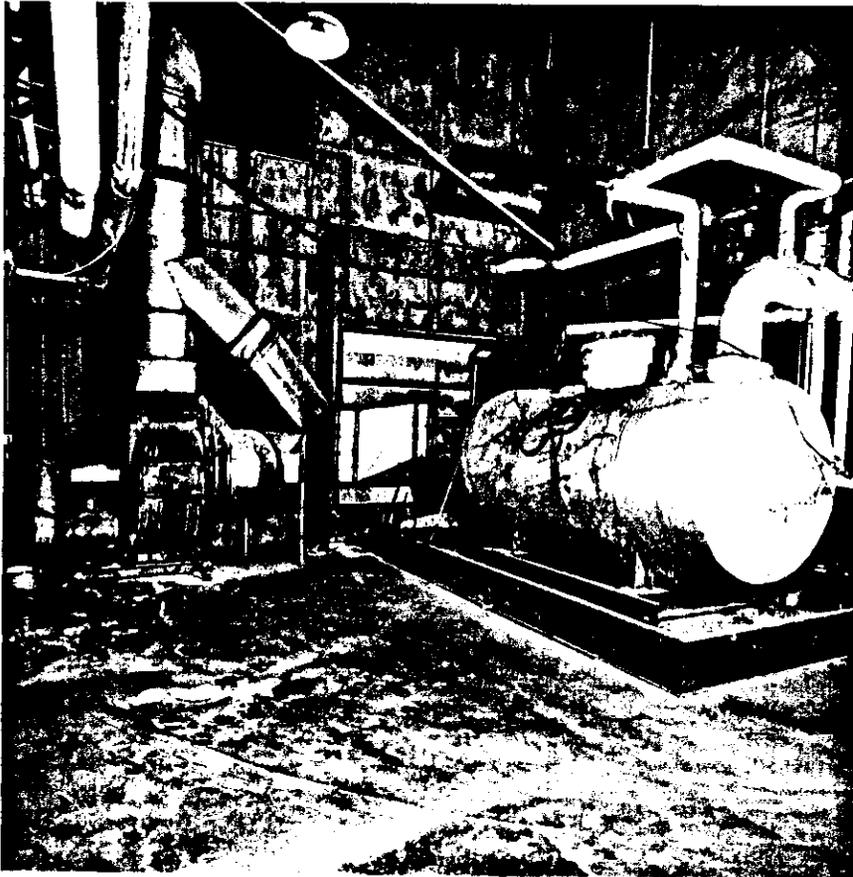


90030939-23CN  
(Photo taken 1990)

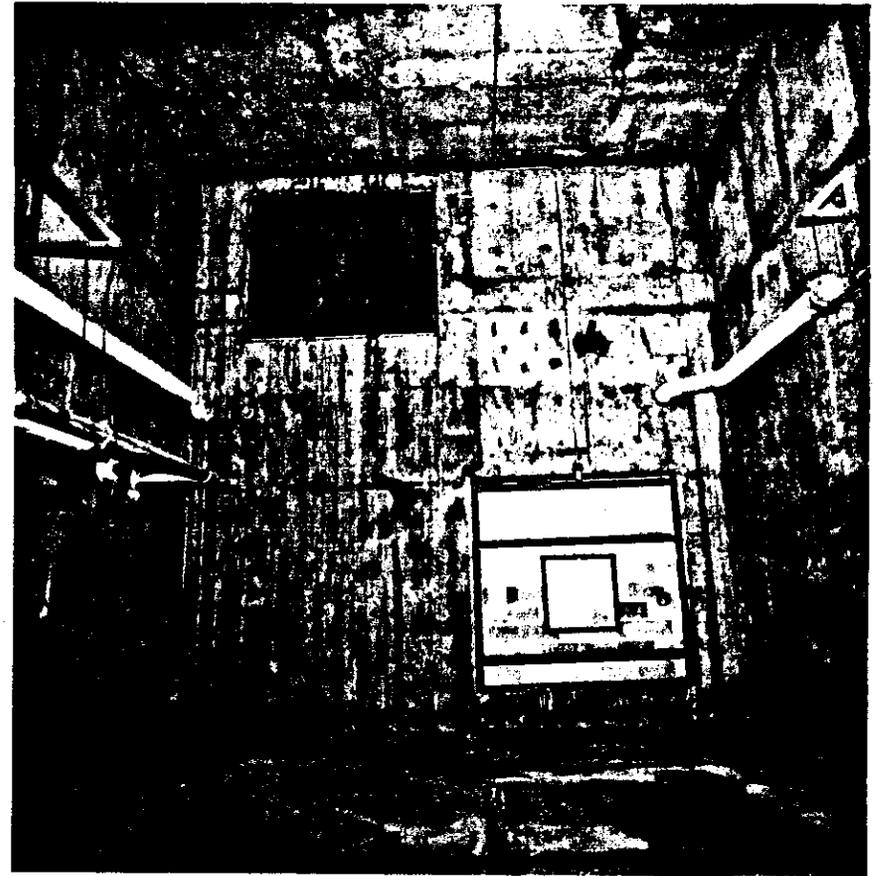


96030030-20CN  
(Photo taken 1996)

Figure D-3. 105-DR Large Sodium Fire Facility: Large Fire Room During 1990 and After Completion of Closure Activities in March 1996.

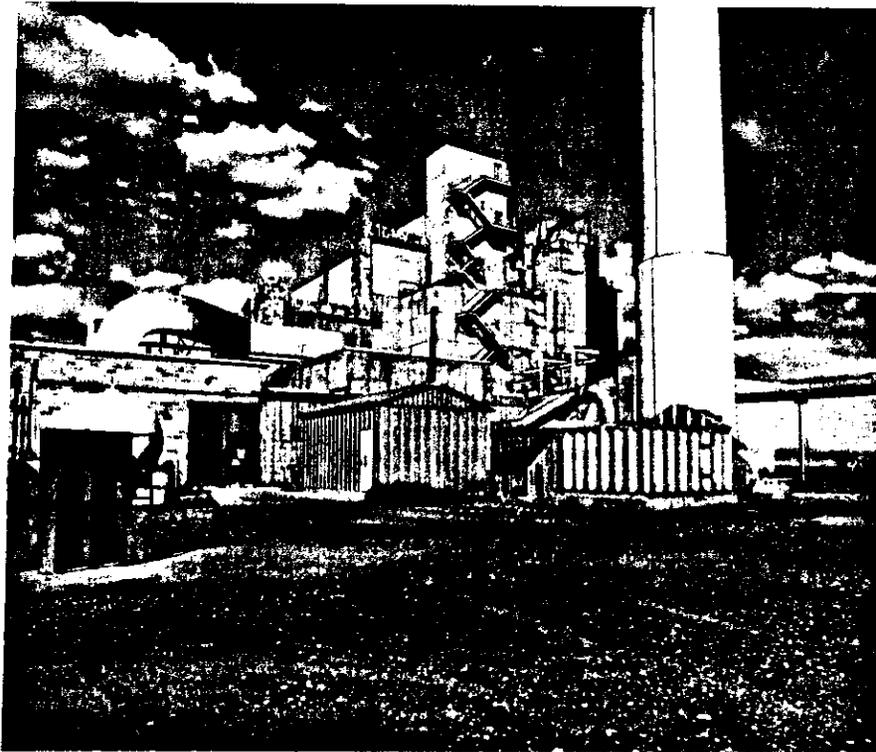


90030939-21CN  
(Photo taken 1990)

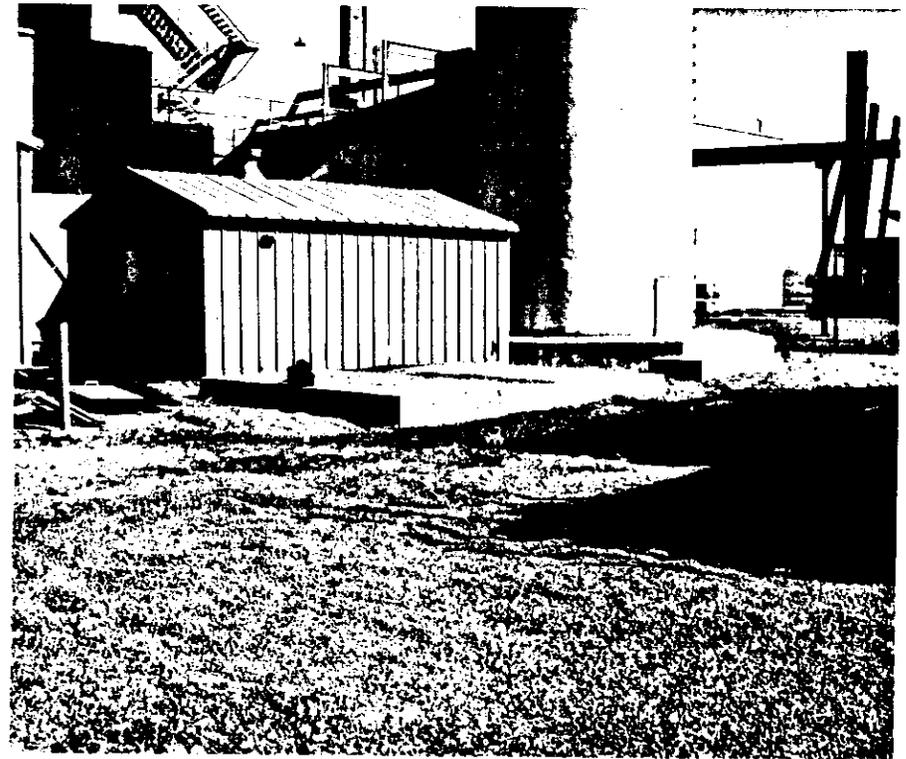


96030030-27CN  
(Photo taken 1996)

Figure D-4. 105-DR Large Sodium Fire Facility: Sodium Handling Room During 1990 and After Completion of Closure Activities in March 1996.



90030939-31CN  
(Photo taken 1990)



(Photo taken 1996)

Figure D-5. 105-DR Large Sodium Fire Facility: Looking North-East Toward the Submerged New Gravel Scrubber (at the base of the 110-DR Stack) During 1990 and Looking North-East at the Empty Pad in March 1996.

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APPENDIX E  
FIELD CHARACTERIZATION REPORT

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From: Special Analytical Studies  
Phone: 373-4771 S3-90  
Date: April 1, 1996  
Subject: FT6039 - 105DR Facility

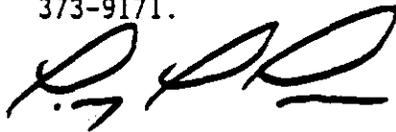
75745-FAST-96-028

To: J. G. Adler H6-23

cc: D. J. Smith S3-90 *gl*  
FAST File

Attached is the analytical report in support of this project.

If you have any questions regarding analysis, please contact either Mr. Don Smith at 373-2482 or Ms. Joy Smith at 373-9171.



L. L. Lockrem  
Manager

sir

Attachment

WHC-SD-EN-EV-034, Rev. 1

FAST PROJECT FT6039  
105DR Facility

Project Sampling and Analytical Screening  
Case Narrative

On March 29, 1996, Field Analytical Services Team (FAST) personnel collected a sample from the 105DR facility walls. A stainless steel scoopula was used to scrape a white carbonate material from the facility wall. The sample was placed into a certified clean borosilicate glass vial for testing at the facility. Sampling and testing information is contained in WHC-N-1025-2.

The sample was tested for the presence of calcium and or sodium. The Hazardous Chemical Testing Kit was used for analytical screening of the sample. Initially, a calcium test was performed by adding ammonium oxalate to a solution of the sample mixed with water. The addition of ammonium oxalate resulted in a white precipitate which indicates the presence of calcium. To confirm this a metals analysis test was performed. The flame test consists of heating a flame wire loop and then coating it in the sample solution and placing it in a torch flame. The flame colors give indication of metals which may be present. The flame color was observed through a green glass, displaying an orange color which indicates calcium and through a cobalt blue glass, displaying a yellow color which also indicated the presence of calcium. If sodium was present in this sample, the sodium salts would have re-solidified as crystals on the flame wire. This did not occur.

Based on the testing performed, the material on the 105DR facility wall is a calcium carbonate.

DISTRIBUTION

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