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Meeting Minutes Transmittal - Comment Draft

**Simulated High Level Waste Slurry Closure Plan
Unit Managers Meeting
337 Building, Mt. Shuksan Room
Richland, Washington**

**October 19, 1994
2:00 p.m. to 4:00 p.m.**

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

Ellen M. Mattlin

Ellen M. Mattlin, Unit Manager, RL

Date: 11/21/94

Not Present

Daniel L. Duncan, RCRA Program Manager, EPA Region 10

Date: _____

Greta P. Davis

Greta P. Davis, Unit Manager, Washington State Department of Ecology

Date: 11/21/94

Simulated High-Level Waste Slurry, PNL Concurrence

H. Wayne Slater

H. Wayne Slater, Contractor Representative

Date: 11/21/94

Purpose: Discuss Revision of Closure Plan

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

- Attachment #1 - Agenda
- Attachment #2 - Summary of Discussion
- Attachment #3 - Attendance List
- Attachment #4 - Action Items
- Attachment #5 - SHLWS Closure Plan Rev. 6 Notice of Deficiency
September 29, 1994
- Attachment #6 - Draft Response to Ecology SHLWS T/S Unit NOD



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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

1315 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

September 29, 1994

Mr. James E. Rasmussen, Acting Program Manager
U.S. Department of Energy
P.O. Box 550
Richland, WA 99352

Mr. Billy D. Shipp, Manager
Engineering Technology Center
Pacific Northwest Laboratories
P.O. Box 999
Richland, WA 99352

Dear Messrs. Rasmussen and Shipp:

Re: Simulated High Level Waste Slurry Treatment and Storage T/S Unit Closure Plan
Revision 6

This letter formally transmits to the U.S. Department of Energy and Pacific Northwest Laboratories the Notice of Deficiency (NOD) generated by the Washington State Department of Ecology. The Simulated High Level Waste Slurry Closure Plan (SHLWS), Revision 6, was evaluated for compliance with the Dangerous Waste Regulations (WAC 173-303), applicable closure requirements and guidance.

This NOD is to clarify and formally transmit comments generated from review of the Revision 6, SHLWS Closure Plan.

If you have any questions, please call me at (509) 736-3025.

Sincerely,

Greta P. Davis, SHLWS Unit Manager
Nuclear Waste Program

GD:sr
Enclosure

cc: Cliff Clark, USDOE
Ellen Mattlin, USDOE
Roger Bowman, WHC
Fred Ruck III, WHC

Wayne Slater, PNL
Harold Tildon, PNL
Dan Duncan, EPA
Administrative Records

Attachment 5

**Simulated High Level Waste Slurry Closure Plan
Unit Managers Meeting
337 Building, Mt. Shuksan Room
Richland, Washington**

**October 19, 1994
2:00 p.m. to 4:00 p.m.**

**SHLWS Closure Plan, Rev. 6
Notice of Deficiency
September 29, 1994**

Attachment 1

**Simulated High Level Waste Slurry Closure Plan
Unit Managers Meeting
337 Building, Mt. Shuksan Room
Richland, Washington**

**October 19, 1994
2:00 p.m. to 4:00 p.m.**

Agenda

1. Approval of Past Unit Managers Meeting Minutes (Ecology/RL/PNL)
2. Closure Plan Notice of Deficiency (Ecology/RL/PNL)
3. Separate EPA/State Identification Number Update (Ecology/RL/PNL)
4. SHLWS Legacy Equipment Removal Status (RL/PNL)
5. Soil Sampling Schedule (Ecology/RL/PNL)
6. Planning Schedule for Taking Closure Plan to Public (RL/PNL)
7. General Discussion (Ecology/RL/PNL)
8. Status Action Items (Ecology/RL/PNL)
 - New Action Items
9. Next Unit Managers Meeting (Ecology/RL/PNL)
 - Proposed dates during the week of November 7
 - Proposed Topics

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Attachment 2**Simulated High Level Waste Slurry Closure Plan
Unit Managers Meeting
337 Building, Mt. Shuksan Room
Richland, Washington**

**October 19, 1994
2:00 p.m. to 4:00 p.m.**

Summary of Discussion and Commitments/Agreements**1. Approval of Past Unit Managers Meeting Minutes**

The September 21, 1994 Unit Manager Meeting minutes were approved.

2. Closure Plan Notice of Deficiency

Mr. W. Slater (PNL) distributed copies of SHLWS Closure Plan Rev. 6 Notice of Deficiency September 29, 1994 (Attachment 5), and PNL's draft response to Ecology SHLWS T/S Unit NOD (Attachment 6). Referring to the proposed foreword to the closure plan, Ms. G. Davis (Ecology) requested that a reference to Ecology's letters approving treatment of the slurry and authorizing release of the treated material for disposal be included in the foreword.

3. Separate EPA/State Identification Number Update

Ms. Davis reported that following a discussion with EPA Headquarters, it was concluded that the SHLWS should be closed under the existing ID number.

4. SHLWS Legacy Equipment Removal Status

Mr. R. Fichter (PNL) stated that approximately 80 percent of the legacy equipment has been prepared for removal. Three barrels of wood scrap are ready to move to the 305-B Facility for disposal. The drip pans will be deconned and rinsed before sampling is initiated, and the rinse water will be incorporated into the equipment decon and sampled at one time. Mr. Fichter added that as a contingency, two or three of the pans will be maintained for potential remediation. If any pans remain on site during sampling, they can be moved within the yard.

Mr. Fichter noted that there is a leak in the southwest corner of the yard, approximately 30 to 40 yards from the closest unit. Mr. Fichter stated that the leak appears to be a fire hydrant main, and it is leaking about two gallons a minute. Mr. Fichter stated that PNL has been aware of the leak for at least six weeks, and should be repairing the leak in the near future.

5. Soil Sampling Schedule

Ms. J. Julya (PNL) stated that sampling is scheduled for November 8, 1994, pending the weather. A tent can be used for protection in the event of wind or rain during sampling.

~~6. Planning Schedule for Taking Closure Plan to Public~~

Mr. Day noted that this topic was discussed at the previous Unit Managers Meeting (9-21-94).

7. General Discussion

During the last Unit Managers Meeting (9-21-94), Ms. Davis provided a draft closure plan time schedule statusing her portion of the schedule. Mr. Slater stated that he would provide a revised schedule at the next Unit Managers Meeting. Ms. J. Bartz (GSSC) noted that a schedule should be included in the closure plan; otherwise the unit must be closed within six months after modification of the permit is effective, which Ms. Bartz estimated would be the end of December 1995.

An issue resolution meeting was scheduled for October 24, 1994, to discuss NOD comment No. 8, which states that a disclaimer needs to be added to Table A.2, Page A-7.

8. Status Action Items

- **New Action Items**

There were no new action items generated during the meeting.

9. Next Unit Managers Meeting

- **Proposed Dates During the Week of November 7**

The next meeting was scheduled for November 21, 1994, at 2 p.m.

- **Proposed Topics**

There were no new proposed topics for the next meeting.

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Attachment 4

**Simulated High Level Waste Slurry Closure Plan
Unit Managers Meeting
337 Building, Mt. Shuksan Room
Richland, Washington**

**October 19, 1994
2:00 p.m. to 4:00 p.m.**

Action Items

Action Item

Description

None

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Attachment 5

**Simulated High Level Waste Slurry Closure Plan
Unit Managers Meeting
337 Building, Mt. Shuksan Room
Richland, Washington**

**October 19, 1994
2:00 p.m. to 4:00 p.m.**

**SHLWS Closure Plan, Rev. 6
Notice of Deficiency
September 29, 1994**



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

1315 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

September 29, 1994

Mr. James E. Rasmussen, Acting Program Manager
U.S. Department of Energy
P.O. Box 550
Richland, WA 99352

Mr. Billy D. Shipp, Manager
Engineering Technology Center
Pacific Northwest Laboratories
P.O. Box 999
Richland, WA 99352

Dear Messrs. Rasmussen and Shipp:

Re: Simulated High Level Waste Slurry Treatment and Storage T/S Unit Closure Plan
Revision 6

This letter formally transmits to the U.S. Department of Energy and Pacific Northwest Laboratories the Notice of Deficiency (NOD) generated by the Washington State Department of Ecology. The Simulated High Level Waste Slurry Closure Plan (SHLWS), Revision 6, was evaluated for compliance with the Dangerous Waste Regulations (WAC 173-303), applicable closure requirements and guidance.

This NOD is to clarify and formally transmit comments generated from review of the Revision 6, SHLWS Closure Plan.

If you have any questions, please call me at (509) 736-3025.

Sincerely,

A handwritten signature in cursive script that reads "Greta P. Davis".

Greta P. Davis, SHLWS Unit Manager
Nuclear Waste Program

GD:sr
Enclosure

cc: Cliff Clark, USDOE
Ellen Mattlin, USDOE
Roger Bowman, WHC
Fred Ruck III, WHC

Wayne Slater, PNL
Harold Tildon, PNL
Dan Duncan, EPA
Administrative Records



**SIMULATED HIGH LEVEL WASTE SLURRY CLOSURE PLAN, REV. 6
NOTICE OF DEFICIENCY
SEPTEMBER 29, 1994**

No. Concurrence	Comment/Response
1. <u>CHAPTER 1.0, SECTION 1.3, Page 1-5, Line 12:</u>	Correct location of closure area from 1100 Area to 3000 Area.
2. <u>CHAPTER 3.0, SECTION 3.1, Page 3-4, Line 13:</u>	Modify text by adding the Dangerous Waste (DW) Code Numbers next to each constituent listed, i.e., Silver (D011). Link each waste code to the appropriate DW designation characteristic. This section should include all applicable Dangerous Waste Codes listed in the Form 3 Application.
3. <u>CHAPTER 4.0, SECTION 4.0, Page 4-1, Line 29:</u> <i>"No decontamination was necessary . . ."</i>	Include how this conclusion was reached. As the statement stands, there is nothing to substantiate this statement.
4. <u>CHAPTER 4.0, SECTION 4.0, Page 4-6, Line 1:</u> <i>"These remain at the site."</i>	The final version of this closure plan should state the quantity of pallets, what happened to the pallets (portions cut out), where they were sent, i.e., recycled/drummed for DW storage. Clearly identify the methods on which the pallets were dispositioned. (Example: 40 pallets were recycled and 60 had portions with potential contamination spots, the spots were cut out and drummed as DW waste and sent to storage. The remainder of the pallet, after dissection, was recycled.)
5. <u>CHAPTER 4.0, SECTION 4.0, Page 4-7, Line 1, Lines 12 & 13, Lines 19 thru 27, and Line 29:</u> <i>"These samples were tested . . ."</i>	The results of the tests performed need to be incorporated into this section.

94133021010

"There was no known spillage . . ."

There were two spills addressed in the Data Quality Objective (DQO) process meetings that were made during transfer of materials from one point to another. Indicate whether the fork-lift truck and other associated equipment surveyed after the spill? If so, state why the equipment required no decontamination.

This paragraph needs to include information on how the area of the spill was affected. It is also inconsistent with the preceding and following paragraphs. Modify text for consistency.

" . . . the storage area when a drum was being moved . . ."

How was the drum being moved? If by fork-lift, was there possible contamination on the fork-lift resulting from the spill?

6. CHAPTER 6.0, SECTION 6.3.2.2, Page 6-23, Lines 16 & 17: ". . . and pallets (if not previously removed)."

The pallets referenced in this section are not applicable, as they are not generated waste due to the cleanup activities. Strike the above referenced portion from this section.

7. CHAPTER 6.0, SECTION 6.3.2.3, Page 6-25, Line 1:

Place a table or list of the PNL release limits in this section so that they can be compared to the actual limits in the closure certification results.

8. APPENDIX A SAMPLING AND ANALYSIS PLAN, TABLE A.2, Page A-7:

A disclaimer needs to be added to this table stating, "The MTCA Level B values listed above (or in Table A.2) are unique to the conditions at the SHLWS Facility and are not indicative of MTCA Level B values to be used at other Hanford Sites."

9. APPENDIX B - QUALITY ASSURANCE, SECTION B.6, Page B-9:

Mention in this section that Ecology will be taking two split samples.

10. APPENDIX B - QUALITY ASSURANCE, SECTION B.6.3, Page B-11:

Address holding time in this section.

9 4 1 3 3 0 2 1 0 1 1

Attachment 6

**Simulated High Level Waste Slurry Closure Plan
Unit Managers Meeting
337 Building, Mt. Shuksan Room
Richland, Washington**

**October 19, 1994
2:00 p.m. to 4:00 p.m.**

Draft Response to Ecology SHLWS T/S Unit NOD

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RESPONSE TO ECOLOGY SHLWS T/S UNIT NOD

Items 1) through 10) include responses to Ecology NOD comments. Items A) through M) consist of recommended changes to the document, many of which are a result of our proposed responses to the NOD comments. The balance of the recommended changes (N thru Z) are the result of a decision to identify the WHC subcontractors as the primary source for analytical services rather than the resources of PNL. Additions have been recommended for Section B.6.3 Sample Preservation and Holding Time for completeness.

- 1) Chapter 1.0, Section 1.3, Page 1-5, Line 12 - **Accepted**
Change "1100" to "3000" Area.
- 2) Chapter 3.0, Section 3.1, Page 3-4, Line 13 - **Accepted**
Add dangerous waste codes after "...ignitable (D001),...corrosive (D002),...silver (D011), barium (D005), cadmium (D006), lead (D008), mercury (D009), and chromium (D007)."
- 3) Chapter 4.0, Section 4.0, Page 4-1, Line 29 - **Accepted**
Replace the existed text following "...truck." with the following: "All containers were sealed during movement between the treatment and storage areas; therefore, no Decontamination was necessary, and the truck was removed from the site."
- 4) Chapter 4.0, Section 4.0, Page 4-6, Line 1 - **Accepted**
Delete "These remain at the site." and replace with.."Fifty-two (52) pallets were recycled intact. Potential contamination spots on the remaining fifty (50) pallets were cut out, drummed as dangerous waste, and sent to a permitted storage unit. The remainder of the pallets, after dissection, were recycled."
- 5) Chapter 4.0, Section 4.0, Page 4-7,

Lines 1, - Accepted

Line 1-4, Add after ...concern. (See Section 3.2 for the results of the tests.)

Lines 12-13, - No change is required in light of the changes to lines 19-27 and 29.

Lines 19-27, - Modified for clarification

The paragraph beginning with line 19 is rewritten as follows: Delete the first sentence. Add the following phrase to the beginning of the next sentence "Well before actual treatment of the waste was undertaken, a"...leak of approximately 10 gal...single bermed storage area.

Line 29, - Modified for clarification

Modify the paragraph beginning with line 28 as follows: A spill, not associated with the treatment activity, and involving about 20

October 17, 1994

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gal.....and later grouted. Since it was noted during cleanup of the spill that there was no visible contamination of the fork-lift that had been used to move the drum, the fork-lift was release from the site.

- 6) Chapter 6.0, Section 6.3.2.2, Page 6-23, Lines 16-17 - **Accepted**
Lines 16-17 will read "...waste constituents, disposable equipment, and liquid decontamination wastes. A satellite accumulation..."
- 7) Chapter 6.0, Section 6.3.2.4, Page 6-25, Line 1 - **Accepted with exception.**
Release limits for hand held survey instruments are not appropriate. This Line will be modified to read: "...that all radioactivity is within contamination control levels using hand held instruments as given in DOE's Radiological Control Manual ."
- 8) Appendix A, Table A.2, Page A-7 - **Hold No change required.**
- 9) Appendix B, Section B.6, Page B-9 - **Accepted**
Line 14 will read: "...are met. Additionally, the Washington State Department of Ecology will also be taking two split samples during sample collection activities."
- 10) Appendix B, Section B.6.3, Page B-11 - **Hold**
This section clearly states holding times for each type of sample. No modification is necessary.

Other proposed changes and changes necessitated by the above:

- A) As per phone conversation between Clark Lindenmeier and Alex Stone:
On page 3-8 line 25, change the word "is" to "was" within the sentence to read "....that the treated SHLWS was not hazardous...."
- B) Add following to Reference list on page 6-26:
USDOE. "Radiological Control Manual." April 1994.
- C) Add attached Tables 3.6, 7, & 8 that include acute rat and fish toxicity data.
- D) Delete on page 3-9, line 23. "(Zabel 1989)"
- E) Add a sentence on page 3-9, line 24. "The results of these tests are given in Table 3.6, (Zabel 1989)."
- F) Delete on page 3-10, line 2. "(Majnarich and Ladiges 1989)"
- G) Add a sentence on page 3-10, line 2. "The results of these tests are given in Tables 3.7 and 3.8, (Majnarich and Ladiges 1989)."

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- H) Delete and add on page 6-8, line 25 as follows: Delete "disposed of", and replace with "removed from the Unit". Add after "...solid waste, and the pallet wood will be recycled"
- I) Add to sentence on page 6-8, line 34 as follows: "...regulations, and the pallet wood will be recycled.
- J) Add to sentence on page 6.8, line 17 as follows: "Consistent with regulatory requirements and waste minimization guidelines, the equipment and...."
- K) Add a paragraph on page 3-10, following line 14 as follows: "The area in which the slurry and subsequent treated waste was stored was not a radiation control area. No other radioactive material was brought into the SHLWS T/S Unit. All process equipment used during treatment and the grout containers shipped to disposal were surveyed and no radiation was found above background as determined by hand held survey instruments. The grouted waste was released by Ecology for disposal as non-regulated waste material."
- L) A FOREWORD is proposed that would precede Chapter 1.0. This was in response to internal PNL comments that there was a need to provide a more reader-friendly summary of the historical essentials related to the SHLWS, its disposition, and potential legacy risk to the public associated with storage and treatment of the slurry. These paragraphs follow:

 FOREWORD

In support of ceramic melter experimental work being conducted by the Pacific Northwest Laboratory (PNL) in 1977, process chemical slurries, representing two specific nuclear fuel processing streams were procured. The two primary mixtures were referred to as PW-0 and PW-7a, and consisted of a complex of metal nitrate compounds in a nitric acid slurry mixture. The mixtures contained some naturally occurring radioactive material (NORM), but they were not radioactive and did not pose a threat to human health and the environment. The mixtures were stored in the 1234 Laydown Yard and were periodically used in experiments over the next several years.

In 1988, after determining that there was no further experimental requirement for the slurry material, it was designated as a dangerous waste due to its corrosivity and the present of metals in the mixtures. A RCRA Part A (Form 3) Permit Application was submitted to the Washington State Department of Ecology (Ecology) to allow storage and treatment of the material. Soon thereafter, Ecology approved treatment of the slurry using an 'in-barrel' process involving neutralization and blending with Portland cement, blast furnace slag, and fly ash. The result were 55 gallon (208 liter) monolithic masses of dry concrete. This treatment process was determined to be the best available

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technology for treatment of this material. Testing of the treated material revealed that it was no longer corrosive, ignitable, or toxic and therefore was no longer a dangerous waste material. In addition, the naturally occurring radioactivity of the grouted material was less than the original slurry. As a result of the treatment and tests described above, Ecology authorized release of this material for disposal at an appropriate land-fill.

During treatment operations, there was no spillage of the slurry. However, during storage at the 1234 Yard/SHLWS T/S Unit before treatment, some leakage and one spill occurred from the storage containers. The amount of material that leaked to the ground was determined to be below reportable levels. In all cases, soil showing evidence of leaked/spilled material was removed (confirmed by sampling in most cases) and subsequently grouted during treatment of the slurries. Although there is no known legacy environmental, safety, or health condition at the Unit resulting from the storage and treatment of the slurry, this Closure Plan has been prepared in accordance with WAC-173-303. Through field sampling it will be demonstrated that any contamination of the Unit resulting from the storage and treatment of the slurry has been removed to acceptable levels so that the site may be released for future beneficial use.

-
- M) On page 6-21, line 14 and 15. Replace: "..been initiated,..data review with "..been initiated, PNL anticipates two weeks for sampling, 45 days for analysis, 10 days for internal review of data and 21 days for data validation."
- N) On page A-7, lines 18, 22, and 25. Replace "6020" with "6010" and delete footnote "g" reference.
- Line 28. Replace "6020" with "200.8" and delete footnote "g" reference.
- Line 32. Replace "Alpha" with "LAL-91-SOP-0060" and add a new footnote "g."
- Line 33. Replace "Beta" with "LAL-91-SOP-0060" and add footnote "g".
- Line 41. Delete present footnote "g' text and change to "Westinghouse Hanford Company (WHC) procedure."
- O) On page A-8, Line 3. Replace: "..be collected.....supporting.." with "..be collected by PNL and analyzed by either PNL, WHC or one of either supporting.."
- P) On Page A-11, Lines 16, 20, and 23. Replace "6020" with "6010" and delete footnote "a" reference.
- Line 26. Replace "6020" with "200.8" and delete footnote "a" reference.

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Line 30. Replace "Alpha" with "LAL-91-SOP-0060."

Line 31. Replace "Beta" with "LAL-91-SOP-0060."

Under "Analytical Method" column, replace "DataChem/PNL/IT" with "Contract Lab."

Line 33. Delete footnote.

Q) Page A-12, Line 9. Replace "6020" with "6010."

Line 14. Replace "6020" with "200.8."

Line 19. Replace "Alpha" with "LAL-91-SOP-0060."

Line 20. Replace "Beta" with "LAL-91-SOP-0060."

R) Page B-5, Line 25. Insert "and WHC" before "include."

Lines 26 and 27. Replace "..DataChem Laboratories...(IT 163635-A-M1)." with "..PNL and WHC analytical laboratories."

S) Page B-7, Line 11. Replace "..DCL-121121-A-M1 and IT-163635-A-M1." with "..with PNL and WHC analytical laboratories."

T) Page B-8, Line 16. Replace "..for Data Chem....(IT 163635-A-M1)." with "..with PNL and WHC analytical laboratories."

For completeness, the following changes are proposed to Section B.6.3, Pages B-10 and 11.

U) Page B-10, Line 25. Insert "Lead, Cerium" before "... Preserve.."

Line 26. Insert new line as follows: "Mercury - Preserve by cooling to 4° C: Holding time 28 days"

Line 29. Replace "7" by "14"

Line 31. Insert a new line as follows: "Total Alpha/Beta - No Preservation; holding time 6 months"

Line 34. Insert "Metals, Lead, Cerium" before "... Preserve.."

Line 36. Under "Liquid Wastes", Insert new lines as follows:
"Volatile Organics - Preserve by acidifying with Hydrochloric Acid to a pH<2 and cooling to 4° C; holding time 14 days"

"Semivolatile Organics - Preserve by cooling to 4° C; holding time 14 days"

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"Total Alpha/Beta - Preserve by acidifying with Nitric Acid to pH<2;
holding time 6 months"

- V) Page B-11, Line 8. Insert ", after Total Activity results are reviewed" before."..daily to.."
- W) Page B-17, Lines 18 and 19. Delete text and replace with "A certificate of analysis will be required for each lot of sample containers used."
- X) Page B-18, Lines 30 and 31. Replace "..DCL...-A-M1." with "..with PNL and WHC analytical laboratories."
- Y) Page B-20, Line 4. Replace "..DCL..-M1." with "..with PNL and WHC analytical laboratories."

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Table 3.6. Comparison of the Average Body Weights and Mortality of Rats Receiving PWO by Gavage

<u>Test Compound</u>	<u>Dose mg/kg**</u>	<u>No. Rats</u>	<u>Mortality</u>	<u>Initial wt. g.</u>	<u>14 Day wt. g.</u>
PWO-Composite 2	5000	10	1*	212.3	306.3
PWO-Composite 2	500	10	0	209.5	302.4
Distilled Water	2***	10	0	210.0	301.4
PWO-Composite 1	5000	10	0	220.4	307.7
PWO-Composite 1	500	10	0	210.8	302.2
Distilled Water	2***	10	0	210.0	301.4

*Died as a result of test material in lung cavity (perforated esophagus)

**Per kilogram of body weight

***Distilled water (ml)

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Table 3.7 Summary of Fathead Minnow Mortality
96-Hour Acute Bioassay - Unbuffered

PWO Grout (Sample EBL #89007)

<u>Treatment/Replicate</u>		<u>Count</u>	<u>Count</u>	<u>Mortality</u>	<u>Mortality</u>
Control	A	10	10	0	
	B	10	10	0	
	C	10	10	0	0
100 ppm	A	10	10	0	
	B	10	10	0	
	C	10	10	0	0
1000 ppm	A	10	10	0	
	B	10	10	0	
	C	10	10	0	0

Water Grout (Sample EBL #89008)

<u>Treatment/Replicate</u>		<u>Count</u>	<u>Count</u>	<u>Mortality</u>	<u>Mortality</u>
Control	A	10	10	0	
	B	10	10	0	
	C	10	10	0	0
100 ppm	A	10	10	0	
	B	10	10	0	
	C	10	10	0	0
1000 ppm	A	10	10	0	
	B	10	10	0	
	C	10	10	0	0

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Table 3.8 Summary of Fathead Minnow Mortality
96-Hour Acute Bioassay - Buffered

<u>Treatment/Replicate</u>		PWO Grout (Sample EBL #89011)			<u>Average Mortality</u>
		<u>Count</u>	<u>Count</u>	<u>Percent Mortality</u>	
Control	A	10	10	0	3.3
	B	10	9	10	
	C	10	10	0	
100 ppm	A	10	10	0	0
	B	10	10	0	
	C	10	10	0	
1000 ppm	A	10	10	0	0
	B	10	10	0	
	C	10	10	0	

<u>Treatment/Replicate</u>		Water Grout (Sample EBL #89012)			<u>Average Mortality</u>
		<u>Count</u>	<u>Count</u>	<u>Percent Mortality</u>	
Control	A	10	10	0	3.3
	B	10	9	10	
	C	10	10	0	
100 ppm	A	10	10	0	0
	B	10	10	0	
	C	10	10	0	
1000 ppm	A	10	10	0	0
	B	10	10	0	
	C	10	10	0	

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Distribution:

C.M. Andersen	PNL	(P7-40)
J.K. Bartz	GSSC	(R3-82)
E.M. Bowers	RL	(K8-50)
R.C. Bowman	WHC	(H6-24)
D.S. Broussard	PNL	(K1-67)
R.M. Carosino	RL	(A4-52)
G.P. Davis	Ecology	(B5-18)
B.J. Day	PNL	(P7-68)
D.L. Duncan	EPA	(HW-106)
S.L. Jones	GSSC	(K8-50)
E.M. Mattlin	RL	(A5-15)
F.A. Ruck	WHC	(H6-23)
M.A. Selby	Ecology	(B5-18)
H.W. Slater	PNL	(P7-35)
H.T. Tilden	PNL	(P7-79)
J.L. Waite	WHC	(B2-35)
RCRA Files/GHL	WHC	(H6-23)

ADMINISTRATIVE RECORD (Simulated High Level Waste Slurry
Treatment/Storage, TS-3-4) [Care of EDMC, WHC (H6-08)]

Washington State Department of Ecology Nuclear and Mixed Waste
Hanford Files, P.O. Box 47600, Olympia, Washington 98504-7600

Environmental Protection Agency Region 10, Seattle, Washington 98101,
Mail Stop HW-074 (Records Center) Distribution: Distribution:

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