~~XXXX~~ RMIS View/Print Document Cover Sheet ~~XXXX~~

This document was retrieved from the Documentation and Records Management (DRM) ISEARCH System. It is intended for Information only and may not be the most recent or updated version. Contact a Document Service Center (see Hanford Info for locations) if you need additional retrieval information.

Accession #: D196012497

Document #: SD-WM-DP-167

Title/Desc:

45 DAY SAFETY SCREENING RESULTS & FINAL REPORT FOR
TANK 241BX106 & AUGER SAMPLES 95-AUG-049 &
95-AUG-050

Pages: 55

Sta. 4
JAN 24 1996

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT
No 614774

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Characterization Plans, Coordination and Reports	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Tank 241-BX-106/Waste Management/CPCR/Techical Basis Characterization	6. Cog. Engr.: Leela M. Sasaki	7. Purchase Order No.: N/A
8. Originator Remarks: This document is being released into the supporting document system for retrievability purposes.		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: N/A
11. Receiver Remarks: For release.		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 01/22/96

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)			
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Trans- mittal	Orig- inator Dispo- sition	Receiv- er Dispo- sition			
1	WHC-SD-WM-DP-167	N/A	0	45-Day Safety Screening Results and Final Report for Tank 241-BX-106, Auger Samples 95-AUG-049 and 95-AUG-050	Q	2	1	1			
16. KEY											
Approval Designator (F)		Reason for Transmittal (G)			Disposition (H) & (I)						
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)			1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged						
17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G)	(H)	(J) Name (K) Signature (L) Date (M) MSIN				(J) Name (K) Signature (L) Date (M) MSIN				(G)	(H)
Reason	Disp.									Reason	Disp.
2	1	Cog. Eng. L. M. Sasaki 1/23/96									
2	1	Cog. Mgr. J.G. Kristofzski 1/23/96									
2	1	QA Tzu L. Tung 1/24/96									
		Safety									
		Env.									
2	1	Program Support A.D. Rice 1-24-96									
4	4	Ruth D. Webb 1/23/96									
18. L. B. Webb Signature of EDT Originator		19. N/A Authorized Representative Date for Receiving Organization			20. J.G. Kristofzski Cognizant Manager Date		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments				

45-DAY SAFETY SCREENING RESULTS AND FINAL REPORT FOR TANK 241-BX-106, AUGER SAMPLES 95-AUG-049 AND 95-AUG-050.

Leela M. Sasaki

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

EDT/ECN: EDT-614774 UC: 2070
Org Code: 75725 Charge Code: MD378
B&R Code: EW 3120074 Total Pages: 52

Key Words: 45-Day Safety Screening and Final Results, Auger Samples 95-
AUG-049 and 95-AUG-050, Tank 241-BX-106 Final Results

Abstract: N/A

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: WHC/BCS Document Control Services, P.O. Box 1970, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

Release Approval

Date

Approved for Public Release

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

WHC-SD-WM-DP-167, REV. 0

ANALYTICAL SERVICES

**45-DAY SAFETY SCREENING RESULTS AND FINAL REPORT FOR
TANK 241-BX-106, AUGER SAMPLES
95-AUG-049 AND 95-AUG-050**

Project Coordinator: Leela M. Sasaki

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

by

Westinghouse Hanford Company
Box 1970
Richland, Washington

WHC-SD-WM-DP-167, REV. 0

TABLE OF CONTENTS

Narrative	1
Sample Data Summary	7
Chain of Custody Forms	10
Photographs	13
Sample Handling	16
Bulk Density Worksheet	17
Extrusion Worklist # 4731 (Riser 6)	19
Extrusion Worklist # 4732 (Riser 2)	20
Sample Preparations	21
Fusion Digestion Worklist # 4777	22
Inorganic Analyses	23
Differential Scanning Calorimetry (DSC)	
DSC Worklist # 4849	24
DSC Worklist # 5090	32
Thermogravimetric Analysis (TGA)	
TGA Worklist # 4847	33
Radiochemical Analyses	39
Total Alpha Analysis (AT)	
AT Worklist # 4862	40
This Document consists of pages 1 through 49 .	

WHC-SD-WM-DP-167, REV. 0

NARRATIVE

SUMMARY

Two auger samples from tank 241-BX-106 (BX-106) were received at the 222-S Laboratory and underwent safety screening analyses - differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), total alpha analysis, and bulk density measurements - in accordance with the sampling and analysis plan (SAP) (Sasaki 1995).

No safety screening notification limits were exceeded on any of the BX-106 samples. No exotherms were observed and the upper limits of the one-sided 95-percent confidence intervals for total alpha activity results were well below the notification limit. Tank headspace flammability was measured at 0 percent of the lower flammability limit (LFL).

SCOPE

This document serves as the 45-day and final report deliverable for the tank BX-106 auger samples (95-AUG-49 and 95-AUG-50) collected between December 15 and December 18, 1995. The samples were received, extruded, and analyzed by the 222-S Laboratory in accordance with the referenced SAP (Sasaki 1995). Any exceptions to the plan are discussed in the following sections.

This report includes the safety screening results (tank headspace flammability, DSC, TGA, total alpha activity, and bulk density) and copies of all DSC and TGA raw data scans as requested per the SAP. As the final report, the following are also included: chains of custody; bulk density worksheets; sample preparation data; and total alpha analysis raw data.

SAMPLE RECEIPT AND EXTRUSION

Auger Sample 95-AUG-49, Riser 6

Auger sample 95-AUG-49 was collected from riser 6 of tank BX-106 on December 15, 1995 using a 20-inch auger bit with flutes 1 inch apart. The auger sample was received at the 222-S Laboratory on December 22, 1995 and extruded on January 5, 1996. The sample was contained on the bottom 8 flutes of the auger sampler. The solids were black in color and the texture was that of a soft, wet sludge. The sample also contained about three small pieces of white material. A total of 63.1 grams of solids were recovered from the sampler. No drainable liquids were present in the sample. Sample numbers associated with this auger sample are: S96T000110, S96T000112, and S96T000113. Details of the extrusion and subsampling are provided in the hot cell logbook for tank BX-106 (Fuller 1995).

Auger Sample 95-AUG-50, Riser 2

Auger sample 95-AUG-50 was collected from riser 6 of tank BX-106 on December 18, 1995 using a 20-inch auger bit with flutes 1/2 inch apart. The auger

sample was received at the 222-S Laboratory on December 22, 1995 and extruded on January 5, 1996. The sample was contained on the bottom 15 flutes of the auger sampler. The solids were black in color and the texture was that of a soft, wet sludge. A total of 40.9 grams of solids were recovered from the sampler. No drainable liquids were present in the sample. The sample also contained an electrical cord which was wrapped around the auger and across several flutes; the cord was removed and set aside. Sample numbers associated with this auger sample are: S96T000114, S96T000116, and S96T000117. Details of the extrusion and subsampling are provided in the hot cell logbook for tank BX-106 (Fuller 1995).

TANK HEADSPACE FLAMMABILITY

Prior to core sampling, the flammability of the tank headspace was measured to address the vapor flammability issue of the safety screening data quality objective (Dukelow, et al. 1995). The tank vapor space was sampled on December 20, 1995 in accordance with work package ES-95-00586 to determine flammability of the vapor space gasses. Sampling of the tank dome space was done through riser 2. The combustible gas meter reading was 0 percent of the LFL, indicating no flammability concerns with this tank. Other measurements made were oxygen (20.9 percent), total organic vapors (1.5 parts per million), and ammonia (2 parts per million).

ANALYTICAL RESULTS

Analytical results appear in the Sample Data Summary and a discussion of the results is presented below. Any deviations from the requirements of the SAP are noted in the following sections.

TGA (Moisture)

The weight percent water by TGA was performed under a nitrogen purge using procedure LA-560-112, Rev. B-1 on a Mettler TG 50 instrument.

The average result for auger sample 95-AUG-49 (sample S96T000112) was 36.20 percent with a relative percent difference (RPD) of 19.0 percent. The average result for auger sample 95-AUG-50 (sample S96T000116) was 41.18 percent with a RPD of 11.1 percent. Relative percent differences for the two samples were outside the ± 10 percent required by the SAP; reruns were not requested because the TGA results are only needed to calculate the exotherms on a dry weight basis and no exotherms were exhibited by the samples. The standard recovery was 102.9 percent, within the required 90 to 110 percent range.

DSC

Differential scanning calorimetry analyses were performed under a nitrogen purge using procedure LA-514-114, Rev. C-1 on a Perkin Elmer DSC 7 instrument. The DSC scans from the Perkin Elmer instrument show exotherms as valleys and endotherms as peaks. Using the average percent water by TGA for each sample, exotherms in J/g on a dry weight basis are calculated from the exotherms in J/g on a wet weight basis.

No exotherms were observed in either of the waste samples. Standards recoveries were 100.4 percent and 96.34 percent, within the required range of 90 to 100 percent.

Total Alpha Activity

The total alpha analyses were performed using procedure LA-508-101, Rev. D-2. The solid samples were prepared by fusion prior to the total alpha analysis; the fusion was performed using procedure LA-549-141, Rev. D-0.

The SAP specifies a total alpha notification limit of 41 $\mu\text{Ci/g}$. This number is derived from the safety screening data quality objective's notification limit of 1 g/L of plutonium using the conservative assumptions that all the plutonium is plutonium-239 and the density is 1.5 g/mL. If the actual density of a sample is above 1.5 g/mL, the notification limit of 41 $\mu\text{Ci/g}$ was to be recalculated using the higher density number (Sasaki 1995). The highest measured density for the BX-106 auger samples was 1.68 g/mL; using this result, the notification limit would be 36.6 $\mu\text{Ci/g}$.

The average results for the samples were 0.619 $\mu\text{Ci/g}$ and 0.560 $\mu\text{Ci/g}$ for auger sample 95-AUG-49 (sample S96T000113) and auger sample 95-AUG-50 (sample S96T000117), respectively. The RPDs for 95-AUG-49 and 95-AUG-50 were within the required ± 20 percent at 10.7 percent and 6.07 percent, respectively. The standard recovery for both samples was 90.26 percent, within the 80 to 120 percent range required by the SAP. Spike recoveries were slightly outside the required 80 to 120 percent range at 79.59 and 79.08 percent. No reruns were requested since the total alpha results were well below the notification limit.

The one-sided 95-percent upper confidence interval was calculated for the two auger samples. The upper limit of the one-sided 95-percent confidence interval was 0.827 $\mu\text{Ci/g}$ for 95-AUG-49 (sample S96T000113) and 0.667 $\mu\text{Ci/g}$ for 95-AUG-50 (sample S96T000117), both well below the notification limit of 36.6 $\mu\text{Ci/g}$.

Bulk Density

Bulk density measurements were performed on the samples using procedure LO-160-103, Rev. A-7.

WHC-SD-WM-DP-167, REV. 0

Bulk densities of the solids were 1.68 g/mL for auger sample 95-AUG-49 (sample S96T000113) and 1.60 g/mL for auger sample 95-AUG-50 (sample S96T000117). Due to insufficient amounts of sample, no duplicate bulk density measurements were performed.

Project Coordinator: L. M. Sasaki

REFERENCES

- Dukelow, G. T., J. W. Hunt, H. Babad, and J. E. Meacham, 1995, *Tank Safety Screening Data Quality Objective*, WHC-SD-WM-SP-004, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
- Fuller, R. K., 1995, *Tank BX-106*, WHC-N-1138, Westinghouse Hanford Company, Richland, Washington.
- Sasaki, L. M., 1995, *Tank 241-BX-106 Auger Sampling and Analysis Plan*, WHC-SD-WM-TSAP-068, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

WHC-SD-WM-DP-167, REV. 0

SAMPLE DATA SUMMARY

45-Day Safety Screening Results for Augers 95-AUG-49 and -50
BX-106 (A)

CORE NUMBER: 95-AUG-49
SEGMENT #: 95-AUG-49

SEGMENT PORTION: W Whole Segment

Sample#	R#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
				Lower	Upper									
S96T000110		Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.680	n/a	n/a	n/a	n/a	5.00e-01	n/a
S96T000112		% Water by TGA using Mettler	%	None	None	102.9	n/a	39.64	32.75	36.20	19.0	n/a	n/a	n/a
S96T000112		DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	100.4	n/a	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a	n/a
S96T000112		DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a	n/a
S96T000113	F	Alpha of Digested Solid	wt/g	-1.0e+00	41.00	90.26	<4.07e-02	6.52e-01	5.86e-01	6.19e-01	10.7	79.59	6.03e-02	1.49E+01

=> Limit violated
=> Selected limit

23-Jan-1996 10:35:30
A-0002-1

45-Day Safety Screening Results for Augers 95-AUG-49 and -50
BX-106 (A)

CORE NUMBER: 95-AUG-50
SEGMENT #: 95-AUG-50

SEGMENT PORTION: W Whole Segment

Sample#	R A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count	Err%
S96T000114		Bulk Density of Sample	g/mL	Lower	Upper	n/a	n/a	1.600	n/a	n/a	n/a	n/a	5.00e-01		n/a
S96T000116		% Water by TGA using Mettler	%	None	None	102.9	n/a	38.90	43.46	41.18	11.1	n/a	n/a		n/a
S96T000116		DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	438.0	96.34	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a		n/a
S96T000116		DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	438.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a		n/a
S96T000117	F	Alpha of Digested Solid	uCi/g	-1.0e+00	438.0	90.26	<4.07e-02	5.43e-01	5.77e-01	5.60e-01	6.07	79.08	6.24e-02		1.74e+01

=> Limit violated
=> Selected Limit

WHC-SD-WM-DP-167, REV. 0

WHC-SD-WM-DP-167, REV. 0

CHAIN OF CUSTODY FORMS

CHAIN-OF-CUSTODY RECORD FOR AUGER SAMPLING

(1) Shipment Number 200W-08-TF

(3) Supervisor

1009C
(6) Cook Social Number

Radiation Survey Data:		(31) LABORATORY		(8) Shipment Description	
Over Top Dose Rate	<u>50.5</u>	<u>7.0</u>		A. Work Package Number	<u>ES-95-00586-0</u>
Side Dose Rate	<u>8.0</u>	<u>2.0</u>		B. Cask Seal Number	<u>4060</u>
Bottom Dose Rate	<u>2.0</u>	<u>UNABLE TO</u> <u>(Alpha) SOLVENT</u> <u>RENTAL LINED</u> <u>(Beta-Gamma)</u>		C. Date and Time Sample	<u>12-15-95 / 1240 hrs</u>
Smearable Contamination	<u><20 dpm/100cm²</u> (Alpha)			D. Expected Liquid Content	<u>10%</u>
	<u><1000 dpm/100cm²</u> (Beta-Gamma)	E. Expected Solid Content	<u>* 90%</u>	F. Dose Rate Through Drill String	<u>150 mR/hr</u>
RCT ⁺	<u>Ten. Gault</u> (Signature)	ECT ⁺	<u>SN Galt</u> (Signature)	G. Expected Sample Length	<u>10 1/2"</u>

129) INFORMATION (includes statement of laboratory tests to be performed.)

11

1109 Field Comments

* SAMPLE MEDIUM, visky solid

[32] Laboratory Comments

WHC-SD-WM-DP-167, REV. 0

171 Point of Origin

EX 106 memo

17) Requested By: Singam P.

James Archibald James Sackels

27) Relinquished By (Signs and Pallet)

Wendell C. Brown

225) Reprinted By (Sign and Print)

AFET Card Available

(15) Deal Direct Upon Release?

(29) Seed Intact Upon Receipt?

100

(30) End Date Consistent with the Record?

□

Shipment No. _____

Cook: Serial No.

Sample No.

~~Scripture No.~~

[illegible]

COPY

CHAIN-OF-CUSTODY RECORD FOR AUGER SAMPLING

(1) Shipment Number 200W-08-TF (2) Sample Number 95-AUG-50 (3) Supervisor R.J. Farnick
 (4) Tank BX-106 (5) Rewer 2 (6) Cask Serial Number C2000

Radiation Survey Data:		(7) FIELD		(31) LABORATORY		(18) Shipment Description	
Over Top Dose Rate		<u><0.5</u>		<u>4.5</u>		A. Work Package Number	<u>ES-95-00586/0</u>
Side Dose Rate		<u>7.0</u>		<u>1.0</u>		B. Cask Seal Number	<u>4061</u>
Bottom Dose Rate		<u>1.0</u>		<u>1.0</u>		C. Date and Time Sample	<u>12-18-95 / 1205 hrs</u>
Smearable Contamination		<u><20 dpm/100 cm²</u>		<u>UNABLE TO</u>		Removed from Tank	<u>10%</u>
		<u><1000 dpm/cm²</u>		<u>PEARL FOR SUBSIDY</u>		D. Expected Liquid Content	<u>* 90%</u>
				<u>(Beta-Gamma)</u>		E. Expected Solid Content	<u>400 mR/hr</u>
ACT: <u>Tow</u>				<u>SAI</u>		F. Dose Rate Through Drill String	<u>9"</u>
				<u>(Signature)</u>		G. Expected Sample Length	

(9) INFORMATION (Include statement of laboratory tests to be performed.)

12

(10) Field Comments		(13) Laboratory Comments		(14) Date/Time		(15) Sender Comments	
<p>① SAMPLE MEDIUM, MUSHY, FREE FLOWING, SOLID. THIS 95-AUG-50 SAMPLE IS THE ONE WITH SHEATH + BIT FUSED AS ONE. USE EXTREME CAUTION WHEN EXTRACTING FROM OTC. INSIDE OF OTC POSSIBILITY OF HIGH LEVELS.</p>		<p>② T-HANDLE NIPPLE ON TOP OF DRILL BIT IS NOT ATTACHED.</p>		<p>12-22-95</p>		<p>12-22-95</p>	
<p>(17) Relinquished By (Sign and PRINT)</p> <p><u>James Sicks</u></p>		<p>(18) Received By (Sign and PRINT)</p> <p><u>James Sicks</u></p>		<p>(19) Date/Time</p> <p><u>12-22-95</u></p>		<p>(20) Receiver Comments</p>	
<p>(21) Relinquished By (Sign and PRINT)</p> <p><u>James Sicks</u></p>		<p>(22) Received By (Sign and PRINT)</p> <p><u>James Sicks</u></p>		<p>(23) Date/Time</p> <p><u>12-22-95</u></p>		<p>(24) Receiver Comments</p>	
<p>(25) Relinquished By (Sign and PRINT)</p> <p><u>James Sicks</u></p>		<p>(26) Received By (Sign and PRINT)</p> <p><u>James Sicks</u></p>		<p>(27) Date/Time</p> <p><u>12-22-95</u></p>		<p>(28) Receiver Comments</p>	
<p>(16) Seal Intact Upon Release?</p> <p>☒ Yes ☐ No</p>		<p>(29) Seal Intact Upon Receipt?</p> <p>☒ Yes ☐ No</p>		<p>(30) Seal Date Consistent with this Record?</p> <p>☒ Yes ☐ No</p>		<p>Cask Seal No. ☒ Yes ☐ No</p>	
<p>Shipment No. ☒ Yes ☐ No</p>		<p>Sample No. ☒ Yes ☐ No</p>					

WHC-SD-WM-DP-167, REV. 0

WHC-SD-WM-DP-167, REV. 0

PHOTOGRAPHS

1-5-96

BX-106 95-AUG-049

BX-106 95-AUG-050

1-5-96

WHC-SD-WM-DP-167, REV. 0

SAMPLE HANDLING

Bulk Density Worksheet

WHC-SD-WM-DP-167, REV. 0

Requestor: L. Sayak

Date: 07-09-96

Tank: BX106
Core: _____
Seg: _____
Auger: 75 AUG-49

Tank: BX106
Core: _____
Seg: _____
Auger: 95 AUG-19

Start Time: _____
End Time: _____

Homogenization
Time (Min.): _____

Jar#: 8595A
Jar/Vial Size: 1 mL
Initial Weight: 9.46 g
Final Weight: 7.60 g
Net Weight: 1.86 g

Conc#: 8595A
Final Vol: 10.0 mL
Initial Weight: 7.60 g
Final Weight: 24.39 g
Net Weight: 16.79 g

Appearance/Narrative:

1.86 / 10.0 = 1.68 g/mL

Start Time: _____
End Time: _____

Homogenization
Time (Min.): _____

Jar#: 8595B
Jar/Vial Size: 1 mL
Initial Weight: 9.26 g
Final Weight: 7.60 g
Net Weight: 1.66 g

Conc#: _____
Final Vol: 9.6 mL
Initial Weight: 7.60 g
Final Weight: 24.39 g
Net Weight: _____ g

Appearance/Narrative:

Insufficient Sample for
Deduction

Bulk Density Worksheet

Req. stor: < .5 sec

Date: 8-19-96

Tank: BX/06
Core: ---
Seg: ---
Auger: 95-2009-50

Tank: ---
Core: ---
Seg: ---
Auger: ---

Start Time: ---
End Time: ---
Homogenization Time (Min): ---
Jar#: 8596 (A)
Jar/Vial Size: --- mL
Initial Weight: --- g
Final Weight: --- g
Net Weight: --- g

Core#: 8596 (A)
Final Vol: 5.8 mL
Initial Weight: 7.68 g
Final Weight: 16.93 g
Net Weight: 9.25 g

Appearance/Narrative: 9.35 / 5.8 = 1.60 g/L

Start Time: ---
End Time: ---
Homogenization Time (Min): ---
Jar#: 8596 (B)
Jar/Vial Size: --- mL
Initial Weight: --- g
Final Weight: --- g
Net Weight: --- g

Core#: ---
Final Vol: --- mL
Initial Weight: --- g
Final Weight: --- g
Net Weight: --- g

Appearance/Narrative: ---

insufficient sample for Density
Bulk Density

LABCORE Data Entry Template for Worklist#

4731

Analyst: EC Instrument: BA000 Book # N/A

Method: LO-160-103 Rev/Mod A-7

Worklist Comment: BX-106 95-AUG-49 RISER 6 EXTRUSION

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 INSTCHK01			EXTRUD01	SOLID	<u>20</u>	<u>19.98</u>	<u>N/A</u>	
		2 INSTCHK02			EXTRUD01	SOLID	<u>500</u>	<u>499.47</u>	<u>N/A</u>	
96000007	BX-106 (A)	3 SAMPLE	S96T000018	0	DLIQVOL1	SOLID	<u>N/A</u>	<u>0</u>		mL
96000007	BX-106 (A)	4 SAMPLE	S96T000018	0	DLIQWT01	SOLID	<u>N/A</u>	<u>0</u>		g
96000007	BX-106 (A)	5 SAMPLE	S96T000018	0	EST.G/ML	SOLID	<u>N/A</u>	<u>0</u>		g/mL
96000007	BX-106 (A)	6 SAMPLE	S96T000018	0	EXTRUD01	SOLID	<u>N/A</u>	<u>complete</u>		
96000007	BX-106 (A)	7 SAMPLE	S96T000018	0	LLIQWT01	SOLID	<u>N/A</u>	<u>0</u>		g
96000007	BX-106 (A)	8 SAMPLE	S96T000018	0	NOTEBOOK	SOLID	<u>N/A</u>	<u>N-1138</u>		
96000007	BX-106 (A)	9 SAMPLE	S96T000018	0	SLDVOL01	SOLID	<u>N/A</u>	<u>N/A</u>		mL
96000007	BX-106 (A)	10 SAMPLE	S96T000018	0	SLDWT-01	SOLID	<u>N/A</u>	<u>63.1</u>		g
96000007	BX-106 (A)	11 SAMPLE	S96T000018	0	APPEAR01	SOLID	<u>N/A</u>	<u>complete</u>		
96000007	BX-106 (A)	12 SAMPLE	S96T000018	0	ORGVOL01	SOLID	<u>N/A</u>	<u>0</u>		mL

Final page for worklist #

4731

EC 1-8-96
Analyst Signature Date

EC 1-8-96
Analyst Signature Date

Reviewed by John B. Bandy 1-8-96

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist#

4732

Analyst: EC Instrument: BA000 Book # N/A

Method: LO-160-103 Rev/Mod A-7

Worklist Comment: BX-106 95-AUG-50 RISER 2 EXTRUSION

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 INSTCHK01			EXTRUD01	SOLID	<u>20</u>	<u>19.98</u>	<u>N/A</u>	
		2 INSTCHK02			EXTRUD01	SOLID	<u>500</u>	<u>499.47</u>	<u>N/A</u>	
96000008	BX-106 (A)	3 SAMPLE	S96T000019	0	DLIQVOL1	SOLID	<u>N/A</u>	<u>0</u>		mL
96000008	BX-106 (A)	4 SAMPLE	S96T000019	0	DLIQWT01	SOLID	<u>N/A</u>	<u>0</u>		g
96000008	BX-106 (A)	5 SAMPLE	S96T000019	0	EST.G/ML	SOLID	<u>N/A</u>	<u>0</u>		g/mL
96000008	BX-106 (A)	6 SAMPLE	S96T000019	0	EXTRUD01	SOLID	<u>N/A</u>	<u>complete</u>		
96000008	BX-106 (A)	7 SAMPLE	S96T000019	0	LLIQWT01	SOLID	<u>N/A</u>	<u>0</u>		g
96000008	BX-106 (A)	8 SAMPLE	S96T000019	0	NOTEBOOK	SOLID	<u>N/A</u>	<u>N-1138</u>		
96000008	BX-106 (A)	9 SAMPLE	S96T000019	0	SLDVOL01	SOLID	<u>N/A</u>	<u>NA</u>		mL
96000008	BX-106 (A)	10 SAMPLE	S96T000019	0	SLDWT-01	SOLID	<u>N/A</u>	<u>40.9</u>		g
96000008	BX-106 (A)	11 SAMPLE	S96T000019	0	APPEAR01	SOLID	<u>N/A</u>	<u>complete</u>		
96000008	BX-106 (A)	12 SAMPLE	S96T000019	0	ORGVOL01	SOLID	<u>N/A</u>	<u>0</u>		mL

Final page for worklist #

4732

EC 1-8-96
Analyst Signature Date

EC 1-8-96
Analyst Signature Date

Reviewed by Bob B. Bay 1-8-96

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WHC-SD-WM-DP-167, REV. 0

SAMPLE PREPARATIONS

LABCORE Data Entry Template for Worklist#

4777

Analyst:

QAM

Instrument:

FUS01

SN16355

Book #

Method: LA-549-141 Rev/Mod

E-0

Worklist Comment: BX-106 95-AUG-049 & 95-AUG-050 Fusion Digestion rkt

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK-PREP			FUSION01	SOLID	<u>1</u>	<u>.250</u>	N/A	g/L
96000007	BX-106 (A)	2 SAMPLE	S96T000113 0 F		FUSION01	SOLID	N/A	<u>2.1992</u>		g/L
		<u>.5448g</u> →	<u>.2500</u>							
96000007	BX-106 (A)	3 SAMPLE	S96T000113 0		DOSE-02	SOLID	N/A	<u>50</u>		mrads/hour
96000007	BX-106 (A)	4 DUP	S96T000113 0 F		FUSION01	SOLID	<u>2.1992</u>	<u>2.3032</u>	N/A	g/L
		<u>.5758g</u> →	<u>.2500</u>							
96000007	BX-106 (A)	5 DUP	S96T000113 0		DOSE-02	SOLID	<u>50</u>	<u>50</u>	N/A	mrads/hour
96000008	BX-106 (A)	6 SAMPLE	S96T000117 0 F		FUSION01	SOLID	N/A	<u>2.1248</u>		g/L
		<u>.5312g</u> →	<u>.2500</u>							
96000008	BX-106 (A)	7 SAMPLE	S96T000117 0		DOSE-02	SOLID	N/A	<u>65</u>		mrads/hour
96000008	BX-106 (A)	8 DUP	S96T000117 0		FUSION01	SOLID	<u>2.1248</u>	<u>2.0440</u>	N/A	g/L
		<u>.5110g</u> →	<u>.2500</u>							
96000008	BX-106 (A)	9 DUP	S96T000117 0		DOSE-02	SOLID	<u>65</u>	<u>650</u>	N/A	mrads/hour

Final page for worklist #

4777

QAM
Analyst Signature

1-10-96
Date

Keith Fuller
Analyst Signature

1/12/96
Date

S96T000112 → 113

S96T000114 → 117

Data Entry Comments:

All samples & QC - 40me HNO₃ - <1% solids

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WHC-SD-WM-DP-167, REV. 0

INORGANIC ANALYSES

LABCORE Data Entry Template for Worklist#

4849

Analyst: ADP Instrument: DSC0 3 Book # 12N14B

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Please run BX-106 ^{DSCs} ~~TCAs~~ under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-03	SOLID	28.45	28.55	N/A	Joules/g
96000007	BX-106 (A)	2 SAMPLE	S96T000112	0	DSC-03	SOLID	N/A	Ø		Joules/g
96000007	BX-106 (A)	3 DUP	S96T000112	0	DSC-03	SOLID	Ø	Ø	N/A	Joules/g
		4 STD			DSC-03	SOLID	28.45	27.41	N/A	Joules/g
96000008	BX-106 (A)	5 SAMPLE	S96T000116	0	DSC-03	SOLID	N/A	Ø		Joules/g
96000008	BX-106 (A)	6 DUP	S96T000116	0	DSC-03	SOLID	Ø	Ø	N/A	Joules/g

Final page for worklist #

4849

See attached for signatures

Analyst Signature

Date

1/16/96

Analyst Signature

Date

1-16-96

Verified by Blandina
Valenzuela 1/17/96

^{BDV}
^{1/17/96}
~~S96T~~ S96T000112 produced ^{BDV} at three endotherms one at 130.53°C with a delta H of 671.82 J/g, second at 278.3°C with a delta H of 404.37 J/g and third at 451.96°C with a delta H of 828 J/g
Data Entry Comments: S96T000116 produced two endotherms at one at 131.96°C with a delta H of 811.57 J/g and second at 315.84°C with a delta H of 270.7 J/g

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist#

4849

Analyst: ALP **Instrument:** DSC0 **Book #** 12N14B

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run BX-106 ^{DSC's} ~~TGAs~~ under N2. bdv

LAD 1-22-96

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	SOLID			N/A	Joules/g
96000007	BX-106 (A)	2 SAMPLE	S96T000112	0	DSC-01	SOLID	N/A			Joules/g
96000007	BX-106 (A)	3 DUP	S96T000112	0	DSC-01	SOLID			N/A	Joules/g
96000008	BX-106 (A)	4 SAMPLE	S96T000116	0	DSC-01	SOLID	N/A			Joules/g
96000008	BX-106 (A)	5 DUP	S96T000116	0	DSC-01	SOLID			N/A	Joules/g

Final page for worklist #

4849

Anthony Puente 01-14-96
Analyst Signature **Date**

Analyst Signature **Date**

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Curve 1: DSC

File Info: IN0011403 Sun Jan 14 18:42:09 1996

Sample Weight: 15.000 mg

12N148 Indium at 10C/min

BEST AVAILABLE COPY

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 26 TO 31

N2, EXOTHERM DOWN

TEMP: 150.0 °C

TIME: 8

0.0 min RATE: 10.0 °C/min

Temperature (°C)

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System

Sun Jan 14 18:58:29 1996

WHC-SD-WM-DP-167, REV. 0

Curve 1: DSC

File Info: SAM011503 Mon Jan 15 04:26:27 1996

Sample Weight: 28.820 mg

S95T000112 SAM

BEST AVAILABLE COPY

exotherm down, N2 purge gas

TEMP: 25.0 °C TIME: 0.0 min RATE: 10.0 °C/min

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Mon Jan 15 04:31:09 1996

Curve 1: DSC

File info: SAM011504 Mon Jan 15 05:30:19 1996

Sample Weight: 50.960 mg

S96T000112 DUP

BEST AVAILABLE COPY

WHC-SD-WM-DP-167, REV. 0

exotherm down, N2 purge gas

TEMP: 95.0 °C TIME: 0.0 min RATE: 10.0 °C/min

AD PURINTON
PERKIN-ELMER

7 Series Thermal Analysis System
Tue Jan 16 15:13:22 1996

Curve 1: DSC

File info: IND011502 Mon Jan 15 19:25:55 1996

Sample Weight: 15.000 mg

12N148 Indium at 10C/min

BEST AVAILABLE COPY

WHC-SD-WM-DP-167, REV. 0

N2, EXOTHERM DOWN

TEMP: 150.0 °C TIME: 0.0 min RATE: 10.0 °C/min

Temperature (°C)

AD PURINTON

PERKIN-ELMER

7 Series Thermal Analysis System

Mon Jan 15 19:26:29 1996

Curve 1: DSC
File info: SAM011506 Mon Jan 15 20:25:05 1996
Sample Weight: 42.740 mg
S96T000116 SAM

BEST AVAILABLE COPY

WHC-SD-WM-DP-167, REV. 0

exotherm down, N2 purge gas

Temperature (°C)

TEMP1: 35.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 500.0 °C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Mon Jan 15 20:47:00 1996

Curve 1: DSC
 File info: SAM011507 Mon Jan 15 21: 44: 41 1996
 Sample Weight: 35.960 mg
 S96T000116 DUP

BEST AVAILABLE COPY

exotherm down, N2 purge gas
 TEMP: 50.0 °C
 TIME: 600.0 s
 RATE: 10.0 °C/min

AD PURINTON
 PERKIN-ELMER
 7 Series Thermal Analysis System
 Mon Jan 15 21: 46: 04 1996

LABCORE Data Entry Template for Worklist#

5090

Analyst: BVN Instrument: DSC01 Book #

Method: LA-514-113 Rev/Mod

Worklist Comment: Dry DSC for BX-106. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
96000007	BX-106 (A)	1 SAMPLE	S96T000112	0	DSC-02	SOLID	N/A	Ø		Joules/g Dry
96000007	BX-106 (A)	2 DUP	S96T000112	0	DSC-02	SOLID	Ø	Ø	N/A	Joules/g Dry
96000008	BX-106 (A)	3 SAMPLE	S96T000116	0	DSC-02	SOLID	N/A	Ø		Joules/g Dry
96000008	BX-106 (A)	4 DUP	S96T000116	0	DSC-02	SOLID	Ø	Ø	N/A	Joules/g Dry

Data entered + verified by **Final page for worklist #**

5090

Analyst Signature

Date

Analyst Signature

Date

Data Entry Comments:

LABCORE Data Entry Template for Worklist#

4847

Analyst: SME Instrument: TGA0 1 Book # 75287
11/5/96 BDV

Method: LA-560-112 Rev/Mod B-1

Worklist Comment: Please run BX-106 TGAs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	SOLID	<u>59.2</u>	<u>60.93</u>	<u>N/A</u>	%
96000007	BX-106 (A)	2 SAMPLE	S96T000112	0	TGA-01	SOLID	<u>N/A</u>	<u>39.64</u>		%
96000007	BX-106 (A)	3 DUP	S96T000112	0	TGA-01	SOLID	<u>39.64</u>	<u>32.75</u>	<u>N/A</u>	%
96000008	BX-106 (A)	4 SAMPLE	S96T000116	0	TGA-01	SOLID	<u>N/A</u>	<u>38.90</u>		%
96000008	BX-106 (A)	5 DUP	S96T000116	0	TGA-01	SOLID	<u>38.90</u>	<u>43.46</u>	<u>N/A</u>	%

Final page for worklist #

4847

Lusie M. Jutton 1-14-96
Analyst Signature Date

R. J. Jutton 1-16-96
Analyst Signature Date

Verified by Blandina Valenzuela
1-18-96

Data Entry Comments: S96T000112
S95T000115 produced a second weight loss step of 9.40% at
approximately 260°C
S96T000116 produced a second weight loss step of 9.13% at approximately 260°C

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number,
R = Replicate Number, A = Aliquot Code.

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 34 TO 38.

S96T000112 N2

31.552 mg

Rate: 10.0 °C/min

File: 00055.001

TG

METTLER

14-Jan-96

Ident: 0.0

222-S Laboratory

Step Analysis
Height-12.51 mg
-39.64 %
ResidC. 19.04 mg
60.36 %
Dpeak 123.0 °C

Step Analysis
Height -2.97 mg
-9.40 %
ResidC. 15.88 mg
50.34 %
Dpeak 267.0 °C

35

10. mg

100.

200.

300.

400.

°C

WHC-SD-WM-DP-167-REV-0

S96T000112 DUP N2
 41.343 mg
 Rate: 10.0 °C/min
 File: 00057.001 TG METTLER 14-Jan-96
 Ident: 0.0 222-S Laboratory

S96T000116 N2
36.837 mg

Rate: 10.0 °C/min

File: 00059.001 TG METTLER 14-Jan-96
Ident: 0.0 222-S Laboratory

Step Analysis
Height-14.33 mg
-38.90 %
ResidC. 22.51 mg
61.10 %
Dpeak 103.0 °C

Step Analysis
Height -3.36 mg
-9.13 %
ResidC. 18.84 mg
51.16 %

S96T000116 DUP N2

19.121 mg

Rate: 10.0 °C/min

File: 00061.001

TG

METTLER

14-Jan-96

Ident: 0.0

222-S Laboratory

Step Analysis
Height -8.31 mg
-43.46 %
ResidC. 10.81 mg
56.54 %
Dpeak 65.0 °C

Step Analysis
Height -1.35 mg
-7.06 %
ResidC. 9.24 mg
48.31 %

38

5. mg

100.

200.

300.

400.

°C

WHC-SD-WM-DP-167, REV. 0

RADIOCHEMICAL ANALYSES

LABCORE Data Entry Template for Worklist# 4862

Analyst: DPB Instrument: AB00 14 Book# 14B56

Method: LA-508-101 Rev/Mod D-2

Worklist Comment: Determine sample size using Ludlum. Use .100 mL A-SPK. SLF

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@ALPHA01	SOLID		
2 BLNK-PREP			@ALPHA01	SOLID		
3 BLNK/BKG			@ALPHA01	SOLID		
4 SAMPLE	S96T000113	0 F	@ALPHA01	SOLID	96000007	BX-106 (A)
	Analytes Requested: ALPHA01 , ALPHA01E					
5 DUP	S96T000113	0 F	@ALPHA01	SOLID		
6 SPK	S96T000113	0 F	@ALPHA01	SOLID		
7 SAMPLE	S96T000117	0 F	@ALPHA01	SOLID	96000008	BX-106 (A)
	Analytes Requested: ALPHA01 , ALPHA01E					
8 DUP	S96T000117	0 F	@ALPHA01	SOLID		
9 SPK	S96T000117	0 F	@ALPHA01	SOLID		

Final page for worklist # 4862

James P. Bromley 1/13/96 1620
Analyst Signature Date

C. J. Quinn 1/15/96
Analyst Signature Date
W. B. Quinn 1/16/96

Data Entry Comments:

Low SPK recoveries are acceptable due to
low sample alpha activity. No recs requested.

W. B. Quinn 1/16/96

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 4862

Analyst: dpb

Instrument: AB14

Book# _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine sample size using Ludlum. Use .100 mL A-SPK. SLF

Seq Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD		0		QALPHA01 ALPHA01	SOLID	1.54E-05	1.39E-5	90.260 % Recovery	
1 STD		0		QALPHA01 ALPHA01E	SOLID	1.00	4.30E+00	4.300 % Ct. Error	
2 BLNK-PREP		0		QALPHA01 ALPHA01	SOLID	1	<4.07E-2	uCi/g	
2 BLNK-PREP		0		QALPHA01 ALPHA01E	SOLID	1.00	5.00E+02	500.000 % Ct. Error	
3 BLNK/BKG		0		QALPHA01 ALPHA01	SOLID	1.00E+00	1.22E+00	1.220 uCi/g	
4 SAMPLE	S96T000113	0	F	QALPHA01 ALPHA01	SOLID	N/A	6.52E-01	6.030e-002 uCi/g	
4 SAMPLE	S96T000113	0	F	QALPHA01 ALPHA01E	SOLID	N/A	1.49E+01	0.000 % Ct. Error	
5 DUP	S96T000113	0	F	QALPHA01 ALPHA01	SOLID	6.52E-1	5.86E-1	10.660 RPD	
5 DUP	S96T000113	0	F	QALPHA01 ALPHA01E	SOLID	1.00	1.53E+01	15.300 % Ct. Error	
6 SPK	S96T000113	0	F	QALPHA01 ALPHA01	SOLID	3.92E-02	3.12E-02	79.590 % Recovery	
7 SAMPLE	S96T000117	0	F	QALPHA01 ALPHA01	SOLID	N/A	5.43E-01	6.240e-002 uCi/g	
7 SAMPLE	S96T000117	0	F	QALPHA01 ALPHA01E	SOLID	N/A	1.74E+01	0.000 % Ct. Error	
8 DUP	S96T000117	0	F	QALPHA01 ALPHA01	SOLID	5.43E-1	5.77E-1	6.070 RPD	
8 DUP	S96T000117	0	F	QALPHA01 ALPHA01E	SOLID	1.00	1.67E+01	16.700 % Ct. Error	
9 SPK	S96T000117	0	F	QALPHA01 ALPHA01	SOLID	3.92E-02	3.10E-02	79.080 % Recovery	

Final page for worklist# 4862

Analyst Signature

Date

Analyst Signature

Date

Reviewer Signature

1/22/96
Date

WORKBOOK PAGE: STD1

AT : LA-508-101 (D-2)

STANDARD

		STANDARD	REPLICATE
Type	DETECTOR NUMBER	14	14
STD	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	2133	2106
4862	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.37	0.37
AT	SAMPLE SIZE in mL (SS)	10.000	10.000
Test Code	DILUTION FACTOR (DF)	1	1
@ALPHA01	STANDARD BOOK NUMBER (Std BN)	14B56	14B56
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	70.730	69.830
Batch Number	Standard Value in $\mu\text{Ci/mL}$	1.54E-05	
96000313	Concentration in $\mu\text{Ci/L}$ =	1.40E-02	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$ =	1.38E-02	
0	AVERAGE CONCENTRATION in $\mu\text{Ci/L}$ =	1.3922E-02	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
WL#4862	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
Instrument Code	Relative Counting Error = $[(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
CJO			
Chemist			
SLF	ALPHA TOTAL CONCENTRATION in $\mu\text{Ci/mL}$	1.39E-05	DETECTION LEVEL
Analyst			
DPB			
Date Complete			1.21E-07
01/15/96	RELATIVE COUNTING ERROR =	4.3%	$\mu\text{Ci/mL}$
Analysis Date			
01/13/96			
Analysis Time			
04:20 PM			
Sample Point			
BX-106			

Analyst:	CJO	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/16/96
STANDARD.WB1 Rev. 1.0 508101ML		

WHC-SD-WM-DP-167, REV. 0

WORKBOOK PAGE: BLANK2

AT : LA-508-101 (D-2)

SOLIDS

		BLNK-PREP	REPLICATE
Type	DETECTOR NUMBER	14	14
BLNK-PREP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	12	15
4862	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.37	0.37
AT	SAMPLE SIZE in mL (SS)	0.100	0.100
Test Code	DILUTION FACTOR (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.1992	2.1992
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
SOLID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE	0.294	0.411

Batch Number	
96000313	Blank Concentration in $\mu\text{Ci/g}$ < 2.92E-02
Rerun	Replicate Concentration in $\mu\text{Ci/g}$ < 4.07E-02
0	Maximum Concentration in $\mu\text{Ci/g}$ < 4.0720E-02

Sample Prep	
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$
Sample #	$\text{ALPHA TOTAL } \mu\text{Ci/g} = R_s * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$
WL#4862	
Instrument Code	Relative Counting Error = $[(The \text{ Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By	CJO
Chemist	
SLF	α RESULTS α
Analyst	ALPHA TOTAL in $\mu\text{Ci/g}$ < 4.07E-02
DPB	LESS THAN Value was Determined from Rmax.
Date Complete	RELATIVE COUNTING ERROR 500.0%
01/15/96	
Analysis Date	
01/13/96	
Analysis Time	
04:20 PM	
Sample Point	
BX-108	

Analyst:	CJO	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/16/96
BLANK.WB1 Rev. 1.0	508101ML	

WHC-SD-WM-DP-167, REV. 0

WORKBOOK PAGE: SAM4

AT : LA-508-101 (D-2)

SOLIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	14	14
SAMPLE	DISH SIZE (1 , 2 , or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	214	203
4862	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.37	0.37
AT	SAMPLE SIZE in mL (SS)	0.100	0.100
Test Code	DILUTION FACTOR (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.1992	2.1992
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
SOLID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE	6.763	6.397
Batch Number			
96000313	Blank Concentration in $\mu\text{Ci/g}$	6.70E-01	
Rerun	Replicate Concentration in $\mu\text{Ci/g}$	6.34E-01	
0	Average Concentration in $\mu\text{Ci/g}$	6.5194E-01	
Sample Prep			
FUSION01	R_s (Sample Count Rate) = (TC / CT) - BKG		
Sample #	ALPHA TOTAL $\mu\text{Ci/g}$ = $R_s * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000113			
Instrument Code	Relative Counting Error = $[(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
CJO			
Chemist			
SLF	v RESULTS v		
Analyst	ALPHA TOTAL in $\mu\text{Ci/g}$	6.52E-01	DETECTION LEVEL
DPB			
Date Complete			6.03E-02
01/15/96	RELATIVE COUNTING ERROR	14.9%	$\mu\text{Ci/g}$
Analysis Date			
01/13/96			
Analysis Time			
04:20 PM			
Sample Point			
BX-106			

Analyst:	CJO	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/16/96
SAMPLE.WB1 Rev. 1.0 508101ML		

WORKBOOK PAGE: DUP5

AT : LA-508-101 (D-2)

SOLIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	14	14
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	194	200
4862	COUNT TIME In MINUTES (CT)	30	30
AT or TB ?	BACKGROUND In cpm (BKG)	0.37	0.37
AT	SAMPLE SIZE In mL (SS)	0.100	0.100
Test Code	DILUTION FACTOR (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.3032	2.3032
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	6.097	6.297
Batch Number			
96000313	Blank Concentration in $\mu\text{Ci/g}$	5.77E-01	
Rerun	Replicate Concentration in $\mu\text{Ci/g}$	5.96E-01	
0	Average Concentration in $\mu\text{Ci/g}$	5.8624E-01	
Sample Prep			
FUSION01	Rs (Sample Count Rate) = (TC / CT) - BKG		
Sample #	ALPHA TOTAL $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)		
S96T000113			
Instrument Code	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
CJO			
Chemist			
SLF	v RESULTS v		
Analyst	ALPHA TOTAL	5.86E-01	DETECTION LEVEL
DPB	in $\mu\text{Ci/g}$		
Date Complete	RELATIVE COUNTING ERROR	15.3%	5.76E-02 $\mu\text{Ci/g}$
01/15/96			
Analysis Date			
01/13/96			
Analysis Time			
04:20 PM			
Sample Point			
BX-106			

Analyst:	CJO	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/16/96
SAMPLE.WB1 Rev. 1.0	508101ML	

WHC-SD-WM-DP-167, REV. 0

WORKBOOK PAGE: SPIKE6

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	14	14
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	49072	45991
4862	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.37	0.37
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.100	0.100
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.1992	2.1992
Matrix	SPIKE VOLUME in mL (SVol)	0.100	0.100
SOLID	SPIKE DILUTION FACTOR (SDF)	1	1
Batch Number	SPIKE BOOK NUMBER (Spk BN)	119B43	119B43
96000313	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	3.9211E-02	3.9211E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2274	0.2274
0	SAMPLE + SPIKE $\mu\text{Ci/g}$ (S+S)	1.62E+02	1.52E+02
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/g}$ in SAMPLE	6.5194E-01	
FUSION01			
Sample #			
S96T000113			
Instrument Code			
WB27807			
Prepared By			
CJO			
Chemist			
SLF			
Analyst			
DPB			
Date Complete			
01/15/96			
Analysis Date			
01/13/96			
Analysis Time			
04:20 PM			
Sample Point			
BX-106			

Rs (Sample Count Rate) = (TC / CT) - BKG
SAMPLE + SPIKE $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)
QC ACTUAL = SVal
QC FOUND = (((S+S $\mu\text{Ci/g}$ - SAMPLE $\mu\text{Ci/g}$) * ((SDF/(SVol*1000)))/(DF/SS/Dg/L))))
PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) * 100

QC ACTUAL	=	3.92E-02
QC FOUND	=	3.12E-02
AVG. PERCENT SPIKE RECOVERY	=	79.7%

Analyst:	CJO	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/16/96

SPIKE.WB1 Rev. 1.0 508101ML

WHC-SD-WM-DP-167, REV. 0

WORKBOOK PAGE: SAM7

AT : LA-508-101 (D-2) SOLIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	14	14
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	158	182
4862	COUNT TIME In MINUTES (CT)	30	30
AT or TB ?	BACKGROUND In cpm (BKG)	0.37	0.37
AT	SAMPLE SIZE In mL (SS)	0.100	0.100
Test Code	DILUTION FACTOR (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.1248	2.1248
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	4.897	5.697
Batch Number			
96000313	Blank Concentration in $\mu\text{Ci/g}$	5.02E-01	
Repin	Replicate Concentration in $\mu\text{Ci/g}$	5.84E-01	
0	Average Concentration in $\mu\text{Ci/g}$	5.4317E-01	
Sample Prep			
FUSION01	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	$\text{ALPHA TOTAL } \mu\text{Ci/g} = R_s * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000117			
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
CJO			
Chemist			
SLF	ν RESULTS ν		
Analyst	ALPHA TOTAL in $\mu\text{Ci/g}$	5.43E-01	DETECTION LEVEL
DPB			
Date Complete			
01/15/96	RELATIVE COUNTING ERROR	17.4%	6.24E-02 $\mu\text{Ci/g}$
Analysis Date			
01/13/96			
Analysis Time			
04:20 PM			
Sample Point			
BX-106			

Analyst:	CJO	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/16/96
SAMPLE.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: DUP8

AT : LA-508-101 (D-2)

SOLIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	14	14
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	178	169
4862	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.37	0.37
AT	SAMPLE SIZE in mL (SS)	0.100	0.100
Test Code	DILUTION FACTOR (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.044	2.044
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	5.563	5.263
Batch Number			
98000313	Blank Concentration in $\mu\text{Ci/g}$	5.93E-01	
Rerun	Replicate Concentration in $\mu\text{Ci/g}$	5.61E-01	
0	Average Concentration in $\mu\text{Ci/g}$	5.7708E-01	
Sample Prep			
FUSION01	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/g}$ = $R_s * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000117			
Instrument Code	Relative Counting Error = $[(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
CJO			
Chemist			
SLF	α RESULTS α		
Analyst	ALPHA TOTAL in $\mu\text{Ci/g}$	5.77E-01	DETECTION LEVEL
DPB			
Date Complete			6.49E-02
01/15/96	RELATIVE COUNTING ERROR	16.7%	$\mu\text{Ci/g}$
Analysis Date			
01/13/96			
Analysis Time			
04:20 PM			
Sample Point			
BX-108			

Analyst:	CJO	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/16/96
SAMPLE.WB1 Rev. 1.0	508107ML	

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	14	14
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	48316	46054
4862	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.37	0.37
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.100	0.100
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.1248	2.1248
Matrix	SPIKE VOLUME in mL (SVol)	0.100	0.100
SOLID	SPIKE DILUTION FACTOR (SDF)	1	1
Batch Number	SPIKE BOOK NUMBER (Spk BN)	119B43	119B43
96000313	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	3.9211E-02	3.9211E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2274	0.2274
0	SAMPLE + SPIKE $\mu\text{Ci/g}$ (S+S)	1.65E+02	1.57E+02
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/g}$ in SAMPLE	5.4317E-01	
FUSION01			
Sample #			
S96T000117			
Instrument Code			
WB27807			
Prepared By			
CJO			
Chemist			
SLF			
Analyst			
DPB			
Date Complete			
01/15/96			
Analysis Date			
01/13/96			
Analysis Time			
04:20 PM			
Sample Point			
BX-106			

$$Rs \text{ (Sample Count Rate)} = (TC / CT) - BKG$$

$$\text{SAMPLE} + \text{SPIKE } \mu\text{Ci/g} = Rs * 1000\text{mL/L} * DF / (EFF * SS * \text{Dg/L} * 2220000\text{dpm}/\mu\text{Ci})$$

$$QC \text{ ACTUAL} = SVal$$

$$QC \text{ FOUND} = (((S+S \mu\text{Ci/g} - \text{SAMPLE } \mu\text{Ci/g}) * ((SDF/(SVol*1000))/(DF/SS/Dg/L))))$$

$$\text{PERCENT SPIKE RECOVERY} = (QC \text{ FOUND} / QC \text{ ACTUAL}) * 100$$

QC ACTUAL	=	3.92E-02
QC FOUND	=	3.10E-02
AVG. PERCENT SPIKE RECOVERY	=	79.2%

Analyst:	CJO	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/16/96
SPIKE.WB1 Rev. 1.0	508101MD	

DISTRIBUTION SHEET

To Distribution	From Characterization Plans, Coordination and Reports	Page 1 of 1	
		Date: 01-22-96	
Project Title/Work Order WHC-SD-WM-DP-167, REV. 0, "45-Day Safety Screening Results and Final Report for Tank 241-BX-106, Auger Samples 95-AUG-049 and 95-AUG-050"		EDT NO.: 614774	
		ECN NO.: N/A	
Name	MSIN	Text With all Attach	EDT/ECN ONLY

Pacific Northwest Laboratory

J. R. Gormsen	K7-28		X
S. J. Harris	K7-22	X	
K. L. Silvers	P7-27		X

U.S. Department of Energy, RL

C. A. Babel	S7-54	X	
-------------	-------	---	--

Westinghouse Hanford Company

J. N. Appel	G3-21		X
H. Babad	S7-30	X	
S. D. Estey	R2-11	X	
G. D. Forehand	S7-31		X
V. W. Hall	T6-03	X	
J. E. Hyatt	S3-31	X	
D. C. Hetzer	S6-31		X
L. Jensen	R2-12	X	
N. W. Kirch	R2-11	X	
M. J. Kupfer	H5-49	X	
J. E. Meacham	S7-15	X	
K. L. Powell	T6-04		X
L. M. Sasaki	R2-12	X	
L. W. Shelton	H5-49	X	
B. C. Simpson	R2-12		X
M. J. Sutey	T4-07	X	
J. A. Voogd	H5-03		X
Central Files	A3-88	2	
EDMC	H6-08	X	
LTIC	T6-03		X
TCRC	R2-12	X	
TFIC (Tank Farm Information Center)	R1-20		X

Washington State Department of Ecology

Single-Shell Tank Unit Manager

A. B. Stone	B5-18	X	
-------------	-------	---	--

U. S. Department of Energy

Jim Poppiti			X
12800 Middlebrook Rd.			
Trevion II, EM-36			
Germantown, MD 20874			

Los Alamos Technical Associates

T. T. Tran		X	
309 Bradley Blvd.			
Richland, WA 99352			