0013741
5 of 7

SST

WASTE CHARACTERIZATION PROJECT

CORE 16 DATA REPORT

REV. 0

APPENDIX C

PHYSICAL PROPERTIES

C1 - INTRODUCTION

Introduction to Physical Properties Primary Data Package

This section of the Core 16 Primary Data Package contains primary or "raw" data collected during preparation and analysis of physical properties on Core 16 samples. 325-A Hot Cell operations uses a numbering system related to tank number, core number, and segment. Within the 325-B Hot Cells, all analytical information is tracked by the laboratory sample number.

C2 - LABORATORY ANALYST

SIGNATURE LIST

SAMPLE PREPARATION AND PHYSICAL TESTING
LABORATORY ANALYST SIGNATURE LIST

Analyst Name	Initials	Written Name	Initials
Thomas K. Andrews	TKA		
Dale V. Archer	DVA		
John L. Green	JLG		JLG
F. Vaughn Hoopes	FVH		
Mary E. Peterson	MEP		MEP.
GARRY ~~Gary~~ M. Richardson	GMR		GMR
Randall D. Scheele	RDS		
Elmer H. Shade	EHS		
Rick T. Steele	RTS		RTS
Joel M. Tingey	JMT		JMT
H. Craig Buchanan	HCB		HCB
Shawn A. Homi	SAH		

C3 - 325A HOT CELL EXTRUSION/-

CHARACTERIZATION LRB

C03–001

BNW- 53674
01-12-90

PACIFIC NORTHWEST LABORATORY
ISSUED
JAN 12 1990
BATTELLE RECORDS MGMT.

THIS BOOK IS INTEDNDED TO BE USED FOR RECORDING RESEARCH PERFORMED FOR THE U.S DEPARTMENT OF ENERGY UNDER BNW'S OPERATING CONTRACT EY-76-C-06-1830.

M62019

	LABORATORY RECORD BOOK NUMBER BNW- 53674	This document consists of ..... pages, copy no. .....
	TITLE (INDICATE SUBJECT CONTENT) project #16021 CHARACTERIZATION OF SINGLE SHELL TANK WASTE	

AUTHOR - DIVISION AND DEPARTMENT

PERIOD COVERED FROM TO

Route To	P. R. No.	Location	Route Date	Signature & Date
JM Quigley	33359	P7-25	01-12-90	JM Quigley 1/15/90

9111210715

C03-002

SINGLE SHELL TANK WASTE CHARACTERIZATION

This lab notebook will be used to document the activities of the 325A hot cell facility in support of the Single Shell Tank sample analysis project.

The work to be performed includes the receipt, examination, sample distribution, homogenization, compositing, and physical characterization of the single shell tank core samples.

Personnel participating in this research and authorized to make entries in this lab notebook include the following:

NAME	SIGNATURE	INITIALS
J M TINGEY	Jm Tingey	JMT

Authorized Reviewers

NAME	SIGNATURE	INITIALS

Project No. _____ Date of Work _____

Entered By _____ Date _____

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

C03-003

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53674 JAN 23 '91

CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number 90-5-005 (2) Sample Number #4 (3) Supervisor* DCHartley

(4) Tank 110B (5) Riser 6 (6) Segment 90-012 (7) Core 018 (8) Cask Serial Number 1004C

Radiation Survey Data:	(9) FIELD	(26) LABORATORY
Over Top Dose Rate	1 mr/HR	1 mR/HR
Side Dose Rate	1.5 mr/HR	1.5 mR/HR
Bottom Dose Rate	1 mr/HR	1 mR/HR
Smearable Contamination	< DET. (alpha)	< DL (alpha)
	< DET. (beta-gamma)	< DL (beta-gamma)
	RPT* [signature] (Signature)	RPT* [signature] (Signature)

(10) Shipment Description:	
A. Work Package Number	2W-89-0105 7/W
B. Cask Seal Number	N/A
C. Sampler Number Used	28
D. Date and Time Sampler Unseated	5/4/90, 1606
E. Expected Liquid Content	30%
F. Expected Solid Content	70%
G. Dose Rate Through Drill String	47 mr/HR
H. Expected Sample Length	19"

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

Characterize sample per WHC-CP-0210 Waste Characterization Plan for the Hanford Site Single-Shell Tanks

(12) Field Comments:

(27) Laboratory Comments

(13) POINT OF ORIGIN	(14) SENDER NAME	(16) DATE RELEASED	(18) DESTINATION	(20) RECIPIENT NAME	(22) DATE RECEIVED
241-B	D.C. Hartley	5/8/90	325 Bldg.	TK Andrews	5-8-90
110	(15) SENDER SIGNATURE* DCHartley	(17) TIME RELEASED 0900	Zone	(21) RECIPIENT SIGNATURE* TK Andrews	(23) TIME RECEIVED 0930

(19) Seal Intact Upon Release?	(24) Seal Intact Upon Receipt?	(25) Seal Data Consistent with this Record?		
		Shipment No.	Cask Seal No.	Sample No.
☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No

DISTRIBUTION White – Office of Sample Management; Pink – Process Engineering, R1-51; Yellow – Recipient of Sample; Goldenrod – Tank Farm Operations, T4-01

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BC-6000-309 (02/90)

C03-004

WORK PLACE COPY

3

May 11, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-4-EXT
Page 1 of 6

Extrusion of Sample
Tank 241-B-110 Core 16 Segment 4

When you have finished an instruction, put a check in from of the item.

General Instructions:

1) Keep the sample in a sealed container as much as possible to prevent it from drying out.
3) After centrifuging the solids volume is the average of the high and low volumes of the solids.
3) All requested weights for sample + container are for a closed container.
4) Identify the instrument used for any measurement by reference number or by the calibration ID and provide the calibration expiration date.

M&TE List

✓ Balance I:
Calib ID 388-06-01-016 Calib Exp Date 08-07-90
Location "A" Cell

✓ Balance 2:
Calib ID 362-06-01-035 Calib Exp Date 08-07-90
Location "B" Cell

✓ Thermocouple 1:
Calib ID 6929 Calib Exp Date 09-08-91
Type K Location "B" Cell

✓ Digital Thermometer:
Calib ID 01225 Calib Exp Date 7-12-90

Signature HC Buchanan Date 5/18/90 LRB 53674 Page 3

53674 JAN 23 '91

C03-005

BC-6000-309 (02/90)
LRB 53674 Page 2
Yellow – Recipient of Sample
Goldenrod – Tank Farm Operations, T4-0
White – Office of Sample Management
Pink – Process Engineering, R1-5
DISTRIB

RECEIPT OF 241-B-110 CORE 16 SEGMENT 4

✓1. Record the identifications provided on the chain-of-custody record with the samples and compare to the numbers inscribed on the sampler.

Sampler # 28 90-012

✓2. Receive and transfer the samplers and liners into B-Cell and extrude using SOP No 325-EXT-1, RECEIPT AND EXTRUSION OF CORE SAMPLES AT THE 325A SHIELDED FACILITY; 325-A-29, RECEIVING OF WASTE TANK SAMPLES IN ONSITE TRANSFER CASK; and PNL Technical Procedure PNL-ALO-130, PROCEDURE FOR THE RECEIPT AND INSPECTION OF SINGLE SHELL TANK (SST) SAMPLES.

EXTRUSION AND SAMPLING OF 241-B-110 CORE 16 SEGMENT 4

✓3. Weigh two labeled 20 mL prepared glass vials and caps for volatile organic analysis.

	110B-C16-VOL4	
Vial & Cap	N/A	g
	90-3520	
Vial & Cap	12.74	g
Balance	2	

✓4. Weigh a 250 mL and a 500 mL safety jar labeled 110B-C16-DL4 and 110B-C16-SOL4, respectively.

	110B-C16-DL4		110B-C16-SOL4	
Jar + Lid	N/A	g	345.09	g
Balance	2			

✓5. Weigh the labeled plastic scintillation vial 90-3521.

	90-3521	
Jar + Lid	6.65	g
Balance	2	

Signature H. Craig Buchanan Date 5/14/90 LRB 53674 Page 4

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9112150719

May 11, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-4-EXT

✓ 6. Measure cell temperature.

34 °C

Thermometer ID 01225 Thermocouple ID #1

✓ 7. Weigh the extruder tray.

Extruder Tray 794.43 g

Balance 2

✓ 8. Prepare the camera for use.

✓ 9. Lift the bottom end of the liner and drain any oil from the liner into the dish. Be careful the sampler doesn't slide out of the liner.

✓ 10. When all of the oil has drained from the liner, remove the dish and inspect the oil collected to determine whether any sample is present.

Amount of Sample 20-25 mL None Amount of oil 20-25 mL

✓ 11. Wipe the sampler with rags to remove any residual oil, if needed.

✓ 12. Remove the V-Ring seal from the valve end of sampler with a 3/32" allen wrench.

✓ 13. Move the extruder platform to the forward position. Set the torque and speed switches to 0 and the directional switch to brake.

✓ 14. Transfer the sampler to the extruder making sure that the valve closure wires are at top, put a wooden block under the rear of the sampler, insert push rod into the sampler, and remove wooden block. Seat and lock the push rod in back of extruder. Clamp the sampler into position.

✓ 15. Place the sampler valve wrench into closed valve slot. (Horizontal is closed and vertical is open.)

✓ 16. Place the weighed 250 mL jar 110B-C16-DL4 into position under the drain spout of the extruder collection tray to collect any free liquid from the sample.

✓ 17. Open the sampler valve. With the valve closure wires at top, turn the valve counterclockwise (towards the front) to open the valve. Confirm that the valve is open before proceeding.

Signature HC Buchanan Date 5/15/90 LRB 53674 Page 5

NOTEBOOK NO. 53674 JAN 23 '91

9112100720

May 11, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-4-EXT
Page 4 of 6

✓18. To extrude the sample, switch the directional switch to reverse and set the torque at less than or equal to 30. Do not exceed a torque setting of 30! Gradually increase the speed. Do not exceed a speed setting of 50.

✓19. Watch carefully as the rod and piston approach the valve, paying close attention that the extruder does not bind or catch. Continue extruding until the piston falls into the tray.

✓20. Transfer a 5 gm sample of the extruded solids and place it in the vial labeled 90-3520. Seal the vial as soon as possible. Time is of the essence. Weigh the sample. This sample will be used to determine the volatile organic components in the sample.

	90-3520	
Total	23.30	g
Vial & Cap	17.74	g
Sample	5.56	g

Balance 2

___21. Drain the free liquid into the 250 mL jar 110B-C16-DL4. Seal and weigh. Measure the height (ht) of sample from the bottom of the jar in mm. Estimate the volume using: Volume = (ht - 5) mm X 50mL/15 mm.

110B-C16-DL4

Total	_____	g	N/A	Volume	_____ mL
Jar + Lid	_____	g			
Sample	_____	g			

Balance ___

✓22. Remove the extruder tray and weigh.

Total	1106.50	g
Extruder Tray	794.43	g
Sample	312.07	g

Balance 2

✓23. Position the extruder tray for photographs. Place a color bar beside the sample. Photograph the extruded sample. Record the picture number(s).

Signature H.C. Buchanan Date 5/15/90 LRB 53674 Page 6

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May 11, 1990
JM Tingey

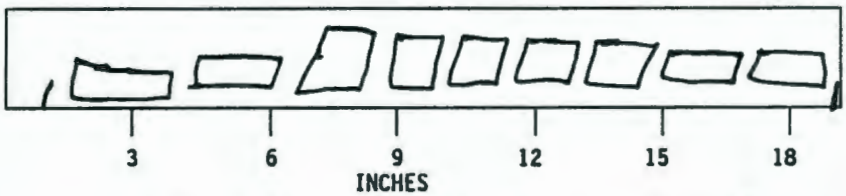
Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-4-EXT
Page 5 of 6

Photograph Number(s) 3 + 4

24. Measure the dimensions of the solids in the sample and describe the color, consistency, and other pertinant properties of the material.

Length 19" cm

BOTTOM TOP



Description moist, light tan, equal segments ~16 segments of ~ 1" to 1½", many stood on end

25. Transfer about 1.0 g of extruded solids to a weighed vial labeled 90-3521. Deliver to 325B facility with its ARFS. This sample will be used to analyze particle size.

90-3521

Total 7.59 g
Vial & Cap 6.65 g
Sample 0.94 g

Balance 2

Date Delivered 5/25/90

26. Transfer the remaining sample to a weighed 500 mL jar labeled 110B-C16-SOL4. Seal and weigh.

110B-C16-SOL4

Total 641.07 g
Jar + Lid 345.09 g
Sample 295.98 g

Signature H.C. Buchanan Date 5/15/90 LRB 53674 Page 7

53674 JAN 23 '91 RECORDS CENTER

May 11, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-4-EXT
Page 6 of 6

Balance 2

__27. If there is greater than 25 ml of drainable liquids, transfer 5 ml of the drainable liquid to the organic analysis vial labeled 110B-C16-VOL4. Seal the vial and weigh. Transfer this vial and 90-3520 to either RT Steele or RW Stromatt as soon as possible.

110B-C16-VOL4

Total _____g
Vial & Cap _____g
Sample _____g

N/A

Balance ____

Date Delivered 5/25/90 90-3520 only

Signature HC Buchanan Date 5/15/90 LRB 53674 Page 8

BMW NOTEBOOK NO. 53674 JAN 23 '91 RECORDS CENTER

May 13, 1990
JM Tingey

Reference Tech Procedure: PNL-ALO-135

SINGLE SHELL TANK WASTE CHARACTERIZATION
HOMOGENIZATION

Tank ID: 110B
Riser ID: 6
Core ID: 16

Segment Number: 4
Shipment #: 90-S-005
WHC Sample ID: 90-012
325A Sample ID: 110B-C16-SOL4

HOMOGENIZATION

Start time 13:15
End time 13:30
Homogenization time 15 min

Visual observations: Light tan in color, easily poured from mixer, no need to scrape mixer

ANALYSIS SAMPLES

TOP
Sample Identification: N/A
Bottle Weight : _____ g
Sample and Bottle : _____ g
Sample Weight : _____ g

BOTTOM
Sample Identification: N/A
Bottle Weight : _____ g
Sample and Bottle : _____ g
Sample Weight : _____ g

ANALYSIS
Sample Identification: _____
Sample and Bottle Wt.: _____ g
Bottle Weight : _____ g
Sample Weight : _____ g

BULK
Sample Identification: 110B-C16-4H
Sample and Bottle Wt.: 532.73 g
Bottle Weight : 263.71 g
Sample Weight : 269.02 g

Signature HC Buchanan Name HC Buchanan Date 5/16/90
Signature JM Tingey Name JM TINGEY Date 5/17/90

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C03-011

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9 1 1 1 0 7 2 4

PENETRATION RESISTANCE DATA SHEET

Date: 5/15/90

Measurement Obtained By: Shade / Buchanan

Sample No.: 110B C16 5014

Sample Description:

Diameter: 2 1/2 Height: ~ 3 1/2"

Physical Appearance: chunks, with air spaces

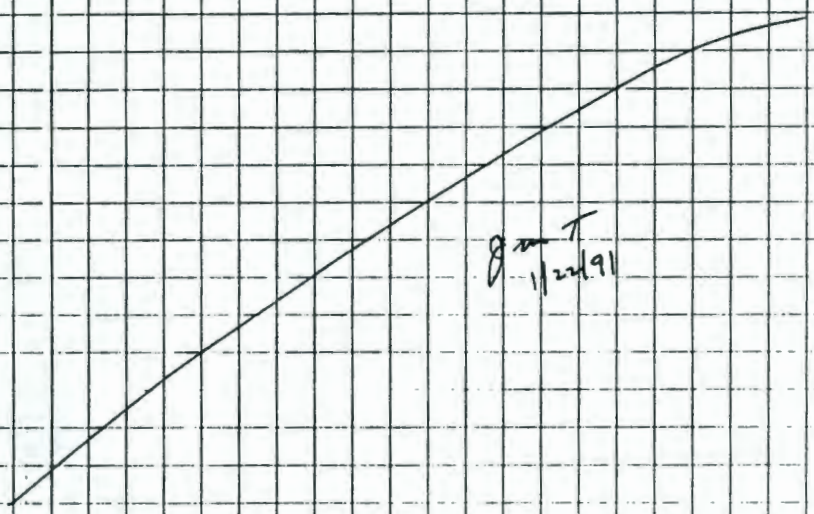
Remarks: smooth appearance, as extruded

Penetrometer No.: CT-421A

Diameter of End: 1"

Penetration Resistance: < 1 psi

LRB 53674 Page 10



JMT 1/22/91

Project No. Date of Work

Entered By JM Tingey Date 1/22/91

Disclosed To and Understood By

Signed 1. Date

2. Date

C03-012

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CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number 90-S-005 (2) Sample Number 90-013 (3) Supervisor* D.C. Hartley

(4) Tank 110 B (5) Riser 6 (6) Segment 5 (7) Core 018 (8) Cask Serial Number 014C

Radiation Survey Data:	(9) FIELD	(26) LABORATORY
Over Top Dose Rate	1 mr/HR	1 mR/HR
Side Dose Rate	1.5 mr/HR	1.5 mR/HR
Bottom Dose Rate	1 mr/HR	1 mR/HR
Smearable Contamination	<DET. (alpha)	<D.L. (alpha)
	<DET. (beta-gamma)	<D.L. (beta-gamma)
	RPT* (Signature)	RPT* Frank Hardy (Signature)

(10) Shipment Description:

A. Work Package Number	2W-89-01057/W
B. Cask Seal Number	N/A
C. Sampler Number Used	23
D. Date and Time Sampler Unseated	5-4-90 1706
E. Expected Liquid Content	30%
F. Expected Solid Content	70%
G. Dose Rate Through Drill String	44 mr/HR
H. Expected Sample Length	19"

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

Characterize sample per WHC-CP-0210 Waste Characterization Plan for the Hanford Site Single-Shell Tanks

(12) Field Comments:

(27) Laboratory Comments

(13) POINT OF ORIGIN	(14) SENDER NAME	(16) DATE RELEASED	(18) DESTINATION	(20) RECIPIENT NAME	(22) DATE RECEIVED
241-B 110	D.C. Hartley	5/8/90	325 Bldg. 300 Area	TK Andrews	5-8-90
	(15) SENDER SIGNATURE* D.C. Hartley	(17) TIME RELEASED 0900		(21) RECIPIENT SIGNATURE* TK Andrews	(23) TIME RECEIVED 0930

(19) Seal Intact Upon Release? ☒ Yes ☐ No

(24) Seal Intact Upon Receipt? ☒ Yes ☐ No

(25) Seal Data Consistent with this Record?

Shipment No.	Cask Seal No.	Sample No.
☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No

DISTRIBUTION: White – Office of Sample Management; Pink – Process Engineering, R1-51; Yellow – Recipient of Sample; Goldenrod – Tank Farm Operations, T4-01

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BC-6000-309 (02/90)

C03-013

C03-013

WORK PLACE COPY

May 15, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-5-EXT

Extrusion of Sample
Tank 241-B-110 Core 16 Segment 5

When you have finished an instruction, put a check in from of the item.

General Instructions:

1) Keep the sample in a sealed container as much as possible to prevent it from drying out.
3) After centrifuging the solids volume is the average of the high and low volumes of the solids.
3) All requested weights for sample + container are for a closed container.
4) Identify the instrument used for any measurement by reference number or by the calibration ID and provide the calibration expiration date.

M&TE List

✓ Balance 1:
Calib ID 388-06-01-016 Calib Exp Date 08-07-90
Location "A" Cell

✓ Balance 2:
Calib ID 362-06-01-035 Calib Exp Date 08-07-90
Location "B" Cell

✓ Thermocouple 1:
Calib ID 6929 Calib Exp Date 09-08-91
Type K Location "B" Cell

✓ Digital Thermometer:
Calib ID 01225 Calib Exp Date 7-12-90

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Signature H C Buchanan Date 5/15/90 LRB 53674 Page 12

May 15, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-5-EXT
Page 2 of 6

RECEIPT OF 241-B-110 CORE 16 SEGMENT 5

1. Record the sampler number provided on the chain-of-custody record for sample 90-013 and compare this sampler number to the number inscribed on the sampler.

   Sampler # 23

2. Receive and transfer the samplers and liners into B-Cell and extrude using SOP No 325-EXT-1, RECEIPT AND EXTRUSION OF CORE SAMPLES AT THE 325A SHIELDED FACILITY; 325-A-29, RECEIVING OF WASTE TANK SAMPLES IN ONSITE TRANSFER CASK; and PNL Technical Procedure PNL-ALO-130, PROCEDURE FOR THE RECEIPT AND INSPECTION OF SINGLE SHELL TANK (SST) SAMPLES.

EXTRUSION AND SAMPLING OF 241-B-110 CORE 16 SEGMENT 5

3. Weigh two labeled 20 mL prepared glass vials and caps for volatile organic analysis.

	110B-C16-VOL5	90-3522
Vial & Cap	N/A g	17.91 g
Balance	2	

4. Weigh a 250 mL and a 500 mL safety jar labeled 110B-C16-DL5 and 110B-C16-SOL5, respectively.

	110B-C16-DL5	110B-C16-SOL5
Jar + Lid	N/A g	353.56 g
Balance	2	

5. Weigh and label the plastic scintillation vial for particle size analysis. This vial should be labeled 90-3523.

	90-3523
Jar + Lid	7.64 g
Balance	2

Signature H.C. Buchanan Date 5/17/90 LRB 53674 Page 13

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May 15, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-5-EXT
Page 3 of 6

✓6. Measure cell temperature.

33 °C

Thermometer ID 01225 Thermocouple ID 6929

✓7. Weigh the extruder tray.

Extruder Tray 794.44 g

Balance 2

✓8. Prepare the camera for use.

✓9. Lift the bottom end of the liner and drain any oil from the liner into the dish. Be careful the sampler doesn't slide out of the liner.

✓10. When all of the oil has drained from the liner, remove the dish and inspect the oil collected to determine whether any sample is present.

Amount of Sample none Amount of oil 20-25 ml

✓11. Wipe the sampler with rags to remove any residual oil, if needed.

✓12. Remove the V-Ring seal from the valve end of sampler with a 3/32" allen wrench.

✓13. Move the extruder platform to the forward position. Set the torque and speed switches to 0 and the directional switch to brake.

✓14. Transfer the sampler to the extruder making sure that the valve closure wires are at top, put a wooden block under the rear of the sampler, insert push rod into the sampler, and remove wooden block. Seat and lock the push rod in back of extruder. Clamp the sampler into position.

✓15. Place the sampler valve wrench into closed valve slot. (Horizontal is closed and vertical is open.)

✓16. Place the weighed 250 mL jar 110B-C16-DL5 into position under the drain spout of the extruder collection tray to collect any free liquid from the sample.

✓17. Open the sampler valve. With the valve closure wires at top, turn the valve counterclockwise (towards the front) to open the valve. Confirm that the valve is open before proceeding.

Signature HC Buchanan Date 5/18/90 LRB 53674 Page 14

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May 15, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-5-EXT
Page 4 of 6

18. To extrude the sample, switch the directional switch to reverse and set the torque at less than or equal to 30. Do not exceed a torque setting of 301 Gradually increase the speed. Do not exceed a speed setting of 50.

19. Watch carefully as the rod and piston approach the valve, paying close attention that the extruder does not bind or catch. Continue extruding until the piston falls into the tray.

20. Transfer a 5 gm sample of the extruded solids and place it in the vial labeled 90-3522. Seal the vial as soon as possible. Time is of the essence. Weigh the sample. This sample will be used to determine the volatile organic components in the sample.

90-3522

Total	23.38 g	Delivered 5/25/90
Vial & Cap	17.91 g	[illegible] 5/25/90
Sample	5.47 g	

Balance 2

21. Drain the free liquid into the 250 mL jar 110B-C16-DL5. Seal and weigh. Measure the height (ht) of sample from the bottom of the jar in mm. Estimate the volume using: Volume = (ht - 5) mm X 50mL/15 mm.

110B-C16-DL5

Total	NA g	Volume no free liquid mL
Jar + Lid	g	
Sample	g	

Balance ___

22. Remove the extruder tray and weigh.

Total	1084.45 g
Extruder Tray	794.44 g
Sample	290.01 g

Balance 2

23. Position the extruder tray for photographs. Place a color bar beside the sample. Photograph the extruded sample. Record the picture number(s).

Signature HC Buchanan Date 5/18/90 LRB 53674 Page 15

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BNW LABORATORY NOTEBOOK NO. 53674

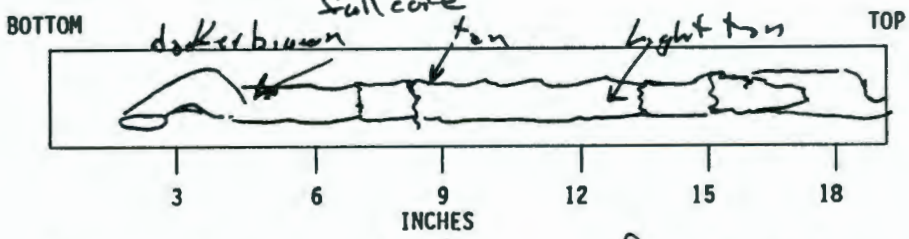
May 15, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-5-EXT
Page 5 of 6

Photograph Number(s) #5 #6

24. Measure the dimensions of the solids in the sample and describe the color, consistency, and other pertinant properties of the material.

Length 19" cm
Full core



Description clearly interstitial, weighs breaks during extrusion darker on lower end to light tan on upper end

25. Transfer about 1.0 g of extruded solids to a weighed vial labeled 90-3523. Deliver to 325B facility with its ARFS. This sample will be used to analyze particle size.

90-3523

Total 8.97 g
Vial & Cap 7.64 g
Sample 1.33 g

Balance 2

Date Delivered 5/25/90

26. Transfer the remaining sample to a weighed 500 mL jar labeled 110B-C16-SOL5. Seal and weigh.

110B-C16-SOL5

Total 628.59 g
Jar + Lid 353.56 g
Sample 275.03 g

Signature FC Buchanan Date 5/25/90 LRB 53674 ~~5/25/9~~ 5/25/90 Page 16

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BNW LABORATORY NOTEBOOK NO. 53674

May 15, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-5-EXT
Page 6 of 6

Balance 2

✓ 27. If there is greater than 25 ml of drainable liquids, transfer 5 ml of the drainable liquid to the organic analysis vial labeled 110B-C16-VOL5. Seal the vial and weigh. Transfer this vial and 90-3522 to either RT Steele or RW Stromatt as soon as possible.

110B-C16-VOL5

Total NA g no free liquid
Vial & Cap g
Sample g

Balance ___

Date Delivered NA

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JAN 23 '91
BNW LABORATORY NOTEBOOK NO. 53674

Signature HC Budowa Date 5/9/91 LRB 53674 Page 17

May 15, 1990
JM Tingey

Reference Tech Procedure: PNL-ALO-135

SINGLE SHELL TANK WASTE CHARACTERIZATION
HOMOGENIZATION

Tank ID: 110B
Riser ID: 6
Core ID: 16

Segment Number: 5
Shipment #: 90-S-005
WHC Sample ID: 90-013
325A Sample ID: 110B-C16-SOL5

HOMOGENIZATION

Start time 14:18
End time 14:33
Homogenization time 15 min

Visual observations: _____

ANALYSIS SAMPLES

TOP

Sample Identification: 90-3619
Bottle Weight : 8.30 g
Sample and Bottle : 10.649 g
Sample Weight : 2.349 g

BOTTOM

Sample Identification: 90-3620
Bottle Weight : 8.31 g
Sample and Bottle : 12.643 g
Sample Weight : 4.333 g

ANALYSIS

Sample Identification: _____
Sample and Bottle Wt.: _____ g
Bottle Weight : _____ g
Sample Weight : _____ g

BULK

Sample Identification: 110B-C16-5H
Sample and Bottle Wt.: 491.24 g
Bottle Weight : 263.55 g
Sample Weight : 227.69 g

Signature HC Buchanan Name HC Buchanan Date 5/21/90
Signature JM Tingey Name JM Tingey Date 5/21/90

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BNW LABORATORY NOTEBOOK NO. 53674
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9 1 1 2 1 0 7 3 4

BNW LABORATORY NOTEBOOK NO. 53672

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CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number 90-5-004 (2) Sample Number 90-009 (3) Supervisor* DCHartley

(4) Tank 110B (5) Riser #6 (6) Segment 1 (7) Core 018 (8) Cask Serial Number 100C

Radiation Survey Data:	(9) FIELD	(26) LABORATORY
Over Top Dose Rate	<.5mr/hr	<.5 mr/hr
Side Dose Rate	2mr/hr	2 mr/hr
Bottom Dose Rate	1mr/hr	1 mr/hr
Smearable Contamination	<Det. (alpha)	<DL (alpha)
	<Det. (beta-gamma)	<DL (beta-gamma)
	RP** Kolinski (Signature)	RP** TKE (Signature)

(10) Shipment Description:

A. Work Package Number	2W-89-01057/W
B. Cask Seal Number	N/A
C. Sampler Number Used	44
D. Date and Time Sampler Unseated	5-1-90, 1454
E. Expected Liquid Content	30%
F. Expected Solid Content	70%
G. Dose Rate Through Drill String	50 mr/hr.
H. Expected Sample Length	9"

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

Characterize sample per WHC-EP-0210 Waste Characterization Plan for the Hanford Site Single-Shell Tanks

(12) Field Comments:

(27) Laboratory Comments

(13) POINT OF ORIGIN	(14) SENDER NAME	(16) DATE RELEASED	(18) DESTINATION	(20) RECIPIENT NAME	(22) DATE RECEIVED
241-B	D.C. Hartley	5-7-90	325 Bldg.	TK Andrews	5-7-90
110	(15) SENDER SIGNATURE* DCHartley	(17) TIME RELEASED 0945	300 Area	(21) RECIPIENT SIGNATURE* TK Andrews	(23) TIME RECEIVED 10:45

(19) Seal Intact Upon Release? ☒ Yes ☐ No

(24) Seal Intact Upon Receipt? ☒ Yes ☐ No

(25) Seal Data Consistent with this Record?

Shipment No. ☒ Yes ☐ No Cask Seal No. ☒ Yes ☐ No Sample No. ☒ Yes ☐ No

DISTRIBUTION White – Office of Sample Management; Pink – Process Engineering R1-51; Yellow – Recipient of Sample; Goldenrod – Tank Farm Operations T4-07

LRB 53672 Page 129

BC-6000-309 (02/90)

C03-021

WORK PLACE COPY

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-1-EXT

Extrusion of Sample
Tank 241-B-110 Core 16 Segment 1

When you have finished an instruction, put a check in from of the item.

General Instructions:

1) Keep the sample in a sealed container as much as possible to prevent it from drying out.
3) After centrifuging the solids volume is the average of the high and low volumes of the solids.
3) All requested weights for sample + container are for a closed container.
4) Identify the instrument used for any measurement by reference number or by the calibration ID and provide the calibration expiration date.

M&TE List

✓ Balance 1:
Calib ID 388-06-01-016 Calib Exp Date 08-07-90
Location "A" Cell

✓ Balance 2:
Calib ID 362-06-01-035 Calib Exp Date 08-07-90
Location "B" Cell

✓ Thermocouple 1:
Calib ID 6929 Calib Exp Date 09-08-91
Type K Location "B" Cell

✓ Digital Thermometer:
Calib ID 01225 Calib Exp Date 7-12-90

Signature JM Richardson Date 5-10-90 LRB 53672 Page 130

BMW LABORATORY
JAN 23 '91
53672

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-1-EXT
Page 2 of 5

RECEIPT OF 241-B-110 CORE 16 SEGMENT 1

1. Record the identifications provided on the chain-of-custody record with the samples and compare to the numbers inscribed on the sampler.

   Sampler # 44

2. Receive and transfer the samplers and liners into B-Cell and extrude using SOP No 325-EXT-1, RECEIPT AND EXTRUSION OF CORE SAMPLES AT THE 325A SHIELDED FACILITY; 325-A-29, RECEIVING OF WASTE TANK SAMPLES IN ONSITE TRANFER CASK; and PNL Technical Procedure PNL-ALO-130, PROCEDURE FOR THE RECEIPT AND INSPECTION OF SINGLE SHELL TANK (SST) SAMPLES.

EXTRUSION AND SAMPLING OF 241-B-110 CORE 16 SEGMENT 1

3. Weigh two labeled 20 mL prepared glass vials and caps for volatile organic analysis.

	110B-C16-VOL1	110B-C16-VOS1
Vial & Cap	~~17.630~~ g CB 5-9-90	17.630 g
Balance	1	

4. Weigh a 250 mL and a 500 mL safety jar labeled 110B-C16-DL1 and 110B-C16-SOL1, respectively.

	110B-C16-DL1	110B-C16-SOL1
Jar + Lid	261.25 g	347.92 g
Balance	1	

5. Weigh the labeled plastic scintillation vial 110B-C16-PS1.

	110B-C16-PS1
Jar + Lid	6.803 g
Balance	1

JAN 23 '91
53672

Signature JM Richardson Date 5-10-90 LRB 53672 Page 131

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-1-EXT
Page 3 of 5

✓6. Measure cell temperature.

33 °C

Thermometer ID 01225 Thermocouple ID 6929

✓7. Weigh the extruder tray on balance 2.

Extruder Tray 294.47 g

__8. Prepare the camera for use.

✓9. Lift the bottom end of the liner and drain any oil from the liner into the dish. Be careful the sampler doesn't slide out of the liner.

✓10. When all of the oil has drained from the liner, remove the dish and inspect the oil collected to determine whether any sample is present.
Amount of Sample 15 mL Amount of oil 15 mL

✓11. Wipe the sampler with rags to remove any residual oil, if needed.

✓12. Remove the V-Ring seal from the valve end of sampler with a 3/32" allen wrench.

✓13. Move the extruder platform to the forward position. Set the torque and speed switches to 0 and the directional switch to brake.

✓14. Transfer the sampler to the extruder making sure that the valve closure wires are at top, put a wooden block under the rear of the sampler, insert push rod into the sampler, and remove wooden block. Seat and lock the push rod in back of extruder. Clamp the sampler into position.

✓15. Place the sampler valve wrench into closed valve slot. (Horizontal is closed and vertical is open.)

✓16. Place the weighed 250 mL jar 110B-C16-DL1 into position under the drain spout of the extruder collection tray to collect any free liquid from the sample.

✓17. Open the sampler valve. With the valve closure wires at top, turn the valve counterclockwise (towards the front) to open the valve. Confirm that the valve is open before proceeding.

✓18. To extrude the sampler, switch the directional switch to reverse and set the torque at less than or equal to 30. Do not exceed a torque setting of 30! Gradually increase the speed. Do not exceed a speed setting of 50.

Signature JM Tingey Date 5-10-90 LRB 53672 Page 132

BNW LABORATORY NOTEBOOK NO 53672 JAN 2 91

BNW LABORATORY COPIED FOR

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-1-EXT
Page 4 of 5

✓19. Watch carefully as the rod and piston approach the valve, paying close attention that the extruder does not bind or catch. Continue extruding until the piston falls into the tray.

✓20. Transfer a 5 gm sample of the extruded solids and place it in the vial labeled 110B-C16-VOS1. Seal the vial as soon as possible. Time is of the essence. Weigh the sample.

	110B-C16-VOS1	
Total	22.66	g
Vial & Cap	17.630	g
Sample	5.030	g

Balance ✓

✓21. Drain the free liquid into the 250 mL jar 110B-C16-DL1. Seal and weigh. Measure the height (ht) of sample from the bottom of the jar in mm. Estimate the volume using: Volume = (ht - 5) mm X 50mL/15 mm.

Total		g	Volume	NA mL
Jar + Lid	216.25	g	no free liquid	
Sample		g		

Balance NA

✓22. Remove the extruder tray and weigh.

Total	939.28	g
Extruder Tray	794.47	g
Sample	144.81	g

Balance 2

✓23. Position the extruder tray for photographs. Place a color bar beside the sample. Photograph the extruded sample. Record the picture number(s).

Photograph Number(s) #2 & #3

✓24. Measure the dimensions of the solids in the sample and describe.

Length 5-11-90 ~~11"~~ 9" in ~~cm~~ difficult to measure, because sample chunks were on end with 1" pieces at lower end & extrusion

Description Top portion is dark in color going to lighter on lower end. Small chunk ~1" extruded 1st then long void space with sample at top of extrusion

Signature JM Richardson Date 5-10-90 LRB 53672 Page 133

C03-025

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9112130738

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-1-EXT
Page 5 of 5

✓25. Transfer about 1.0 g of extruded solids to a weighed vial labeled 110B-C16-PS1. Deliver to 325B facility with its RFAS.

110B-C16-PS1

Total 7.770 g
Vial & Cap 6.803 g
Sample 0.967 g

Balance 2

Date Delivered 5/11/90

✓26. Transfer the remaining sample to a weighed 500 mL jar labeled 110B-C16-SOL1. Seal and weigh.

110B-C16-SOL1

Total 485.52 g
Jar + Lid 347.92 g
Sample 137.60 g

Balance 2

✓27. If there is greater than 25 ml of drainable liquids, transfer 5 ml of the drainable liquid to the organic analysis vial labeled 110B-C16-VOL1. Seal the vial and weigh. Transfer this vial and 110B-C16-VOS1 to either RT Steele or RW Stromatt as soon as possible.

110B-C16-VOL1

Total ~~N/A~~ g no drainable liquid
Vial & Cap ~~N/A~~ g
Sample ~~N/A~~ g

Balance ___

Date Delivered NA

110B-C16-VOS1 Delivered 5/11/90 g 5/11/90

Signature Jm Richardson Date 5-10-90 LRB 53672 Page 134

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May 15, 1990
JM Tingey

Reference Tech Procedure: PNL-ALO-135

SINGLE SHELL TANK WASTE CHARACTERIZATION
HOMOGENIZATION

Tank ID: 110B
Riser ID: 6
Core ID: 16

Segment Number: 1
Shipment #: 90-S-004
WHC Sample ID: 90-009
325A Sample ID: 110B-C16-SOL1

HOMOGENIZATION

Start time 10:55
End time 11:10
Homogenization time 15 min

Visual observations: clearing in texture, dark brown in color
pumped and scraped from mixing vessel

ANALYSIS SAMPLES

TOP

Sample Identification: N/A
Bottle Weight : _____ g
Sample and Bottle : _____ g
Sample Weight : _____ g

BOTTOM

Sample Identification: N/A
Bottle Weight : _____ g
Sample and Bottle : _____ g
Sample Weight : _____ g

ANALYSIS

Sample Identification: _____
Sample and Bottle Wt.: _____ g
Bottle Weight : _____ g
Sample Weight : _____ g

BULK

Sample Identification: 110B-C16-1H
Sample and Bottle Wt.: 369.10 g
Bottle Weight : 264.58 g
Sample Weight : 104.68 g

Signature Elmer H. Shade Name Elmer H. Shade Date 5/16/90
Signature Joel M Tingey Name Joel M Tingey Date 5/16/90

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C03-077

BNW LABORATORY NOTEBOOK NO. 53672
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PENETRATION RESISTANCE DATA SHEET

Date: 5/15/90

Measurement Obtained By: Shade / Buchanan

Sample No.: 1108 C16 SOL1

Sample Description:

Diameter: 2 1/2 Height: ~1 1/2 - 2"

Physical Appearance: chunky with air spaces, dark brown in color

Remarks: as excavated surface conditions

Penetrometer No.: CT-421A

Diameter of End: 1"

Penetration Resistance: 61 psi

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J T 1/21/91

Project No. _____ Date of Work _____

Entered By J M Tingey Date 1/21/99

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

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53672 JAN 23 '91

9 1 1 2 1 0 7 4 2

BNW LABORATORY INTERBOUND NO. 53672 JAN 23 '91

COPIES FOR PNL RECORDS CENTER

CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number 90-S-004 (2) Sample Number 90-010 (3) Supervisor* D.L. Hartley

(4) Tank 110B (5) Riser 6 (6) Segment 2 (7) Core 018 (8) Cask Serial Number C 1026

Radiation Survey Data:	(9) FIELD	(26) LABORATORY
Over Top Dose Rate	<.5 mr/Hr	<.5 mR/HR
Side Dose Rate	2 mr/Hr	2 mR/HR
Bottom Dose Rate	1 mr/Hr	1 mR/HR
Smearable Contamination	<DET. (alpha)	<DL (alpha)
	<DET (beta-gamma)	<DL (beta-gamma)
	RP* K.J. Koch (Signature)	RP** T.W. Hoyt (Signature)

(10) Shipment Description:

A. Work Package Number	2W-89-0105/W
B. Cask Seal Number	N/A
C. Sampler Number Used	#45
D. Date and Time Sampler Unseated	5-4-90, 1055
E. Expected Liquid Content	30%
F. Expected Solid Content	70%
G. Dose Rate Through Drill String	40 mr/Hr.
H. Expected Sample Length	19"

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

Characterize sample per WHC-EP-0210 Waste Characterization Plan for the Hanford Site Single-Shell Tanks

C03-029

(12) Field Comments:

(27) Laboratory Comments

(13) POINT OF ORIGIN	(14) SENDER NAME	(16) DATE RELEASED	(18) DESTINATION	(20) RECIPIENT NAME	(22) DATE RECEIVED
241-B 110	D.L. Hartley	5-7-90	325 Bldg, 300 Area	T.K. Andrews	5-7-90
	(15) SENDER SIGNATURE* D.L. Hartley	(17) TIME RELEASED 0945		(21) RECIPIENT SIGNATURE* T.K. Andrews	(23) TIME RECEIVED 10:45

(19) Seal Intact Upon Release? ☒ Yes ☐ No

(24) Seal Intact Upon Receipt? ☒ Yes ☐ No

(25) Seal Data Consistent with this Record?
Shipment No. ☒ Yes ☐ No
Cask Seal No. ☒ Yes ☐ No
Sample No. ☒ Yes ☐ No

DISTRIBUTION White – Office of Sample Management; Pink – Process Engineering, R1-51; Yellow – Recipient of Sample; Goldenrod – Tank Farm Operations, T4-07

LRB 53672 Page 137

BC-6000-309 (02/90)

WORK PLACE COPY

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-2-EXT

Extrusion of Sample
Tank 241-B-110 Core 16 Segment 2

When you have finished an instruction, put a check in from of the item.

General Instructions:

1) Keep the sample in a sealed container as much as possible to prevent it from drying out.
3) After centrifuging the solids volume is the average of the high and low volumes of the solids.
3) All requested weights for sample + container are for a closed container.
4) Identify the instrument used for any measurement by reference number or by the calibration ID and provide the calibration expiration date.

M&TE List

✓ Balance 1:
Calib ID 388-06-01-016 Calib Exp Date 08-07-90
Location "A" Cell

✓ Balance 2:
Calib ID 362-06-01-035 Calib Exp Date 08-07-90
Location "B" Cell

✓ Thermocouple 1:
Calib ID 6929 Calib Exp Date 09-08-91
Type K Location "B" Cell

✓ Digital Thermometer:
Calib ID 01225 Calib Exp Date 7-12-90

BNW LABORATORY NOTEBOOK
53672
JAN 2 0 '91

Signature JM Richardson Date 5-9-90 LRB 53672 Page 138

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-2-EXT
Page 2 of 5

RECEIPT OF 241-B-110 CORE 16 SEGMENT 2

✓1. Record the identifications provided on the chain-of-custody record with the samples and compare to the numbers inscribed on the sampler.

Sampler # 45

✓2. Receive and transfer the samplers and liners into B-Cell and extrude using SOP No 325-EXT-1, RECEIPT AND EXTRUSION OF CORE SAMPLES AT THE 325A SHIELDED FACILITY; 325-A-29, RECEIVING OF WASTE TANK SAMPLES IN ONSITE TRANSFER CASK; and PNL Technical Procedure PNL-ALO-130, PROCEDURE FOR THE RECEIPT AND INSPECTION OF SINGLE SHELL TANK (SST) SAMPLES.

EXTRUSION AND SAMPLING OF 241-B-110 CORE 16 SEGMENT 2

✓3. Weigh two labeled 20 mL prepared glass vials and caps for volatile organic analysis.

	110B-C16-VOL2	
~~Vial & Cap~~	_____ g	No Drainable Liquid 5/9/89
	110B-C16-VOS2	
Vial & Cap	17.782 g	
Balance	1	

✓4. Weigh a 250 mL and a 500 mL safety jar labeled 110B-C16-DL2 and 110B-C16-SOL2, respectively.

	110B-C16-DL2	110B-C16-SOL2
Jar + Lid	263.85 g	349.51 g
Balance	1	

✓5. Weigh the labeled plastic scintillation vial 110B-C16-PS2.

	110B-C16-PS2
Jar + Lid	6.858 g
Balance	1

Signature JM Richardson Date 5-9-90 LRB 53672 Page 139

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BNW LABORATORY NOTEBOOK NO. 53672
9112170744
C03-031

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-2-EXT
Page 3 of 5

✓6. Measure cell temperature.

33 °C

Thermometer ID 01225 Thermocouple ID 6929

✓7. Weigh the extruder tray on balance 2.

Extruder Tray 794.49 g

✓8. Prepare the camera for use.

✓9. Lift the bottom end of the liner and drain any oil from the liner into the dish. Be careful the sampler doesn't slide out of the liner.

✓10. When all of the oil has drained from the liner, remove the dish and inspect the oil collected to determine whether any sample is present.

Amount of Sample None Amount of oil 10-15 ml

✓11. Wipe the sampler with rags to remove any residual oil, if needed.

✓12. Remove the V-Ring seal from the valve end of sampler with a 3/32" allen wrench.

✓13. Move the extruder platform to the forward position. Set the torque and speed switches to 0 and the directional switch to brake.

✓14. Transfer the sampler to the extruder making sure that the valve closure wires are at top, put a wooden block under the rear of the sampler, insert push rod into the sampler, and remove wooden block. Seat and lock the push rod in back of extruder. Clamp the sampler into position.

✓15. Place the sampler valve wrench into closed valve slot. (Horizontal is closed and vertical is open.)

✓16. Place the weighed 250 mL jar 110B-C16-DL2 into position under the drain spout of the extruder collection tray to collect any free liquid from the sample.

✓17. Open the sampler valve. With the valve closure wires at top, turn the valve counterclockwise (towards the front) to open the valve. Confirm that the valve is open before proceeding.

✓18. To extrude the sample, switch the directional switch to reverse and set the torque at less than or equal to 30. Do not exceed a torque setting of 30! Gradually increase the speed. Do not exceed a speed setting of 50.

Signature [signature] Date 5-9-90 LRB 53672 Page 140

BNW LABORATORY NOTEBOOK 53672 JAN 2 7 91

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-2-EXT
Page 4 of 5

✓ 19. Watch carefully as the rod and piston approach the valve, paying close attention that the extruder does not bind or catch. Continue extruding until the piston falls into the tray.

✓ 20. Transfer a 5 gm sample of the extruded solids and place it in the vial labeled **110B-C16-VOS2**. Seal the vial as soon as possible. Time is of the essence. Weigh the sample.

	110B-C16-VOS2	
Total	33.270	g
Vial & Cap	27.782	g
Sample	5.488	g

Balance 2

✓ 21. Drain the free liquid into the 250 mL jar **110B-C16-DL2**. Seal and weigh. Measure the height (ht) of sample from the bottom of the jar in mm. Estimate the volume using: Volume = (ht - 5) mm X 50mL/15 mm.

Total	NA	g
Jar + Lid		g
Sample		g

Volume NA mL

Balance ___

✓ 22. Remove the extruder tray and weigh.

Total	1103.18	g
Extruder Tray	794.49	g
Sample	308.69	g

Balance 2

✓ 23. Position the extruder tray for photographs. Place a color bar beside the sample. Photograph the extruded sample. Record the picture number(s).

Photograph Number(s) #9 #10 #11 #12

✓ 24. Measure the dimensions of the solids in the sample and describe.

Length 19" ~~cm~~ in 5-9-90

Description Soft core light tan on lower end changing in color to a dark brown on upper portion some dark and light streaking in upper 1/2" cleaning in texture

Signature JM Richardson Date 5-9-90 LRB 53672 Page 141

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BNWL LABORATORY NOTEBOOK NO. 53672

C03-033

May 8, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-2-EXT
Page 5 of 5

25. Transfer about 1.0 g of extruded solids to a weighed vial labeled 110B-C16-PS2. Deliver to 325B facility with its ARFS.

110B-C16-PS2

Total 8.660 g
Vial & Cap 6.858 g
Sample 1.802 g

Balance 2

Date Delivered 5/11/90

26. Transfer the remaining sample to a weighed 500 mL jar labeled 110B-C16-SOL2. Seal and weigh.

110B-C16-SOL2

Total 642.80 g
Jar + Lid 349.51 g
Sample 293.29 g

Balance 2

27. If there is greater than 25 ml of drainable liquids, transfer 5 ml of the drainable liquid to the organic analysis vial labeled 110B-C16-VOL2. Seal the vial and weigh. Transfer this vial and 110B-C16-VOS2 to either RT Steele or RW Stromatt as soon as possible.

110B-C16-VOL2

Total ____ g
Vial & Cap ____ g
Sample ____ g

No Drainable Liquid
5/9/89 JMT

Balance ____

Date Delivered 5/11/90 110B-C16-VOS2 only

Signature JM Richardson Date 5-9-90 LRB 53672 Page 142

BNW LABORATORY NOTEBOOK 53672
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JAN 2 3 31

May 13, 1990
JM Tingey

Reference Tech Procedure: PNL-ALO-135

SINGLE SHELL TANK WASTE CHARACTERIZATION
HOMOGENIZATION

Tank ID: 110B
Riser ID: 6
Core ID: 16

Segment Number: 2
Shipment #: 90-S-004
WHC Sample ID: 90-010
325A Sample ID: 110B-C16-2SOL

HOMOGENIZATION

Start time 0900
End time 0915
Homogenization time 15 min

Visual observations: Light colored tomato brown slurry

ANALYSIS SAMPLES

TOP
Sample Identification: N/A
Bottle Weight : _____ g
Sample and Bottle : _____ g
Sample Weight : _____ g

BOTTOM
Sample Identification: N/A
Bottle Weight : _____ g
Sample and Bottle : _____ g
Sample Weight : _____ g

ANALYSIS
Sample Identification: _____
Sample and Bottle Wt.: _____ g
Bottle Weight : _____ g
Sample Weight : _____ g

BULK
Sample Identification: 110B-C16-2H
Sample and Bottle Wt.: 508.67 g
Bottle Weight : 263.16 g
Sample Weight : 245.51 g

Signature TK Andrews Name TK Andrews Date 5-14-90
Signature JM Tingey Name JM Tingey Date 5-14-90

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C03-035

BNW LABORATORY NOTEBOOK NO. 53672
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9112150748

BNW LABORATORY NOTEBOOK

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53672 - JAN 25 '91

CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number 90-S-004 (2) Sample Number 90-011 (3) Supervisor* DCHartley

(4) Tank 110B (5) Riser 6 (6) Segment 3 (7) Core 018 (8) Cask Serial Number C1023

Radiation Survey Data:	(9) FIELD	(26) LABORATORY
Over Top Dose Rate	<.5 mr/Hr	<.5 mR/Hr
Side Dose Rate	2 mr/Hr	2 mR/HR
Bottom Dose Rate	1 mr/Hr	1 mR/HR
Smearable Contamination:	<DET. (alpha)	<DL (alpha)
	<DET. (beta-gamma)	<DL (beta-gamma)
	RP* J Kovach (Signature)	RPT* Frank Hagley (Signature)

(10) Shipment Description:

A. Work Package Number	2W-89-01057/W
B. Cask Seal Number	N/A
C. Sampler Number Used	#41
D. Date and Time Sampler Unseated	5-4-90, 1432
E. Expected Liquid Content	30%
F. Expected Solid Content	70%
G. Dose Rate Through Drill String	48 mr/Hr.
H. Expected Sample Length	19"

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

Characterize sample per WHC-EP-0210 Waste Characterization Plan for the Hanford Site Single-Shell Tanks

(12) Field Comments:

(27) Laboratory Comments

(13) POINT OF ORIGIN	(14) SENDER NAME	(16) DATE RELEASED	(18) DESTINATION	(20) RECIPIENT NAME	(22) DATE RECEIVED
R41-B	D.C. Hartley	5-7-90	325 Bldg.	TK Andrews	5-7-90
110	(15) SENDER SIGNATURE* DCHartley	(17) TIME RELEASED 0945	300 Area	(21) RECIPIENT SIGNATURE* TKAndrews	(23) TIME RECEIVED 10:45

(19) Seal Intact Upon Release? ☒ Yes ☐ No

(24) Seal Intact Upon Receipt? ☒ Yes ☐ No

(25) Seal Data Consistent with this Record?

Shipment No.	Cask Seal No.	Sample No.
☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No

DISTRIBUTION White – Office of Sample Management; Pink – Process Engineering R1-51; Yellow – Recipient of Sample; Goldenrod – Tank Farm Operations, T6-07

BC-6000-309 (02/90)

LRB 53672 Page 144

C03-036

WORK PLACE COPY

May 9, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-3-EXT
Page 1 of 6

Extrusion of Sample
Tank 241-B-110 Core 16 Segment 3

When you have finished an instruction, put a check in from of the item.

General Instructions:

1) Keep the sample in a sealed container as much as possible to prevent it from drying out.
3) After centrifuging the solids volume is the average of the high and low volumes of the solids.
3) All requested weights for sample + container are for a closed container.
4) Identify the instrument used for any measurement by reference number or by the calibration ID and provide the calibration expiration date.

M&TE List

✓ Balance 1:
Calib ID 388-06-01-016 Calib Exp Date 08-07-90
Location "A" Cell

✓ Balance 2:
Calib ID 362-06-01-035 Calib Exp Date 08-07-90
Location "B" Cell

✓ Thermocouple 1:
Calib ID 6929 Calib Exp Date 09-08-91
Type K Location "B" Cell

✓ Digital Thermometer:
Calib ID 01225 Calib Exp Date 7-12-90

Signature HC Buchanan Date 5/18/90 LRB 53672 Page 145

C03-037

Eng.-Process Engineering R.S.
LRB 53672 Page 144
JAN 23 '91
53672

RECEIPT OF 241-B-110 CORE 16 SEGMENT 3

✓1. Record the identifications provided on the chain-of-custody record with the samples and compare to the numbers inscribed on the sampler.

Sampler # 41

✓2. Receive and transfer the samplers and liners into B-Cell and extrude using SOP No 325-EXT-1, RECEIPT AND EXTRUSION OF CORE SAMPLES AT THE 325A SHIELDED FACILITY; 325-A-29, RECEIVING OF WASTE TANK SAMPLES IN ONSITE TRANSFER CASK; and PNL Technical Procedure PNL-ALO-130, PROCEDURE FOR THE RECEIPT AND INSPECTION OF SINGLE SHELL TANK (SST) SAMPLES.

EXTRUSION AND SAMPLING OF 241-B-110 CORE 16 SEGMENT 3

✓3. Weigh two labeled 20 mL prepared glass vials and caps for volatile organic analysis.

	110B-C16-VOL3	110B-C16-VOS3
Vial & Cap	N/A g	17.77 g
Balance	✓	

✓4. Weigh a 250 mL and a 500 mL safety jar labeled 110B-C16-DL3 and 110B-C16-SOL3, respectively.

	110B-C16-DL3	110B-C16-SOL3
Jar + Lid	262.60 g	345.58 g
Balance	✓	

✓5. Weigh the labeled plastic scintillation vial 110B-C16-PS3.

	110B-C16-PS3
Jar + Lid	6.67 g
Balance	✓

Signature HC Buchanan Date 5/11/90 LRB 53672 Page 146

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May 9, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-3-EXT
Page 3 of 6

✓ 6. Measure cell temperature.

35 °C

Thermometer ID ~~6929~~ 01225 CB 5/14/90 Thermocouple ID ~~01225~~ 6929 CB 5/14/90

✓ 7. Weigh the extruder tray.

Extruder Tray 794.46 g

Balance 2

✓ 8. Prepare the camera for use.

✓ 9. Lift the bottom end of the liner and drain any oil from the liner into the dish. Be careful the sampler doesn't slide out of the liner.

✓ 10. When all of the oil has drained from the liner, remove the dish and inspect the oil collected to determine whether any sample is present.

Amount of Sample ~~15 ml~~ CB 5/11/90 none Amount of oil 15 ml

✓ 11. Wipe the sampler with rags to remove any residual oil, if needed.

✓ 12. Remove the V-Ring seal from the valve end of sampler with a 3/32" allen wrench.

✓ 13. Move the extruder platform to the forward position. Set the torque and speed switches to 0 and the directional switch to brake.

✓ 14. Transfer the sampler to the extruder making sure that the valve closure wires are at top, put a wooden block under the rear of the sampler, insert push rod into the sampler, and remove wooden block. Seat and lock the push rod in back of extruder. Clamp the sampler into position.

✓ 15. Place the sampler valve wrench into closed valve slot. (Horizontal is closed and vertical is open.)

✓ 16. Place the weighed 250 mL jar 110B-C16-DL3 into position under the drain spout of the extruder collection tray to collect any free liquid from the sample.

✓ 17. Open the sampler valve. With the valve closure wires at top, turn the valve counterclockwise (towards the front) to open the valve. Confirm that the valve is open before proceeding.

Signature H. Craig Bachmann Date 5/11/90 LRB 53672 Page 147

9112100752
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May 9, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-3-EXT
Page 4 of 6

✓18. To extrude the sample, switch the directional switch to reverse and set the torque at less than or equal to 30. Do not exceed a torque setting of 30! Gradually increase the speed. Do not exceed a speed setting of 50.

✓19. Watch carefully as the rod and piston approach the valve, paying close attention that the extruder does not bind or catch. Continue extruding until the piston falls into the tray.

✓20. Transfer a 5 gm sample of the extruded solids and place it in the vial labeled 110B-C16-VOS3. Seal the vial as soon as possible. Time is of the essence. Weigh the sample.

	110B-C16-VOS3
Total	23.35 g
Vial & Cap	17.77 g
Sample	5.58 g

Balance 2

✓21. Drain the free liquid into the 250 mL jar 110B-C16-DL3. Seal and weigh. Measure the height (ht) of sample from the bottom of the jar in mm. Estimate the volume using: Volume = (ht - 5) mm X 50mL/15 mm.

	110B-C16-DL3		
Total	N/A g	Volume	no liquid mL
Jar + Lid	N/A g		
Sample	N/A g		

Balance ___

✓22. Remove the extruder tray and weigh.

Total	1108.22 g
Extruder Tray	794.46 g
Sample	313.76 g

Balance 2

✓23. Position the extruder tray for photographs. Place a color bar beside the sample. Photograph the extruded sample. Record the picture number(s).

Signature H. Craig Buchanan Date 5/11/90 LRB 53672 Page 148

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May 9, 1990
JM Tingey

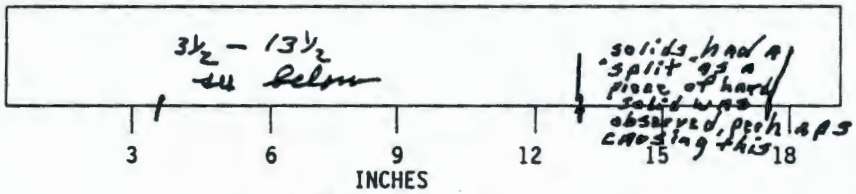
Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-3-EXT
Page 5 of 6

Photograph Number(s) 1 & 2

24. Measure the dimensions of the solids in the sample and describe the color, consistency, and other pertinant properties of the material.

Length 20 19" cm 5/11/90

BOTTOM TOP



Description light "tan"; granular, chunks on extruder tray about 1-2" long each.

25. Transfer about 1.0 g of extruded solids to a weighed vial labeled 110B-C16-PS3. Deliver to 325B facility with its ARFS.

110B-C16-PS3

Total 8.19 g
Vial & Cap 6.67 g
Sample 1.52 g

Balance 2

Date Delivered 5/25/90

26. Transfer the remaining sample to a weighed 500 mL jar labeled 110B-C16-SOL3. Seal and weigh.

110B-C16-SOL3

Total 638.24 g
Jar + Lid 345.58 g
Sample 292.66 g

Balance 2

Signature H. Craig Buchanan Date 5/11/90 LRB 53672 Page 149

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9112130754

May 9, 1990
JM Tingey

Reference Tech Procedure: WHC-053-1
Test Instructions: 110B-C16-3-EXT
Page 6 of 6

__27. If there is greater than 25 ml of drainable liquids, transfer 5 ml of the drainable liquid to the organic analysis vial labeled 110B-C16-VOL3. Seal the vial and weigh. Transfer this vial and 110B-C16-VOS3 to either RT Steele or RW Stromatt as soon as possible.

110B-C16-VOL3

Total _____g

Vial & Cap _____g

Sample _____g

Balance ____

NA

Date Delivered 5/25/90 110B-C16-VOS3 only

BATTELLE PNL LABORATORY RECORDS CENTER
JAN 2 0 1991
53672

Signature JM Tingey Date 5/25/90 LRB 53672 Page 150

May 15, 1990
JM Tingey

Reference Tech Procedure: PNL-ALO-135
Page 1 of 1

SINGLE SHELL TANK WASTE CHARACTERIZATION
HOMOGENIZATION

Tank ID: 110B
Riser ID: 6
Core ID: 16

Segment Number: 3
Shipment #: 90-S-004
WHC Sample ID: 90-011
325A Sample ID: 110B-C16-SOL3

HOMOGENIZATION

Start time 14:41
End time 14:56
Homogenization time 15 min

Visual observations: light tan in color, creamy texture easily poured from homogenization can

ANALYSIS SAMPLES

TOP
Sample Identification: 90-3617
Bottle Weight : 8.31 g
Sample and Bottle : 10.96 g
Sample Weight : 2.650 g

BOTTOM
Sample Identification: 90-3618
Bottle Weight : 8.35 g
Sample and Bottle : 11.04 g
Sample Weight : 2.69 g

ANALYSIS
Sample Identification: ____
Sample and Bottle Wt.: ____ g
Bottle Weight : ____ g
Sample Weight : ____ g

BULK
Sample Identification: 110B-C16-3H
Sample and Bottle Wt.: 510.80 g
Bottle Weight : 262.72 g
Sample Weight : 248.08 g

Signature HC Buchanan Name HC Buchanan Date 5/17/90
Signature JM Tingey Name JM Tingey Date 5/17/90

LRB 53672 Page 151

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PENETRATION RESISTANCE DATA SHEET

Date: 15 May 90

Measurement Obtained By: Elmer Shade / Craig Buchanan

Sample No.: 110B C16 S0C3

Sample Description:

Diameter: 2 1/2" Height: ~3 1/2"

Physical Appearance: chunks, with air void spaces,

Remarks: smooth appearences, as extruded

Penetrometer No.: CT-421A

Diameter of End: 1"

Penetration Resistance: < 1 psi

LBB 53672 Page 152

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C03-044

C4 - 325B HOT CELL SST

CHARACTERIZATION DATA LRB

C04-001

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BNW LABORATORY NOTEBOOK NO. 52917

S/

Core 4 Sample Distribution

	Id.	Vol	D.I.	Del.To:	ACT	Anal.
	CA-COMP	~60ml	NONE	313	< 1	HG
02	↓	↓	↓	↓	↓	↓
03	↓	↓	↓	↓	↓	↓
04	↓	↓	↓	↓	↓	↓
05	↓	↓	↓	↓	↓	↓

Core 16 1 (Particle Size)

Took out Particle size samples for 90-3515_ seq. 1 + 90-3517_seq 2

Core ~~16~~ 1 (VOA's)

5/15/90

90-3514-1	90-3514-2	90-3514-3
24.6797	25.5342	25.4716
23.7569	24.5447	24.4702
0.9228 g.	0.9895 g.	1.0014 g.

90-3516-1	90-3516-2	90-3516-3
25.9894	25.6652	24.5008
25.0255	24.6732	23.4447
0.9639 g.	0.9920 g.	1.0561 g.

Core 9 Comp Mercury

5/16/90

90-1257-01	90-1257-02	90-1257-03	90-1257-04	90-1257-05
96.5943	89.9425	96.3408	.0497 ml.	Blank
96.3790	89.6425	96.0843	H3 Spike (1ppm)	
0.2153 g.	.3000 g.	0.2565 g.		
		+		
		.0497 ml. H3 Spike (1ppm)		

All of the samples were given to John Enman (313) for Analysis.

50λ pipet DIW 22°C

.0496 x = .0496
.0497 s = .0001
.0496 R = .020
.0495 N = 5
.0497
Avg = .0497 ml

22°C

5-17-90 R Stule

Reviewed pages 106-117 for completeness, accuracy, legibility. All calculations were checked this time No Errors found.

Project No. _____ Date of Work _____

Entered By _____ Date _____

Disclosed To and Understood By **C04-002**

Signed 1. _____ Date _____

2. _____ Date _____

118 5/17/90

Core 10-COMP (Mercury)

90-1279-01	90-1279-02	90-1279-03.	90-1279-04	90-1279-D5
94.1560	93.4905	97.2961	.0498 ml.	BLANK
93.9398	93.1948	97.0454	H3-Spike (1ppm)	
0.2162 g.	0.2957 g.	0.2507 g.		

+

.0498 ml. H3-Spike. (1PPM)

50λ Pipet
.0497 x̄ = .04977
.0496 s = .0001
.0496 R = .17%
.0498
.0497
Del = .0498 ml

EP TOX Core 2 - Seq. 2 (Mercury)

5/21/90

90-2555 - A5, A6, B5, D5, + D6.
25 mls. Diluted to 100 mls.
30 mls. of Reagents Added
10.0608 ml. Spike (H-4) added to A6 + D6.
Digested for 2 hrs. at 95°C in waterbath.
All sample was taken to Lab. 313.

5 ml. Pipet
DIW. 25°C
5.0219 x̄ = 5.0155 g.
5.0226 s = .0078
5.0120 R = .15%
5.0038 N = 5
5.0171
Del. = 5.0304 ml

EP TOX Core 2 - Seq 5 (Mercury)

5/22/90

90-2556 - A5, A6, B5, D5, + D6
25 mls Diluted to 100 mls.
30 mls of Reagents added
* 9.9903 mls. of Spike (H-4) Added to A6 and D6 * P.96 LRB #52909
Digested for 2 hrs. at 95°C in water bath.
All of samples were taken to Lab 313.

EP TOX Core 3 - COMP. Mercury

90-2557 - A5
Done with 2556 exactly the same way.

5/30/90

Core 16 V.O.A.'S
90-3518

#1	#2	#3
25.9141	25.0917	25.7315
25.0260	24.1526	24.6490
0.8881 g	0.9391 g	1.0825 g

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Core 16

5/30/90 A.H.

90-3520

#1	#2	#3
25.3402	25.4377	25.1918
24.2857	24.4924	24.1408
1.0545g	0.9453g	1.0510g

90-3522

#1	#2	#3
25.5582	24.9052	24.7878
24.5656	23.8959	23.7813
0.9926g	1.0093g	1.0065g

Samples were taken out and delivered to room 30~~2~~1 for analysis. A.H. 5/30/90

5/31/90 A.H.

5/31/90 Core 16 Particle Size

Took out particle size samples on 90-3519, 90-3521, 90-3523.

Battelle
Pacific Northwest Laboratories

Project Number _____

Internal Distribution

PNO
File/LB

Date May 29, 1990

To T.E. Jones

From R.T. Steele RTS

Subject Core 16 Homogenization Check Samples

T. Jones
Core 16 Homo. check
5/29/90

We received approximately 2 1/2 grams each of samples 90-3617, 90-3618, and 90-3619. We received about 4 1/2 grams of 90-3620. Test Instruction number SST-099 directed the A-Hotcells to send me 2 1/2 grams of material to analyze. This is not enough to complete all of the work requested on these samples. For future reference it would be advantageous to receive 5 grams of material for each sample if both duplicate fusions and weight percent solids data are requested.

Per test instructions SST-102 and SST-103 all four samples are to be fused in duplicate and samples 90-3617 and 90-3619 are to be analyzed for wt % solids data, again in duplicate. Please consider the following proposal to try and cover all basis:

Sample Id	Duplicate fusion	Duplicate wt% solids
90-3617	yes	yes (one only)
90-3618	yes	yes (one only)
90-3619	yes	no
90-3620	yes	yes

Please let me know if these changes would adversely impact this program. We are ready to start working on this material.

File:
Please proceed as you have outlined

Proje
Ente
Discl
Sign

Dave Jones

Date

P. 119 LRB #52917

C04-004

FOR PNL
JAN 23 '91
52917

Core 16 (Fusions)

5/31/90 A.H.

90-3617-A1	Ni #22	90-3617-A2	Ni #23	90-3617-A3
41.6019	41.2866	40.7563	41.4843	Blank
41.0698	41.0698	41.2268	41.2268	
0.5321 g wet	0.2168 g dry	0.5295 g wet	0.2575 g dry	

flux: 0.6545 g KNO_3 #22 2.0992 g KOH \ flux: 0.5227 g KNO_3 #23 2.0887 g KOH \ flux: 0.5050 g KNO_3 Blk. 2.1710 g KOH

S.H. 5/31/90

6-4-90 A.H. Wt. % solids

90-3617-H1		90-3618-H1	
9.0547	8.4568	9.2679	8.6756
8.0449	8.0449	8.2856	8.2856
1.0098 g wet	0.4119 g dry	0.9823 g wet	0.3900 g dry

90-3620-H1		90-3620-H2	
9.1519	8.6309	8.7980	8.4471
8.2375	8.2375	8.0367	8.0367
0.9144 g wet	0.3934 g dry	0.9613 g wet	0.4104 g dry

Samples were put in the oven on 5-31-90 at 1530 hrs. temp. 104°C and were taken out on 6-1-90 at 0845 hrs. temp. 107°C.

6-5-90 A.H. Particle size sample numbers 90-3519, 90-3521, and 90-3523 were delivered to room 406 for analysis.

6-4-90

90-3618-A1	Ni #24	90-3618-A2	Ni #25
44.0338	43.7328	37.6153	37.3306
43.5167	43.5167	37.1032	37.1032
0.5171 g wet	0.2161 g dry	0.5121 g wet	0.2274 g dry

flux: 0.5727 g KNO_3 #24 2.7687 g KOH \ flux: 0.6956 g KNO_3 #25 2.6172 g KOH

90-3619-A1 Fusion	Ni #26	Ni #27	90-3619-A2	90-3619-A3 Blank
40.3407	40.0608	40.2162	39.9014	
39.8390	39.8390	39.6601	39.6601	
0.5017 g wet	0.2218 g dry	0.5561 g wet	0.2413 g dry	

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flux:

#26 0.5868g KNO_3
2.3491g KOH

27# 0.5394g KNO_3
2.5868g KOH

BLK. 0.5680g KNO_3
2.5264g KOH

NO_3
OH

6/8/90
A.N.

90-3620 A1 fusion Ni
#28
46.9205
46.4127
0.5078g wet

46.6521
46.4127
0.2394g dry

29# A2 90-3620
46.0947
45.5218
0.5729g wet

45.7861
45.5218
0.2643g dry

A1 flux #28
0.5005g KNO_3
1.8942g KOH
2.3947g

flux #29 A2
0.5666g KNO_3
2.1069g KOH
2.6735g

6-18-90
RTS

Reviewed pgs 118-120 for completeness, legibility and accuracy of calculations. No discrepancies found.

7-16-19
A.N.

Core 2 seg. 2 Hg

90-2555 D1 90-2555 D2 90-2555 D3 90-2555 D4

92.6834
92.3290
0.3544g

89.3583
89.1685
0.1898g

93.5055
93.3029
0.2026g

0.0501 ml of 1ppm mercury spike (D3) H

0.0501 ml of 1ppm mercury spike H-3

pipette
50 2 calibration DIW @ 27°C
10.0500
20.0500
30.0502
40.0501
50.0491
$\bar{x}$ = 0.0499g
s = 0.0007
R.S.D = 0.89%
delivery - 0.0501 ml.

1ml pipette calib. DIW @ 27°C
1. 0.9936
2. 1.0021
3. 1.0035
4. 0.9953
5. 0.78%
6. 1.0030
7. .9975
$\bar{x}$ = 0.9978g
s = 0.0053
R.S.D. .53%

90-2555 D5
methods blank

delivery 1.0013 ml.

A3
VK

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BNW LABORATORY NOTEBOOK NO. 52917

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Entered By _____ Date _____
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2. _____ Date _____

C04-006

7-16-90 AGH — took out 90-2555 Core 2 seg. 2 for mercury analysis

8/7/90 RS — Reviewed page 121 for completeness & legibility. Calculations checked, no discrepancies found.

8/8/90 A.G.H. — Core 2 Segment 5 mercury analysis 90-2556

D1	D2	D3	D4
97.2862	92.5288	90.7284	spiked
97.0794	92.3001	90.4891	Blank
0.2068 g sample	0.2287 g sample	0.2393 g sample (spiked sample)	

D5 Reagent Blank — 0.0500 ml of 1 ppm mercury spike (spike I.D. H-3) was added to D3 and D4

SO2 calibration DIW @ 29°C

0.0497
0.0495
0.0498
0.0498
0.0500

$\bar{x}$ = 0.0498 g
s = 0.0002
RSD = 0.4%
dlvy. 0.0500 ml

samples were taken to lab 313 for analysis

8/21/90 A.G.H. — Core 16 Segment 3 Fusions (90-3617 and 90-3618) were Taken out of cell in 1 ml. aliquots added to 10 ml 2% HCl

Lab #	I.d.	Vol. (ml)	Dil.	Del. to	Act.	Analysis
90-3617	A1 Core 16 Seg. 3	11.0078	10.93x	A-cell	41 mcha.	I.C.P.
90-3617	A2					
90-3617	A3 BIK					
90-3618	A1					
90-3618	A2					

1 ml pipet calib. DIW @ 26°C

1.0031
1.0040
1.0030
1.0048
1.0030

$\bar{x}$ = 1.0036 g
s = 0.0008
R.S.D. = 0.08%
dlvy. = 1.0068-1.
n = 5

(for 90-3617, 90-3618)

on page 120 Core 16 Seg. 3 Fusion data.

Project No. _____ Date of Work _____
Entered By _____ Date _____
Disclosed To and Understood By
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2. _____ Date _____

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8/21/90 A.H.	Lab#	I.d.	Vol (ml)	O.I.	Ocl to	Activity	Analysis
	90-3617 A1	Core 16 seg. 3	20	none	309	<5 mr/hr	G.E.A.
	90-3617 A2	↓	↓	↓	↓	↓	↓
	90-3617 A3	↓	↓	↓	↓	↓	↓
	90-3618 A1	↓	↓	↓	↓	↓	↓
	90-3618 A2	↓	↓	↓	↓	↓	↓
	90-3619 A1	Core 16 seg. 5	11.02	10.81x	A-cell	<0.5 mr/hr.	I.C.P.
	90-3619 A2	↓	↓	↓	↓	↓	↓
	90-3619 A3	↓	↓	↓	↓	↓	↓
	90-3620 A1	↓	↓	↓	↓	↓	↓
	90-3620 A2	↓	↓	↓	↓	↓	↓

1ml pipet calibration (for 90-3619, 90-3620)

1.0189	25°C
1.0190	n = 5
1.0173	$\bar{x}$ = 1.0168g
1.0173	s = 0.0018
1.0164	R.S.D. = 0.1770
	Avg. 1.0148ml

8/23/90 A.H.	Lab#	I.d.	Vol (ml)	O.I.	Ocl to	Activity	Analysis
	90-3619 A1	Core 16 seg. 5	20	none	309	<0.5 mr/hr	G.E.A.
	90-3619 A2	↓	↓	↓	↓	↓	↓
	90-3619 A3	↓	↓	↓	↓	↓	↓
	90-3620 A1	↓	↓	↓	↓	↓	↓
	90-3620 A2	↓	↓	↓	↓	↓	↓

9-4-90 A.H.

Core 16 Composite Analysis (90-4180)

C1 132.0313
129.9615
2.0698g smpl.

C2 132.4426
130.2448
2.1978g smpl.

118.0592
19.6025
98.4567g DIW + 96.4276g DIW = 194.8843g DIW

116.0044
19.5818

117.7733
19.6175
98.1558g DIW +

118.2215
19.6047
98.6168g DIW

196.7726g DIW

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C04-008

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9/4/90
A.H.

Core 16 water leach continued

C3 spiked sample

132.1896
131.1470
1.0426g sample

111.2580
19.5712
91.6868g DIW

(10.00 ml anionspike for C3 and C4)

C4 spiked blank

112.0949
19.6357
92.4592g DIW

C5

121.2328
19.5844
101.6434g DIW +

spiked
117.6776
19.7313
97.9463g DIW

199.5897g DIW

C5
117.3194
19.6213
97.6981g DIW +

120.2226
20.3535
99.8691

197.5712g DIW for C5

9-6-90
A.H.

Lab #	Id	Vol.	Oil.	Del. to	Act.	Analysis
90-4180 C1	Core 16 comp.	20 ml	none	A-cell	2.5	I.C.P.
" " C2	"	"		"	"	"
" C3				400	2.5	I.C.
" C4				400	2.5	I.C.
" C5	Core 16 comp.	20 ml		Acell	20.5	ICP
90-4180 C1			None	400		I.C.
" C2				400		I.C.
" C5				400		I.C.
" C1	Core 16 comp.	20 ml		313	20.5	Cr(VI) + NH3
" C2		"		"	"	"
" C5		"		"	"	"
90-4180 C1		50 ml		309	20.5	Radiochemistry
" C2		"		"		"
" C3		"		"		"
" C5		"		"		"
90-4180 C1		20 ml				Complexant
" C2		"				"
" C5		"				"

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Core 16 Composite water leach continued

9/6/90
A.W.

Lab#		Id	Vol.	Oil.	Del. To	Aq.	Analysis
90-4180	C1	Core 16 comp.	20ml	none	30g	2.5	H-3
	C2						
	C3						
	C1						Ni-63
	C2						
	C3						

9/7/90
RCS

Completed review of this LRB for accuracy and completeness. No discrepancies found

9/11/90
A.W.

Core Composite fusions (90-4178, 90-4179)

90-4178 A1

47.7800 47.1383
46.8775 46.8775
0.6025g wet 0.2608g dry

A1 flux 2.5340g added

90-4178 A2

52.3003 52.0460
51.8476 51.8476
0.4527g wet 0.1984g dry

A2 flux 2.6625g Added

90-4178 A3 Blank
2.5154g flux added

90-4179 A1

51.5217 51.0999
50.8449 50.8449
0.6768g wet 0.2550g dry

A1 flux 2.5550g added

90-4179 A2

47.7904 48.1974
47.5163 47.5163
0.2741g dry 0.6811 g wet

A2 flux 2.7034g added

weight percent solids. ~~data forms on next page.~~

90-4178 H1

9.2105 8.5518
8.0584 8.0584
1.1521g wet 0.4934g dry

90-4178 H2

9.1643 8.6394
8.2318 8.2318
0.9325g wet 0.4076g dry

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9/11/90 weight percent solids

90-4180 H1		90-4180 H2	
9.6300	8.8191	9.1844	8.6255
8.2175	8.2175	8.2064	8.2064
1.4125 g wet	0.6016 g dry	0.9780 g wet	0.4191 g dry

Lab #	I.d.	Vol.	Dil.	Dcl. To	Act.	Analysis
90-4178 A1	Core 16 comp.	20 ml.	None	309	< 2 mrem/hr	G.E.A.
90-4178 A2	↓	↓	↓	↓	↓	↓
90-4178 A3	↓	↓	↓	↓	↓	↓
90-4179 A1	↓	↓	↓	↓	↓	↓
90-4179 A2	↓	↓	↓	↓	↓	↓

9/12/90 1 ml. pipet calibration using DIW at 25°C

0.9976 n=5 (for 90-4178 and 90-4179)
1.0035 $\bar{x}$ = 1.0020 g
1.0008 S = 0.0028
1.0039 R.S.D. = 0.28%
1.0040 dluy. 1.0050 ml.

Lab #	Id.	Vol. (ml)	Dil.	Dcl. To	Act.	Analysis
90-4179 C1	Core 16 comp	11.006	10.95x	Acell	< 0.5 mr/hr	I.C.P.
" " C2	↓	↓	↓	↓	↓	↓
" " C3	↓	↓	↓	↓	↓	↓
90-4179 C1	↓	↓	↓	↓	↓	↓
90-4179 C2	↓	↓	↓	↓	↓	↓

(90-4180) Core 16 composite analysis pH

Sample I.D.	Cal. check points	observed pH
C1	7 and 10	8.12
C2	10 - lot 890125-24 exp 1/91	8.08
C5	7 - lot 3005701 exp. 2/92	7.41

Note:
Buffers were 7 and 10 calibrated 7.00 and 10.01 respectively and were rechecked and indicated 7.12 for buffer 7 and 10.15 for buffer 10.

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C04-011

9/13/90 A.G.H. 90-0708 A3, 90-1277 A-2, 90-1277 A3 and 90-1278 A2 were taken out for radiochemistry highest reading 0.5 mr/hr @ contact.

EOX Core 16 Comp.

9/19/90 [illegible]

90-4180-F1	90-4180-F2	90-4180-F3	90-4180 F4
25.7281	25.8065	25.2581	25.6050
24.5837	24.5808	24.2942	24.4724
1.1454 g.	1.2257 g.	0.9634 g.	1.1326 g

Semi. Vols. Core 16 Comp

90-4180-E1	90-4180-E2	90-4180-E3	90-4180-E4
25.3091	26.0894	25.5561	25.6006
24.2595	25.0150	24.5414	24.5717
1.0496 g.	1.0744 g.	1.0147 g.	1.0289 g.

9/18/90 A.H. 90-4180 acid digestions (for AA)

90-4180 B1	90-4180 B2	90-4180 B3 (spiked sample)	90-4180 B4	90-4180 B5
51.7923	51.6196	51.9048	spiked blank	blank only
50.5325	50.5061	50.7531		
1.2598 g smpl. wt.	1.1135 g smpl. wt.	1.1517 g sample wt.		

Note some of B2 solution spattered out of the beaker during the final warming stage for No apparent reason and it was treated exactly like the others in this batch. (meaning nothing special was introduced in the process.)

5ml pipet calibration D.I.W. @ 23°C ← (This information is needed for spike addition in B3 and B4)

5.0889 n=5

5.0890 $\bar{x}$ = 5.0729 g

5.0582 s = 0.0180

5.0787 R.S.D. = 0.36%

5.0498 dluy. 5.0854 ml

spike identification: AAGF-2 (5ml)

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C04-012

90-4180 AA Acid digestion

9/18/90 A.N.

Lab #	I.d.	Vol(ml)	Dil.	Delivered to:	Act.	Analysis
90-4180 B1	Core 16 composite	20	none	303	1.3 mrad/hr.	AA
" B2	↓	↓	↓	↓	↓	↓
" B3	↓	↓	↓	↓	↓	↓
" B4	↓	↓	↓	↓	↓	↓
" B5	↓	↓	↓	↓	↓	↓

9/20/90 A.N. Took out a additional 20 ml. of 90-3617 A1, A2, A3 and 90-3619-A1, A2, A3 read less than 0.5 mr/hr @ contact.

9-21-90 A.N. 90-4180 I.C.P. Acid digestions (designated A1, A2, A3, A4, + A5)

90-4180 A1	90-4180 A2	90-4180 A3 (spiked sample)	90-4180 A4	90-4180 A5
52.0757	51.8713	51.5977	spiked blank B-3	Blank
50.8467	50.7469	50.1823		
1.2190 g smpl.	1.1244 g smpl.	1.4154 g smpl.		

B-3 - spike I.D.

5ml pipet calib. DIW 24°C

5.0690 n=5

5.0686 $\bar{x}$ = 5.0644 g

5.0523 $\bar{s}$ = 0.0093

5.0750 R.S.D. = 0.18%

5.0573 dlvy. = 5.0781 ml

spike delivery (A3 on A4)

25.3904 ml

9/24/90 A.N.

Lab #	I.d.	Vol(ml)	Dil	Delivered to:	Act.	Analysis
90-4180 A1	Core 16 comp.	20	none	Acell	1 mrad/hr	I.C.P.
" A2	↓	↓	↓	↓	↓	↓
" A3	↓	↓	↓	↓	↓	↓
" A4	↓	↓	↓	↓	↓	↓
" A5	↓	↓	↓	↓	↓	↓

9-25-90 A.N. 90-4180 Mercury Digestions (designated as D1 to D5)

D1	D2	D3 (spiked smpl)	D4	D5
92.6393	93.8174	93.9687	spiked blank H-3	blank
92.3895	93.5402	93.7128		
0.2498 g	0.2772 g	0.2559 g		

H-3 - spike I.d.

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C04-013

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9/25/90
A.V.

Solvcalib DIW @ 26°C

0.0492 n=5
0.0480 $\bar{x}$=0.0490g
0.0489 s=0.0006
0.0496 R.S.D. = 1.2%
0.0492 dlvy. (=0.0492 ml)

H-3 - spike I.d.

Lab #		I.d.	Vol.*	D.I.	Delivered to	Act.	Analysis
90-4180	A1 D1	Core 16 comp	—	none	313	210 mrem/hr	H3
"	A2 D2	↓	↓	↓	↓	↓	↓
"	A3 D3						
"	A4 D4						
"	A5 D5						

*unable to give final volume since a few ml. of DIW was needed to wash the sample from the erlenmeyer flasks to the sample bottles.

10/12/90 Reviewed pages 125-129. Checked for accuracy of data and completeness of entries. Made corrections where needed.

10/3/90
AcTI

Mercury Sample Prep. 90-4180 Core-16 Composite

D1 (smpl)	D2 (dup. smpl.)	D3 (spiked smpl)	D4	D5
60.2385	60.6153	59.2980	(spiked blank)	(blank)
60.0177	60.4015	59.0512		
0.2208g	0.2138g	0.2468g		

200λ pipett calib (for spike)

0.2000 n=5
0.2002 $\bar{x}$=0.2001g
0.1998 s=0.0007
0.1996 R.S.D. = 0.21%
0.2007 dlvy. = 0.2006 ml

all weighings were done on MettleTolledo in cell two.

Mercury spike I.d. H-3, and 200λ of 1ppm spike was added to D3 and D4

Lab #		I.d.	Vol	D.I.	Delivered to	Act. (mrem/hr)	Analysis
90-4180	D1	Core 16 comp	51 ml	none	313	1	Mercury
"	D2	↓	↓	↓	↓	1	↓
"	D3					1	
"	D4					0	
"	D5					0	

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C04-014

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130 11/13/90 KTS — Review ... uracy & completeness. No discrepancy found.

11/14/90 KTS — Took out 90-3417 A1, A2 and 90-3419 A-1, A2 for J. Ruggles read 0.5 mr/hr @ contact.

12-14-90 RTS — Reviewed pg 130. No problems

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C04-015

C5 - PERCENT SOLIDS DATA

SST

% SOLIDS DATA COVER SHEET

Balance Identification Number: 360-06-01-016

Procedure: PNL-ALO-504

% Solids LRB#: BNW-52917

Percent Soilds Data Form

Date 6-1-90 Sample ID # 90-3620 H1

Analyst [illegible] Reviewer [illegible]

Tare Wt. + Wet Sample : 9.1519 g

Tare Wt. : 8.2375 g

Wet Sample Wt: = 0.9144 g

Time/Date into Oven : 1530hrs/5-31-90 Oven Temp. : 104 °C

Time/Date out Oven : 0345hrs/6-1-90 Oven Temp. : 107 °C

Tare Wt. + Dry Sample : 8.6309 g

Tare Wt. : 8.2375 g

Dry Sample Wt. : 0.3934 g

$$\% \text{ Solids} = \frac{\text{(Dry Sample Wt)}}{\text{(Wet Sample Wt.)}} \times 100\%$$

% Solids = 43.02 %

Percent Soilds Data Form

Date 6-1-90 Sample ID # 90-3620 H2

Analyst Shawn A. Yoni Reviewer [illegible]

Tare Wt. + Wet Sample : 8.9980 g

Tare Wt. : 8.0367 g

Wet Sample Wt: = 0.9613 g

Time/Date into Oven : 1530hrs/5-31-90 Oven Temp. : 104°C

Time/Date out Oven : 0895hrs/6-1-90 Oven Temp. : 107°C

Tare Wt. + Dry Sample : 8.4471 g

Tare Wt. : 8.0367 g

Dry Sample Wt. : 0.4104 g

$$\% \text{ Solids} = \frac{\text{(Dry Sample Wt)}}{\text{(Wet Sample Wt.)}} \times 100\%$$

% Solids = 42.69 %

9112170776

PERCENT SOLIDS DATA FORM

DATE 9/10/90 SAMPLE ID # 90-4178 #H1

ANALYST [illegible] REVIEWER RTS

Tare Wt. + Wet Sample: 9.2105

Tare Wt.: 8.0584

Wet Sample Wt: = 1.1521

Time/Date into Oven: 1120/9/10/90 Oven Temp: 107°C

Time/Date out Oven: 0830/9-11-90 Oven Temp: 109°C

Tare Wt. + Dry Sample: 8.5518

Tare Wt.: 8.0584

Dry Sample Wt.: 0.4934

$$\% \text{ Solids} = \frac{\text{(Dry Sample Wt.)}}{\text{(Wet Sample Wt.)}} \times 100\%$$

% Solids = 42.82 %

9112150277

PERCENT SOLIDS DATA FORM

DATE 9/10/90 SAMPLE ID # 90-4178 #42

ANALYST [illegible] REVIEWER RTS

Tare Wt. + Wet Sample: 9.1643

Tare Wt.: 8.2318

Wet Sample Wt: = 0.9325

Time/Date into Oven: 1120 / 9-10-90 Oven Temp: 107°C

Time/Date out Oven: 0830 / 9-11-90 Oven Temp: 109°C

Tare Wt. + Dry Sample: 8.6394

Tare Wt.: 8.2318

Dry Sample Wt.: 0.4076

$$\% \text{ Solids} = \frac{\text{(Dry Sample Wt.)}}{\text{(Wet Sample Wt.)}} \times 100\%$$

% Solids = 43.71 %

PERCENT SOLIDS DATA FORM

DATE 9/10/90 SAMPLE ID # 90-4180 #H1

ANALYST [illegible] REVIEWER [illegible]

Tare Wt. + Wet Sample: 9.6300

Tare Wt.: 8.2175

Wet Sample Wt: = 1.4125

Time/Date into Oven: 1120/9-10-90 Oven Temp: 107°C

Time/Date out Oven: 0830/9-11-90 Oven Temp: 109°C

Tare Wt. + Dry Sample: 8.8191

Tare Wt.: 8.2175

Dry Sample Wt.: 0.6016

$$\% \text{ Solids} = \frac{\text{(Dry Sample Wt.)}}{\text{(Wet Sample Wt.)}} \times 100\%$$

% Solids = 42.59 %

PERCENT SOLIDS DATA FORM

DATE 9/10/90 SAMPLE ID # 90-4180 HZ

ANALYST [illegible] REVIEWER RTS

Tare Wt. + Wet Sample: 9.1844

Tare Wt.: 8.2064

Wet Sample Wt: = 0.9780

Time/Date into Oven: 1120/9-10-90 Oven Temp: 107°C

Time/Date out Oven: 0830/9-11-90 Oven Temp: 109°C

Tare Wt. + Dry Sample: 8.6255

Tare Wt.: 8.2064

Dry Sample Wt.: 0.4191

$$\% \text{ Solids} = \frac{(\text{Dry Sample Wt.})}{(\text{Wet Sample Wt.})} \times 100\%$$

% Solids = 42.85 %

Percent Soilds Data Form

Date 6-1-90 Sample ID #90-3617 H1

Analyst [illegible] Reviewer [illegible]

Tare Wt. + Wet Sample : 9.0547g

Tare Wt. : 8.0449 g

Wet Sample Wt: = 1.0098g

Time/Date into Oven : 1530hrs/5-31-90 Oven Temp. : 107°C

Time/Date out Oven : 0845hrs/6-1-90 Oven Temp. : 107°C

Tare Wt. + Dry Sample : 8.4568g

Tare Wt. : 8.0449g

Dry Sample Wt. : 0.4119g

$$\% \text{ Solids} = \frac{\text{(Dry Sample Wt)}}{\text{(Wet Sample Wt.)}} \times 100\%$$

% Solids = 40.79 %

Percent Soilds Data Form

Date 6-1-90 Sample ID # 90-3618 H1

Analyst [illegible] Reviewer [illegible]

Tare Wt. + Wet Sample : 9.2679g

Tare Wt. : 8.2856g

Wet Sample Wt: = 0.9823g

Time/Date into Oven : 1530hrs/5-31-90 Oven Temp. : 104°C

Time/Date out Oven : 0345hrs/6-1-90 Oven Temp. : 107°C

Tare Wt. + Dry Sample : 8.6756g

Tare Wt. : 8.2856g

Dry Sample Wt. : 0.3900g

$$\% \text{ Solids} = \frac{\text{(Dry Sample Wt)}}{\text{(Wet Sample Wt.)}} \times 100\%$$

% Solids = 39.70 %

C6 - pH DATA

SST

pH DATA COVER SHEET

pH Equipment Identification Number: 6629
(Serial Number)

Procedure: WHC-053-1

pH LRB#: BNW-52917

pH Form for SST

Date: 9-12-90

Analyst: [illegible]

Reviewer: [illegible]

Calibration check points: 7 / 10

Buffer lot number: 3005701 / 890125-24

Buffer exp. date: 2/92 / Jan. 1991

325A number	ALO number	Obs. pH
	90-4180 C1	8.12
	90-4180 C2	8.08
	90-4180 C5	7.41
	Buffers were	
	calibrated	
	at 7 observed	
	7.00 and 10	
	observed 10.01	
	Buffer recheck	
	7	7.12
	10	10.15

C06-003