SAF-RC-006
100-N Area D4 – Other
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Bill Rodgers X5-51 KW 7/31/12
INITIAL/DATE

COMMENTS:

SDG K3948 SAF-RC-006

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Waste Site(s): 100N Waste Pad

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

25 July 2012

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99354

Subject: Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	1207018
SDG #	K3948
SAF #	RC-006
Date Received	07/12/12
# Samples	2
Matrix	OTHER LIQUID
Volatiles	
Semivolatiles	
Pest/PCB	
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	X
Inorganics	X

The electronic data deliverable (EDD) has been emailed. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 24 pages.

R:\GROUP\PM\ORLETTE\Hanford\Data\B_ltrs.DOC

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1207 018

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford SAF# RC-006
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SW TAT: 15 Day

Date Rec'd: 7/12/12 Date Due: 7/27/12

		A			B	C			
Refrigerator #		2			2	2			
#/Type Container	Liquid	1AG			1AG	1AG			
	Solid								
Volume	Liquid	125			125	125			
	Solid								
Preservatives		—			—	—			
ANALYSES REQUESTED	ORGANIC: VOA, BNA, Pest/PCB, Herb				INORG: Metal Hg, CN	Ignitability	TOX		
Lionville Laboratory Use Only		Met			IGN.	TOX			

MATRIX CODES:
W Water, WW Waste Water, GW Groundwater, WST Waste, WI Wipe, SO Solid, S Soil, SL Sludge, SE Sediment, PC Paint Chips, O Oil, NAL Non-Aqueous Liquid, L Leachate, A Air, T Tissue, F Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Met	IGN.	TOX
01	J1PVJ9			OTHER (OIL)	7-3-12	0830	X	X	X
02	J1PVK0			↓	↓	0841	X	X	X

Special Instructions: OTHER = OIL
Possible Sample HAZ. (FLAMMABLE)

Met = HSL + B, Mo, Si (no TL)

Special Instructions:
1. * Sample Cooling not maintained
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	V Hernandez	7/12/12	0950

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-006-348	Page 1 of 1

Collector R Shuler	**Company Contact** Bill Rodgers	**Telephone No.** 206.251.7439	**Project Coordinator** KESSNER, JH	**Price Code** 9K	**Data Turnaround** 15 Days
Project Designation 100-N Area D4 - Other	**Sampling Location** 100N Waste Pad		**SAF No.** RC-006		
Ice Chest No. NA	**Field Logbook No.** EL-1516-20	**COA** RD4MXX2F00	**Method of Shipment** Fed Ex		
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** ~~NA~~ AJ 7-3-12 NA		**Bill of Lading/Air Bill No.** See ~~OSPE~~ HMSR AJ 7-9-12		

POSSIBLE SAMPLE HAZARDS/REMARKS
~~NONE~~ WHR 7-3-12
Flammable

Special Handling and/or Storage
~~NONE~~ WHR 7-3-12
Cool to 4°C *

Preservation	Cool 4C	None	Cool 4C									
Type of Container	G/P	G	aG									
No. of Container(s)	1	1	1									
Volume	AJ ~~60mL~~ 7-3-12 125mL	125mL	~~60mL~~ AJ 7-3-12 125mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Ignitability - 1010	TOX - 9020									
Sample No.	Matrix *	Sample Date	Sample Time									
J1PVJ9	OTHER	7-3-12	0830	X	X	X						
J1PVK0	OTHER	7-3-12	0841	X	X	X						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: Royal Sluka Royal Sluka	7/3/12 0900	Received By/Stored In: WH Rodgers WHR	0900 7-3-12
Relinquished By/Removed From: WH Rodgers WHR	1430 7-3-12	Received By/Stored In: A. Freier A. Freier	1060#1 1430 7-3-12
Relinquished By/Removed From: A. Freier A. Freier	1060#1 WCH 7-9-12 1245	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	7-12-12 0950	Received By/Stored In: VICTOR HERNANDEZ	7-12-12 0950
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS
NONE

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

* Sample Cooling not maintained.
AJ 7-9-12

REVIEWED BY DWShea DATE 7/9/12

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wl=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-006

Date: 7/12/12

LvL Batch #: 1207018

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FED EX		Airbill # 4943 0225 9952 9941 9930
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	*Comments:*
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	**Temp**	°C 22.6 21.4 22.4	Cooler # 4 G Box
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☐ Yes	☑ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☑ Yes	☐ No	☐ N/A
14. QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☐ Yes	☑ No	
16. Project Manager contacted concerning any discrepancies?	☑ Yes	☐ No	☐ N/A

Person Contacted O. Johnson Date 7/12/12

SR-002-B.doc

000000005

METALS

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/24/2012 10:14

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PVJ9	1207018-01	Other Liquid	07/03/2012 08:30	07/12/2012 09:50
J1PVK0	1207018-02	Other Liquid	07/03/2012 08:41	07/12/2012 09:50

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1PVJ9	Zinc	2100	92.2

12. All duplicate analyses for analytes were within the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL.

13. For the purposes of this report, the data have been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

14. LvL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory

7/24/12
Date

rgc/07-018hgn%

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
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Case Narrative

Client: WC-HANFORD RC-006
LVL#: 1207018
SDG/SAF#: K3948/RC-006

W.O.#: 60049-001-001-0001-00
Date Received: 07-12-12

METALS

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvL) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analysis of 2 oil samples.

2. The samples were prepared and analyzed in accordance with methods listed on the data report forms. The samples were reported on a wet weight, 'as-received' basis.

3. All analyses were performed within the required holding times.

4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation, samples were greater than 20X MB value}.

8. All ICP Interference Check Standards were within control limits.

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer.

10. The matrix spike (MS) recoveries for 1 analyte was outside the 75-125% control limits.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

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264 Welsh Pool Road
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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/24/2012 10:14

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
B	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag)
*	Value outside QC acceptance criteria
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
wet	Sample results reported on a wet weight basis
RPD	Relative Percent Difference

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-006 Project Number: K3948 Project Manager: Joan Kessner	**Reported:** 07/24/2012 10:14

J1PVJ9
1207018-01 (Other Liquid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	19.6	U	19.6	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Antimony	0.980	U	0.980	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Arsenic	0.980	U	0.980	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Barium	**0.305**	B	0.490	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Beryllium	0.196	U	0.196	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Boron	**19.8**		1.96	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Cadmium	**0.0577**	B	0.245	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Calcium	**1330**		19.6	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Chromium	**0.634**	B	0.980	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Cobalt	2.94	U	2.94	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Copper	**5.80**		1.96	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Iron	**16.6**	B	19.6	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Lead	**1.35**		0.980	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Magnesium	**55.1**		4.90	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Manganese	**0.454**	B	0.980	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Molybdenum	**13.6**		0.980	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Nickel	2.45	U	2.45	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Potassium	98.0	U	98.0	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Selenium	**0.873**	B	0.980	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Silicon	**15.7**		5.88	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Silver	0.980	U	0.980	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Sodium	**10.9**	B	49.0	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Vanadium	0.980	U	0.980	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Zinc	**656**		2.94	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Mercury	0.0205	U	0.0205	mg/kg	1	L207069	07/13/2012	07/17/2012	7471A

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/24/2012 10:14

J1PVK0
1207018-02 (Other Liquid)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	19.2	U	19.2	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Antimony	0.962	U	0.962	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Arsenic	0.962	U	0.962	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Barium	**1.83**		0.481	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Beryllium	0.192	U	0.192	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Boron	**22.3**		1.92	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Cadmium	**0.151**	B	0.240	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Calcium	**1310**		19.2	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Chromium	**5.57**		0.962	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Cobalt	2.88	U	2.88	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Copper	**33.6**		1.92	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Iron	**22.7**		19.2	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Lead	**0.972**		0.962	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Magnesium	**132**		4.81	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Manganese	**0.464**	B	0.962	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Molybdenum	**3.11**		0.962	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Nickel	**2.07**	B	2.40	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Potassium	96.2	U	96.2	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Selenium	**0.707**	B	0.962	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Silicon	**9.21**		5.77	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Silver	0.962	U	0.962	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Sodium	**10.3**	B	48.1	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Vanadium	**1.55**		0.962	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Zinc	**808**		2.88	mg/kg	1	L207102	07/19/2012	07/20/2012	6010B
Mercury	0.0214	U	0.0214	mg/kg	1	L207069	07/13/2012	07/17/2012	7471A

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/24/2012 10:14

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L207069 - SW 7471A Prep										
Blank (L207069-BLK1)				Prepared: 07/12/2012 Analyzed: 07/17/2012						
Mercury	0.0290	U	0.0290	mg/kg						
Duplicate (L207069-DUP2)		**Source: 1207018-01**		Prepared: 07/12/2012 Analyzed: 07/17/2012						
Mercury	0.0205	U	0.0205	mg/kg		0.0205 U				20
Matrix Spike (L207069-MS2)		**Source: 1207018-01**		Prepared: 07/12/2012 Analyzed: 07/17/2012						
Mercury	0.112		0.0205	mg/kg	0.11364	0.0205 U	98.6	75-125		
Reference (L207069-SRM1)				Prepared: 07/12/2012 Analyzed: 07/17/2012						
Mercury	1.28		0.0290	mg/kg	1.2900		98.9	62.6-138		
Batch L207102 - SW 3050B										
Blank (L207102-BLK1)				Prepared: 07/19/2012 Analyzed: 07/20/2012						
Aluminum	19.2	U	19.2	mg/kg						
Antimony	0.962	U	0.962	mg/kg						
Arsenic	0.962	U	0.962	mg/kg						
Barium	0.481	U	0.481	mg/kg						
Beryllium	0.192	U	0.192	mg/kg						
Boron	1.92	U	1.92	mg/kg						
Cadmium	0.240	U	0.240	mg/kg						
Calcium	19.2	U	19.2	mg/kg						
Chromium	0.962	U	0.962	mg/kg						
Cobalt	2.88	U	2.88	mg/kg						
Copper	1.92	U	1.92	mg/kg						
Iron	19.2	U	19.2	mg/kg						
Lead	0.962	U	0.962	mg/kg						
Magnesium	1.60	B	4.81	mg/kg						
Manganese	0.962	U	0.962	mg/kg						
Molybdenum	0.962	U	0.962	mg/kg						
Nickel	2.40	U	2.40	mg/kg						
Potassium	96.2	U	96.2	mg/kg						
Selenium	0.962	U	0.962	mg/kg						
Silicon	5.77	U	5.77	mg/kg						
Silver	0.962	U	0.962	mg/kg						
Sodium	48.1	U	48.1	mg/kg						
Vanadium	0.962	U	0.962	mg/kg						
Zinc	2.88	U	2.88	mg/kg						

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	07/24/2012 10:14

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L207102 - SW 3050B										
Duplicate (L207102-DUP2)		**Source: 1207018-01**		Prepared: 07/19/2012 Analyzed: 07/20/2012						
Aluminum	19.6	U	19.6	mg/kg		19.6 U				20
Antimony	0.980	U	0.980	mg/kg		0.980 U				20
Arsenic	0.980	U	0.980	mg/kg		0.980 U				20
Barium	0.306	B	0.490	mg/kg		0.305			0.4	20
Beryllium	0.196	U	0.196	mg/kg		0.196 U				20
Boron	19.6		1.96	mg/kg		19.8			0.7	20
Cadmium	0.0589	B	0.245	mg/kg		0.0577			2	20
Calcium	1330		19.6	mg/kg		1330			0.6	20
Chromium	0.647	B	0.980	mg/kg		0.634			2	20
Cobalt	2.94	U	2.94	mg/kg		2.94 U				20
Copper	5.63		1.96	mg/kg		5.80			3	20
Iron	17.8	B	19.6	mg/kg		16.6			7	20
Lead	1.38		0.980	mg/kg		1.35			3	20
Magnesium	55.2		4.90	mg/kg		55.1			0.2	20
Manganese	0.500	B	0.980	mg/kg		0.454			10	20
Molybdenum	13.6		0.980	mg/kg		13.6			0.1	20
Nickel	2.45	U	2.45	mg/kg		2.45 U				20
Potassium	98.0	U	98.0	mg/kg		98.0 U				20
Selenium	0.745	B	0.980	mg/kg		0.873			16	20
Silicon	16.4		5.88	mg/kg		15.7			4	20
Silver	0.980	U	0.980	mg/kg		0.980 U				20
Sodium	49.0	U	49.0	mg/kg		10.9				20
Vanadium	0.980	U	0.980	mg/kg		0.980 U				20
Zinc	658		2.94	mg/kg		656			0.3	20
Matrix Spike (L207102-MS2)		**Source: 1207018-01**		Prepared: 07/19/2012 Analyzed: 07/20/2012						
Aluminum	186		19.2	mg/kg	192.31	19.6 U	97	75-125		
Antimony	41.4		0.962	mg/kg	48.077	0.980 U	86	75-125		
Arsenic	176		0.962	mg/kg	192.31	0.980 U	91	75-125		
Barium	184		0.481	mg/kg	192.31	0.305	96	75-125		
Beryllium	4.63		0.192	mg/kg	4.8077	0.196 U	96	75-125		
Boron	105		1.92	mg/kg	96.154	19.8	89	75-125		
Cadmium	3.98		0.240	mg/kg	4.8077	0.0577	82	75-125		
Calcium	3290		19.2	mg/kg	2403.8	1330	81	75-125		
Chromium	18.9		0.962	mg/kg	19.231	0.634	95	75-125		
Cobalt	46.5		2.88	mg/kg	48.077	2.94 U	97	75-125		
Copper	26.8		1.92	mg/kg	24.038	5.80	87	75-125		

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/24/2012 10:14

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L207102 - SW 3050B									
Matrix Spike (L207102-MS2)		**Source: 1207018-01**		Prepared: 07/19/2012 Analyzed: 07/20/2012					
Iron	108	19.2	mg/kg	96.154	16.6	96	75-125		
Lead	44.0	0.962	mg/kg	48.077	1.35	89	75-125		
Magnesium	2300	4.81	mg/kg	2403.8	55.1	93	75-125		
Manganese	46.3	0.962	mg/kg	48.077	0.454	95	75-125		
Molybdenum	106	0.962	mg/kg	96.154	13.6	96	75-125		
Nickel	46.2	2.40	mg/kg	48.077	2.45 U	96	75-125		
Potassium	2180	96.2	mg/kg	2403.8	98.0 U	91	75-125		
Selenium	180	0.962	mg/kg	192.31	0.873	93	75-125		
Silicon	87.7	5.77	mg/kg	96.154	15.7	75	75-125		
Silver	4.55	0.962	mg/kg	4.8077	0.980 U	95	75-125		
Sodium	2220	48.1	mg/kg	2403.8	10.9	92	75-125		
Vanadium	46.6	0.962	mg/kg	48.077	0.980 U	97	75-125		
Zinc	615	2.88	mg/kg	48.077	656	-84*	75-125		
Reference (L207102-SRM1)				Prepared: 07/19/2012 Analyzed: 07/20/2012					
Aluminum	9470	60.0	mg/kg	6670.0		142	0-200.89		
Antimony	47.5	3.00	mg/kg	53.000		90	0-235.8		
Arsenic	111	3.00	mg/kg	114.00		97	82.8-117.54		
Barium	300	1.50	mg/kg	307.00		98	79.8-120.2		
Beryllium	104	0.600	mg/kg	108.00		97	82.8-117.6		
Boron	80.3	6.00	mg/kg	85.100		94	67.5-132.8		
Cadmium	222	0.750	mg/kg	225.00		99	83.6-116.4		
Calcium	3180	60.0	mg/kg	3360.0		95	83.3-116.9		
Chromium	77.7	3.00	mg/kg	77.200		101	73.3-126.4		
Cobalt	160	9.00	mg/kg	166.00		97	80.7-118.7		
Copper	267	6.00	mg/kg	271.00		99	80.8-119.2		
Iron	8270	60.0	mg/kg	8420.0		98	78.6-121.1		
Lead	177	3.00	mg/kg	190.00		93	81.6-118.4		
Magnesium	8260	15.0	mg/kg	8570.0		96	83.2-116.7		
Manganese	840	3.00	mg/kg	965.00		87	69.3-130.5		
Molybdenum	226	3.00	mg/kg	235.00		96	76.2-123.8		
Nickel	212	7.50	mg/kg	221.00		96	79.6-120.8		
Potassium	13800	300	mg/kg	14400		96	81.9-118.1		
Selenium	184	3.00	mg/kg	187.00		98	75.9-124.6		
Silicon	788	18.0	mg/kg	807.00		98	0-219.3		
Silver	80.7	3.00	mg/kg	83.500		97	82.7-117.1		
Sodium	8640	150	mg/kg	9730.0		89	82.5-117.2		

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/24/2012 10:14

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L207102 - SW 3050B									
Reference (L207102-SRM1)				Prepared: 07/19/2012 Analyzed: 07/20/2012					
Vanadium	100	3.00	mg/kg	98.700		102	75.9-123.6		
Zinc	195	9.00	mg/kg	199.00		98	78.4-121.6		

Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L207102
Date/Time Initiated: 7/19/12 0910
Date/Time Completed: 7/19/12 1600
Analyst: MW
Matrix (circle): Soil Water Other waste
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.

~~Digested~~ / Undigested (circle one)
Balance #: B14
Balance Cal Verification: Y NA
Temp: 95°
BLOCK 1 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/TC	Texture	Color / Appearance	Artifact	Turb
1207005-01		0.51	50		TO	oily	dark gray / cloudy		
L207102-DUP1		0.51	50			↓	↓		
MS1	0.5 *	0.53	50			↓	↓		
1207005-02		0.50	50			oily	dark amber/opaque		
1207018-01		0.51	50			oily	black / opaque		
L207102-DUP2		0.51	50			↓	↓		
MS2	0.5	0.52	50			↓	↓		
1207018-02		0.52	50			oily	dark reddish black/opaque		
L207102-BLK1		0.52	50			~~fine~~	white boiling chips		
SRM1	*	0.50	50			fine	pink granular		

MW 7/19/12

Spiking IDs / Expiration Date:
MS#: 1200457

LCS#: 1101357

Reagent IDs:
HNO_3 L08023
HCl L01031
H_2O_2 K09A03
1:1 HNO_3 637-066-02
1:1 HCl

File ID#:

Data Review By/Date:
Bee 7/23/12

R:\group\QA\SOP\Signed\SPI\Metals Digestion log.doc

* also 0.25 ml 1200380 U- 1200386 Zr

Page #:

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 7/12/12-7/13/12
Start Time/Temp: 1310/94°
End Time/Temp: 1340/96°

Instrument ID: HG3,2
Balance # B29 /NA
Pipette Calibration (Daily) (Y)

Logbook # 1143
Prep Batch: L2070689 w.E. [illegible] 7/14/12
Worksheet: HG071202
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
blank				10ml	50	
0.2µg/l		0.100		10ml	50	
1.0µg/l		0.500		10ml	50	
2.0µg/l		1.000		10ml	50	
5.0 µg/l		2.500		10ml	50	
10.0 µg/l		5.000		10ml	50	
IOV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L207069-BLK1				0.31	50	
SRM1		(*)	(*)	0.31	50	
1207005-01				0.31	50	RAD
L207069-DUP1				0.31	50	
MS1		0.500	1.0	0.30	50	
1207005-02				0.32	50	
1207018-01				0.44	50	transferred from
L207069-DUP2				0.44	50	L207070 due to
MS2		0.500	1.0	0.44	50	matrix change
1207018-02				0.42	50	(waste from NAL)
						See next page and
						opposite next page.
						pm 7/13/12

pm 7/12/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200588	7/13/12 1025
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: [illegible] 7/23/12

se book # 1134-131 for std traceability information

Soil LCS True Value = 1.29 mg/Kg
Standard # 1101357 (*)

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Water LCS Spiking Concentration: 1.0 µg/ml

INORGANICS

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/27/2012 10:56

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PVJ9	1207018-01	Other Liquid	07/03/2012 08:30	07/12/2012 09:50
J1PVK0	1207018-02	Other Liquid	07/03/2012 08:41	07/12/2012 09:50

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Case Narrative

Client: WC-HANFORD RC-006 K3948
LVL#: 1207018 **Date Received:** 07-12-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 nonaqueous liquid samples.

2. The sample was prepared and analyzed in accordance with the methods indicated on the data summary report.

   Lionville Lab (LvL) is NELAP accredited by the State of Pennsylvania. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from a sample that did not meet LvL's sample acceptance policy as noted on the Sample Receipt Checklist.

5. The method blank for Total Halides was within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits and method criteria.

7. The matrix spike recoveries for Total Halides were within the 75-125% control limits. The matrix spike duplicate was within the 20% Relative Percent Difference (RPD) control limit.

8. Results for Total Halides are reported on an "as-received" weight basis.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory

7/27/12
Date

njp\i07-018

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

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WC-Hanford, Inc.	Project: RC-006	
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Richland WA, 99354	Project Manager: Joan Kessner	07/27/2012 10:56

Notes and Definitions

U	Analyte included in the analysis, but not detected
F-01	Sample did not ignite; sample was heated to approximately 210°F
*	Value outside QC acceptance criteria
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
Dry	Sample results reported on a dry weight basis
Wet	Sample results reported on a wet weight basis
RPD	Relative Percent Difference
LOD	Limit of Detection (LOD): the minimum estimated concentration of a target analyte that can be detected reliably. Concentrations at the LOD or between the LOD and LOQ are flagged estimated with either a 'J' qualifier or client-specific qualifier.
LOQ	Limit of Quantitation (LOQ): the minimum concentration of a target analyte that can be quantified reliably

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/27/2012 10:56

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PVJ9 (1207018-01) Other Liquid									
Ignitability	40 F-01	40	40	°F	1	L207177	07/27/2012	07/27/2012	Pensky-Marten Closed Cup
Total Halides	**270**	20.0	40.0	mg/kg	1	L207175	07/26/2012	07/26/2012	9023
J1PVK0 (1207018-02) Other Liquid									
Ignitability	40 F-01	40	40	°F	1	L207177	07/27/2012	07/27/2012	Pensky-Marten Closed Cup
Total Halides	**123**	20.0	40.0	mg/kg	1	L207175	07/26/2012	07/26/2012	9023

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3948	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/27/2012 10:56

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L207175 - Default Prep GenChem										
Blank (L207175-BLK1)				Prepared & Analyzed: 07/26/2012						
Total Halides	20.0 U	20.0	40.0	mg/kg						
LCS (L207175-BS1)				Prepared & Analyzed: 07/26/2012						
Total Halides	2980	20.0	40.0	mg/kg	2998.0		99.3	80-120		
Matrix Spike (L207175-MS1)	**Source: 1207018-01**			Prepared & Analyzed: 07/26/2012						
Total Halides	2690	20.0	40.0	mg/kg	2748.0	270	88.0	75-125		
Matrix Spike Dup (L207175-MSD1)	**Source: 1207018-01**			Prepared & Analyzed: 07/26/2012						
Total Halides	3070	20.0	40.0	mg/kg	2748.0	270	102	75-125	13.5	20
Batch L207177 - Default Prep GenChem										
LCS (L207177-BS1)				Prepared & Analyzed: 07/27/2012						
Ignitability	82	40	40	°F	81.000		101	99-101		
Duplicate (L207177-DUP1)	**Source: 1207018-01**			Prepared & Analyzed: 07/27/2012						
Ignitability	40 F-01	40	40	°F		40 U				20