SAF-RC-029
Remaining Sites Confirmation Sampling – Soil Full Protocol
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 6/25/12
INITIAL/DATE

COMMENTS:

SDG K3924 SAF RC-029

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Waste Site: 100-C-7:1 (033-Pb Hot Spot)

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

20 June 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 #	1206031
SDG #	K3924
SAF #	RC-029
Date Received	06/13/12
# Samples	1
Matrix	SOIL
Volatiles	
Semivolatiles	
Pest/PCB	
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	X
Inorganics	

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1206 031

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-207

Est. Final Proj. Sampling Date

Project#

Project Contact/Phone#

Lionville Laboratory Project Manager O. Johnson

QC SW Del STD TAT 21 Days

Date Rec'd 6-13-12 Date Due 7-4-12

Refrigerator #

#/Type Container: Liquid / Solid

Volume: Liquid / Solid

Preservatives

ANALYSES REQUESTED →

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	ORGANIC: VOA	BNA	Pest/PCB	Herb	INORG: Metal	CN	Lionville Laboratory Use Only
											A		
											2		
											1		
											125		
											—		
01	T1PRX1	✓	✓	Soil	6-11-12	9:15					X		Met①

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

Special Instructions:

Met① = HSL + B, Mo, Si (NO-TL)

Special Instructions:

1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
		6/13/12	0945

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-207-082	Page 1 of 1
Collector: A. Dunnum	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: 8L
Project Designation: Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites - I	Sampling Location: 100-C-7:1 (033-Pb Hot Spot)		SAF No.: RC-207	Data Turnaround: 21 Days
Ice Chest No.: WCH-11-068	Field Logbook No.: EL-1655-05	COA: R00C712600	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A110 367		Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool, 4 degrees Centigrade

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	125mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.										
Sample No.	Matrix *	Sample Date	Sample Time								
J1PRX1	SOIL	6-11-12	9:15	X							

CHAIN OF POSSESSION

Sign/Print Names			
Relinquished By/Removed From: A. Dunnum	Date/Time: 6-11-12 9:20	Received By/Stored In: B. Fahlberg B.F&RSS	Date/Time: 0900 6-11-12
Relinquished By/Removed From: B. Fahlberg B. Fuller	Date/Time: 1445 6-11-12	Received By/Stored In: C. Bingham	Date/Time: 1060H1 6-11-12 1445
Relinquished By/Removed From: C. Bingham WCH	Date/Time: 1060H1 6-12-12 1430	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 6-13-12 0945	Received By/Stored In: Victor HERNANDEZ	Date/Time: 6-13-12 0945
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(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) {Mercury}

REVIEWED BY AJ DATE 6-12-12

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=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

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford Date: 6/13/18

Project/SAF/SOW/Release #: RC-207

LvL Batch #: 1206031 Sample Custodian: Ted Hansen

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx	Airbill # 7936 7262 0559	
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 2°	°C	Cooler # WCH-11-068
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 _____ Date _____

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-207 Project Number: K3924 Project Manager: Joan Kessner	**Reported:** 06/19/2012 11:08

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PRX1	1206031-01	Soil	06/11/2012 09:15	06/13/2012 09:45

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Case Narrative

Client: WC-HANFORD RC-207
LVL#: 1206031
SDG/SAF#: K3924/RC-207

W.O.#: 60049-001-001-0001-00
Date Received: 06-13-12

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 1 soil sample.

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

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

4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvL'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, or samples 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 with the exception of Magnesium at 82.0% (83.2-116.7% range). The sample results for Magnesium may be slightly biased low.

10. The matrix spike (MS) recoveries for 22 analytes were 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:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1PRX1	Aluminum	42,000	71.3
	Antimony	100	78.8
	Arsenic	100	84.2
	Barium	1,100	75.4
	Beryllium	100	84.7
	Boron	100	76.1
	Cadmium	100	85.3
	Calcium	20,800	61.7
	Chromium	100	79.8
	Cobalt	100	78.4
	Iron	42,000	48.8
	Lead	100	68.1
	Magnesium	21,600	67.8
	Manganese	1,000	65.9
	Molybdenum	100	81.0
	Nickel	100	75.7
	Potassium	12,000	78.1
	Selenium	100	82.5
	Silicon	2,100	72.0
	Silver	100	79.7
	Vanadium	1,000	74.0
	Zinc	100	76.6

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Mercury and Cadmium were less 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

6/20/12
Date

LVL
LIONVILLE LABORATORY
A division of Elsevine Analytical Corporation

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WC-Hanford, Inc.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3924	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/19/2012 11:08

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.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3924	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/19/2012 11:08

J1PRX1

1206031-01 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**7840**		4.02	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Antimony	0.483	U	0.483	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Arsenic	**2.41**		0.805	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Barium	**165**		0.402	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Beryllium	**0.333**		0.161	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Boron	**8.85**		1.61	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Cadmium	**0.114**	B	0.161	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Calcium	**5700**		80.5	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Chromium	**9.52**		0.161	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Cobalt	**5.57**		1.61	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Copper	**12.5**		0.805	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Iron	**17900**		16.1	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Lead	**17.9**		0.402	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Magnesium	**3950**		60.3	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Manganese	**293**		4.02	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Molybdenum	**0.449**	B	1.61	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Nickel	**8.95**		3.22	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Potassium	**1190**		322	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Selenium	0.241	U	0.241	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Silicon	**408**		1.61	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Silver	0.161	U	0.161	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Sodium	**337**		40.2	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Vanadium	**47.5**		2.01	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Zinc	**35.3**		8.05	mg/kg dry	1	L206118	06/15/2012	06/18/2012	6010B
Mercury	**0.0167**	B	0.0273	mg/kg dry	1	L206095	06/13/2012	06/13/2012	7471A

LIONVILLE LABORATORY
A division of Spectrum Analytical Corporation

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WC-Hanford, Inc.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3924	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/19/2012 11:08

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 L206095 - SW 7471A Prep										
Blank (L206095-BLK1)				Prepared & Analyzed: 06/13/2012						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L206095-DUP2)		**Source: 1206031-01**		Prepared & Analyzed: 06/13/2012						
Mercury	0.0253	B	0.0265	mg/kg dry		0.0167			41.2*	20
Matrix Spike (L206095-MS2)		**Source: 1206031-01**		Prepared & Analyzed: 06/13/2012						
Mercury	0.177		0.0251	mg/kg dry	0.13918	0.0167	115	75-125		20
Reference (L206095-SRM1)				Prepared & Analyzed: 06/13/2012						
Mercury	1.29		0.0290	mg/kg wet	1.2900		99.9	62.6-138		
Batch L206118 - SW 3050B										
Blank (L206118-BLK1)				Prepared: 06/15/2012 Analyzed: 06/18/2012						
Aluminum	4.10	U	4.10	mg/kg wet						
Antimony	0.492	U	0.492	mg/kg wet						
Arsenic	0.820	U	0.820	mg/kg wet						
Barium	0.410	U	0.410	mg/kg wet						
Beryllium	0.164	U	0.164	mg/kg wet						
Boron	1.64	U	1.64	mg/kg wet						
Cadmium	0.164	U	0.164	mg/kg wet						
Calcium	5.54	B	82.0	mg/kg wet						
Chromium	0.164	U	0.164	mg/kg wet						
Cobalt	1.64	U	1.64	mg/kg wet						
Copper	0.820	U	0.820	mg/kg wet						
Iron	16.4	U	16.4	mg/kg wet						
Lead	0.410	U	0.410	mg/kg wet						
Magnesium	61.5	U	61.5	mg/kg wet						
Manganese	4.10	U	4.10	mg/kg wet						
Molybdenum	1.64	U	1.64	mg/kg wet						
Nickel	3.28	U	3.28	mg/kg wet						
Potassium	328	U	328	mg/kg wet						
Selenium	0.246	U	0.246	mg/kg wet						
Silicon	1.64	U	1.64	mg/kg wet						
Silver	0.164	U	0.164	mg/kg wet						
Sodium	41.0	U	41.0	mg/kg wet						
Vanadium	2.05	U	2.05	mg/kg wet						
Zinc	8.20	U	8.20	mg/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-207 Project Number: K3924 Project Manager: Joan Kessner	**Reported:** 06/19/2012 11:08

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 L206118 - SW 3050B									
Duplicate (L206118-DUP1)	**Source: 1206031-01**	Prepared: 06/15/2012 Analyzed: 06/18/2012							
Aluminum	8540	4.60	mg/kg dry		7840			9	20
Antimony	0.552 U	0.552	mg/kg dry		0.483 U				20
Arsenic	2.56	0.920	mg/kg dry		2.41			6	20
Barium	187	0.460	mg/kg dry		165			13	20
Beryllium	0.391	0.184	mg/kg dry		0.333			16	20
Boron	12.1	1.84	mg/kg dry		8.85			31*	20
Cadmium	0.145 B	0.184	mg/kg dry		0.114			24*	20
Calcium	5920	92.0	mg/kg dry		5700			4	20
Chromium	9.63	0.184	mg/kg dry		9.52			1	20
Cobalt	5.64	1.84	mg/kg dry		5.57			1	20
Copper	12.7	0.920	mg/kg dry		12.5			2	20
Iron	17700	18.4	mg/kg dry		17900			1	20
Lead	13.3	0.460	mg/kg dry		17.9			30*	20
Magnesium	3830	69.0	mg/kg dry		3950			3	20
Manganese	277	4.60	mg/kg dry		293			5	20
Molybdenum	0.501 B	1.84	mg/kg dry		0.449			11	20
Nickel	9.70	3.68	mg/kg dry		8.95			8	20
Potassium	1280	368	mg/kg dry		1190			7	20
Selenium	0.276 U	0.276	mg/kg dry		0.241 U				20
Silicon	386	1.84	mg/kg dry		408			6	20
Silver	0.184 U	0.184	mg/kg dry		0.161 U				20
Sodium	410	46.0	mg/kg dry		337			20	20
Vanadium	48.1	2.30	mg/kg dry		47.5			1	20
Zinc	35.3	9.20	mg/kg dry		35.3			0.003	20
Matrix Spike (L206118-MS1)	**Source: 1206031-01**	Prepared: 06/15/2012 Analyzed: 06/18/2012							
Aluminum	8350	3.79	mg/kg dry	151.46	7840	340*	75-125		
Antimony	9.66	0.454	mg/kg dry	37.865	0.483 U	26*	75-125		
Arsenic	109	0.757	mg/kg dry	151.46	2.41	70*	75-125		
Barium	277	0.379	mg/kg dry	151.46	165	73*	75-125		
Beryllium	2.97	0.151	mg/kg dry	3.7865	0.333	70*	75-125		
Boron	58.0	1.51	mg/kg dry	75.730	8.85	65*	75-125		
Cadmium	2.81	0.151	mg/kg dry	3.7865	0.114	71*	75-125		
Calcium	7110	75.7	mg/kg dry	1893.2	5700	74*	75-125		
Chromium	20.4	0.151	mg/kg dry	15.146	9.52	72*	75-125		
Cobalt	31.6	1.51	mg/kg dry	37.865	5.57	69*	75-125		
Copper	27.5	0.757	mg/kg dry	18.932	12.5	80	75-125		

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2620 Fermi Avenue	Project Number: K3924	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/19/2012 11:08

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 L206118 - SW 3050B									
Matrix Spike (L206118-MS1)		**Source: 1206031-01**		Prepared: 06/15/2012 Analyzed: 06/18/2012					
Iron	18500	15.1	mg/kg dry	75.730	17900	758*	75-125		
Lead	32.6	0.379	mg/kg dry	37.865	17.9	39*	75-125		
Magnesium	5000	56.8	mg/kg dry	1893.2	3950	55*	75-125		
Manganese	284	3.79	mg/kg dry	37.865	293	-24*	75-125		
Molybdenum	53.1	1.51	mg/kg dry	75.730	0.449	69*	75-125		
Nickel	33.9	3.03	mg/kg dry	37.865	8.95	66*	75-125		
Potassium	2510	303	mg/kg dry	1893.2	1190	70*	75-125		
Selenium	100	0.227	mg/kg dry	151.46	0.241 U	66*	75-125		
Silicon	375	1.51	mg/kg dry	75.730	408	-43*	75-125		
Silver	2.69	0.151	mg/kg dry	3.7865	0.161 U	71*	75-125		
Sodium	1790	37.9	mg/kg dry	1893.2	337	77	75-125		
Vanadium	73.2	1.89	mg/kg dry	37.865	47.5	68*	75-125		
Zinc	62.0	7.57	mg/kg dry	37.865	35.3	70*	75-125		
Reference (L206118-SRM1)				Prepared: 06/15/2012 Analyzed: 06/18/2012					
Aluminum	8380	9.74	mg/kg wet	6670.0		126	0-200.89		
Antimony	28.1	1.17	mg/kg wet	53.000		53	0-235.8		
Arsenic	101	1.95	mg/kg wet	114.00		88	82.8-117.54		
Barium	275	0.974	mg/kg wet	307.00		90	79.8-120.2		
Beryllium	91.0	0.390	mg/kg wet	108.00		84	82.8-117.6		
Boron	67.8	3.90	mg/kg wet	85.100		80	67.5-132.8		
Cadmium	199	0.390	mg/kg wet	225.00		88	83.6-116.4		
Calcium	2840	195	mg/kg wet	3360.0		84	83.3-116.9		
Chromium	69.2	0.390	mg/kg wet	77.200		90	73.3-126.4		
Cobalt	139	3.90	mg/kg wet	166.00		84	80.7-118.7		
Copper	230	1.95	mg/kg wet	271.00		85	80.8-119.2		
Iron	7240	39.0	mg/kg wet	8420.0		86	78.6-121.1		
Lead	165	0.974	mg/kg wet	190.00		87	81.6-118.4		
Magnesium	7030	146	mg/kg wet	8570.0		82*	83.2-116.7		
Manganese	743	9.74	mg/kg wet	965.00		77	69.3-130.5		
Molybdenum	199	3.90	mg/kg wet	235.00		85	76.2-123.8		
Nickel	187	7.79	mg/kg wet	221.00		85	79.6-120.8		
Potassium	12500	779	mg/kg wet	14400		87	81.9-118.1		
Selenium	165	0.584	mg/kg wet	187.00		88	75.9-124.6		
Silicon	211	3.90	mg/kg wet	807.00		26	0-219.3		
Silver	78.3	0.390	mg/kg wet	83.500		94	82.7-117.1		
Sodium	8270	97.4	mg/kg wet	9730.0		85	82.5-117.2		

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

WC-Hanford, Inc.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3924	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/19/2012 11:08

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 L206118 - SW 3050B									
Reference (L206118-SRM1)			Prepared: 06/15/2012 Analyzed: 06/18/2012						
Vanadium	89.5	4.87	mg/kg wet	98.700		91	75.9-123.6		
Zinc	169	19.5	mg/kg wet	199.00		85	78.4-121.6		

Lionville Laboratory

Logbook #: 1128

JJS 6/15/12 WB

SAMPLE DIGESTION RECORD

Digestion Batch #: ~~L206103~~ L206118
Date/Time Initiated: 6/18/12 1030
Date/Time Completed: 6/15/12 1605
Analyst: JJS
Matrix (circle): (Soil) Water Other
Method (circle one): 3005A 3010A (3050) 200.7 (1994)
pH/Turbidity: N/A for Solids.
NOTE: All temperatures are recorded as corrected temperatures

(Digested) / Undigested (circle one)
Balance #: B14
Balance Cal Verification: Y NA
Temp: 96
BLOCK (1) 2 (circle one)

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1206031-01		0.64	50		TO	Fine	Brown	Rocks	N/A
L206118-BS1		0.56	50			↓	↓	↓	
-MS1	0.5	0.68	50			↓	↓		
1206033-01		0.60	50			Coarse	Gray/White		
L206118-BS2		0.61	50			↓	↓		
-MS2	0.5	0.65	50			↓	↓		
-BLK1		0.61	50			Coarse	Boiling Chips		
-SRM1	✓	0.77	50		↓	Fine	pink sand		↓

JJS

6/15/12

Spiking IDs / Expiration Date:
MS#: 1000457
LCS#: ✓ 1001357

Reagent IDs:
HNO_3 K94023
HCl L01031
H_2O_2 K004103
1:1 HNO_3 637-066-02
1:1 HCl

File ID#:

Data Review By/Date: 6/18/12

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Signed\SPI\Metals Digestion log.doc

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Lionville Laboratory

MERCURY PREPARATION

Logbook # 1132

Analyst: MLeh
Date 6/13/12
Start Time/Temp: 1455/95°
End Time/Temp: 1525/95°

Instrument ID: HG3.1
Balance # B29 /NA
Pipette Calibration (Daily) M

Prep Batch: L206095
Worksheet: HG061301
SOP No. ME-HgCVAA
BLOCK 1 2 (circle one) (3)

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	
5.0µg/l		2.500		10ml	50	
10.0µg/l		5.000		10ml	50	
ICV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L206095-BLK1				0.31	50	
SRM1		A	A	0.31	50	
1206030-01				0.39	50	RA D I
L206095-DUP1				0.38	50	|
MS1		0.500	1.0	0.38	50	|
1206031-01				0.34	50	
L206095-DUP2				0.35	50	
MS2		0.500	1.0	0.37	50	
1206032-01				0.35	50	
L206095-DUP3				0.36	50	
MS3		0.500	1.0	0.37	50	
1206032-02				0.35	50	
03				0.37	50	
04				0.33	50	
05				0.37	50	
		MW 6/13/12				

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200585	6/13/12 1015
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: 6/14/12

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

see book # 9368 for std traceability information

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

PREPARATION BENCH SHEET

L206118

Lionville Laboratory

Printed: 6/18/2012 1:20:16PM

Matrix: Solid **Prepared using: METALS - SW 3050B** **(No Surrogate)**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1206031-01	6010B ICP Trace	06/15/2012 10:10	0.64	50					WC-Hanford, Inc.	HSL + B, Mo, Si (no TL)
1206033-01	6010B ICP Trace	06/15/2012 10:10	0.6	50					WC-Hanford, Inc.	HSL + B, Mo, Si (no TL)
L206118-BLK1	QC	06/15/2012 10:10	0.61	50						
L206118-DUP1	QC	06/15/2012 10:10	0.56	50		1206031-01				
L206118-DUP2	QC	06/15/2012 10:10	0.61	50		1206033-01				
L206118-MS1	QC	06/15/2012 10:10	0.68	50	1200457	1206031-01	500			
L206118-MS2	QC	06/15/2012 10:10	0.65	50	1200457	1206033-01	500			
L206118-SRM1	QC	06/15/2012 10:10	0.77	50	1101357		770			

JJS 6/18/12
Extracts Relinquished By Date

Rhettel 06/18/12
Extracts Received By Date