SAF-RC-234
100-IU-2 & 100-IU-6 Remaining Waste Sites – Other
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 3/13/13
INITIAL/DATE

COMMENTS:

SDG K4054 SAF-RC-234

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 600-371

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

11 March 2013

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 #	1301064
SDG #	K4054
SAF #	RC-234
Date Received	01/25/13
# 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

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 19 pages.

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1301064

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-234

Est. Final Proj. Sampling Date

Project#

Project Contact/Phone#

Lionville Laboratory Project Manager Arletta Johnson

QC SW Del STL TAT 15

Date Rec'd 1-25-13 Date Due 2-9-13

Refrigerator #

#/Type Container: Liquid / Solid

Volume: Liquid / Solid

Preservatives

ANALYSES REQUESTED →

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	A	B	ORGANIC VOA	BNA	Pest/PCB	Herb	INORG (1) Metal + H+	CN	(2) TCLP Metals	+ H+
								2	2								
								1pl	1agl								
								125	125								
								—									
								Lionville Laboratory Use Only *									
								METALS								TCLP metals	1
W Water	01	J1RD43	✓	✓	S	1-23-13	1035	X								X	X
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:

METALS = HSL + B, Mo, Sn (No TL)

Special Instructions: *

1. Please Leave + Hold TCLP until directed to run by - Joan Kessner.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	[illegible]	1.25.13	0945

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-234-002	Page 1 of 1
Collector: ~~Brackett, RA~~ DUNNUM, M 1/23/13	Company Contact: Joan Kessner — Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: 9L 9C BH 1/23/13 — Data Turnaround: ~~21 Days~~ 15 DAYS BH 1/23/13
Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites - Other	Sampling Location: 600-371	SAF No.: RC-234	
Ice Chest No.: WCH-12-023	Field Logbook No.: EL-1666 — COA: 0603712600	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A120717	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

May contain hazardous substances that present risk to humans and/or the environment

Special Handling and/or Storage

Maintain preservation as indicated in header

Preservation	None	None									
Type of Container	G/P	aG									
No. of Container(s)	1	1									
Volume	125mL	125mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									
Sample No. / Matrix * / Sample Date / Sample Time											
J1RD43 / OTHER / 1/23/12 / 1035	X	X									

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: ~~Brackett, RA~~ DUNNUM, M — Date/Time: 1-23-13 1050	Received By/Stored In: BHUDSON BHudson — Date/Time: 1/23/13 1050		
Relinquished By/Removed From: BHUDSON BHudson — Date/Time: 1/23/13 1135	Received By/Stored In: A. Freier A. Freier — Date/Time: 1135 1-23-13		
Relinquished By/Removed From: WCH — Date/Time: 1145 — A Freier A. Freier 1-23-13	Received By/Stored In: fed Ex — Date/Time:		
Relinquished By/Removed From: Fed Ex 1-25-13 0945 — Date/Time:	Received By/Stored In: — Date/Time: 1-25-13-0945		
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

** Please leach and hold TCLP until directed to run analysis by Joan Kessner

(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}

(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470 {Mercury}

REVIEWED BY CMB DATE 1-23-13

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=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

0000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W. C. Hanford **Date:** 1-25-13

Project/SAF/SOW/Release #: RC-234

LvL Batch #: 1301064 **Sample Custodian:** D. Jones

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7945 8387 7896
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** 3.3	**°C**	Cooler # WCH-12-023
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 1.25.13	☐ No	☑ N/A
13. VOA, TOC, TOX, RSK-175, Sulfides, Non-Halogenated VOAs (Alcohol/Glycol) 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 _____

METALS

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-234	
2620 Fermi Avenue	Project Number: K4054	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	02/21/2013 11:05

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1RD43	1301064-01	Other Solid	01/23/2013 10:35	01/25/2013 09:45

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

Case Narrative

Client: WC-HANFORD RC-234
LVL#: 1301064
SDG/SAF#: K4054/RC-234

W.O.#: 60049-001-001-0001-00
Date Received: 01-25-13

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.

   The sample is reported on a wet weight, "as received" basis.

   The sample was analyzed with a 3-fold dilution for ICP metals due to sample matrix. The sample was reanalyzed with a 12-fold dilution for Calcium due to a high concentration of Calcium in the sample and reported with the suffix "...RE1", the corresponding QC samples DUP3, PS3 and MS3 were renamed as DUP7, PS7, and MS7, to facilitate reporting these analyses with the further dilution.

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 control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within method criteria.

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation (3-10X the LOD or samples greater than 20X MB value}.

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

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

10. The matrix spike (MS) recovery for 5 analytes was outside the 75-125% control limits.

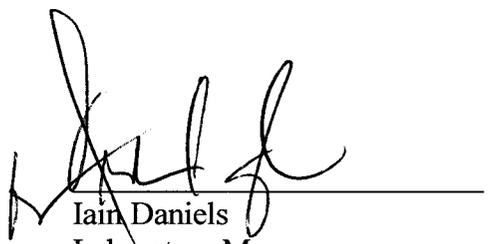
11. For analytes where the MS is out of control, a post-digestion MS (PDS) is performed. A PDS was prepared at meaningful concentration levels for the following analytes: Aluminum, Antimony, Calcium, Iron, and Silicon.

12. The duplicate analyses for 6 analytes were outside the 20% Relative Percent Difference (RPD) control limit criteria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The duplicate results for Arsenic, Boron, Cadmium, Chromium, Copper, Lead, Nickel, Potassium, Sodium, and Zinc 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 hardcopy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



Iain Daniels
Laboratory Manager
Lionville Laboratory

3/11/13
Date

m1301064hg%rgc.doc

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-234	
2620 Fermi Avenue	Project Number: K4054	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	02/21/2013 11:05

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-234	
2620 Fermi Avenue	Project Number: K4054	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	02/21/2013 11:05

J1RD43

1301064-01 (Other Solid)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**1610**		52.6	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Antimony	2.63	U	2.63	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Arsenic	**1.53**	B	2.63	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Barium	**19.0**		1.32	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Beryllium	0.526	U	0.526	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Boron	**3.87**	B	5.26	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Cadmium	**0.234**	B	0.658	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Chromium	**2.09**	B	2.63	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Cobalt	7.89	U	7.89	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Copper	**4.11**	B	5.26	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Iron	**2990**		52.6	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Lead	**2.78**		2.63	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Magnesium	**959**		13.2	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Manganese	**55.0**		2.63	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Molybdenum	2.63	U	2.63	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Nickel	**1.90**	B	6.58	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Potassium	**480**		263	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Selenium	2.63	U	2.63	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Silicon	**404**		15.8	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Silver	2.63	U	2.63	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Sodium	**101**	B	132	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Vanadium	**8.15**		2.63	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Zinc	**24.4**		7.89	mg/kg wet	3	L302012	02/04/2013	02/06/2013	6010B
Mercury	0.0281	U	0.0281	mg/kg	1	L302014	02/04/2013	02/05/2013	7471A

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WC-Hanford, Inc.	Project: RC-234	
2620 Fermi Avenue	Project Number: K4054	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	02/21/2013 11:05

J1RD43

1301064-01RE1 (Other Solid)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Metals by SW846 6000/7000 series								
Calcium	**168000**	211	mg/kg wet	12	L302012	02/04/2013	02/07/2013	6010B

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WC-Hanford, Inc.	Project: RC-234	
2620 Fermi Avenue	Project Number: K4054	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	02/21/2013 11:05

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 L302012 - SW 3050B										
Blank (L302012-BLK1)				Prepared: 02/04/2013 Analyzed: 02/06/2013						
Aluminum	19.2	U	19.2	mg/kg wet						
Antimony	0.962	U	0.962	mg/kg wet						
Arsenic	0.962	U	0.962	mg/kg wet						
Barium	0.481	U	0.481	mg/kg wet						
Beryllium	0.192	U	0.192	mg/kg wet						
Boron	1.92	U	1.92	mg/kg wet						
Cadmium	0.240	U	0.240	mg/kg wet						
Calcium	8.94	B	19.2	mg/kg wet						
Chromium	0.962	U	0.962	mg/kg wet						
Cobalt	2.88	U	2.88	mg/kg wet						
Copper	1.92	U	1.92	mg/kg wet						
Iron	19.2	U	19.2	mg/kg wet						
Lead	0.962	U	0.962	mg/kg wet						
Magnesium	3.72	B	4.81	mg/kg wet						
Manganese	0.962	U	0.962	mg/kg wet						
Molybdenum	0.962	U	0.962	mg/kg wet						
Nickel	2.40	U	2.40	mg/kg wet						
Potassium	96.2	U	96.2	mg/kg wet						
Selenium	0.962	U	0.962	mg/kg wet						
Silicon	1.99	B	5.77	mg/kg wet						
Silver	0.962	U	0.962	mg/kg wet						
Sodium	9.73	B	48.1	mg/kg wet						
Vanadium	0.962	U	0.962	mg/kg wet						
Zinc	2.88	U	2.88	mg/kg wet						
Duplicate (L302012-DUP3)			**Source: 1301064-01**	Prepared: 02/04/2013 Analyzed: 02/06/2013						
Aluminum	2690		56.6	mg/kg wet		1610		50.2*		20
Antimony	2.83	U	2.83	mg/kg wet		2.63 U				20
Arsenic	3.13		2.83	mg/kg wet		1.53		68.8*		20
Barium	25.4		1.42	mg/kg wet		19.0		28.8*		20
Beryllium	0.566	U	0.566	mg/kg wet		0.526 U				20
Boron	5.24	B	5.66	mg/kg wet		3.87		30.0*		20
Cadmium	0.155	B	0.708	mg/kg wet		0.234		40.7*		20
Chromium	4.01		2.83	mg/kg wet		2.09		62.9*		20
Cobalt	8.49	U	8.49	mg/kg wet		7.89 U				20
Copper	6.78		5.66	mg/kg wet		4.11		49.0*		20
Iron	4940		56.6	mg/kg wet		2990		49.3*		20

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WC-Hanford, Inc.	Project: RC-234	
2620 Fermi Avenue	Project Number: K4054	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	02/21/2013 11:05

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 L302012 - SW 3050B									
Duplicate (L302012-DUP3)	**Source: 1301064-01**	Prepared: 02/04/2013 Analyzed: 02/06/2013							
Lead	5.74	2.83	mg/kg wet		2.78			69.5*	20
Magnesium	1420	14.2	mg/kg wet		959			38.5*	20
Manganese	81.7	2.83	mg/kg wet		55.0			39.1*	20
Molybdenum	2.83 U	2.83	mg/kg wet		2.63 U				20
Nickel	3.09 B	7.08	mg/kg wet		1.90			47.8*	20
Potassium	676	283	mg/kg wet		480			33.8*	20
Selenium	2.83 U	2.83	mg/kg wet		2.63 U				20
Silicon	406	17.0	mg/kg wet		404			0.335	20
Silver	2.83 U	2.83	mg/kg wet		2.63 U				20
Sodium	131 B	142	mg/kg wet		101			25.9*	20
Vanadium	13.0	2.83	mg/kg wet		8.15			45.8*	20
Zinc	38.4	8.49	mg/kg wet		24.4			44.3*	20
Duplicate (L302012-DUP7)	**Source: 1301064-01RE1**	Prepared: 02/04/2013 Analyzed: 02/07/2013							
Calcium	138000	226	mg/kg wet		168000			19.2	20
Matrix Spike (L302012-MS3)	**Source: 1301064-01**	Prepared: 02/04/2013 Analyzed: 02/06/2013							
Aluminum	2360	51.7	mg/kg wet	172.41	1610	437*	75-125		
Antimony	30.6	2.59	mg/kg wet	43.103	2.63 U	71.0*	75-125		
Arsenic	180	2.59	mg/kg wet	172.41	1.53	103	75-125		
Barium	192	1.29	mg/kg wet	172.41	19.0	100	75-125		
Beryllium	4.21	0.517	mg/kg wet	4.3103	0.526 U	97.6	75-125		
Boron	86.7	5.17	mg/kg wet	86.207	3.87	96.0	75-125		
Cadmium	4.60	0.647	mg/kg wet	4.3103	0.234	101	75-125		
Chromium	18.6	2.59	mg/kg wet	17.241	2.09	95.9	75-125		
Cobalt	42.3	7.76	mg/kg wet	43.103	7.89 U	98.0	75-125		
Copper	26.0	5.17	mg/kg wet	21.552	4.11	102	75-125		
Iron	3500	51.7	mg/kg wet	86.207	2990	591*	75-125		
Lead	42.8	2.59	mg/kg wet	43.103	2.78	92.7	75-125		
Magnesium	3110	12.9	mg/kg wet	2155.2	959	99.6	75-125		
Manganese	102	2.59	mg/kg wet	43.103	55.0	108	75-125		
Molybdenum	85.4	2.59	mg/kg wet	86.207	2.63 U	99.1	75-125		
Nickel	43.5	6.47	mg/kg wet	43.103	1.90	96.5	75-125		
Potassium	2680	259	mg/kg wet	2155.2	480	102	75-125		
Selenium	177	2.59	mg/kg wet	172.41	2.63 U	103	75-125		
Silicon	416	15.5	mg/kg wet	86.207	404	13.5*	75-125		
Silver	4.20	2.59	mg/kg wet	4.3103	2.63 U	97.4	75-125		
Sodium	2320	129	mg/kg wet	2155.2	101	103	75-125		

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-234	
2620 Fermi Avenue	Project Number: K4054	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	02/21/2013 11:05

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 L302012 - SW 3050B									
Matrix Spike (L302012-MS3)		**Source: 1301064-01**	Prepared: 02/04/2013 Analyzed: 02/06/2013						
Vanadium	53.2	2.59	mg/kg wet	43.103	8.15	105	75-125		
Zinc	71.2	7.76	mg/kg wet	43.103	24.4	108	75-125		
Matrix Spike (L302012-MS7)		**Source: 1301064-01RE1**	Prepared: 02/04/2013 Analyzed: 02/07/2013						
Calcium	154000	207	mg/kg wet	2155.2	168000	-653*	75-125		
Post Spike (L302012-PS3)		**Source: 1301064-01**	Prepared: 02/04/2013 Analyzed: 02/06/2013						
Aluminum	82700		ug/L	66000	18400	97.5	75-125		
Antimony	343		ug/L	300.00	2.79	113	75-125		
Iron	154000		ug/L	126000	34100	95.0	75-125		
Silicon	12100		ug/L	6300.0	4610	119	75-125		
Post Spike (L302012-PS7)		**Source: 1301064-01RE1**	Prepared: 02/04/2013 Analyzed: 02/07/2013						
Calcium	2350000		ug/L	62400	1910000	702*	75-125		
Reference (L302012-SRM1)			Prepared: 02/04/2013 Analyzed: 02/06/2013						
Aluminum	10800	56.6	mg/kg wet	6670.0		162	0-200.89		
Antimony	45.9	2.83	mg/kg wet	53.000		86.7	0-235.8		
Arsenic	115	2.83	mg/kg wet	114.00		101	82.8-117.54		
Barium	290	1.42	mg/kg wet	307.00		94.6	79.8-120.2		
Beryllium	108	0.566	mg/kg wet	108.00		100	82.8-117.6		
Boron	80.2	5.66	mg/kg wet	85.100		94.3	67.5-132.8		
Cadmium	230	0.708	mg/kg wet	225.00		102	83.6-116.4		
Calcium	3310	56.6	mg/kg wet	3360.0		98.4	83.3-116.9		
Chromium	81.5	2.83	mg/kg wet	77.200		106	73.3-126.4		
Cobalt	166	8.49	mg/kg wet	166.00		99.9	80.7-118.7		
Copper	276	5.66	mg/kg wet	271.00		102	80.8-119.2		
Iron	8570	56.6	mg/kg wet	8420.0		102	78.6-121.1		
Lead	181	2.83	mg/kg wet	190.00		95.0	81.6-118.4		
Magnesium	7490	14.2	mg/kg wet	8570.0		87.4	83.2-116.7		
Manganese	968	2.83	mg/kg wet	965.00		100	69.3-130.5		
Molybdenum	235	2.83	mg/kg wet	235.00		100	76.2-123.8		
Nickel	222	7.08	mg/kg wet	221.00		100	79.6-120.8		
Potassium	13900	283	mg/kg wet	14400		96.9	81.9-118.1		
Selenium	190	2.83	mg/kg wet	187.00		101	75.9-124.6		
Silicon	501	17.0	mg/kg wet	807.00		62.1	0-219.3		
Silver	84.5	2.83	mg/kg wet	83.500		101	82.7-117.1		
Sodium	9610	142	mg/kg wet	9730.0		98.8	82.5-117.2		
Vanadium	106	2.83	mg/kg wet	98.700		107	75.9-123.6		

LIONVILLE LABORATORY
A division of Baseline Analytical Corporation

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WC-Hanford, Inc.	Project: RC-234	
2620 Fermi Avenue	Project Number: K4054	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	02/21/2013 11:05

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 L302012 - SW 3050B										
Reference (L302012-SRM1)				Prepared: 02/04/2013 Analyzed: 02/06/2013						
Zinc	198		8.49	mg/kg wet	199.00		99.6	78.4-121.6		
Batch L302014 - SW 7471A Prep										
Blank (L302014-BLK1)				Prepared: 02/04/2013 Analyzed: 02/05/2013						
Mercury	0.0290	U	0.0290	mg/kg						
Duplicate (L302014-DUP3)		**Source: 1301064-01**		Prepared: 02/04/2013 Analyzed: 02/05/2013						
Mercury	0.0243	U	0.0243	mg/kg		0.0281 U				20
Matrix Spike (L302014-MS3)		**Source: 1301064-01**		Prepared: 02/04/2013 Analyzed: 02/05/2013						
Mercury	0.166		0.0265	mg/kg	0.14706	0.0281 U	113	75-125		
Reference (L302014-SRM1)				Prepared: 02/04/2013 Analyzed: 02/05/2013						
Mercury	1.29		0.0290	mg/kg	1.2900		99.8	62.6-138		

Lionville Laboratory Logbook #: 1194

SAMPLE DIGESTION RECORD

Digestion Batch #: L302012
Date/Time Initiated: 2/4/13 1825
Date/Time Completed: 2/5/13 1400
Analyst: MW
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: 95
BLOCK 1 2 (circle one)
(3)

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1302062-01		0.56	50		TO	fine	dark brown soil	rocks	
L302012-DUP1		0.53	50						
MS1	0.5	0.58	50						
1302063-01		0.54	50			fine	light brown, dusty	vegetation, moss, rocks	
L302012-DUP2		0.55	50						
MS2	0.5	0.54	50						
1302064-01		0.57	50			fine	light brown dusty	moss, chalk/gypsum (?)	
L302012-DUP3		0.53	50						
MS3	0.5	0.58	50						
1302065-01		0.58	50			not fine	brown soil	green flakes (?)	
L302012-DUP4		0.56	50						
MS4	0.5	0.58	50						
1302066-01		0.57	50			not fine	brown, soil	green chunky flakes, rocks	
L302012-DUP5		0.57	50						
MS5	0.5	0.60	50						
1302067-01		0.59	50			fine	nearly black soil	vegetation	
L302012-DUP6		0.56	50						
MS6	0.5	0.59	50						
1302067-02		0.54	50			fine	brown soil	rocks	
03		0.62	50			fine	brown soil	vegetation	
L302012-BLK1		0.52	50			coarse	boiling days		
SRM1	(A)	0.53	50			fine	pink, Sandy		
		MW 2/4/13							

Spiking IDs / Expiration Date:
MS#: 1300144

LCS#: 1201014 (A)

Reagent IDs:
HNO_3 000000033901
HCl 000001830 1
H_2O_2 L-11A03
1:1 HNO_3 637-076-07
1:1 HCl

File ID#:

Data Review By/Date:
Rev2/8/13

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Signed\SPI\Metals Digestion log.doc

Page #:

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1198

Analyst: [illegible]
Date 2/4/13
Start Time/Temp: 2110/94°
End Time/Temp: 2145/95°

Instrument ID: HG21
Balance # B14 /NA
Pipette Calibration (Daily) (Y) ____

Prep Batch: L302014
Worksheet: HG020501
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.
Mark				10ml	50	
0.2ug/l		0.100		10ml	50	
1.0ug/l		0.500		10ml	50	
2.0ug/l		1.000		10ml	50	
5.0ug/l		2.500		10ml	50	
10.0ug/l		5.000		10ml	50	
ICV		0.1125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L302014-BLK1				0.31	50	
w.e. MW 2/4/13 1 SRM1		(*)	(*)	0.31	50	
1302062-01			w.e. MW 2/4/13	0.34 0.37	50	
L302014-DUP1				0.38 0.39	50	
w.e. MW 2/4/13 1 MS1		0.500	1.0	0.35	50	
1302063-01				0.32	50	
L302014-DUP2				0.36	50	
w.e. MW 2/4/13 1 MS2		0.500	1.0	0.33	50	
1302064-01				0.32	50	
L302014-DUP3				0.37	50	
w.e. MW 2/4/13 1 MS3		0.500	1.0	0.34	50	
1302065-01				0.37	50	
L302014-DUP4				0.34	50	
w.e. MW 2/4/13 1 MS4		0.500	1.0	0.38	50	
1302066-01				0.33	50	
L302014-DUP5				0.35	50	
w.e. MW 2/4/13 1 MS5		0.500	1.0	0.35	50	
1302067-01				0.32	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RT 1201235	2/4/13 1915
ICV/CCV/LCS	(I.V. 1201411)	N/A

Reviewed By/Date: RMP. 02/07/13

Soil LCS True Value = 1129 mg/Kg
Standard # 1201014

see book # 1198 for std traceability information
Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Soil LCS Spiking Concentration: 1.0 µg/ml

00000034
0000000018

Lionville Laboratory

MERCURY PREPARATION

Analyst: [signature]
Date 2/4/13
Start Time/Temp: [illegible]
End Time/Temp: [illegible]

Instrument ID: HG3.1
Balance # B14 /NA
Pipette Calibration (Daily) Y

Logbook # 1198
Prep Batch: L302014
Worksheet: HG020501
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.
L302014-DUP				0.33	50	
MSG		0.500	1.0	0.38	50	
1308067-02				0.39	50	
w.f. PW 2/4/13 03				0.36	50	

PW 2/4/13

Standard:	ID	Prep Date/Time
ICAL/MS		
ICV/CCV/LCS		

Soil LCS True Value = [illegible] 034 mg/Kg
Standard # [illegible]

Reviewed By/Date: PMP, 02/07/13

see book # 1198 for std traceability information
Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Soil LCS Spiking Concentration: 1.0 µg/ml