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

COMPLETE COPY OF DATA PACKAGE TO:

Bill Rodgers X5-51 KW 6/27/12
INITIAL/DATE

COMMENTS:

SDG K3925 SAF-RC-006

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Waste Site(s): 105-N Paint

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 #	1206033
SDG #	K3925
SAF #	RC-006
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

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 25 pages.

CHAIN OF CUSTODY

Lionville Laboratory Use Only
1206033

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: STD TAT: 7 Days
Date Rec'd: 6/13/12 Date Due: 6-20-12

Refrigerator #									A		B					
#/Type Container	Liquid								2		2					
	Solid								1GL		1GL					
Volume	Liquid															
	Solid								60		125					
Preservatives									NA		NA					
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		Lionville Laboratory Use Only														
									Metal		Temp Metal					

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																
001	JiPT13	✓	✓	S	6/12/12	0835								X		X						

Special Instructions:

MetA① = HSL+B, Mo, S; (NO-TL)

Special Instructions:

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

Relinquished by	Received by	Date	Time
FedX	[signature]	6/13/12	1525

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-006-345	Page 1 of 1

Collector: R. Strickland	Company Contact: Bill Rodgers	Telephone No.: 206.251.7439	Project Coordinator: KESSNER, JH
Price Code: 9K	Data Turnaround: ~~15~~ 7 Days SMS 6-12-12		
Project Designation: 100-N Area D4 - Other	Sampling Location: 105-N Paint	SAF No.: RC-006	
Ice Chest No.: CHZM HILL-007	Field Logbook No.: EL-1516-20	COA: RD4MXX2F00	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: NA A110401		Bill of Lading/Air Bill No.: SEE DSPC 06/12/12 RS

POSSIBLE SAMPLE HAZARDS/REMARKS

Lead

Special Handling and/or Storage

~~None~~ Cool 4C SMS 6-12-12

Preservation	Cool 4C	None									
Type of Container	G/P	G									
No. of Container(s)	1	1									
Volume	60mL	125mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time										
J1PT13	OTHER	6-12-12	0835	X	X								

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	6/12/12 1000	[signature] MD767 FRIDGE	6/12/12 1000
[signature] MD767 FRIDGE	06/12/12 1400	FED EX	
FEDEX	6/13/12 1525	[signature] MARTIN	6/13/12 1525

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

Temp 10°C

REVIEWED BY SMS DATE 6/12/12

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: [signature] 6/13/12 15	Title	Date/Time: 6/13/12 15:25
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

00000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford **Date:** 6/13/12

Project/SAF/SOW/Release #: RC-006

LvL Batch #: 1206033 **Sample Custodian:** Marlon Ford

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fedx		Airbill # 793 67145 5069
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 10	°C	Cooler # Blue CH2M Hill 007
How was the temperature taken?	☒ IR	☐ Temp. Blank	☐ Other (Specify): 10.0°C
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 Lab placed QC stickers
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 6/13/12	

SR-002-B.doc

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3925	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/20/2012 13:23

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PT13	1206033-01	Other Solid	06/12/2012 08:35	06/13/2012 15:25

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-006
LVL#: 1206033
SDG/SAF#: K3925/RC-006

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 analyses of 1 other solid sample and 1 TCLP leachate sample.

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

   The other solid sample was analyzed and reported with a 3-fold dilution for ICP metals due to sample matrix.

   The other solid sample was analyzed and reported with a 50-fold dilution for Mercury due to high concentration of Mercury in the sample.

   The TCLP leachate sample was analyzed and reported with a 5-fold dilution for ICP metals due to sample matrix.

   The TCLP leachate sample was analyzed and reported with a 4-fold dilution for Mercury due to high concentration of Mercury in the sample.

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).

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 pages.

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation, MB value less than 5% of the RCRA limit, 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 with the exception of Magnesium at 82.0% (83.2-116.7% range). The sample result for Magnesium may be slightly biased low. All laboratory control samples (LCS) were within the 80-120% control limits.

10. The other solid matrix spike (MS) recoveries for 12 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 serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1PT13	Aluminum	22,000	97.1
	Antimony	100	102.2
	Arsenic	100	108.6
	Calcium	40,800	91.1
	Chromium	100	94.7
	Cobalt	100	86.0
	Iron	12,000	97.1
	Lead	1,100	85.8
	Molybdenum	100	98.1
	Selenium	100	106.2
	Zinc	1,100	70.7
	Mercury	1.0	107.4

12. The other solid duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL.

13. The TCLP duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample result for Chromium less than ten times the MDL.

14. The TCLP extract from sample J1PT13 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

The matrix spike (MS) concentration for Mercury was equivalent to the regulatory level (200 ppb) as per SW846 method 1311. The required spike concentration is above the linear

range of the instrument, resulting in a 50-fold dilution. The MS recovery was greater than 50% as per method criteria.

15. 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.

16. 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.

17. 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.

6/20/12

Iain Daniels
Laboratory Manager
Lionville Laboratory

Date

alm/06-033

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: K3925	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/20/2012 13:14

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: K3925 Project Manager: Joan Kessner	**Reported:** 06/20/2012 13:23

J1PT13
1206033-01 (Other Solid)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**7990**		12.5	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Antimony	1.50	U	1.50	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Arsenic	2.50	U	2.50	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Barium	**2010**		1.25	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Beryllium	0.500	U	0.500	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Boron	**8.00**		5.00	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Cadmium	**6.03**		0.500	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Calcium	**75000**		250	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Chromium	**48.1**		0.500	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Cobalt	**107**		5.00	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Copper	**12.0**		2.50	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Iron	**4460**		50.0	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Lead	**516**		1.25	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Magnesium	**1760**		188	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Manganese	**41.6**		12.5	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Molybdenum	**0.609**	B	5.00	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Nickel	**11.3**		10.0	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Potassium	**1230**		1000	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Selenium	0.750	U	0.750	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Silicon	**395**		5.00	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Silver	0.500	U	0.500	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Sodium	**788**		125	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Vanadium	**6.60**		6.25	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Zinc	**2220**		25.0	mg/kg wet	3	L206118	06/15/2012	06/18/2012	6010B
Mercury	**24.3**		1.50	mg/kg wet	50	L206142	06/18/2012	06/19/2012	7471A

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3925	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/20/2012 13:23

J1PT13
1206033-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
TCLP Metals by SW846 1311 6000/7000 series									
Arsenic	0.0750	U	0.0750	mg/L	5	L206119	06/15/2012	06/18/2012	6010
Barium	**0.240**		0.00500	mg/L	5	L206119	06/15/2012	06/18/2012	6010
Cadmium	**0.0220**		0.0150	mg/L	5	L206119	06/15/2012	06/18/2012	6010
Chromium	**0.00978**	B	0.0250	mg/L	5	L206119	06/15/2012	06/18/2012	6010
Lead	0.0500	U	0.0500	mg/L	5	L206119	06/15/2012	06/18/2012	6010
Selenium	0.100	U	0.100	mg/L	5	L206119	06/15/2012	06/18/2012	6010
Silver	0.0300	U	0.0300	mg/L	5	L206119	06/15/2012	06/18/2012	6010
Mercury	**0.0133**		0.000800	mg/L	4	L206130	06/18/2012	06/19/2012	7470

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3925	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/20/2012 13:23

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										
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						
Duplicate (L206118-DUP2)		**Source: 1206033-01**		Prepared: 06/15/2012 Analyzed: 06/18/2012						
Aluminum	7940		12.3	mg/kg wet		7990			0.6	20
Antimony	1.48	U	1.48	mg/kg wet		1.50 U				20
Arsenic	2.46	U	2.46	mg/kg wet		2.50 U				20
Barium	1920		1.23	mg/kg wet		2010			5	20
Beryllium	0.492	U	0.492	mg/kg wet		0.500 U				20
Boron	8.18		4.92	mg/kg wet		8.00			2	20
Cadmium	6.88		0.492	mg/kg wet		6.03			13	20
Calcium	77200		246	mg/kg wet		75000			3	20
Chromium	59.3		0.492	mg/kg wet		48.1			21*	20
Cobalt	98.9		4.92	mg/kg wet		107			8	20
Copper	11.6		2.46	mg/kg wet		12.0			4	20

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3925	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/20/2012 13:23

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-DUP2)		**Source: 1206033-01**		Prepared: 06/15/2012 Analyzed: 06/18/2012						
Iron	4010		49.2	mg/kg wet		4460			10	20
Lead	465		1.23	mg/kg wet		516			10	20
Magnesium	1770		184	mg/kg wet		1760			0.6	20
Manganese	39.9		12.3	mg/kg wet		41.6			4	20
Molybdenum	4.92	U	4.92	mg/kg wet		0.609				20
Nickel	11.9		9.84	mg/kg wet		11.3			5	20
Potassium	1410		984	mg/kg wet		1230			14	20
Selenium	0.768		0.738	mg/kg wet		0.750 U				20
Silicon	474		4.92	mg/kg wet		395			18	20
Silver	0.492	U	0.492	mg/kg wet		0.500 U				20
Sodium	880		123	mg/kg wet		788			11	20
Vanadium	7.22		6.15	mg/kg wet		6.60			9	20
Zinc	2040		24.6	mg/kg wet		2220			8	20
Matrix Spike (L206118-MS2)		**Source: 1206033-01**		Prepared: 06/15/2012 Analyzed: 06/18/2012						
Aluminum	9320		11.5	mg/kg wet	153.85	7990	868*	75-125		
Antimony	6.14		1.38	mg/kg wet	38.462	1.50 U	16*	75-125		
Arsenic	73.5		2.31	mg/kg wet	153.85	2.50 U	48*	75-125		
Barium	2180		1.15	mg/kg wet	153.85	2010	113	75-125		
Beryllium	3.38		0.462	mg/kg wet	3.8462	0.500 U	88	75-125		
Boron	75.0		4.62	mg/kg wet	76.923	8.00	87	75-125		
Cadmium	10.3		0.462	mg/kg wet	3.8462	6.03	110	75-125		
Calcium	74300		231	mg/kg wet	1923.1	75000	-36*	75-125		
Chromium	79.8		0.462	mg/kg wet	15.385	48.1	206*	75-125		
Cobalt	132		4.62	mg/kg wet	38.462	107	65*	75-125		
Copper	32.8		2.31	mg/kg wet	19.231	12.0	108	75-125		
Iron	5310		46.2	mg/kg wet	76.923	4460	1100*	75-125		
Lead	423		1.15	mg/kg wet	38.462	516	-240*	75-125		
Magnesium	3460		173	mg/kg wet	1923.1	1760	88	75-125		
Manganese	82.6		11.5	mg/kg wet	38.462	41.6	107	75-125		
Molybdenum	34.5		4.62	mg/kg wet	76.923	0.609	44*	75-125		
Nickel	43.0		9.23	mg/kg wet	38.462	11.3	83	75-125		
Potassium	3280		923	mg/kg wet	1923.1	1230	107	75-125		
Selenium	102		0.692	mg/kg wet	153.85	0.750 U	66*	75-125		
Silicon	462		4.62	mg/kg wet	76.923	395	87	75-125		
Silver	3.75		0.462	mg/kg wet	3.8462	0.500 U	98	75-125		
Sodium	2690		115	mg/kg wet	1923.1	788	99	75-125		

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-006 Project Number: K3925 Project Manager: Joan Kessner	**Reported:** 06/20/2012 13:23

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-MS2)		**Source: 1206033-01**	Prepared: 06/15/2012 Analyzed: 06/18/2012						
Vanadium	42.7	5.77	mg/kg wet	38.462	6.60	94	75-125		
Zinc	1730	23.1	mg/kg wet	38.462	2220	-1270*	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		
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		

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3925	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/20/2012 13:23

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 L206142 - SW 7471A Prep										
Blank (L206142-BLK1)				Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	0.0281	U	0.0281	mg/kg wet						
Duplicate (L206142-DUP1)		**Source: 1206033-01**		Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	18.5		1.50	mg/kg wet		24.3			27.2*	20
Matrix Spike (L206142-MS1)		**Source: 1206033-01**		Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	24.7		1.50	mg/kg wet	0.16667	24.3	200*	75-125		
Reference (L206142-SRM1)				Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	1.30		0.0290	mg/kg wet	1.2900		101	62.6-138		

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3925	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/20/2012 13:23

TCLP Metals by SW846 1311 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 L206119 - SW 3010A										
Blank (L206119-BLK1)				Prepared: 06/15/2012 Analyzed: 06/18/2012						
Arsenic	0.0150	U	0.0150	mg/L						
Barium	0.00100	U	0.00100	mg/L						
Cadmium	0.00300	U	0.00300	mg/L						
Chromium	0.00500	U	0.00500	mg/L						
Lead	0.0100	U	0.0100	mg/L						
Selenium	0.0200	U	0.0200	mg/L						
Silver	0.00600	U	0.00600	mg/L						
Blank (L206119-BLK2)				Prepared: 06/15/2012 Analyzed: 06/18/2012						
Arsenic	0.0750	U	0.0750	mg/L						
Barium	0.00500	U	0.00500	mg/L						
Cadmium	0.0150	U	0.0150	mg/L						
Chromium	0.0250	U	0.0250	mg/L						
Lead	0.0500	U	0.0500	mg/L						
Selenium	0.100	U	0.100	mg/L						
Silver	0.0300	U	0.0300	mg/L						
LCS (L206119-BS1)				Prepared: 06/15/2012 Analyzed: 06/18/2012						
Arsenic	9.70		0.0150	mg/L	10.000		97.0	80-120		
Barium	4.84		0.00100	mg/L	5.0000		96.8	80-120		
Cadmium	0.236		0.00300	mg/L	0.25000		94.6	80-120		
Chromium	0.486		0.00500	mg/L	0.50000		97.1	80-120		
Lead	2.39		0.0100	mg/L	2.5000		95.5	80-120		
Selenium	9.35		0.0200	mg/L	10.000		93.5	80-120		
Silver	0.464		0.00600	mg/L	0.50000		92.7	80-120		
Duplicate (L206119-DUP1)		**Source: 1206033-01**		Prepared: 06/15/2012 Analyzed: 06/18/2012						
Arsenic	0.0105	B	0.0750	mg/L		0.0750 U				20
Barium	0.335		0.00500	mg/L		0.240			33.1*	20
Cadmium	0.0311		0.0150	mg/L		0.0220			33.9*	20
Chromium	0.0138	B	0.0250	mg/L		0.00978			34.2*	20
Lead	0.0500	U	0.0500	mg/L		0.0500 U				20
Selenium	0.100	U	0.100	mg/L		0.100 U				20
Silver	0.0300	U	0.0300	mg/L		0.0300 U				20

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K3925	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/20/2012 13:23

TCLP Metals by SW846 1311 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 L206119 - SW 3010A										
Matrix Spike (L206119-MS1)			**Source: 1206033-01**	Prepared: 06/15/2012 Analyzed: 06/18/2012						
Arsenic	4.66		0.0750	mg/L	5.0000	0.0750 U	93.1	50-1000		
Barium	67.3		0.00500	mg/L	100.00	0.240	67.1	50-1000		
Cadmium	0.942		0.0150	mg/L	1.0000	0.0220	92.0	50-1000		
Chromium	4.38		0.0250	mg/L	5.0000	0.00978	87.4	50-1000		
Lead	4.19		0.0500	mg/L	5.0000	0.0500 U	83.8	50-1000		
Selenium	0.902		0.100	mg/L	1.0000	0.100 U	90.2	50-1000		
Silver	4.49		0.0300	mg/L	5.0000	0.0300 U	89.9	50-1000		
Batch L206130 - SW 7470A Prep										
Blank (L206130-BLK1)				Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	0.000200	U	0.000200	mg/L						
Blank (L206130-BLK2)				Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	0.000200	U	0.000200	mg/L						
Blank (L206130-BLK3)				Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	0.000200	U	0.000200	mg/L						
LCS (L206130-BS1)				Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	0.00508		0.000200	mg/L	0.0050000		102	80-120		
Duplicate (L206130-DUP1)			**Source: 1206033-01**	Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	0.0132		0.000800	mg/L		0.0133			0.302	20
Matrix Spike (L206130-MS1)			**Source: 1206033-01**	Prepared: 06/18/2012 Analyzed: 06/19/2012						
Mercury	0.198		0.0100	mg/L	0.20000	0.0133	92.1	50-1000		

Lionville Laboratory

Logbook #: 1128

JJS 6/15/12

SAMPLE DIGESTION RECORD

Digestion Batch #: ~~L206 03~~ L206118
Date/Time Initiated: 6/15/12 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-Dp1		0.56	50						
-MS1	0.5	0.68	50						
1206033-01		0.60	50			Coarse	Gray/White		
L206118-Dp2		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#: 1200457

LCS#: 1001357

Reagent IDs:
HNO_3 K94023
HCl L01031
H_2O_2 K09103
1:1 HNO_3 637-066-02
1:1 HCl

File ID#:

Data Review By/Date: 6/18/12

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Page #:

PREPARATION BENCH SHEET

L206118

Lionville Laboratory

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

00000020

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

Rmeltel 06/18/12

Extracts Received By Date

Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L206119
Date/Time Initiated: 6/15/12 1045
Date/Time Completed: 6/18/12 1345
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 #: N/A
Balance Cal Verification: Y NA
Temp: 96
BLOCK 1 2 3 (circle one)

C/C - clear/colorless

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1206037-01		50	50	<2	TC	N/A	C/C	N/A	N/A
L206119 -Dup1		50	50	<2					
-MS1	0.5	50	50						
-BLK1		50	50				C/C		
-BS1	0.5	50	50				C/C		
+ -BLK2		50	50	<2			C/C		

JJS 6/18/12

Spiking IDs / Expiration Date:
MS#: 1101384
JJS ~~1200388~~ 1200463
6/19/12 WE.

LCS#: 1200458

Reagent IDs:
HNO_3 K99023
HCl
H_2O_2
1:1 HNO_3
1:1 HCl 637-069-01

File ID#:

Data Review By/Date: [signature] 6/18/12

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+: Associated with L206104.

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PREPARATION BENCH SHEET

L206119

Lionville Laboratory

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

Matrix: Solid **Prepared using: METALS - SW 3010A** **(No Surrogate)**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1206033-01	1311/6010B TCLP RCRA ICP MET	06/15/2012 10:18	50	50					WC-Hanford, Inc.	
L206119-BLK1	QC	06/15/2012 10:18	50	50						
L206119-BLK2	QC	06/15/2012 10:18	50	50						Associated with L206104.
L206119-BS1	QC	06/15/2012 10:18	50	50	1200458					
L206119-DUP1	QC	06/15/2012 10:18	50	50		1206033-01				
L206119-MS1	QC	06/15/2012 10:18	50	50	1200463	1206033-01				

JJS 6/18/12

Extracts Relinquished By Date

Brooter 06/18/12

Extracts Received By Date

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 6/18/12
Start Time/Temp: 1830/95°
End Time/Temp: 1900/97°

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

Logbook # 1132
Prep Batch: L206142
Worksheet: HG061902
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	
0.2 ug/L		0.100		10ml	50	
1.0 ug/L		0.500		10ml	50	
2.0 ug/L		1.000		10ml	50	
5.0 ug/L		2.500		10ml	50	
10.0 ug/L		5.000		10ml	50	
ICV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L206142-BLK1				0.32	50	
SRM1				0.31	50	
1206033-01				0.30	50	
L206142-DUP1				0.30	50	
MS1		0.500	1.0	0.30	50	
1206042-01				0.34	50	
L206142-DUP2				0.35	50	
MS2		0.500	1.0	0.34	50	
1206042-02				0.34	50	
03				0.37	50	
04				0.37	50	
05				0.35	50	
06				0.39	50	
07				0.37	50	
08				0.38	50	
09						
10						

Cancelled by client

[illegible] 6/18/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200588	6/18/12 1130
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: [illegible] 6/20/12

se book # 9368 for std traceability information

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

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

ME-HgCVAA-Prep0910

Page #:

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Lionville Laboratory

MERCURY PREPARATION

Logbook # 1132

Analyst: [signature]
Date 6/18/12
Start Time/Temp: 1415/97°
End Time/Temp: 1615/97°

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

Prep Batch: L206130
Worksheet: HG061901
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				35	35	
0.2 ug/l		0.070		35	35	
1.0 ug/l		0.350		35	35	
2.0 ug/l		0.700		35	35	
5.0 ug/l		1.750		35	35	
10.0 ug/l		3.500		35	35	
ICV		0.0875	2.5	35	35	
CCV		0.175	5.0	35	35	
ICB/CCB				35	35	
L206130-BLK1				35	35	
BS1		0.175	5.0	35	35	
BLK2	<			35	35	L206104
BLK3	<			35	35	L206105
1206033-01	<			35	35	
L206130-DUP1	<			35	35	
MS1		0.700	200*	35	35	
1206036-01	<			35	35	
L206130-DUP2	<			35	35	
MS2		0.700	200*	35	35	

[initials] 6/18/12

Standard:	ID	Prep Date/Time
ICAL/MS	BI 1200588	6/18/12 1130
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: [signature] 6/20/12

se book # 9368 for std traceability information

Soil LCS True Value = N/A mg/Kg
Standard #

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

* used 1200587 (10 ug/ml)

ME-HgCVAA-Prep0910

Page #:

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Lionville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 1116

Start Date: 6-14-12 Start Time: 12:51 Analyst: RH SOP: SPI-1311.1	End Date: 6-15-12 End Time: 6:30 Analyst: RH Method: 1311.1	Tumbler Speed: 30 RPM Leachate Batch #: L206104 Leachate Page: 1 of 1 Room Temp. (°C): Start 21 /Finish 21 **Room Temp. Acceptance Criteria:** **23°C ± 2°**

LvL #: 1206033-01 Client ID#: JIPT13 pH After 5 Min: 9.38 pH After Acid/Heat: 1.90 Extraction Fluid/pH: #1 4.94 Sample Wt.(g): 25 Extract Fluid Vol.(mL): 500 pH After Extraction: 7.54	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: _____
LvL #: L206104 Client ID#: N/A pH After 5 Min: N/A pH After Acid/Heat: N/A Extraction Fluid/pH: N/A Sample Wt.(g): N/A Extract Fluid Vol.(mL): 500 pH After Extraction: N/A	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: BLANK
LvL # Client ID#: pH After 5 Min: pH After Acid/Heat: Extraction Fluid/pH: Sample Wt.(g): Extract Fluid Vol.(mL): pH After Extraction:	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added:
LvL #: Client ID#: pH After 5 Min: pH After Acid/Heat: Extraction Fluid/pH: Sample Wt.(g): Extract Fluid Vol.(mL): pH After Extraction:	Initial Filtration Data and Comments: Solids: _____% / NA RH Initial Filtrate Added:

Standard	ID	Prep Date	Expir Date	pH Acceptance Criteria
Fluid #1	1200733	6-6-12	12-6-12	4.93 ± 0.05
Fluid # 2				2.88 ± 0.05

SPI-1311.1-A-0310 Reviewed By/Date [signature] 6/19/12 Page #