SAF-RC-206
Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites – Full Soil Protocol
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 7/7/11
INITIAL/DATE

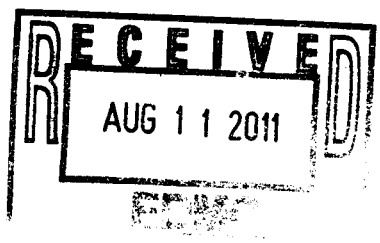
COMMENTS:

SDG K3409 **SAF-RC-206**

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: **C-7 BCL stockpiles**



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24 June 2011

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H9-03
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 #	1106048
SDG #	K3409
SAF #	RC-206
Date Received	06/16/11
# Samples	4
Matrix	SOIL
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

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-206 Project Number: K3409 Project Manager: Joan Kessner	**Reported:** 06/23/2011 14:01

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1JF55	1106048-01	Soil	06/13/2011 07:50	06/16/2011 10:00
J1JF56	1106048-02	Soil	06/13/2011 08:00	06/16/2011 10:00
J1JF57	1106048-03	Soil	06/13/2011 08:10	06/16/2011 10:00
J1JF58	1106048-04	Soil	06/13/2011 08:20	06/16/2011 10:00

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Case Narrative

Client: WC-HANFORD RC-206
LVL#: 1106048
SDG/SAF#: K3409/RC-206

W.O.#: 60049-001-001-0001-00
Date Received: 06-16-11

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 4 soil samples.

2. The samples were 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 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. The preparation/method blank for 1 analyte was outside method criteria. {less than the Limit of Quantitation (3-10X the LOD), samples greater than 20X MB value}.

   a). The MB result for Selenium was greater than the Limit of Quantitation (LOQ) {3-10x the (LOD) Limit of Detection} however the sample results for Selenium were below the client's reporting limit. The sample results were reported herein "uncorrected" for the levels found in the MB.

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

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.

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer with the exception of Silicon (391.26%). The samples were reported for Silicon as per the project manager.

10. The matrix spike (MS) recoveries for 9 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
J1JF55	Aluminum	22,000	79.5
	Antimony	100	94.8
	Chromium	100	80.0
	Iron	42,000	50.9
	Lead	100	76.2
	Magnesium	21,600	69.8
	Manganese	1,000	50.5
	Nickel	100	80.8
	Silicon	100	0.0*

* The PDS concentration for Silicon was prepared at too low a level for a recovery.

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limit critieria. 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

6/24/11
Date

alm/06-048

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WC-Hanford, Inc.	Project: RC-206	
2620 Fermi Avenue	Project Number: K3409	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/23/2011 14:01

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-206	
2620 Fermi Avenue	Project Number: K3409	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	06/23/2011 14:01

J1JF55
1106048-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**9740**		3.76	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Antimony	0.451	U	0.451	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Arsenic	**5.64**		0.752	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Barium	**91.3**		0.376	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Beryllium	**0.389**		0.150	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Boron	**1.16**	B	1.50	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Cadmium	**0.122**	B	0.150	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Calcium	**9190**		75.2	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Chromium	**10.1**		0.150	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Cobalt	**9.33**		1.50	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Copper	**19.3**		0.752	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Iron	**24200**		15.0	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Lead	**6.32**		0.376	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Magnesium	**6470**		56.4	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Manganese	**381**		3.76	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Molybdenum	**0.476**	B	1.50	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Nickel	**12.9**		3.01	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Potassium	**1880**		301	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Selenium	0.226	U	0.226	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Silicon	**1440**		1.50	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Silver	0.150	U	0.150	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Sodium	**631**		37.6	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Vanadium	**56.2**		1.88	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Zinc	**52.8**		7.52	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Mercury	0.0301	U	0.0301	mg/kg dry	1	L106175	06/21/2011	06/21/2011	7471A

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WC-Hanford, Inc.	Project: RC-206	
2620 Fermi Avenue	Project Number: K3409	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	06/23/2011 14:01

J1JF56

1106048-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**9100**		4.40	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Antimony	0.528	U	0.528	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Arsenic	**5.19**		0.881	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Barium	**82.9**		0.440	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Beryllium	**0.384**		0.176	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Boron	**1.12**	B	1.76	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Cadmium	**0.133**	B	0.176	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Calcium	**8730**		88.1	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Chromium	**9.19**		0.176	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Cobalt	**8.31**		1.76	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Copper	**17.1**		0.881	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Iron	**22300**		17.6	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Lead	**6.25**		0.440	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Magnesium	**5970**		66.1	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Manganese	**339**		4.40	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Molybdenum	**0.372**	B	1.76	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Nickel	**10.8**		3.52	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Potassium	**1770**		352	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Selenium	0.264	U	0.264	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Silicon	**1200**		1.76	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Silver	0.176	U	0.176	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Sodium	**549**		44.0	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Vanadium	**49.0**		2.20	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Zinc	**47.0**		8.81	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Mercury	0.0277	U	0.0277	mg/kg dry	1	L106175	06/21/2011	06/21/2011	7471A

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WC-Hanford, Inc.	Project: RC-206	
2620 Fermi Avenue	Project Number: K3409	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	06/23/2011 14:01

J1JF57
1106048-03 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**12500**		4.87	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Antimony	0.584	U	0.584	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Arsenic	**8.16**		0.973	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Barium	**107**		0.487	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Beryllium	**0.503**		0.195	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Boron	**1.52**	B	1.95	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Cadmium	**0.160**	B	0.195	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Calcium	**12400**		97.3	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Chromium	**13.5**		0.195	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Cobalt	**9.98**		1.95	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Copper	**21.9**		0.973	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Iron	**25200**		19.5	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Lead	**9.38**		0.487	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Magnesium	**7860**		73.0	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Manganese	**453**		4.87	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Molybdenum	**0.498**	B	1.95	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Nickel	**15.0**		3.89	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Potassium	**2510**		389	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Selenium	0.292	U	0.292	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Silicon	**1450**		1.95	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Silver	0.195	U	0.195	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Sodium	**709**		48.7	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Vanadium	**51.6**		2.43	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Zinc	**57.6**		9.73	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Mercury	0.0314	U	0.0314	mg/kg dry	1	L106175	06/21/2011	06/21/2011	7471A

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WC-Hanford, Inc.	Project: RC-206	
2620 Fermi Avenue	Project Number: K3409	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	06/23/2011 14:01

J1JF58

1106048-04 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**11100**		5.11	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Antimony	0.613	U	0.613	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Arsenic	**6.86**		1.02	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Barium	**91.0**		0.511	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Beryllium	**0.459**		0.204	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Boron	**1.47**	B	2.04	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Cadmium	**0.147**	B	0.204	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Calcium	**10400**		102	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Chromium	**12.5**		0.204	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Cobalt	**8.63**		2.04	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Copper	**18.6**		1.02	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Iron	**22900**		20.4	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Lead	**8.30**		0.511	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Magnesium	**6590**		76.6	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Manganese	**383**		5.11	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Molybdenum	**0.381**	B	2.04	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Nickel	**13.4**		4.09	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Potassium	**2270**		409	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Selenium	0.307	U	0.307	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Silicon	**1730**		2.04	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Silver	0.204	U	0.204	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Sodium	**548**		51.1	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Vanadium	**52.2**		2.55	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Zinc	**52.0**		10.2	mg/kg dry	1	L106151	06/20/2011	06/20/2011	6010B
Mercury	0.0312	U	0.0312	mg/kg dry	1	L106175	06/21/2011	06/21/2011	7471A

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WC-Hanford, Inc.	Project: RC-206	
2620 Fermi Avenue	Project Number: K3409	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/23/2011 14:01

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 L106151 - SW 3050B										
Blank (L106151-BLK1)				Prepared & Analyzed: 06/20/2011						
Aluminum	4.24	U	4.24	mg/kg wet						
Antimony	0.508	U	0.508	mg/kg wet						
Arsenic	0.847	U	0.847	mg/kg wet						
Barium	0.424	U	0.424	mg/kg wet						
Beryllium	0.169	U	0.169	mg/kg wet						
Boron	1.69	U	1.69	mg/kg wet						
Cadmium	0.169	U	0.169	mg/kg wet						
Calcium	84.7	U	84.7	mg/kg wet						
Chromium	0.169	U	0.169	mg/kg wet						
Cobalt	1.69	U	1.69	mg/kg wet						
Copper	0.847	U	0.847	mg/kg wet						
Iron	16.9	U	16.9	mg/kg wet						
Lead	0.424	U	0.424	mg/kg wet						
Magnesium	63.6	U	63.6	mg/kg wet						
Manganese	4.24	U	4.24	mg/kg wet						
Molybdenum	1.69	U	1.69	mg/kg wet						
Nickel	3.39	U	3.39	mg/kg wet						
Potassium	339	U	339	mg/kg wet						
Selenium	0.267		0.254	mg/kg wet						
Silicon	1.69	U	1.69	mg/kg wet						
Silver	0.169	U	0.169	mg/kg wet						
Sodium	42.4	U	42.4	mg/kg wet						
Vanadium	2.12	U	2.12	mg/kg wet						
Zinc	8.47	U	8.47	mg/kg wet						
Duplicate (L106151-DUP2)			Source: 1106048-01	Prepared & Analyzed: 06/20/2011						
Aluminum	9820		3.87	mg/kg dry		9740			0.828	20
Antimony	0.465	U	0.465	mg/kg dry		0.451 U				20
Arsenic	5.55		0.774	mg/kg dry		5.64			1.58	20
Barium	89.5		0.387	mg/kg dry		91.3			2.04	20
Beryllium	0.389		0.155	mg/kg dry		0.389			0.223	20
Boron	1.15	B	1.55	mg/kg dry		1.16			0.575	20
Cadmium	0.125	B	0.155	mg/kg dry		0.122			2.18	20
Calcium	9540		77.4	mg/kg dry		9190			3.75	20
Chromium	9.84		0.155	mg/kg dry		10.1			2.88	20
Cobalt	9.22		1.55	mg/kg dry		9.33			1.17	20
Copper	19.9		0.774	mg/kg dry		19.3			2.58	20

LVL
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-206	
2620 Fermi Avenue	Project Number: K3409	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/23/2011 14:01

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 L106151 - SW 3050B										
Duplicate (L106151-DUP2)		**Source: 1106048-01**		Prepared & Analyzed: 06/20/2011						
Iron	24400		15.5	mg/kg dry		24200			0.566	20
Lead	6.08		0.387	mg/kg dry		6.32			3.89	20
Magnesium	6370		58.1	mg/kg dry		6470			1.54	20
Manganese	383		3.87	mg/kg dry		381			0.360	20
Molybdenum	0.442	B	1.55	mg/kg dry		0.476			7.38	20
Nickel	12.3		3.10	mg/kg dry		12.9			5.33	20
Potassium	1870		310	mg/kg dry		1880			0.555	20
Selenium	0.232	U	0.232	mg/kg dry		0.226 U				20
Silicon	1510		1.55	mg/kg dry		1440			4.67	20
Silver	0.155	U	0.155	mg/kg dry		0.150 U				20
Sodium	685		38.7	mg/kg dry		631			8.21	20
Vanadium	57.1		1.94	mg/kg dry		56.2			1.68	20
Zinc	51.1		7.74	mg/kg dry		52.8			3.18	20
Matrix Spike (L106151-MS2)		**Source: 1106048-01**		Prepared & Analyzed: 06/20/2011						
Aluminum	10500		4.31	mg/kg dry	172.34	9740	415*	75-125		20
Antimony	17.6		0.517	mg/kg dry	43.084	0.451 U	40.8*	75-125		20
Arsenic	147		0.862	mg/kg dry	172.34	5.64	82.2	75-125		20
Barium	240		0.431	mg/kg dry	172.34	91.3	86.0	75-125		20
Beryllium	3.69		0.172	mg/kg dry	4.3084	0.389	76.7	75-125		20
Boron	67.7		1.72	mg/kg dry	86.168	1.16	77.2	75-125		20
Cadmium	3.60		0.172	mg/kg dry	4.3084	0.122	80.6	75-125		20
Calcium	11500		86.2	mg/kg dry	2154.2	9190	107	75-125		20
Chromium	22.7		0.172	mg/kg dry	17.234	10.1	73.1*	75-125		20
Cobalt	42.5		1.72	mg/kg dry	43.084	9.33	77.1	75-125		20
Copper	38.1		0.862	mg/kg dry	21.542	19.3	86.9	75-125		20
Iron	25900		17.2	mg/kg dry	86.168	24200	1900*	75-125		20
Lead	37.1		0.431	mg/kg dry	43.084	6.32	71.5*	75-125		20
Magnesium	7910		64.6	mg/kg dry	2154.2	6470	66.6*	75-125		20
Manganese	406		4.31	mg/kg dry	43.084	381	57.1*	75-125		20
Molybdenum	72.4		1.72	mg/kg dry	86.168	0.476	83.4	75-125		20
Nickel	44.3		3.45	mg/kg dry	43.084	12.9	72.8*	75-125		20
Potassium	3790		345	mg/kg dry	2154.2	1880	88.4	75-125		20
Selenium	138		0.259	mg/kg dry	172.34	0.226 U	80.3	75-125		20
Silicon	1870		1.72	mg/kg dry	86.168	1440	500*	75-125		20
Silver	3.31		0.172	mg/kg dry	4.3084	0.150 U	76.8	75-125		20
Sodium	2640		43.1	mg/kg dry	2154.2	631	93.4	75-125		20

LIONVILLE LABORATORY
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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-206	
2620 Fermi Avenue	Project Number: K3409	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	06/23/2011 14:01

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 L106151 - SW 3050B									
Matrix Spike (L106151-MS2)		Source: 1106048-01		Prepared & Analyzed: 06/20/2011					
Vanadium	93.8	2.15	mg/kg dry	43.084	56.2	87.2	75-125		20
Zinc	87.3	8.62	mg/kg dry	43.084	52.8	80.1	75-125		20
Reference (L106151-SRM1)				Prepared & Analyzed: 06/20/2011					
Aluminum	8920	12.5	mg/kg wet	6670.0		134	0-200.89		
Antimony	67.6	1.50	mg/kg wet	53.000		128	0-235.8		
Arsenic	117	2.50	mg/kg wet	114.00		103	82.8-117.54		
Barium	318	1.25	mg/kg wet	307.00		104	79.8-120.2		
Beryllium	103	0.500	mg/kg wet	108.00		95.3	82.8-117.6		
Boron	81.2	5.00	mg/kg wet	85.100		95.4	67.5-132.8		
Cadmium	225	0.500	mg/kg wet	225.00		100	83.6-116.4		
Calcium	3260	250	mg/kg wet	3360.0		96.9	83.3-116.9		
Chromium	77.9	0.500	mg/kg wet	77.200		101	73.3-126.4		
Cobalt	164	5.00	mg/kg wet	166.00		98.9	80.7-118.7		
Copper	275	2.50	mg/kg wet	271.00		102	80.8-119.2		
Iron	8580	50.0	mg/kg wet	8420.0		102	78.6-121.1		
Lead	186	1.25	mg/kg wet	190.00		97.9	81.6-118.4		
Magnesium	8400	188	mg/kg wet	8570.0		98.0	83.2-116.7		
Manganese	880	12.5	mg/kg wet	965.00		91.2	69.3-130.5		
Molybdenum	248	5.00	mg/kg wet	235.00		106	76.2-123.8		
Nickel	222	10.0	mg/kg wet	221.00		100	79.6-120.8		
Potassium	14600	1000	mg/kg wet	14400		102	81.9-118.1		
Selenium	194	0.750	mg/kg wet	187.00		104	75.9-124.6		
Silicon	3160	5.00	mg/kg wet	807.00		391*	0-219.3		
Silver	80.2	0.500	mg/kg wet	83.500		96.0	82.7-117.1		
Sodium	9600	125	mg/kg wet	9730.0		98.6	82.5-117.2		
Vanadium	102	6.25	mg/kg wet	98.700		103	75.9-123.6		
Zinc	193	25.0	mg/kg wet	199.00		97.2	78.4-121.6		

LIONVILLE LABORATORY
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264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-206	
2620 Fermi Avenue	Project Number: K3409	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/23/2011 14:01

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 L106175 - SW 7471A Prep										
Blank (L106175-BLK1)				Prepared & Analyzed: 06/21/2011						
Mercury	0.0281	U	0.0281	mg/kg wet						
Duplicate (L106175-DUP4)		Source: 1106048-01		Prepared & Analyzed: 06/21/2011						
Mercury	0.0301	U	0.0301	mg/kg dry		0.0301 U				20
Matrix Spike (L106175-MS4)		Source: 1106048-01		Prepared & Analyzed: 06/21/2011						
Mercury	0.153		0.0283	mg/kg dry	0.15713	0.0301 U	97.2	75-125		20
Reference (L106175-SRM1)				Prepared & Analyzed: 06/21/2011						
Mercury	1.20		0.0281	mg/kg wet	1.2900		92.8	62.6-138		

Lionville Laboratory

Logbook #: 971

SAMPLE DIGESTION RECORD

Digestion Batch #: L106151
Date/Time Initiated: 6/20/11 1010
Date/Time Completed: 6/20/11 1515
Analyst: JDB
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: 98
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
1106047-01		0.74	50		TO	Fine	Brown	Rocks	N/A
L106151-DM1		0.66	50						
-MS1	0.5	0.73	50						
1106047-02		0.60	50			Fine	Brown	Rocks	
-03		0.70	50			Fine	Brown	Rocks	
-04		0.66	50			Fine	Brown	Rocks	
-05		0.59	50			Fine	Brown	Rocks	
-06		0.52	50			Fine	Brown	Rocks	
-07		0.58	50			Fine	Brown	Rocks	
-08		0.59	50			Fine	Brown	Rocks	
1106048-01		0.71	50			Fine	Brown	Rocks	
L106151-DM2		0.69	50						
-MS2	0.5	0.62	50						
1106055-02		0.63	50			Fine	Brown	Rocks	
-03		0.61	50			Fine	Brown	Rocks	
-04		0.56	50			Fine	Brown	Rocks	
L106151-BLK1		0.59	50			Coarse	Boiling Chips		
-LCS1	B	0.60	50			Fine	Lcs/Reagent		

JW 6/20/11

Spiking IDs / Expiration Date:
MS#: 100897

LCS#: 1100103

Reagent IDs:
HNO_3 H090941
HCl H190541
H_2O_2 H03A11
1:1 HNO_3 6-37-041-05
1:1 HCl

File ID#:

Data Review By/Date: 6/22/11

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

Page #: 55

000000013

Lionville Laboratory

MERCURY PREPARATION

Analyst: MLeL
Date 6/20/11 – 6/21/11
Start Time/Temp: 1330/94°
End Time/Temp: 1410/96°

Instrument ID: HG3.2 / HG3.1
Balance # B29 /NA
Pipette Calibration (Daily) (Y)

Logbook # 968
Prep Batch: L107175
Worksheet: HG062102 / HG062202
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				10ml	50	
ICB/CCB				10ml	50	
L106175-BLK1				0.32	50	
SRM1		Ø	Ø	0.32	50	
1106042-01				0.34	50	
L106175-DUP1				0.32	50	
MS1		0.500	1.0	0.34	50	
1106042-02				0.34	50	
1106045-01				0.32	50	
L106175-DUP2				0.33	50	
MS2		0.500	1.0	0.33	50	
1106047-01				0.35	50	
L106175-DUP3				0.36	50	
MS3		0.500	1.0	0.34	50	
1106047-02				0.30	50	
03				0.34	50	
04				0.37	50	
05				0.32	50	
06				0.33	50	
07				0.32	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1107851A	6/21/11 1140
ICV/CCV/LCS	IV1 1107761A	6/21/11 1140

Reviewed By/Date: 6/22/11

Soil LCS True Value = 1.29 mg/Kg
Standard # 1100703 Ø

see book # 9365 for std traceability information

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

Lionville Laboratory

MERCURY PREPARATION

Analyst: MWell
Date 6/20/11 – 6/21/11
Start Time/Temp: 0947
End Time/Temp: see log

Instrument ID: HG3.2
Balance # B29/B14 /NA
Pipette Calibration (Daily) (Y)

W.E. MW 6/20/11
Logbook # 968
Prep Batch: LOT L106175
Worksheet: HG062102
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.
1106047-08				0.34	50	
1106048-01				0.32	50	
L106175-DUP4				0.32	50	
MS4		0.500	1.0	0.34	50	
1106048-02				0.36	50	
03				0.34	50	
04				0.33	50	
1106055-01				0.36	50	PMD
L106175-DUP5				0.34	50	"
MS5		0.500	1.0	0.35	50	"

MW 6/20/11

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

Soil LCS True Value = see log mg/Kg
Standard # _____

Reviewed By/Date: [signature] 6/22/11

se book # 9368 for std traceability information
Water Matrix Spiking Solution Concentration = 0.1 µg/ml
after LCS Spiking Concentration: 1.0 µg/ml

Lionville Laboratory Use Only

1106048

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
Division of Eberline Analytical Corporation

Client WC. Hanford SAF# RC-206

Est. Final Proj. Sampling Date

Project#

Project Contact/Phone#

Lionville Laboratory Project Manager Arlette Johnson

QC SW Del STD TAT 21 days

Date Rec'd 6-16-11 Date Due 7-7-11

Refrigerator #

#/Type Container: Liquid / Solid

Volume: Liquid / Solid

Preservatives

ANALYSES REQUESTED →

	A		B	C
#/Type Container Liquid	2		2	2
#/Type Container Solid	1pl		1pl	1pl
Volume Liquid	250		125	125
Volume Solid			—	—
Preservatives				
ORGANIC: VOA				
ORGANIC: BNA				
ORGANIC: Pest/PCB				
ORGANIC: Herb				
ORGANIC: Spec. Ind. Extract	X			
INORG: Cl				
INORG: Metal + Hg			Met	
INORG: CN				
INORG: Cr6				Cr6

0000000016

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	Lionville Laboratory Use Only
01	JIJF55			S	6-13-11	0750	X X X
02	JIJF56			↓	↓	0800	X X X
03	JIJF57			↓	↓	0810	X X X
04	JIJF58			↓	↓	0820	X X X

Special Instructions: Run matrix QC

Special Instructions:

1.
2.
3.
4. See SRG
5.
6.

Relinquished by	Received by	Date	Time
		6-16-11	10:00

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time
ORIGINAL REWRITTEN			

RF 6-13-11

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-206-024 | Page 1 of 2

Collector: A. Dunnum / T. Welch-Koelling	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH
Project Designation: Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites - F	Sampling Location: C-7 BCL stockpiles		SAF No.: RC-206
Ice Chest No.: ERC-F 99-066 (RF 6-14-11)	Field Logbook No.: EL-1655-01	COA: R100C72600	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A100761		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8L | Data Turnaround: 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 degrees centigrade

Preservation	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P
No. of Container(s)	1	1	1
Volume	125mL	125mL	250mL
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	SPECIAL EXTRACTION - ASTM D3987 (No CAS)

Sample No.	Matrix *	Sample Date	Sample Time			
J1JF53	SOIL	RF				
J1JF54	SOIL	6-7-11				
J1JF55	SOIL	6-13-11	0750	X	X	X
J1JF56	SOIL	6-13-11	0800	X	X	X
J1JF57	SOIL	6-13-11	0810	X	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	6/13/11 1510	Bob Fahlberg B. Fahlberg	6-13-11 1510
B. Fahlberg B. Fahlberg	6-13-11 1620	A. Freier A. Freier 1060, #1	6-13-11 1620
A. Freier A. Freier 1060, #1	6-14-11 0945	Fed Ex	
[signature]	6-16-11 10:00	[signature] DSH.KS	6-16-11 10:00

SPECIAL INSTRUCTIONS

Hold special extraction until directed to run by Joan Kessner

(1) ICP Metals - 6010TR (Close-out 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 [signature] DATE 6/14/11

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

0000000017

RF 6-11-22

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-206-024	Page 1 of 1
Collector: A. Dunnum / T. Welch - Koelling	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 - F	Sampling Location: C-7 BCL stockpiles		SAF No.: RC-206	Data Turnaround: 21 Days
Ice Chest No.: ERC-99-066	Field Logbook No.: EL-1655-01	COA: R100C72600	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A100 761		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	Cool 4C	None									
Type of Container	G/P	G/P	G/P									
No. of Container(s)	1	1	1									
Volume	125mL	125mL	250mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	SPECIAL EXTRACTION - ASTM D3987 (No CAS)									
Sample No.	Matrix *	Sample Date	Sample Time									
J1JF58	SOIL	6-13-11	0820	X	X	X						
J1JF59	SOIL											
J1JF60	SOIL	RF	6-13-11									
J1JF61	SOIL											
J1JF62	SOIL											

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
T. Welch-Koelling	6/13/11 1510	Bob Fahlberg R. Fahlberg	6-13-11 1510
B. Fahlberg R. Fahlberg	6-13-11 1020	A. Freier A. Freier	6-13-11 1020
A. Freier A. Freier	6-14-11 0945	Fed Ex	
Fed Ex	6-16-11 10:00		6/16/11 1000

SPECIAL INSTRUCTIONS

Hold special extraction until directed to run by Joan Kessner

(1) ICP Metals - 6010TR (Close-out 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 DATE 6/14/11

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

00000018

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC. Hanford Date: 6-16-11

Project/SAF/SOW/Release #: RC-206

LvL Batch #: 1106048 Sample Custodian:

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier: FedEx		Airbill # 7972 0331 7938
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 4.8	°C	Cooler # ERC-99-066
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 _____

LVL
LIONVILLE LABORATORY
A division of Hoefline Analytical Corporation

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-206 Project Number: K3409 Project Manager: Joan Kessner	**Reported:** 06/21/2011 17:17

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1JF55	1106048-01	Soil	06/13/2011 07:50	06/16/2011 10:00
J1JF56	1106048-02	Soil	06/13/2011 08:00	06/16/2011 10:00
J1JF57	1106048-03	Soil	06/13/2011 08:10	06/16/2011 10:00
J1JF58	1106048-04	Soil	06/13/2011 08:20	06/16/2011 10:00

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Exton, Pennsylvania 19341
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Case Narrative

Client: WC-HANFORD RC-206 K3409
LVL#: 1106048 **Date Received:** 06-16-11

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were 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 samples that met LvL's sample acceptance policy.

5. The method blank for Hexavalent Chromium (Cr^{6+}) was within the method criteria.

6. The Laboratory Control Samples (LCS) for Cr^{6+} were within the laboratory control limits.

7. The matrix spike recoveries for Cr^{6+} were within the 75-125% control limits.

8. The replicate analysis for Cr^{6+} was within the 20% Relative Percent Difference (RPD) control limit.

9. Results for soil samples are reported on a dry weight basis.

10. 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

6/24/11
Date

njp\i06-048

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 9 pages.

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WC-Hanford, Inc.	Project: RC-206	
2620 Fermi Avenue	Project Number: K3409	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/21/2011 17:17

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Results reported from a dilution; related reporting limits are elevated due to the presence of an interference or a high target value.
*	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-206	
2620 Fermi Avenue	Project Number: K3409	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/21/2011 17:17

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1JF55 (1106048-01) Soil									
%Solids	**93.6**	0.1	0.1	% by Weight	1	L106147	06/17/2011	06/17/2011	SM2540G
Hexavalent Chromium	0.21 U	0.21	0.53	mg/kg dry	1	L106157	06/17/2011	06/20/2011	SW846 7196A
J1JF56 (1106048-02) Soil									
%Solids	**90.1**	0.1	0.1	% by Weight	1	L106147	06/17/2011	06/17/2011	SM2540G
Hexavalent Chromium	0.22 U	0.22	0.55	mg/kg dry	1	L106157	06/17/2011	06/20/2011	SW846 7196A
J1JF57 (1106048-03) Soil									
%Solids	**84.2**	0.1	0.1	% by Weight	1	L106147	06/17/2011	06/17/2011	SM2540G
Hexavalent Chromium	0.24 U	0.24	0.59	mg/kg dry	1	L106157	06/17/2011	06/20/2011	SW846 7196A
J1JF58 (1106048-04) Soil									
%Solids	**87.4**	0.1	0.1	% by Weight	1	L106147	06/17/2011	06/17/2011	SM2540G
Hexavalent Chromium	0.23 U	0.23	0.57	mg/kg dry	1	L106157	06/17/2011	06/20/2011	SW846 7196A

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WC-Hanford, Inc.	Project: RC-206	
2620 Fermi Avenue	Project Number: K3409	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/21/2011 17:17

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L106157 - SW 3060A										
Blank (L106157-BLK1)				Prepared: 06/17/2011 Analyzed: 06/20/2011						
Hexavalent Chromium	0.20 U	0.20	0.50	mg/kg wet						
LCS (L106157-BS1)				Prepared: 06/17/2011 Analyzed: 06/20/2011						
Hexavalent Chromium	3.84	0.20	0.50	mg/kg wet	4.0000		96	80-120		
LCS (L106157-BS2)				Prepared: 06/17/2011 Analyzed: 06/20/2011						
Hexavalent Chromium	1070 D	20.0	50.0	mg/kg wet	1017.5		105	80-120		
Duplicate (L106157-DUP3)	Source: 1106048-04			Prepared: 06/17/2011 Analyzed: 06/20/2011						
Hexavalent Chromium	0.23 U	0.23	0.57	mg/kg dry		0.23 U				20
Matrix Spike (L106157-MS5)	Source: 1106048-04			Prepared: 06/17/2011 Analyzed: 06/20/2011						
Hexavalent Chromium	4.15	0.23	0.57	mg/kg dry	4.5782	0.23 U	91	75-125		
Matrix Spike (L106157-MS6)	Source: 1106048-04			Prepared: 06/17/2011 Analyzed: 06/20/2011						
Hexavalent Chromium	1080 D	22.9	57.2	mg/kg dry	1230.9	0.23 U	88	75-125		

Lionville Laboratory Use Only

1106048

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-206

Est. Final Proj. Sampling Date

Project#

Project Contact/Phone#

Lionville Laboratory Project Manager Arletta Johnson

QC SW Del STD TAT 21 days

Date Rec'd 6-16-11 Date Due 7-7-11

Refrigerator #		A					B		C					
#/Type Container	Liquid	2					2		2					
	Solid	1 pl					1 pl		1 pl					
Volume	Liquid													
	Solid	250					125		125					
Preservatives		—					—		—					
ANALYSES REQUESTED →		VOA	BNA	Pest/PCB	Herb	Spec. Gamma Extract	ORGANIC		INORG (1) Metal + Hg	CN	Cr6			

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	Lionville Laboratory Use Only												
													Met		Cr6					
	01	JIJF55			S	6-13-11	0750					X	X		X					
	02	JIJF56			↓	↓	0800					X	X		X					
	03	JIJF57			↓	↓	0810					X	X		X					
	04	JIJF58			↓	↓	0820					X	X		X					

Special Instructions: Run matrix QC

Special Instructions:

1.
2.
3.
4. See SRC
5.
6.

Relinquished by	Received by	Date	Time
		6-16-11	10:00

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time
ORIGIN L REWRITTEN			

RF 6-13-11

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-206-024	Page 1 of 12
Collector: A. Dunnum | T. Welch-Koelling	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 - F	Sampling Location: C-7 BCL stockpiles		SAF No.: RC-206	Data Turnaround: 21 Days
Ice Chest No.: ERC-8 (RF 6-14-11) 99-066	Field Logbook No.: EL-1655-01	COA: R100C72600	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A100761		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	Cool 4C	None								
Type of Container	G/P	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	125mL	125mL	250mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	SPECIAL EXTRACTION - ASTM D3987 (No CAS)								

Sample No.	Matrix *	Sample Date	Sample Time									
J1JF53	SOIL	RF										
J1JF54	SOIL	6-7-11										
J1JF55	SOIL	6-13-11	0750	X	X	X						
J1JF56	SOIL	6-13-11	0800	X	X	X						
J1JF57	SOIL	6-13-11	0810	X	X	X						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
T. Welch-Koelling	6/13/11 1510	Bob Fahlberg B. Fahlberg	6-13-11 1510
B. Fahlberg B. Fahlberg	6-13-11 1620	1060, #1 A. Frerer A. Frerer	6-13-11 1620
A. Frerer A. Frerer 1060, #1	6-14-11 0945	Fed Ex	
Fed Ex	6-16-11 10:00		6-16-11 10:00

SPECIAL INSTRUCTIONS

Hold special extraction until directed to run by Joan Kessner

(1) ICP Metals - 6010TR (Close-out 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 DATE 6/14/11

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

RC 6-11-2 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-206-024	Page 1 of 1
Collector: A. Dunnum / T. Welch - Keelling	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites - F	Sampling Location: C-7 BCL stockpiles		SAF No.: RC-206	
Ice Chest No.: ERC-99-066	Field Logbook No.: EL-1655-01	COA: R100C72600	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A100 761		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	Cool 4C	None								
Type of Container	G/P	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	125mL	125mL	250mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	SPECIAL EXTRACTION - ASTM D3987 (No CAS)								
Sample No. / Matrix * / Sample Date / Sample Time											
J1JF58 / SOIL / 6-13-11 / 0820	X	X	X								
J1JF59 / SOIL											
J1JF60 / SOIL / RF / 6-13-11											
J1JF61 / SOIL											
J1JF62 / SOIL											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
T. Welch-Keelling	6/13/11 1510	Bob Fahlberg R. Fahlberg	6-13-11 1510
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
B. Fahlberg R. Fahlberg	6-13-11 1620	1060, #1 A. Freier A. Freier	6-13-11 1620
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
WCH 1060 #1 A. Freier A. Freier	6-14-11 0945	Fed Ex	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex	6-16-11 1000		6-16-11 1000
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

Hold special extraction until directed to run by Joan Kessner

(1) ICP Metals - 6010TR (Close-out 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 - 7471A - (CV) {Mercury}

REVIEWED BY DATE 6/14/11

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: 6-16-11

Project/SAF/SOW/Release #: RC-206

LvL Batch #: 1106048 Sample Custodian:

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier: FedEx		Airbill # 7972 0331 7938
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 4.8 °C		Cooler # ERC-99-066
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 _____