SAF-RC-225
100K Remaining Waste Sites – Soil In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 12/18/12
INITIAL/DATE

COMMENTS:

SDG KP0149 SAF-RC-225

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 100-K-92

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

16 December 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 #	1211073
SDG #	KP0149
SAF #	RC-225
Date Received	11/16/12
# Samples	2
Matrix	SOIL
Volatiles	
Semivolatiles	
Pest/PCB	X
Glycols	
DRO/KRO/GRO	X
PAHs	X
Herbicides	
Metals	X
Inorganics	X

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

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 64 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1211073

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 W.C-Hanford SAF# RC-225 KP0149

Est. Final Proj. Sampling Date

Project#

Project Contact/Phone#

Lionville Laboratory Project Manager Arletta Johnson

QC SW Del Std TAT 7day

Date Rec'd 11-16-12 Date Due 11-23-12

Refrigerator #				E		A	B		C		D					
				2		2	2		2		2					
#/Type Container	Liquid															
	Solid			1qal		1qal	1qal		1		1					
Volume	Liquid															
	Solid			125		125	125		125		125					
Preservatives				—		—	—		—		—					
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	~~Pest~~ PCB	Herb	TPH-D	PAHS 8310		Metal + HS	CN	Cr+6					
		Lionville Laboratory Use Only														
				8082		DRO/MO	8310		METALS		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														
01	J1R5M7			S	11-13-12	1240			X		X	X		X		X				
02	J1R5M8			J	J	1305			X		X	X		X		X				

Special Instructions:

METALS = HSL + B, Mo, Si (NOTL)

Special Instructions:

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

Relinquished by	Received by	Date	Time
[signature]	[signature]	11-16-12	1015

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-225-076	Page 1 of 1

Collector Brackett, R	Company Contact Joan Kessner	Telephone No. (509) 375-4688	Project Coordinator KESSNER, JH
Project Designation 100K Remaining Waste Sites - Soil In-Process	Sampling Location 100-K-92		SAF No. RC-225
Ice Chest No. WCH-11-008	Field Logbook No. EL-1666	COA 010K922600	Method of Shipment FedEx
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A120642		Bill of Lading/Air Bill No. See OSPC

Price Code 8B

Data Turnaround 7 Days

000000004

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C						
Type of Container	G/P	G/P	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	125mL	125mL	125mL	125mL	125mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	TPH-Diesel Range - WTPH-D +	PCBs - 8082	PAHs - 8310						

Sample No.	Matrix *	Sample Date	Sample Time										
J1R5M7	SOIL	11-13-12	1240	X	X	X	X	X					
J1R5M8	SOIL	11-13-12	1305	X	X	X	X	X					

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R Brackett	11-13-12 1315	BHUDSON	11/13/12 1315
BHUDSON	11/13/12 1355	1060#1 A. Freier	11-13-12 1355
WCH A. Freier	11-14-12 1042	Fed Ex	
Fed Ex	11-16-12 1015	D Smith	11-16-12 1015

SPECIAL INSTRUCTIONS

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

KP0149

REVIEWED BY CMB DATE 11-14-12

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

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

WCH-EE-011

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WCHanford **Date:** 11-16-12

Project/SAF/SOW/Release #: RC-225

LvL Batch #: 1211073 **Sample Custodian:** D. Smith

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7940 7649 2503
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-11-008
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 _____	

SR-002-B-0412.doc

PCBs

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/20/2012 20:00

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R5M7	1211073-01	Soil	11/13/2012 12:40	11/16/2012 10:15
J1R5M8	1211073-02	Soil	11/13/2012 13:05	11/16/2012 10:15

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-225 KP0149
LVL #: 1211073

W.O. #: 60049-001-001-0001-00
Received: 11-16-2012

PCBs

Two (2) soil samples were collected on 11-13-2012.

The samples and associated QC samples were extracted 11-16-2012 and analyzed 11-20-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8082. All samples received Copper-Sulfur and Sulfuric Acid cleanups based on SW846 methods 3660A and 3665A.

Lionville Laboratory (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. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.

2. All required holding times for extraction and analysis have been met.

3. One (1) of twelve (12) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12GC193) has been enclosed.

4. The method blank was below the reporting limits for all target compounds.

5. All blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. The samples are reported on a dry weight basis.

8. All initial calibrations associated with this data set were within acceptance criteria.

9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria. Per SW846 Method 8000B, the attached table lists compounds where the %difference or drift was greater than 15%, and the mean across all compounds was used for evaluation of the continuing calibration. Results associated with these compounds are considered to have greater uncertainty.

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 hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

12/13/12
Date

r:\group\data\2012\pcb\wc hanford\1211073alm.doc

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.

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC193

Initiator: Catherine Carey
Date: 11/20/12
Client: wx Hanford

Batch: 1211073
Samples: #02 (J1R5M8)
Method: ~~SW846~~/MCAWW/CLP/

Parameter: PCB
Matrix: soil
Prep Batch: L211137

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken* __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

DCB recovery is high in sample #02 (417%)

2. Known or Probable Causes(s)

Interference from DCB in AR1268

3. Discussion and Proposed Action Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Narrate ID.

4. Project Manager Instructions...signature/date: 12/10/12

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 12/10/12 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA for diposition.

Route
✓ Lab Manager: Daniels
✓ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
✓ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

8082A PCBs

Analytes with %Difference or %Drift >15%, Where Mean is Used for Continuing Calibration

Analyte	CCV1 11.20.12 8:50:10 AM		CCV2 11.20.12 12:32:38 PM		CCV3 11.20.12 6:15:17 PM		CCV4		CCV5		CCV6		CCV7		CCV8	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Tetrachloro-meta-xylene (surrogate)																
Decachlorobiphenyl (surrogate)	-20.1		-16.5													
Aroclor 1016-1																
Aroclor 1016-2																
Aroclor 1016-3																
Aroclor 1016-4																
Aroclor 1016-5																
Aroclor 1260-1																
Aroclor 1260-2																
Aroclor 1260-3																
Aroclor 1260-4																
Aroclor 1260-5	-15.9															
Mean %D or %Drift	-4.2	-3.1	-3.0	-3.1	0.3	0.7										

Sample results reported from affected CCV:

CCV1: L211137-BIK1, BS1

CCV2: 1211073-01, 02 L211137-MS1, MS2, MSD2, 1211067-01 (10x)

CCV3:

CCV4:

CCV5:

CCV6:

CCV7:

CCV8:

GLOSSARY OF DATA

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
J	=	Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.
.I	=	Indicates an interference on one analytical column only. Result is reported from remaining analytical column.
P	=	This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 and flagged with a "P".
D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
NS	=	Not Spiked.
SP	=	Indicates Spiked Compound.
NPM	=	No pattern match for multi-component target analytes.

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/20/2012 20:00

J1R5M7
1211073-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	14.4	U	14.4	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1221	14.4	U	14.4	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1232	14.4	U	14.4	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1242	14.4	U	14.4	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1248	14.4	U	14.4	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1254	14.4	U	14.4	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1260	14.4	U	14.4	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1262	14.4	U	14.4	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1268	14.4	U	14.4	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Surrogate: Decachlorobiphenyl	*82 %*		*43-144*			*L211137*	*11/16/2012*	*11/20/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*86 %*		*52-141*			*L211137*	*11/16/2012*	*11/20/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/20/2012 20:00

J1R5M8
1211073-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.9	U	13.9	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1221	13.9	U	13.9	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1232	13.9	U	13.9	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1242	13.9	U	13.9	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1248	13.9	U	13.9	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1254	**110**		13.9	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1260	**64.0**		13.9	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1262	13.9	U	13.9	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Aroclor 1268	**38.7**		13.9	ug/kg dry	1	L211137	11/16/2012	11/20/2012	8082
Surrogate: Decachlorobiphenyl	*417 % **		*43-144*			*L211137*	*11/16/2012*	*11/20/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*86 %*		*52-141*			*L211137*	*11/16/2012*	*11/20/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/20/2012 20:00

Polychlorinated Biphenyls by SW846 8082 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211137 - SW 3540C										
Blank (L211137-BLK1)				Prepared: 11/16/2012 Analyzed: 11/20/2012						
Aroclor 1016	13.3	U	13.3	ug/kg wet						
Aroclor 1221	13.3	U	13.3	ug/kg wet						
Aroclor 1232	13.3	U	13.3	ug/kg wet						
Aroclor 1242	13.3	U	13.3	ug/kg wet						
Aroclor 1248	13.3	U	13.3	ug/kg wet						
Aroclor 1254	13.3	U	13.3	ug/kg wet						
Aroclor 1260	13.3	U	13.3	ug/kg wet						
Aroclor 1262	13.3	U	13.3	ug/kg wet						
Aroclor 1268	13.3	U	13.3	ug/kg wet						
Surrogate: Decachlorobiphenyl	*26.3*			*ug/kg wet*	*33.333*		*79*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*28.2*			*ug/kg wet*	*33.337*		*85*	*52-141*		
LCS (L211137-BS1)				Prepared: 11/16/2012 Analyzed: 11/20/2012						
Aroclor 1016	137		13.3	ug/kg wet	166.67		82	50-138		
Aroclor 1260	151		13.3	ug/kg wet	166.67		90	50-148		
Surrogate: Decachlorobiphenyl	*25.7*			*ug/kg wet*	*33.333*		*77*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*29.0*			*ug/kg wet*	*33.337*		*87*	*52-141*		
Matrix Spike (L211137-MS2)		**Source: 1211073-01**		Prepared: 11/16/2012 Analyzed: 11/20/2012						
Aroclor 1016	157		14.6	ug/kg dry	182.79	14.4 U	86	50-138		
Aroclor 1260	176		14.6	ug/kg dry	182.79	14.4 U	96	50-148		
Surrogate: Decachlorobiphenyl	*33.0*			*ug/kg dry*	*36.559*		*90*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*32.4*			*ug/kg dry*	*36.562*		*89*	*52-141*		
Matrix Spike Dup (L211137-MSD2)		**Source: 1211073-01**		Prepared: 11/16/2012 Analyzed: 11/20/2012						
Aroclor 1016	159		14.7	ug/kg dry	184.74	14.4 U	86	50-138	0.1	40
Aroclor 1260	178		14.7	ug/kg dry	184.74	14.4 U	96	50-148	0.02	40
Surrogate: Decachlorobiphenyl	*34.0*			*ug/kg dry*	*36.948*		*92*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*34.3*			*ug/kg dry*	*36.952*		*93*	*52-141*		

PREPARATION BENCH SHEET

L211137

Lionville Laboratory

Printed: 11/20/2012 9:44:55AM

000000015

Matrix: Solid **Prepared using: Extraction - SW 3540/3550** **Surrogate used: 1201397**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211067-01	8082 PCBs	11/16/2012 16:19	30	10				250	WC-Hanford, Inc.	
1211073-01	8082 PCBs	11/16/2012 16:19	30.81	10				250	WC-Hanford, Inc.	
1211073-02	8082 PCBs	11/16/2012 16:19	30.74	10				250	WC-Hanford, Inc.	
L211137-BLK1	QC	11/16/2012 16:19	30	10				250		
L211137-BS1	QC	11/16/2012 16:19	30	10	1200902		250	250		
L211137-MS1	QC	11/16/2012 16:19	30.12	10	1200902	1211067-01	250	250		
L211137-MS2	QC	11/16/2012 16:19	30.37	10	1200902	1211073-01	250	250		
L211137-MSD1	QC	11/16/2012 16:19	30.31	10	1200902	1211067-01	250	250		
L211137-MSD2	QC	11/16/2012 16:19	30.05	10	1200902	1211073-01	250	250		

S cleared 11.20.12
Cu lot # B10X036

Extracts Relinquished By 11/20/12 09:45 Date

Shah 11.20. 09:45
Extracts Received By Date

1201397 (89919202)

DRO/MO

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/23/2012 13:09

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R5M7	1211073-01	Soil	11/13/2012 12:40	11/16/2012 10:15
J1R5M8	1211073-02	Soil	11/13/2012 13:05	11/16/2012 10:15

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Phone (610) 280-3000
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Case Narrative

Client: WC-HANFORD RC-225 KP0149
LVL #: 1211073

W.O. #: 60049-001-001-0001-00
Date Received: 11-16-2012

DIESEL RANGE ORGANICS

Two (2) soil samples were collected on 11-13-2012.

The samples and associated QC samples were extracted 11-16-2012 and analyzed 11-21-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8015B for Diesel Range Organics.

Lionville Laboratory (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. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. The samples were 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 hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

12/13/12
Date

r:\group\data\2012\dro\wc hanford\1211073alm.doc

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.

GLOSSARY OF DATA

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
J	=	Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.
.I	=	Indicates an interference on one analytical column only. Result is reported from remaining analytical column.
P	=	This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 and flagged with a "P".
D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
NS	=	Not Spiked.
SP	=	Indicates Spiked Compound.
NPM	=	No pattern match for multi-component target analytes.

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/23/2012 13:09

Extractable Petroleum Hydrocarbons by SW846 8015

Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R5M7 (1211073-01) Soil								
Surrogate: p-Terphenyl	*105 %*	*39-129*			*L211133*	*11/16/2012 15:41*	*11/21/2012 15:00*	*8015M*
Diesel Range Organics	69900	3700	ug/kg dry	1	L211133	11/16/2012 15:41	11/21/2012 15:00	8015M
Motor Oil	184000	11100	ug/kg dry	1	L211133	11/16/2012 15:41	11/21/2012 15:00	8015M
J1R5M8 (1211073-02) Soil								
Surrogate: p-Terphenyl	*83 %*	*39-129*			*L211133*	*11/16/2012 15:41*	*11/21/2012 17:53*	*8015M*
Diesel Range Organics	31900	3550	ug/kg dry	1	L211133	11/16/2012 15:41	11/21/2012 17:53	8015M
Motor Oil	70000	10600	ug/kg dry	1	L211133	11/16/2012 15:41	11/21/2012 17:53	8015M

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2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/23/2012 13:09

Extractable Petroleum Hydrocarbons by SW846 8015 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211133 - SW 3540C										
Blank (L211133-BLK1)				Prepared: 11/16/2012 15:41 Analyzed: 11/21/2012 02:28						
Diesel Range Organics	3330	U	3330	ug/kg wet						
Motor Oil	10000	U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*6650*			*ug/kg wet*	*6666.7*		*100*	*39-129*		
LCS (L211133-BS1)				Prepared: 11/16/2012 15:41 Analyzed: 11/21/2012 04:23						
Diesel Range Organics	50200		3330	ug/kg wet	66667		75	42-133		
Surrogate: p-Terphenyl	*5880*			*ug/kg wet*	*6666.7*		*88*	*39-129*		
Matrix Spike (L211133-MS3)		**Source: 1211073-01**		Prepared: 11/16/2012 15:41 Analyzed: 11/21/2012 15:58						
Diesel Range Organics	129000		3630	ug/kg dry	72639	69900	81	42-133		
Surrogate: p-Terphenyl	*6670*			*ug/kg dry*	*7263.9*		*92*	*39-129*		
Matrix Spike Dup (L211133-MSD3)		**Source: 1211073-01**		Prepared: 11/16/2012 15:41 Analyzed: 11/21/2012 16:55						
Diesel Range Organics	111000		3670	ug/kg dry	73432	69900	56	42-133	36	40
Surrogate: p-Terphenyl	*6270*			*ug/kg dry*	*7343.2*		*85*	*39-129*		

PREPARATION BENCH SHEET

L211133

Lionville Laboratory

Printed: 11/19/2012 9:03:29PM

00000022

Matrix: Solid **Prepared using: Extraction - SW 3540C** **Surrogate used: 1201102**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211067-01	8015M DRO	11/16/2012 15:41	30.02	1				1000	WC-Hanford, Inc.	
1211069-01	8015M DRO	11/16/2012 15:41	30.14	1				1000	WC-Hanford, Inc.	
1211073-01	8015M DRO	11/16/2012 15:41	30	1				1000	WC-Hanford, Inc.	
1211073-02	8015M DRO	11/16/2012 15:41	30.24	1				1000	WC-Hanford, Inc.	
L211133-BLK1	QC	11/16/2012 15:41	30	1				1000		
L211133-BS1	QC	11/16/2012 15:41	30	1	1200846		1000	1000		
L211133-MS1	QC	11/16/2012 15:41	30	1	1200846	1211067-01	1000	1000		
L211133-MS2	QC	11/16/2012 15:41	30.67	1	1200846	1211069-01	1000	1000		
L211133-MS3	QC	11/16/2012 15:41	30.57	1	1200846	1211073-01	1000	1000		
L211133-MSD1	QC	11/16/2012 15:41	30.46	1	1200846	1211067-01	1000	1000		
L211133-MSD2	QC	11/16/2012 15:41	30	1	1200846	1211069-01	1000	1000		
L211133-MSD3	QC	11/16/2012 15:41	30.24	1	1200846	1211073-01	1000	1000		

Extracts Relinquished By — Date 11/19/12 2105

Extracts Received By — Date 11/19/12

PAHs

264 Welsh Pool Road
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Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 21:27

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R5M7	1211073-01	Soil	11/13/2012 12:40	11/16/2012 10:15
J1R5M8	1211073-02	Soil	11/13/2012 13:05	11/16/2012 10:15

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Case Narrative

Client: WC-HANFORD RC-225 KP0149
LVL #: 1211073

W.O. #: 60049-001-001-0001-00
Date Received: 11-16-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

Two (2) soil samples were collected on 11-13-2012.

The samples and associated QC samples were extracted 11-16,28-2012 and analyzed 11-16-2012 and 12-01-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8310.

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1. The results presented in this report are derived from samples that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.

2. The samples were originally extracted within their holding time. Due to blank contamination, the samples were re-extracted outside of hold time. Both the original and the re-extracted results have been reported. A copy of the Sample Discrepancy Report (SDR # 12GC203) has been enclosed.

3. All samples required 5-fold instrument dilutions due to high concentrations of target analytes.

4. One (1) of twelve (12) surrogate recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR # 12GC203) has been enclosed.

5. The method blank L211136 contained Acenaphthylene and Fluorene at a level above the reporting limit. Acenaphthylene and Fluorene were detected in both samples processed with this blank at levels at or above the reporting limit. A copy of the Sample Discrepancy Report (SDR # 12GC203) has been enclosed.

6. All blank spike recoveries were within acceptance criteria.

7. Seven (7) of sixty- four (64) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR # 12GC203) has been enclosed.

8. The initial calibrations associated with this data set were within acceptance criteria.

9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

10. The samples were reported on a dry weight basis.

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.

11. 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
LvL Laboratory Manager

12/13/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 126C203

Initiator: Catherine Carey
Date: 12/03/12
Client: WC Hanford

Batch: 1211073
Samples: BLK1, MS3/MSD3
Method: SW846/MCAWW/CLP/

Parameter: PAH
Matrix: SOIL
Prep Batch: L211136 + ~~L211237~~ CAC 12/03/12

1. Reason for SDR

a. COC Discrepancy
__ Tech Profile Error
__ Transcription Error
__ Client Request
__ Wrong Test Code
__ Sampler Error on C-O-C
__ Other _____

b. General Discrepancy
__ Missing Sample/Extract *
__ Hold Time Exceeded
__ Improper Bottle Type
__ Container Broken *
__ Insufficient Sample *
__ Not Amenable to Analysis
__ Wrong Sample Pulled
__ Preservation Wrong
__ Label ID's Illegible
__ Received Past Hold

Note *: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

L211136-BLK has hits for Acenaphthylene + Fluorene
CAC 12/01/12

several spike recoveries outside QC limits in L211136-MS3/MSD3

surrogate recovery is high in L211136-MS3 (interference)

2. Known or Probable Causes(s)

Sample 02 is very high in Non target compounds, and appears non homogeneous.

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:
Fluorene is below client required DL in blank L211136 and samples.
Data from original run is usable for all analytes but Acenaphthylene which was above 100µg/Kg in L211136-BLK.

12/13/12 Narrate ID.

4. Project Manager Instructions...signature/date: _____
__ Concur with Proposed Action
✓ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
__ Date/Person _____
__ Add
__ Cancel

12/13/12

5. Final Action...signature/date: _____ Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA for diposition.

Route
✓ Lab Manager: Daniels
✓ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
✓ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

GLOSSARY OF DATA

DATA QUALIFIERS

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NPM	=	No pattern match for multi-component target analytes.

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 21:27

J1R5M7
1211073-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Acenaphthylene	**59.7**	D	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Acenaphthene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Fluorene	**10.1**	J, D	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Phenanthrene	**66.6**	D	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Anthracene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Fluoranthene	**15.4**	J, D	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Indeno[1,2,3-cd]pyrene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Pyrene	**5.03**	J, D	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benz[a]anthracene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Chrysene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benzo[b] fluoranthene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benzo[k] fluoranthene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benzo[a] pyrene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Dibenz[a,h]anthracene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benzo[g,h,i] perylene	18.3	U	18.3	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Surrogate: Triphenylene	*82 %*		*68-129*			*L211136*	*11/16/2012*	*11/26/2012*	*8310*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 21:27

J1R5M7
1211073-01RE1 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Acenaphthylene	**5.28**	J, D	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Acenaphthene	**7.94**	J, D	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Fluorene	**6.38**	J, D	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Phenanthrene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Anthracene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Fluoranthene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Indeno[1,2,3-cd]pyrene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Pyrene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benz[a]anthracene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Chrysene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benzo[b] fluoranthene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benzo[k] fluoranthene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benzo[a] pyrene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Dibenz[a,h]anthracene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benzo[g,h,i] perylene	18.2	U	18.2	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Surrogate: Triphenylene	*84 %*		*68-129*			*L211237*	*11/28/2012*	*12/01/2012*	*8310*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 21:27

J1R5M8
1211073-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**132**	D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Acenaphthylene	**391**	D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Acenaphthene	**59.8**	D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Fluorene	**21.4**	D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Phenanthrene	**101**	D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Anthracene	**8.02**	J, D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Fluoranthene	**72.9**	D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Indeno[1,2,3-cd]pyrene	**5.47**	J, D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Pyrene	**14.5**	J, D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benz[a]anthracene	**18.9**	D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Chrysene	**14.4**	J, D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benzo[b] fluoranthene	**6.41**	J, D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benzo[k] fluoranthene	17.8	U	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benzo[a] pyrene	**10.6**	J, D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Dibenz[a,h]anthracene	17.8	U	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Benzo[g,h,i] perylene	**8.69**	J, D	17.8	ug/kg dry	5	L211136	11/16/2012	11/26/2012	8310
Surrogate: Triphenylene	*115 %*		*68-129*			*L211136*	*11/16/2012*	*11/26/2012*	*8310*

264 Welsh Pool Road
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Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 21:27

J1R5M8
1211073-02RE1 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**144**	D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Acenaphthylene	**133**	D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Acenaphthene	17.8	U	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Fluorene	**9.62**	J, D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Phenanthrene	**34.6**	D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Anthracene	17.8	U	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Fluoranthene	**96.7**	D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Indeno[1,2,3-cd]pyrene	17.8	U	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Pyrene	**19.0**	D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benz[a]anthracene	**28.3**	D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Chrysene	**20.5**	D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benzo[b] fluoranthene	**17.2**	J, D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benzo[k] fluoranthene	**10.2**	J, D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benzo[a] pyrene	**14.9**	J, D	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Dibenz[a,h]anthracene	17.8	U	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Benzo[g,h,i] perylene	17.8	U	17.8	ug/kg dry	5	L211237	11/28/2012	12/01/2012	8310
Surrogate: Triphenylene	*126 %*		*68-129*			*L211237*	*11/28/2012*	*12/01/2012*	*8310*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 21:27

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211136 - SW 3540C										
Blank (L211136-BLK1)				Prepared: 11/16/2012 Analyzed: 11/26/2012						
Naphthalene	3.33	U	3.33	ug/kg wet						
Acenaphthylene	197		3.33	ug/kg wet						
Acenaphthene	3.33	U	3.33	ug/kg wet						
Fluorene	5.00		3.33	ug/kg wet						
Phenanthrene	3.33	U	3.33	ug/kg wet						
Anthracene	3.33	U	3.33	ug/kg wet						
Fluoranthene	3.33	U	3.33	ug/kg wet						
Indeno[1,2,3-cd]pyrene	3.33	U	3.33	ug/kg wet						
Pyrene	3.33	U	3.33	ug/kg wet						
Benz[a]anthracene	3.33	U	3.33	ug/kg wet						
Chrysene	3.33	U	3.33	ug/kg wet						
Benzo[b] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[k] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[a] pyrene	3.33	U	3.33	ug/kg wet						
Dibenz[a,h]anthracene	3.33	U	3.33	ug/kg wet						
Benzo[g,h,i] perylene	3.33	U	3.33	ug/kg wet						
Surrogate: Triphenylene	*146*			*ug/kg wet*	*166.67*		*88*	*68-129*		
LCS (L211136-BS1)				Prepared: 11/16/2012 Analyzed: 11/26/2012						
Naphthalene	152		3.33	ug/kg wet	166.67		91	0-127		
Acenaphthylene	160		3.33	ug/kg wet	166.67		96	50-140		
Acenaphthene	161		3.33	ug/kg wet	166.67		97	17-139		
Fluorene	164		3.33	ug/kg wet	166.67		99	28-145		
Phenanthrene	162		3.33	ug/kg wet	166.67		97	30-152		
Anthracene	160		3.33	ug/kg wet	166.67		96	19-171		
Fluoranthene	166		3.33	ug/kg wet	166.67		100	34-159		
Indeno[1,2,3-cd]pyrene	165		3.33	ug/kg wet	166.67		99	31-156		
Pyrene	168		3.33	ug/kg wet	166.67		101	33-152		
Benz[a]anthracene	173		3.33	ug/kg wet	166.67		104	32-157		
Chrysene	162		3.33	ug/kg wet	166.67		97	31-159		
Benzo[b] fluoranthene	174		3.33	ug/kg wet	166.67		104	33-164		
Benzo[k] fluoranthene	172		3.33	ug/kg wet	166.67		103	28-161		
Benzo[a] pyrene	174		3.33	ug/kg wet	166.67		104	29-149		
Dibenz[a,h]anthracene	176		3.33	ug/kg wet	166.67		106	27-153		
Benzo[g,h,i] perylene	179		3.33	ug/kg wet	166.67		107	32-157		
Surrogate: Triphenylene	*172*			*ug/kg wet*	*166.67*		*103*	*68-129*		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 21:27

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211136 - SW 3540C										
Matrix Spike (L211136-MS3)		**Source: 1211073-02**		Prepared: 11/16/2012 Analyzed: 11/26/2012						
Naphthalene	371	D	17.7	ug/kg dry	177.26	132	135*	0-127		
Acenaphthylene	432	D	17.7	ug/kg dry	177.26	391	23*	50-140		
Acenaphthene	488	D	17.7	ug/kg dry	177.26	59.8	242*	17-139		
Fluorene	190	D	17.7	ug/kg dry	177.26	21.4	95	28-145		
Phenanthrene	299	D	17.7	ug/kg dry	177.26	101	112	30-152		
Anthracene	208	D	17.7	ug/kg dry	177.26	8.02	113	19-171		
Fluoranthene	367	D	17.7	ug/kg dry	177.26	72.9	166*	34-159		
Indeno[1,2,3-cd]pyrene	197	D	17.7	ug/kg dry	177.26	5.47	108	31-156		
Pyrene	246	D	17.7	ug/kg dry	177.26	14.5	130	33-152		
Benz[a]anthracene	296	D	17.7	ug/kg dry	177.26	18.9	156	32-157		
Chrysene	254	D	17.7	ug/kg dry	177.26	14.4	135	31-159		
Benzo[b] fluoranthene	257	D	17.7	ug/kg dry	177.26	6.41	142	33-164		
Benzo[k] fluoranthene	203	D	17.7	ug/kg dry	177.26	17.8 U	114	28-161		
Benzo[a] pyrene	295	D	17.7	ug/kg dry	177.26	10.6	161*	29-149		
Dibenz[a,h]anthracene	173	D	17.7	ug/kg dry	177.26	17.8 U	98	27-153		
Benzo[g,h,i] perylene	328	D	17.7	ug/kg dry	177.26	8.69	180*	32-157		
Surrogate: Triphenylene	*251*			*ug/kg dry*	*177.26*		*142**	*68-129*		
Matrix Spike Dup (L211136-MSD3)		**Source: 1211073-02**		Prepared: 11/16/2012 Analyzed: 11/26/2012						
Naphthalene	207	D	17.7	ug/kg dry	177.14	132	42	0-127	105*	40
Acenaphthylene	203	D	17.7	ug/kg dry	177.14	391	-106*	50-140	-311	40
Acenaphthene	157	D	17.7	ug/kg dry	177.14	59.8	55	17-139	126*	40
Fluorene	162	D	17.7	ug/kg dry	177.14	21.4	79	28-145	18	40
Phenanthrene	234	D	17.7	ug/kg dry	177.14	101	75	30-152	39	40
Anthracene	154	D	17.7	ug/kg dry	177.14	8.02	82	19-171	31	40
Fluoranthene	208	D	17.7	ug/kg dry	177.14	72.9	76	34-159	74*	40
Indeno[1,2,3-cd]pyrene	153	D	17.7	ug/kg dry	177.14	5.47	83	31-156	26	40
Pyrene	171	D	17.7	ug/kg dry	177.14	14.5	88	33-152	39	40
Benz[a]anthracene	173	D	17.7	ug/kg dry	177.14	18.9	87	32-157	57*	40
Chrysene	137	D	17.7	ug/kg dry	177.14	14.4	69	31-159	64*	40
Benzo[b] fluoranthene	169	D	17.7	ug/kg dry	177.14	6.41	92	33-164	43*	40
Benzo[k] fluoranthene	163	D	17.7	ug/kg dry	177.14	17.8 U	92	28-161	22	40
Benzo[a] pyrene	177	D	17.7	ug/kg dry	177.14	10.6	94	29-149	53*	40
Dibenz[a,h]anthracene	156	D	17.7	ug/kg dry	177.14	17.8 U	88	27-153	10	40
Benzo[g,h,i] perylene	174	D	17.7	ug/kg dry	177.14	8.69	94	32-157	63*	40
Surrogate: Triphenylene	*209*			*ug/kg dry*	*177.14*		*118*	*68-129*		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 21:27

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211237 - SW 3540C										
Blank (L211237-BLK1)				Prepared: 11/28/2012 Analyzed: 12/01/2012						
Naphthalene	3.33	U	3.33	ug/kg wet						
Acenaphthylene	3.33	U	3.33	ug/kg wet						
Acenaphthene	3.33	U	3.33	ug/kg wet						
Fluorene	3.33	U	3.33	ug/kg wet						
Phenanthrene	3.33	U	3.33	ug/kg wet						
Anthracene	3.33	U	3.33	ug/kg wet						
Fluoranthene	3.33	U	3.33	ug/kg wet						
Indeno[1,2,3-cd]pyrene	3.33	U	3.33	ug/kg wet						
Pyrene	3.33	U	3.33	ug/kg wet						
Benz[a]anthracene	3.33	U	3.33	ug/kg wet						
Chrysene	3.33	U	3.33	ug/kg wet						
Benzo[b] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[k] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[a] pyrene	3.33	U	3.33	ug/kg wet						
Dibenz[a,h]anthracene	3.33	U	3.33	ug/kg wet						
Benzo[g,h,i] perylene	3.33	U	3.33	ug/kg wet						
Surrogate: Triphenylene	*140*			*ug/kg wet*	*166.67*		*84*	*68-129*		
LCS (L211237-BS1)				Prepared: 11/28/2012 Analyzed: 12/01/2012						
Naphthalene	113		3.33	ug/kg wet	166.67		68	0-127		
Acenaphthylene	140		3.33	ug/kg wet	166.67		84	50-140		
Acenaphthene	128		3.33	ug/kg wet	166.67		77	17-139		
Fluorene	142		3.33	ug/kg wet	166.67		85	28-145		
Phenanthrene	137		3.33	ug/kg wet	166.67		82	30-152		
Anthracene	142		3.33	ug/kg wet	166.67		85	19-171		
Fluoranthene	140		3.33	ug/kg wet	166.67		84	34-159		
Indeno[1,2,3-cd]pyrene	147		3.33	ug/kg wet	166.67		88	31-156		
Pyrene	144		3.33	ug/kg wet	166.67		86	33-152		
Benz[a]anthracene	151		3.33	ug/kg wet	166.67		90	32-157		
Chrysene	145		3.33	ug/kg wet	166.67		87	31-159		
Benzo[b] fluoranthene	154		3.33	ug/kg wet	166.67		92	33-164		
Benzo[k] fluoranthene	153		3.33	ug/kg wet	166.67		92	28-161		
Benzo[a] pyrene	157		3.33	ug/kg wet	166.67		94	29-149		
Dibenz[a,h]anthracene	156		3.33	ug/kg wet	166.67		94	27-153		
Benzo[g,h,i] perylene	158		3.33	ug/kg wet	166.67		95	32-157		
Surrogate: Triphenylene	*143*			*ug/kg wet*	*166.67*		*86*	*68-129*		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 21:27

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211237 - SW 3540C										
Matrix Spike (L211237-MS3)		**Source: 1211073-01RE1**		Prepared: 11/28/2012 Analyzed: 12/01/2012						
Naphthalene	136	D	18.0	ug/kg dry	180.48	18.2 U	75	0-127		
Acenaphthylene	130	D	18.0	ug/kg dry	180.48	5.28	69	50-140		
Acenaphthene	150	D	18.0	ug/kg dry	180.48	7.94	79	17-139		
Fluorene	154	D	18.0	ug/kg dry	180.48	6.38	82	28-145		
Phenanthrene	153	D	18.0	ug/kg dry	180.48	18.2 U	85	30-152		
Anthracene	136	D	18.0	ug/kg dry	180.48	18.2 U	75	19-171		
Fluoranthene	157	D	18.0	ug/kg dry	180.48	18.2 U	87	34-159		
Indeno[1,2,3-cd]pyrene	152	D	18.0	ug/kg dry	180.48	18.2 U	84	31-156		
Pyrene	155	D	18.0	ug/kg dry	180.48	18.2 U	86	33-152		
Benz[a]anthracene	155	D	18.0	ug/kg dry	180.48	18.2 U	86	32-157		
Chrysene	151	D	18.0	ug/kg dry	180.48	18.2 U	84	31-159		
Benzo[b] fluoranthene	151	D	18.0	ug/kg dry	180.48	18.2 U	84	33-164		
Benzo[k] fluoranthene	157	D	18.0	ug/kg dry	180.48	18.2 U	87	28-161		
Benzo[a] pyrene	136	D	18.0	ug/kg dry	180.48	18.2 U	76	29-149		
Dibenz[a,h]anthracene	156	D	18.0	ug/kg dry	180.48	18.2 U	87	27-153		
Benzo[g,h,i] perylene	158	D	18.0	ug/kg dry	180.48	18.2 U	87	32-157		
Surrogate: Triphenylene	*174*			*ug/kg dry*	*180.48*		*96*	*68-129*		
Matrix Spike Dup (L211237-MSD3)		**Source: 1211073-01RE1**		Prepared: 11/28/2012 Analyzed: 12/01/2012						
Naphthalene	143	D	18.5	ug/kg dry	185.05	18.2 U	77	0-127	3	40
Acenaphthylene	142	D	18.5	ug/kg dry	185.05	5.28	74	50-140	7	40
Acenaphthene	121	D	18.5	ug/kg dry	185.05	7.94	61	17-139	25	40
Fluorene	156	D	18.5	ug/kg dry	185.05	6.38	81	28-145	1	40
Phenanthrene	153	D	18.5	ug/kg dry	185.05	18.2 U	82	30-152	3	40
Anthracene	140	D	18.5	ug/kg dry	185.05	18.2 U	76	19-171	0.3	40
Fluoranthene	177	D	18.5	ug/kg dry	185.05	18.2 U	96	34-159	9	40
Indeno[1,2,3-cd]pyrene	156	D	18.5	ug/kg dry	185.05	18.2 U	84	31-156	0.2	40
Pyrene	164	D	18.5	ug/kg dry	185.05	18.2 U	89	33-152	4	40
Benz[a]anthracene	168	D	18.5	ug/kg dry	185.05	18.2 U	91	32-157	5	40
Chrysene	159	D	18.5	ug/kg dry	185.05	18.2 U	86	31-159	2	40
Benzo[b] fluoranthene	163	D	18.5	ug/kg dry	185.05	18.2 U	88	33-164	5	40
Benzo[k] fluoranthene	159	D	18.5	ug/kg dry	185.05	18.2 U	86	28-161	0.9	40
Benzo[a] pyrene	138	D	18.5	ug/kg dry	185.05	18.2 U	74	29-149	2	40
Dibenz[a,h]anthracene	159	D	18.5	ug/kg dry	185.05	18.2 U	86	27-153	0.4	40
Benzo[g,h,i] perylene	164	D	18.5	ug/kg dry	185.05	18.2 U	89	32-157	2	40
Surrogate: Triphenylene	*155*			*ug/kg dry*	*185.05*		*84*	*68-129*		

PREPARATION BENCH SHEET

L211237

Lionville Laboratory

Printed: 12/3/2012 9:05:16PM

00000037

Matrix: Solid **Prepared using: HPLC - SW 3540C** **Surrogate used: 1200612**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211067-01	8310 PAH	11/28/2012 14:35	15.59	5				50	WC-Hanford, Inc.	
1211069-01RE1	8310 PAH	11/28/2012 14:35	30.08	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
1211073-01RE1	8310 PAH	11/28/2012 14:35	30.47	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
1211073-02RE1	8310 PAH	11/28/2012 14:35	30.13	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
L211237-BLK1	QC	11/28/2012 14:35	30	5				50		
L211237-BS1	QC	11/28/2012 14:35	30	5	1200963		50	50		
L211237-MS1	QC	11/28/2012 14:35	15.03	5	1200963	1211067-01	50	50		
L211237-MS2	QC	11/28/2012 14:35	30.02	5	1200963	211069-01RE	50	50		
L211237-MS3	QC	11/28/2012 14:35	30.76	5	1200963	211073-01RE	50	50		
L211237-MSD1	QC	11/28/2012 14:35	15.3	5	1200963	1211067-01	50	50		
L211237-MSD2	QC	11/28/2012 14:35	30.98	5	1200963	211069-01RE	50	50		
L211237-MSD3	QC	11/28/2012 14:35	30	5	1200963	211073-01RE	50	50		

From L211136 on 11/28/2012 by MLF

Revision for BSD CAC 12/03/12

Extracts Relinquished By Date

Extracts Received By Date

PREPARATION BENCH SHEET

L211237

Lionville Laboratory

Printed: 12/3/2012 10:56:25AM

Matrix: Solid **Prepared using: HPLC - SW 3540C** **Surrogate used: 1200612**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211067-01	8310 PAH	11/28/2012 14:35	15.59	5				50	WC-Hanford, Inc.	
1211069-01RE1	8310 PAH	11/28/2012 14:35	30.08	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
1211073-01RE1	8310 PAH	11/28/2012 14:35	30.47	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
1211073-02RE1	8310 PAH	11/28/2012 14:35	30.13	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
L211237-BLK1	QC	11/28/2012 14:35	30	5				50		
L211237-BS1	QC	11/28/2012 14:35	30	5	1200963		50	50		
L211237-BSD1	QC	11/28/2012 14:35	30	5				50		
L211237-MS1	QC	11/28/2012 14:35	15.03	5	1200963	1211067-01	50	50		
L211237-MS2	QC	11/28/2012 14:35	30.02	5	1200963	211069-01RE	50	50		
L211237-MS3	QC	11/28/2012 14:35	30.76	5	1200963	211073-01RE	50	50		
L211237-MSD1	QC	11/28/2012 14:35	15.3	5	1200963	1211067-01	50	50		
L211237-MSD2	QC	11/28/2012 14:35	30.98	5	1200963	211069-01RE	50	50		
L211237-MSD3	QC	11/28/2012 14:35	30	5	1200963	211073-01RE	50	50		

From L211136 on 11/28/2012 by MLF

LK 12-3-12
Extracts Relinquished By Date

Revision
Extracts Received By Date

000000038

PREPARATION BENCH SHEET

L211237

Lionville Laboratory

Printed: 11/29/2012 2:55:03PM

Matrix: Solid **Prepared using: SVOCGCMS - SW 3540C** **Surrogate used: 1200612**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211067-01RE1	8310 PAH	11/28/2012 14:35	15.59	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
1211069-01RE1	8310 PAH	11/28/2012 14:35	30.08	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
1211073-01RE1	8310 PAH	11/28/2012 14:35	30.47	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
1211073-02RE1	8310 PAH	11/28/2012 14:35	30.13	5				50	WC-Hanford, Inc.	From L211136 by MLF on 11/28/2012
L211237-BLK1	QC	11/28/2012 14:35	30	5				50		
L211237-BS1	QC	11/28/2012 14:35	30	5	1200963		50	50		
L211237-MS1	QC	11/28/2012 14:35	15.03	5	1200963	211067-01RE	50	50		
L211237-MS2	QC	11/28/2012 14:35	30.02	5	1200963	211069-01RE	50	50		
L211237-MS3	QC	11/28/2012 14:35	30.76	5	1200963	211073-01RE	50	50		
L211237-MSD1	QC	11/28/2012 14:35	15.3	5	1200963	211067-01RE	50	50		
L211237-MSD2	QC	11/28/2012 14:35	30.98	5	1200963	211069-01RE	50	50		
L211237-MSD3	QC	11/28/2012 14:35	30	5	1200963	211073-01RE	50	50		

From L211136 on 11/28/2012 by MLF

11/29/12 1525 — Extracts Relinquished By — Date

11/30/12 — Extracts Received By — Date

PREPARATION BENCH SHEET

L211136

Lionville Laboratory

Printed: 11/19/2012 5:22:06PM

Matrix: Solid **Prepared using: Extraction - SW 3540/~~3550~~** 11/12/6/12 TE **Surrogate used: 1200612**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211067-01	8310 PAH	11/16/2012 16:00	30.35	5				50	WC-Hanford, Inc.	
1211069-01	8310 PAH	11/16/2012 16:00	30	5				50	WC-Hanford, Inc.	
1211073-01	8310 PAH	11/16/2012 16:00	30.24	5				50	WC-Hanford, Inc.	
1211073-02	8310 PAH	11/16/2012 16:00	30.13	5				50	WC-Hanford, Inc.	
L211136-BLK1	QC	11/16/2012 16:00	30	5				50		
L211136-BS1	QC	11/16/2012 16:00	30	5	1200963		50	50		
L211136-MS1	QC	11/16/2012 16:00	30.37	5	1200963	1211067-01	50	50		
L211136-MS2	QC	11/16/2012 16:00	30.6	5	1200963	1211069-01	50	50		
L211136-MS3	QC	11/16/2012 16:00	30.28	5	1200963	1211073-02	50	50		
L211136-MSD1	QC	11/16/2012 16:00	30.58	5	1200963	1211067-01	50	50		
L211136-MSD2	QC	11/16/2012 16:00	30.8	5	1200963	1211069-01	50	50		
L211136-MSD3	QC	11/16/2012 16:00	30.3	5	1200963	1211073-02	50	50		

Extracts Relinquished By — Date 11/19/12 17:22

Extracts Received By — Date 11/19/12

METALS

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-225 Project Number: KP0149 Project Manager: Joan Kessner	**Reported:** 12/03/2012 13:22

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R5M7	1211073-01	Soil	11/13/2012 12:40	11/16/2012 10:15
J1R5M8	1211073-02	Soil	11/13/2012 13:05	11/16/2012 10:15

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-225
LVL#: 1211073
SDG/SAF#: KP0149/RC-225

W.O.#: 60049-001-001-0001-00
Date Received: 11-16-12

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 2 soil samples.

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

   All samples were analyzed and reported with 3-fold dilutions for ICP metals due to sample matrix.

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

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

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

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

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

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

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

10. The matrix spike (MS) recoveries for 7 analytes were outside the 75-125% 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 pages.

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, Iron, Antimony, Calcium, Magnesium, Manganese, and Silicon. The Silicon post digestion spike recovery is outside the 75-125% control limit possibly due to matrix effect.

12. All duplicate analyses were within 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

12/4/12
Date

alm/11-073hg%

264 Welsh Pool Road
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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 13:22

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-225 Project Number: KP0149 Project Manager: Joan Kessner	**Reported:** 12/03/2012 13:22

J1R5M7
1211073-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**11000**		13.0	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Antimony	1.56	U	1.56	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Arsenic	**2.88**		2.60	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Barium	**78.8**		1.30	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Beryllium	**0.407**	B	0.520	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Boron	**2.47**	B	5.20	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Cadmium	0.520	U	0.520	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Calcium	**3680**		260	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Chromium	**13.2**		0.520	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Cobalt	**7.26**		5.20	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Copper	**14.0**		2.60	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Iron	**22600**		52.0	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Lead	**5.36**		1.30	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Magnesium	**3680**		195	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Manganese	**364**		13.0	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Molybdenum	5.20	U	5.20	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Nickel	**10.2**	B	10.4	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Potassium	**2100**		1040	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Selenium	0.781	U	0.781	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Silicon	**1190**		5.20	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Silver	0.520	U	0.520	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Sodium	**276**		130	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Vanadium	**57.7**		6.51	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Zinc	**46.6**		26.0	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Mercury	0.0294	U	0.0294	mg/kg dry	1	L211168	11/20/2012	11/21/2012	7471A

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 13:22

J1R5M8

1211073-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**9670**		13.6	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Antimony	**1.36**	B	1.64	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Arsenic	**2.86**		2.73	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Barium	**79.6**		1.36	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Beryllium	**0.339**	B	0.546	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Boron	**2.94**	B	5.46	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Cadmium	**0.479**	B	0.546	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Calcium	**3830**		273	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Chromium	**17.9**		0.546	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Cobalt	**7.42**		5.46	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Copper	**30.4**		2.73	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Iron	**23600**		54.6	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Lead	**35.2**		1.36	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Magnesium	**3630**		205	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Manganese	**388**		13.6	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Molybdenum	**5.97**		5.46	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Nickel	**14.4**		10.9	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Potassium	**1850**		1090	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Selenium	0.819	U	0.819	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Silicon	**1110**		5.46	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Silver	0.546	U	0.546	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Sodium	**238**		136	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Vanadium	**63.6**		6.82	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Zinc	**121**		27.3	mg/kg dry	3	L211166	11/20/2012	11/29/2012	6010B
Mercury	**0.0670**		0.0276	mg/kg dry	1	L211168	11/20/2012	11/21/2012	7471A

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 13:22

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 L211166 - SW 3050B										
Blank (L211166-BLK1)				Prepared: 11/20/2012 Analyzed: 11/29/2012						
Aluminum	4.81	U	4.81	mg/kg wet						
Antimony	0.577	U	0.577	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	0.192	U	0.192	mg/kg wet						
Calcium	96.2	U	96.2	mg/kg wet						
Chromium	0.192	U	0.192	mg/kg wet						
Cobalt	1.92	U	1.92	mg/kg wet						
Copper	0.962	U	0.962	mg/kg wet						
Iron	19.2	U	19.2	mg/kg wet						
Lead	0.481	U	0.481	mg/kg wet						
Magnesium	1.90	B	72.1	mg/kg wet						
Manganese	4.81	U	4.81	mg/kg wet						
Molybdenum	1.92	U	1.92	mg/kg wet						
Nickel	3.85	U	3.85	mg/kg wet						
Potassium	385	U	385	mg/kg wet						
Selenium	0.288	U	0.288	mg/kg wet						
Silicon	1.92	U	1.92	mg/kg wet						
Silver	0.192	U	0.192	mg/kg wet						
Sodium	48.1	U	48.1	mg/kg wet						
Vanadium	2.40	U	2.40	mg/kg wet						
Zinc	9.62	U	9.62	mg/kg wet						
Duplicate (L211166-DUP3)		**Source: 1211073-01**		Prepared: 11/20/2012 Analyzed: 11/29/2012						
Aluminum	11600		14.1	mg/kg dry		11000			5	20
Antimony	1.69	U	1.69	mg/kg dry		1.56 U				20
Arsenic	3.18		2.82	mg/kg dry		2.88			10	20
Barium	80.3		1.41	mg/kg dry		78.8			2	20
Beryllium	0.399	B	0.565	mg/kg dry		0.407			2	20
Boron	2.47	B	5.65	mg/kg dry		2.47			0.4	20
Cadmium	0.565	U	0.565	mg/kg dry		0.520 U				20
Calcium	3740		282	mg/kg dry		3680			2	20
Chromium	13.8		0.565	mg/kg dry		13.2			5	20
Cobalt	7.72		5.65	mg/kg dry		7.26			6	20
Copper	14.4		2.82	mg/kg dry		14.0			3	20

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 13:22

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 L211166 - SW 3050B										
Duplicate (L211166-DUP3)		**Source: 1211073-01**		Prepared: 11/20/2012 Analyzed: 11/29/2012						
Iron	23300		56.5	mg/kg dry		22600			3	20
Lead	5.55		1.41	mg/kg dry		5.36			3	20
Magnesium	3880		212	mg/kg dry		3680			5	20
Manganese	377		14.1	mg/kg dry		364			4	20
Molybdenum	5.65	U	5.65	mg/kg dry		5.20 U				20
Nickel	11.1	B	11.3	mg/kg dry		10.2			8	20
Potassium	2220		1130	mg/kg dry		2100			5	20
Selenium	0.847	U	0.847	mg/kg dry		0.781 U				20
Silicon	1220		5.65	mg/kg dry		1190			2	20
Silver	0.565	U	0.565	mg/kg dry		0.520 U				20
Sodium	292		141	mg/kg dry		276			5	20
Vanadium	58.3		7.06	mg/kg dry		57.7			0.9	20
Zinc	48.2		28.2	mg/kg dry		46.6			4	20
Matrix Spike (L211166-MS3)		**Source: 1211073-01**		Prepared: 11/20/2012 Analyzed: 11/29/2012						
Aluminum	13700		14.6	mg/kg dry	194.79	11000	1360*	75-125		
Antimony	13.2		1.75	mg/kg dry	48.697	1.56 U	27*	75-125		
Arsenic	170		2.92	mg/kg dry	194.79	2.88	86	75-125		
Barium	279		1.46	mg/kg dry	194.79	78.8	103	75-125		
Beryllium	4.79		0.584	mg/kg dry	4.8697	0.407	90	75-125		
Boron	82.8		5.84	mg/kg dry	97.394	2.47	82	75-125		
Cadmium	4.32		0.584	mg/kg dry	4.8697	0.520 U	89	75-125		
Calcium	7220		292	mg/kg dry	2434.8	3680	145*	75-125		
Chromium	31.6		0.584	mg/kg dry	19.479	13.2	95	75-125		
Cobalt	52.0		5.84	mg/kg dry	48.697	7.26	92	75-125		
Copper	39.4		2.92	mg/kg dry	24.348	14.0	105	75-125		
Iron	27900		58.4	mg/kg dry	97.394	22600	5420*	75-125		
Lead	47.2		1.46	mg/kg dry	48.697	5.36	86	75-125		
Magnesium	6830		219	mg/kg dry	2434.8	3680	129*	75-125		
Manganese	496		14.6	mg/kg dry	48.697	364	271*	75-125		
Molybdenum	82.7		5.84	mg/kg dry	97.394	5.20 U	85	75-125		
Nickel	55.2		11.7	mg/kg dry	48.697	10.2	92	75-125		
Potassium	4310		1170	mg/kg dry	2434.8	2100	91	75-125		
Selenium	166		0.877	mg/kg dry	194.79	0.781 U	85	75-125		
Silicon	1190		5.84	mg/kg dry	97.394	1190	-6*	75-125		
Silver	4.20		0.584	mg/kg dry	4.8697	0.520 U	86	75-125		
Sodium	2670		146	mg/kg dry	2434.8	276	98	75-125		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 13:22

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 L211166 - SW 3050B									
Matrix Spike (L211166-MS3)		**Source: 1211073-01**	Prepared: 11/20/2012 Analyzed: 11/29/2012						
Vanadium	111	7.30	mg/kg dry	48.697	57.7	110	75-125		
Zinc	104	29.2	mg/kg dry	48.697	46.6	117	75-125		
Post Spike (L211166-PS3)		**Source: 1211073-01**	Prepared: 11/20/2012 Analyzed: 11/29/2012						
Aluminum	190000		ug/L	66000	127000	96	75-125		
Antimony	300		ug/L	300.00	-0.177	100	75-125		
Calcium	99400		ug/L	62400	42400	91	75-125		
Iron	368000		ug/L	126000	261000	85	75-125		
Magnesium	101000		ug/L	64800	42500	91	75-125		
Manganese	6990		ug/L	3000.0	4190	93	75-125		
Silicon	17900		ug/L	3300.0	13800	127*	75-125		
Reference (L211166-SRM1)			Prepared: 11/20/2012 Analyzed: 11/29/2012						
Aluminum	12000	14.7	mg/kg wet	6670.0		180	0-200.89		
Antimony	34.3	1.76	mg/kg wet	53.000		65	0-235.8		
Arsenic	117	2.94	mg/kg wet	114.00		103	82.8-117.54		
Barium	331	1.47	mg/kg wet	307.00		108	79.8-120.2		
Beryllium	111	0.588	mg/kg wet	108.00		103	82.8-117.6		
Boron	81.9	5.88	mg/kg wet	85.100		96	67.5-132.8		
Cadmium	231	0.588	mg/kg wet	225.00		102	83.6-116.4		
Calcium	3400	294	mg/kg wet	3360.0		101	83.3-116.9		
Chromium	85.0	0.588	mg/kg wet	77.200		110	73.3-126.4		
Cobalt	168	5.88	mg/kg wet	166.00		101	80.7-118.7		
Copper	273	2.94	mg/kg wet	271.00		101	80.8-119.2		
Iron	8760	58.8	mg/kg wet	8420.0		104	78.6-121.1		
Lead	189	1.47	mg/kg wet	190.00		99	81.6-118.4		
Magnesium	9120	221	mg/kg wet	8570.0		106	83.2-116.7		
Manganese	865	14.7	mg/kg wet	965.00		90	69.3-130.5		
Molybdenum	230	5.88	mg/kg wet	235.00		98	76.2-123.8		
Nickel	223	11.8	mg/kg wet	221.00		101	79.6-120.8		
Potassium	14500	1180	mg/kg wet	14400		101	81.9-118.1		
Selenium	196	0.882	mg/kg wet	187.00		105	75.9-124.6		
Silicon	1500	5.88	mg/kg wet	807.00		185	0-219.3		
Silver	83.6	0.588	mg/kg wet	83.500		100	82.7-117.1		
Sodium	9710	147	mg/kg wet	9730.0		100	82.5-117.2		
Vanadium	111	7.35	mg/kg wet	98.700		112	75.9-123.6		
Zinc	204	29.4	mg/kg wet	199.00		102	78.4-121.6		

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/03/2012 13:22

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 L211168 - SW 7471A Prep										
Blank (L211168-BLK1)				Prepared: 11/20/2012 Analyzed: 11/21/2012						
Mercury	0.0281	U	0.0281	mg/kg wet						
Duplicate (L211168-DUP3)		**Source: 1211073-01**		Prepared: 11/20/2012 Analyzed: 11/21/2012						
Mercury	0.0278	U	0.0278	mg/kg dry		0.0294 U				20
Matrix Spike (L211168-MS3)		**Source: 1211073-01**		Prepared: 11/20/2012 Analyzed: 11/21/2012						
Mercury	0.150		0.0263	mg/kg dry	0.14609	0.0294 U	103	75-125		20
Reference (L211168-SRM1)				Prepared: 11/20/2012 Analyzed: 11/21/2012						
Mercury	1.24		0.0281	mg/kg wet	1.2900		95.9	62.6-138		

Lionville Laboratory

Logbook #: 1154

SAMPLE DIGESTION RECORD

Digestion Batch #: L211166
Date/Time Initiated: 11/20/12 1100
Date/Time Completed: 11/21/12 1345
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)

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/TC	Texture	Color / Appearance	Artifact	Turb
1211067-01		0.60	50		TO	coarse	black sludge	liquid/rocks	
L211166-DUP1		0.61	50						
MS1	0.5	0.62	50						
1211069-01		0.56	50			fine	brown powdery soil	rocks/veg.	
L211166-DUP2		0.60	50						
MS2	0.5	0.61	50						
1211073-01		0.64	50			fine	dk brown powdery soil	veg.	
L211166-DUP3		0.59	50						
MS3	0.5	0.57	50						
1211073-02		0.59	50			fine	dk brown soil	rocks/veg	
1211083-01		0.59	50			fine	dk brown soil	rocks/veg.	
L211166-DUP4		0.56	50						
MS4	0.5	0.57	50						
1211083-02		0.58	50			fine	dk brown soil	rocks/veg	
03		0.56	50			fine	dk brown soil	rocks	
L211166-BLK1		0.52	50						
SRM1	(*)	0.51	50						

MW 11/20/12

Spiking IDs / Expiration Date:
MS#: 1201377

LCS#: 1201014 (*)

Reagent IDs:
HNO_3 0000003380
HCl 113029
H_2O_2 L11A03
1:1 HNO_3 637-076-07
1:1 HCl

File ID#:

Data Review By/Date:
11/26/12

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

Page #:

PREPARATION BENCH SHEET

L211166

Lionville Laboratory

Printed: 11/30/2012 12:31:26PM

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
1211067-01	6010B ICP Trace	11/20/2012 11:00	0.6	50					WC-Hanford, Inc.	HSL + B, Mo, Si (no TL)
1211069-01	6010B ICP Trace	11/20/2012 11:00	0.56	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211073-01	6010B ICP Trace	11/20/2012 11:00	0.64	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211073-02	6010B ICP Trace	11/20/2012 11:00	0.59	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211083-01	6010B ICP Trace	11/20/2012 11:00	0.59	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211083-02	6010B ICP Trace	11/20/2012 11:00	0.58	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211083-03	6010B ICP Trace	11/20/2012 11:00	0.56	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
L211166-BLK1	QC	11/20/2012 11:00	0.52	50						
L211166-DUP1	QC	11/20/2012 11:00	0.61	50		1211067-01				
L211166-DUP2	QC	11/20/2012 11:00	0.6	50		1211069-01				
L211166-DUP3	QC	11/20/2012 11:00	0.59	50		1211073-01				
L211166-DUP4	QC	11/20/2012 11:00	0.56	50		1211083-01				
L211166-MS1	QC	11/20/2012 11:00	0.62	50	1201377	1211067-01	500			
L211166-MS2	QC	11/20/2012 11:00	0.61	50	1201377	1211069-01	500			
L211166-MS3	QC	11/20/2012 11:00	0.57	50	1201377	1211073-01	500			
L211166-MS4	QC	11/20/2012 11:00	0.57	50	1201377	1211083-01	500			
L211166-PS1	QC	11/20/2012 11:00	0.6	50	1001493	1211067-01	100			
L211166-PS2	QC	11/20/2012 11:00	0.56	50	1001902	1211069-01	100			
L211166-PS3	QC	11/20/2012 11:00	0.64	50	1001902	1211073-01	100			
L211166-PS4	QC	11/20/2012 11:00	0.59	50	1001493	1211083-01	100			

Revision for time/post spike

Extracts Relinquished By Date

Extracts Received By Date

AJM 11/30/12

PREPARATION BENCH SHEET

L211166

Lionville Laboratory

Printed: 11/30/2012 12:31:26P

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
L211166-SRM1	QC	11/20/2012 11:00	0.51	50	1201014		510			

Revision for time / post spike
AJM 11/30/12

Extracts Relinquished By Date

Extracts Received By Date

PREPARATION BENCH SHEET

L211166

Lionville Laboratory

Printed: 11/21/2012 2:22:11PM

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
1211067-01	6010B ICP Trace	11/20/2012 10:49	0.6	50					WC-Hanford, Inc.	HSL + B, Mo, Si (no TL)
1211069-01	6010B ICP Trace	11/20/2012 10:49	0.56	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211073-01	6010B ICP Trace	11/20/2012 10:49	0.64	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211073-02	6010B ICP Trace	11/20/2012 10:49	0.59	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211083-01	6010B ICP Trace	11/20/2012 10:49	0.59	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211083-02	6010B ICP Trace	11/20/2012 10:49	0.58	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1211083-03	6010B ICP Trace	11/20/2012 10:49	0.56	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
L211166-BLK1	QC	11/20/2012 10:49	0.52	50						
L211166-DUP1	QC	11/20/2012 10:49	0.61	50		1211067-01				
L211166-DUP2	QC	11/20/2012 10:49	0.6	50		1211069-01				
L211166-DUP3	QC	11/20/2012 10:49	0.59	50		1211073-01				
L211166-DUP4	QC	11/20/2012 10:49	0.56	50		1211083-01				
L211166-MS1	QC	11/20/2012 10:49	0.62	50	1201377	1211067-01	500			
L211166-MS2	QC	11/20/2012 10:49	0.61	50	1201377	1211069-01	500			
L211166-MS3	QC	11/20/2012 10:49	0.57	50	1201377	1211073-01	500			
L211166-MS4	QC	11/20/2012 10:49	0.57	50	1201377	1211083-01	500			
L211166-PS1	QC	11/20/2012 10:49	0.5	50						
L211166-SRM1	QC	11/20/2012 10:49	0.51	50	1201014		510			

Extracts Relinquished By — Date: 11/21/12

Extracts Received By — Date: 11/28/12

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 11/20/12
Start Time/Temp: 1755/94°
End Time/Temp: 1830/96°

Instrument ID: HG3.2/HG3.3
Balance # B14 /NA
Pipette Calibration (Daily) (Y)

Logbook # 1153
Prep Batch: L211168
Worksheet: HG112102/HG112103
SOP No. ME-HgCVAA
BLOCK 1 2 (3) (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				10 ml	50	
0.2 µg/l		0.100		10 ml	50	
1.0 µg/l		0.500		10 ml	50	
2.0 µg/l		1.000		10 ml	50	
5.0 µg/l		2.500		10 ml	50	
10.0 µg/l		5.000		10 ml	50	
ICV		0.125	2.5	10 ml	50	
CCV		0.250	5.0	10 ml	50	
ICB/CCB				10 ml	50	
L211168-BLK1				0.32	50	
SRM1		(*)	(*)	0.32	50	
1211067-01				0.36	50	
L211168-DUP1				0.39	50	
MS1		0.500	1.0	0.37	50	
1211069-01				0.36	50	
L211168-DUP2				0.39	50	
MS2		0.500	1.0	0.33	50	
1211073-01				0.34	50	
L211168-DUP3				0.36	50	
MS3		0.500	1.0	0.38	50	
1211073-02				0.35	50	
1211082-01				0.35	50	RAD (!)
L211168-DUP4				0.36	50	↓
MS4		0.500	1.0	0.34	50	↓
1211083-01				0.34	50	
L211168-DUP5				0.39	50	
MS5		0.500	1.0	0.39	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	11/20/12 1130
ICV/CCV/LCS	(I.V. 1201411)	N/A

Reviewed By/Date: [illegible] 11/26/12

se book # 1153 for std traceability information

Soil LCS True Value = 1.29 mg/Kg (*)
Standard # 1201014

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

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 11/20/12
Start Time/Temp: See page 074
End Time/Temp:

Instrument ID: HG3.2/HG3.3
Balance # B14 /NA
Pipette Calibration (Daily) Y

Logbook # 1153
Prep Batch: L211168
Worksheet: HG112102/HG112103
SOP No. ME-HgCVAA
BLOCK 1 2 3 (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.
1211083-02				0.32	50	
03				0.37	50	

[illegible] 11/20/12

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

Reviewed By/Date: [illegible] 11/20/12

se book # 1153 for std traceability information

Soil LCS True Value = See page 074 mg/Kg
Standard # _____

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

ME-HgCVAA-Prep0910

Page #:

000000057

WET CHEMISTRY

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/21/2012 13:56

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R5M7	1211073-01	Soil	11/13/2012 12:40	11/16/2012 10:15
J1R5M8	1211073-02	Soil	11/13/2012 13:05	11/16/2012 10:15

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Client: WC-HANFORD RC-255 KP0149
LVL#: 1211073 **Date Received:** 11-16-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 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 blanks for Hexavalent Chromium (Cr^{6+}) were 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 analyses were 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

11/23/12
Date

njp\i11-073

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.

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/21/2012 13:56

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-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/21/2012 13:56

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R5M7 (1211073-01) Soil										
%Solids	**90.1**			0.1	% by Weight	1	L211144	11/18/2012 18:07	11/18/2012 18:07	SM2540G
Hexavalent Chromium	0.22	U	0.22	0.56	mg/kg dry	1	L211146	11/19/2012 11:35	11/19/2012 17:10	SW846 7196A
J1R5M8 (1211073-02) Soil										
%Solids	**93.2**			0.1	% by Weight	1	L211144	11/18/2012 18:07	11/18/2012 18:07	SM2540G
Hexavalent Chromium	0.21	U	0.21	0.54	mg/kg dry	1	L211174	11/20/2012 14:35	11/20/2012 17:30	SW846 7196A

Lionville Laboratory, PADEP Lab ID# 15-00009
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Exton, PA 19341
Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/21/2012 13:56

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211144 - NO PREP											
Duplicate (L211144-DUP4)		**Source: 1211073-01**			Prepared & Analyzed: 11/18/2012 18:07						
%Solids	90.3			0.1	% by Weight		90.1			0.2	20
Batch L211146 - Default Prep GenChem											
Blank (L211146-BLK1)					Prepared: 11/19/2012 12:07 Analyzed: 11/19/2012 17:10						
Hexavalent Chromium	0.20	U	0.20	0.50	mg/kg wet						
LCS (L211146-BS1)					Prepared: 11/19/2012 12:07 Analyzed: 11/19/2012 17:10						
Hexavalent Chromium	4.02		0.20	0.50	mg/kg wet	4.0000		100	80-120		
LCS (L211146-BS2)					Prepared: 11/19/2012 12:07 Analyzed: 11/19/2012 17:10						
Hexavalent Chromium	1080	D	20.0	50.0	mg/kg wet	1139.9		95	80-120		
Duplicate (L211146-DUP3)		**Source: 1211073-01**			Prepared: 11/19/2012 11:35 Analyzed: 11/19/2012 17:10						
Hexavalent Chromium	0.22	U	0.22	0.56	mg/kg dry		0.22 U				20
Matrix Spike (L211146-MS5)		**Source: 1211073-01**			Prepared: 11/19/2012 11:35 Analyzed: 11/19/2012 17:10						
Hexavalent Chromium	4.39		0.22	0.56	mg/kg dry	4.4412	0.22 U	99	75-125		
Matrix Spike (L211146-MS6)		**Source: 1211073-01**			Prepared: 11/19/2012 11:35 Analyzed: 11/19/2012 17:10						
Hexavalent Chromium	1170	D	22.2	55.5	mg/kg dry	1315.6	0.22 U	89	75-125		
Batch L211174 - Default Prep GenChem											
Blank (L211174-BLK1)					Prepared: 11/20/2012 14:35 Analyzed: 11/20/2012 17:30						
Hexavalent Chromium	0.20	U	0.20	0.50	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0149	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/21/2012 13:56

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211174 - Default Prep GenChem										
LCS (L211174-BS1)				Prepared: 11/20/2012 14:35 Analyzed: 11/20/2012 17:30						
Hexavalent Chromium	4.22	0.20	0.50	mg/kg wet	4.0000		106	80-120		
LCS (L211174-BS2)				Prepared: 11/20/2012 14:35 Analyzed: 11/20/2012 17:30						
Hexavalent Chromium	968 D	20.0	50.0	mg/kg wet	1088.4		89	80-120		