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

COMPLETE COPY OF DATA PACKAGE TO:

Bill Rodgers X9-08 KW 10/30/12
INITIAL/DATE

COMMENTS:

SDG K4002 SAF-RC-006

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Waste Site(s): 183-D Pump House

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

26 October 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 #	1210040
SDG #	K4002
SAF #	RC-006
Date Received	10/12/12
# Samples	3
Matrix	OTHER SOLID
Volatiles	
Semivolatiles	
Pest/PCB	X
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	X
Inorganics	

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

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 32 pages.

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1210040

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford SAF#RC-006
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SW TAT: 15

Date Rec'd: 10/12/12 Date Due: 10/27/12

Refrigerator #		A						B							
				1											
#/Type Container	Liquid														
	Solid			1AG				1AG							
Volume	Liquid														
	Solid			60				60							
Preservatives				–				–							
ANALYSES REQUESTED →		ORGANIC						INORG							
		VOA	BNA	~~Pest~~ PCB	Herb			Metal Hg	CN						
		Lionville Laboratory Use Only													
				8082				METALS							

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
W Water	01	J1R2T7			SO	10-10-12	0940			X				X						
WW Waste Water	02	1 T8			1	1	0955			X				X						
GW Groundwater	03	1 X5			1	1	1005			X				X						
WST Waste																				
WI Wipe																				
SO Solid																				
S Soil																				
SL Sludge																				
SE Sediment																				
PC Paint Chips																				
O Oil																				
NAL Non-Aqueous Liquid																				
L Leachate																				
A Air																				
T Tissue																				
F Fish																				

Special Instructions:

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

Special Instructions:

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

Relinquished by	Received by	Date	Time
[signature]	[signature]	10/12/12	0955

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-006-366	Page 1 of 1

Collector: R. Strickland	Company Contact: Bill Rodgers	Telephone No.: 206.251.7439	Project Coordinator: KESSNER, JH
Price Code: 9K	Data Turnaround: 15 Days		
Project Designation: 100-N Area D4 - Other	Sampling Location: 183-D Pump House		SAF No.: RC-006
Ice Chest No.: WCH-11-017	Field Logbook No.: EL-1516-21	COA: RD4MXX2F00	Method of Shipment: FEDEX
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A110-414		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Lead

Special Handling and/or Storage

~~None~~ COOL TO 4C 10/10/12 RS

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	aG										
No. of Container(s)	1	1										
Volume	60mL	60mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082										

Sample No.	Matrix *	Sample Date	Sample Time										
J1R2T7	OTHER	10-10-12	0940	X	X								
J1R2T8	OTHER	10-10-12	0955	X	X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. STRICKLAND WCH R. Strickland	10/10/12 1130	R. STRICKLAND R. Strickland MO 767 FRIDGE	10/10/12 1130
R. STRICKLAND R. Strickland MO 767 FRIDGE	10/10/12 1400	FEDEX	
Fed Ex	10-12-12 0955	VICTOR HERNANDEZ	10-12-12 0955

SPECIAL INSTRUCTIONS

None

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

REVIEWED BY SMS DATE 10/10/12

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

00000004

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-006-367	Page 1 of 1

Collector R. Strickland	Company Contact Bill Rodgers	Telephone No. 206.251.7439	Project Coordinator KESSNER, JH	Price Code 9K	Data Turnaround 15 Days
Project Designation 100-N Area D4 - Other	Sampling Location 183-D Pump House		SAF No. RC-006		
Ice Chest No. WCH-11-017	Field Logbook No. EL-1516-21	COA RD4MXX2F00	Method of Shipment FEDEX		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A11D 414		Bill of Lading/Air Bill No. See OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

Lead

Special Handling and/or Storage

~~None~~ Cool to 4°C
SMS 10/10/12

Preservation	Cool 4C	Cool 4C									
Type of Container	G/P	aG									
No. of Container(s)	1	1									
Volume	60mL	60mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082									

Sample No.	Matrix *	Sample Date	Sample Time										
J1R2X5	OTHER	10-10-12	1005	X	X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Strickland WCH	10/10/12 1130	R. Strickland MD767 FRIDGE	10/10/12 1130
R. Strickland MD767 FRIDGE	10/10/12 1400	FED EX	
FED EX	10-12-12 0955	VICTOR HERNANDEZ	10-12-12 0955
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
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

None

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

REVIEWED BY SMS
DATE 10/10/12

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

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

WCH-EE-011

000000005

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford

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

Date: 10/12/12

LvL Batch #: 1210040

Sample Custodian: [signature]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FED EX		Airbill # 7991 6480 4543
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 3.1°	°C	Cooler # WCH-11-017
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.doc

PCBs

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

WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/26/2012 11:01

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T7	1210040-01	Other Solid	10/10/2012 09:40	10/12/2012 09:55
J1R2T8	1210040-02	Other Solid	10/10/2012 09:55	10/12/2012 09:55
J1R2X5	1210040-03	Other Solid	10/10/2012 10:05	10/12/2012 09:55

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-006 K4002
LVL #: 1210040

W.O. #: 60049-001-001-0001-00
Received: 10-12-2012

PCBs

Three (3) other solid samples were collected on 10-10-2012.

The samples and associated QC samples were extracted 10-24-2012 and analyzed 10-25-2012 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 for client specified target compounds. All samples received Copper-Sulfur and Sulfuric Acid cleanups based on SW846 methods 3660A and 3665A, respectively.

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 samples had reduced initial volumes due to the matrix. Reporting limits have been adjusted for this necessary change.

4. Samples J1R2T7, L210206-MS1 and L210206-MSD1 required 4-fold instrument dilutions due to high concentrations of non-target analytes.

5. All obtainable surrogate recoveries were within acceptance criteria.

6. The method blank was below the reporting limit for all target compounds.

7. All blank spike recoveries were within acceptance criteria.

8. One (1) of four (4) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12GC178) has been enclosed.

9. The samples are reported on a wet weight 'as received' basis.

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

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

12. Patterns for Aroclors 1254 and 1260 were identified in these samples. The reported Aroclors were chosen based on the best pattern match and fit. Quantitation was performed using congeners common to both Aroclors to give the best overall total PCB concentration.

13. 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

10/26/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC178

Initiator: L. Kauffman
Date: 10-26-2012
Client: WC Hanford RC-006

Batch: 1210040
Samples: All
Method: SW846/MCAWW/CLP/

Parameter: PCB
Matrix: Solid
Prep Batch: L210206

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)

One of four matrix spike recoveries was above the acceptance range.
AR1016 on L210206-MS1 read 141% recovery (range = 50-138)

2. Known or Probable Causes(s)

Sample matrix and dilution

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: 10/26/12

✓ 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: 10/26/12 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
X Lab Manager: Daniels
X 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

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-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/26/2012 11:01

J1R2T7

1210040-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	3000	U	3000	ug/kg wet	4	L210206	10/24/2012	10/25/2012	8082
Aroclor 1221	3000	U	3000	ug/kg wet	4	L210206	10/24/2012	10/25/2012	8082
Aroclor 1232	3000	U	3000	ug/kg wet	4	L210206	10/24/2012	10/25/2012	8082
Aroclor 1242	3000	U	3000	ug/kg wet	4	L210206	10/24/2012	10/25/2012	8082
Aroclor 1248	3000	U	3000	ug/kg wet	4	L210206	10/24/2012	10/25/2012	8082
Aroclor 1254	**14400**	D	3000	ug/kg wet	4	L210206	10/24/2012	10/25/2012	8082
Aroclor 1260	**10700**	D	3000	ug/kg wet	4	L210206	10/24/2012	10/25/2012	8082
Aroclor 1262	3000	U	3000	ug/kg wet	4	L210206	10/24/2012	10/25/2012	8082
Aroclor 1268	3000	U	3000	ug/kg wet	4	L210206	10/24/2012	10/25/2012	8082
Surrogate: Decachlorobiphenyl	*114 %*		*43-144*			*L210206*	*10/24/2012*	*10/25/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*109 %*		*52-141*			*L210206*	*10/24/2012*	*10/25/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/26/2012 11:01

J1R2T8

1210040-02 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	716	U	716	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1221	716	U	716	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1232	716	U	716	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1242	716	U	716	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1248	716	U	716	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1254	**7990**		716	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1260	**7040**		716	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1262	716	U	716	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1268	716	U	716	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Surrogate: Decachlorobiphenyl	*90 %*		*43-144*			*L210206*	*10/24/2012*	*10/25/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*92 %*		*52-141*			*L210206*	*10/24/2012*	*10/25/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/26/2012 11:01

J1R2X5

1210040-03 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	687	U	687	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1221	687	U	687	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1232	687	U	687	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1242	687	U	687	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1248	687	U	687	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1254	**3660**		687	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1260	**3140**		687	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1262	687	U	687	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Aroclor 1268	687	U	687	ug/kg wet	1	L210206	10/24/2012	10/25/2012	8082
Surrogate: Decachlorobiphenyl	*90 %*		*43-144*			*L210206*	*10/24/2012*	*10/25/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*101 %*		*52-141*			*L210206*	*10/24/2012*	*10/25/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/26/2012 11:01

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 L210206 - SW 3540C										
Blank (L210206-BLK1)				Prepared: 10/24/2012 Analyzed: 10/25/2012						
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	*43.3*			*ug/kg wet*	*33.333*		*130*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.3*			*ug/kg wet*	*33.337*		*106*	*52-141*		
LCS (L210206-BS1)				Prepared: 10/24/2012 Analyzed: 10/25/2012						
Aroclor 1016	138		13.3	ug/kg wet	166.67		83	50-138		
Aroclor 1260	154		13.3	ug/kg wet	166.67		93	50-148		
Surrogate: Decachlorobiphenyl	*36.2*			*ug/kg wet*	*33.333*		*109*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*30.8*			*ug/kg wet*	*33.337*		*92*	*52-141*		
Matrix Spike (L210206-MS1)		**Source: 1210040-01**		Prepared: 10/24/2012 Analyzed: 10/25/2012						
Aroclor 1016	12000	D	2730	ug/kg wet	8560.2	3000 U	141*	50-138		
Aroclor 1260	17300	D	2730	ug/kg wet	8560.2	10700	77	50-148		
Surrogate: Decachlorobiphenyl	*1610*			*ug/kg wet*	*1712.0*		*94*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*1720*			*ug/kg wet*	*1712.2*		*101*	*52-141*		
Matrix Spike Dup (L210206-MSD1)		**Source: 1210040-01**		Prepared: 10/24/2012 Analyzed: 10/25/2012						
Aroclor 1016	12500	D	2970	ug/kg wet	9293.7	3000 U	135	50-138	4	40
Aroclor 1260	15800	D	2970	ug/kg wet	9293.7	10700	54	50-148	34	40
Surrogate: Decachlorobiphenyl	*1590*			*ug/kg wet*	*1858.7*		*86*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*1860*			*ug/kg wet*	*1858.9*		*100*	*52-141*		

PREPARATION BENCH SHEET

L210206

Lionville Laboratory

Printed: 10/25/2012 3:18:37PM

00000017

Matrix: Solid **Prepared using: Extraction - SW 3540C** **Surrogate used: 1201060**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210040-01	8082 PCBs	10/24/2012 17:01	0.5321	10				250	WC-Hanford, Inc.	
1210040-02	8082 PCBs	10/24/2012 17:01	0.557	10				250	WC-Hanford, Inc.	
1210040-03	8082 PCBs	10/24/2012 17:01	0.5807	10				250	WC-Hanford, Inc.	
1210047-01	8082 PCBs	10/24/2012 17:01	0.5841	10				250	Bechtel Marine Propulsion Corp.	
1210047-02	8082 PCBs	10/24/2012 17:01	0.52	10				250	Bechtel Marine Propulsion Corp.	
1210053-01	8082 PCBs	10/24/2012 17:01	0.515	10				250	Bechtel Marine Propulsion Corp.	
1210053-02	8082 PCBs	10/24/2012 17:01	0.52	10				250	Bechtel Marine Propulsion Corp.	
1210053-03	8082 PCBs	10/24/2012 17:01	0.4906	10				250	Bechtel Marine Propulsion Corp.	
1210053-04	8082 PCBs	10/24/2012 17:01	0.5	10				250	Bechtel Marine Propulsion Corp.	
1210053-05	8082 PCBs	10/24/2012 17:01	0.5	10				250	Bechtel Marine Propulsion Corp.	
1210053-06	8082 PCBs	10/24/2012 17:01	0.5313	10				250	Bechtel Marine Propulsion Corp.	
1210053-07	8082 PCBs	10/24/2012 17:01	0.6	10				250	Bechtel Marine Propulsion Corp.	
1210053-08	8082 PCBs	10/24/2012 17:01	0.5	10				250	Bechtel Marine Propulsion Corp.	
1210053-09	8082 PCBs	10/24/2012 17:01	0.5712	10				250	Bechtel Marine Propulsion Corp.	
1210053-10	8082 PCBs	10/24/2012 17:01	0.596	10				250	Bechtel Marine Propulsion Corp.	
1210053-11	8082 PCBs	10/24/2012 17:01	0.5061	10				250	Bechtel Marine Propulsion Corp.	
1210053-12	8082 PCBs	10/24/2012 17:01	0.5926	10				250	Bechtel Marine Propulsion Corp.	
1210053-13	8082 PCBs	10/24/2012 17:01	0.673	10				250	Bechtel Marine Propulsion Corp.	
1210053-14	8082 PCBs	10/24/2012 17:01	0.515	10				250	Bechtel Marine Propulsion Corp.	
L210206-BLK1	QC	10/24/2012 17:01	30	10				250		

10/25/12 1520

Extracts Relinquished By Date

S Jeanvert 10.25.12 S2
Cu Lot # B10X036
SJak 10.25.12 15:30

Extracts Received By Date

PREPARATION BENCH SHEET

L210206

Lionville Laboratory

Printed: 10/25/2012 3:18:37PM

00000018

Matrix: Solid

Prepared using: Extraction - SW 3540C

Surrogate used: 1201060

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
L210206-BS1	QC	10/24/2012 17:01	30	10	1200902		250	250		
L210206-MS1	QC	10/24/2012 17:01	0.5841	10	1200902	1210040-01	250	250		
L210206-MS2	QC	10/24/2012 17:01	0.5733	10	1200902	1210047-01	250	250		
L210206-MS3	QC	10/24/2012 17:01	0.5507	10	1200902	1210053-06	250	250		
L210206-MSD1	QC	10/24/2012 17:01	0.538	10	1200902	1210040-01	250	250		
L210206-MSD2	QC	10/24/2012 17:01	0.5786	10	1200902	1210047-01	250	250		
L210206-MSD3	QC	10/24/2012 17:01	0.5448	10	1200902	1210053-06	250	250		

Scleaned 10.25.12 SZ
Cu lot # B10X036

Extracts Relinquished By — Date: 10/25/12 1520

Extracts Received By — Date: 10.25.12 15:30

METALS

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

WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 13:52

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T7	1210040-01	Other Solid	10/10/2012 09:40	10/12/2012 09:55
J1R2T8	1210040-02	Other Solid	10/10/2012 09:55	10/12/2012 09:55
J1R2X5	1210040-03	Other Solid	10/10/2012 10:05	10/12/2012 09:55

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-006
LVL#: 1210040
SDG/SAF#: K4002/RC-006

W.O.#: 60049-001-001-0001-00
Date Received: 10-12-12

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 3 other solid samples.

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

   All samples were reported with 3-fold dilutions for ICP analytes due to sample matrix. Sample J1R2T8 was reanalyzed and reported with a 6-fold dilution for Iron and a 24-fold dilution for Zinc. Sample J1R2X5 was reanalyzed and reported with 6-fold dilutions for Iron and Lead and a 24-fold dilution for Zinc due to high concentration of these analytes.

   Sample J1R2T7 was analyzed and reported with a 5-fold dilution for Mercury, sample J1R2T8 was analyzed and reported with a 25-fold dilution for Mercury and sample J1R2X5 was analyzed and reported with a 50-fold dilution for Mercury due to high concentration of Mercury in the sample.

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of the ending CCV for Barium, Antimony, and Silicon in file ICP101712A. Samples J1R2T7, J1R2T8, and J1R2X5 were reported from file ICP101712A and were surrounded by CCVs within control. The ending instrument run QC for file ICP101712C were not analyzed due to an instrument malfunction, however digestion batch QC samples L210119-BLK1 and L210119-SRM1 that were analyzed in file ICP101712C were surrounded by in control run QC and were reported.

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.

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

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

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

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

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

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration levels for the following analytes: Aluminum, Antimony, Chromium, Copper, Iron, Manganese, Lead, Silicon, and Zinc.

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1R2T7	Mercury	1.0	108.1

12. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Arsenic and Potassium were less than ten times the MDL.

13. For the purposes of this report, the data have been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

14. LvL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory

10/19/12
Date

alm/10-040hgn%

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

WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 13:52

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-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 13:52

J1R2T7
1210040-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**104000**		56.6	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Antimony	2.83	U	2.83	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Arsenic	**3.09**		2.83	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Barium	**161**		1.42	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Beryllium	0.566	U	0.566	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Boron	**8.32**		5.66	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Cadmium	**2.93**		0.708	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Calcium	**1860**		56.6	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Chromium	**3410**		0.566	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Cobalt	**426**		5.66	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Copper	**177**		2.83	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Iron	**26500**		56.6	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Lead	**19600**		1.42	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Magnesium	**431**		212	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Manganese	**1590**		14.2	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Molybdenum	**6.01**		5.66	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Nickel	**26.9**		11.3	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Potassium	**202**	B	1130	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Selenium	**2.08**	B	2.83	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Silicon	**261**		5.66	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Silver	**0.646**		0.566	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Sodium	**131**	B	142	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Vanadium	**21.5**		7.08	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Zinc	**608**		28.3	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Mercury	**2.82**		0.145	mg/kg wet	5	L210122	10/16/2012	10/16/2012	7471A

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 13:52

J1R2T8

1210040-02 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**92900**		51.7	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Antimony	**12.6**		2.59	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Arsenic	**33.2**		2.59	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Barium	**1400**		1.29	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Beryllium	0.517	U	0.517	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Boron	**27.4**		5.17	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Cadmium	**17.2**		0.647	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Calcium	**7290**		51.7	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Chromium	**8360**		0.517	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Cobalt	**303**		5.17	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Copper	**379**		2.59	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Iron	**139000**		103	mg/kg wet	6	L210119	10/15/2012	10/17/2012	6010B
Lead	**3470**		1.29	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Magnesium	**1930**		194	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Manganese	**1270**		12.9	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Molybdenum	**20.3**		5.17	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Nickel	**71.1**		10.3	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Potassium	**1470**		1030	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Selenium	**7.09**		2.59	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Silicon	**626**		5.17	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Silver	**1.14**		0.517	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Sodium	**374**		129	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Vanadium	**22.4**		6.47	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Zinc	**16800**		207	mg/kg wet	24	L210119	10/15/2012	10/17/2012	6010B
Mercury	**19.4**		0.703	mg/kg wet	25	L210122	10/16/2012	10/17/2012	7471A

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 13:52

J1R2X5
1210040-03 (Other Solid)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**3090**		55.6	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Antimony	**14.4**		2.78	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Arsenic	**30.9**		2.78	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Barium	**173**		1.39	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Beryllium	0.556	U	0.556	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Boron	**31.6**		5.56	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Cadmium	**5.08**		0.694	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Calcium	**12700**		55.6	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Chromium	**8610**		0.556	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Cobalt	**227**		5.56	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Copper	**756**		2.78	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Iron	**234000**		111	mg/kg wet	6	L210119	10/15/2012	10/17/2012	6010B
Lead	**39000**		2.78	mg/kg wet	6	L210119	10/15/2012	10/17/2012	6010B
Magnesium	**2550**		208	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Manganese	**1300**		13.9	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Molybdenum	**52.4**		5.56	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Nickel	**249**		11.1	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Potassium	**1890**		1110	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Selenium	**2.79**		2.78	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Silicon	**587**		5.56	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Silver	0.556	U	0.556	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Sodium	**613**		139	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Vanadium	**15.6**		6.94	mg/kg wet	3	L210119	10/15/2012	10/17/2012	6010B
Zinc	**6200**		222	mg/kg wet	24	L210119	10/15/2012	10/17/2012	6010B
Mercury	**47.5**		1.18	mg/kg wet	50	L210122	10/16/2012	10/17/2012	7471A

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 13:52

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 L210119 - SW 3050B										
Blank (L210119-BLK1)				Prepared: 10/15/2012 Analyzed: 10/17/2012						
Aluminum	4.04	B	4.90	mg/kg wet						
Antimony	0.588	U	0.588	mg/kg wet						
Arsenic	0.980	U	0.980	mg/kg wet						
Barium	0.490	U	0.490	mg/kg wet						
Beryllium	0.196	U	0.196	mg/kg wet						
Boron	1.96	U	1.96	mg/kg wet						
Cadmium	0.196	U	0.196	mg/kg wet						
Calcium	7.76	B	98.0	mg/kg wet						
Chromium	0.196	U	0.196	mg/kg wet						
Cobalt	1.96	U	1.96	mg/kg wet						
Copper	0.980	U	0.980	mg/kg wet						
Iron	19.6	U	19.6	mg/kg wet						
Lead	0.490	U	0.490	mg/kg wet						
Magnesium	73.5	U	73.5	mg/kg wet						
Manganese	4.90	U	4.90	mg/kg wet						
Molybdenum	1.96	U	1.96	mg/kg wet						
Nickel	3.92	U	3.92	mg/kg wet						
Potassium	392	U	392	mg/kg wet						
Selenium	0.294	U	0.294	mg/kg wet						
Silicon	1.96	U	1.96	mg/kg wet						
Silver	0.196	U	0.196	mg/kg wet						
Sodium	49.0	U	49.0	mg/kg wet						
Vanadium	2.45	U	2.45	mg/kg wet						
Zinc	9.80	U	9.80	mg/kg wet						
Duplicate (L210119-DUP1)			**Source: 1210040-01**	Prepared: 10/15/2012 Analyzed: 10/17/2012						
Aluminum	102000		14.7	mg/kg wet		104000			1	20
Antimony	1.76	U	1.76	mg/kg wet		2.83 U				20
Arsenic	1.90	B	2.94	mg/kg wet		3.09			48*	20
Barium	157		1.47	mg/kg wet		161			3	20
Beryllium	0.588	U	0.588	mg/kg wet		0.566 U				20
Boron	8.59		5.88	mg/kg wet		8.32			3	20
Cadmium	2.96		0.588	mg/kg wet		2.93			1	20
Calcium	1600		294	mg/kg wet		1860			15	20
Chromium	3130		0.588	mg/kg wet		3410			9	20
Cobalt	420		5.88	mg/kg wet		426			1	20
Copper	156		2.94	mg/kg wet		177			13	20

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

WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 13:52

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 L210119 - SW 3050B										
Duplicate (L210119-DUP1)		**Source: 1210040-01**		Prepared: 10/15/2012 Analyzed: 10/17/2012						
Iron	30200		58.8	mg/kg wet		26500			13	20
Lead	23900		1.47	mg/kg wet		19600			20	20
Magnesium	344		221	mg/kg wet		431			22*	20
Manganese	1960		14.7	mg/kg wet		1590			21*	20
Molybdenum	6.16		5.88	mg/kg wet		6.01			2	20
Nickel	27.5		11.8	mg/kg wet		26.9			2	20
Potassium	149	B	1180	mg/kg wet		202			30*	20
Selenium	2.14		0.882	mg/kg wet		2.08			3	20
Silicon	254		5.88	mg/kg wet		261			3	20
Silver	0.632		0.588	mg/kg wet		0.646			2	20
Sodium	122	B	147	mg/kg wet		131			7	20
Vanadium	21.4		7.35	mg/kg wet		21.5			0.01	20
Zinc	445		29.4	mg/kg wet		608			31*	20
Matrix Spike (L210119-MS1)		**Source: 1210040-01**		Prepared: 10/15/2012 Analyzed: 10/17/2012						
Aluminum	103000		14.4	mg/kg wet	192.31	104000	-551*	75-125		
Antimony	30.5		1.73	mg/kg wet	48.077	2.83 U	63*	75-125		
Arsenic	211		2.88	mg/kg wet	192.31	3.09	108	75-125		
Barium	369		1.44	mg/kg wet	192.31	161	108	75-125		
Beryllium	5.10		0.577	mg/kg wet	4.8077	0.566 U	106	75-125		
Boron	100		5.77	mg/kg wet	96.154	8.32	96	75-125		
Cadmium	7.46		0.577	mg/kg wet	4.8077	2.93	94	75-125		
Calcium	3970		288	mg/kg wet	2403.8	1860	88	75-125		
Chromium	2970		0.577	mg/kg wet	19.231	3410	-2270*	75-125		
Cobalt	465		5.77	mg/kg wet	48.077	426	81	75-125		
Copper	193		2.88	mg/kg wet	24.038	177	63*	75-125		
Iron	27800		57.7	mg/kg wet	96.154	26500	1410*	75-125		
Lead	27700		1.44	mg/kg wet	48.077	19600	16700*	75-125		
Magnesium	2730		216	mg/kg wet	2403.8	431	96	75-125		
Manganese	1740		14.4	mg/kg wet	48.077	1590	328*	75-125		
Molybdenum	103		5.77	mg/kg wet	96.154	6.01	101	75-125		
Nickel	76.6		11.5	mg/kg wet	48.077	26.9	103	75-125		
Potassium	2580		1150	mg/kg wet	2403.8	202	99	75-125		
Selenium	206		0.865	mg/kg wet	192.31	2.08	106	75-125		
Silicon	256		5.77	mg/kg wet	96.154	261	-5*	75-125		
Silver	5.97		0.577	mg/kg wet	4.8077	0.646	111	75-125		
Sodium	2550		144	mg/kg wet	2403.8	131	100	75-125		

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2620 Fermi Avenue	Project Number: K4002	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 13:52

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 L210119 - SW 3050B									
Matrix Spike (L210119-MS1)		**Source: 1210040-01**	Prepared: 10/15/2012 Analyzed: 10/17/2012						
Vanadium	70.8	7.21	mg/kg wet	48.077	21.5	103	75-125		
Zinc	538	28.8	mg/kg wet	48.077	608	-147*	75-125		
Post Spike (L210119-PS1)		**Source: 1210040-01**	Prepared: 10/15/2012 Analyzed: 10/17/2012						
Aluminum	1250000		ug/L	126000	1100000	114	75-125		
Antimony	321		ug/L	300.00	3.30	106	75-125		
Chromium	43000		ug/L	6300.0	36100	110	75-125		
Copper	5420		ug/L	3300.0	1880	107	75-125		
Iron	348000		ug/L	66000	281000	102	75-125		
Lead	246000		ug/L	30300	208000	123	75-125		
Manganese	19900		ug/L	3000.0	16800	104	75-125		
Silicon	6030		ug/L	3300.0	2770	99	75-125		
Zinc	10200		ug/L	3300.0	6450	113	75-125		
Reference (L210119-SRM1)			Prepared: 10/15/2012 Analyzed: 10/18/2012						
Aluminum	12300	14.4	mg/kg wet	6670.0		184	0-200.89		
Antimony	46.5	1.73	mg/kg wet	53.000		88	0-235.8		
Arsenic	120	2.88	mg/kg wet	114.00		105	82.8-117.54		
Barium	310	1.44	mg/kg wet	307.00		101	79.8-120.2		
Beryllium	105	0.577	mg/kg wet	108.00		98	82.8-117.6		
Boron	83.5	5.77	mg/kg wet	85.100		98	67.5-132.8		
Cadmium	228	0.577	mg/kg wet	225.00		101	83.6-116.4		
Calcium	3290	288	mg/kg wet	3360.0		98	83.3-116.9		
Chromium	86.2	0.577	mg/kg wet	77.200		112	73.3-126.4		
Cobalt	166	5.77	mg/kg wet	166.00		100	80.7-118.7		
Copper	272	2.88	mg/kg wet	271.00		100	80.8-119.2		
Iron	8530	57.7	mg/kg wet	8420.0		101	78.6-121.1		
Lead	191	1.44	mg/kg wet	190.00		100	81.6-118.4		
Magnesium	8040	216	mg/kg wet	8570.0		94	83.2-116.7		
Manganese	1160	14.4	mg/kg wet	965.00		120	69.3-130.5		
Molybdenum	238	5.77	mg/kg wet	235.00		101	76.2-123.8		
Nickel	229	11.5	mg/kg wet	221.00		103	79.6-120.8		
Potassium	14500	1150	mg/kg wet	14400		101	81.9-118.1		
Selenium	193	0.865	mg/kg wet	187.00		103	75.9-124.6		
Silicon	1110	5.77	mg/kg wet	807.00		137	0-219.3		
Silver	83.9	0.577	mg/kg wet	83.500		100	82.7-117.1		
Sodium	9240	144	mg/kg wet	9730.0		95	82.5-117.2		
Vanadium	110	7.21	mg/kg wet	98.700		111	75.9-123.6		

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Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 13:52

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 L210119 - SW 3050B										
Reference (L210119-SRM1)				Prepared: 10/15/2012 Analyzed: 10/18/2012						
Zinc	203		28.8	mg/kg wet	199.00		102	78.4-121.6		
Batch L210122 - SW 7471A Prep										
Blank (L210122-BLK1)				Prepared & Analyzed: 10/16/2012						
Mercury	0.0265	U	0.0265	mg/kg wet						
Duplicate (L210122-DUP1)		**Source: 1210040-01**		Prepared & Analyzed: 10/16/2012						
Mercury	2.70		0.145	mg/kg wet		2.82			4.38	20
Matrix Spike (L210122-MS1)		**Source: 1210040-01**		Prepared & Analyzed: 10/16/2012						
Mercury	2.85		0.132	mg/kg wet	0.14706	2.82	20.6*	75-125		
Reference (L210122-SRM1)				Prepared & Analyzed: 10/16/2012						
Mercury	1.19		0.0290	mg/kg wet	1.2900		92.5	62.6-138		

Lionville Laboratory

Logbook #: 1154

SAMPLE DIGESTION RECORD

Digestion Batch #: L210119
Date/Time Initiated: 10/15/12 1900
Date/Time Completed: 10/16/12 1300
Analyst: LP/ 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 3 (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
1210040-01		0.53	50		TO	coarse	silver, gray, some rust color - paint	chips (?)	
L210119-DUP1		0.51	50						
MS1	0.5	0.52	50						
1210040-02		0.58	50			coarse	silver + rust paint chips	a strip of rusty metal	
03		0.54	50			coarse	rust, yellow blue paint chips	hard lumps (?)	
1210041-01		0.59	50			coarse	grey / granular	rocks	RAD II
L210119-DUP2		0.58	50						
MS2	0.5	0.63	50						
1210041-02		0.76	50			coarse	gray / gravel	rocks	RAD II
03		0.58	50			coarse	brown + gray / granular	rocks	RAD II
04		0.58	50			coarse	gray + tan / granular	rocks	RAD II
05		0.62	50			coarse	dark gray + brown / granular	rocks	RAD II
06		0.52	50			coarse	lt. grey / granular	rocks	RAD II
L210119-BLK		0.51	50			coarse	brick chips		
SRM1	*	0.52	50			fine	pink / sandy		

MW 10/15/12

Spiking IDs / Expiration Date:
MS#: 1200457

LCS#: * 1201014

Reagent IDs:
HNO_3 L08023
HCl L13029
H_2O_2 L11A03
1:1 HNO_3 637-066-02
1:1 HCl

File ID#:

Data Review By/Date:
10/17/12

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Lionville Laboratory

MERCURY PREPARATION

Logbook # 1153

Analyst: MLehl / RB
Date 10/16/12 (Spike Conc 10/16/12)
Start Time/Temp: 1805 / 94°
End Time/Temp: 1835 / 95°

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

Prep Batch: L210122
Worksheet: HG101601 / HG101701
SOP No. ME-HgCVAA
BLOCK 1 (3) 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				10 ml	50	
0.2 ug/l		0.100		10 ml	50	
1.0 ug/l		0.500		10 ml	50	
2.0 ug/l		1.000		10 ml	50	
5.0 ug/l		2.500		10 ml	50	
10.0 ug/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	
L210122-BLK1				0.34	50	
SRM1		(*)	(*)	0.31	50	
1210040-01				0.31	50	
L210122-DUP1				0.31	50	
MS1		0.500	1.0	0.34	50	
1210040-02				0.32	50	
03				0.38	50	
1210041-01.				0.34	50	RADII
L210122-DUP2				~~0.38~~ 0.32	50	QCM 02 (ltd amt of sa)
MS2		0.500	1.0	0.36	50	
1210041-02				0.38	50	
03				0.31	50	
04				0.32	50	
05				0.35	50	
06				0.38	50	
		MW 10/16/12				

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	10/16/12 1225
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: 10/18/12

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
Soil LCS Spiking Concentration: 1.0 µg/ml

ME-HgCVAA-Prep0910

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