SAF-RC-191
100N Field Remediation - Other
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

No Distribution Required

COMMENTS:

SDG KP0168 SAF RC-191

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 100-N-84:5 manholes

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

11 January 2013

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99354

Subject: Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	1212047
SDG #	KP0168
SAF #	RC-191
Date Received	12/14/12
# Samples	3
Matrix	OTHER SOLID
Volatiles	
Semivolatiles	X
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 97 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1212047

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

KP0168

Client: WC Hanford RC-191
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SH TAT: 7 Days

Date Rec'd: 12-14-12 Date Due: 12-21-12

Refrigerator #		A	B		C	D	E	F			G				
#/Type Container	Liquid														
	Solid	1AG	1AG		1AG	1AG	1AG	1AG			1AG				
Volume	Liquid														
	Solid	60	60		60	60	60	60			60				
Preservatives		—	—		—	—	—	—			—				
ANALYSES REQUESTED →		ORGANIC						INORG							
		VOA	BNA	~~Pest~~/PCB	Herb	Pest	PAHs	WTPH-D	Metal HG	CN		IC ANIONS	NO2 NO3 PH	% MOIST		
		Lionville Laboratory Use Only													
			8270	8082		8081	8310	DRO/MO	METALS			ANIONS	N3NZ PH	% MOIST		

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	8270	8082	8081	8310	DRO/MO	METALS	ANIONS	N3NZ PH	% MOIST
01	J1R745			SOIL	12-12-12	1243	X	X	X	X	X	X	X	X	X
02	J1R746			⊥	⊥	1317	X	X	X	X	X	X	X	X	X
03	J1R744			⊥	⊥	1217		X 4	X 5	X 3	X 2	X (1)			X

Special Instructions: MATRIX QC
OTHER = Soil
METALS = HSL+B, Mo, S: (NOTL)
Report on dry weight per client

Special Instructions:
1. ** Please run % moisture to present data in DRY MATTER BASIS.
2. SAMPLE # 03 PLEASE RUN ANALYSIS IN THE FOLLOWING ORDER TO PRIORITY.
3. ⊥ (1) ICP METALS, (2) WTPH-D, (3) PAHs, (4) PCBs AND (5) PESTICIDES.
4. NO BOTTLES FOR PCB OR PESTICIDES.
5. ~~Sample # 02 DID NOT Receive Sample Bottle for Pesticides and PAHs.~~ VH 12-14-12 VH 12-14-12
6.

Relinquished by	Received by	Date	Time
Fred Eo	[signature]	12/14/12	0945

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-191-35	Page 1 of 1

Collector Q. Stowe	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code ~~9L~~ 9B 12/12/12	Data Turnaround ~~21~~ Days 7 12/12/12		
Project Designation 100N Field Remediation - Other	Sampling Location 100-N-84:5 manholes		SAF No. RC-191
Ice Chest No. KCC-08-028	Field Logbook No. EL-1652-08	COA 01N8452000	Method of Shipment ~~Hand Deliver~~ (Fed Ex) 12/12/12
Shipped To ~~EBERLINE SERVICES~~ (LIONVILLE) 12/12/12	Offsite Property No. A120684		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G	G	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	60mL	60mL	60mL	60mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	TPH-Diesel Range - WTPH-D +	VOA - 8260A (TCL)	Semi-VOA - 8270A (TCL)	PAHs - 8310	PCBs - 8082	Pesticides - 8081		
Sample No. / Matrix * / Sample Date / Sample Time										
~~J1R744~~ / ~~OTHER~~ / ~~12-12-12~~ / ~~1217~~										
J1R745 / OTHER / 12-12-12 / 1243	X	X	X	X	X	X	X	X		
J1R746 / OTHER / 12-12-12 / 1317	X	X	X	X	X	X	X	X		

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe TPMC	12-12-12 1405	David W. Shea DWShea	12/12/12 1405
DAVID W SHEA DWShea	12/12/12 1451	A. Freier A. Freier (1060#1)	12-12-12 1451
A. Freier A. Freier (WCH)	12-13-12 1000	Fed Ex	
Fed Ex	12-14-12 0945	Victor Hernandez	12-14-12 0945

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}

(2) IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2 {Nitrogen in Nitrite and Nitrate}; pH - 9045 {pH Measurement}

** Please run % moisture to present data in dry matter basis. DWS 12/12/12

Matrix *

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

KP0168

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

REVIEWED BY CMB DATE 12-13-12

WCH-EE-011

000000004

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-191-35	Page 1 of 1

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: ~~9L~~ 9B DN 12/12/12	Data Turnaround: ~~21~~ 7 Days DN 12/12/12		
Project Designation: 100N Field Remediation - Other	Sampling Location: 100-N-84:5 manholes		SAF No.: RC-191
Ice Chest No.: RCC-08-028	Field Logbook No.: EL-1652-08	COA: ~~01~~ AJ 12-12-12 01N8452000	Method of Shipment: ~~Hand Deliver~~ / Fed Ex DN 12/12/12
Shipped To: ~~EBERLINE SERVICES~~ / LIONVILLE DN 12/12/12	Offsite Property No.: A120684		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	G/P	G/P	G	G	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	0	0		
Volume	60mL	60mL	60mL	60mL	60mL	60mL	60mL	60mL		

SAMPLE ANALYSIS

12-13-12 cmB
please run analysis in the following order of priority

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions. (1)	See item (2) in Special Instructions. AJ 12-12-12	TPH-Diesel Range - WTPH-D + (2)	VOA - 8260A (TCL)	Semi-VOA - 8270A (TCL) AJ 12-12-12	PAHs - 8310 (3)	PCBs - 8082 (4)	Pesticides - 8081 (5)		
J1R744	OTHER	12-12-12	1217	X	X	X			X	X	X		
J1R745	OTHER	~~12-12-12~~	1243										
J1R746 DN	~~OTHER~~	12-12-12	1317										

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
TPMC Quincy Stowe	1405 12-12-12	DWSHEA DWSHEA	12/12/12 1405
DWSHEA DWSHEA	12-12-12 1451	Victoria Bingham	1060HI 12-12-12 1451
Victoria Bingham VCH	1000 12-13-12 1060HI	fed EX	
fed EX	12-14-12 0945	VICTOR HERNANDEZ	12-14-12 0945

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}

~~(2) IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}, NO2/NO3 - 353.2 {Nitrogen in Nitrite and Nitrate}, pH - 9045 {pH Measurement}~~ AJ 12-12-12

*Contact Joan Kessner on analysis order due to low volume of material DWS 12/12/12

** Please run percent moisture to present data on dry matter basis. DWS 12/12/12

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

REVIEWED BY AJ DATE 12-13-12

LABORATORY SECTION	Received By	Title
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By

KP0168

WCH-EE-011

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-191 KP0168 **Date:** 12/14/12

LvL Batch #: 1212047 **Sample Custodian:** Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7942 9544 9905
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** 3.4	°C	Cooler # RCC08-028
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, RSK-175, Sulfides, Non-Halogenated VOAs (Alcohol/Glycol) free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted_____ Date _____

SR-002-B-1112.doc

SEMIVOLATILES

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

WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/21/2012 15:28

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R745	1212047-01	Other Solid	12/12/2012 12:43	12/14/2012 09:45
J1R746	1212047-02	Other Solid	12/12/2012 13:17	12/14/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Case Narrative

Client: WC-HANFORD RC-191 KP0168
LVL #: 1212047

W.O. #: 60049-001-001-0001-00
Date Received: 12-14-2012

GCMS SEMIVOLATILE

Two (2) soil samples were collected on 12-12-2012.

The samples and associated QC samples were extracted 12-14-2012 and analyzed 12-18,20,21-2012 according to Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8270C for TCL Semivolatile target compounds.

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 meet LvL's sample acceptance policy.

2. Samples were extracted and analyzed within holding time.

3. Non-target compounds were detected in these samples.

4. Due to the nature of the matrix, the samples required a 3-fold instrument dilution for analysis. Reporting limits have been adjusted to reflect the necessary dilutions.

5. All obtainable surrogate recoveries were within QC acceptance criteria.

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

7. All blank spike recoveries were within QC acceptance criteria.

8. Fifteen (15) of one hundred and twenty-eight (128) obtainable matrix spike recoveries were outside QC acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS216) has been enclosed.

9. 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.

10. The initial calibrations analyzed on 12-18-2012 instrument 5972D and 12-19-2012 instrument 5972C were within acceptance criteria.

11. The initial calibration analyzed on 12-18-2012 instrument 5972C was within acceptance criteria. Per method 8000B/8270C, the attached Table 1 shows the target compounds where the RSD exceeded 15%, and the mean RSD was used for evaluation of the initial calibration. Results associated with these compounds are considered to have greater uncertainty. Refer to the Analysis Batch Sequence Summary Forms to associate the calibration with client samples.

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

13. Internal standard area and retention time criteria were met.

14. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

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

Iain Daniels
LvL Laboratory Manager

1/13/13
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12ms216

Initiator: Sharon Saylor
Date: 12-21-12
Client: WC Hanford

Batch: 1212047
Samples: L212130-ms2, msd2
Method: (SW846)/MCAWW/CLP/

Parameter: 8270C
Matrix: Soil
Prep Batch: L212130

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)

① Spike recoveries outside QC acceptance limits in L212130-ms2 and L212130-msd2 but L212130-BS1 is ok

2. Known or Probable Causes(s) possible matrix effect samples required a 3 fold dilution for analysis

RLC 1/2/13

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: narrate

4. Project Manager Instructions...signature/date: 1/13/13

__ 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: 1/13/13

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

TABLE 1

TCL - 8000B/8270C COMPOUNDS WHERE THE MEAN %RSD IS USED TO MEET CRITERIA FOR INITIAL CALIBRATION OF AN INDIVIDUAL COMPOUND

MEAN RSD USED FOR EVALUATION: 6-75 CALIBRATION: 12/2029 59MC12/18/12

>15% RSD	Compound	>15% RSD	Compound	>15% RSD	Compound
	1,2,4-Trichlorobenzene		Di-n-butyl Phthalate		Surrogates:
	1,2-Dichlorobenzene		Di-n-octyl Phthalate		2-Fluorophenol
	1,3-Dichlorobenzene		Fluoranthene		Phenol-d5
	1,4-Dichlorobenzene		Fluorene		Nitrobenzene-d5
	2,4,5-Trichlorophenol		Hexachlorobenzene		2-Fluorobiphenyl
	2,4,6-Trichlorophenol		Hexachlorobutadiene		2,4,6-Tribromophenol
	2,4-Dichlorophenol	✓	Hexachlorocyclopentadiene		p-Terphenyl-d14
	2,4-Dimethylphenol		Hexachloroethane		
✓	2,4-Dinitrophenol		Indeno[1,2,3-cd]pyrene		
	2,4-Dinitrotoluene		Isophorone		
	2,6-Dinitrotoluene		Naphthalene		
	2-Chloronaphthalene		Nitrobenzene		
	2-Chlorophenol		N-Nitrosodi-n-propylamine		
	2-Methylnaphthalene		N-Nitrosodiphenylamine		
	2-Methylphenol	✓	Pentachlorophenol		
	2-Nitroaniline		Phenanthrene		
	2-Nitrophenol		Phenol		
	3- and/or 4-Methylphenol		Pyrene		
	3,3'-Dichlorobenzidine				
	3-Nitroaniline				
✓	4,6-Dinitro-2-methylphenol		**OLM04.2 TCL addons:**		
	4-Bromophenyl Phenyl Ether		1,1-Biphenyl		
	4-Chloro-3-methylphenol		Atrazine		
	4-Chloroaniline		Benzaldehyde		
	4-Chlorophenyl Phenyl Ether		Caprolactam		
	4-Nitroaniline				
✓	4-Nitrophenol		**NonTCL addons:**		
	Acenaphthene		1,2-Diphenylhydrazine		
	Acenaphthylene		1,4-Dioxane		
	Anthracene		1-Methylnapthalene		
	Benz[a]anthracene		2,3,4,6-Tetrachlorophenol		
	Benzo[a] pyrene		Acetophenone		
	Benzo[b] fluoranthene		Aniline		
	Benzo[g,h,i] perylene		Benzidine		
	Benzo[k] fluoranthene		Benzoic Acid		
	Benzyl alcohol		N-Nitrosodimethylamine		
	Bis(2-chloroethoxy) methane		Pyridine		
	Bis(2-chloroethyl) ether		Tributylphosphate		
	Bis(2-chloroisopropyl) ether				
	Bis(2-ethylhexyl) phthalate				
	Butyl Benzyl Phthalate				
	Carbazole				
	Chrysene				
	Dibenz[a,h]anthracene				
	Dibenzofuran				
	Diethyl Phthalate				
	Dimethyl Phthalate				

GLOSSARY

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit, which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection 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. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike 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	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

MP	-	Missed Peak: Manually added peak not found by automatic quantitation program.
PA	-	Peak Assignment: quantitation report was changed to reflect correct peak assignment.
RI	-	Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene, which are poorly resolved on the BNA column.
SP	-	Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
CB	-	Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background
PI	-	Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

ANALYSIS BATCH (SEQUENCE) SUMMARY
8270C

Laboratory:	Lionville Laboratory	SDG:	KP0168
Client:	WC-Hanford, Inc.	Project:	RC-191
Sequence:	2120148	Instrument:	HP5972C
Matrix:	Solid	Calibration:	1212029

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2120148-TUN1	C121801.D	12/18/12 12:40
Cal Standard	2120148-CAL5	C121803.D	12/18/12 14:17
Cal Standard	2120148-CAL1	C121804.D	12/18/12 15:03
Cal Standard	2120148-CAL2	C121805.D	12/18/12 15:49
Cal Standard	2120148-CAL3	C121806.D	12/18/12 16:34
Cal Standard	2120148-CAL4	C121807.D	12/18/12 17:20
Secondary Cal Check	2120148-SCV1	C121808.D	12/18/12 18:05
J1R745	1212047-01	C121810.D	12/18/12 19:36
J1R746	1212047-02	C121811.D	12/18/12 20:22
J1R746	L212130-MS2	C121812.D	12/18/12 21:08

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:28

J1R745
1212047-01 (Other Solid)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,2,4-Trichlorobenzene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
1,2-Dichlorobenzene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
1,3-Dichlorobenzene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
1,4-Dichlorobenzene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4,5-Trichlorophenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4,6-Trichlorophenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4-Dichlorophenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4-Dimethylphenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4-Dinitrophenol	5140	U	5140	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4-Dinitrotoluene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,6-Dinitrotoluene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Chloronaphthalene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Chlorophenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Methylnaphthalene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Methylphenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Nitroaniline	5140	U	5140	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Nitrophenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
3,3'-Dichlorobenzidine	2060	U	2060	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
3-Nitroaniline	5140	U	5140	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4,6-Dinitro-2-methylphenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Bromophenyl Phenyl Ether	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Chloro-3-methylphenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Chloroaniline	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Chlorophenyl Phenyl Ether	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
3- and/or 4-Methylphenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Nitroaniline	5140	U	5140	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Nitrophenol	5140	U	5140	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Acenaphthene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Acenaphthylene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Anthracene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benz[a]anthracene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benzo[a] pyrene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benzo[b] fluoranthene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benzo[g,h,i] perylene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benzo[k] fluoranthene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Bis(2-chloroethoxy) methane	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:28

J1R745
1212047-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Bis(2-chloroisopropyl) ether	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Bis(2-ethylhexyl) phthalate	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Butyl Benzyl Phthalate	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Carbazole	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Chrysene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Dibenz[a,h]anthracene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Dibenzofuran	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Diethyl Phthalate	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Dimethyl Phthalate	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Di-n-butyl Phthalate	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Di-n-octyl Phthalate	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Fluoranthene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Fluorene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Hexachlorobenzene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Hexachlorobutadiene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Hexachlorocyclopentadiene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Hexachloroethane	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Indeno[1,2,3-cd]pyrene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Isophorone	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Naphthalene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Nitrobenzene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
N-Nitrosodi-n-propylamine	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
N-Nitrosodiphenylamine	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Pentachlorophenol	5140	U	5140	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Phenanthrene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Phenol	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Pyrene	1030	U	1030	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
TIC:Aldol Condensate 2	**17400**	A, B, J, D		ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
TIC:Aldol Condensate 1	**257**	A, B, J, D		ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Surrogate: 2-Fluorophenol	*56 %*		*25-121*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*
Surrogate: Phenol-d5	*61 %*		*24-113*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*55 %*		*23-120*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*69 %*		*30-115*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*57 %*		*19-122*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*71 %*		*18-137*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:28

J1R746
1212047-02 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
1,2,4-Trichlorobenzene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
1,2-Dichlorobenzene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
1,3-Dichlorobenzene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
1,4-Dichlorobenzene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4,5-Trichlorophenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4,6-Trichlorophenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4-Dichlorophenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4-Dimethylphenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4-Dinitrophenol	5360	U	5360	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,4-Dinitrotoluene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2,6-Dinitrotoluene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Chloronaphthalene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Chlorophenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Methylnaphthalene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Methylphenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Nitroaniline	5360	U	5360	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
2-Nitrophenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
3,3'-Dichlorobenzidine	2140	U	2140	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
3-Nitroaniline	5360	U	5360	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4,6-Dinitro-2-methylphenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Bromophenyl Phenyl Ether	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Chloro-3-methylphenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Chloroaniline	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Chlorophenyl Phenyl Ether	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
3- and/or 4-Methylphenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Nitroaniline	5360	U	5360	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
4-Nitrophenol	5360	U	5360	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Acenaphthene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Acenaphthylene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Anthracene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benz[a]anthracene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benzo[a] pyrene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benzo[b] fluoranthene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benzo[g,h,i] perylene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Benzo[k] fluoranthene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Bis(2-chloroethoxy) methane	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:28

J1R746
1212047-02 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Bis(2-chloroisopropyl) ether	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Bis(2-ethylhexyl) phthalate	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Butyl Benzyl Phthalate	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Carbazole	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Chrysene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Dibenz[a,h]anthracene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Dibenzofuran	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Diethyl Phthalate	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Dimethyl Phthalate	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Di-n-butyl Phthalate	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Di-n-octyl Phthalate	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Fluoranthene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Fluorene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Hexachlorobenzene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Hexachlorobutadiene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Hexachlorocyclopentadiene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Hexachloroethane	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Indeno[1,2,3-cd]pyrene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Isophorone	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Naphthalene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Nitrobenzene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
N-Nitrosodi-n-propylamine	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
N-Nitrosodiphenylamine	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Pentachlorophenol	5360	U	5360	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Phenanthrene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Phenol	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Pyrene	1070	U	1070	ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
TIC:Unknown 2	**271**	J, D		ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
TIC:Unknown 1	**495**	J, D		ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
TIC:Unknown 3	**280**	J, D		ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
TIC:Aldol Condensate 1	**3940**	A, B, J, D		ug/kg dry	3	L212130	12/14/2012	12/18/2012	8270C
Surrogate: 2-Fluorophenol	*53 %*		*25-121*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*
Surrogate: Phenol-d5	*61 %*		*24-113*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*53 %*		*23-120*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*70 %*		*30-115*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:28

J1R746
1212047-02 (Other Solid)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2,4,6-Tribromophenol	*59 %*	*19-122*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*74 %*	*18-137*			*L212130*	*12/14/2012*	*12/18/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:28

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212130 - SW 3540C										
Blank (L212130-BLK1)				Prepared: 12/14/2012 Analyzed: 12/20/2012						
1,2,4-Trichlorobenzene	330	U	330	ug/kg wet						
1,2-Dichlorobenzene	330	U	330	ug/kg wet						
1,3-Dichlorobenzene	330	U	330	ug/kg wet						
1,4-Dichlorobenzene	330	U	330	ug/kg wet						
2,4,5-Trichlorophenol	330	U	330	ug/kg wet						
2,4,6-Trichlorophenol	330	U	330	ug/kg wet						
2,4-Dichlorophenol	330	U	330	ug/kg wet						
2,4-Dimethylphenol	330	U	330	ug/kg wet						
2,4-Dinitrophenol	1650	U	1650	ug/kg wet						
2,4-Dinitrotoluene	330	U	330	ug/kg wet						
2,6-Dinitrotoluene	330	U	330	ug/kg wet						
2-Chloronaphthalene	330	U	330	ug/kg wet						
2-Chlorophenol	330	U	330	ug/kg wet						
2-Methylnaphthalene	330	U	330	ug/kg wet						
2-Methylphenol	330	U	330	ug/kg wet						
2-Nitroaniline	1650	U	1650	ug/kg wet						
2-Nitrophenol	330	U	330	ug/kg wet						
3,3'-Dichlorobenzidine	660	U	660	ug/kg wet						
3-Nitroaniline	1650	U	1650	ug/kg wet						
4,6-Dinitro-2-methylphenol	330	U	330	ug/kg wet						
4-Bromophenyl Phenyl Ether	330	U	330	ug/kg wet						
4-Chloro-3-methylphenol	330	U	330	ug/kg wet						
4-Chloroaniline	330	U	330	ug/kg wet						
4-Chlorophenyl Phenyl Ether	330	U	330	ug/kg wet						
3- and/or 4-Methylphenol	330	U	330	ug/kg wet						
4-Nitroaniline	1650	U	1650	ug/kg wet						
4-Nitrophenol	1650	U	1650	ug/kg wet						
Acenaphthene	330	U	330	ug/kg wet						
Acenaphthylene	330	U	330	ug/kg wet						
Anthracene	330	U	330	ug/kg wet						
Benz[a]anthracene	330	U	330	ug/kg wet						
Benzo[a] pyrene	330	U	330	ug/kg wet						
Benzo[b] fluoranthene	330	U	330	ug/kg wet						
Benzo[g,h,i] perylene	330	U	330	ug/kg wet						
Benzo[k] fluoranthene	330	U	330	ug/kg wet						
Bis(2-chloroethoxy) methane	330	U	330	ug/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:28

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212130 - SW 3540C										
Blank (L212130-BLK1)				Prepared: 12/14/2012 Analyzed: 12/20/2012						
Bis(2-chloroethyl) ether	330	U	330	ug/kg wet						
Bis(2-chloroisopropyl) ether	330	U	330	ug/kg wet						
Bis(2-ethylhexyl) phthalate	330	U	330	ug/kg wet						
Butyl Benzyl Phthalate	330	U	330	ug/kg wet						
Carbazole	330	U	330	ug/kg wet						
Chrysene	330	U	330	ug/kg wet						
Dibenz[a,h]anthracene	330	U	330	ug/kg wet						
Dibenzofuran	330	U	330	ug/kg wet						
Diethyl Phthalate	330	U	330	ug/kg wet						
Dimethyl Phthalate	330	U	330	ug/kg wet						
Di-n-butyl Phthalate	330	U	330	ug/kg wet						
Di-n-octyl Phthalate	330	U	330	ug/kg wet						
Fluoranthene	330	U	330	ug/kg wet						
Fluorene	330	U	330	ug/kg wet						
Hexachlorobenzene	330	U	330	ug/kg wet						
Hexachlorobutadiene	330	U	330	ug/kg wet						
Hexachlorocyclopentadiene	330	U	330	ug/kg wet						
Hexachloroethane	330	U	330	ug/kg wet						
Indeno[1,2,3-cd]pyrene	330	U	330	ug/kg wet						
Isophorone	330	U	330	ug/kg wet						
Naphthalene	330	U	330	ug/kg wet						
Nitrobenzene	330	U	330	ug/kg wet						
N-Nitrosodi-n-propylamine	330	U	330	ug/kg wet						
N-Nitrosodiphenylamine	330	U	330	ug/kg wet						
Pentachlorophenol	1650	U	1650	ug/kg wet						
Phenanthrene	330	U	330	ug/kg wet						
Phenol	330	U	330	ug/kg wet						
Pyrene	330	U	330	ug/kg wet						
Aldol Condensate 2 TICS	15300	A, J		ug/kg wet						
Aldol Condensate 1	345	A, J		ug/kg wet						
Unknown 1	165	J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1870*			*ug/kg wet*	*2500.0*		*75*	*25-121*		
Surrogate: Phenol-d5	*1880*			*ug/kg wet*	*2500.0*		*75*	*24-113*		
Surrogate: Nitrobenzene-d5	*1360*			*ug/kg wet*	*1666.7*		*82*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1390*			*ug/kg wet*	*1666.7*		*84*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1640*			*ug/kg wet*	*2500.0*		*65*	*19-122*		
Surrogate: p-Terphenyl-d14	*1410*			*ug/kg wet*	*1666.7*		*84*	*18-137*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:44

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212130 - SW 3540C									
LCS (L212130-BS1)			Prepared: 12/14/2012 Analyzed: 12/21/2012						
1,2,4-Trichlorobenzene	1470		ug/kg wet	2000.0		74	45-110		
1,2-Dichlorobenzene	1450		ug/kg wet	2000.0		73	45-105		
1,3-Dichlorobenzene	1410		ug/kg wet	2000.0		70	40-100		
1,4-Dichlorobenzene	1420		ug/kg wet	2000.0		71	35-105		
2,4,5-Trichlorophenol	1730		ug/kg wet	2000.0		87	30-140		
2,4,6-Trichlorophenol	1470		ug/kg wet	2000.0		73	20-110		
2,4-Dichlorophenol	1580		ug/kg wet	2000.0		79	40-110		
2,4-Dimethylphenol	1480		ug/kg wet	2000.0		74	30-105		
2,4-Dinitrophenol	760		ug/kg wet	2000.0		38	25-130		
2,4-Dinitrotoluene	1700		ug/kg wet	2000.0		85	50-115		
2,6-Dinitrotoluene	1720		ug/kg wet	2000.0		86	40-120		
2-Chloronaphthalene	1580		ug/kg wet	2000.0		79	45-115		
2-Chlorophenol	1530		ug/kg wet	2000.0		77	45-105		
2-Methylnaphthalene	1460		ug/kg wet	2000.0		73	45-110		
2-Methylphenol	1630		ug/kg wet	2000.0		81	40-120		
2-Nitroaniline	1720		ug/kg wet	2000.0		86	45-120		
2-Nitrophenol	1520		ug/kg wet	2000.0		76	40-110		
3,3'-Dichlorobenzidine	1110		ug/kg wet	2000.0		56	15-130		
3-Nitroaniline	1190		ug/kg wet	2000.0		59	40-130		
4,6-Dinitro-2-methylphenol	1070		ug/kg wet	2000.0		54	20-140		
4-Bromophenyl Phenyl Ether	1730		ug/kg wet	2000.0		86	45-115		
4-Chloro-3-methylphenol	1640		ug/kg wet	2000.0		82	35-115		
4-Chloroaniline	821		ug/kg wet	2000.0		41	10-100		
4-Chlorophenyl Phenyl Ether	1630		ug/kg wet	2000.0		81	45-110		
3- and/or 4-Methylphenol	1600		ug/kg wet	2000.0		80	40-120		
4-Nitroaniline	1260		ug/kg wet	2000.0		63	40-130		
4-Nitrophenol	1610		ug/kg wet	2000.0		81	15-140		
Acenaphthene	1580		ug/kg wet	2000.0		79	45-110		
Acenaphthylene	1600		ug/kg wet	2000.0		80	45-115		
Anthracene	1540		ug/kg wet	2000.0		77	45-130		
Benz[a]anthracene	1750		ug/kg wet	2000.0		87	45-130		
Benzo[a] pyrene	1810		ug/kg wet	2000.0		90	45-130		
Benzo[b] fluoranthene	1920		ug/kg wet	2000.0		96	40-130		
Benzo[g,h,i] perylene	1720		ug/kg wet	2000.0		86	45-125		
Benzo[k] fluoranthene	1940		ug/kg wet	2000.0		97	45-125		
Bis(2-chloroethoxy) methane	1610		ug/kg wet	2000.0		80	45-110		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:44

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212130 - SW 3540C									
LCS (L212130-BS1)			Prepared: 12/14/2012 Analyzed: 12/21/2012						
Bis(2-chloroethyl) ether	1600		ug/kg wet	2000.0		80	40-110		
Bis(2-chloroisopropyl) ether	1620		ug/kg wet	2000.0		81	30-115		
Bis(2-ethylhexyl) phthalate	2000		ug/kg wet	2000.0		100	40-145		
Butyl Benzyl Phthalate	1840		ug/kg wet	2000.0		92	50-125		
Carbazole	1620		ug/kg wet	2000.0		81	40-140		
Chrysene	1800		ug/kg wet	2000.0		90	45-130		
Dibenz[a,h]anthracene	1710		ug/kg wet	2000.0		85	45-125		
Dibenzofuran	1580		ug/kg wet	2000.0		79	45-120		
Diethyl Phthalate	1620		ug/kg wet	2000.0		81	50-125		
Dimethyl Phthalate	1600		ug/kg wet	2000.0		80	45-130		
Di-n-butyl Phthalate	1480		ug/kg wet	2000.0		74	50-130		
Di-n-octyl Phthalate	2460		ug/kg wet	2000.0		123	40-150		
Fluoranthene	1600		ug/kg wet	2000.0		80	45-130		
Fluorene	1620		ug/kg wet	2000.0		81	45-120		
Hexachlorobenzene	1770		ug/kg wet	2000.0		89	45-130		
Hexachlorobutadiene	1680		ug/kg wet	2000.0		84	45-105		
Hexachlorocyclopentadiene	1580		ug/kg wet	2000.0		79	10-100		
Hexachloroethane	1450		ug/kg wet	2000.0		73	35-110		
Indeno[1,2,3-cd]pyrene	1750		ug/kg wet	2000.0		87	45-130		
Isophorone	1560		ug/kg wet	2000.0		78	40-110		
Naphthalene	1590		ug/kg wet	2000.0		79	40-110		
Nitrobenzene	1510		ug/kg wet	2000.0		75	40-105		
N-Nitrosodi-n-propylamine	1790		ug/kg wet	2000.0		90	30-130		
N-Nitrosodiphenylamine	1660		ug/kg wet	2000.0		83	50-120		
Pentachlorophenol	1090		ug/kg wet	2000.0		55	25-120		
Phenanthrene	1620		ug/kg wet	2000.0		81	50-120		
Phenol	1530		ug/kg wet	2000.0		77	40-115		
Pyrene	1570		ug/kg wet	2000.0		78	45-125		
Surrogate: 2-Fluorophenol	*1840*		*ug/kg wet*	*2500.0*		*74*	*25-121*		
Surrogate: Phenol-d5	*1920*		*ug/kg wet*	*2500.0*		*77*	*24-113*		
Surrogate: Nitrobenzene-d5	*1290*		*ug/kg wet*	*1666.7*		*78*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1380*		*ug/kg wet*	*1666.7*		*83*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1680*		*ug/kg wet*	*2500.0*		*67*	*19-122*		
Surrogate: p-Terphenyl-d14	*1270*		*ug/kg wet*	*1666.7*		*76*	*18-137*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:44

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212130 - SW 3540C										
Matrix Spike (L212130-MS2)		**Source: 1212047-02**		Prepared: 12/14/2012 Analyzed: 12/18/2012						
1,2,4-Trichlorobenzene	853	D		ug/kg dry	2184.9	1070 U	39*	45-110		
1,2-Dichlorobenzene	714	D		ug/kg dry	2184.9	1070 U	33*	45-105		
1,3-Dichlorobenzene	651	D		ug/kg dry	2184.9	1070 U	30*	40-100		
1,4-Dichlorobenzene	685	D		ug/kg dry	2184.9	1070 U	31*	35-105		
2,4,5-Trichlorophenol	1580	D		ug/kg dry	2184.9	1070 U	72	30-140		
2,4,6-Trichlorophenol	1310	D		ug/kg dry	2184.9	1070 U	60	20-110		
2,4-Dichlorophenol	1210	D		ug/kg dry	2184.9	1070 U	55	40-110		
2,4-Dimethylphenol	1270	D		ug/kg dry	2184.9	1070 U	58	30-105		
2,4-Dinitrophenol	502	D		ug/kg dry	2184.9	5360 U	23*	25-130		
2,4-Dinitrotoluene	1400	D		ug/kg dry	2184.9	1070 U	64	50-115		
2,6-Dinitrotoluene	1490	D		ug/kg dry	2184.9	1070 U	68	40-120		
2-Chloronaphthalene	1360	D		ug/kg dry	2184.9	1070 U	62	45-115		
2-Chlorophenol	926	D		ug/kg dry	2184.9	1070 U	42*	45-105		
2-Methylnaphthalene	1100	D		ug/kg dry	2184.9	1070 U	51	45-110		
2-Methylphenol	1130	D		ug/kg dry	2184.9	1070 U	52	40-120		
2-Nitroaniline	1420	D		ug/kg dry	2184.9	5360 U	65	45-120		
2-Nitrophenol	859	D		ug/kg dry	2184.9	1070 U	39*	40-110		
3,3'-Dichlorobenzidine	1080	D		ug/kg dry	2184.9	2140 U	50	15-130		
3-Nitroaniline	1120	D		ug/kg dry	2184.9	5360 U	51	40-130		
4,6-Dinitro-2-methylphenol	917	D		ug/kg dry	2184.9	1070 U	42	20-140		
4-Bromophenyl Phenyl Ether	1470	D		ug/kg dry	2184.9	1070 U	67	45-115		
4-Chloro-3-methylphenol	1190	D		ug/kg dry	2184.9	1070 U	55	35-115		
4-Chloroaniline	692	D		ug/kg dry	2184.9	1070 U	32	10-100		
4-Chlorophenyl Phenyl Ether	1430	D		ug/kg dry	2184.9	1070 U	65	45-110		
3- and/or 4-Methylphenol	1170	D		ug/kg dry	2184.9	1070 U	54	40-120		
4-Nitroaniline	1520	D		ug/kg dry	2184.9	5360 U	69	40-130		
4-Nitrophenol	1190	D		ug/kg dry	2184.9	5360 U	55	15-140		
Acenaphthene	1410	D		ug/kg dry	2184.9	1070 U	64	45-110		
Acenaphthylene	1510	D		ug/kg dry	2184.9	1070 U	69	45-115		
Anthracene	1570	D		ug/kg dry	2184.9	1070 U	72	45-130		
Benz[a]anthracene	1550	D		ug/kg dry	2184.9	1070 U	71	45-130		
Benzo[a] pyrene	1400	D		ug/kg dry	2184.9	1070 U	64	45-130		
Benzo[b] fluoranthene	1510	D		ug/kg dry	2184.9	1070 U	69	40-130		
Benzo[g,h,i] perylene	1330	D		ug/kg dry	2184.9	1070 U	61	45-125		
Benzo[k] fluoranthene	1510	D		ug/kg dry	2184.9	1070 U	69	45-125		
Bis(2-chloroethoxy) methane	1020	D		ug/kg dry	2184.9	1070 U	47	45-110		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:44

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212130 - SW 3540C										
Matrix Spike (L212130-MS2)		**Source: 1212047-02**		Prepared: 12/14/2012 Analyzed: 12/18/2012						
Bis(2-chloroethyl) ether	736	D		ug/kg dry	2184.9	1070 U	34*	40-110		
Bis(2-chloroisopropyl) ether	788	D		ug/kg dry	2184.9	1070 U	36	30-115		
Bis(2-ethylhexyl) phthalate	1680	D		ug/kg dry	2184.9	1070 U	77	40-145		
Butyl Benzyl Phthalate	1690	D		ug/kg dry	2184.9	1070 U	77	50-125		
Carbazole	1570	D		ug/kg dry	2184.9	1070 U	72	40-140		
Chrysene	1620	D		ug/kg dry	2184.9	1070 U	74	45-130		
Dibenz[a,h]anthracene	1440	D		ug/kg dry	2184.9	1070 U	66	45-125		
Dibenzofuran	1440	D		ug/kg dry	2184.9	1070 U	66	45-120		
Diethyl Phthalate	1480	D		ug/kg dry	2184.9	1070 U	68	50-125		
Dimethyl Phthalate	1470	D		ug/kg dry	2184.9	1070 U	67	45-130		
Di-n-butyl Phthalate	1540	D		ug/kg dry	2184.9	1070 U	70	50-130		
Di-n-octyl Phthalate	1670	D		ug/kg dry	2184.9	1070 U	76	40-150		
Fluoranthene	1580	D		ug/kg dry	2184.9	1070 U	72	45-130		
Fluorene	1480	D		ug/kg dry	2184.9	1070 U	68	45-120		
Hexachlorobenzene	1510	D		ug/kg dry	2184.9	1070 U	69	45-130		
Hexachlorobutadiene	925	D		ug/kg dry	2184.9	1070 U	42*	45-105		
Hexachlorocyclopentadiene	0.00	U		ug/kg dry	2184.9	1070 U	*	10-100		
Hexachloroethane	565	D		ug/kg dry	2184.9	1070 U	26*	35-110		
Indeno[1,2,3-cd]pyrene	1440	D		ug/kg dry	2184.9	1070 U	66	45-130		
Isophorone	1040	D		ug/kg dry	2184.9	1070 U	48	40-110		
Naphthalene	1040	D		ug/kg dry	2184.9	1070 U	48	40-110		
Nitrobenzene	849	D		ug/kg dry	2184.9	1070 U	39*	40-105		
N-Nitrosodi-n-propylamine	931	D		ug/kg dry	2184.9	1070 U	43	30-130		
N-Nitrosodiphenylamine	1460	D		ug/kg dry	2184.9	1070 U	67	50-120		
Pentachlorophenol	1200	D		ug/kg dry	2184.9	5360 U	55	25-120		
Phenanthrene	1560	D		ug/kg dry	2184.9	1070 U	72	50-120		
Phenol	1040	D		ug/kg dry	2184.9	1070 U	47	40-115		
Pyrene	1670	D		ug/kg dry	2184.9	1070 U	76	45-125		
Surrogate: 2-Fluorophenol	*1140*			*ug/kg dry*	*2731.1*		*42*	*25-121*		
Surrogate: Phenol-d5	*1500*			*ug/kg dry*	*2731.1*		*55*	*24-113*		
Surrogate: Nitrobenzene-d5	*794*			*ug/kg dry*	*1820.7*		*44*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1260*			*ug/kg dry*	*1820.7*		*69*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1530*			*ug/kg dry*	*2731.1*		*56*	*19-122*		
Surrogate: p-Terphenyl-d14	*1310*			*ug/kg dry*	*1820.7*		*72*	*18-137*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:44

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212130 - SW 3540C										
Matrix Spike Dup (L212130-MSD2)		**Source: 1212047-02**		Prepared: 12/14/2012 Analyzed: 12/20/2012						
1,2,4-Trichlorobenzene	1140	D		ug/kg dry	2207.3	1070 U	52	45-110	28	40
1,2-Dichlorobenzene	955	D		ug/kg dry	2207.3	1070 U	43*	45-105	28	40
1,3-Dichlorobenzene	872	D		ug/kg dry	2207.3	1070 U	40	40-100	28	40
1,4-Dichlorobenzene	868	D		ug/kg dry	2207.3	1070 U	39	35-105	23	40
2,4,5-Trichlorophenol	1680	D		ug/kg dry	2207.3	1070 U	76	30-140	5	40
2,4,6-Trichlorophenol	1080	D		ug/kg dry	2207.3	1070 U	49	20-110	20	40
2,4-Dichlorophenol	1530	D		ug/kg dry	2207.3	1070 U	69	40-110	22	40
2,4-Dimethylphenol	1320	D		ug/kg dry	2207.3	1070 U	60	30-105	3	40
2,4-Dinitrophenol	1530	D		ug/kg dry	2207.3	5360 U	69	25-130	100*	40
2,4-Dinitrotoluene	1670	D		ug/kg dry	2207.3	1070 U	76	50-115	17	40
2,6-Dinitrotoluene	1640	D		ug/kg dry	2207.3	1070 U	74	40-120	9	40
2-Chloronaphthalene	1570	D		ug/kg dry	2207.3	1070 U	71	45-115	13	40
2-Chlorophenol	1220	D		ug/kg dry	2207.3	1070 U	55	45-105	26	40
2-Methylnaphthalene	1400	D		ug/kg dry	2207.3	1070 U	63	45-110	23	40
2-Methylphenol	1250	D		ug/kg dry	2207.3	1070 U	57	40-120	9	40
2-Nitroaniline	1610	D		ug/kg dry	2207.3	5360 U	73	45-120	11	40
2-Nitrophenol	1280	D		ug/kg dry	2207.3	1070 U	58	40-110	38	40
3,3'-Dichlorobenzidine	644	D		ug/kg dry	2207.3	2140 U	29	15-130	52*	40
3-Nitroaniline	1240	D		ug/kg dry	2207.3	5360 U	56	40-130	9	40
4,6-Dinitro-2-methylphenol	1510	D		ug/kg dry	2207.3	1070 U	69	20-140	48*	40
4-Bromophenyl Phenyl Ether	1730	D		ug/kg dry	2207.3	1070 U	78	45-115	15	40
4-Chloro-3-methylphenol	1580	D		ug/kg dry	2207.3	1070 U	72	35-115	27	40
4-Chloroaniline	921	D		ug/kg dry	2207.3	1070 U	42	10-100	27	40
4-Chlorophenyl Phenyl Ether	1630	D		ug/kg dry	2207.3	1070 U	74	45-110	12	40
3- and/or 4-Methylphenol	1520	D		ug/kg dry	2207.3	1070 U	69	40-120	24	40
4-Nitroaniline	1570	D		ug/kg dry	2207.3	5360 U	71	40-130	2	40
4-Nitrophenol	1720	D		ug/kg dry	2207.3	5360 U	78	15-140	35	40
Acenaphthene	1660	D		ug/kg dry	2207.3	1070 U	75	45-110	15	40
Acenaphthylene	1750	D		ug/kg dry	2207.3	1070 U	79	45-115	14	40
Anthracene	1740	D		ug/kg dry	2207.3	1070 U	79	45-130	9	40
Benz[a]anthracene	1720	D		ug/kg dry	2207.3	1070 U	78	45-130	9	40
Benzo[a] pyrene	1750	D		ug/kg dry	2207.3	1070 U	79	45-130	21	40
Benzo[b] fluoranthene	1870	D		ug/kg dry	2207.3	1070 U	85	40-130	21	40
Benzo[g,h,i] perylene	1210	D		ug/kg dry	2207.3	1070 U	55	45-125	10	40
Benzo[k] fluoranthene	1910	D		ug/kg dry	2207.3	1070 U	87	45-125	22	40
Bis(2-chloroethoxy) methane	1400	D		ug/kg dry	2207.3	1070 U	63	45-110	31	40

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/21/2012 15:44

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212130 - SW 3540C										
Matrix Spike Dup (L212130-MSD2)		**Source: 1212047-02**		Prepared: 12/14/2012 Analyzed: 12/20/2012						
Bis(2-chloroethyl) ether	1130	D		ug/kg dry	2207.3	1070 U	51	40-110	41*	40
Bis(2-chloroisopropyl) ether	1170	D		ug/kg dry	2207.3	1070 U	53	30-115	38	40
Bis(2-ethylhexyl) phthalate	1630	D		ug/kg dry	2207.3	1070 U	74	40-145	4	40
Butyl Benzyl Phthalate	1860	D		ug/kg dry	2207.3	1070 U	84	50-125	9	40
Carbazole	1710	D		ug/kg dry	2207.3	1070 U	78	40-140	8	40
Chrysene	1830	D		ug/kg dry	2207.3	1070 U	83	45-130	11	40
Dibenz[a,h]anthracene	1120	D		ug/kg dry	2207.3	1070 U	51	45-125	26	40
Dibenzofuran	1650	D		ug/kg dry	2207.3	1070 U	75	45-120	12	40
Diethyl Phthalate	1700	D		ug/kg dry	2207.3	1070 U	77	50-125	12	40
Dimethyl Phthalate	1640	D		ug/kg dry	2207.3	1070 U	74	45-130	10	40
Di-n-butyl Phthalate	1710	D		ug/kg dry	2207.3	1070 U	77	50-130	9	40
Di-n-octyl Phthalate	1780	D		ug/kg dry	2207.3	1070 U	81	40-150	5	40
Fluoranthene	1860	D		ug/kg dry	2207.3	1070 U	84	45-130	15	40
Fluorene	1720	D		ug/kg dry	2207.3	1070 U	78	45-120	14	40
Hexachlorobenzene	1740	D		ug/kg dry	2207.3	1070 U	79	45-130	14	40
Hexachlorobutadiene	1210	D		ug/kg dry	2207.3	1070 U	55	45-105	25	40
Hexachlorocyclopentadiene	0.00	U		ug/kg dry	2207.3	1070 U	*	10-100		40
Hexachloroethane	754	D		ug/kg dry	2207.3	1070 U	34*	35-110	28	40
Indeno[1,2,3-cd]pyrene	1220	D		ug/kg dry	2207.3	1070 U	55	45-130	17	40
Isophorone	1370	D		ug/kg dry	2207.3	1070 U	62	40-110	26	40
Naphthalene	1420	D		ug/kg dry	2207.3	1070 U	64	40-110	29	40
Nitrobenzene	1210	D		ug/kg dry	2207.3	1070 U	55	40-105	34	40
N-Nitrosodi-n-propylamine	1370	D		ug/kg dry	2207.3	1070 U	62	30-130	37	40
N-Nitrosodiphenylamine	1690	D		ug/kg dry	2207.3	1070 U	76	50-120	13	40
Pentachlorophenol	1460	D		ug/kg dry	2207.3	5360 U	66	25-120	19	40
Phenanthrene	1830	D		ug/kg dry	2207.3	1070 U	83	50-120	15	40
Phenol	1360	D		ug/kg dry	2207.3	1070 U	62	40-115	26	40
Pyrene	1960	D		ug/kg dry	2207.3	1070 U	89	45-125	15	40
Surrogate: 2-Fluorophenol	*1350*			*ug/kg dry*	*2759.1*		*49*	*25-121*		
Surrogate: Phenol-d5	*1480*			*ug/kg dry*	*2759.1*		*54*	*24-113*		
Surrogate: Nitrobenzene-d5	*938*			*ug/kg dry*	*1839.4*		*51*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1220*			*ug/kg dry*	*1839.4*		*66*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1170*			*ug/kg dry*	*2759.1*		*42*	*19-122*		
Surrogate: p-Terphenyl-d14	*1350*			*ug/kg dry*	*1839.4*		*74*	*18-137*		

PREPARATION BENCH SHEET

L212130

Lionville Laboratory

Printed: 12/15/2012 12:48:27PM

Matrix: Solid

Prepared using: Extraction - SW 3540C/~~3550~~ RCC 12/22/12

Surrogate used: 1201561

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1212043-01	8270C TCL SVOC	12/14/2012 16:20	30.07	4				500	WC-Hanford, Inc.	
1212043-02	8270C TCL SVOC	12/14/2012 16:20	30.55	1				500	WC-Hanford, Inc.	
1212043-03	8270C TCL SVOC	12/14/2012 16:20	30.67	1				500	WC-Hanford, Inc.	
1212047-01	8270C TCL SVOC	12/14/2012 16:20	30.45	1				500	WC-Hanford, Inc.	
1212047-02	8270C TCL SVOC	12/14/2012 16:20	30.79	1				500	WC-Hanford, Inc.	
1212048-01	8270C TCL SVOC	12/14/2012 16:20	30.53	1				500	WC-Hanford, Inc.	see Versions
L212130-BLK1	QC	12/14/2012 16:20	30	1				500		
L212130-BS1	QC	12/14/2012 16:20	30	1	1201565		600	500		
L212130-MS1	QC	12/14/2012 16:20	30.91	1	1201565	1212043-02	600	500		
L212130-MS2	QC	12/14/2012 16:20	30.53	1	1201565	1212047-02	600	500		
L212130-MS3	QC	12/14/2012 16:20	30.04	1	1201565	1212048-01	600	500		
L212130-MSD1	QC	12/14/2012 16:20	30.92	1	1201565	1212043-02	600	500		
L212130-MSD2	QC	12/14/2012 16:20	30.22	1	1201565	1212047-02	600	500		
L212130-MSD3	QC	12/14/2012 16:20	30.76	1	1201565	1212048-01	600	500		

Extracts Relinquished By — Date 12/15/12 1245

Extracts Received By — Date 12/15/12 1545

PESTICIDES

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/19/2012 23:56

Analytical Report for Organochlorine Pesticides by SW846 8081A

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R745	1212047-01	Other Solid	12/12/2012 12:43	12/14/2012 09:45
J1R746	1212047-02	Other Solid	12/12/2012 13:17	12/14/2012 09:45
J1R744	1212047-03	Other Solid	12/12/2012 12:17	12/14/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-191 KP0168
LVL #: 1212047

W.O. #: 60049-001-001-0001-00
Date Received: 12-14-2012

CHLORINATED PESTICIDES

Three (3) other solid samples were collected on 12-12-2012.

The samples and associated QC samples were extracted 12-14-2012 and analyzed 12-16-2012 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 8081A for client specified target compounds. All samples received Copper-Sulfur cleanup based on SW846 method 3660A.

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 recorded on the Sample Receipt Checklist.

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

3. The samples required a 4-fold instrument dilution due to the nature of the matrix. Reporting limits have been adjusted to reflect the necessary dilutions.

4. All obtainable surrogate recoveries were within acceptance criteria.

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

6. All blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

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

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

10. All continuing calibration standards analyzed prior to sample extracts 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. 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

1/13/13
Date

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-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/19/2012 23:56

J1R745

1212047-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Organochlorine Pesticides by SW846 8081A									
alpha-BHC	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
gamma-BHC	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
beta-BHC	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
delta-BHC	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Heptachlor	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Aldrin	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Heptachlor epoxide	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
gamma-Chlordane	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
alpha-Chlordane	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endosulfan I	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
4,4'-DDE	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Dieldrin	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endrin	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
4,4'-DDD	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endosulfan II	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
4,4'-DDT	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endrin aldehyde	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endosulfan sulfate	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Methoxychlor	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endrin ketone	1.39	U	1.39	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Toxaphene	20.8	U	20.8	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Surrogate: Tetrachloro-meta-xylene	*88.8 %*		*28-166*			*L212133*	*12/14/2012*	*12/16/2012*	*8081A*
Surrogate: Decachlorobiphenyl	*77.0 %*		*37-153*			*L212133*	*12/14/2012*	*12/16/2012*	*8081A*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/19/2012 23:56

J1R746
1212047-02 (Other Solid)

Lionville Laboratory

Organochlorine Pesticides by SW846 8081A

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
alpha-BHC	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
gamma-BHC	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
beta-BHC	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
delta-BHC	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Heptachlor	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Aldrin	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Heptachlor epoxide	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
gamma-Chlordane	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
alpha-Chlordane	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endosulfan I	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
4,4'-DDE	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Dieldrin	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endrin	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
4,4'-DDD	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endosulfan II	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
4,4'-DDT	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endrin aldehyde	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endosulfan sulfate	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Methoxychlor	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endrin ketone	1.45	U	1.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Toxaphene	21.8	U	21.8	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Surrogate: Tetrachloro-meta-xylene	*84.5 %*		*28-166*			*L212133*	*12/14/2012*	*12/16/2012*	*8081A*
Surrogate: Decachlorobiphenyl	*76.7 %*		*37-153*			*L212133*	*12/14/2012*	*12/16/2012*	*8081A*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/19/2012 23:56

J1R744
1212047-03 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Organochlorine Pesticides by SW846 8081A									
alpha-BHC	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
gamma-BHC	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
beta-BHC	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
delta-BHC	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Heptachlor	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Aldrin	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Heptachlor epoxide	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
gamma-Chlordane	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
alpha-Chlordane	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endosulfan I	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
4,4'-DDE	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Dieldrin	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endrin	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
4,4'-DDD	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endosulfan II	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
4,4'-DDT	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endrin aldehyde	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endosulfan sulfate	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Methoxychlor	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Endrin ketone	6.45	U	6.45	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Toxaphene	96.9	U	96.9	ug/kg dry	4	L212133	12/14/2012	12/16/2012	8081A
Surrogate: Tetrachloro-meta-xylene	*80.6 %*		*28-166*			*L212133*	*12/14/2012*	*12/16/2012*	*8081A*
Surrogate: Decachlorobiphenyl	*70.2 %*		*37-153*			*L212133*	*12/14/2012*	*12/16/2012*	*8081A*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/19/2012 23:56

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212133 - SW 3540C										
Blank (L212133-BLK1)				Prepared: 12/14/2012 Analyzed: 12/16/2012						
alpha-BHC	0.333	U	0.333	ug/kg wet						
gamma-BHC	0.333	U	0.333	ug/kg wet						
beta-BHC	0.333	U	0.333	ug/kg wet						
delta-BHC	0.333	U	0.333	ug/kg wet						
Heptachlor	0.333	U	0.333	ug/kg wet						
Aldrin	0.333	U	0.333	ug/kg wet						
Heptachlor epoxide	0.333	U	0.333	ug/kg wet						
gamma-Chlordane	0.333	U	0.333	ug/kg wet						
alpha-Chlordane	0.333	U	0.333	ug/kg wet						
Endosulfan I	0.333	U	0.333	ug/kg wet						
4,4'-DDE	0.333	U	0.333	ug/kg wet						
Dieldrin	0.333	U	0.333	ug/kg wet						
Endrin	0.333	U	0.333	ug/kg wet						
4,4'-DDD	0.333	U	0.333	ug/kg wet						
Endosulfan II	0.333	U	0.333	ug/kg wet						
4,4'-DDT	0.333	U	0.333	ug/kg wet						
Endrin aldehyde	0.333	U	0.333	ug/kg wet						
Endosulfan sulfate	0.333	U	0.333	ug/kg wet						
Methoxychlor	0.333	U	0.333	ug/kg wet						
Endrin ketone	0.333	U	0.333	ug/kg wet						
Toxaphene	5.00	U	5.00	ug/kg wet						
Surrogate: Tetrachloro-meta-xylene	*25.9*			*ug/kg wet*	*33.337*		*77.8*	*28-166*		
Surrogate: Decachlorobiphenyl	*21.2*			*ug/kg wet*	*33.333*		*63.6*	*37-153*		
LCS (L212133-BS1)				Prepared: 12/14/2012 Analyzed: 12/16/2012						
alpha-BHC	32.3		0.333	ug/kg wet	33.333		96.8	65-145		
gamma-BHC	31.6		0.333	ug/kg wet	33.333		94.8	70-143		
beta-BHC	30.5		0.333	ug/kg wet	33.333		91.4	75-143		
delta-BHC	31.2		0.333	ug/kg wet	33.333		93.7	65-143		
Heptachlor	29.5		0.333	ug/kg wet	33.333		88.4	70-139		
Aldrin	29.5		0.333	ug/kg wet	33.333		88.6	70-143		
Heptachlor epoxide	30.1		0.333	ug/kg wet	33.333		90.2	71-138		
gamma-Chlordane	30.2		0.333	ug/kg wet	33.333		90.6	71-137		
alpha-Chlordane	30.0		0.333	ug/kg wet	33.333		90.0	72-136		
Endosulfan I	30.0		0.333	ug/kg wet	33.333		90.0	72-139		
4,4'-DDE	33.2		0.333	ug/kg wet	33.333		99.5	70-154		
Dieldrin	30.5		0.333	ug/kg wet	33.333		91.4	73-143		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/19/2012 23:56

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212133 - SW 3540C										
LCS (L212133-BS1)				Prepared: 12/14/2012 Analyzed: 12/16/2012						
Endrin	30.6		0.333	ug/kg wet	33.333		91.8	74-137		
4,4'-DDD	34.1		0.333	ug/kg wet	33.333		102	52-153		
Endosulfan II	30.2		0.333	ug/kg wet	33.333		90.7	72-139		
4,4'-DDT	29.3		0.333	ug/kg wet	33.333		88.0	58-148		
Endrin aldehyde	22.1		0.333	ug/kg wet	33.333		66.2	49-129		
Endosulfan sulfate	29.5		0.333	ug/kg wet	33.333		88.6	66-139		
Methoxychlor	27.5		0.333	ug/kg wet	33.333		82.4	50-144		
Endrin ketone	29.3		0.333	ug/kg wet	33.333		88.0	70-139		
Surrogate: Tetrachloro-meta-xylene	*28.0*			*ug/kg wet*	*33.337*		*84.0*	*28-166*		
Surrogate: Decachlorobiphenyl	*23.3*			*ug/kg wet*	*33.333*		*70.0*	*37-153*		
Matrix Spike (L212133-MS2)		**Source: 1212047-01**		Prepared: 12/14/2012 Analyzed: 12/16/2012						
alpha-BHC	28.8	D	1.40	ug/kg dry	35.128	1.39 U	82.0	65-145		
gamma-BHC	29.5	D	1.40	ug/kg dry	35.128	1.39 U	84.1	70-143		
beta-BHC	30.9	D	1.40	ug/kg dry	35.128	1.39 U	88.0	75-143		
delta-BHC	26.0	D	1.40	ug/kg dry	35.128	1.39 U	74.1	65-143		
Heptachlor	30.9	D	1.40	ug/kg dry	35.128	1.39 U	88.1	70-139		
Aldrin	28.9	D	1.40	ug/kg dry	35.128	1.39 U	82.3	70-143		
Heptachlor epoxide	31.2	D	1.40	ug/kg dry	35.128	1.39 U	88.8	71-138		
gamma-Chlordane	28.5	D	1.40	ug/kg dry	35.128	1.39 U	81.0	71-137		
alpha-Chlordane	29.3	D	1.40	ug/kg dry	35.128	1.39 U	83.5	72-136		
Endosulfan I	30.0	D	1.40	ug/kg dry	35.128	1.39 U	85.3	72-139		
4,4'-DDE	30.0	D	1.40	ug/kg dry	35.128	1.39 U	85.3	70-154		
Dieldrin	29.5	D	1.40	ug/kg dry	35.128	1.39 U	84.1	73-143		
Endrin	31.1	D	1.40	ug/kg dry	35.128	1.39 U	88.6	74-137		
4,4'-DDD	30.0	D	1.40	ug/kg dry	35.128	1.39 U	85.5	52-153		
Endosulfan II	30.1	D	1.40	ug/kg dry	35.128	1.39 U	85.6	72-139		
4,4'-DDT	27.1	D	1.40	ug/kg dry	35.128	1.39 U	77.2	58-148		
Endrin aldehyde	28.2	D	1.40	ug/kg dry	35.128	1.39 U	80.3	49-129		
Endosulfan sulfate	30.2	D	1.40	ug/kg dry	35.128	1.39 U	86.0	66-139		
Methoxychlor	30.4	D	1.40	ug/kg dry	35.128	1.39 U	86.5	50-144		
Endrin ketone	30.6	D	1.40	ug/kg dry	35.128	1.39 U	87.1	70-139		
Surrogate: Tetrachloro-meta-xylene	*29.5*			*ug/kg dry*	*35.131*		*84.0*	*28-166*		
Surrogate: Decachlorobiphenyl	*25.6*			*ug/kg dry*	*35.128*		*73.0*	*37-153*		

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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/19/2012 23:56

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212133 - SW 3540C										
Matrix Spike Dup (L212133-MSD2)		**Source: 1212047-01**		Prepared: 12/14/2012 Analyzed: 12/16/2012						
alpha-BHC	29.7	D	1.40	ug/kg dry	34.964	1.39 U	85.0	65-145	3.59	40
gamma-BHC	30.5	D	1.40	ug/kg dry	34.964	1.39 U	87.1	70-143	3.50	40
beta-BHC	32.2	D	1.40	ug/kg dry	34.964	1.39 U	92.1	75-143	4.55	40
delta-BHC	26.1	D	1.40	ug/kg dry	34.964	1.39 U	74.6	65-143	0.672	40
Heptachlor	31.7	D	1.40	ug/kg dry	34.964	1.39 U	90.7	70-139	2.91	40
Aldrin	29.6	D	1.40	ug/kg dry	34.964	1.39 U	84.8	70-143	2.99	40
Heptachlor epoxide	32.0	D	1.40	ug/kg dry	34.964	1.39 U	91.4	71-138	2.89	40
gamma-Chlordane	30.2	D	1.40	ug/kg dry	34.964	1.39 U	86.4	71-137	6.45	40
alpha-Chlordane	30.7	D	1.40	ug/kg dry	34.964	1.39 U	87.8	72-136	5.02	40
Endosulfan I	30.9	D	1.40	ug/kg dry	34.964	1.39 U	88.3	72-139	3.46	40
4,4'-DDE	32.2	D	1.40	ug/kg dry	34.964	1.39 U	92.0	70-154	7.56	40
Dieldrin	30.6	D	1.40	ug/kg dry	34.964	1.39 U	87.4	73-143	3.85	40
Endrin	32.1	D	1.40	ug/kg dry	34.964	1.39 U	91.9	74-137	3.66	40
4,4'-DDD	32.3	D	1.40	ug/kg dry	34.964	1.39 U	92.5	52-153	7.87	40
Endosulfan II	31.5	D	1.40	ug/kg dry	34.964	1.39 U	90.1	72-139	5.12	40
4,4'-DDT	28.0	D	1.40	ug/kg dry	34.964	1.39 U	80.1	58-148	3.69	40
Endrin aldehyde	28.5	D	1.40	ug/kg dry	34.964	1.39 U	81.4	49-129	1.36	40
Endosulfan sulfate	30.6	D	1.40	ug/kg dry	34.964	1.39 U	87.5	66-139	1.73	40
Methoxychlor	31.0	D	1.40	ug/kg dry	34.964	1.39 U	88.6	50-144	2.40	40
Endrin ketone	31.2	D	1.40	ug/kg dry	34.964	1.39 U	89.2	70-139	2.38	40
Surrogate: Tetrachloro-meta-xylene	*32.1*			*ug/kg dry*	*34.968*		*91.8*	*28-166*		
Surrogate: Decachlorobiphenyl	*27.1*			*ug/kg dry*	*34.964*		*77.5*	*37-153*		

8081A/B Pesticides
Analytes with %Difference or %Drift >15%, Where Mean is Used for Continuing Calibration

Analyte	CCV1 12.16.12 1:59:12 PM		CCV2 12.16.12 10:42:56 PM		CCV3		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)		-21.6		-17.2												
alpha-BHC																
gamma-BHC																
beta-BHC																
delta-BHC																
Heptachlor																
Aldrin																
Heptachlor epoxide																
gamma chlordane																
alpha chlordane																
Endosulfan I																
4,4'-DDE																
Dieldrin																
Endrin																
4,4'-DDD																
Endosulfan II																
4,4'-DDT		-24.8	-35.1	-37.2												
Endrin aldehyde																
Endosulfan sulfate																
Methoxychlor		-20.0	-24.9	-23.2												
Endrin ketone																
Toxaphene																
Mean %D or %Drift	3.9	-6.2	-0.8	-2.2												

Sample results reported from affected CCV:

CCV1: L212133 - BIK1, BS1, MS2, MSD2, MS4, MSD4, 1212047-01, 02, 03 1212048-01

CCV2:

CCV3:

CCV4:

CCV5:

CCV6:

CCV7:

CCV8:

PREPARATION BENCH SHEET

L212133

Lionville Laboratory

Printed: 12/15/2012 12:38:45PM

000000043

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
1212043-01	8082 PCBs	12/14/2012 17:18	30.02	10				250	WC-Hanford, Inc.	
1212043-02	8082 PCBs	12/14/2012 17:18	30.89	10				250	WC-Hanford, Inc.	
~~1212043-03~~	~~8081A TCL Pesticides~~	~~12/14/2012 17:18~~	~~30.85~~	~~10~~		VOID		~~250~~	~~WC-Hanford, Inc.~~	~~Added for BatchQC in L212133~~
1212043-03	8082 PCBs	12/14/2012 17:18	30.85	10				250	WC-Hanford, Inc.	
1212047-01	8081A TCL Pesticides	12/14/2012 17:18	30.37	10				250	WC-Hanford, Inc.	
1212047-01	8082 PCBs	12/14/2012 17:18	30.37	10				250	WC-Hanford, Inc.	
1212047-02	8081A TCL Pesticides	12/14/2012 17:18	30.54	10				250	WC-Hanford, Inc.	
1212047-02	8082 PCBs	12/14/2012 17:18	30.54	10				250	WC-Hanford, Inc.	
1212047-03	8081A TCL Pesticides	12/14/2012 17:18	10.11	10				250	WC-Hanford, Inc.	
1212047-03	8082 PCBs	12/14/2012 17:18	10.11	10				250	WC-Hanford, Inc.	
1212048-01	8081A TCL Pesticides	12/14/2012 17:18	30.36	10				250	WC-Hanford, Inc.	
1212048-01	8082 PCBs	12/14/2012 17:18	30.36	10				250	WC-Hanford, Inc.	
L212133-BLK1	QC	12/14/2012 17:18	30	10				250		pcb
L212133-BLK2	QC	12/14/2012 17:18	30	10				250		PEST
L212133-BS1	QC	12/14/2012 17:18	30	10	1200902		250	250		pcb
L212133-BS2	QC	12/14/2012 17:18	30	10	1201358		250	250		PEST
L212133-MS1	QC	12/14/2012 17:18	30.31	10	1200902	1212043-03	250	250		pcb
L212133-MS2	QC	12/14/2012 17:18	30.03	10	1201358	1212047-01	250	250		PEST
L212133-MS3	QC	12/14/2012 17:18	30.34	10	1200902	1212047-01	250	250		pcb
L212133-MS4	QC	12/14/2012 17:18	30.6	10	1201358	1212048-01	250	250		PEST

Cu lot# B10X036 S cleaned 1215.12 SL

12/15/12 1240 — Extracts Relinquished By — Date

12/15/12 12:40 — Extracts Received By — Date

PREPARATION BENCH SHEET

L212133

Lionville Laboratory

Printed: 12/15/2012 12:38:45PM

000000044

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
L212133-MS5	QC	12/14/2012 17:18	30.09	10	1200902	1212048-01	250	250		pcb
L212133-MSD1	QC	12/14/2012 17:18	30.91	10	1200902	1212043-03	250	250		pcb
L212133-MSD2	QC	12/14/2012 17:18	30.17	10	1201358	1212047-01	250	250		PEST
L212133-MSD3	QC	12/14/2012 17:18	30.79	10	1200902	1212047-01	250	250		pcb
L212133-MSD4	QC	12/14/2012 17:18	30.74	10	1201358	1212048-01	250	250		PEST
L212133-MSD5	QC	12/14/2012 17:18	30.03	10	1200902	1212048-01	250	250		pcb

Scleaned 12/15/12 SZ
Cu lot # 310X036

12/15/12 1240
Extracts Relinquished By Date

12/15/12 12:40
Extracts Received By Date

PCBs

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/20/2012 00:24

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R745	1212047-01	Other Solid	12/12/2012 12:43	12/14/2012 09:45
J1R746	1212047-02	Other Solid	12/12/2012 13:17	12/14/2012 09:45
J1R744	1212047-03	Other Solid	12/12/2012 12:17	12/14/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-191 KP0168
LVL #: 1212047

W.O. #: 60049-001-001-0001-00
Received: 12-14-2012

PCBs

Three (3) other solid samples were collected on 12-12-2012.

The samples and associated QC samples were extracted 12-14-2012 and analyzed 12-16,17-2012 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. 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. 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

1/13/13
Date

r:\group\data\2012\pcb\wc hanford\1212047oj.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. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/20/2012 00:24

J1R745

1212047-01 (Other Solid)

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	L212133	12/14/2012	12/16/2012	8082
Aroclor 1221	13.9	U	13.9	ug/kg dry	1	L212133	12/14/2012	12/16/2012	8082
Aroclor 1232	13.9	U	13.9	ug/kg dry	1	L212133	12/14/2012	12/16/2012	8082
Aroclor 1242	13.9	U	13.9	ug/kg dry	1	L212133	12/14/2012	12/16/2012	8082
Aroclor 1248	13.9	U	13.9	ug/kg dry	1	L212133	12/14/2012	12/16/2012	8082
Aroclor 1254	13.9	U	13.9	ug/kg dry	1	L212133	12/14/2012	12/16/2012	8082
Aroclor 1260	13.9	U	13.9	ug/kg dry	1	L212133	12/14/2012	12/16/2012	8082
Aroclor 1262	13.9	U	13.9	ug/kg dry	1	L212133	12/14/2012	12/16/2012	8082
Aroclor 1268	13.9	U	13.9	ug/kg dry	1	L212133	12/14/2012	12/16/2012	8082
Surrogate: Decachlorobiphenyl	*67 %*		*43-144*			*L212133*	*12/14/2012*	*12/16/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*98 %*		*52-141*			*L212133*	*12/14/2012*	*12/16/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/20/2012 00:24

J1R746

1212047-02 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	14.5	U	14.5	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1221	14.5	U	14.5	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1232	14.5	U	14.5	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1242	**7.35**	J	14.5	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1248	14.5	U	14.5	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1254	**14.1**	J	14.5	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1260	**3.82**	J	14.5	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1262	14.5	U	14.5	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1268	14.5	U	14.5	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Surrogate: Decachlorobiphenyl	*67 %*		*43-144*			*L212133*	*12/14/2012*	*12/17/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*98 %*		*52-141*			*L212133*	*12/14/2012*	*12/17/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/20/2012 00:24

J1R744
1212047-03 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	64.4	U	64.4	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1221	64.4	U	64.4	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1232	64.4	U	64.4	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1242	64.4	U	64.4	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1248	64.4	U	64.4	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1254	**58.3**	J	64.4	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1260	**17.1**	J	64.4	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1262	64.4	U	64.4	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Aroclor 1268	64.4	U	64.4	ug/kg dry	1	L212133	12/14/2012	12/17/2012	8082
Surrogate: Decachlorobiphenyl	*61 %*		*43-144*			*L212133*	*12/14/2012*	*12/17/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*90 %*		*52-141*			*L212133*	*12/14/2012*	*12/17/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/20/2012 00:24

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 L212133 - SW 3540C										
Blank (L212133-BLK2)				Prepared: 12/14/2012 Analyzed: 12/16/2012						
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	*24.4*			*ug/kg wet*	*33.333*		*73*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.4*			*ug/kg wet*	*33.337*		*106*	*52-141*		
LCS (L212133-BS2)				Prepared: 12/14/2012 Analyzed: 12/16/2012						
Aroclor 1016	149		13.3	ug/kg wet	166.67		89	50-138		
Aroclor 1260	148		13.3	ug/kg wet	166.67		89	50-148		
Surrogate: Decachlorobiphenyl	*24.7*			*ug/kg wet*	*33.333*		*74*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*34.6*			*ug/kg wet*	*33.337*		*104*	*52-141*		
Matrix Spike (L212133-MS3)		**Source: 1212047-01**		Prepared: 12/14/2012 Analyzed: 12/16/2012						
Aroclor 1016	153		13.9	ug/kg dry	173.84	13.9 U	88	50-138		
Aroclor 1260	143		13.9	ug/kg dry	173.84	13.9 U	82	50-148		
Surrogate: Decachlorobiphenyl	*23.3*			*ug/kg dry*	*34.769*		*67*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*34.0*			*ug/kg dry*	*34.772*		*98*	*52-141*		
Matrix Spike Dup (L212133-MSD3)		**Source: 1212047-01**		Prepared: 12/14/2012 Analyzed: 12/16/2012						
Aroclor 1016	151		13.7	ug/kg dry	171.30	13.9 U	88	50-138	0.2	40
Aroclor 1260	143		13.7	ug/kg dry	171.30	13.9 U	84	50-148	2	40
Surrogate: Decachlorobiphenyl	*22.0*			*ug/kg dry*	*34.260*		*64*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*32.9*			*ug/kg dry*	*34.264*		*96*	*52-141*		

8082/A PCBs

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

Analyte	CCV1 12.16.12 3:36:06 PM		CCV2 12.16.12 11:41:36 PM		CCV3 12.17.12 4:24:37 AM		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)	-28.5	-19.6	-27.7	-19.2	-31.4	-23.4										
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	-15.9				-17.0											
Aroclor 1260-5	-18.1	-16.5	-16.9	-15.2	-20.2	-18.7										
Mean %D or %Drift	-3.1	-2.3	-1.9	-1.8	-3.0	-2.9										

Sample results reported from affected CCV:

CCV1: L212133-BLK2, BS2, MS1, MSD1, MS3, MSD3, 1212043-01, 02, 03, 1212047-01

CCV2: 1212047-02, 03; 1212048-01, L212133-MS5, MSD5

CCV3: _____

CCV4: _____

CCV5: _____

CCV6: _____

CCV7: _____

CCV8: _____

PREPARATION BENCH SHEET

L212133

Lionville Laboratory

Printed: 12/15/2012 12:38:45PM

000000054

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
1212043-01	8082 PCBs	12/14/2012 17:18	30.02	10				250	WC-Hanford, Inc.	
1212043-02	8082 PCBs	12/14/2012 17:18	30.89	10				250	WC-Hanford, Inc.	
~~1212043-03~~	~~8081A TCL Pesticides~~	~~12/14/2012 17:18~~	~~30.85~~	~~10~~		VOID		~~250~~	~~WC-Hanford, Inc.~~	~~Added for BatchQC in: L212133~~
1212043-03	8082 PCBs	12/14/2012 17:18	30.85	10				250	WC-Hanford, Inc.	
1212047-01	8081A TCL Pesticides	12/14/2012 17:18	30.37	10				250	WC-Hanford, Inc.	
1212047-01	8082 PCBs	12/14/2012 17:18	30.37	10				250	WC-Hanford, Inc.	
1212047-02	8081A TCL Pesticides	12/14/2012 17:18	30.54	10				250	WC-Hanford, Inc.	
1212047-02	8082 PCBs	12/14/2012 17:18	30.54	10				250	WC-Hanford, Inc.	
1212047-03	8081A TCL Pesticides	12/14/2012 17:18	10.11	10				250	WC-Hanford, Inc.	
1212047-03	8082 PCBs	12/14/2012 17:18	10.11	10				250	WC-Hanford, Inc.	
1212048-01	8081A TCL Pesticides	12/14/2012 17:18	30.36	10				250	WC-Hanford, Inc.	
1212048-01	8082 PCBs	12/14/2012 17:18	30.36	10				250	WC-Hanford, Inc.	
L212133-BLK1	QC	12/14/2012 17:18	30	10				250		pcb
L212133-BLK2	QC	12/14/2012 17:18	30	10				250		PEST
L212133-BS1	QC	12/14/2012 17:18	30	10	1200902		250	250		pcb
L212133-BS2	QC	12/14/2012 17:18	30	10	1201358		250	250		PEST
L212133-MS1	QC	12/14/2012 17:18	30.31	10	1200902	1212043-03	250	250		pcb
L212133-MS2	QC	12/14/2012 17:18	30.03	10	1201358	1212047-01	250	250		PEST
L212133-MS3	QC	12/14/2012 17:18	30.34	10	1200902	1212047-01	250	250		pcb
L212133-MS4	QC	12/14/2012 17:18	30.6	10	1201358	1212048-01	250	250		PEST

Cu lot # B10X036 S cleaned 1215.12 SZ

Extracts Relinquished By — Date 12/15/12 1240

Extracts Received By — Date 12/15/12 12:40

PREPARATION BENCH SHEET

L212133

Lionville Laboratory

Printed: 12/15/2012 12:38:45PM

000000055

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
L212133-MS5	QC	12/14/2012 17:18	30.09	10	1200902	1212048-01	250	250		pcb
L212133-MSD1	QC	12/14/2012 17:18	30.91	10	1200902	1212043-03	250	250		pcb
L212133-MSD2	QC	12/14/2012 17:18	30.17	10	1201358	1212047-01	250	250		PEST
L212133-MSD3	QC	12/14/2012 17:18	30.79	10	1200902	1212047-01	250	250		pcb
L212133-MSD4	QC	12/14/2012 17:18	30.74	10	1201358	1212048-01	250	250		PEST
L212133-MSD5	QC	12/14/2012 17:18	30.03	10	1200902	1212048-01	250	250		pcb

Scheared 12/15/12 SZ
Cu lot # B10X036

12/15/12 1240
Extracts Relinquished By Date

12/15/12 12:40
Extracts Received By Date

DRO/MO

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/19/2012 23:33

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R745	1212047-01	Other Solid	12/12/2012 12:43	12/14/2012 09:45
J1R746	1212047-02	Other Solid	12/12/2012 13:17	12/14/2012 09:45
J1R744	1212047-03	Other Solid	12/12/2012 12:17	12/14/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-191 KP0168
LVL #: 1212047

W.O. #: 60049-001-001-0001-00
Date Received: 12-14-2012

DIESEL RANGE ORGANICS

Three (3) soil samples were collected on 12-12-2012.

The samples and associated QC samples were extracted 12-15-2012 and analyzed 12-18,19-2012 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.
2. All required holding times for extraction and analysis have been met.
3. Samples J1R745 and J1R746 required instrument dilutions due to high concentrations of target analytes and the nature of the matrix.
4. All obtainable surrogate recoveries were within acceptance criteria.
5. The method blank was below the reporting limits for all target compounds.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
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.
10. The samples were reported on a dry weight basis.
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 hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

1/13/13
Date

r:\group\data\2012\dro\wc hanford\1212047oj.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. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/19/2012 23:33

Extractable Petroleum Hydrocarbons by SW846 8015
Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R745 (1212047-01) Other Solid								
Surrogate: p-Terphenyl	*84 %*	*39-129*			*L212135*	*12/15/2012 11:51*	*12/19/2012 12:13*	*8015M*
Diesel Range Organics	7000 U	7000	ug/kg dry	2	L212135	12/15/2012 11:51	12/19/2012 12:13	8015M
Motor Oil	101000	21000	ug/kg dry	2	L212135	12/15/2012 11:51	12/19/2012 12:13	8015M
J1R746 (1212047-02) Other Solid								
Surrogate: p-Terphenyl	*87 %*	*39-129*			*L212135*	*12/15/2012 11:51*	*12/19/2012 09:19*	*8015M*
Diesel Range Organics	3530 U	3530	ug/kg dry	1	L212135	12/15/2012 11:51	12/19/2012 09:19	8015M
Motor Oil	35800	10600	ug/kg dry	1	L212135	12/15/2012 11:51	12/19/2012 09:19	8015M
J1R744 (1212047-03) Other Solid								
Surrogate: p-Terphenyl	*123 %*	*39-129*			*L212135*	*12/15/2012 11:51*	*12/19/2012 13:11*	*8015M*
Diesel Range Organics	52700 U	52700	ug/kg dry	5	L212135	12/15/2012 11:51	12/19/2012 13:11	8015M
Motor Oil	307000	158000	ug/kg dry	5	L212135	12/15/2012 11:51	12/19/2012 13:11	8015M

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/19/2012 23:33

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 L212135 - SW 3540/3550									
Blank (L212135-BLK1)			Prepared: 12/15/2012 11:51 Analyzed: 12/18/2012 20:43						
Diesel Range Organics	3330 U	3330	ug/kg wet						
Motor Oil	10000 U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*6420*		*ug/kg wet*	*6666.7*		*96*	*39-129*		
LCS (L212135-BS1)			Prepared: 12/15/2012 11:51 Analyzed: 12/18/2012 21:41						
Diesel Range Organics	51300	3330	ug/kg wet	66667		77	42-133		
Surrogate: p-Terphenyl	*5820*		*ug/kg wet*	*6666.7*		*87*	*39-129*		
Matrix Spike (L212135-MS2)	**Source: 1212047-02**		Prepared: 12/15/2012 11:51 Analyzed: 12/19/2012 10:17						
Diesel Range Organics	69500	3560	ug/kg dry	71174	3530 U	98	42-133		
Surrogate: p-Terphenyl	*6740*		*ug/kg dry*	*7117.4*		*95*	*39-129*		
Matrix Spike Dup (L212135-MSD2)	**Source: 1212047-02**		Prepared: 12/15/2012 11:51 Analyzed: 12/19/2012 11:15						
Diesel Range Organics	88200	3690	ug/kg dry	73796	3530 U	120	42-133	20	40
Surrogate: p-Terphenyl	*8200*		*ug/kg dry*	*7379.6*		*111*	*39-129*		

PREPARATION BENCH SHEET

L212135

Lionville Laboratory

Printed: 12/16/2012 5:56:01PM

00000062

Matrix: Solid

Prepared using: GC - SW 3540/3550

Surrogate used: 1201463

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1212044-01	8015M DRO	12/15/2012 11:51	30.56	1				1000	WC-Hanford, Inc.	
1212044-02	8015M DRO	12/15/2012 11:51	30.03	1				1000	WC-Hanford, Inc.	
1212044-03	8015M DRO	12/15/2012 11:51	30.83	1				1000	WC-Hanford, Inc.	
1212047-01	8015M DRO	12/15/2012 11:51	30.13	1				1000	WC-Hanford, Inc.	
1212047-02	8015M DRO	12/15/2012 11:51	31.46	1				1000	WC-Hanford, Inc.	
1212047-03	8015M DRO	12/15/2012 11:51	15.5	1				1000	WC-Hanford, Inc.	
1212048-01	8015M DRO	12/15/2012 11:51	30.35	1				1000	WC-Hanford, Inc.	
L212135-BLK1	QC	12/15/2012 11:51	30	1				1000		
L212135-BS1	QC	12/15/2012 11:51	30	1	1201538		1000	1000		
L212135-MS1	QC	12/15/2012 11:51	30.01	1	1201538	1212044-01	1000	1000		
L212135-MS2	QC	12/15/2012 11:51	31.24	1	1201538	1212047-02	1000	1000		
L212135-MS3	QC	12/15/2012 11:51	30.75	1	1201538	1212048-01	1000	1000		
L212135-MSD1	QC	12/15/2012 11:51	28.96	1	1201538	1212044-01	1000	1000		
L212135-MSD2	QC	12/15/2012 11:51	30.13	1	1201538	1212047-02	1000	1000		
L212135-MSD3	QC	12/15/2012 11:51	30.01	1	1201538	1212048-01	1000	1000		

12/16/12 1756 — Extracts Relinquished By — Date

Catherine Carey 12/16/12 — Extracts Received By — Date

PAHs

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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/18/2012 22:04

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R745	1212047-01	Other Solid	12/12/2012 12:43	12/14/2012 09:45
J1R746	1212047-02	Other Solid	12/12/2012 13:17	12/14/2012 09:45
J1R744	1212047-03	Other Solid	12/12/2012 12:17	12/14/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
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Case Narrative

Client: WC-HANFORD RC-191 KP0168
LVL #: 1212042

W.O. #: 60049-001-001-0001-00
Date Received: 12-14-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

Three (3) other solid samples were collected on 12-12-2012.

The samples and associated QC samples were extracted 12-14-2012 and analyzed 12-17-2012 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.

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. The 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. 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.
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 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

1/13/13
Date

r:\group\data\2012\pah 8310\wc hanford\1212047oj.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.

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

WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/18/2012 22:04

J1R745
1212047-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**40.6**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Acenaphthylene	**26.7**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Acenaphthene	**69.7**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Fluorene	**57.6**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Phenanthrene	**20.8**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Anthracene	3.47	U	3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Fluoranthene	**51.1**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Indeno[1,2,3-cd]pyrene	**15.1**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Pyrene	**52.9**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benz[a]anthracene	**35.0**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Chrysene	**38.4**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[b] fluoranthene	**23.7**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[k] fluoranthene	**16.2**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[a] pyrene	**39.5**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Dibenz[a,h]anthracene	**2.05**	J	3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[g,h,i] perylene	**27.1**		3.47	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Surrogate: Triphenylene	*99 %*		*68-129*			*L212131*	*12/14/2012*	*12/17/2012*	*8310*

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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/18/2012 22:04

J1R746
1212047-02 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**93.8**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Acenaphthylene	**76.3**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Acenaphthene	3.67	U	3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Fluorene	**14.8**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Phenanthrene	**72.5**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Anthracene	**2.22**	J	3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Fluoranthene	**88.6**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Indeno[1,2,3-cd]pyrene	3.67	U	3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Pyrene	**36.1**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benz[a]anthracene	**8.46**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Chrysene	**19.1**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[b] fluoranthene	**15.1**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[k] fluoranthene	**7.92**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[a] pyrene	**17.7**		3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Dibenz[a,h]anthracene	**1.18**	J	3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[g,h,i] perylene	3.67	U	3.67	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Surrogate: Triphenylene	*99 %*		*68-129*			*L212131*	*12/14/2012*	*12/17/2012*	*8310*

264 Welsh Pool Road
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Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/18/2012 22:04

J1R744
1212047-03 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	5.39	U	5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Acenaphthylene	5.39	U	5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Acenaphthene	**35.0**		5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Fluorene	**11.3**		5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Phenanthrene	**7.42**		5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Anthracene	5.39	U	5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Fluoranthene	**28.7**		5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Indeno[1,2,3-cd]pyrene	5.39	U	5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Pyrene	**14.4**		5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benz[a]anthracene	**4.78**	J	5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Chrysene	**8.64**		5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[b] fluoranthene	5.39	U	5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[k] fluoranthene	5.39	U	5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[a] pyrene	**10.5**		5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Dibenz[a,h]anthracene	5.39	U	5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Benzo[g,h,i] perylene	5.39	U	5.39	ug/kg dry	1	L212131	12/14/2012	12/17/2012	8310
Surrogate: Triphenylene	*93 %*		*68-129*			*L212131*	*12/14/2012*	*12/17/2012*	*8310*

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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/18/2012 22:04

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 L212131 - SW 3540/3550										
Blank (L212131-BLK1)				Prepared: 12/14/2012 Analyzed: 12/17/2012						
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	*162*			*ug/kg wet*	*166.67*		*97*	*68-129*		
LCS (L212131-BS1)				Prepared: 12/14/2012 Analyzed: 12/17/2012						
Naphthalene	140		3.33	ug/kg wet	166.67		84	0-127		
Acenaphthylene	150		3.33	ug/kg wet	166.67		90	50-140		
Acenaphthene	142		3.33	ug/kg wet	166.67		85	17-139		
Fluorene	149		3.33	ug/kg wet	166.67		89	28-145		
Phenanthrene	154		3.33	ug/kg wet	166.67		92	30-152		
Anthracene	163		3.33	ug/kg wet	166.67		98	19-171		
Fluoranthene	164		3.33	ug/kg wet	166.67		98	34-159		
Indeno[1,2,3-cd]pyrene	168		3.33	ug/kg wet	166.67		101	31-156		
Pyrene	163		3.33	ug/kg wet	166.67		98	33-152		
Benz[a]anthracene	174		3.33	ug/kg wet	166.67		105	32-157		
Chrysene	163		3.33	ug/kg wet	166.67		98	31-159		
Benzo[b] fluoranthene	180		3.33	ug/kg wet	166.67		108	33-164		
Benzo[k] fluoranthene	174		3.33	ug/kg wet	166.67		104	28-161		
Benzo[a] pyrene	182		3.33	ug/kg wet	166.67		109	29-149		
Dibenz[a,h]anthracene	177		3.33	ug/kg wet	166.67		106	27-153		
Benzo[g,h,i] perylene	176		3.33	ug/kg wet	166.67		105	32-157		
Surrogate: Triphenylene	*161*			*ug/kg wet*	*166.67*		*96*	*68-129*		

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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/18/2012 22:04

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 L212131 - SW 3540/3550									
Matrix Spike (L212131-MS2)		**Source: 1212047-02**	Prepared: 12/14/2012 Analyzed: 12/17/2012						
Naphthalene	177	3.64	ug/kg dry	182.25	93.8	46	0-127		
Acenaphthylene	174	3.64	ug/kg dry	182.25	76.3	54	50-140		
Acenaphthene	144	3.64	ug/kg dry	182.25	3.67 U	79	17-139		
Fluorene	161	3.64	ug/kg dry	182.25	14.8	80	28-145		
Phenanthrene	201	3.64	ug/kg dry	182.25	72.5	70	30-152		
Anthracene	168	3.64	ug/kg dry	182.25	2.22	91	19-171		
Fluoranthene	205	3.64	ug/kg dry	182.25	88.6	64	34-159		
Indeno[1,2,3-cd]pyrene	174	3.64	ug/kg dry	182.25	3.67 U	95	31-156		
Pyrene	179	3.64	ug/kg dry	182.25	36.1	78	33-152		
Benz[a]anthracene	180	3.64	ug/kg dry	182.25	8.46	94	32-157		
Chrysene	182	3.64	ug/kg dry	182.25	19.1	89	31-159		
Benzo[b] fluoranthene	178	3.64	ug/kg dry	182.25	15.1	89	33-164		
Benzo[k] fluoranthene	170	3.64	ug/kg dry	182.25	7.92	89	28-161		
Benzo[a] pyrene	179	3.64	ug/kg dry	182.25	17.7	88	29-149		
Dibenz[a,h]anthracene	169	3.64	ug/kg dry	182.25	1.18	92	27-153		
Benzo[g,h,i] perylene	180	3.64	ug/kg dry	182.25	3.67 U	99	32-157		
Surrogate: Triphenylene	*169*		*ug/kg dry*	*182.25*		*93*	*68-129*		
Matrix Spike Dup (L212131-MSD2)		**Source: 1212047-02**	Prepared: 12/14/2012 Analyzed: 12/17/2012						
Naphthalene	208	3.66	ug/kg dry	183.21	93.8	62	0-127	30	40
Acenaphthylene	198	3.66	ug/kg dry	183.21	76.3	66	50-140	21	40
Acenaphthene	160	3.66	ug/kg dry	183.21	3.67 U	87	17-139	10	40
Fluorene	181	3.66	ug/kg dry	183.21	14.8	91	28-145	12	40
Phenanthrene	219	3.66	ug/kg dry	183.21	72.5	80	30-152	13	40
Anthracene	187	3.66	ug/kg dry	183.21	2.22	101	19-171	10	40
Fluoranthene	233	3.66	ug/kg dry	183.21	88.6	79	34-159	21	40
Indeno[1,2,3-cd]pyrene	201	3.66	ug/kg dry	183.21	3.67 U	110	31-156	14	40
Pyrene	208	3.66	ug/kg dry	183.21	36.1	94	33-152	18	40
Benz[a]anthracene	208	3.66	ug/kg dry	183.21	8.46	109	32-157	14	40
Chrysene	202	3.66	ug/kg dry	183.21	19.1	100	31-159	11	40
Benzo[b] fluoranthene	218	3.66	ug/kg dry	183.21	15.1	111	33-164	21	40
Benzo[k] fluoranthene	197	3.66	ug/kg dry	183.21	7.92	103	28-161	15	40
Benzo[a] pyrene	203	3.66	ug/kg dry	183.21	17.7	101	29-149	13	40
Dibenz[a,h]anthracene	193	3.66	ug/kg dry	183.21	1.18	105	27-153	13	40
Benzo[g,h,i] perylene	211	3.66	ug/kg dry	183.21	3.67 U	115	32-157	15	40
Surrogate: Triphenylene	*192*		*ug/kg dry*	*183.21*		*105*	*68-129*		

8310 PAH

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

Analyte	12/17/12 1100 CCV1	12/17/12 1653 CCV2	12/17/12 1932 CCV3	CCV4	CCV5	CCV6	CCV7	CCV8
Triphenylene (surrogate)			17.8					
Naphthalene								
Acenaphthylene								
Acenaphthene								
Fluorene								
Phenanthrene								
Anthracene								
Fluoranthene								
Indeno[1,2,3-cd]pyrene								
Pyrene								
Benz[a]anthracene								
Chrysene								
Benzo[b]fluoranthene								
Benzo[k]fluoranthene								
Benzo[a]pyrene								
Dibenz[a,h]anthracene								
Benzo[g,h,i]perylene								
Mean %D or %Drift			4.3					

Sample results reported from affected CCV:

CCV1: _____

CCV2: _____

CCV3: L212131-MSD2, 1212047-03, 1212048-01, L212131-MS3, MSD3

CCV4: _____

CCV5: _____

CCV6: _____

CCV7: _____

CCV8: _____

PREPARATION BENCH SHEET

L212131

Lionville Laboratory

Printed: 12/16/2012 2:07:43PM

000000073

Matrix: Solid

Prepared using: HPLC - SW 3540/3550

Surrogate used: 1200612

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1212043-01	8310 PAH	12/14/2012 16:26	30.52	5				50	WC-Hanford, Inc.	
1212043-02	8310 PAH	12/14/2012 16:26	30.27	5				50	WC-Hanford, Inc.	
1212043-03	8310 PAH	12/14/2012 16:26	30.1	5				50	WC-Hanford, Inc.	
1212047-01	8310 PAH	12/14/2012 16:26	30.33	5				50	WC-Hanford, Inc.	
1212047-02	8310 PAH	12/14/2012 16:26	30.24	5				50	WC-Hanford, Inc.	
1212047-03	8310 PAH	12/14/2012 16:26	30.25	5				50	WC-Hanford, Inc.	
1212048-01	8310 PAH	12/14/2012 16:26	30.06	5				50	WC-Hanford, Inc.	
L212131-BLK1	QC	12/14/2012 16:26	30	5				50		
L212131-BS1	QC	12/14/2012 16:26	30	5	1200963		50	50		
L212131-MS1	QC	12/14/2012 16:26	30.62	5	1200963	1212043-02	50	50		
L212131-MS2	QC	12/14/2012 16:26	30.5	5	1200963	1212047-02	50	50		
L212131-MS3	QC	12/14/2012 16:26	30.77	5	1200963	1212048-01	50	50		
L212131-MSD1	QC	12/14/2012 16:26	30.91	5	1200963	1212043-02	50	50		
L212131-MSD2	QC	12/14/2012 16:26	30.34	5	1200963	1212047-02	50	50		
L212131-MSD3	QC	12/14/2012 16:26	30.06	5	1200963	1212048-01	50	50		

12/16/12 1407

Extracts Relinquished By — Date

12/16/12 14:07

Extracts Received By — Date

METALS

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

WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 12:29

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R745	1212047-01	Other Solid	12/12/2012 12:43	12/14/2012 09:45
J1R746	1212047-02	Other Solid	12/12/2012 13:17	12/14/2012 09:45
J1R744	1212047-03	Other Solid	12/12/2012 12:17	12/14/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Case Narrative

Client: WC-HANFORD RC-191
LVL#: 1212047
SDG/SAF#: KP1068/RC-191

W.O.#: 60049-001-001-0001-00
Date Received: 12-14-12

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 other solid samples were reported on a dry weight basis as per the client's request.

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

   Sample J1R744 was reanalyzed and reported with a 20-fold dilution for Mercury due to high concentration of Mercury in the sample.

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

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

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

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

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.

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.

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 6 analytes were outside the 75-125% control limits.

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

12. The duplicate analyses for 2 analytes were outside 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Arsenic, Molybdenum, and Nickel 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

12/19/12
Date

alm/12-047hg%

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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 12:29

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-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/20/2012 12:29

J1R745
1212047-01 (Other Solid)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**8120**		13.2	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Antimony	1.58	U	1.58	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Arsenic	**2.32**	B	2.64	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Barium	**74.1**		1.32	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Beryllium	**0.280**	B	0.527	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Boron	**2.67**	B	5.27	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Cadmium	**0.195**	B	0.527	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Calcium	**6900**		264	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Chromium	**11.9**		0.527	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Cobalt	**7.57**		5.27	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Copper	**20.9**		2.64	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Iron	**26900**		52.7	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Lead	**11.9**		1.32	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Magnesium	**4640**		198	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Manganese	**328**		13.2	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Molybdenum	**0.774**	B	5.27	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Nickel	**11.4**		10.5	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Potassium	**1290**		1050	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Selenium	0.791	U	0.791	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Silicon	**473**		5.27	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Silver	0.527	U	0.527	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Sodium	**1040**		132	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Vanadium	**67.4**		6.59	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Zinc	**97.4**		26.4	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Mercury	**0.0538**		0.0264	mg/kg dry	1	L212151	12/17/2012	12/18/2012	7471A

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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 12:29

J1R746
1212047-02 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**4820**		14.1	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Antimony	1.70	U	1.70	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Arsenic	**2.20**	B	2.83	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Barium	**73.7**		1.41	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Beryllium	**0.201**	B	0.565	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Boron	5.65	U	5.65	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Cadmium	0.565	U	0.565	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Calcium	**4920**		283	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Chromium	**15.3**		0.565	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Cobalt	**5.53**	B	5.65	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Copper	**19.0**		2.83	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Iron	**18200**		56.5	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Lead	**7.36**		1.41	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Magnesium	**2970**		212	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Manganese	**245**		14.1	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Molybdenum	5.65	U	5.65	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Nickel	**8.26**	B	11.3	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Potassium	**1060**	B	1130	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Selenium	0.848	U	0.848	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Silicon	**378**		5.65	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Silver	0.565	U	0.565	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Sodium	**256**		141	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Vanadium	**39.8**		7.07	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Zinc	**101**		28.3	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Mercury	**0.0261**	B	0.0278	mg/kg dry	1	L212151	12/17/2012	12/18/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/20/2012 12:29

J1R744
1212047-03 (Other Solid)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**8360**		20.8	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Antimony	**2.26**	B	2.49	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Arsenic	**4.33**		4.15	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Barium	**122**		2.08	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Beryllium	**0.262**	B	0.830	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Boron	**2.58**	B	8.30	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Cadmium	**0.378**	B	0.830	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Calcium	**8410**		415	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Chromium	**28.1**		0.830	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Cobalt	**8.21**	B	8.30	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Copper	**150**		4.15	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Iron	**43800**		83.0	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Lead	**299**		2.08	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Magnesium	**4530**		311	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Manganese	**453**		20.8	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Molybdenum	**3.01**	B	8.30	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Nickel	**23.6**		16.6	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Potassium	**1750**		1660	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Selenium	1.25	U	1.25	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Silicon	**759**		8.30	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Silver	**6.61**		0.830	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Sodium	**457**		208	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Vanadium	**62.3**		10.4	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Zinc	**628**		41.5	mg/kg dry	3	L212149	12/17/2012	12/19/2012	6010B
Mercury	**13.9**		0.840	mg/kg dry	20	L212151	12/17/2012	12/18/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/20/2012 12:29

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 L212149 - SW 3050B										
Blank (L212149-BLK1)				Prepared: 12/17/2012 Analyzed: 12/19/2012						
Aluminum	4.49	B	4.72	mg/kg wet						
Antimony	0.566	U	0.566	mg/kg wet						
Arsenic	0.943	U	0.943	mg/kg wet						
Barium	0.472	U	0.472	mg/kg wet						
Beryllium	0.189	U	0.189	mg/kg wet						
Boron	1.89	U	1.89	mg/kg wet						
Cadmium	0.189	U	0.189	mg/kg wet						
Calcium	94.3	U	94.3	mg/kg wet						
Chromium	0.189	U	0.189	mg/kg wet						
Cobalt	1.89	U	1.89	mg/kg wet						
Copper	0.943	U	0.943	mg/kg wet						
Iron	18.9	U	18.9	mg/kg wet						
Lead	0.472	U	0.472	mg/kg wet						
Magnesium	1.36	B	70.8	mg/kg wet						
Manganese	4.72	U	4.72	mg/kg wet						
Molybdenum	1.89	U	1.89	mg/kg wet						
Nickel	3.77	U	3.77	mg/kg wet						
Potassium	377	U	377	mg/kg wet						
Selenium	0.283	U	0.283	mg/kg wet						
Silicon	1.89	U	1.89	mg/kg wet						
Silver	0.189	U	0.189	mg/kg wet						
Sodium	47.2	U	47.2	mg/kg wet						
Vanadium	2.36	U	2.36	mg/kg wet						
Zinc	9.43	U	9.43	mg/kg wet						
Duplicate (L212149-DUP2)		**Source: 1212047-01**		Prepared: 12/17/2012 Analyzed: 12/19/2012						
Aluminum	7730		13.9	mg/kg dry		8120			5	20
Antimony	1.67	U	1.67	mg/kg dry		1.58 U				20
Arsenic	3.23		2.78	mg/kg dry		2.32			33*	20
Barium	66.7		1.39	mg/kg dry		74.1			11	20
Beryllium	0.261	B	0.555	mg/kg dry		0.280			7	20
Boron	2.42	B	5.55	mg/kg dry		2.67			10	20
Cadmium	0.162	B	0.555	mg/kg dry		0.195			19	20
Calcium	6240		278	mg/kg dry		6900			10	20
Chromium	27.7		0.555	mg/kg dry		11.9			80*	20
Cobalt	8.10		5.55	mg/kg dry		7.57			7	20
Copper	31.4		2.78	mg/kg dry		20.9			40*	20

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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 12:29

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 L212149 - SW 3050B										
Duplicate (L212149-DUP2)		**Source: 1212047-01**		Prepared: 12/17/2012 Analyzed: 12/19/2012						
Iron	30100		55.5	mg/kg dry		26900			11	20
Lead	11.8		1.39	mg/kg dry		11.9			0.2	20
Magnesium	5360		208	mg/kg dry		4640			14	20
Manganese	354		13.9	mg/kg dry		328			8	20
Molybdenum	1.38	B	5.55	mg/kg dry		0.774			56*	20
Nickel	23.5		11.1	mg/kg dry		11.4			69*	20
Potassium	1240		1110	mg/kg dry		1290			4	20
Selenium	0.833	U	0.833	mg/kg dry		0.791 U				20
Silicon	452		5.55	mg/kg dry		473			5	20
Silver	0.555	U	0.555	mg/kg dry		0.527 U				20
Sodium	947		139	mg/kg dry		1040			9	20
Vanadium	64.5		6.94	mg/kg dry		67.4			4	20
Zinc	100		27.8	mg/kg dry		97.4			3	20
Matrix Spike (L212149-MS2)		**Source: 1212047-01**		Prepared: 12/17/2012 Analyzed: 12/19/2012						
Aluminum	9990		13.6	mg/kg dry	181.88	8120	1030*	75-125		
Antimony	13.3		1.64	mg/kg dry	45.469	1.58 U	29*	75-125		
Arsenic	161		2.73	mg/kg dry	181.88	2.32	87	75-125		
Barium	237		1.36	mg/kg dry	181.88	74.1	90	75-125		
Beryllium	4.35		0.546	mg/kg dry	4.5469	0.280	89	75-125		
Boron	79.7		5.46	mg/kg dry	90.938	2.67	85	75-125		
Cadmium	4.24		0.546	mg/kg dry	4.5469	0.195	89	75-125		
Calcium	10400		273	mg/kg dry	2273.4	6900	152*	75-125		
Chromium	31.1		0.546	mg/kg dry	18.188	11.9	106	75-125		
Cobalt	48.5		5.46	mg/kg dry	45.469	7.57	90	75-125		
Copper	43.8		2.73	mg/kg dry	22.734	20.9	101	75-125		
Iron	29100		54.6	mg/kg dry	90.938	26900	2490*	75-125		
Lead	53.9		1.36	mg/kg dry	45.469	11.9	92	75-125		
Magnesium	7040		205	mg/kg dry	2273.4	4640	106	75-125		
Manganese	417		13.6	mg/kg dry	45.469	328	196*	75-125		
Molybdenum	80.9		5.46	mg/kg dry	90.938	0.774	88	75-125		
Nickel	53.3		10.9	mg/kg dry	45.469	11.4	92	75-125		
Potassium	3400		1090	mg/kg dry	2273.4	1290	93	75-125		
Selenium	156		0.818	mg/kg dry	181.88	0.791 U	86	75-125		
Silicon	527		5.46	mg/kg dry	90.938	473	59*	75-125		
Silver	3.98		0.546	mg/kg dry	4.5469	0.527 U	88	75-125		
Sodium	3400		136	mg/kg dry	2273.4	1040	104	75-125		

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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 12:29

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 L212149 - SW 3050B									
Matrix Spike (L212149-MS2)		**Source: 1212047-01**	Prepared: 12/17/2012 Analyzed: 12/19/2012						
Vanadium	116	6.82	mg/kg dry	45.469	67.4	106	75-125		
Zinc	140	27.3	mg/kg dry	45.469	97.4	94	75-125		
Post Spike (L212149-PS2)		**Source: 1212047-01**	Prepared: 12/17/2012 Analyzed: 12/19/2012						
Aluminum	151000		ug/L	66000	92300	89	75-125		
Antimony	297		ug/L	300.00	1.59	98	75-125		
Calcium	135000		ug/L	62400	78400	90	75-125		
Iron	413000		ug/L	126000	306000	85	75-125		
Manganese	6430		ug/L	3000.0	3730	90	75-125		
Silicon	11700		ug/L	6300.0	5380	101	75-125		
Reference (L212149-SRM1)			Prepared: 12/17/2012 Analyzed: 12/19/2012						
Aluminum	11800	14.2	mg/kg wet	6670.0		176	0-200.89		
Antimony	44.0	1.70	mg/kg wet	53.000		83	0-235.8		
Arsenic	116	2.83	mg/kg wet	114.00		101	82.8-117.54		
Barium	292	1.42	mg/kg wet	307.00		95	79.8-120.2		
Beryllium	108	0.566	mg/kg wet	108.00		100	82.8-117.6		
Boron	83.6	5.66	mg/kg wet	85.100		98	67.5-132.8		
Cadmium	228	0.566	mg/kg wet	225.00		101	83.6-116.4		
Calcium	3440	283	mg/kg wet	3360.0		102	83.3-116.9		
Chromium	84.9	0.566	mg/kg wet	77.200		110	73.3-126.4		
Cobalt	168	5.66	mg/kg wet	166.00		101	80.7-118.7		
Copper	267	2.83	mg/kg wet	271.00		99	80.8-119.2		
Iron	8910	56.6	mg/kg wet	8420.0		106	78.6-121.1		
Lead	185	1.42	mg/kg wet	190.00		97	81.6-118.4		
Magnesium	8930	212	mg/kg wet	8570.0		104	83.2-116.7		
Manganese	1120	14.2	mg/kg wet	965.00		116	69.3-130.5		
Molybdenum	240	5.66	mg/kg wet	235.00		102	76.2-123.8		
Nickel	228	11.3	mg/kg wet	221.00		103	79.6-120.8		
Potassium	14700	1130	mg/kg wet	14400		102	81.9-118.1		
Selenium	192	0.849	mg/kg wet	187.00		102	75.9-124.6		
Silicon	702	5.66	mg/kg wet	807.00		87	0-219.3		
Silver	83.3	0.566	mg/kg wet	83.500		100	82.7-117.1		
Sodium	9680	142	mg/kg wet	9730.0		99	82.5-117.2		
Vanadium	107	7.08	mg/kg wet	98.700		109	75.9-123.6		
Zinc	203	28.3	mg/kg wet	199.00		102	78.4-121.6		

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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 12:29

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 L212151 - SW 7471A Prep										
Blank (L212151-BLK1)				Prepared: 12/17/2012 Analyzed: 12/18/2012						
Mercury	0.0300	U	0.0300	mg/kg wet						
Duplicate (L212151-DUP3)		**Source: 1212047-01**		Prepared: 12/17/2012 Analyzed: 12/18/2012						
Mercury	0.0529		0.0257	mg/kg dry		0.0538			1.66	20
Matrix Spike (L212151-MS3)		**Source: 1212047-01**		Prepared: 12/17/2012 Analyzed: 12/18/2012						
Mercury	0.193		0.0271	mg/kg dry	0.15070	0.0538	92.3	75-125		
Reference (L212151-SRM1)				Prepared: 12/17/2012 Analyzed: 12/18/2012						
Mercury	1.36		0.0273	mg/kg wet	1.2900		105	62.6-138		

Lionville Laboratory

Logbook #: 1194

SAMPLE DIGESTION RECORD

Digestion Batch #: L212149
Date/Time Initiated: 12/17/12 1140
Date/Time Completed: 12/17/12 2030
Analyst: MW
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.

Digested / Undigested (circle one)
Balance #: B14
Balance Cal Verification: Y NA
Temp: 94°
BLOCK 1 2 (circle one)
3

NOTE: All temperatures are recorded as corrected temperatures

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1212025-01		0.56	50		TO	not fine	blackstone sandy	rocks	
L212149-DUP1		0.55	50						
MS1	0.5	0.58	50						
1212025-02		0.58	50			fine	brown soil	rocks	
1212047-01		0.60	50			fine	brown soil	rocks, rust scale	
L212149-DUP2		0.57	50						
MS2	0.5	0.58	50						
1212047-02		0.59	50			not fine	brown soil	rocks, vegetation	
03		0.59	50			coarse	brown soil	rock, vegetation	
L212149-DUP1		0.53	50			coarse	boiling chips		
SRM1	A	0.53	50			fine	pink sandy		

MW 12/17/12

Spiking IDs / Expiration Date:
MS#: 1201581
LCS#: 1201014 A

Reagent IDs:
HNO_3 0000003390
HCl L13079
H_2O_2 L11A03
1:1 HNO_3 637-076-07
1:1 HCl

File ID#:

Data Review By/Date:
12/19/12

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Page #:

PREPARATION BENCH SHEET

L212149

Lionville Laboratory

Printed: 12/17/2012 8:33:24PM

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
1212025-01	6010B ICP Trace	12/17/2012 11:40	0.56	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1212025-02	6010B ICP Trace	12/17/2012 11:40	0.58	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1212047-01	6010B ICP Trace	12/17/2012 11:40	0.6	50					WC-Hanford, Inc.	HSL + B, Mo, Si (no TL)
1212047-02	6010B ICP Trace	12/17/2012 11:40	0.59	50					WC-Hanford, Inc.	HSL + B, Mo, Si (no TL)
1212047-03	6010B ICP Trace	12/17/2012 11:40	0.59	50					WC-Hanford, Inc.	HSL + B, Mo, Si (no TL)
L212149-BLK1	QC	12/17/2012 11:40	0.53	50						
L212149-DUP1	QC	12/17/2012 11:40	0.55	50		1212025-01				
L212149-DUP2	QC	12/17/2012 11:40	0.57	50		1212047-01				
L212149-MS1	QC	12/17/2012 11:40	0.58	50	1201581	1212025-01	500			
L212149-MS2	QC	12/17/2012 11:40	0.58	50	1201581	1212047-01	500			
L212149-PS1	QC	12/17/2012 11:40	0.56	50	1201582	1212025-01	100			
L212149-PS2	QC	12/17/2012 11:40	0.6	50	1201582	1212047-01	100			
L212149-SRM1	QC	12/17/2012 11:40	0.53	50	1201014		530			

Extracts Relinquished By — Date: 12/17/12

Extracts Received By — Date: 12/18/12

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 12/17/12
Start Time/Temp: 1750/94°
End Time/Temp: 1820/98°

Instrument ID: HG3.1/HG3.2
Balance # B14 /NA
Pipette Calibration (Daily) Y

Logbook # 1198
Prep Batch: L212151
Worksheet: HG121801/HG121802
SOP No. ME-HgCVAA
BLOCK 1 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
Blank				10ml	50	
0.2 ug/l		0.100		10ml	50	
1.0 ug/l		0.500		10ml	50	
2.0 ug/l		1.000		10ml	50	
5.0 ug/l		2.500		10ml	50	
10.0 ug/l		5.000		10ml	50	
ICV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L212151-BLK1				0.30	50	
SRM1		*	*	0.33	50	
1212025-01				0.32	50	
L212151-DUP1				0.36	50	
MS1		0.500	1.0	0.37	50	
1212025-02				0.32	50	
L212151-DUP2				0.37	50	
MS2		0.500	1.0	0.37	50	
1212043-01				0.33	50	
02				0.35	50	
03				0.35	50	
1212047-01				0.36	50	
L212151-DUP3				0.37	50	
MS3		0.500	1.0	0.35	50	
1212047-02				0.36	50	
03				0.35	50	
1212048-01				0.35	50	
L212151-DUP4				0.37	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	12/17/12 1235
ICV/CCV/LCS	(I.V. 120141)	N/A

Reviewed By/Date: [illegible] 12/19/12

se book # 1153 for std traceability information

Soil LCS True Value = 1.24 mg/Kg
Standard # 120101 *

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

ME-HgCVAA-Prep0910

Page #:

000000088

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1198

Analyst: [illegible]
Date 12/17/12
Start Time/Temp: [illegible] 01
End Time/Temp: [illegible]

Instrument ID: HG3.1/HG3.2
Balance # B14 /NA
Pipette Calibration (Daily) (Y) ____

Prep Batch: L212151
Worksheet: HG121801/HG121802
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
L212151-MS4		0.500	1.0	0.36	50	

[illegible] 12/17/12

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

Reviewed By/Date: [illegible] 12/19/12

se book # 1153 for std traceability information

Soil LCS True Value = [illegible] 01 mg/Kg
Standard # ____

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

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-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 17:07

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R745	1212047-01	Other Solid	12/12/2012 12:43	12/14/2012 09:45
J1R746	1212047-02	Other Solid	12/12/2012 13:17	12/14/2012 09:45
J1R744	1212047-03	Other Solid	12/12/2012 12:17	12/14/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-191 KP0168
LVL#: 1212047 **Date Received:** 12-14-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 3 solid samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the data summary report. Results for soil or solid pH are measured in water at 25°C unless otherwise specified.

   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 with the exceptions of Nitrate, Nitrite and Orthophosphate.

4. The results presented in this report are derived from samples that met LvL's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits and method criteria.

7. The matrix spike recoveries were within the 75-125% control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for these solid 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

1/13/13
Date

njp\i12-047

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 11 pages.

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-191 Project Number: KP0168 Project Manager: Joan Kessner	**Reported:** 12/20/2012 17:07

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).
D	Results reported from a dilution; related reporting limits are elevated due to the presence of an interference or a high target value.
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
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-191	
2620 Fermi Avenue	Project Number: KP0168	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 17:07

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R745 (1212047-01) Other Solid										
%Solids	**94.8**			0.1	% by Weight	1	L212138	12/16/2012 12:35	12/16/2012 12:35	SM2540G
Bromide	1.0	U	1.0	5.2	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Chloride	**222**		5.2	26.0	mg/kg dry	5	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Fluoride	1.0	U	1.0	5.2	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Nitrate	**56.6**		1.0	5.2	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	5.2	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Orthophosphate	**2.9**	B, J	2.1	10.4	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Sulfate	**37.4**		1.0	5.2	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Nitrate/Nitrite as N	**13.9**	D	0.52	2.60	mg/kg dry	5	L212172	12/18/2012 10:20	12/18/2012 15:22	EPA 353.2
pH	**8.50**		0.10	0.10	pH Units	1	L212168	12/18/2012 11:10	12/18/2012 12:30	SW846 9045D
J1R746 (1212047-02) Other Solid										
%Solids	**89.9**			0.1	% by Weight	1	L212138	12/16/2012 12:35	12/16/2012 12:35	SM2540G
Bromide	1.1	U	1.1	5.4	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Chloride	1.1	U	1.1	5.4	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Fluoride	1.1	U	1.1	5.4	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Nitrate	**195**		5.4	27.1	mg/kg dry	5	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Nitrite	1.1	U	1.1	5.4	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Orthophosphate	**23.8**		2.2	10.8	mg/kg dry	1	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Sulfate	**383**		10.8	54.1	mg/kg dry	10	L212170	12/18/2012 10:20	12/18/2012 12:02	EPA 300.0 (1993)
Nitrate/Nitrite as N	**4.86**		0.11	0.54	mg/kg dry	1	L212172	12/18/2012 10:20	12/18/2012 15:25	EPA 353.2
pH	**6.13**		0.10	0.10	pH Units	1	L212168	12/18/2012 12:35	12/18/2012 12:35	SW846 9045D
J1R744 (1212047-03) Other Solid										
%Solids	**61.2**			0.1	% by Weight	1	L212138	12/16/2012 12:35	12/16/2012 12:35	SM2540G

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 17:07

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212138 - % Solids										
Duplicate (L212138-DUP1)		**Source: 1212047-01**		Prepared & Analyzed: 12/16/2012 12:35						
%Solids	96.3		0.1	% by Weight		94.8			2	20
Batch L212168 - Default Prep GenChem										
Duplicate (L212168-DUP1)		**Source: 1212047-01**		Prepared: 12/18/2011 11:10 Analyzed: 12/18/2012 12:32						
pH	8.51	0.10	0.10	pH Units		8.50			0.118	20
Reference (L212168-SRM1)				Prepared: 12/18/2012 11:10 Analyzed: 12/18/2012 12:38						
pH	7.02	0.10	0.10	pH Units	7.0000		100	99-101		
Batch L212170 - Default Prep GenChem										
Blank (L212170-BLK1)				Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 12:02						
Fluoride	1.0 U	1.0	5.0	mg/kg wet						
Chloride	1.0 U	1.0	5.0	mg/kg wet						
Bromide	1.0 U	1.0	5.0	mg/kg wet						
Orthophosphate	2.0 U	2.0	10.0	mg/kg wet						
Sulfate	1.0 U	1.0	5.0	mg/kg wet						
Nitrate	1.0 U	1.0	5.0	mg/kg wet						
Nitrite	1.0 U	1.0	5.0	mg/kg wet						
LCS (L212170-BS1)				Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 12:02						
Fluoride	49.0	1.0	5.0	mg/kg wet	50.000		98.0	80-120		
Chloride	46.8	1.0	5.0	mg/kg wet	50.000		93.6	80-120		
Bromide	47.2	1.0	5.0	mg/kg wet	50.000		94.4	80-120		
Orthophosphate	47.1	2.0	10.0	mg/kg wet	50.000		94.2	80-120		
Sulfate	47.8	1.0	5.0	mg/kg wet	50.000		95.6	80-120		
Nitrate	47.7	1.0	5.0	mg/kg wet	50.000		95.4	80-120		
Nitrite	47.7	1.0	5.0	mg/kg wet	50.000		95.4	80-120		

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 17:07

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212170 - Default Prep GenChem										
LCS Dup (L212170-BSD1)				Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 12:02						
Fluoride	48.5	1.0	5.0	mg/kg wet	50.000		97.0	80-120	1.03	20
Chloride	46.2	1.0	5.0	mg/kg wet	50.000		92.4	80-120	1.29	20
Bromide	46.6	1.0	5.0	mg/kg wet	50.000		93.2	80-120	1.28	20
Orthophosphate	47.8	2.0	10.0	mg/kg wet	50.000		95.6	80-120	1.48	20
Sulfate	47.5	1.0	5.0	mg/kg wet	50.000		95.0	80-120	0.630	20
Nitrate	46.3	1.0	5.0	mg/kg wet	50.000		92.6	80-120	2.98	20
Nitrite	47.4	1.0	5.0	mg/kg wet	50.000		94.8	80-120	0.631	20
Duplicate (L212170-DUP1)		**Source: 1212047-01**		Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 12:02						
Fluoride	1.0 U	1.0	5.2	mg/kg dry		1.0 U				20
Chloride	234	5.2	25.9	mg/kg dry		222			5.33	20
Bromide	1.0 U	1.0	5.2	mg/kg dry		1.0 U				20
Orthophosphate	2.6 B, J	2.1	10.4	mg/kg dry		2.9			11.6	20
Sulfate	44.8	1.0	5.2	mg/kg dry		37.4			17.9	20
Nitrate	60.3	1.0	5.2	mg/kg dry		56.6			6.32	20
Nitrite	1.0 U	1.0	5.2	mg/kg dry		1.0 U				20
Matrix Spike (L212170-MS1)		**Source: 1212047-01**		Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 12:02						
Fluoride	47.0	1.0	4.9	mg/kg dry	48.807	1.0 U	96.4	75-125		
Bromide	46.2	1.0	4.9	mg/kg dry	48.807	1.0 U	94.6	75-125		
Orthophosphate	48.1	2.0	9.8	mg/kg dry	48.807	2.9	92.6	75-125		
Sulfate	92.0	1.0	4.9	mg/kg dry	48.807	37.4	112	75-125		
Nitrite	48.0	1.0	4.9	mg/kg dry	48.807	1.0 U	98.4	75-125		
Matrix Spike (L212170-MS2)		**Source: 1212047-01**		Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 12:02						
Nitrate	156	2.0	9.8	mg/kg dry	97.614	56.6	102	75-125		
Matrix Spike (L212170-MS3)		**Source: 1212047-01**		Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 12:02						
Chloride	736	9.8	48.8	mg/kg dry	488.07	222	105	75-125		

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc.	Project: RC-191	
2620 Fermi Avenue	Project Number: KP0168	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/20/2012 17:07

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L212172 - Default Prep GenChem											
Blank (L212172-BLK1)					Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 15:20						
Nitrate/Nitrite as N	0.10	U	0.10	0.50	mg/kg wet						
LCS (L212172-BS1)					Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 15:19						
Nitrate/Nitrite as N	5.39		0.10	0.50	mg/kg wet	5.0000		108	90-110		
Duplicate (L212172-DUP1)		**Source: 1212047-01**			Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 15:23						
Nitrate/Nitrite as N	14.5	D	0.52	2.59	mg/kg dry		13.9			4.49	20
Matrix Spike (L212172-MS1)		**Source: 1212047-01**			Prepared: 12/18/2012 10:20 Analyzed: 12/18/2012 15:24						
Nitrate/Nitrite as N	40.3	D	0.49	2.44	mg/kg dry	24.403	13.9	108	75-125		