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

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 11/27/12
INITIAL/DATE

COMMENTS:

SDG KP0146 SAF-RC-225

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 100-K-93

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

25 November 2012

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

Subject: Analytical Data Package

Dear Ms. Kessner:

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

LvLI Batch #	1211027
SDG #	KP0146
SAF #	RC-225
Date Received	11/08/12
# Samples	1
Matrix	SOIL
Volatiles	X
Semivolatiles	X
Pest/PCB	X
Glycols	
DRO/KRO/GRO	X
PAHs	X
Herbicides	
Metals	X
Inorganics	

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

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1211027

Custody Transfer Record/Lab Work Request

Page 1 of 1

Lionville Laboratory
A Division of Eberline Analytical Corporation

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

KP0146

Client: WC Hanford SAF# RC-225

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: STD Del: STD TAT: 7 Days

Date Rec'd: 11-8-12 Date Due: 11-15-12

		A-C	D	E		F	G		H			I				
Refrigerator #		Foo1	2	2		2	2		2			2				
#/Type Container	Liquid															
	Solid	Beneck	1AG	1AG		1AG	1AG		1AG			1G				
Volume	Liquid															
	Solid	15	125	125		125	125		125			20				
Preservatives		—	—	—		—	—		—			—				
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	~~Pest~~/PCB	Herb	PAHs	HPAHs		Metal ~~Hg~~	CN		% Moisture				
		Lionville Laboratory Use Only														
		8260 TCL	8270 TCL	8082		8310	DRO/MO		METALS			% 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	8260	8270	8082		8310	DRO/MO		METALS			% MOIST				
01	J1R557	✓	✓	Soil	11-6-12	1015	X	X	X		X	X		X			X				

Special Instructions:

METALS = HSL + B, Mo, Si (NO TL)

Special Instructions:

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

NR

Relinquished by	Received by	Date	Time
[illegible]	K Hernandez	11/8/12	0950

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-225-073	Page 1 of 1

Collector Brackette, R	Company Contact Joan Kessner	Telephone No. (509) 375-4688	Project Coordinator KESSNER, JH
Price Code 8B	Data Turnaround 7 Days		
Project Designation 100K Remaining Waste Sites - Soil In-Process	Sampling Location 100-K-93		SAF No. RC-225
Ice Chest No. WCH-12-029	Field Logbook No. EL-1666	COA 010K932600 ~~R011KX1Y00~~ 11-7-12 cmB	Method of Shipment FedEx
Shipped To EBERLINE SERVICES/ LIONVILLE	Offsite Property No. A120638		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cocl 4C	Freeze	Cool 4C	Cool 4C	Cool 4C					
Type of Container	G/P	aG	Gs*	aG	aG	aG					
No. of Container(s)	1	1	3 +1 *	1	1	1					
Volume	125mL	125mL	40mL	125mL	125mL	125mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) **	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310					
Sample No.	Matrix *	Sample Date	Sample Time								
J1R557	SOIL	11/6/12	1015	X	X	X	X	X	X		
~~J1R558~~ BH 11/6/12	SOIL										

REVIEWED BY AJ DATE 11-7-12

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From RoB Brackett	Date/Time 1110 11-6-12	Received By/Stored In BHUDSON	Date/Time 1110 11/6/12
Relinquished By/Removed From BHUDSON	Date/Time 1435 11/6/12	Received By/Stored In Sandra Bingham	Date/Time 1060HH 11-6-12 1435
Relinquished By/Removed From Sandra Bingham	Date/Time 1060HH WCH 11-7-12 0837	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 11-8-12 0950	Received By/Stored In Victor Hernandez	Date/Time 11-8-12 0950
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(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}

** freeze upon receipt 11-6-12 cmB

* 20 ml % moisture ~~vile~~ vial AJ 11-7-12

11-6-12 cmB

VOA samples frozen upon collection

KP0146

Matrix *

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

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

WCH-EE-011

0000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford **Date:** 11/8/12

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

LvL Batch #: 1211027 **Sample Custodian:** Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 7940
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 2-8°	°C	Cooler # WCH-12-029
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 VH 11/8/12
13. VOA, TOC, TOX free of headspace?	☑ Yes	☐ No	☐ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted_____ Date _____

SR-002-B-0412.doc

VOLATILES

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 12:12

Analytical Report for Volatile Organic Compounds by SW846 8260B

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R557	1211027-01	Soil	11/06/2012 10:15	11/08/2012 09:50

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-225 KP0146
LVL #: 1211027

W.O. #: 60049-001-001-0001-00
Received: 11-08-2012

GC/MS VOLATILE

One (1) soil sample was collected on 11-06-2012.

The sample and associated QC samples were prepared and analyzed 11-08-2012 according to criteria set forth in Lionville Laboratory SOPs. The preparation procedure was based on SW846 Method 5035A and the analysis procedure was based on SW846 Method 8260B for TCL Volatile 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 a sample that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.

2. The sample was analyzed within recommended holding time.

3. Non-target compounds were not detected in these samples.

4. All surrogate recoveries were within acceptance criteria.

5. All matrix spike recoveries were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. The method blank was below the reporting limit for all target analytes.

8. The sample is reported on a dry weight basis.

9. All internal standard area and retention time criteria were met.

10. All initial calibrations associated with this data set were within acceptance criteria using the mean RSD described in method 8000B. Per method 8000B/8260B, the attached Table 1 provides the mean RSD and indicates the target compounds where the RSD exceeded 15%; results for the indicated target compounds are considered to have greater uncertainty.

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

12. Manual integrations are performed according to SOP QA-125 to produce quality data with 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").

Iain Daniels
LvL Laboratory Manager

11/23/12
Date

TABLE 1

FULL LIST - 8000B/8260B COMPOUNDS WHERE THE MEAN %RSD IS USED TO MEET

CRITERIA FOR INITIAL CALIBRATION OF AN INDIVIDUAL COMPOUND

MEAN RSD USED FOR EVALUATION: 5.647 INSTRUMENT ID/DATE: 5972K 11/5/12

>15% RSD	Compound	>15% RSD	Compound	>15% RSD	Compound
	1,1,1,2-Tetrachloroethane		Carbon Disulfide		trans-1,4-Dichloro-2-butene
	1,1,1-Trichloroethane		Carbon Tetrachloride		Trichloroethene
	1,1,2,2-Tetrachloroethane		Chlorobenzene		Trichlorofluoromethane
	1,1,2-Trichloroethane	✓	Chloroethane		Vinyl acetate
	1,1-Dichloroethane		Chloroform		Vinyl chloride
	1,1-Dichloroethene		Chloromethane		Xylenes, total
	1,1-Dichloropropene		cis-1,2-Dichloroethene		
	1,2,3-Trichlorobenzene		cis-1,3-Dichloropropene		
	1,2,3-Trichloropropane		Cyclohexane		
	1,2,3-Trimethylbenzene		Cyclohexanone		
	1,2,4-Trichlorobenzene		Dibromochloromethane		
	1,2,4-Trimethylbenzene		Dibromofluoromethane		
	1,2-Dibromo-3-chloropropane		Dibromomethane		
	1,2-Dibromoethane		Dichlorodifluoromethane		
	1,2-Dichlorobenzene		Diethyl Ether		
	1,2-Dichloroethane		Ethyl Acetate		
	1,2-Dichloroethene (total)		Ethyl Methacrylate		
	1,2-Dichloropropane		Ethylbenzene		**Surrogates:**
	1,2-Xylene		Ethylene oxide		1,2-Dichloroethane-d4
	1,3- and 1,4-Xylenes		Freon-113		Toluene-d8
	1,3,5-Trimethylbenzene		Freon-114		4-Bromofluorobenzene
	1,3-Dichlorobenzene		Hexachlorobutadiene		
	1,3-Dichloropropane		Hexane		
	1,3-Dichloropropene (total)		Iodomethane		
	1,4-Dichlorobenzene		Isobutyl alcohol		
	1,4-Dioxane		Isopropylbenzene		
	2,2-Dichloropropane		Methacrylonitrile		
✓	2-Butanone		Methyl Acetate		
	2-Chloro-1,3-butadiene		Methyl Methacrylate		
	2-Chloroethyl Vinyl Ether		Methylcyclohexane		
	2-Chlorotoluene		Methylene Chloride		
	2-Hexanone		Methyl-tert-Butyl Ether		
	2-Nitropropane		Naphthalene		
	3-Chloropropene		n-Butyl Alcohol		
	4-Chlorotoluene		n-Butylbenzene		
	4-Isopropyltoluene		n-Propylbenzene		
	4-Methyl-2-pentanone		Pentachloroethane		
✓	Acetone		Propionitrile		
	Acetonitrile		sec-Butylbenzene		
	Acrolein		Styrene		
	Acrylonitrile		tert-Butyl alcohol		
	Benzene		tert-Butylbenzene		
	Bromobenzene		Tetrachloroethene		
	Bromochloromethane		Tetrahydrofuran		
	Bromodichloromethane		Toluene		
	Bromoform		trans-1,2-Dichloroethene		
	Bromomethane		trans-1,3-Dichloropropene		

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.

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 12:12

J1R557
1211027-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
1,1,2,2-Tetrachloroethane	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
1,1,2-Trichloroethane	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
1,1-Dichloroethane	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
1,1-Dichloroethene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
1,2-Dichloroethane	9.63	U	9.63	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
1,2-Dichloroethene (total)	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
1,2-Dichloropropane	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
2-Butanone	19.3	U	19.3	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
2-Hexanone	19.3	U	19.3	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
4-Methyl-2-pentanone	19.3	U	19.3	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Acetone	19.3	U	19.3	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Benzene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Bromodichloromethane	9.63	U	9.63	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Bromoform	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Bromomethane	16.0	U	16.0	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Carbon Disulfide	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Carbon Tetrachloride	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Chlorobenzene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Chloroethane	16.0	U	16.0	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Chloroform	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Chloromethane	16.0	U	16.0	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
cis-1,2-Dichloroethene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
cis-1,3-Dichloropropene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Dibromochloromethane	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Ethylbenzene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Methylene Chloride	9.63	U	9.63	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Styrene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Tetrachloroethene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
trans-1,2-Dichloroethene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Toluene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
trans-1,3-Dichloropropene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Trichloroethene	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Vinyl chloride	16.0	U	16.0	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Xylenes, total	8.02	U	8.02	ug/kg dry	1	L211084	11/08/2012	11/08/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*82 %*		*60-130*			*L211084*	*11/08/2012*	*11/08/2012*	*8260B*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 12:12

J1R557

1211027-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*77 %*	*72-117*			*L211084*	*11/08/2012*	*11/08/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*88 %*	*72-144*			*L211084*	*11/08/2012*	*11/08/2012*	*8260B*

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2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 12:12

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211084 - SW 5035A										
Blank (L211084-BLK1)				Prepared & Analyzed: 11/08/2012						
1,1,1-Trichloroethane	5.00	U	5.00	ug/kg wet						
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/kg wet						
1,1,2-Trichloroethane	5.00	U	5.00	ug/kg wet						
1,1-Dichloroethane	5.00	U	5.00	ug/kg wet						
1,1-Dichloroethene	5.00	U	5.00	ug/kg wet						
1,2-Dichloroethane	6.00	U	6.00	ug/kg wet						
1,2-Dichloroethene (total)	5.00	U	5.00	ug/kg wet						
1,2-Dichloropropane	5.00	U	5.00	ug/kg wet						
2-Butanone	12.0	U	12.0	ug/kg wet						
2-Hexanone	12.0	U	12.0	ug/kg wet						
4-Methyl-2-pentanone	12.0	U	12.0	ug/kg wet						
Acetone	4.84	J	12.0	ug/kg wet						
Benzene	5.00	U	5.00	ug/kg wet						
Bromodichloromethane	6.00	U	6.00	ug/kg wet						
Bromoform	5.00	U	5.00	ug/kg wet						
Bromomethane	10.0	U	10.0	ug/kg wet						
Carbon Disulfide	5.00	U	5.00	ug/kg wet						
Carbon Tetrachloride	5.00	U	5.00	ug/kg wet						
Chlorobenzene	5.00	U	5.00	ug/kg wet						
Chloroethane	10.0	U	10.0	ug/kg wet						
Chloroform	5.00	U	5.00	ug/kg wet						
Chloromethane	10.0	U	10.0	ug/kg wet						
cis-1,2-Dichloroethene	5.00	U	5.00	ug/kg wet						
cis-1,3-Dichloropropene	5.00	U	5.00	ug/kg wet						
Dibromochloromethane	5.00	U	5.00	ug/kg wet						
Ethylbenzene	5.00	U	5.00	ug/kg wet						
Methylene Chloride	6.00	U	6.00	ug/kg wet						
Styrene	5.00	U	5.00	ug/kg wet						
Tetrachloroethene	5.00	U	5.00	ug/kg wet						
trans-1,2-Dichloroethene	5.00	U	5.00	ug/kg wet						
Toluene	5.00	U	5.00	ug/kg wet						
trans-1,3-Dichloropropene	5.00	U	5.00	ug/kg wet						
Trichloroethene	5.00	U	5.00	ug/kg wet						
Vinyl chloride	10.0	U	10.0	ug/kg wet						
Xylenes, total	5.00	U	5.00	ug/kg wet						
Surrogate: 1,2-Dichloroethane-d4	*37.3*			*ug/kg wet*	*50.000*		*75*	*60-130*		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 12:12

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211084 - SW 5035A									
Blank (L211084-BLK1)			Prepared & Analyzed: 11/08/2012						
Surrogate: Toluene-d8	*36.5*		*ug/kg wet*	*50.000*		*73*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*39.2*		*ug/kg wet*	*50.000*		*78*	*72-144*		
LCS (L211084-BS1)			Prepared & Analyzed: 11/08/2012						
1,1,1-Trichloroethane	39.9	5.00	ug/kg wet	50.000		80	65-130		
1,1,2,2-Tetrachloroethane	36.5	5.00	ug/kg wet	50.000		73	50-130		
1,1,2-Trichloroethane	36.2	5.00	ug/kg wet	50.000		72	60-125		
1,1-Dichloroethane	41.8	5.00	ug/kg wet	50.000		84	70-130		
1,1-Dichloroethene	38.4	5.00	ug/kg wet	50.000		77	60-130		
1,2-Dichloroethane	40.9	6.00	ug/kg wet	50.000		82	60-130		
1,2-Dichloroethene (total)	79.2	5.00	ug/kg wet	100.00		79	75-125		
1,2-Dichloropropane	39.4	5.00	ug/kg wet	50.000		79	70-130		
2-Butanone	74.5	12.0	ug/kg wet	50.000		149	20-200		
2-Hexanone	53.9	12.0	ug/kg wet	50.000		108	20-200		
4-Methyl-2-pentanone	42.0	12.0	ug/kg wet	50.000		84	40-150		
Acetone	102	12.0	ug/kg wet	50.000		204	15-240		
Benzene	39.3	5.00	ug/kg wet	50.000		79	75-125		
Bromodichloromethane	37.9	6.00	ug/kg wet	50.000		76	65-135		
Bromoform	35.5	5.00	ug/kg wet	50.000		71	60-130		
Bromomethane	29.3	10.0	ug/kg wet	50.000		59	40-150		
Carbon Disulfide	41.0	5.00	ug/kg wet	50.000		82	55-140		
Carbon Tetrachloride	39.6	5.00	ug/kg wet	50.000		79	60-135		
Chlorobenzene	36.4	5.00	ug/kg wet	50.000		73	70-125		
Chloroethane	37.4	10.0	ug/kg wet	50.000		75	50-150		
Chloroform	41.8	5.00	ug/kg wet	50.000		84	70-130		
Chloromethane	37.6	10.0	ug/kg wet	50.000		75	40-130		
cis-1,2-Dichloroethene	39.4	5.00	ug/kg wet	50.000		79	70-125		
cis-1,3-Dichloropropene	36.1	5.00	ug/kg wet	50.000		72	70-125		
Dibromochloromethane	34.9	5.00	ug/kg wet	50.000		70	65-125		
Ethylbenzene	37.1	5.00	ug/kg wet	50.000		74	70-125		
Methylene Chloride	38.4	6.00	ug/kg wet	50.000		77	45-140		
Styrene	35.0	5.00	ug/kg wet	50.000		70	70-125		
Tetrachloroethene	36.7	5.00	ug/kg wet	50.000		73	60-130		
trans-1,2-Dichloroethene	39.8	5.00	ug/kg wet	50.000		80	65-130		
Toluene	36.5	5.00	ug/kg wet	50.000		73	70-125		
trans-1,3-Dichloropropene	38.4	5.00	ug/kg wet	50.000		77	65-125		
Trichloroethene	39.0	5.00	ug/kg wet	50.000		78	70-130		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 12:12

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211084 - SW 5035A									
LCS (L211084-BS1)			Prepared & Analyzed: 11/08/2012						
Vinyl chloride	37.0	10.0	ug/kg wet	50.000		74	50-150		
Xylenes, total	108	5.00	ug/kg wet	150.00		72	70-125		
Surrogate: 1,2-Dichloroethane-d4	*39.6*		*ug/kg wet*	*50.000*		*79*	*60-130*		
Surrogate: Toluene-d8	*36.3*		*ug/kg wet*	*50.000*		*73*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*38.1*		*ug/kg wet*	*50.000*		*76*	*72-144*		
Matrix Spike (L211084-MS1)		**Source: 1211027-01**	Prepared & Analyzed: 11/08/2012						
1,1,1-Trichloroethane	95.6	9.87	ug/kg dry	98.675	8.02 U	97	65-130		
1,1,2,2-Tetrachloroethane	96.3	9.87	ug/kg dry	98.675	8.02 U	98	50-130		
1,1,2-Trichloroethane	90.4	9.87	ug/kg dry	98.675	8.02 U	92	60-125		
1,1-Dichloroethane	100	9.87	ug/kg dry	98.675	8.02 U	102	70-130		
1,1-Dichloroethene	90.3	9.87	ug/kg dry	98.675	8.02 U	92	60-130		
1,2-Dichloroethane	101	11.8	ug/kg dry	98.675	9.63 U	103	60-130		
1,2-Dichloroethene (total)	185	9.87	ug/kg dry	197.35	8.02 U	94	75-125		
1,2-Dichloropropane	96.6	9.87	ug/kg dry	98.675	8.02 U	98	70-130		
2-Butanone	131	23.7	ug/kg dry	98.675	19.3 U	133	20-200		
2-Hexanone	92.8	23.7	ug/kg dry	98.675	19.3 U	94	20-200		
4-Methyl-2-pentanone	98.5	23.7	ug/kg dry	98.675	19.3 U	100	40-150		
Acetone	152	23.7	ug/kg dry	98.675	19.3 U	154	15-240		
Benzene	94.6	9.87	ug/kg dry	98.675	8.02 U	96	75-125		
Bromodichloromethane	92.8	11.8	ug/kg dry	98.675	9.63 U	94	65-135		
Bromoform	86.3	9.87	ug/kg dry	98.675	8.02 U	87	60-130		
Bromomethane	66.8	19.7	ug/kg dry	98.675	16.0 U	68	40-150		
Carbon Disulfide	95.4	9.87	ug/kg dry	98.675	8.02 U	97	55-140		
Carbon Tetrachloride	94.0	9.87	ug/kg dry	98.675	8.02 U	95	60-135		
Chlorobenzene	87.1	9.87	ug/kg dry	98.675	8.02 U	88	70-125		
Chloroethane	84.4	19.7	ug/kg dry	98.675	16.0 U	86	50-150		
Chloroform	101	9.87	ug/kg dry	98.675	8.02 U	102	70-130		
Chloromethane	88.3	19.7	ug/kg dry	98.675	16.0 U	89	40-130		
cis-1,2-Dichloroethene	92.6	9.87	ug/kg dry	98.675	8.02 U	94	70-125		
cis-1,3-Dichloropropene	84.4	9.87	ug/kg dry	98.675	8.02 U	86	70-125		
Dibromochloromethane	86.8	9.87	ug/kg dry	98.675	8.02 U	88	65-125		
Ethylbenzene	84.4	9.87	ug/kg dry	98.675	8.02 U	86	70-125		
Methylene Chloride	92.0	11.8	ug/kg dry	98.675	9.63 U	93	45-140		
Styrene	82.4	9.87	ug/kg dry	98.675	8.02 U	84	70-125		
Tetrachloroethene	86.1	9.87	ug/kg dry	98.675	8.02 U	87	60-130		
trans-1,2-Dichloroethene	92.5	9.87	ug/kg dry	98.675	8.02 U	94	65-130		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 12:12

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211084 - SW 5035A									
Matrix Spike (L211084-MS1)		**Source: 1211027-01**	Prepared & Analyzed: 11/08/2012						
Toluene	88.5	9.87	ug/kg dry	98.675	8.02 U	90	70-125		
trans-1,3-Dichloropropene	93.5	9.87	ug/kg dry	98.675	8.02 U	95	65-125		
Trichloroethene	92.4	9.87	ug/kg dry	98.675	8.02 U	94	70-130		
Vinyl chloride	83.5	19.7	ug/kg dry	98.675	16.0 U	85	50-150		
Xylenes, total	251	9.87	ug/kg dry	296.02	8.02 U	85	70-125		
Surrogate: 1,2-Dichloroethane-d4	*98.7*		*ug/kg dry*	*98.675*		*100*	*60-130*		
Surrogate: Toluene-d8	*90.0*		*ug/kg dry*	*98.675*		*91*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*98.9*		*ug/kg dry*	*98.675*		*100*	*72-144*		
Matrix Spike Dup (L211084-MSD1)		**Source: 1211027-01**	Prepared & Analyzed: 11/08/2012						
1,1,1-Trichloroethane	134	12.5	ug/kg dry	125.08	8.02 U	107	65-130	10	20
1,1,2,2-Tetrachloroethane	150	12.5	ug/kg dry	125.08	8.02 U	120	50-130	21*	20
1,1,2-Trichloroethane	134	12.5	ug/kg dry	125.08	8.02 U	107	60-125	16	20
1,1-Dichloroethane	142	12.5	ug/kg dry	125.08	8.02 U	114	70-130	11	20
1,1-Dichloroethene	130	12.5	ug/kg dry	125.08	8.02 U	104	60-130	13	20
1,2-Dichloroethane	144	15.0	ug/kg dry	125.08	9.63 U	115	60-130	11	20
1,2-Dichloroethene (total)	262	12.5	ug/kg dry	250.16	8.02 U	105	75-125	11	20
1,2-Dichloropropane	139	12.5	ug/kg dry	125.08	8.02 U	111	70-130	12	20
2-Butanone	167	30.0	ug/kg dry	125.08	19.3 U	133	20-200	0.5	20
2-Hexanone	131	30.0	ug/kg dry	125.08	19.3 U	105	20-200	11	20
4-Methyl-2-pentanone	147	30.0	ug/kg dry	125.08	19.3 U	118	40-150	16	20
Acetone	191	30.0	ug/kg dry	125.08	19.3 U	153	15-240	0.8	20
Benzene	135	12.5	ug/kg dry	125.08	8.02 U	108	75-125	12	20
Bromodichloromethane	133	15.0	ug/kg dry	125.08	9.63 U	106	65-135	12	20
Bromoform	127	12.5	ug/kg dry	125.08	8.02 U	102	60-130	15	20
Bromomethane	107	25.0	ug/kg dry	125.08	16.0 U	86	40-150	23*	20
Carbon Disulfide	136	12.5	ug/kg dry	125.08	8.02 U	108	55-140	12	20
Carbon Tetrachloride	133	12.5	ug/kg dry	125.08	8.02 U	107	60-135	11	20
Chlorobenzene	129	12.5	ug/kg dry	125.08	8.02 U	103	70-125	15	20
Chloroethane	125	25.0	ug/kg dry	125.08	16.0 U	100	50-150	16	20
Chloroform	142	12.5	ug/kg dry	125.08	8.02 U	113	70-130	10	20
Chloromethane	125	25.0	ug/kg dry	125.08	16.0 U	100	40-130	11	20
cis-1,2-Dichloroethene	133	12.5	ug/kg dry	125.08	8.02 U	106	70-125	12	20
cis-1,3-Dichloropropene	127	12.5	ug/kg dry	125.08	8.02 U	101	70-125	17	20
Dibromochloromethane	129	12.5	ug/kg dry	125.08	8.02 U	104	65-125	16	20
Ethylbenzene	127	12.5	ug/kg dry	125.08	8.02 U	102	70-125	17	20
Methylene Chloride	132	15.0	ug/kg dry	125.08	9.63 U	106	45-140	13	20

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 12:12

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211084 - SW 5035A									
Matrix Spike Dup (L211084-MSD1)	**Source: 1211027-01**		Prepared & Analyzed: 11/08/2012						
Styrene	120	12.5	ug/kg dry	125.08	8.02 U	96	70-125	14	20
Tetrachloroethene	124	12.5	ug/kg dry	125.08	8.02 U	99	60-130	12	20
trans-1,2-Dichloroethene	130	12.5	ug/kg dry	125.08	8.02 U	104	65-130	10	20
Toluene	131	12.5	ug/kg dry	125.08	8.02 U	104	70-125	15	20
trans-1,3-Dichloropropene	138	12.5	ug/kg dry	125.08	8.02 U	111	65-125	16	20
Trichloroethene	132	12.5	ug/kg dry	125.08	8.02 U	105	70-130	12	20
Vinyl chloride	124	25.0	ug/kg dry	125.08	16.0 U	99	50-150	16	20
Xylenes, total	375	12.5	ug/kg dry	375.24	8.02 U	100	70-125	16	20
Surrogate: 1,2-Dichloroethane-d4	*139*		*ug/kg dry*	*125.08*		*111*	*60-130*		
Surrogate: Toluene-d8	*132*		*ug/kg dry*	*125.08*		*105*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*149*		*ug/kg dry*	*125.08*		*119*	*72-144*		

Lionville Laboratory

Logbook # 1178

Soil Sample Preparation Record

Sample ID	PREPARATION		Analyst Initials	Sample Weight (g)	Comments
	Date	Time			
-BLK1	11/8/12	10:02	NBL	5.0	
-BS1		10:00		5.0	
1211027 – 01A		11:13		3.32	34.39
01B		11:14		2.70	33.63
01C		11:14		2.13	33.23

11/8/12

Page #

MV-soil_sample_prep_record_1012

PREPARATION BENCH SHEET

L211084

Lionville Laboratory

Printed: 11/9/2012 12:31:51PM

Matrix: Solid **Prepared using: VOAGCMS - SW 5035A** **Surrogate used: 0902344**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211027-01	8260B (5035A) TCL VOC	11/08/2012 11:40	3.32	5				5	WC-Hanford, Inc.	
L211084-BLK1	QC	11/08/2012 10:42	5	5				5		
L211084-BS1	QC	11/08/2012 10:07	5	5	1201312		5	5		
L211084-MS1	QC	11/08/2012 12:38	2.7	5	1201312	1211027-01	5	5		
L211084-MSD1	QC	11/08/2012 13:13	2.13	5	1201312	1211027-01	5	5		

m 11/9/12

Extracts Relinquished By Date

NA RG 11/12/12

Extracts Received By Date

SEMIVOLATILES

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/15/2012 09:36

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R557	1211027-01	Soil	11/06/2012 10:15	11/08/2012 09:50

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-225 KP0146
LVL #: 1211027

W.O. #: 60049-001-001-0001-00
Date Received: 11-08-2012

SEMIVOLATILE

One (1) soil sample was collected on 11-06-2012.

The sample and associated QC samples were extracted 11-08-2012 and analyzed 11-09-2012 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 client specified 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 a sample that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.

2. The sample was extracted and analyzed within holding time.

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

4. All samples required 3-fold instrument dilutions.

5. All obtainable surrogate recoveries were within acceptance criteria.

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

7. All blank spike recoveries were within acceptance criteria

8. One (1) of one hundred and twenty-eight matrix spike recoveries was outside acceptance criteria.

9. The sample was reported on a dry weight basis.

10. All initial calibrations associated with this data set were 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.

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

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

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.

13. 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").

14. 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

11/23/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12MS194

Initiator: Sharon Saylor
Date: 11-14-12
Client: WCHanford

Batch: 1211027
Samples: L211073-ms1
Method: SW846/MCAWW/CLP/

Parameter: 8270C
Matrix: Soil
Prep Batch: L211073

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) low recovery of 3,3' Dichlorobenzidine in L211073-ms1 but L211073-msd1 and L211073-BS1 are ok 14% (15-130%)
RE 11/15/12

2. Known or Probable Causes(s) 3,3' dichlorobenzidine can be subject to oxidative losses during solvent concentration
RE 11/15/12

3. Discussion and Proposed Action Other Description:

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

namte

4. Project Manager Instructions...signature/date: 11/28/12

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

5. Final Action...signature/date: 11/28/12 Other Explanation:

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

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

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

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

QA-139-A-0208

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: 9.70 CALIBRATION: 121011 C11/09/12

>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				

ANALYSIS BATCH (SEQUENCE) SUMMARY
8270C

Laboratory:	Lionville Laboratory	SDG:	DRAFT KP0146
Client:	WC-Hanford, Inc.	Project:	RC-225
Sequence:	2110081	Instrument:	HP5972C
Matrix:	Solid	Calibration:	1211011

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2110081-TUN1	C110901.D	11/09/12 09:43
Cal Standard	2110081-CAL5	C110902.D	11/09/12 10:16
Cal Standard	2110081-CAL3	C110905.D	11/09/12 12:47
Cal Standard	2110081-CAL4	C110906.D	11/09/12 13:37
Cal Standard	2110081-CAL2	C110907.D	11/09/12 14:27
Cal Standard	2110081-CAL1	C110909.D	11/09/12 16:06
Secondary Cal Check	2110081-SCV1	C110910.D	11/09/12 16:56
LCS	L211073-BS1	C110911.D	11/09/12 17:46
Blank	L211073-BLK1	C110912.D	11/09/12 18:36
DRAFT: J1R557	1211027-01	C110913.D	11/09/12 19:25
J1R557	L211073-MS1	C110914.D	11/09/12 20:15
J1R557	L211073-MSD1	C110915.D	11/09/12 21:05

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.

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	11/15/2012 09:36

J1R557
1211027-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
1,2,4-Trichlorobenzene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
1,2-Dichlorobenzene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
1,3-Dichlorobenzene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
1,4-Dichlorobenzene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2,4,5-Trichlorophenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2,4,6-Trichlorophenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2,4-Dichlorophenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2,4-Dimethylphenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2,4-Dinitrophenol	5210	U	5210	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2,4-Dinitrotoluene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2,6-Dinitrotoluene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2-Chloronaphthalene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2-Chlorophenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2-Methylnaphthalene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2-Methylphenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2-Nitroaniline	5210	U	5210	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
2-Nitrophenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
3,3'-Dichlorobenzidine	2090	U	2090	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
3-Nitroaniline	5210	U	5210	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
4,6-Dinitro-2-methylphenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
4-Bromophenyl Phenyl Ether	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
4-Chloro-3-methylphenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
4-Chloroaniline	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
4-Chlorophenyl Phenyl Ether	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
3- and/or 4-Methylphenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
4-Nitroaniline	5210	U	5210	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
4-Nitrophenol	5210	U	5210	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Acenaphthene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Acenaphthylene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Anthracene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Benz[a]anthracene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Benzo[a] pyrene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Benzo[b] fluoranthene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Benzo[g,h,i] perylene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Benzo[k] fluoranthene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Bis(2-chloroethoxy) methane	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C

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Richland WA, 99354	Project Manager: Joan Kessner	11/15/2012 09:36

J1R557
1211027-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Bis(2-chloroisopropyl) ether	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Bis(2-ethylhexyl) phthalate	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Butyl Benzyl Phthalate	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Carbazole	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Chrysene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Dibenz[a,h]anthracene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Dibenzofuran	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Diethyl Phthalate	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Dimethyl Phthalate	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Di-n-butyl Phthalate	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Di-n-octyl Phthalate	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Fluoranthene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Fluorene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Hexachlorobenzene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Hexachlorobutadiene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Hexachlorocyclopentadiene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Hexachloroethane	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Indeno[1,2,3-cd]pyrene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Isophorone	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Naphthalene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Nitrobenzene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
N-Nitrosodi-n-propylamine	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
N-Nitrosodiphenylamine	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Pentachlorophenol	5210	U	5210	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Phenanthrene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Phenol	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Pyrene	1040	U	1040	ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
TIC:Aldol Condensate 1	**447**	A, B, D, J		ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
TIC:Aldol Condensate 2	**59100**	A, B, D, J		ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
TIC:Aldol Condensate 3	**235**	A, D, J		ug/kg dry	3	L211073	11/08/2012	11/09/2012	8270C
Surrogate: 2-Fluorophenol	*55 %*		*25-121*			*L211073*	*11/08/2012*	*11/09/2012*	*8270C*
Surrogate: Phenol-d5	*55 %*		*24-113*			*L211073*	*11/08/2012*	*11/09/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*60 %*		*23-120*			*L211073*	*11/08/2012*	*11/09/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*63 %*		*30-115*			*L211073*	*11/08/2012*	*11/09/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*43 %*		*19-122*			*L211073*	*11/08/2012*	*11/09/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/15/2012 09:36

J1R557

1211027-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: p-Terphenyl-d14	*64 %*	*18-137*			*L211073*	*11/08/2012*	*11/09/2012*	*8270C*

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Richland WA, 99354	Project Manager: Joan Kessner	11/15/2012 09:36

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 L211073 - SW 3540C										
Blank (L211073-BLK1)				Prepared: 11/08/2012 Analyzed: 11/09/2012						
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-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:36

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 L211073 - SW 3540C										
Blank (L211073-BLK1)				Prepared: 11/08/2012 Analyzed: 11/09/2012						
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						
Unknown 1 TICS	608	J		ug/kg wet						
Trichloro-1-propene	1030	J		ug/kg wet						
Aldol Condensate 2	49500	A, J		ug/kg wet						
Aldol Condensate 3 RW 11/15/12	368	A, J		ug/kg wet						
Aldol Condensate 1	533	A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1530*			*ug/kg wet*	*2500.0*		*61*	*25-121*		
Surrogate: Phenol-d5	*1620*			*ug/kg wet*	*2500.0*		*65*	*24-113*		
Surrogate: Nitrobenzene-d5	*1050*			*ug/kg wet*	*1666.7*		*63*	*23-120*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:36

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 L211073 - SW 3540C										
Blank (L211073-BLK1)				Prepared: 11/08/2012 Analyzed: 11/09/2012						
Surrogate: 2-Fluorobiphenyl	*1110*			*ug/kg wet*	*1666.7*		*67*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1310*			*ug/kg wet*	*2500.0*		*52*	*19-122*		
Surrogate: p-Terphenyl-d14	*1190*			*ug/kg wet*	*1666.7*		*72*	*18-137*		
LCS (L211073-BS1)				Prepared: 11/08/2012 Analyzed: 11/09/2012						
1,2,4-Trichlorobenzene	1240		330	ug/kg wet	2000.0		62	45-110		
1,2-Dichlorobenzene	1290		330	ug/kg wet	2000.0		64	45-105		
1,3-Dichlorobenzene	1270		330	ug/kg wet	2000.0		63	40-100		
1,4-Dichlorobenzene	1280		330	ug/kg wet	2000.0		64	35-105		
2,4,5-Trichlorophenol	1390		330	ug/kg wet	2000.0		69	30-140		
2,4,6-Trichlorophenol	1300		330	ug/kg wet	2000.0		65	20-110		
2,4-Dichlorophenol	1320		330	ug/kg wet	2000.0		66	40-110		
2,4-Dimethylphenol	1180		330	ug/kg wet	2000.0		59	30-105		
2,4-Dinitrophenol	558	J	1650	ug/kg wet	2000.0		28	25-130		
2,4-Dinitrotoluene	1370		330	ug/kg wet	2000.0		68	50-115		
2,6-Dinitrotoluene	1390		330	ug/kg wet	2000.0		69	40-120		
2-Chloronaphthalene	1340		330	ug/kg wet	2000.0		67	45-115		
2-Chlorophenol	1360		330	ug/kg wet	2000.0		68	45-105		
2-Methylnaphthalene	1290		330	ug/kg wet	2000.0		64	45-110		
2-Methylphenol	1360		330	ug/kg wet	2000.0		68	40-120		
2-Nitroaniline	1500	J	1650	ug/kg wet	2000.0		75	45-120		
2-Nitrophenol	1270		330	ug/kg wet	2000.0		64	40-110		
3,3'-Dichlorobenzidine	1350		660	ug/kg wet	2000.0		67	15-130		
3-Nitroaniline	1300	J	1650	ug/kg wet	2000.0		65	40-130		
4,6-Dinitro-2-methylphenol	941		330	ug/kg wet	2000.0		47	20-140		
4-Bromophenyl Phenyl Ether	1280		330	ug/kg wet	2000.0		64	45-115		
4-Chloro-3-methylphenol	1350		330	ug/kg wet	2000.0		68	35-115		
4-Chloroaniline	1000		330	ug/kg wet	2000.0		50	10-100		
4-Chlorophenyl Phenyl Ether	1310		330	ug/kg wet	2000.0		66	45-110		
3- and/or 4-Methylphenol	1390		330	ug/kg wet	2000.0		70	40-120		
4-Nitroaniline	1460	J	1650	ug/kg wet	2000.0		73	40-130		
4-Nitrophenol	1490	J	1650	ug/kg wet	2000.0		74	15-140		
Acenaphthene	1370		330	ug/kg wet	2000.0		68	45-110		
Acenaphthylene	1430		330	ug/kg wet	2000.0		72	45-115		
Anthracene	1370		330	ug/kg wet	2000.0		68	45-130		
Benz[a]anthracene	1450		330	ug/kg wet	2000.0		73	45-130		
Benzo[a] pyrene	1350		330	ug/kg wet	2000.0		68	45-130		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:36

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 L211073 - SW 3540C										
LCS (L211073-BS1)				Prepared: 11/08/2012 Analyzed: 11/09/2012						
Benzo[b] fluoranthene	1430		330	ug/kg wet	2000.0		72	40-130		
Benzo[g,h,i] perylene	1480		330	ug/kg wet	2000.0		74	45-125		
Benzo[k] fluoranthene	1360		330	ug/kg wet	2000.0		68	45-125		
Bis(2-chloroethoxy) methane	1300		330	ug/kg wet	2000.0		65	45-110		
Bis(2-chloroethyl) ether	1270		330	ug/kg wet	2000.0		64	40-110		
Bis(2-chloroisopropyl) ether	1360		330	ug/kg wet	2000.0		68	30-115		
Bis(2-ethylhexyl) phthalate	1590		330	ug/kg wet	2000.0		80	40-145		
Butyl Benzyl Phthalate	1510		330	ug/kg wet	2000.0		76	50-125		
Carbazole	1570		330	ug/kg wet	2000.0		79	40-140		
Chrysene	1510		330	ug/kg wet	2000.0		76	45-130		
Dibenz[a,h]anthracene	1470		330	ug/kg wet	2000.0		73	45-125		
Dibenzofuran	1390		330	ug/kg wet	2000.0		70	45-120		
Diethyl Phthalate	1380		330	ug/kg wet	2000.0		69	50-125		
Dimethyl Phthalate	1330		330	ug/kg wet	2000.0		66	45-130		
Di-n-butyl Phthalate	1420		330	ug/kg wet	2000.0		71	50-130		
Di-n-octyl Phthalate	1560		330	ug/kg wet	2000.0		78	40-150		
Fluoranthene	1410		330	ug/kg wet	2000.0		71	45-130		
Fluorene	1350		330	ug/kg wet	2000.0		68	45-120		
Hexachlorobenzene	1380		330	ug/kg wet	2000.0		69	45-130		
Hexachlorobutadiene	1330		330	ug/kg wet	2000.0		66	45-105		
Hexachlorocyclopentadiene	919		330	ug/kg wet	2000.0		46	10-100		
Hexachloroethane	1290		330	ug/kg wet	2000.0		65	35-110		
Indeno[1,2,3-cd]pyrene	1470		330	ug/kg wet	2000.0		74	45-130		
Isophorone	1260		330	ug/kg wet	2000.0		63	40-110		
Naphthalene	1420		330	ug/kg wet	2000.0		71	40-110		
Nitrobenzene	1210		330	ug/kg wet	2000.0		60	40-105		
N-Nitrosodi-n-propylamine	1510		330	ug/kg wet	2000.0		76	30-130		
N-Nitrosodiphenylamine	1400		330	ug/kg wet	2000.0		70	50-120		
Pentachlorophenol	1230	J	1650	ug/kg wet	2000.0		61	25-120		
Phenanthrene	1440		330	ug/kg wet	2000.0		72	50-120		
Phenol	1380		330	ug/kg wet	2000.0		69	40-115		
Pyrene	1450		330	ug/kg wet	2000.0		73	45-125		
Surrogate: 2-Fluorophenol	*1830*			*ug/kg wet*	*2500.0*		*73*	*25-121*		
Surrogate: Phenol-d5	*1850*			*ug/kg wet*	*2500.0*		*74*	*24-113*		
Surrogate: Nitrobenzene-d5	*1150*			*ug/kg wet*	*1666.7*		*69*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1220*			*ug/kg wet*	*1666.7*		*73*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1850*			*ug/kg wet*	*2500.0*		*74*	*19-122*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:36

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 L211073 - SW 3540C										
LCS (L211073-BS1)				Prepared: 11/08/2012 Analyzed: 11/09/2012						
Surrogate: p-Terphenyl-d14	*1220*			*ug/kg wet*	*1666.7*		*73*	*18-137*		
Matrix Spike (L211073-MS1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/09/2012						
1,2,4-Trichlorobenzene	1210	D	1050	ug/kg dry	2116.6	1040 U	57	45-110		
1,2-Dichlorobenzene	1120	D	1050	ug/kg dry	2116.6	1040 U	53	45-105		
1,3-Dichlorobenzene	1010	J, D	1050	ug/kg dry	2116.6	1040 U	48	40-100		
1,4-Dichlorobenzene	1100	D	1050	ug/kg dry	2116.6	1040 U	52	35-105		
2,4,5-Trichlorophenol	1470	D	1050	ug/kg dry	2116.6	1040 U	70	30-140		
2,4,6-Trichlorophenol	1390	D	1050	ug/kg dry	2116.6	1040 U	66	20-110		
2,4-Dichlorophenol	1310	D	1050	ug/kg dry	2116.6	1040 U	62	40-110		
2,4-Dimethylphenol	1200	D	1050	ug/kg dry	2116.6	1040 U	57	30-105		
2,4-Dinitrophenol	769	J, D	5240	ug/kg dry	2116.6	5210 U	36	25-130		
2,4-Dinitrotoluene	1590	D	1050	ug/kg dry	2116.6	1040 U	75	50-115		
2,6-Dinitrotoluene	1560	D	1050	ug/kg dry	2116.6	1040 U	74	40-120		
2-Chloronaphthalene	1410	D	1050	ug/kg dry	2116.6	1040 U	66	45-115		
2-Chlorophenol	1260	D	1050	ug/kg dry	2116.6	1040 U	59	45-105		
2-Methylnaphthalene	1270	D	1050	ug/kg dry	2116.6	1040 U	60	45-110		
2-Methylphenol	1280	D	1050	ug/kg dry	2116.6	1040 U	61	40-120		
2-Nitroaniline	1510	J, D	5240	ug/kg dry	2116.6	5210 U	71	45-120		
2-Nitrophenol	1200	D	1050	ug/kg dry	2116.6	1040 U	57	40-110		
3,3'-Dichlorobenzidine	304	J, D	2100	ug/kg dry	2116.6	2090 U	14*	15-130		
3-Nitroaniline	1010	J, D	5240	ug/kg dry	2116.6	5210 U	48	40-130		
4,6-Dinitro-2-methylphenol	1220	D	1050	ug/kg dry	2116.6	1040 U	58	20-140		
4-Bromophenyl Phenyl Ether	1310	D	1050	ug/kg dry	2116.6	1040 U	62	45-115		
4-Chloro-3-methylphenol	1660	D	1050	ug/kg dry	2116.6	1040 U	79	35-115		
4-Chloroaniline	665	J, D	1050	ug/kg dry	2116.6	1040 U	31	10-100		
4-Chlorophenyl Phenyl Ether	1460	D	1050	ug/kg dry	2116.6	1040 U	69	45-110		
3- and/or 4-Methylphenol	1370	D	1050	ug/kg dry	2116.6	1040 U	65	40-120		
4-Nitroaniline	1260	J, D	5240	ug/kg dry	2116.6	5210 U	60	40-130		
4-Nitrophenol	1410	J, D	5240	ug/kg dry	2116.6	5210 U	66	15-140		
Acenaphthene	1430	D	1050	ug/kg dry	2116.6	1040 U	67	45-110		
Acenaphthylene	1560	D	1050	ug/kg dry	2116.6	1040 U	74	45-115		
Anthracene	1690	D	1050	ug/kg dry	2116.6	1040 U	80	45-130		
Benz[a]anthracene	1710	D	1050	ug/kg dry	2116.6	1040 U	81	45-130		
Benzo[a] pyrene	1570	D	1050	ug/kg dry	2116.6	1040 U	74	45-130		
Benzo[b] fluoranthene	1720	D	1050	ug/kg dry	2116.6	1040 U	81	40-130		
Benzo[g,h,i] perylene	1420	D	1050	ug/kg dry	2116.6	1040 U	67	45-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:36

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 L211073 - SW 3540C										
Matrix Spike (L211073-MS1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/09/2012						
Benzo[k] fluoranthene	1750	D	1050	ug/kg dry	2116.6	1040 U	83	45-125		
Bis(2-chloroethoxy) methane	1330	D	1050	ug/kg dry	2116.6	1040 U	63	45-110		
Bis(2-chloroethyl) ether	1200	D	1050	ug/kg dry	2116.6	1040 U	57	40-110		
Bis(2-chloroisopropyl) ether	1190	D	1050	ug/kg dry	2116.6	1040 U	56	30-115		
Bis(2-ethylhexyl) phthalate	1830	D	1050	ug/kg dry	2116.6	1040 U	87	40-145		
Butyl Benzyl Phthalate	1850	D	1050	ug/kg dry	2116.6	1040 U	87	50-125		
Carbazole	1960	D	1050	ug/kg dry	2116.6	1040 U	92	40-140		
Chrysene	1750	D	1050	ug/kg dry	2116.6	1040 U	83	45-130		
Dibenz[a,h]anthracene	1330	D	1050	ug/kg dry	2116.6	1040 U	63	45-125		
Dibenzofuran	1520	D	1050	ug/kg dry	2116.6	1040 U	72	45-120		
Diethyl Phthalate	1640	D	1050	ug/kg dry	2116.6	1040 U	78	50-125		
Dimethyl Phthalate	1490	D	1050	ug/kg dry	2116.6	1040 U	71	45-130		
Di-n-butyl Phthalate	1780	D	1050	ug/kg dry	2116.6	1040 U	84	50-130		
Di-n-octyl Phthalate	1990	D	1050	ug/kg dry	2116.6	1040 U	94	40-150		
Fluoranthene	1750	D	1050	ug/kg dry	2116.6	1040 U	83	45-130		
Fluorene	1510	D	1050	ug/kg dry	2116.6	1040 U	71	45-120		
Hexachlorobenzene	1390	D	1050	ug/kg dry	2116.6	1040 U	65	45-130		
Hexachlorobutadiene	1180	D	1050	ug/kg dry	2116.6	1040 U	56	45-105		
Hexachlorocyclopentadiene	450	J, D	1050	ug/kg dry	2116.6	1040 U	21	10-100		
Hexachloroethane	858	J, D	1050	ug/kg dry	2116.6	1040 U	41	35-110		
Indeno[1,2,3-cd]pyrene	1340	D	1050	ug/kg dry	2116.6	1040 U	63	45-130		
Isophorone	1260	D	1050	ug/kg dry	2116.6	1040 U	60	40-110		
Naphthalene	1370	D	1050	ug/kg dry	2116.6	1040 U	65	40-110		
Nitrobenzene	1190	D	1050	ug/kg dry	2116.6	1040 U	56	40-105		
N-Nitrosodi-n-propylamine	1290	D	1050	ug/kg dry	2116.6	1040 U	61	30-130		
N-Nitrosodiphenylamine	1450	D	1050	ug/kg dry	2116.6	1040 U	68	50-120		
Pentachlorophenol	1350	J, D	5240	ug/kg dry	2116.6	5210 U	64	25-120		
Phenanthrene	1770	D	1050	ug/kg dry	2116.6	1040 U	84	50-120		
Phenol	1390	D	1050	ug/kg dry	2116.6	1040 U	65	40-115		
Pyrene	1860	D	1050	ug/kg dry	2116.6	1040 U	88	45-125		
Surrogate: 2-Fluorophenol	*1710*			*ug/kg dry*	*2645.7*		*65*	*25-121*		
Surrogate: Phenol-d5	*1890*			*ug/kg dry*	*2645.7*		*71*	*24-113*		
Surrogate: Nitrobenzene-d5	*1230*			*ug/kg dry*	*1763.8*		*70*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1350*			*ug/kg dry*	*1763.8*		*77*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1610*			*ug/kg dry*	*2645.7*		*61*	*19-122*		
Surrogate: p-Terphenyl-d14	*1410*			*ug/kg dry*	*1763.8*		*80*	*18-137*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:36

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 L211073 - SW 3540C										
Matrix Spike Dup (L211073-MSD1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/09/2012						
1,2,4-Trichlorobenzene	1330	D	1060	ug/kg dry	2131.4	1040 U	63	45-110	9	40
1,2-Dichlorobenzene	1260	D	1060	ug/kg dry	2131.4	1040 U	59	45-105	11	40
1,3-Dichlorobenzene	1160	D	1060	ug/kg dry	2131.4	1040 U	54	40-100	13	40
1,4-Dichlorobenzene	1240	D	1060	ug/kg dry	2131.4	1040 U	58	35-105	12	40
2,4,5-Trichlorophenol	1730	D	1060	ug/kg dry	2131.4	1040 U	81	30-140	15	40
2,4,6-Trichlorophenol	1530	D	1060	ug/kg dry	2131.4	1040 U	72	20-110	9	40
2,4-Dichlorophenol	1530	D	1060	ug/kg dry	2131.4	1040 U	72	40-110	15	40
2,4-Dimethylphenol	1410	D	1060	ug/kg dry	2131.4	1040 U	66	30-105	15	40
2,4-Dinitrophenol	1210	J, D	5280	ug/kg dry	2131.4	5210 U	57	25-130	44*	40
2,4-Dinitrotoluene	1580	D	1060	ug/kg dry	2131.4	1040 U	74	50-115	1	40
2,6-Dinitrotoluene	1610	D	1060	ug/kg dry	2131.4	1040 U	75	40-120	2	40
2-Chloronaphthalene	1540	D	1060	ug/kg dry	2131.4	1040 U	72	45-115	9	40
2-Chlorophenol	1520	D	1060	ug/kg dry	2131.4	1040 U	71	45-105	18	40
2-Methylnaphthalene	1410	D	1060	ug/kg dry	2131.4	1040 U	66	45-110	10	40
2-Methylphenol	1620	D	1060	ug/kg dry	2131.4	1040 U	76	40-120	22	40
2-Nitroaniline	1900	J, D	5280	ug/kg dry	2131.4	5210 U	89	45-120	22	40
2-Nitrophenol	1300	D	1060	ug/kg dry	2131.4	1040 U	61	40-110	7	40
3,3'-Dichlorobenzidine	391	J, D	2110	ug/kg dry	2131.4	2090 U	18	15-130	24	40
3-Nitroaniline	1200	J, D	5280	ug/kg dry	2131.4	5210 U	56	40-130	17	40
4,6-Dinitro-2-methylphenol	1480	D	1060	ug/kg dry	2131.4	1040 U	70	20-140	19	40
4-Bromophenyl Phenyl Ether	1520	D	1060	ug/kg dry	2131.4	1040 U	71	45-115	14	40
4-Chloro-3-methylphenol	1810	D	1060	ug/kg dry	2131.4	1040 U	85	35-115	8	40
4-Chloroaniline	815	J, D	1060	ug/kg dry	2131.4	1040 U	38	10-100	20	40
4-Chlorophenyl Phenyl Ether	1590	D	1060	ug/kg dry	2131.4	1040 U	75	45-110	8	40
3- and/or 4-Methylphenol	1510	D	1060	ug/kg dry	2131.4	1040 U	71	40-120	9	40
4-Nitroaniline	1680	J, D	5280	ug/kg dry	2131.4	5210 U	79	40-130	28	40
4-Nitrophenol	1650	J, D	5280	ug/kg dry	2131.4	5210 U	78	15-140	16	40
Acenaphthene	1610	D	1060	ug/kg dry	2131.4	1040 U	76	45-110	12	40
Acenaphthylene	1770	D	1060	ug/kg dry	2131.4	1040 U	83	45-115	12	40
Anthracene	1770	D	1060	ug/kg dry	2131.4	1040 U	83	45-130	4	40
Benz[a]anthracene	1800	D	1060	ug/kg dry	2131.4	1040 U	84	45-130	4	40
Benzo[a] pyrene	1660	D	1060	ug/kg dry	2131.4	1040 U	78	45-130	5	40
Benzo[b] fluoranthene	1800	D	1060	ug/kg dry	2131.4	1040 U	84	40-130	4	40
Benzo[g,h,i] perylene	1550	D	1060	ug/kg dry	2131.4	1040 U	73	45-125	8	40
Benzo[k] fluoranthene	1670	D	1060	ug/kg dry	2131.4	1040 U	78	45-125	5	40
Bis(2-chloroethoxy) methane	1530	D	1060	ug/kg dry	2131.4	1040 U	72	45-110	13	40

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:36

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 L211073 - SW 3540C										
Matrix Spike Dup (L211073-MSD1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/09/2012						
Bis(2-chloroethyl) ether	1360	D	1060	ug/kg dry	2131.4	1040 U	64	40-110	12	40
Bis(2-chloroisopropyl) ether	1430	D	1060	ug/kg dry	2131.4	1040 U	67	30-115	18	40
Bis(2-ethylhexyl) phthalate	2040	D	1060	ug/kg dry	2131.4	1040 U	96	40-145	10	40
Butyl Benzyl Phthalate	1960	D	1060	ug/kg dry	2131.4	1040 U	92	50-125	5	40
Carbazole	2000	D	1060	ug/kg dry	2131.4	1040 U	94	40-140	1	40
Chrysene	1930	D	1060	ug/kg dry	2131.4	1040 U	91	45-130	9	40
Dibenz[a,h]anthracene	1460	D	1060	ug/kg dry	2131.4	1040 U	68	45-125	9	40
Dibenzofuran	1710	D	1060	ug/kg dry	2131.4	1040 U	80	45-120	11	40
Diethyl Phthalate	1740	D	1060	ug/kg dry	2131.4	1040 U	82	50-125	5	40
Dimethyl Phthalate	1670	D	1060	ug/kg dry	2131.4	1040 U	78	45-130	10	40
Di-n-butyl Phthalate	1880	D	1060	ug/kg dry	2131.4	1040 U	88	50-130	5	40
Di-n-octyl Phthalate	2100	D	1060	ug/kg dry	2131.4	1040 U	99	40-150	5	40
Fluoranthene	1870	D	1060	ug/kg dry	2131.4	1040 U	88	45-130	6	40
Fluorene	1640	D	1060	ug/kg dry	2131.4	1040 U	77	45-120	7	40
Hexachlorobenzene	1450	D	1060	ug/kg dry	2131.4	1040 U	68	45-130	4	40
Hexachlorobutadiene	1320	D	1060	ug/kg dry	2131.4	1040 U	62	45-105	10	40
Hexachlorocyclopentadiene	538	J, D	1060	ug/kg dry	2131.4	1040 U	25	10-100	17	40
Hexachloroethane	953	J, D	1060	ug/kg dry	2131.4	1040 U	45	35-110	10	40
Indeno[1,2,3-cd]pyrene	1470	D	1060	ug/kg dry	2131.4	1040 U	69	45-130	9	40
Isophorone	1400	D	1060	ug/kg dry	2131.4	1040 U	66	40-110	10	40
Naphthalene	1540	D	1060	ug/kg dry	2131.4	1040 U	72	40-110	11	40
Nitrobenzene	1370	D	1060	ug/kg dry	2131.4	1040 U	64	40-105	14	40
N-Nitrosodi-n-propylamine	1600	D	1060	ug/kg dry	2131.4	1040 U	75	30-130	21	40
N-Nitrosodiphenylamine	1680	D	1060	ug/kg dry	2131.4	1040 U	79	50-120	14	40
Pentachlorophenol	1370	J, D	5280	ug/kg dry	2131.4	5210 U	64	25-120	1	40
Phenanthrene	1790	D	1060	ug/kg dry	2131.4	1040 U	84	50-120	0.08	40
Phenol	1570	D	1060	ug/kg dry	2131.4	1040 U	74	40-115	12	40
Pyrene	1940	D	1060	ug/kg dry	2131.4	1040 U	91	45-125	4	40
Surrogate: 2-Fluorophenol	*1860*			*ug/kg dry*	*2664.2*		*70*	*25-121*		
Surrogate: Phenol-d5	*2030*			*ug/kg dry*	*2664.2*		*76*	*24-113*		
Surrogate: Nitrobenzene-d5	*1230*			*ug/kg dry*	*1776.1*		*69*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1400*			*ug/kg dry*	*1776.1*		*79*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1720*			*ug/kg dry*	*2664.2*		*64*	*19-122*		
Surrogate: p-Terphenyl-d14	*1420*			*ug/kg dry*	*1776.1*		*80*	*18-137*		

PREPARATION BENCH SHEET

L211073

Lionville Laboratory

Printed: 11/9/2012 1:56:13PM

000000044

Matrix: Solid **Prepared using: Extraction - SW 3540C** **Surrogate used: 1201164**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211027-01	8270C TCL SVOC	11/08/2012 14:56	30.35	1				500	WC-Hanford, Inc.	use Versions
L211073-BLK1	QC	11/08/2012 14:56	30	1				500		
L211073-BS1	QC	11/08/2012 14:56	30	1	1201082		600	500		
L211073-MS1	QC	11/08/2012 14:56	30.21	1	1201082	1211027-01	600	500		
L211073-MSD1	QC	11/08/2012 14:56	30	1	1201082	1211027-01	600	500		

Extracts Relinquished By: Date 11/9/12 1358

Extracts Received By: Date 11/9/12 1420

PCBs

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 18:49

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R557	1211027-01	Soil	11/06/2012 10:15	11/08/2012 09:50

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-225 KP0146
LVL #: 1211027

W.O. #: 60049-001-001-0001-00
Received: 11-08-2012

PCBs

One (1) soil sample was collected on 11-06-2012.

The sample and associated QC samples were extracted 11-08-2012 and analyzed 11-09-2012 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 a sample 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 were 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.
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

11/23/12
Date

r:\group\data\2012\pcb\wc hanford\1211027.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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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 18:49

J1R557
1211027-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	14.2	U	14.2	ug/kg dry	1	L211075	11/08/2012	11/09/2012	8082
Aroclor 1221	14.2	U	14.2	ug/kg dry	1	L211075	11/08/2012	11/09/2012	8082
Aroclor 1232	14.2	U	14.2	ug/kg dry	1	L211075	11/08/2012	11/09/2012	8082
Aroclor 1242	14.2	U	14.2	ug/kg dry	1	L211075	11/08/2012	11/09/2012	8082
Aroclor 1248	14.2	U	14.2	ug/kg dry	1	L211075	11/08/2012	11/09/2012	8082
Aroclor 1254	14.2	U	14.2	ug/kg dry	1	L211075	11/08/2012	11/09/2012	8082
Aroclor 1260	14.2	U	14.2	ug/kg dry	1	L211075	11/08/2012	11/09/2012	8082
Aroclor 1262	14.2	U	14.2	ug/kg dry	1	L211075	11/08/2012	11/09/2012	8082
Aroclor 1268	14.2	U	14.2	ug/kg dry	1	L211075	11/08/2012	11/09/2012	8082
Surrogate: Decachlorobiphenyl	*95 %*		*43-144*			*L211075*	*11/08/2012*	*11/09/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*85 %*		*52-141*			*L211075*	*11/08/2012*	*11/09/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 18:49

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 L211075 - SW 3540C										
Blank (L211075-BLK1)				Prepared: 11/08/2012 Analyzed: 11/09/2012						
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	*35.1*			*ug/kg wet*	*33.333*		*105*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*33.6*			*ug/kg wet*	*33.337*		*101*	*52-141*		
LCS (L211075-BS1)				Prepared: 11/08/2012 Analyzed: 11/09/2012						
Aroclor 1016	136		13.3	ug/kg wet	166.67		82	50-138		
Aroclor 1260	158		13.3	ug/kg wet	166.67		95	50-148		
Surrogate: Decachlorobiphenyl	*33.3*			*ug/kg wet*	*33.333*		*100*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*29.8*			*ug/kg wet*	*33.337*		*89*	*52-141*		
Matrix Spike (L211075-MS1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/09/2012						
Aroclor 1016	149		14.1	ug/kg dry	176.38	14.2 U	85	50-138		
Aroclor 1260	171		14.1	ug/kg dry	176.38	14.2 U	97	50-148		
Surrogate: Decachlorobiphenyl	*34.4*			*ug/kg dry*	*35.276*		*98*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*31.9*			*ug/kg dry*	*35.279*		*90*	*52-141*		
Matrix Spike Dup (L211075-MSD1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/09/2012						
Aroclor 1016	153		14.2	ug/kg dry	177.61	14.2 U	86	50-138	2	40
Aroclor 1260	180		14.2	ug/kg dry	177.61	14.2 U	101	50-148	4	40
Surrogate: Decachlorobiphenyl	*34.2*			*ug/kg dry*	*35.523*		*96*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*31.4*			*ug/kg dry*	*35.526*		*88*	*52-141*		

PREPARATION BENCH SHEET

L211075

Lionville Laboratory

Printed: 11/9/2012 2:04:16PM

000000051

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211027-01	8082 PCBs	11/08/2012 14:55	30	10				250	WC-Hanford, Inc.	
L211075-BLK1	QC	11/08/2012 14:55	30	10				250		
L211075-BS1	QC	11/08/2012 14:55	30	10	1200902		250	250		
L211075-MS1	QC	11/08/2012 14:55	30.21	10	1200902	1211027-01	250	250		
L211075-MSD1	QC	11/08/2012 14:55	30	10	1200902	1211027-01	250	250		

S cleared 11.09.12 SL
Cu lot# B10X036

11/9/12 1400
Extracts Relinquished By Date

S Lak 11.09.12 14:20
Extracts Received By Date

DRO/MO

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 18:48

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R557	1211027-01	Soil	11/06/2012 10:15	11/08/2012 09:50

LIONVILLE LABORATORY
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Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-225 KP0146
LVL #: 1211027

W.O. #: 60049-001-001-0001-00
Date Received: 11-08-2012

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 11-06-2012.

The sample and associated QC samples were extracted 11-08-2012 and analyzed 11-10-2012 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 a sample 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 were 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.
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

11/23/12
Date

r:\group\data\2012\dro\wc hanford\1211027.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-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 18:48

J1R557
1211027-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Extractable Petroleum Hydrocarbons by SW846 8015									
Diesel Range Organics	3600	U	3600	ug/kg dry	1	L211070	11/08/2012	11/10/2012	8015M
Motor Oil	**19700**		10800	ug/kg dry	1	L211070	11/08/2012	11/10/2012	8015M
Surrogate: p-Terphenyl	*60 %*		*39-129*			*L211070*	*11/08/2012*	*11/10/2012*	*8015M*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/14/2012 18:48

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 L211070 - SW 3540C										
Blank (L211070-BLK1)				Prepared: 11/08/2012 Analyzed: 11/10/2012						
Diesel Range Organics	3330	U	3330	ug/kg wet						
Motor Oil	10000	U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*6980*			*ug/kg wet*	*6666.7*		*105*	*39-129*		
LCS (L211070-BS1)				Prepared: 11/08/2012 Analyzed: 11/10/2012						
Diesel Range Organics	58500		3330	ug/kg wet	66667		88	42-133		
Surrogate: p-Terphenyl	*6610*			*ug/kg wet*	*6666.7*		*99*	*39-129*		
Matrix Spike (L211070-MS1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/10/2012						
Diesel Range Organics	68500		3510	ug/kg dry	70180	3600 U	98	42-133		
Surrogate: p-Terphenyl	*7500*			*ug/kg dry*	*7018.0*		*107*	*39-129*		
Matrix Spike Dup (L211070-MSD1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/10/2012						
Diesel Range Organics	76400		3510	ug/kg dry	70250	3600 U	109	42-133	11	40
Surrogate: p-Terphenyl	*7330*			*ug/kg dry*	*7025.0*		*104*	*39-129*		

PREPARATION BENCH SHEET

L211070

Lionville Laboratory

Printed: 11/10/2012 8:30:37AM

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211027-01	8015M DRO	11/08/2012 14:50	29.62	1				1000	WC-Hanford, Inc.	
L211070-BLK1	QC	11/08/2012 14:50	30	1				1000		
L211070-BS1	QC	11/08/2012 14:50	30	1	1200846		1000	1000		
L211070-MS1	QC	11/08/2012 14:50	30.37	1	1200846	1211027-01	1000	1000		
L211070-MSD1	QC	11/08/2012 14:50	30.34	1	1200846	1211027-01	1000	1000		

Extracts Relinquished By Date

Extracts Received By Date

PAHs

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:51

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R557	1211027-01	Soil	11/06/2012 10:15	11/08/2012 09:50

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-225 KP0146
LVL #: 1211027

W.O. #: 60049-001-001-0001-00
Date Received: 11-08-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) soil sample was collected on 11-06-2012.

The sample and associated QC samples were extracted 11-08-2012 and analyzed 11-13-2012 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 a sample that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.
2. All required holding times for extraction and analysis have been met.
3. All samples required a 10-fold instrument dilution due to high concentrations of non-target analytes.
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. One (1) of thirty-two (32) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC189) has been enclosed.
8. The sample was reported on a dry weight basis.
9. The 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.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

11/23/12
Date

r:\group\data\2012\pah 8310\wc hanford\1211027.doc
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC189

Initiator: L. Kauffman
Date: 11-15-2012
Client: WC Hanford RC-225

Batch: 121027
Samples: 01
Method: SW846/MCAWW/CLP/

Parameter: PAH
Matrix: Soil
Prep Batch: L 211074

1. Reason for SDR

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

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

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

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

One of thirty-two matrix spike recoveries was above the acceptance criteria.

2. Known or Probable Causes(s)

Sample matrix

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:

No target present - No impact on data

Narrate

ID

4. Project Manager Instructions...signature/date: 11/23/12

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

5. Final Action...signature/date: 11/23/12

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

Other Explanation:

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

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

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

QA-139-A-0208

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

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Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:51

J1R557
1211027-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**51.5**	D	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Acenaphthylene	**32.0**	J, D	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Acenaphthene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Fluorene	**16.6**	J, D	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Phenanthrene	**172**	D	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Anthracene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Fluoranthene	**38.7**	D	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Indeno[1,2,3-cd]pyrene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Pyrene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Benz[a]anthracene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Chrysene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Benzo[b] fluoranthene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Benzo[k] fluoranthene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Benzo[a] pyrene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Dibenz[a,h]anthracene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Benzo[g,h,i] perylene	35.0	U	35.0	ug/kg dry	10	L211074	11/08/2012	11/13/2012	8310
Surrogate: Triphenylene	*82 %*		*68-129*			*L211074*	*11/08/2012*	*11/13/2012*	*8310*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 09:51

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 L211074 - SW 3540C										
Blank (L211074-BLK1)				Prepared: 11/08/2012 Analyzed: 11/13/2012						
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	*151*			*ug/kg wet*	*166.67*		*90*	*68-129*		
LCS (L211074-BS1)				Prepared: 11/08/2012 Analyzed: 11/13/2012						
Naphthalene	135		3.33	ug/kg wet	166.67		81	0-127		
Acenaphthylene	137		3.33	ug/kg wet	166.67		82	50-140		
Acenaphthene	152		3.33	ug/kg wet	166.67		91	17-139		
Fluorene	146		3.33	ug/kg wet	166.67		88	28-145		
Phenanthrene	146		3.33	ug/kg wet	166.67		88	30-152		
Anthracene	145		3.33	ug/kg wet	166.67		87	19-171		
Fluoranthene	150		3.33	ug/kg wet	166.67		90	34-159		
Indeno[1,2,3-cd]pyrene	151		3.33	ug/kg wet	166.67		91	31-156		
Pyrene	146		3.33	ug/kg wet	166.67		87	33-152		
Benz[a]anthracene	160		3.33	ug/kg wet	166.67		96	32-157		
Chrysene	146		3.33	ug/kg wet	166.67		88	31-159		
Benzo[b] fluoranthene	157		3.33	ug/kg wet	166.67		94	33-164		
Benzo[k] fluoranthene	157		3.33	ug/kg wet	166.67		94	28-161		
Benzo[a] pyrene	156		3.33	ug/kg wet	166.67		94	29-149		
Dibenz[a,h]anthracene	158		3.33	ug/kg wet	166.67		95	27-153		
Benzo[g,h,i] perylene	157		3.33	ug/kg wet	166.67		94	32-157		
Surrogate: Triphenylene	*152*			*ug/kg wet*	*166.67*		*91*	*68-129*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/15/2012 10:32

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 L211074 - SW 3540C										
Matrix Spike (L211074-MS1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/13/2012						
Naphthalene	208	D	36.1	ug/kg dry	180.62	51.5	87	0-127		
Acenaphthylene	206	D	36.1	ug/kg dry	180.62	32.0	96	50-140		
Acenaphthene	151	D	36.1	ug/kg dry	180.62	35.0 U	84	17-139		
Fluorene	183	D	36.1	ug/kg dry	180.62	16.6	92	28-145		
Phenanthrene	338	D	36.1	ug/kg dry	180.62	172	92	30-152		
Anthracene	139	D	36.1	ug/kg dry	180.62	35.0 U	77	19-171		
Fluoranthene	203	D	36.1	ug/kg dry	180.62	38.7	91	34-159		
Indeno[1,2,3-cd]pyrene	286	D	36.1	ug/kg dry	180.62	35.0 U	159*	31-156		
Pyrene	182	D	36.1	ug/kg dry	180.62	35.0 U	101	33-152		
Benz[a]anthracene	168	D	36.1	ug/kg dry	180.62	35.0 U	93	32-157		
Chrysene	169	D	36.1	ug/kg dry	180.62	35.0 U	93	31-159		
Benzo[b] fluoranthene	185	D	36.1	ug/kg dry	180.62	35.0 U	102	33-164		
Benzo[k] fluoranthene	174	D	36.1	ug/kg dry	180.62	35.0 U	96	28-161		
Benzo[a] pyrene	183	D	36.1	ug/kg dry	180.62	35.0 U	102	29-149		
Dibenz[a,h]anthracene	175	D	36.1	ug/kg dry	180.62	35.0 U	97	27-153		
Benzo[g,h,i] perylene	180	D	36.1	ug/kg dry	180.62	35.0 U	100	32-157		
Surrogate: Triphenylene	*174*			*ug/kg dry*	*180.62*		*96*	*68-129*		
Matrix Spike Dup (L211074-MSD1)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/13/2012						
Naphthalene	181	D	35.4	ug/kg dry	177.08	51.5	73	0-127	17	40
Acenaphthylene	181	D	35.4	ug/kg dry	177.08	32.0	84	50-140	14	40
Acenaphthene	146	D	35.4	ug/kg dry	177.08	35.0 U	82	17-139	2	40
Fluorene	173	D	35.4	ug/kg dry	177.08	16.6	88	28-145	4	40
Phenanthrene	334	D	35.4	ug/kg dry	177.08	172	92	30-152	0.8	40
Anthracene	150	D	35.4	ug/kg dry	177.08	35.0 U	85	19-171	10	40
Fluoranthene	203	D	35.4	ug/kg dry	177.08	38.7	93	34-159	2	40
Indeno[1,2,3-cd]pyrene	252	D	35.4	ug/kg dry	177.08	35.0 U	142	31-156	11	40
Pyrene	167	D	35.4	ug/kg dry	177.08	35.0 U	94	33-152	6	40
Benz[a]anthracene	164	D	35.4	ug/kg dry	177.08	35.0 U	93	32-157	0.2	40
Chrysene	145	D	35.4	ug/kg dry	177.08	35.0 U	82	31-159	13	40
Benzo[b] fluoranthene	133	D	35.4	ug/kg dry	177.08	35.0 U	75	33-164	30	40
Benzo[k] fluoranthene	158	D	35.4	ug/kg dry	177.08	35.0 U	89	28-161	7	40
Benzo[a] pyrene	174	D	35.4	ug/kg dry	177.08	35.0 U	98	29-149	3	40
Dibenz[a,h]anthracene	167	D	35.4	ug/kg dry	177.08	35.0 U	95	27-153	2	40
Benzo[g,h,i] perylene	154	D	35.4	ug/kg dry	177.08	35.0 U	87	32-157	14	40
Surrogate: Triphenylene	*153*			*ug/kg dry*	*177.08*		*87*	*68-129*		

PREPARATION BENCH SHEET

L211074

Lionville Laboratory

Printed: 11/12/2012 10:44:08AM

Matrix: Solid

Prepared using: HPLC - SW 3540C

Surrogate used: 1200612

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211027-01	8310 PAH	11/08/2012 14:56	30.43	5				50	WC-Hanford, Inc.	
L211074-BLK1	QC	11/08/2012 14:56	30	5				50		
L211074-BS1	QC	11/08/2012 14:56	30	5	1200963		50	50		
L211074-MS1	QC	11/08/2012 14:56	29.5	5	1200963	1211027-01	50	50		
L211074-MSD1	QC	11/08/2012 14:56	30.09	5	1200963	1211027-01	50	50		

Extracts Relinquished By Date

Extracts Received By Date

00000067

METALS

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/19/2012 09:26

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R557	1211027-01	Soil	11/06/2012 10:15	11/08/2012 09:50

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-225
LVL#: 1211027
SDG/SAF#: KP0146/RC-225

W.O.#: 60049-001-001-0001-00
Date Received: 11-08-12

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 analysis of 1 soil sample.

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

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

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of CCV4 for Silicon (115.3%). All samples reported from file ICP111212B were surrounded by in control QC.

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

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

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

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

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 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, Iron, Antimony, Chromium, Manganese, and Silicon.

12. The duplicate analyses for 2 analytes were outside the 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 Molybdenum and Mercury 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

11/20/12
Date

alm/11-027ccvhg%

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/19/2012 09:26

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
B	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag)
*	Value outside QC acceptance criteria
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
wet	Sample results reported on a wet weight basis
RPD	Relative Percent Difference

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/19/2012 09:26

J1R557

1211027-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**10400**		13.8	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Antimony	1.65	U	1.65	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Arsenic	**12.9**		2.76	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Barium	**101**		1.38	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Beryllium	**0.357**	B	0.551	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Boron	**1.81**	B	5.51	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Cadmium	**0.800**		0.551	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Calcium	**4800**		276	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Chromium	**157**		0.551	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Cobalt	**7.77**		5.51	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Copper	**25.0**		2.76	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Iron	**24800**		55.1	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Lead	**32.8**		1.38	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Magnesium	**5440**		207	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Manganese	**628**		13.8	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Molybdenum	**0.996**	B	5.51	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Nickel	**20.8**		11.0	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Potassium	**1640**		1100	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Selenium	0.827	U	0.827	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Silicon	**472**		5.51	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Silver	0.551	U	0.551	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Sodium	**220**		138	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Vanadium	**58.9**		6.89	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Zinc	**167**		27.6	mg/kg dry	3	L211069	11/08/2012	11/12/2012	6010B
Mercury	**0.0143**	B	0.0282	mg/kg dry	1	L211072	11/09/2012	11/09/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/19/2012 09:26

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 L211069 - SW 3050B										
Blank (L211069-BLK1)				Prepared: 11/08/2012 Analyzed: 11/12/2012						
Aluminum	4.72	U	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	6.20	B	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	1.21	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 (L211069-DUP2)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/12/2012						
Aluminum	10200		14.5	mg/kg dry		10400			2	20
Antimony	1.74	U	1.74	mg/kg dry		1.65 U				20
Arsenic	16.1		2.91	mg/kg dry		12.9			22*	20
Barium	98.8		1.45	mg/kg dry		101			3	20
Beryllium	0.355	B	0.581	mg/kg dry		0.357			0.5	20
Boron	1.77	B	5.81	mg/kg dry		1.81			3	20
Cadmium	0.846		0.581	mg/kg dry		0.800			6	20
Calcium	4750		291	mg/kg dry		4800			1	20
Chromium	176		0.581	mg/kg dry		157			11	20
Cobalt	7.86		5.81	mg/kg dry		7.77			1	20
Copper	26.8		2.91	mg/kg dry		25.0			7	20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/19/2012 09:26

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 L211069 - SW 3050B										
Duplicate (L211069-DUP2)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/12/2012						
Iron	31900		58.1	mg/kg dry		24800			25*	20
Lead	32.8		1.45	mg/kg dry		32.8			0.1	20
Magnesium	5210		218	mg/kg dry		5440			4	20
Manganese	751		14.5	mg/kg dry		628			18	20
Molybdenum	0.767	B	5.81	mg/kg dry		0.996			26*	20
Nickel	18.6		11.6	mg/kg dry		20.8			11	20
Potassium	1630		1160	mg/kg dry		1640			0.6	20
Selenium	0.872	U	0.872	mg/kg dry		0.827 U				20
Silicon	418		5.81	mg/kg dry		472			12	20
Silver	0.581	U	0.581	mg/kg dry		0.551 U				20
Sodium	215		145	mg/kg dry		220			2	20
Vanadium	60.8		7.27	mg/kg dry		58.9			3	20
Zinc	172		29.1	mg/kg dry		167			3	20
Matrix Spike (L211069-MS2)		**Source: 1211027-01**		Prepared: 11/08/2012 Analyzed: 11/12/2012						
Aluminum	11900		15.1	mg/kg dry	201.07	10400	777*	75-125		
Antimony	12.6		1.81	mg/kg dry	50.268	1.65 U	25*	75-125		
Arsenic	192		3.02	mg/kg dry	201.07	12.9	89	75-125		
Barium	294		1.51	mg/kg dry	201.07	101	96	75-125		
Beryllium	4.99		0.603	mg/kg dry	5.0268	0.357	92	75-125		
Boron	89.9		6.03	mg/kg dry	100.54	1.81	88	75-125		
Cadmium	5.60		0.603	mg/kg dry	5.0268	0.800	96	75-125		
Calcium	7560		302	mg/kg dry	2513.4	4800	110	75-125		
Chromium	233		0.603	mg/kg dry	20.107	157	378*	75-125		
Cobalt	52.9		6.03	mg/kg dry	50.268	7.77	90	75-125		
Copper	48.0		3.02	mg/kg dry	25.134	25.0	91	75-125		
Iron	24200		60.3	mg/kg dry	100.54	24800	-611*	75-125		
Lead	79.1		1.51	mg/kg dry	50.268	32.8	92	75-125		
Magnesium	7710		226	mg/kg dry	2513.4	5440	91	75-125		
Manganese	772		15.1	mg/kg dry	50.268	628	286*	75-125		
Molybdenum	89.4		6.03	mg/kg dry	100.54	0.996	88	75-125		
Nickel	63.9		12.1	mg/kg dry	50.268	20.8	86	75-125		
Potassium	4070		1210	mg/kg dry	2513.4	1640	97	75-125		
Selenium	180		0.905	mg/kg dry	201.07	0.827 U	89	75-125		
Silicon	528		6.03	mg/kg dry	100.54	472	56*	75-125		
Silver	4.67		0.603	mg/kg dry	5.0268	0.551 U	93	75-125		
Sodium	2640		151	mg/kg dry	2513.4	220	96	75-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-225 Project Number: KP0146 Project Manager: Joan Kessner	**Reported:** 11/19/2012 09:26

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 L211069 - SW 3050B									
Matrix Spike (L211069-MS2)		**Source: 1211027-01**	Prepared: 11/08/2012 Analyzed: 11/12/2012						
Vanadium	111	7.54	mg/kg dry	50.268	58.9	103	75-125		
Zinc	215	30.2	mg/kg dry	50.268	167	95	75-125		
Post Spike (L211069-PS2)		**Source: 1211027-01**	Prepared: 11/08/2012 Analyzed: 11/12/2012						
Aluminum	174000		ug/L	66000	113000	93	75-125		
Antimony	303		ug/L	300.00	6.37	99	75-125		
Chromium	1980		ug/L	300.00	1710	89	75-125		
Iron	383000		ug/L	126000	270000	89	75-125		
Manganese	9660		ug/L	3000.0	6840	94	75-125		
Silicon	11300		ug/L	6300.0	5140	98	75-125		
Reference (L211069-SRM1)			Prepared: 11/08/2012 Analyzed: 11/12/2012						
Aluminum	10700	13.2	mg/kg wet	6670.0		160	0-200.89		
Antimony	34.6	1.58	mg/kg wet	53.000		65	0-235.8		
Arsenic	110	2.63	mg/kg wet	114.00		97	82.8-117.54		
Barium	288	1.32	mg/kg wet	307.00		94	79.8-120.2		
Beryllium	101	0.526	mg/kg wet	108.00		94	82.8-117.6		
Boron	75.4	5.26	mg/kg wet	85.100		89	67.5-132.8		
Cadmium	215	0.526	mg/kg wet	225.00		95	83.6-116.4		
Calcium	3150	263	mg/kg wet	3360.0		94	83.3-116.9		
Chromium	77.8	0.526	mg/kg wet	77.200		101	73.3-126.4		
Cobalt	154	5.26	mg/kg wet	166.00		93	80.7-118.7		
Copper	252	2.63	mg/kg wet	271.00		93	80.8-119.2		
Iron	8180	52.6	mg/kg wet	8420.0		97	78.6-121.1		
Lead	177	1.32	mg/kg wet	190.00		93	81.6-118.4		
Magnesium	7920	197	mg/kg wet	8570.0		92	83.2-116.7		
Manganese	953	13.2	mg/kg wet	965.00		99	69.3-130.5		
Molybdenum	220	5.26	mg/kg wet	235.00		94	76.2-123.8		
Nickel	209	10.5	mg/kg wet	221.00		95	79.6-120.8		
Potassium	13700	1050	mg/kg wet	14400		95	81.9-118.1		
Selenium	180	0.789	mg/kg wet	187.00		96	75.9-124.6		
Silicon	191	5.26	mg/kg wet	807.00		24	0-219.3		
Silver	80.4	0.526	mg/kg wet	83.500		96	82.7-117.1		
Sodium	8730	132	mg/kg wet	9730.0		90	82.5-117.2		
Vanadium	101	6.58	mg/kg wet	98.700		103	75.9-123.6		
Zinc	189	26.3	mg/kg wet	199.00		95	78.4-121.6		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0146	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/19/2012 09:26

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 L211072 - SW 7471A Prep										
Blank (L211072-BLK1)				Prepared & Analyzed: 11/09/2012						
Mercury	0.0237	U	0.0237	mg/kg wet						
Duplicate (L211072-DUP2)		**Source: 1211027-01**		Prepared & Analyzed: 11/09/2012						
Mercury	0.0207	B	0.0291	mg/kg dry		0.0143			36.7*	20
Matrix Spike (L211072-MS2)		**Source: 1211027-01**		Prepared & Analyzed: 11/09/2012						
Mercury	0.210		0.0309	mg/kg dry	0.17188	0.0143	114	75-125		20
Reference (L211072-SRM1)				Prepared & Analyzed: 11/09/2012						
Mercury	1.28		0.0243	mg/kg wet	1.2900		99.0	62.6-138		

Lionville Laboratory

Logbook #: 1154

SAMPLE DIGESTION RECORD

Digestion Batch #: L211069
Date/Time Initiated: 11/8/12 1640
Date/Time Completed: 11/9/12 1400
Analyst: CM
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
1211026-01		0.55	50		TOT	fine	Brown soil		
L211069-DUP1		0.51	50			fine	Brown Soil		
MS1	0.5	0.54	50			fine	Brown Soil		
02		0.58	50			fine	Brown Soil		
1211027-01		0.58	50			fine	Brown Soil		
L211069-DUP2		0.55	50			fine	Brown Soil		
MS2	0.5	0.53	50			fine	Brown Soil		
BLK		0.53	50			coarse	Boiling Chips		
SRM	✱	0.57	50			fine	Pink Loamy		

CEM 11/9/12

Spiking IDs / Expiration Date:
MS# : 1201377
LCS# ✱1201014

Reagent IDs:
HNO_3 0000003390
HCl L13029
H_2O_2 L11A03
1:1 HNO_3 037-066-02
1:1 HCl

File ID#:

Data Review By/Date: 11/14/12

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Signed\SPI\Metals Digestion log.doc

Page #:

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1153

Analyst: TCB
Date 11/9/12
Start Time/Temp: 1230 / 93°
End Time/Temp: 1305 / 96°

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

Prep Batch: L211072
Worksheet: HG110901
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				10 mL	50	
0.2 µg/L		0.100		10 mL	50	
1.0		0.500		10 mL	50	
2.0		1.000		10 mL	50	
5.0		2.500		10 mL	50	
10.0		5.000		10 mL	50	
ICV		0.125	2.5	10 mL	50	
CCV		0.25	5.0	10 mL	50	
ICB/CCB				10 mL	50	
L211072-BLK				0.38	50	
SRM		*	*	0.37	50	
12110026-01				0.33	50	
L211072-Dup1				0.34	50	
MS1		0.5	1.0	0.37	50	
02				0.36	50	
1211027-01				0.34	50	
L211072-Dup2				0.33	50	
MS2		0.5	1.0	0.31	50	

TCB 11/9/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	
ICV/CCV/LCS	IV 1200532	

Reviewed By/Date: RC 11/19/12

se book # 1153 for std traceability information

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

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