SAF-RC-073
100-D/DR Burial Grounds & Remaining Sites – Other Quick Turn
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

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

COMMENTS:

SDG K4003 SAF RC-073

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

REVISED TO INCLUDE ADD-ON CHEM

Waste Site: 100-D-50:1 Pipelines - contents

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
2030 Wright Avenue
Richmond, California 94804-3849
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November 3, 2012

Ms. Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99352

Reference: **P.O. #S00W235A01**
Eberline Analytical S2-10-043-7025 SDG K4003

Dear Ms. Kessner:

Enclosed is the data report for one solid (other solid) sample designated under SAF No. RC-073. The sample was received at Eberline Analytical on October 17, 2012. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Joseph Verville
Client Services Manager

NJV/

Enclosure: Data Package

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K4003 was composed of one solid (other solid) sample designated under SAF No. RC-073 with a Project Designation of: 100-D/DR Burial Grounds & Remaining Sites – Other Quick.

The sample was received as stated on the Chain-of-Custody document. The requested tritium and C-14 analyses were verbally changed to low level analyses on October 18, 2012. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results were transmitted to WCH via e-mail on November 3, 2012.

The sample consisted of the gravel like contents of a pipe. Results are reported in units of pCi/gram.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis, Low Level

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis, Low Level

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.5 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.6 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

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

11/3/12

Joseph Verville
Client Services Manager

Date

E B E R L I N E A N A L Y T I C A L - R I C H M O N D
SAMPLE DELIVERY GROUP K4003

SDG	7025
Contact	Joseph Verville

Client	Hanford
Contract	No. S00W235A01
Case no	SDG_K4003

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

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Prepared by

Reviewed by

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	11/03/12

SDG 7025
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K4003

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/03/12

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

SDG 7025
Contact Joseph Verville

LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K4003

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S210043-01	J1R3M5	100D50:1 Pipelns-Content	SOLID		RC-073	RC-073-216	10/16/12 08:55
S210043-02	Lab Control Sample		SOLID		RC-073		
S210043-03	Method Blank		SOLID		RC-073		
S210043-04	Duplicate (S210043-01)	100D50:1 Pipelns-Content	SOLID		RC-073		10/16/12 08:55

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

SDG 7025
Contact Joseph Verville

QC SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K4003

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7025	RC-073-216	J1R3M5	SOLID	100.0	634 g		10/17/12	1	S210043-01	7025-001
		Method Blank	SOLID						S210043-03	7025-003
		Lab Control Sample	SOLID						S210043-02	7025-002
		Duplicate (S210043-01)	SOLID	100.0	634 g		10/17/12	1	S210043-04	7025-004

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

SDG 7025
Contact Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K4003

TEST	MATRIX	METHOD	PREPARATION ERROR BATCH	2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
U	SOLID	Uranium, Isotopic in Solids	7733-108	8.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Solids	7733-108	10.4	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7733-108	7.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Solids	7733-108	10.0	1			1	1	1/1		
H	SOLID	Tritium in Solids	7733-108	10.0	1			1	1	1/1		
NI_L	SOLID	Nickel 63 in Solids	7733-108	11.2	1			1	1	1/1		

Duplicates and Spikes are those with original sample in the QC Batch of some Client sample in this SDG.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

SDG 7025
Contact Joseph Verville

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K4003

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S210043-01	J1R3M5			7025-001	C		10/23/12	10/26/12	MWT	Carbon 14 in Solids
10/16/12	100D50:1 Pipelns-Content		SOLID	7025-001	GAM		10/18/12	10/19/12	MWT	Gamma Scan
10/17/12	RC-073-216	RC-073		7025-001	H		10/24/12	10/26/12	MWT	Tritium in Solids
				7025-001	NI_L		10/30/12	11/01/12	BW	Nickel 63 in Solids
				7025-001	SR		10/27/12	10/29/12	BW	Total Strontium in Solids
				7025-001	U		10/30/12	11/01/12	BW	Uranium, Isotopic in Solids
S210043-02	Lab Control Sample			7025-002	C		10/24/12	10/26/12	MWT	Carbon 14 in Solids
			SOLID	7025-002	GAM		10/18/12	10/19/12	MWT	Gamma Scan
		RC-073		7025-002	H		10/24/12	10/26/12	MWT	Tritium in Solids
				7025-002	NI_L		10/30/12	11/01/12	BW	Nickel 63 in Solids
				7025-002	SR		10/27/12	10/29/12	BW	Total Strontium in Solids
				7025-002	U		10/30/12	11/01/12	BW	Uranium, Isotopic in Solids
S210043-03	Method Blank			7025-003	C		10/23/12	10/26/12	MWT	Carbon 14 in Solids
			SOLID	7025-003	GAM		10/18/12	10/19/12	MWT	Gamma Scan
		RC-073		7025-003	H		10/24/12	10/26/12	MWT	Tritium in Solids
				7025-003	NI_L		10/30/12	11/01/12	BW	Nickel 63 in Solids
				7025-003	SR		10/27/12	10/29/12	BW	Total Strontium in Solids
				7025-003	U		10/30/12	11/01/12	BW	Uranium, Isotopic in Solids
S210043-04	Duplicate (S210043-01)			7025-004	C		10/23/12	10/26/12	MWT	Carbon 14 in Solids
10/16/12	100D50:1 Pipelns-Content		SOLID	7025-004	GAM		10/18/12	10/19/12	MWT	Gamma Scan
10/17/12		RC-073		7025-004	H		10/24/12	10/26/12	MWT	Tritium in Solids
				7025-004	NI_L		10/30/12	11/01/12	BW	Nickel 63 in Solids
				7025-004	SR		10/27/12	10/29/12	BW	Total Strontium in Solids
				7025-004	U		10/30/12	11/01/12	BW	Uranium, Isotopic in Solids

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

SDG 7025
Contact Joseph Verville

WORK SUMMARY, cont.

Client Hanford
Contract No. S00W235A01
Case no SDG K4003

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
C	RC-073	Carbon 14 in Solids	C14_COX_LSC	1			1	1	1		4
GAM	RC-073	Gamma Scan	GAMMA_GS	1			1	1	1		4
H	RC-073	Tritium in Solids	TRITIUM_COX_LSC	1			1	1	1		4
NI_L	RC-073	Nickel 63 in Solids	NI63_LSC	1			1	1	1		4
SR	RC-073	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	1			1	1	1		4
U	RC-073	Uranium, Isotopic in Solids	UISO_PLATE_AEA	1			1	1	1		4
TOTALS				6			6	6	6		24

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

7025-003 Method Blank

METHOD BLANK

SDG	7025	Client/Case no	Hanford SDG_K4003
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S210043-03	Client sample id	Method Blank
Dept sample id	7025-003	Material/Matrix	SOLID
		SAF No	RC-073

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	1.72	1.9	3.08	10.0	U	H
Carbon 14	14762-75-5	-0.079	0.56	0.937	1.00	U	C
Nickel 63	13981-37-8	0.486	1.6	2.70	30.0	U	NI_L
Total Strontium	SR-RAD	0.003	0.13	0.267	1.00	U	SR
Uranium 233/234	U-233/234	0	0.061	0.232	1.00	U	U
Uranium 235	15117-96-1	0	0.074	0.281	1.00	U	U
Uranium 238	U-238	0	0.061	0.232	1.00	U	U
Potassium 40	13966-00-2	U		0.128		U	GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	U		0.011	0.100	U	GAM
Europium 152	14683-23-9	U		0.030	0.100	U	GAM
Europium 154	15585-10-1	U		0.025	0.100	U	GAM
Europium 155	14391-16-3	U		0.022	0.100	U	GAM
Radium 226	13982-63-3	U		0.024		U	GAM
Radium 228	15262-20-1	U		0.043		U	GAM
Thorium 228	14274-82-9	U		0.017		U	GAM
Thorium 232	TH-232	U		0.043		U	GAM
Uranium 235	15117-96-1	U		0.052		U	GAM
Uranium-238	U-238	U		1.29		U	GAM
Americium 241	14596-10-2	U		0.014	0.300	U	GAM

QC-BLANK #82771

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

7025-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7025
Contact Joseph Verville

Client/Case no Hanford SDG K4003
Contract No. S00W235A01

Lab sample id S210043-02
Dept sample id 7025-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No RC-073

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	130	5.9	3.68	10.0		H	128	5.1	102	82-118	80-120
Carbon 14	1070	21	4.72	1.00		C	1060	42	101	83-117	80-120
Nickel 63	244	6.7	3.05	30.0		NI_L	258	10	95	83-117	80-120
Total Strontium	8.45	0.49	0.223	1.00		SR	9.23	0.37	92	83-117	80-120
Uranium 233/234	11.6	1.5	0.259	1.00		U	10.7	0.43	108	75-125	80-120
Uranium 238	11.5	1.5	0.259	1.00		U	10.7	0.43	108	75-125	80-120
Cobalt 60	0.449	0.043	0.021	0.050		GAM	0.486	0.019	92	83-117	80-120
Cesium 137	0.554	0.044	0.033	0.100		GAM	0.580	0.023	96	84-116	80-120

QC-LCS #82770

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

7025-004 J1R3M5

DUPLICATE

SDG	7025			Client/Case no	Hanford SDG K4003
Contact	Joseph Verville			Contract	No. S00W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S210043-04	Lab sample id	S210043-01	Client sample id	J1R3M5
Dept sample id	7025-004	Dept sample id	7025-001	Location/Matrix	100D50:1 Pipelns-Content SOLID
		Received	10/17/12	Collected/Weight	10/16/12 08:55 634 g
% solids	100.0	% solids	100.0	Custody/SAF No	RC-073-216 RC-073

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Tritium	3.15	2.2	3.42	10.0	U	H	0.546	2.3	3.92	U	-		1.6
Carbon 14	0.540	0.52	0.856	1.00	U	C	0.366	0.52	0.854	U	-		0.5
Nickel 63	8.76	2.2	3.08	30.0		NI_L	7.48	2.0	2.95		16	60	0.8
Total Strontium	-0.041	0.11	0.236	1.00	U	SR	0.055	0.12	0.238	U	-		1.2
Uranium 233/234	0.510	0.24	0.230	1.00		U	0.523	0.22	0.211		3	96	0.1
Uranium 235	0.036	0.073	0.278	1.00	U	U	0	0.067	0.255	U	-		0.7
Uranium 238	0.390	0.24	0.230	1.00		U	0.468	0.22	0.211		18	115	0.5
Potassium 40	10.3	0.37	0.185			GAM	11.4	0.36	0.155		10	17	1.8
Cobalt 60	0.184	0.027	0.024	0.050		GAM	0.191	0.022	0.019		4	32	0.4
Cesium 137	2.67	0.052	0.036	0.100		GAM	2.86	0.050	0.030		7	15	1.3
Europium 152	2.01	0.078	0.082	0.100		GAM	1.95	0.066	0.064		3	17	0.5
Europium 154	0.694	0.087	0.080	0.100		GAM	0.791	0.068	0.064		13	27	1.5
Europium 155	U		0.093	0.100	U	GAM	U		0.083	U	-		0.2
Radium 226	0.437	0.047	0.050			GAM	0.405	0.042	0.047		8	27	0.8
Radium 228	0.524	0.11	0.113			GAM	0.580	0.081	0.090		10	40	0.8
Thorium 228	0.699	0.043	0.047			GAM	0.581	0.031	0.035		18	19	2.8
Thorium 232	0.524	0.11	0.113			GAM	0.580	0.081	0.090		10	40	0.8
Uranium 235	U		0.157		U	GAM	U		0.148	U	-		0.1
Uranium-238	U		3.92		U	GAM	U		2.79	U	-		0.5
Americium 241	U		0.222	0.300	U	GAM	U		0.287	U	-		0.4

QC-DUP#1 82772

100-D/DR Burial Grounds & Remaining Sites-
Other Quick

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

7025-001 J1R3M5

DATA SHEET

SDG	7025	Client/Case no	Hanford SDG_K4003
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S210043-01	Client sample id	J1R3M5
Dept sample id	7025-001	Location/Matrix	100D50:1 Pipelns-Content SOLID
Received	10/17/12	Collected/Weight	10/16/12 08:55 634 g
% solids	100.0	Custody/SAF No	RC-073-216 RC-073

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.546	2.3	3.92	10.0	U	H
Carbon 14	14762-75-5	0.366	0.52	0.854	1.00	U	C
Nickel 63	13981-37-8	7.48	2.0	2.95	30.0		NI_L
Total Strontium	SR-RAD	0.055	0.12	0.238	1.00	U	SR
Uranium 233/234	U-233/234	0.523	0.22	0.211	1.00		U
Uranium 235	15117-96-1	0	0.067	0.255	1.00	U	U
Uranium 238	U-238	0.468	0.22	0.211	1.00		U
Potassium 40	13966-00-2	11.4	0.36	0.155			GAM
Cobalt 60	10198-40-0	0.191	0.022	0.019	0.050		GAM
Cesium 137	10045-97-3	2.86	0.050	0.030	0.100		GAM
Europium 152	14683-23-9	1.95	0.066	0.064	0.100		GAM
Europium 154	15585-10-1	0.791	0.068	0.064	0.100		GAM
Europium 155	14391-16-3	U		0.083	0.100	U	GAM
Radium 226	13982-63-3	0.405	0.042	0.047			GAM
Radium 228	15262-20-1	0.580	0.081	0.090			GAM
Thorium 228	14274-82-9	0.581	0.031	0.035			GAM
Thorium 232	TH-232	0.580	0.081	0.090			GAM
Uranium 235	15117-96-1	U		0.148		U	GAM
Uranium-238	U-238	U		2.79		U	GAM
Americium 241	14596-10-2	U		0.287	0.300	U	GAM

100-D/DR Burial Grounds & Remaining Sites-
Other Quick

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

Test	U
Matrix	SOLID
SDG	7025
Contact	Joseph Verville

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K4003

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 7733-108											
S210043-01			7025-001	J1R3M5	0.523	U	0.468	112	70	0	14
S210043-02			7025-002	Lab Control Sample	ok		ok				
S210043-03			7025-003	Method Blank	U	U	U				
S210043-04			7025-004	Duplicate (S210043-01)	ok	- U	ok	131	101	9	20
Nominal values and limits from method				RDLs (pCi/g)	1.00	1.00	1.00	100		4	
							Averages	121		5	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7733-108			2σ prep error 8.0 %	Reference Lab Notebook 7733-108												
S210043-01			J1R3M5	0.255	0.500			100		102			14	10/30/12	10/30	SS-057
S210043-02			Lab Control Sample	0.259	0.500			95		102				10/30/12	10/30	SS-058
S210043-03			Method Blank	0.281	0.500			82		102				10/30/12	10/30	SS-060
S210043-04			Duplicate (S210043-01)	0.278	0.500			84		102			14	10/30/12	10/30	SS-061
Nominal values and limits from method				1.00	0.500			30-110		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	SPP-060	Soil Preparation, rev 0
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-921	Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 5
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 4 SAMPLES	MDA	0.268	± 0.026
	YIELD	90	± 17

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

Test SR Matrix SOLID
SDG 7025
Contact Joseph Verville

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client Hanford
Contract No. S00W235A01
Contract SDG K4003

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
Preparation batch 7733-108					
S210043-01			7025-001	J1R3M5	U
S210043-02			7025-002	Lab Control Sample	ok
S210043-03			7025-003	Method Blank	U
S210043-04			7025-004	Duplicate (S210043-01)	- U
Nominal values and limits from method				RDLs (pCi/g)	1.00

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7733-108			2σ prep error 10.4 % Reference Lab Notebook 7733-108													
S210043-01			J1R3M5	0.238	1.00			94		100			11	10/27/12	10/27	GRB-223
S210043-02			Lab Control Sample	0.223	1.00			94		100				10/27/12	10/27	GRB-229
S210043-03			Method Blank	0.267	1.00			94		100				10/27/12	10/27	GRB-201
S210043-04			Duplicate (S210043-01)	0.236	1.00			92		100			11	10/27/12	10/27	GRB-202
Nominal values and limits from method				1.00	1.00			40-110		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	SPP-060	Soil Preparation, rev 0
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-383	Strontium in Dissolved Solid of < 5.0g Aliquot, rev 4

AVERAGES ± 2 SD	MDA	0.241	±	0.037
FOR 4 SAMPLES	YIELD	94	±	2

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

Test GAM Matrix SOLID
SDG 7025
Contact Joseph Verville

LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. S00W235A01
Contract SDG K4003

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 7733-108						
S210043-01			7025-001	J1R3M5	0.191	2.86
S210043-02			7025-002	Lab Control Sample	ok	ok
S210043-03			7025-003	Method Blank	U	U
S210043-04			7025-004	Duplicate (S210043-01)	ok	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.100

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7733-108			2σ prep error 7.0 %	Reference Lab Notebook 7733-108												
S210043-01			J1R3M5	0.065	566					251			2	10/17/12	10/18	02,02,00
S210043-02			Lab Control Sample	0.021	500					252				10/17/12	10/18	MB,05,00
S210043-03			Method Blank	0.021	500					202				10/17/12	10/18	01,03,00
S210043-04			Duplicate (S210043-01)	0.081	566					757			2	10/17/12	10/18	MB,05,00
Nominal values and limits from method				0.050	500					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	SPP-060	Soil Preparation, rev 0
	SPP-100	Preparation of Sample for Gamma Spectroscopy, rev 0
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.047 ± 0.061
YIELD ____ ± ____

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

Test	C
Matrix	SOLID
SDG	7025
Contact	Joseph Verville

LAB METHOD SUMMARY

CARBON 14 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K4003

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14	
Preparation batch 7733-108						
S210043-01			7025-001	J1R3M5	U	
S210043-02			7025-002	Lab Control Sample	ok	
S210043-03			7025-003	Method Blank	U	
S210043-04			7025-004	Duplicate (S210043-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7733-108			2σ prep error 10.0 % Reference Lab Notebook 7733-108													
S210043-01			J1R3M5	0.854	0.628			100		270			7	10/23/12	10/23	LSC-004
S210043-02			Lab Control Sample	4.72	0.600			100		9				10/23/12	10/24	LSC-004
S210043-03			Method Blank	0.937	0.600			100		270				10/23/12	10/23	LSC-004
S210043-04			Duplicate (S210043-01)	0.856	0.624			100		270			7	10/23/12	10/23	LSC-004
Nominal values and limits from method				1.00	0.600					50			180			

PROCEDURES	REFERENCE	C14_COX_LSC
	SPP-060	Soil Preparation, rev 0
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-251	Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD				
FOR 4 SAMPLES	MDA	1.84	±	3.84
	YIELD	100	±	0

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

Test H Matrix SOLID
SDG 7025
Contact Joseph Verville

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A01
Contract SDG K4003

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7733-108						
S210043-01			7025-001	J1R3M5	U	
S210043-02			7025-002	Lab Control Sample	ok	
S210043-03			7025-003	Method Blank	U	
S210043-04			7025-004	Duplicate (S210043-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	10.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7733-108			2σ prep error 10.0 %	Reference Lab Notebook 7733-108												
S210043-01			J1R3M5	3.92	0.628			100		50			8	10/23/12	10/24	LSC-006
S210043-02			Lab Control Sample	3.68	0.600			100		50				10/23/12	10/24	LSC-006
S210043-03			Method Blank	3.08	0.600			100		50				10/23/12	10/24	LSC-006
S210043-04			Duplicate (S210043-01)	3.42	0.624			100		50			8	10/23/12	10/24	LSC-006
Nominal values and limits from method				10.0	0.600					50			180			

PROCEDURES	REFERENCE	TRITIUM_COX_LSC
	SPP-060	Soil Preparation, rev 0
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-251	Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD				
FOR 4 SAMPLES	MDA	3.52	±	0.720
	YIELD	100	±	0

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 11/03/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K4003

Test NI L Matrix SOLID
SDG 7025
Contact Joseph Verville

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A01
Contract SDG K4003

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63
Preparation batch 7733-108					
S210043-01			7025-001	J1R3M5	7.48
S210043-02			7025-002	Lab Control Sample	ok
S210043-03			7025-003	Method Blank	U
S210043-04			7025-004	Duplicate (S210043-01)	ok
Nominal values and limits from method				RDLs (pCi/g)	30.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7733-108			2σ prep error 11.2 %	Reference Lab Notebook 7733-108												
S210043-01			J1R3M5	2.95	0.500			90		50			14	10/30/12	10/30	LSC-007
S210043-02			Lab Control Sample	3.05	0.500			90		50				10/30/12	10/30	LSC-007
S210043-03			Method Blank	2.70	0.500			99		50				10/30/12	10/30	LSC-007
S210043-04			Duplicate (S210043-01)	3.08	0.500			88		50			14	10/30/12	10/30	LSC-007
Nominal values and limits from method				30.0	0.500			40-110		25			180			

PROCEDURES	REFERENCE	NI63_LSC
	SPP-060	Soil Preparation, rev 0
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-281	Nickel-63 Purification By Extraction Chromatography, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 2.94 ± 0.345
YIELD 92 ± 10

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 11/03/12

SDG 7025
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K4003

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/03/12

SDG 7025
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K4003

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SDG 7025
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REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K4003

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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REPORT GUIDE

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Case no SDG_K4003

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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GUIDE, cont.

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DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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REPORT GUIDE

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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REPORT GUIDE

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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Contact Joseph Verville

REPORT GUIDE

Client Hanford
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Case no SDG_K4003

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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GUIDE, cont.

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/03/12

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-073-216	Page 1 of 1
Collector ~~Q Stowe~~ H. Weber HW 10/16/12	Company Contact: Joan Kessner; Telephone No.: 509-375-4688 (7025)	Project Coordinator: KESSNER, JH	Price Code: 9L; Data Turnaround: 21 Days
Project Designation: 100-D/DR Burial Grounds & Remaining Sites - Other Quick	Sampling Location: 100-D-50:1 Pipelines- Contents K4003	SAF No.: RC-073	
Ice Chest No.: WCH-11-025	Field Logbook No.: EL-1607-14; COA: R00D502000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A110561	Bill of Lading/Air Bill No.: SEE OSRL	

POSSIBLE ~~SAMPLE~~ HAZARDS/REMARKS

Potential Rad <DOT

Special Handling and/or Storage

~~Cool 4 Deg C~~ NONE
AJ 10-16-12

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container	G/P	G/P	aG	aG	aG	aG	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1 ~~0~~	0	0
Volume	60mL	60mL	60mL	125mL	60mL	60mL	500mL	125mL	125mL	125mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2; pH - 9045	Semi-VOA - 8270A (TCL)	PAHs - 8310	PCBs - 8082	Pesticides - 8081	See item (2) in Special Instructions.	Isotopic Uranium	Nickel-63; Strontium-89,90 -- Total Sr	Carbon-14; Tritium - H3
			10-16-12		RCF	26025				LOW LEVEL AJ 10/18/12

Sample No.	Matrix *	Sample Date	Sample Time										
J1R3M5	OTHER	10/16/12	0855		AJ					X	X	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber/	10/16/12 0930	WCH MStankovich	10/16/12 0930
MStankovich	10/16/12 1220	A. Freier	10-16-12 1220
WCH A. Freier	10-16-12 1250	Fed Ex	
Fed Ex		F. Mattawanna	10/17/12 0000

SPECIAL INSTRUCTIONS

Run sample with full (RC-075) QC

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

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

REVIEWED BY CMB DATE 10-16-12

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

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

WCH-EE-011

EBERLINE

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 10/17/12 1000 CoC No. RC-073-216

Container I.D. No. WCH-11-025 Requested TAT (Days) 21 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [X] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [X] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [X] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [X] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [X]
6. Number of samples in shipping container: 1 Sample Matrix X SOLID
7. Number of containers per sample: 1 (Or see CoC _____)
8. Samples are in correct container Yes [X] No [ ]
9. Paperwork agrees with samples? Yes [X] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [X] Appropriate sample labels [X]
11. Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH N/A Preservative _____
13. Describe any anomalies:

14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
15. Inspected by [signature] Date: 10/17/12 Time: 1100

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
J1R3M5	<80						

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 100482 Calibration date 06DEC11

"over 55 years of quality nuclear services"

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

12 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 #	1210048
SDG #	K4003
SAF #	RC-073
Date Received	10/17/12
# Samples	1
Matrix	OTHER SOLID
Volatiles	
Semivolatiles	X
Pest/PCB	X
Glycols	
DRO/KRO/GRO	
PAHs	X
Herbicides	
Metals	X
Inorganics	X

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

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 78 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1210048

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford SAF# RC-073
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SH TAT: 21 Days
Date Rec'd: 10-17-12 Date Due:

		A	B		C			D			E				
Refrigerator #		1	1		1			1			1				
#/Type Container	Liquid														
	Solid	1AG	1AG		1AG			1			1				
Volume	Liquid														
	Solid	125	125		125			60			125				
Preservatives		—	—		—			—			—				
ANALYSES REQUESTED		ORGANIC						INORG							
		VOA	BNA	Pest/PCB	Herb	PAHs		Metal Hg	CN		TC Anions pH	Na NO3			
Lionville Laboratory Use Only			8270 TCL	8081 8082		8310		METALS			ANIONS pH	N3N2			

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
01	J1R3M5 RADI	✓	✓	OTHER	10-16-12	0855		X	X		X			X			X	X	

Special Instructions:
(OTHER: Soil Liquid Contents)
METALS = HSL + B, Mo, Si (NO TL)

Special Instructions:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	[signature]	10/17/12	1005

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-073-216	Page 1 of 1

Collector ~~Q Stowe~~ H.Weber 10/16/12	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Price Code 9L	Data Turnaround 21 Days		
Project Designation 100-D/DR Burial Grounds & Remaining Sites - Other Quick	Sampling Location 100-D-50:1 Pipelines- Contents		SAF No. RC-073
Ice Chest No. WCH-12-026	Field Logbook No. EL-1607-14	COA R00D502000	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A 110542		Bill of Lading/Air Bill No. SEE OSRL

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Rad <DOT

Special Handling and/or Storage

Cool 4 Deg C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container	G/P	G/P	aG	aG	aG	aG	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	0	0
Volume	60mL	~~60mL~~ 125	~~60mL~~ 125	125mL	~~60mL~~ 125	~~60mL~~ 125	500mL	125mL	125mL	125mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2; pH - 9045 RCF	Semi-VOA - 8270A (TCL) 26025	PAHs - 8310	PCBs - 8082	Pesticides - 8081	See item (2) in Special Instructions.	Isotopic Uranium	Nickel-63; Strontium-89,90 -- Total Sr	Carbon-14; Tritium - H3

Sample No.	Matrix *	Sample Date	Sample Time										
J1R3M5	OTHER	10/16/12	0855	X	X	X	X	X	X				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber / [signature]	10/16/12 0930	wch MStankovich	10/16/12 0930
MStankovich	10/16/12 1220	A. Freier [signature]	10-16-12 1220
wch A. Freier [signature]	10-16-12 1250	Fed Ex	
Fed Ex	10-17-12 1005	Victor Hernandez	10-17-12 1005

SPECIAL INSTRUCTIONS

Run sample with full (RC-075) QC

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

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

REVIEWED BY CMB DATE 11-16-12

Matrix *

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

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

WCH-EE-011

00000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-073

Date: 10/17/12

LvL Batch #: 1210048

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7992 0736 1748
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-12-026
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted _____ Date _____

SR-002-B.doc

SEMIVOLATILES

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

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R3M5	1210048-01	Other Solid	10/16/2012 08:55	10/17/2012 10:05

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-073 K4003
LVL #: 1210048

W.O. #: 60049-001-001-0001-00
Date Received: 10-17-2012

SEMIVOLATILE

One (1) other solid sample was collected on 10-16-2012.

The sample and associated QC samples were extracted 10-22-2012 and analyzed 10-25,31-2012 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. The samples required 5-fold instrument dilutions due to the sample matrix. Reporting limits have been adjusted to reflect the necessary 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. Nineteen (19) of one hundred and twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS187) has been enclosed.

9. The sample was reported on a wet weight 'as received' basis.

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

10. 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.

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

11/12/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12ms187

Initiator: Sharon Saylor
Date: 11-5-12
Client: WC Hanford

Batch: 1210048
Samples: L210172-ms1, msd1
Method: SW846/MCAWW/CLP/

Parameter: 8270C
Matrix: other SOLID
Prep Batch: L210172

1. Reason for SDR

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

b. General Discrepancy

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

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

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

(1) Spike recoveries outside QC acceptance limits in L210172-ms1, L210172-msd1 but L210172-BS1 is ok

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

Other Description: namute

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

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

✓ 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: 11/12/12 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: 7.47 CALIBRATION: ~~121/003~~ m11/7/12 C1025

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

GLOSSARY

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit, which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

MP - Missed Peak: Manually added peak not found by automatic quantitation program.

PA - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene, which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

J1R3M5
1210048-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
1,2,4-Trichlorobenzene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
1,2-Dichlorobenzene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
1,3-Dichlorobenzene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
1,4-Dichlorobenzene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2,4,5-Trichlorophenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2,4,6-Trichlorophenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2,4-Dichlorophenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2,4-Dimethylphenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2,4-Dinitrophenol	32100	U	32100	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2,4-Dinitrotoluene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2,6-Dinitrotoluene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2-Chloronaphthalene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2-Chlorophenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2-Methylnaphthalene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2-Methylphenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2-Nitroaniline	32100	U	32100	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
2-Nitrophenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
3,3'-Dichlorobenzidine	12800	U	12800	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
3-Nitroaniline	32100	U	32100	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
4,6-Dinitro-2-methylphenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
4-Bromophenyl Phenyl Ether	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
4-Chloro-3-methylphenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
4-Chloroaniline	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
4-Chlorophenyl Phenyl Ether	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
3- and/or 4-Methylphenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
4-Nitroaniline	32100	U	32100	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
4-Nitrophenol	32100	U	32100	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Acenaphthene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Acenaphthylene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Anthracene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Benz[a]anthracene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Benzo[a] pyrene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Benzo[b] fluoranthene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Benzo[g,h,i] perylene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Benzo[k] fluoranthene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Bis(2-chloroethoxy) methane	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

J1R3M5

1210048-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Bis(2-chloroisopropyl) ether	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Bis(2-ethylhexyl) phthalate	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Butyl Benzyl Phthalate	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Carbazole	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Chrysene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Dibenz[a,h]anthracene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Dibenzofuran	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Diethyl Phthalate	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Dimethyl Phthalate	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Di-n-butyl Phthalate	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Di-n-octyl Phthalate	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Fluoranthene	**1140**	J, D	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Fluorene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Hexachlorobenzene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Hexachlorobutadiene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Hexachlorocyclopentadiene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Hexachloroethane	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Indeno[1,2,3-cd]pyrene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Isophorone	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Naphthalene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Nitrobenzene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
N-Nitrosodi-n-propylamine	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
N-Nitrosodiphenylamine	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Pentachlorophenol	32100	U	32100	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Phenanthrene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Phenol	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Pyrene	6420	U	6420	ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
TIC:Aldol Condensate 1	**25400**	A, B, J, D		ug/kg wet	5	L210172	10/22/2012	10/31/2012	8270C
Surrogate: 2-Fluorophenol	*38 %*		*25-121*			*L210172*	*10/22/2012*	*10/31/2012*	*8270C*
Surrogate: Phenol-d5	*48 %*		*24-113*			*L210172*	*10/22/2012*	*10/31/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*64 %*		*23-120*			*L210172*	*10/22/2012*	*10/31/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*72 %*		*30-115*			*L210172*	*10/22/2012*	*10/31/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*23 %*		*19-122*			*L210172*	*10/22/2012*	*10/31/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*58 %*		*18-137*			*L210172*	*10/22/2012*	*10/31/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

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 L210172 - SW 3540C										
Blank (L210172-BLK1)				Prepared: 10/22/2012 Analyzed: 10/25/2012						
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.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

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 L210172 - SW 3540C										
Blank (L210172-BLK1)				Prepared: 10/22/2012 Analyzed: 10/25/2012						
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	2320	J		ug/kg wet						
Aldol Condensate 3	503	A, J		ug/kg wet						
Aldol Condensate 2	27600	A, J		ug/kg wet						
Aldol Condensate 1	432	A, J		ug/kg wet						
Trichloro-1-propene	1310	J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1450*			*ug/kg wet*	*2500.0*		*58*	*25-121*		
Surrogate: Phenol-d5	*1530*			*ug/kg wet*	*2500.0*		*61*	*24-113*		
Surrogate: Nitrobenzene-d5	*966*			*ug/kg wet*	*1666.7*		*58*	*23-120*		

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2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

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 L210172 - SW 3540C									
Blank (L210172-BLK1)			Prepared: 10/22/2012 Analyzed: 10/25/2012						
Surrogate: 2-Fluorobiphenyl	*1150*		*ug/kg wet*	*1666.7*		*69*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1340*		*ug/kg wet*	*2500.0*		*53*	*19-122*		
Surrogate: p-Terphenyl-d14	*1130*		*ug/kg wet*	*1666.7*		*68*	*18-137*		
LCS (L210172-BS1)			Prepared: 10/22/2012 Analyzed: 10/25/2012						
1,2,4-Trichlorobenzene	1350		ug/kg wet	2000.0		67	45-110		
1,2-Dichlorobenzene	1350		ug/kg wet	2000.0		67	45-105		
1,3-Dichlorobenzene	1270		ug/kg wet	2000.0		63	40-100		
1,4-Dichlorobenzene	1300		ug/kg wet	2000.0		65	35-105		
2,4,5-Trichlorophenol	1660		ug/kg wet	2000.0		83	30-140		
2,4,6-Trichlorophenol	1510		ug/kg wet	2000.0		75	20-110		
2,4-Dichlorophenol	1490		ug/kg wet	2000.0		75	40-110		
2,4-Dimethylphenol	1050		ug/kg wet	2000.0		53	30-105		
2,4-Dinitrophenol	1130		ug/kg wet	2000.0		57	25-130		
2,4-Dinitrotoluene	1580		ug/kg wet	2000.0		79	50-115		
2,6-Dinitrotoluene	1620		ug/kg wet	2000.0		81	40-120		
2-Chloronaphthalene	1410		ug/kg wet	2000.0		71	45-115		
2-Chlorophenol	1390		ug/kg wet	2000.0		69	45-105		
2-Methylnaphthalene	1450		ug/kg wet	2000.0		72	45-110		
2-Methylphenol	1350		ug/kg wet	2000.0		67	40-120		
2-Nitroaniline	1610		ug/kg wet	2000.0		80	45-120		
2-Nitrophenol	1400		ug/kg wet	2000.0		70	40-110		
3,3'-Dichlorobenzidine	1120		ug/kg wet	2000.0		56	15-130		
3-Nitroaniline	1140		ug/kg wet	2000.0		57	40-130		
4,6-Dinitro-2-methylphenol	1420		ug/kg wet	2000.0		71	20-140		
4-Bromophenyl Phenyl Ether	1610		ug/kg wet	2000.0		81	45-115		
4-Chloro-3-methylphenol	1580		ug/kg wet	2000.0		79	35-115		
4-Chloroaniline	777		ug/kg wet	2000.0		39	10-100		
4-Chlorophenyl Phenyl Ether	1550		ug/kg wet	2000.0		78	45-110		
3- and/or 4-Methylphenol	1430		ug/kg wet	2000.0		71	40-120		
4-Nitroaniline	1220		ug/kg wet	2000.0		61	40-130		
4-Nitrophenol	1680		ug/kg wet	2000.0		84	15-140		
Acenaphthene	1460		ug/kg wet	2000.0		73	45-110		
Acenaphthylene	1430		ug/kg wet	2000.0		72	45-115		
Anthracene	1440		ug/kg wet	2000.0		72	45-130		
Benz[a]anthracene	1530		ug/kg wet	2000.0		76	45-130		
Benzo[a] pyrene	1390		ug/kg wet	2000.0		69	45-130		

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

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 L210172 - SW 3540C									
LCS (L210172-BS1)			Prepared: 10/22/2012 Analyzed: 10/25/2012						
Benzo[b] fluoranthene	1540		ug/kg wet	2000.0		77	40-130		
Benzo[g,h,i] perylene	1690		ug/kg wet	2000.0		84	45-125		
Benzo[k] fluoranthene	1590		ug/kg wet	2000.0		80	45-125		
Bis(2-chloroethoxy) methane	1390		ug/kg wet	2000.0		70	45-110		
Bis(2-chloroethyl) ether	1280		ug/kg wet	2000.0		64	40-110		
Bis(2-chloroisopropyl) ether	1300		ug/kg wet	2000.0		65	30-115		
Bis(2-ethylhexyl) phthalate	1610		ug/kg wet	2000.0		80	40-145		
Butyl Benzyl Phthalate	1510		ug/kg wet	2000.0		76	50-125		
Carbazole	1600		ug/kg wet	2000.0		80	40-140		
Chrysene	1620		ug/kg wet	2000.0		81	45-130		
Dibenz[a,h]anthracene	1190		ug/kg wet	2000.0		59	45-125		
Dibenzofuran	1560		ug/kg wet	2000.0		78	45-120		
Diethyl Phthalate	1530		ug/kg wet	2000.0		77	50-125		
Dimethyl Phthalate	1470		ug/kg wet	2000.0		74	45-130		
Di-n-butyl Phthalate	1460		ug/kg wet	2000.0		73	50-130		
Di-n-octyl Phthalate	1560		ug/kg wet	2000.0		78	40-150		
Fluoranthene	1560		ug/kg wet	2000.0		78	45-130		
Fluorene	1530		ug/kg wet	2000.0		77	45-120		
Hexachlorobenzene	1780		ug/kg wet	2000.0		89	45-130		
Hexachlorobutadiene	1570		ug/kg wet	2000.0		78	45-105		
Hexachlorocyclopentadiene	518		ug/kg wet	2000.0		26	10-100		
Hexachloroethane	1260		ug/kg wet	2000.0		63	35-110		
Indeno[1,2,3-cd]pyrene	1600		ug/kg wet	2000.0		80	45-130		
Isophorone	1370		ug/kg wet	2000.0		68	40-110		
Naphthalene	1530		ug/kg wet	2000.0		76	40-110		
Nitrobenzene	1350		ug/kg wet	2000.0		67	40-105		
N-Nitrosodi-n-propylamine	1400		ug/kg wet	2000.0		70	30-130		
N-Nitrosodiphenylamine	1490		ug/kg wet	2000.0		75	50-120		
Pentachlorophenol	1690		ug/kg wet	2000.0		84	25-120		
Phenanthrene	1530		ug/kg wet	2000.0		77	50-120		
Phenol	1390		ug/kg wet	2000.0		70	40-115		
Pyrene	1420		ug/kg wet	2000.0		71	45-125		
Surrogate: 2-Fluorophenol	*1730*		*ug/kg wet*	*2500.0*		*69*	*25-121*		
Surrogate: Phenol-d5	*1850*		*ug/kg wet*	*2500.0*		*74*	*24-113*		
Surrogate: Nitrobenzene-d5	*1230*		*ug/kg wet*	*1666.7*		*74*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1340*		*ug/kg wet*	*1666.7*		*80*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*2420*		*ug/kg wet*	*2500.0*		*97*	*19-122*		

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

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 L210172 - SW 3540C										
LCS (L210172-BS1)				Prepared: 10/22/2012 Analyzed: 10/25/2012						
Surrogate: p-Terphenyl-d14	*1270*			*ug/kg wet*	*1666.7*		*76*	*18-137*		
Matrix Spike (L210172-MS1)		**Source: 1210048-01**		Prepared: 10/22/2012 Analyzed: 10/31/2012						
1,2,4-Trichlorobenzene	1400	D		ug/kg wet	1997.3	6420 U	70	45-110		
1,2-Dichlorobenzene	1270	D		ug/kg wet	1997.3	6420 U	64	45-105		
1,3-Dichlorobenzene	1160	D		ug/kg wet	1997.3	6420 U	58	40-100		
1,4-Dichlorobenzene	1170	D		ug/kg wet	1997.3	6420 U	59	35-105		
2,4,5-Trichlorophenol	1130	D		ug/kg wet	1997.3	6420 U	57	30-140		
2,4,6-Trichlorophenol	968	D		ug/kg wet	1997.3	6420 U	48	20-110		
2,4-Dichlorophenol	774	D		ug/kg wet	1997.3	6420 U	39*	40-110		
2,4-Dimethylphenol	557	D		ug/kg wet	1997.3	6420 U	28*	30-105		
2,4-Dinitrophenol	0.00	U		ug/kg wet	1997.3	32100 U	*	25-130		
2,4-Dinitrotoluene	870	D		ug/kg wet	1997.3	6420 U	44*	50-115		
2,6-Dinitrotoluene	1090	D		ug/kg wet	1997.3	6420 U	55	40-120		
2-Chloronaphthalene	1400	D		ug/kg wet	1997.3	6420 U	70	45-115		
2-Chlorophenol	1110	D		ug/kg wet	1997.3	6420 U	55	45-105		
2-Methylnaphthalene	1390	D		ug/kg wet	1997.3	6420 U	70	45-110		
2-Methylphenol	1020	D		ug/kg wet	1997.3	6420 U	51	40-120		
2-Nitroaniline	1270	D		ug/kg wet	1997.3	32100 U	63	45-120		
2-Nitrophenol	1050	D		ug/kg wet	1997.3	6420 U	53	40-110		
3,3'-Dichlorobenzidine	365	D		ug/kg wet	1997.3	12800 U	18	15-130		
3-Nitroaniline	1010	D		ug/kg wet	1997.3	32100 U	51	40-130		
4,6-Dinitro-2-methylphenol	0.00	U		ug/kg wet	1997.3	6420 U	*	20-140		
4-Bromophenyl Phenyl Ether	1420	D		ug/kg wet	1997.3	6420 U	71	45-115		
4-Chloro-3-methylphenol	545	D		ug/kg wet	1997.3	6420 U	27*	35-115		
4-Chloroaniline	670	D		ug/kg wet	1997.3	6420 U	34	10-100		
4-Chlorophenyl Phenyl Ether	1470	D		ug/kg wet	1997.3	6420 U	74	45-110		
3- and/or 4-Methylphenol	791	D		ug/kg wet	1997.3	6420 U	40	40-120		
4-Nitroaniline	969	D		ug/kg wet	1997.3	32100 U	49	40-130		
4-Nitrophenol	0.00	U		ug/kg wet	1997.3	32100 U	*	15-140		
Acenaphthene	1300	D		ug/kg wet	1997.3	6420 U	65	45-110		
Acenaphthylene	1350	D		ug/kg wet	1997.3	6420 U	68	45-115		
Anthracene	1440	D		ug/kg wet	1997.3	6420 U	72	45-130		
Benz[a]anthracene	1590	D		ug/kg wet	1997.3	6420 U	80	45-130		
Benzo[a] pyrene	1550	D		ug/kg wet	1997.3	6420 U	78	45-130		
Benzo[b] fluoranthene	1570	D		ug/kg wet	1997.3	6420 U	79	40-130		
Benzo[g,h,i] perylene	1140	D		ug/kg wet	1997.3	6420 U	57	45-125		

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2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

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 L210172 - SW 3540C										
Matrix Spike (L210172-MS1)		**Source: 1210048-01**		Prepared: 10/22/2012 Analyzed: 10/31/2012						
Benzo[k] fluoranthene	1840	D		ug/kg wet	1997.3	6420 U	92	45-125		
Bis(2-chloroethoxy) methane	1380	D		ug/kg wet	1997.3	6420 U	69	45-110		
Bis(2-chloroethyl) ether	1210	D		ug/kg wet	1997.3	6420 U	61	40-110		
Bis(2-chloroisopropyl) ether	1530	D		ug/kg wet	1997.3	6420 U	77	30-115		
Bis(2-ethylhexyl) phthalate	1190	D		ug/kg wet	1997.3	6420 U	59	40-145		
Butyl Benzyl Phthalate	1220	D		ug/kg wet	1997.3	6420 U	61	50-125		
Carbazole	1490	D		ug/kg wet	1997.3	6420 U	74	40-140		
Chrysene	1840	D		ug/kg wet	1997.3	6420 U	92	45-130		
Dibenz[a,h]anthracene	710	D		ug/kg wet	1997.3	6420 U	36*	45-125		
Dibenzofuran	1490	D		ug/kg wet	1997.3	6420 U	75	45-120		
Diethyl Phthalate	1450	D		ug/kg wet	1997.3	6420 U	73	50-125		
Dimethyl Phthalate	1330	D		ug/kg wet	1997.3	6420 U	67	45-130		
Di-n-butyl Phthalate	1360	D		ug/kg wet	1997.3	6420 U	68	50-130		
Di-n-octyl Phthalate	1020	D		ug/kg wet	1997.3	6420 U	51	40-150		
Fluoranthene	2540	D		ug/kg wet	1997.3	1140	70	45-130		
Fluorene	1320	D		ug/kg wet	1997.3	6420 U	66	45-120		
Hexachlorobenzene	1370	D		ug/kg wet	1997.3	6420 U	68	45-130		
Hexachlorobutadiene	1810	D		ug/kg wet	1997.3	6420 U	91	45-105		
Hexachlorocyclopentadiene	0.00	U		ug/kg wet	1997.3	6420 U	*	10-100		
Hexachloroethane	1290	D		ug/kg wet	1997.3	6420 U	64	35-110		
Indeno[1,2,3-cd]pyrene	1070	D		ug/kg wet	1997.3	6420 U	54	45-130		
Isophorone	1190	D		ug/kg wet	1997.3	6420 U	59	40-110		
Naphthalene	1490	D		ug/kg wet	1997.3	6420 U	74	40-110		
Nitrobenzene	1540	D		ug/kg wet	1997.3	6420 U	77	40-105		
N-Nitrosodi-n-propylamine	1300	D		ug/kg wet	1997.3	6420 U	65	30-130		
N-Nitrosodiphenylamine	1300	D		ug/kg wet	1997.3	6420 U	65	50-120		
Pentachlorophenol	0.00	U		ug/kg wet	1997.3	32100 U	*	25-120		
Phenanthrene	1860	D		ug/kg wet	1997.3	6420 U	93	50-120		
Phenol	865	D		ug/kg wet	1997.3	6420 U	43	40-115		
Pyrene	2030	D		ug/kg wet	1997.3	6420 U	102	45-125		
Surrogate: 2-Fluorophenol	*1240*			*ug/kg wet*	*2496.7*		*50*	*25-121*		
Surrogate: Phenol-d5	*1150*			*ug/kg wet*	*2496.7*		*46*	*24-113*		
Surrogate: Nitrobenzene-d5	*1110*			*ug/kg wet*	*1664.4*		*67*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1220*			*ug/kg wet*	*1664.4*		*73*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*889*			*ug/kg wet*	*2496.7*		*36*	*19-122*		
Surrogate: p-Terphenyl-d14	*994*			*ug/kg wet*	*1664.4*		*60*	*18-137*		

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Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 12:15

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 L210172 - SW 3540C										
Matrix Spike Dup (L210172-MSD1)		**Source: 1210048-01**		Prepared: 10/22/2012 Analyzed: 10/31/2012						
1,2,4-Trichlorobenzene	1160	D		ug/kg wet	1956.3	6420 U	59	45-110	17	40
1,2-Dichlorobenzene	1160	D		ug/kg wet	1956.3	6420 U	59	45-105	7	40
1,3-Dichlorobenzene	1070	D		ug/kg wet	1956.3	6420 U	55	40-100	6	40
1,4-Dichlorobenzene	1100	D		ug/kg wet	1956.3	6420 U	56	35-105	4	40
2,4,5-Trichlorophenol	1230	D		ug/kg wet	1956.3	6420 U	63	30-140	11	40
2,4,6-Trichlorophenol	1040	D		ug/kg wet	1956.3	6420 U	53	20-110	10	40
2,4-Dichlorophenol	1020	D		ug/kg wet	1956.3	6420 U	52	40-110	29	40
2,4-Dimethylphenol	752	D		ug/kg wet	1956.3	6420 U	38	30-105	32	40
2,4-Dinitrophenol	0.00	U		ug/kg wet	1956.3	32100 U	*	25-130		40
2,4-Dinitrotoluene	958	D		ug/kg wet	1956.3	6420 U	49*	50-115	12	40
2,6-Dinitrotoluene	1200	D		ug/kg wet	1956.3	6420 U	61	40-120	11	40
2-Chloronaphthalene	1370	D		ug/kg wet	1956.3	6420 U	70	45-115	0.4	40
2-Chlorophenol	1210	D		ug/kg wet	1956.3	6420 U	62	45-105	11	40
2-Methylnaphthalene	1210	D		ug/kg wet	1956.3	6420 U	62	45-110	12	40
2-Methylphenol	765	D		ug/kg wet	1956.3	6420 U	39*	40-120	26	40
2-Nitroaniline	1450	D		ug/kg wet	1956.3	32100 U	74	45-120	15	40
2-Nitrophenol	928	D		ug/kg wet	1956.3	6420 U	47	40-110	10	40
3,3'-Dichlorobenzidine	466	D		ug/kg wet	1956.3	12800 U	24	15-130	26	40
3-Nitroaniline	694	D		ug/kg wet	1956.3	32100 U	35*	40-130	35	40
4,6-Dinitro-2-methylphenol	0.00	U		ug/kg wet	1956.3	6420 U	*	20-140		40
4-Bromophenyl Phenyl Ether	1440	D		ug/kg wet	1956.3	6420 U	73	45-115	3	40
4-Chloro-3-methylphenol	826	D		ug/kg wet	1956.3	6420 U	42	35-115	43*	40
4-Chloroaniline	720	D		ug/kg wet	1956.3	6420 U	37	10-100	9	40
4-Chlorophenyl Phenyl Ether	1520	D		ug/kg wet	1956.3	6420 U	78	45-110	5	40
3- and/or 4-Methylphenol	903	D		ug/kg wet	1956.3	6420 U	46	40-120	15	40
4-Nitroaniline	1060	D		ug/kg wet	1956.3	32100 U	54	40-130	11	40
4-Nitrophenol	0.00	U		ug/kg wet	1956.3	32100 U	*	15-140		40
Acenaphthene	1430	D		ug/kg wet	1956.3	6420 U	73	45-110	11	40
Acenaphthylene	1450	D		ug/kg wet	1956.3	6420 U	74	45-115	9	40
Anthracene	1480	D		ug/kg wet	1956.3	6420 U	75	45-130	5	40
Benz[a]anthracene	1690	D		ug/kg wet	1956.3	6420 U	86	45-130	8	40
Benzo[a] pyrene	1630	D		ug/kg wet	1956.3	6420 U	83	45-130	7	40
Benzo[b] fluoranthene	1650	D		ug/kg wet	1956.3	6420 U	84	40-130	7	40
Benzo[g,h,i] perylene	1200	D		ug/kg wet	1956.3	6420 U	61	45-125	7	40
Benzo[k] fluoranthene	1820	D		ug/kg wet	1956.3	6420 U	93	45-125	0.5	40
Bis(2-chloroethoxy) methane	1290	D		ug/kg wet	1956.3	6420 U	66	45-110	5	40

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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 L210172 - SW 3540C										
Matrix Spike Dup (L210172-MSD1)		**Source: 1210048-01**		Prepared: 10/22/2012 Analyzed: 10/31/2012						
Bis(2-chloroethyl) ether	1170	D		ug/kg wet	1956.3	6420 U	60	40-110	2	40
Bis(2-chloroisopropyl) ether	1490	D		ug/kg wet	1956.3	6420 U	76	30-115	0.9	40
Bis(2-ethylhexyl) phthalate	1270	D		ug/kg wet	1956.3	6420 U	65	40-145	9	40
Butyl Benzyl Phthalate	1230	D		ug/kg wet	1956.3	6420 U	63	50-125	3	40
Carbazole	1570	D		ug/kg wet	1956.3	6420 U	80	40-140	8	40
Chrysene	1860	D		ug/kg wet	1956.3	6420 U	95	45-130	3	40
Dibenz[a,h]anthracene	838	D		ug/kg wet	1956.3	6420 U	43*	45-125	19	40
Dibenzofuran	1520	D		ug/kg wet	1956.3	6420 U	78	45-120	4	40
Diethyl Phthalate	1440	D		ug/kg wet	1956.3	6420 U	73	50-125	1	40
Dimethyl Phthalate	1390	D		ug/kg wet	1956.3	6420 U	71	45-130	6	40
Di-n-butyl Phthalate	1490	D		ug/kg wet	1956.3	6420 U	76	50-130	12	40
Di-n-octyl Phthalate	979	D		ug/kg wet	1956.3	6420 U	50	40-150	2	40
Fluoranthene	2660	D		ug/kg wet	1956.3	1140	78	45-130	10	40
Fluorene	1450	D		ug/kg wet	1956.3	6420 U	74	45-120	11	40
Hexachlorobenzene	1530	D		ug/kg wet	1956.3	6420 U	78	45-130	13	40
Hexachlorobutadiene	1590	D		ug/kg wet	1956.3	6420 U	81	45-105	11	40
Hexachlorocyclopentadiene	0.00	U		ug/kg wet	1956.3	6420 U	*	10-100		40
Hexachloroethane	902	D		ug/kg wet	1956.3	6420 U	46	35-110	33	40
Indeno[1,2,3-cd]pyrene	1160	D		ug/kg wet	1956.3	6420 U	59	45-130	11	40
Isophorone	1230	D		ug/kg wet	1956.3	6420 U	63	40-110	6	40
Naphthalene	1350	D		ug/kg wet	1956.3	6420 U	69	40-110	8	40
Nitrobenzene	1210	D		ug/kg wet	1956.3	6420 U	62	40-105	22	40
N-Nitrosodi-n-propylamine	1330	D		ug/kg wet	1956.3	6420 U	68	30-130	5	40
N-Nitrosodiphenylamine	1240	D		ug/kg wet	1956.3	6420 U	63	50-120	2	40
Pentachlorophenol	0.00	U		ug/kg wet	1956.3	32100 U	*	25-120		40
Phenanthrene	1850	D		ug/kg wet	1956.3	6420 U	94	50-120	1	40
Phenol	858	D		ug/kg wet	1956.3	6420 U	44	40-115	1	40
Pyrene	2180	D		ug/kg wet	1956.3	6420 U	111	45-125	9	40
Surrogate: 2-Fluorophenol	*1310*			*ug/kg wet*	*2445.4*		*53*	*25-121*		
Surrogate: Phenol-d5	*941*			*ug/kg wet*	*2445.4*		*38*	*24-113*		
Surrogate: Nitrobenzene-d5	*973*			*ug/kg wet*	*1630.3*		*60*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1140*			*ug/kg wet*	*1630.3*		*70*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1040*			*ug/kg wet*	*2445.4*		*43*	*19-122*		
Surrogate: p-Terphenyl-d14	*1000*			*ug/kg wet*	*1630.3*		*62*	*18-137*		

PREPARATION BENCH SHEET

L210172

Lionville Laboratory

Printed: 10/23/2012 5:42:15PM

Matrix: Solid

Prepared using: SVOCGCMS - SW 3540C

Surrogate used: 1201164

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210042-01	8270C TCL SVOC	10/22/2012 14:11	30.85	1				500	Arcadis	TCL plus, Report Soils @LOD
1210042-02	8270C TCL SVOC	10/22/2012 14:11	30.45	2				500	Arcadis	TCL plus, Report Soils @LOD
1210042-03	8270C TCL SVOC	10/22/2012 14:11	30.11	1				500	Arcadis	TCL plus, Report Soils @LOD
1210042-04	8270C TCL SVOC	10/22/2012 14:11	30.29	4				500	Arcadis	TCL plus, Report Soils @LOD
1210042-05	8270C TCL SVOC	10/22/2012 14:11	30.54	1				500	Arcadis	TCL plus, Report Soils @LOD
1210042-06	8270C TCL SVOC	10/22/2012 14:11	30.03	1				500	Arcadis	TCL plus, Report Soils @LOD
1210042-07	8270C TCL SVOC	10/22/2012 14:11	30.64	1				500	Arcadis	TCL plus, Report Soils @LOD
1210042-08	8270C TCL SVOC	10/22/2012 14:11	30.12	1				500	Arcadis	TCL plus, Report Soils @LOD
1210048-01	8270C TCL SVOC	10/22/2012 14:11	30.84	4				500	WC-Hanford, Inc.	
1210049-01	8270C TCL SVOC	10/22/2012 14:11	30.02	1				500	WC-Hanford, Inc.	
L210172-BLK1	QC	10/22/2012 14:11	30	1				500		
L210172-BS1	QC	10/22/2012 14:11	30	1	1201082		600	500		
L210172-MS1	QC	10/22/2012 14:11	30.04	4	1201082	1210048-01	600	500		
L210172-MS2	QC	10/22/2012 14:11	30.08	1	1201082	1210049-01	600	500		
L210172-MSD1	QC	10/22/2012 14:11	30.67	4	1201082	1210048-01	600	500		
L210172-MSD2	QC	10/22/2012 14:11	30.1	1	1201082	1210049-01	600	500		

Extracts Relinquished By — Date: 10/23/12 1742

Extracts Received By — Date: 10/23/12 1755

PREPARATION BENCH SHEET

L210172

Lionville Laboratory

Printed: 11/5/2012 11:52:32AM

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210042-01	8270C TCL SVOC	10/22/2012 14:11	30.85	1				500	Arcadis	Arcadis, TCL plus, Report Soils @LOD
1210042-02	8270C TCL SVOC	10/22/2012 14:11	30.45	2				500	Arcadis	Arcadis, TCL plus, Report Soils @LOD
1210042-03	8270C TCL SVOC	10/22/2012 14:11	30.11	1				500	Arcadis	Arcadis, TCL plus, Report Soils @LOD
1210042-04	8270C TCL SVOC	10/22/2012 14:11	30.29	4				500	Arcadis	Arcadis, TCL plus, Report Soils @LOD
1210042-05	8270C TCL SVOC	10/22/2012 14:11	30.54	1				500	Arcadis	Arcadis, TCL plus, Report Soils @LOD
1210042-06	8270C TCL SVOC	10/22/2012 14:11	30.03	1				500	Arcadis	Arcadis, TCL plus, Report Soils @LOD
1210042-07	8270C TCL SVOC	10/22/2012 14:11	30.64	1				500	Arcadis	Arcadis, TCL plus, Report Soils @LOD
1210042-08	8270C TCL SVOC	10/22/2012 14:11	30.12	1				500	Arcadis	Arcadis, TCL plus, Report Soils @LOD
1210048-01	8270C TCL SVOC	10/22/2012 14:11	30.84	4				500	WC-Hanford, Inc.	WCH
1210049-01	8270C TCL SVOC	10/22/2012 14:11	30.02	1				500	WC-Hanford, Inc.	WCH
L210172-BLK1	QC	10/22/2012 14:11	30	1				500		WCH
L210172-BLK2	QC	10/22/2012 14:11	30	1				500		Arcadis, TCL plus, Report Soils @LOD
L210172-BS1	QC	10/22/2012 14:11	30	1	1201082		600	500		WCH
L210172-BS2	QC	10/22/2012 14:11	30	1	1201082		600	500		Arcadis, TCL plus, Report Soils @LOD
L210172-MS1	QC	10/22/2012 14:11	30.04	4	1201082	1210048-01	600	500		WCH Dilute X 5
L210172-MS2	QC	10/22/2012 14:11	30.08	1	1201082	1210049-01	600	500		WCH
L210172-MSD1	QC	10/22/2012 14:11	30.67	4	1201082	1210048-01	600	500		WCH Dilute X 5
L210172-MSD2	QC	10/22/2012 14:11	30.1	1	1201082	1210049-01	600	500		WCH

Extracts Relinquished By Date

add dilution comment M 11-5-12

Extracts Received By Date

PESTICIDES

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-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 11/12/2012 09:06

Analytical Report for Organochlorine Pesticides by SW846 8081A

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R3M5	1210048-01	Other Solid	10/16/2012 08:55	10/17/2012 10:05

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-073 K4003
LVL #: 1210048

W.O. #: 60049-001-001-0001-00
Date Received: 10-17-2012

CHLORINATED PESTICIDES

One (1) other solid sample was collected on 10-16-2012.

The sample and associated QC samples were extracted 10-24-2012 and analyzed 10-26-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8081A for client specified target compounds. The sample received Copper-Sulfur cleanup based on SW846 method 3660A.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from 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 limit for all target compounds.

5. One (1) of twenty (20) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12GC183) has been enclosed.

6. Two (2) of forty (40) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12GC183) has been enclosed.

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

8. The sample was reported on a wet weight 'as received' basis.

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

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

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

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

Iain Daniels
LvL Laboratory Manager

11/12/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC183

Initiator: Catherine Carey
Date: 11/07/12
Client: WC Hanford

Batch: 1210048 + 049
Samples: BS1, MS1, + MSD3
Method: SW846/MCAWW/CLP/

Parameter: Pest
Matrix: SOIL
Prep Batch: 1210212

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)

Endrin Aldehyde recovery is low in BS1 (45%)
Beta-BHC + delta-BHC recoveries are low in MS1 (68.9% + 60.4%)
4,4-DDT recovery is low in MSD3 (57.8%) JD. 11/8/12.

2. Known or Probable Causes(s)

Endrin aldehyde is prone to degradation
Recovery is marginal (45 vs 49%)

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

Other Description:
Narrate.

4. Project Manager Instructions...signature/date: 11/11/12
✓ 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: 11/11/12
__ 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
✓ 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

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

Analyte	CCV1 10.26.12 6:29:57 AM		CCV2 10.26.12 1:33:01 pm		CCV3		CCV4		CCV5		CCV6		CCV7		CCV8	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Tetrachloro-meta-xylene (surrogate)																
Decachlorobiphenyl (surrogate)																
alpha-BHC		19.5		15.3												
gamma-BHC		17.6														
beta-BHC																
delta-BHC																
Heptachlor																
Aldrin		15.4														
Heptachlor epoxide																
gamma chlordane																
alpha chlordane		15.0														
Endosulfan I																
4,4'-DDE				22.4												
Dieldrin																
Endrin																
4,4'-DDD			23.6	29.5												
Endosulfan II																
4,4'-DDT			-39.3	-37.9												
Endrin aldehyde																
Endosulfan sulfate																
Methoxychlor			-29.1	-26.2												
Endrin ketone		15.6														
Toxaphene																
Mean %D or %Drift	8.4	11.7	3.3	7.2												

Sample results reported from affected CCV:

CCV1: L210212-BLK1, BS1, MS1, MSD1, MS3, MSD3, 1210048-01, 1210049-01

CCV2:

CCV3:

CCV4:

CCV5:

CCV6:

CCV7:

CCV8:

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

264 Welsh Pool Road
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Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/12/2012 09:06

J1R3M5
1210048-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Organochlorine Pesticides by SW846 8081A									
alpha-BHC	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
gamma-BHC	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
beta-BHC	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
delta-BHC	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Heptachlor	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Aldrin	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Heptachlor epoxide	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
gamma-Chlordane	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
alpha-Chlordane	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Endosulfan I	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
4,4'-DDE	**1.76**	J, D	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Dieldrin	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Endrin	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
4,4'-DDD	**1.56**	J, D	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Endosulfan II	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
4,4'-DDT	**22.7**	D	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Endrin aldehyde	**1.56**	J, D	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Endosulfan sulfate	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Methoxychlor	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Endrin ketone	1.33	U	1.33	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Toxaphene	19.9	U	19.9	ug/kg wet	4	L210212	10/24/2012	10/26/2012	8081A
Surrogate: Tetrachloro-meta-xylene	*106 %*		*28-166*			*L210212*	*10/24/2012*	*10/26/2012*	*8081A*
Surrogate: Decachlorobiphenyl	*93.5 %*		*37-153*			*L210212*	*10/24/2012*	*10/26/2012*	*8081A*

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/12/2012 09:06

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210212 - SW 3540C										
Blank (L210212-BLK1)				Prepared: 10/24/2012 Analyzed: 10/26/2012						
alpha-BHC	0.333	U	0.333	ug/kg wet						
gamma-BHC	0.333	U	0.333	ug/kg wet						
beta-BHC	0.333	U	0.333	ug/kg wet						
delta-BHC	0.333	U	0.333	ug/kg wet						
Heptachlor	0.333	U	0.333	ug/kg wet						
Aldrin	0.333	U	0.333	ug/kg wet						
Heptachlor epoxide	0.333	U	0.333	ug/kg wet						
gamma-Chlordane	0.333	U	0.333	ug/kg wet						
alpha-Chlordane	0.333	U	0.333	ug/kg wet						
Endosulfan I	0.333	U	0.333	ug/kg wet						
4,4'-DDE	0.333	U	0.333	ug/kg wet						
Dieldrin	0.333	U	0.333	ug/kg wet						
Endrin	0.333	U	0.333	ug/kg wet						
4,4'-DDD	0.333	U	0.333	ug/kg wet						
Endosulfan II	0.333	U	0.333	ug/kg wet						
4,4'-DDT	0.333	U	0.333	ug/kg wet						
Endrin aldehyde	0.333	U	0.333	ug/kg wet						
Endosulfan sulfate	0.333	U	0.333	ug/kg wet						
Methoxychlor	0.333	U	0.333	ug/kg wet						
Endrin ketone	0.333	U	0.333	ug/kg wet						
Toxaphene	5.00	U	5.00	ug/kg wet						
Surrogate: Tetrachloro-meta-xylene	*28.9*			*ug/kg wet*	*33.337*		*86.7*	*28-166*		
Surrogate: Decachlorobiphenyl	*28.8*			*ug/kg wet*	*33.333*		*86.3*	*37-153*		
LCS (L210212-BS1)				Prepared: 10/24/2012 Analyzed: 10/26/2012						
alpha-BHC	34.7		0.333	ug/kg wet	33.333		104	65-145		
gamma-BHC	34.3		0.333	ug/kg wet	33.333		103	70-143		
beta-BHC	32.2		0.333	ug/kg wet	33.333		96.7	75-143		
delta-BHC	31.9		0.333	ug/kg wet	33.333		95.7	65-143		
Heptachlor	33.5		0.333	ug/kg wet	33.333		100	70-139		
Aldrin	31.8		0.333	ug/kg wet	33.333		95.5	70-143		
Heptachlor epoxide	34.1		0.333	ug/kg wet	33.333		102	71-138		
gamma-Chlordane	33.6		0.333	ug/kg wet	33.333		101	71-137		
alpha-Chlordane	33.7		0.333	ug/kg wet	33.333		101	72-136		
Endosulfan I	33.1		0.333	ug/kg wet	33.333		99.3	72-139		
4,4'-DDE	34.3		0.333	ug/kg wet	33.333		103	70-154		
Dieldrin	34.8		0.333	ug/kg wet	33.333		104	73-143		

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/12/2012 09:06

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210212 - SW 3540C										
LCS (L210212-BS1)				Prepared: 10/24/2012 Analyzed: 10/26/2012						
Endrin	35.0		0.333	ug/kg wet	33.333		105	74-137		
4,4'-DDD	36.4		0.333	ug/kg wet	33.333		109	52-153		
Endosulfan II	33.4		0.333	ug/kg wet	33.333		100	72-139		
4,4'-DDT	34.8		0.333	ug/kg wet	33.333		104	58-148		
Endrin aldehyde	15.0		0.333	ug/kg wet	33.333		45.0*	49-129		
Endosulfan sulfate	32.9		0.333	ug/kg wet	33.333		98.7	66-139		
Methoxychlor	33.4		0.333	ug/kg wet	33.333		100	50-144		
Endrin ketone	34.4		0.333	ug/kg wet	33.333		103	70-139		
Surrogate: Tetrachloro-meta-xylene	*31.7*			*ug/kg wet*	*33.337*		*95.2*	*28-166*		
Surrogate: Decachlorobiphenyl	*32.3*			*ug/kg wet*	*33.333*		*97.0*	*37-153*		
Matrix Spike (L210212-MS1)		**Source: 1210048-01**		Prepared: 10/24/2012 Analyzed: 10/26/2012						
alpha-BHC	28.9	D	1.32	ug/kg wet	33.124	1.33 U	87.1	65-145		
gamma-BHC	30.4	D	1.32	ug/kg wet	33.124	1.33 U	91.8	70-143		
beta-BHC	22.8	D	1.32	ug/kg wet	33.124	1.33 U	68.9*	75-143		
delta-BHC	20.0	D	1.32	ug/kg wet	33.124	1.33 U	60.4*	65-143		
Heptachlor	32.3	D	1.32	ug/kg wet	33.124	1.33 U	97.6	70-139		
Aldrin	28.7	D	1.32	ug/kg wet	33.124	1.33 U	86.5	70-143		
Heptachlor epoxide	29.3	D	1.32	ug/kg wet	33.124	1.33 U	88.5	71-138		
gamma-Chlordane	29.4	D	1.32	ug/kg wet	33.124	1.33 U	88.9	71-137		
alpha-Chlordane	29.5	D	1.32	ug/kg wet	33.124	1.33 U	89.2	72-136		
Endosulfan I	28.2	D	1.32	ug/kg wet	33.124	1.33 U	85.0	72-139		
4,4'-DDE	32.0	D	1.32	ug/kg wet	33.124	1.76	91.4	70-154		
Dieldrin	29.7	D	1.32	ug/kg wet	33.124	1.33 U	89.7	73-143		
Endrin	29.8	D	1.32	ug/kg wet	33.124	1.33 U	90.0	74-137		
4,4'-DDD	28.9	D	1.32	ug/kg wet	33.124	1.56	82.6	52-153		
Endosulfan II	26.2	D	1.32	ug/kg wet	33.124	1.33 U	79.2	72-139		
4,4'-DDT	58.5	D	1.32	ug/kg wet	33.124	22.7	108	58-148		
Endrin aldehyde	23.1	D	1.32	ug/kg wet	33.124	1.56	65.0	49-129		
Endosulfan sulfate	27.0	D	1.32	ug/kg wet	33.124	1.33 U	81.4	66-139		
Methoxychlor	32.4	D	1.32	ug/kg wet	33.124	1.33 U	97.7	50-144		
Endrin ketone	28.5	D	1.32	ug/kg wet	33.124	1.33 U	86.0	70-139		
Surrogate: Tetrachloro-meta-xylene	*34.3*			*ug/kg wet*	*33.127*		*104*	*28-166*		
Surrogate: Decachlorobiphenyl	*29.2*			*ug/kg wet*	*33.124*		*88.3*	*37-153*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 11/12/2012 09:06

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210212 - SW 3540C										
Matrix Spike Dup (L210212-MSD1)		**Source: 1210048-01**		Prepared: 10/24/2012 Analyzed: 10/26/2012						
alpha-BHC	32.6	D	1.31	ug/kg wet	32.873	1.33 U	99.2	65-145	13.0	40
gamma-BHC	34.3	D	1.31	ug/kg wet	32.873	1.33 U	104	70-143	12.8	40
beta-BHC	26.3	D	1.31	ug/kg wet	32.873	1.33 U	80.0	75-143	14.9	40
delta-BHC	24.1	D	1.31	ug/kg wet	32.873	1.33 U	73.3	65-143	19.3	40
Heptachlor	35.7	D	1.31	ug/kg wet	32.873	1.33 U	108	70-139	10.6	40
Aldrin	33.2	D	1.31	ug/kg wet	32.873	1.33 U	101	70-143	15.5	40
Heptachlor epoxide	33.1	D	1.31	ug/kg wet	32.873	1.33 U	101	71-138	12.9	40
gamma-Chlordane	33.4	D	1.31	ug/kg wet	32.873	1.33 U	102	71-137	13.4	40
alpha-Chlordane	32.7	D	1.31	ug/kg wet	32.873	1.33 U	99.6	72-136	11.0	40
Endosulfan I	31.7	D	1.31	ug/kg wet	32.873	1.33 U	96.5	72-139	12.7	40
4,4'-DDE	36.2	D	1.31	ug/kg wet	32.873	1.76	105	70-154	13.6	40
Dieldrin	33.1	D	1.31	ug/kg wet	32.873	1.33 U	101	73-143	11.6	40
Endrin	33.4	D	1.31	ug/kg wet	32.873	1.33 U	102	74-137	12.0	40
4,4'-DDD	34.4	D	1.31	ug/kg wet	32.873	1.56	99.7	52-153	18.8	40
Endosulfan II	29.4	D	1.31	ug/kg wet	32.873	1.33 U	89.4	72-139	12.1	40
4,4'-DDT	54.2	D	1.31	ug/kg wet	32.873	22.7	95.9	58-148	11.8	40
Endrin aldehyde	25.9	D	1.31	ug/kg wet	32.873	1.56	74.1	49-129	13.2	40
Endosulfan sulfate	30.4	D	1.31	ug/kg wet	32.873	1.33 U	92.4	66-139	12.7	40
Methoxychlor	30.2	D	1.31	ug/kg wet	32.873	1.33 U	91.8	50-144	6.23	40
Endrin ketone	29.4	D	1.31	ug/kg wet	32.873	1.33 U	89.5	70-139	3.99	40
Surrogate: Tetrachloro-meta-xylene	*37.9*			*ug/kg wet*	*32.876*		*115*	*28-166*		
Surrogate: Decachlorobiphenyl	*31.7*			*ug/kg wet*	*32.873*		*96.3*	*37-153*		

PREPARATION BENCH SHEET

L210212

Lionville Laboratory

Printed: 10/26/2012 9:54:30AM

000000038

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210048-01	8081A TCL Pesticides	10/24/2012 19:51	30.08	10				250	WC-Hanford, Inc.	
1210048-01	8082 PCBs	10/24/2012 19:51	30.08	10				250	WC-Hanford, Inc.	
1210049-01	8081A TCL Pesticides	10/24/2012 19:51	30.47	10				250	WC-Hanford, Inc.	
1210049-01	8082 PCBs	10/24/2012 19:51	30.47	10				250	WC-Hanford, Inc.	
L210212-BLK1	QC	10/24/2012 19:51	30	10				250		PEST
L210212-BLK2	QC	10/24/2012 19:51	30	10				250		
L210212-BS1	QC	10/24/2012 19:51	30	10	1200903		250	250		PEST
L210212-BS2	QC	10/24/2012 19:51	30	10	1200902		250	250		pcb
L210212-MS1	QC	10/24/2012 19:51	30.19	10	1200903	1210048-01	250	250		PEST
L210212-MS2	QC	10/24/2012 19:51	30.86	10	1200902	1210048-01	250	250		pcb
L210212-MS3	QC	10/24/2012 19:51	30.52	10	1200903	1210049-01	250	250		PEST
L210212-MS4	QC	10/24/2012 19:51	30.39	10	1200902	1210049-01	250	250		pcb
L210212-MSD1	QC	10/24/2012 19:51	30.42	10	1200903	1210048-01	250	250		PEST
L210212-MSD2	QC	10/24/2012 19:51	30.13	10	1200902	1210048-01	250	250		pcb
L210212-MSD3	QC	10/24/2012 19:51	30.18	10	1200903	1210049-01	250	250		PEST
L210212-MSD4	QC	10/24/2012 19:51	30.54	10	1200902	1210049-01	250	250		pcb

Revision for BS1 spike
MS1
MSD1

10/26/12

Extracts Relinquished By Date

Extracts Received By Date

PREPARATION BENCH SHEET

L210212

Lionville Laboratory

Printed: 10/25/2012 3:17:52PM

Matrix: Solid

Prepared using: Extraction - SW 3540C

Surrogate used: 1201060

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210048-01	8081A TCL Pesticides	10/24/2012 19:51	30.08	10				250	WC-Hanford, Inc.	
1210048-01	8082 PCBs	10/24/2012 19:51	30.08	10				250	WC-Hanford, Inc.	
1210049-01	8081A TCL Pesticides	10/24/2012 19:51	30.47	10				250	WC-Hanford, Inc.	
1210049-01	8082 PCBs	10/24/2012 19:51	30.47	10				250	WC-Hanford, Inc.	
L210212-BLK1	QC	10/24/2012 19:51	30	10				250		
L210212-BLK2	QC	10/24/2012 19:51	30	10				250		
L210212-BS1	QC	10/24/2012 19:51	30	10	1200902		250	250		
L210212-BS2	QC	10/24/2012 19:51	30	10	1200902		250	250		
L210212-MS1	QC	10/24/2012 19:51	30.19	10	1200902	1210049-01	250	250		
L210212-MS2	QC	10/24/2012 19:51	30.86	10	1200902	1210048-01	250	250		
L210212-MS3	QC	10/24/2012 19:51	30.52	10	1200903	1210049-01	250	250		
L210212-MS4	QC	10/24/2012 19:51	30.39	10	1200902	1210049-01	250	250		
L210212-MSD1	QC	10/24/2012 19:51	30.42	10	1200902	1210049-01	250	250		
L210212-MSD2	QC	10/24/2012 19:51	30.13	10	1200902	1210048-01	250	250		
L210212-MSD3	QC	10/24/2012 19:51	30.18	10	1200903	1210049-01	250	250		
L210212-MSD4	QC	10/24/2012 19:51	30.54	10	1200902	1210049-01	250	250		

S cleaned 10.25.12 SZ
Cu lot # B10X036

Extracts Relinquished By — Date 10/25/12 1520

Extracts Received By — Date S Zak 10.25.12 15:30

PCBs

264 Welsh Pool Road
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Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/06/2012 21:34

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R3M5	1210048-01	Other Solid	10/16/2012 08:55	10/17/2012 10:05

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-073 K4003
LVL #: 1210048

W.O. #: 60049-001-001-0001-00
Received: 10-17-2012

PCBs

One (1) other solid sample was collected on 10-16-2012.

The sample and associated QC samples were extracted 10-24-2012 and analyzed 10-31-2012 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 for all target compounds.

5. All blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. The sample was reported on a wet weight 'as received' basis.

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

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

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. 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

11/12/12
Date

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

(8082)A PCBs

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

Analyte	CCV1 10.31.12 10:00:36 AM		CCV2 10.31.12 3:07:47 PM		CCV3 10.31.12 6:30:11 PM		CCV4 11.01.12 2:55:17 AM		CCV5 11.01.12 6:17:46 AM		CCV6 11.01.12 10:20:28 AM		CCV7		CCV8	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Tetrachloro-meta-xylene (surrogate)							-17.7	-18.9	-18.7	-21.0	-15.3	-17.7				
Decachlorobiphenyl (surrogate)	16.9	19.0			18.5	19.2	-20.7	-16.8	-21.7	-17.4	-26.4	-21.9				
Aroclor 1016-1																
Aroclor 1016-2																
Aroclor 1016-3																
Aroclor 1016-4																
Aroclor 1016-5																
Aroclor 1260-1							-15.2	-15.2								
Aroclor 1260-2							-17.4	~~-14.3~~	-17.5		-17.2					
Aroclor 1260-3							-16.1		-15.5		-15.6					
Aroclor 1260-4							-19.9		-19.9		-21.4	-15.9				
Aroclor 1260-5						18.6	-17.9		-18.1		-20.8	-16.3				
Mean %D or %Drift	-0.8	3.4	-6.2	-1.9	3.6	9.4	-14.5	-12.2	-14.6	-11.9	-13.5	-10.8				

Sample results reported from affected CCV:

CCV1: L210212-BK2, BS2, 1210048-01, L210212-MS2, MSD2

CCV2: 12110049-01, L210212-MS4, MSD4

CCV3: 1210053-02,04,05,06,07,08,10; L210206-MS3, MSD3

CCV4: 1210053-01,03,09

CCV5: 1210053-11,12,13,14

CCV6:

CCV7:

CCV8:

264 Welsh Pool Road
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Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 11/06/2012 21:34

J1R3M5
1210048-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.3	U	13.3	ug/kg wet	1	L210212	10/24/2012	10/31/2012	8082
Aroclor 1221	13.3	U	13.3	ug/kg wet	1	L210212	10/24/2012	10/31/2012	8082
Aroclor 1232	13.3	U	13.3	ug/kg wet	1	L210212	10/24/2012	10/31/2012	8082
Aroclor 1242	13.3	U	13.3	ug/kg wet	1	L210212	10/24/2012	10/31/2012	8082
Aroclor 1248	13.3	U	13.3	ug/kg wet	1	L210212	10/24/2012	10/31/2012	8082
Aroclor 1254	**22.7**		13.3	ug/kg wet	1	L210212	10/24/2012	10/31/2012	8082
Aroclor 1260	**65.3**		13.3	ug/kg wet	1	L210212	10/24/2012	10/31/2012	8082
Aroclor 1262	13.3	U	13.3	ug/kg wet	1	L210212	10/24/2012	10/31/2012	8082
Aroclor 1268	13.3	U	13.3	ug/kg wet	1	L210212	10/24/2012	10/31/2012	8082
Surrogate: Decachlorobiphenyl	*121 %*		*43-144*			*L210212*	*10/24/2012*	*10/31/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*128 %*		*52-141*			*L210212*	*10/24/2012*	*10/31/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 11/06/2012 21:34

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 L210212 - SW 3540C										
Blank (L210212-BLK2)				Prepared: 10/24/2012 Analyzed: 10/31/2012						
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	*45.0*			*ug/kg wet*	*33.333*		*135*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*32.6*			*ug/kg wet*	*33.337*		*98*	*52-141*		
LCS (L210212-BS2)				Prepared: 10/24/2012 Analyzed: 10/31/2012						
Aroclor 1016	166		13.3	ug/kg wet	166.67		100	50-138		
Aroclor 1260	187		13.3	ug/kg wet	166.67		112	50-148		
Surrogate: Decachlorobiphenyl	*43.3*			*ug/kg wet*	*33.333*		*130*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*33.1*			*ug/kg wet*	*33.337*		*99*	*52-141*		
Matrix Spike (L210212-MS2)		**Source: 1210048-01**		Prepared: 10/24/2012 Analyzed: 10/31/2012						
Aroclor 1016	159		12.9	ug/kg wet	162.02	13.3 U	98	50-138		
Aroclor 1260	208		12.9	ug/kg wet	162.02	65.3	88	50-148		
Surrogate: Decachlorobiphenyl	*33.5*			*ug/kg wet*	*32.404*		*104*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*36.9*			*ug/kg wet*	*32.408*		*114*	*52-141*		
Matrix Spike Dup (L210212-MSD2)		**Source: 1210048-01**		Prepared: 10/24/2012 Analyzed: 10/31/2012						
Aroclor 1016	179		13.2	ug/kg wet	165.95	13.3 U	108	50-138	10	40
Aroclor 1260	226		13.2	ug/kg wet	165.95	65.3	97	50-148	9	40
Surrogate: Decachlorobiphenyl	*36.7*			*ug/kg wet*	*33.190*		*110*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*40.2*			*ug/kg wet*	*33.193*		*121*	*52-141*		

PREPARATION BENCH SHEET

L210212

Lionville Laboratory

Printed: 10/26/2012 9:54:30AM

00000048

Matrix: Solid

Prepared using: GC - SW 3540C

Surrogate used: 1201060

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210048-01	8081A TCL Pesticides	10/24/2012 19:51	30.08	10				250	WC-Hanford, Inc.	
1210048-01	8082 PCBs	10/24/2012 19:51	30.08	10				250	WC-Hanford, Inc.	
1210049-01	8081A TCL Pesticides	10/24/2012 19:51	30.47	10				250	WC-Hanford, Inc.	
1210049-01	8082 PCBs	10/24/2012 19:51	30.47	10				250	WC-Hanford, Inc.	
L210212-BLK1	QC	10/24/2012 19:51	30	10				250		PEST
L210212-BLK2	QC	10/24/2012 19:51	30	10				250		
L210212-BS1	QC	10/24/2012 19:51	30	10	1200903		250	250		PEST
L210212-BS2	QC	10/24/2012 19:51	30	10	1200902		250	250		pcb
L210212-MS1	QC	10/24/2012 19:51	30.19	10	1200903	1210048-01	250	250		PEST
L210212-MS2	QC	10/24/2012 19:51	30.86	10	1200902	1210048-01	250	250		pcb
L210212-MS3	QC	10/24/2012 19:51	30.52	10	1200903	1210049-01	250	250		PEST
L210212-MS4	QC	10/24/2012 19:51	30.39	10	1200902	1210049-01	250	250		pcb
L210212-MSD1	QC	10/24/2012 19:51	30.42	10	1200903	1210048-01	250	250		PEST
L210212-MSD2	QC	10/24/2012 19:51	30.13	10	1200902	1210048-01	250	250		pcb
L210212-MSD3	QC	10/24/2012 19:51	30.18	10	1200903	1210049-01	250	250		PEST
L210212-MSD4	QC	10/24/2012 19:51	30.54	10	1200902	1210049-01	250	250		pcb

revision for BS1 spike
MS1
MSD1

10/26/12

Extracts Relinquished By Date

Extracts Received By Date

PREPARATION BENCH SHEET

L210212

Lionville Laboratory

Printed: 10/25/2012 3:17:52PM

00000049

Matrix: Solid

Prepared using: Extraction - SW 3540C

Surrogate used: 1201060

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210048-01	8081A TCL Pesticides	10/24/2012 19:51	30.08	10				250	WC-Hanford, Inc.	
1210048-01	8082 PCBs	10/24/2012 19:51	30.08	10				250	WC-Hanford, Inc.	
1210049-01	8081A TCL Pesticides	10/24/2012 19:51	30.47	10				250	WC-Hanford, Inc.	
1210049-01	8082 PCBs	10/24/2012 19:51	30.47	10				250	WC-Hanford, Inc.	
L210212-BLK1	QC	10/24/2012 19:51	30	10				250		
L210212-BLK2	QC	10/24/2012 19:51	30	10				250		
L210212-BS1	QC	10/24/2012 19:51	30	10	1200902		250	250		
L210212-BS2	QC	10/24/2012 19:51	30	10	1200902		250	250		
L210212-MS1	QC	10/24/2012 19:51	30.19	10	1200902	1210049-01	250	250		
L210212-MS2	QC	10/24/2012 19:51	30.86	10	1200902	1210048-01	250	250		
L210212-MS3	QC	10/24/2012 19:51	30.52	10	1200903	1210049-01	250	250		
L210212-MS4	QC	10/24/2012 19:51	30.39	10	1200902	1210049-01	250	250		
L210212-MSD1	QC	10/24/2012 19:51	30.42	10	1200902	1210049-01	250	250		
L210212-MSD2	QC	10/24/2012 19:51	30.13	10	1200902	1210048-01	250	250		
L210212-MSD3	QC	10/24/2012 19:51	30.18	10	1200903	1210049-01	250	250		
L210212-MSD4	QC	10/24/2012 19:51	30.54	10	1200902	1210049-01	250	250		

S cleaned 10.25.12 S2
Cu lot # B10X036

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

Extracts Received By — Date: 10.25.12 15:30

PAHs

264 Welsh Pool Road
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Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 11/05/2012 20:36

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R3M5	1210048-01	Other Solid	10/16/2012 08:55	10/17/2012 10:05

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-073 K4003
LVL #: 1210048

W.O. #: 60049-001-001-0001-00
Date Received: 10-17-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) other solid sample was collected on 10-16-2012.

The sample and associated QC samples were extracted 10-23-2012 and analyzed 10-24,31-2012 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. Two (2) of five (5) surrogate recoveries were within acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC181) has been enclosed.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. Matrix spike recoveries were unobtainable due to high concentrations of target analytes.
7. The initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. The sample was reported on a wet weight 'as received' basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

11/12/12
Date

r:\group\data\2012\pah 8310\wc hanford\1210048.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 #: 12GC181

Initiator: Catherine Carey
Date: 11/05/12
Client: LOC Hanford

Batch: 1210048
Samples: 01, MS1, MSD1
Method: SW846/MCAWW/CLP/

Parameter: PAHs
Matrix: SOIL
Prep Batch: L210187

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)

surrogate recoveries out high in sample #01 + MS1
multiple spike recoveries outside QC limits in MS1, MSD1

2. Known or Probable Causes(s)

high concentration of target analytes (MS,S)
Interference from Non target analyte (surrogates)

3. Discussion and Proposed Action Other Description:

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

Narrate

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

✓ 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: 11/11/12 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

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-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/05/2012 20:36

J1R3M5
1210048-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**1540**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Acenaphthylene	79.0	U	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Acenaphthene	79.0	U	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Fluorene	79.0	U	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Phenanthrene	**598**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Anthracene	**125**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Fluoranthene	**2100**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Indeno[1,2,3-cd]pyrene	**932**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Pyrene	**2620**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Benz[a]anthracene	**1770**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Chrysene	**1950**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Benzo[b] fluoranthene	**1670**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Benzo[k] fluoranthene	**1010**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Benzo[a] pyrene	**2500**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Dibenz[a,h]anthracene	**186**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Benzo[g,h,i] perylene	**1910**	D	79.0	ug/kg wet	25	L210187	10/23/2012	10/31/2012	8310
Surrogate: Triphenylene	*316 % **		*68-129*			*L210187*	*10/23/2012*	*10/31/2012*	*8310*

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-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 11/05/2012 20:36

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 L210187 - SW 3540C										
Blank (L210187-BLK1)				Prepared: 10/23/2012 Analyzed: 10/24/2012						
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	*174*			*ug/kg wet*	*166.67*		*104*	*68-129*		
LCS (L210187-BS1)				Prepared: 10/23/2012 Analyzed: 10/24/2012						
Naphthalene	131		3.33	ug/kg wet	166.67		79	0-127		
Acenaphthylene	134		3.33	ug/kg wet	166.67		80	50-140		
Acenaphthene	138		3.33	ug/kg wet	166.67		83	17-139		
Fluorene	136		3.33	ug/kg wet	166.67		81	28-145		
Phenanthrene	141		3.33	ug/kg wet	166.67		84	30-152		
Anthracene	149		3.33	ug/kg wet	166.67		89	19-171		
Fluoranthene	145		3.33	ug/kg wet	166.67		87	34-159		
Indeno[1,2,3-cd]pyrene	153		3.33	ug/kg wet	166.67		92	31-156		
Pyrene	153		3.33	ug/kg wet	166.67		92	33-152		
Benz[a]anthracene	158		3.33	ug/kg wet	166.67		95	32-157		
Chrysene	151		3.33	ug/kg wet	166.67		91	31-159		
Benzo[b] fluoranthene	158		3.33	ug/kg wet	166.67		95	33-164		
Benzo[k] fluoranthene	156		3.33	ug/kg wet	166.67		94	28-161		
Benzo[a] pyrene	170		3.33	ug/kg wet	166.67		102	29-149		
Dibenz[a,h]anthracene	162		3.33	ug/kg wet	166.67		97	27-153		
Benzo[g,h,i] perylene	169		3.33	ug/kg wet	166.67		101	32-157		
Surrogate: Triphenylene	*186*			*ug/kg wet*	*166.67*		*111*	*68-129*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 11/05/2012 20:36

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 L210187 - SW 3540C										
Matrix Spike (L210187-MS1)		**Source: 1210048-01**		Prepared: 10/23/2012 Analyzed: 10/31/2012						
Naphthalene	1590	D	83.0	ug/kg wet	166.22	1540	30	0-127		
Acenaphthylene	267	D	83.0	ug/kg wet	166.22	79.0 U	161*	50-140		
Acenaphthene	1000	D	83.0	ug/kg wet	166.22	79.0 U	603*	17-139		
Fluorene	140	D	83.0	ug/kg wet	166.22	79.0 U	84	28-145		
Phenanthrene	603	D	83.0	ug/kg wet	166.22	598	3*	30-152		
Anthracene	159	D	83.0	ug/kg wet	166.22	125	21	19-171		
Fluoranthene	1100	D	83.0	ug/kg wet	166.22	2100	-601*	34-159		
Indeno[1,2,3-cd]pyrene	417	D	83.0	ug/kg wet	166.22	932	-310*	31-156		
Pyrene	1040	D	83.0	ug/kg wet	166.22	2620	-953*	33-152		
Benz[a]anthracene	541	D	83.0	ug/kg wet	166.22	1770	-738*	32-157		
Chrysene	578	D	83.0	ug/kg wet	166.22	1950	-824*	31-159		
Benzo[b] fluoranthene	555	D	83.0	ug/kg wet	166.22	1670	-672*	33-164		
Benzo[k] fluoranthene	338	D	83.0	ug/kg wet	166.22	1010	-407*	28-161		
Benzo[a] pyrene	638	D	83.0	ug/kg wet	166.22	2500	-1120*	29-149		
Dibenz[a,h]anthracene	159	D	83.0	ug/kg wet	166.22	186	-16*	27-153		
Benzo[g,h,i] perylene	756	D	83.0	ug/kg wet	166.22	1910	-695*	32-157		
Surrogate: Triphenylene	*280*			*ug/kg wet*	*166.22*		*169**	*68-129*		
Matrix Spike Dup (L210187-MSD1)		**Source: 1210048-01**		Prepared: 10/23/2012 Analyzed: 10/31/2012						
Naphthalene	1640	D	81.7	ug/kg wet	163.56	1540	58	0-127	64*	40
Acenaphthylene	294	D	81.7	ug/kg wet	163.56	79.0 U	180*	50-140	11	40
Acenaphthene	1560	D	81.7	ug/kg wet	163.56	79.0 U	955*	17-139	45*	40
Fluorene	145	D	81.7	ug/kg wet	163.56	79.0 U	89	28-145	5	40
Phenanthrene	691	D	81.7	ug/kg wet	163.56	598	57	30-152	183*	40
Anthracene	184	D	81.7	ug/kg wet	163.56	125	36	19-171	55*	40
Fluoranthene	1270	D	81.7	ug/kg wet	163.56	2100	-507*	34-159	-17	40
Indeno[1,2,3-cd]pyrene	367	D	81.7	ug/kg wet	163.56	932	-345*	31-156	-11	40
Pyrene	1200	D	81.7	ug/kg wet	163.56	2620	-868*	33-152	-9	40
Benz[a]anthracene	598	D	81.7	ug/kg wet	163.56	1770	-714*	32-157	-3	40
Chrysene	657	D	81.7	ug/kg wet	163.56	1950	-790*	31-159	-4	40
Benzo[b] fluoranthene	422	D	81.7	ug/kg wet	163.56	1670	-765*	33-164	-13	40
Benzo[k] fluoranthene	294	D	81.7	ug/kg wet	163.56	1010	-440*	28-161	-8	40
Benzo[a] pyrene	691	D	81.7	ug/kg wet	163.56	2500	-1110*	29-149	-1	40
Dibenz[a,h]anthracene	145	D	81.7	ug/kg wet	163.56	186	-25*	27-153	-44	40
Benzo[g,h,i] perylene	789	D	81.7	ug/kg wet	163.56	1910	-686*	32-157	-1	40
Surrogate: Triphenylene	*211*			*ug/kg wet*	*163.56*		*129*	*68-129*		

PREPARATION BENCH SHEET

L210187

Lionville Laboratory

Printed: 10/24/2012 1:11:29PM

00000058

Matrix: Solid

Prepared using: Extraction - SW 3540C

Surrogate used: 1200612

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210048-01	8310 PAH	10/23/2012 17:04	31.63	5				50	WC-Hanford, Inc.	
1210049-01	8310 PAH	10/23/2012 17:04	30.27	5				50	WC-Hanford, Inc.	
1210059-01	8310 PAH	10/23/2012 17:04	30.76	5				50	WC-Hanford, Inc.	
1210059-02	8310 PAH	10/23/2012 17:04	30.1	5				50	WC-Hanford, Inc.	
1210059-03	8310 PAH	10/23/2012 17:04	30.16	5				50	WC-Hanford, Inc.	
1210059-04	8310 PAH	10/23/2012 17:04	30.42	5				50	WC-Hanford, Inc.	
1210059-05	8310 PAH	10/23/2012 17:04	30.49	5				50	WC-Hanford, Inc.	
1210059-06	8310 PAH	10/23/2012 17:04	31.07	5				50	WC-Hanford, Inc.	
1210059-07	8310 PAH	10/23/2012 17:04	30.6	5				50	WC-Hanford, Inc.	
1210059-08	8310 PAH	10/23/2012 17:04	30.14	5				50	WC-Hanford, Inc.	
1210059-09	8310 PAH	10/23/2012 17:04	31.29	5				50	WC-Hanford, Inc.	
1210059-10	8310 PAH	10/23/2012 17:04	31.02	5				50	WC-Hanford, Inc.	
1210059-11	8310 PAH	10/23/2012 17:04	30.14	5				50	WC-Hanford, Inc.	
1210059-12	8310 PAH	10/23/2012 17:04	30.11	5				50	WC-Hanford, Inc.	
1210059-13	8310 PAH	10/23/2012 17:04	31.75	5				50	WC-Hanford, Inc.	
1210059-14	8310 PAH	10/23/2012 17:04	31.94	5				50	WC-Hanford, Inc.	
1210059-15	8310 PAH	10/23/2012 17:04	31.2	5				50	WC-Hanford, Inc.	
1210059-16	8310 PAH	10/23/2012 17:04	30.66	5				50	WC-Hanford, Inc.	
1210059-17	8310 PAH	10/23/2012 17:04	30.37	5				50	WC-Hanford, Inc.	
L210187-BLK1	QC	10/23/2012 17:04	30	5				50		

Extracts Relinquished By 10/24/12 1315 Date

Extracts Received By 10/24/12 Date

PREPARATION BENCH SHEET

L210187

Lionville Laboratory

Printed: 10/24/2012 1:11:29PM

00000059

Matrix: Solid

Prepared using: Extraction - SW 3540C

Surrogate used: 1200612

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
L210187-BS1	QC	10/23/2012 17:04	30	5	1200963		50	50		
L210187-MS1	QC	10/23/2012 17:04	30.08	5	1200963	1210048-01	50	50		
L210187-MS2	QC	10/23/2012 17:04	30.01	5	1200963	1210049-01	50	50		
L210187-MS3	QC	10/23/2012 17:04	30.57	5	1200963	1210059-02	50	50		
L210187-MSD1	QC	10/23/2012 17:04	30.57	5	1200963	1210048-01	50	50		
L210187-MSD2	QC	10/23/2012 17:04	30	5	1200963	1210049-01	50	50		
L210187-MSD3	QC	10/23/2012 17:04	30.75	5	1200963	1210059-02	50	50		

Extracts Relinquished By — Date: 10/24/12 1315

Extracts Received By: UC — Date: 10/24/12

METALS

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

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/29/2012 08:55

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R3M5	1210048-01	Other Solid	10/16/2012 08:55	10/17/2012 10:05

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-073
LVL#: 1210048
SDG/SAF#: K4003/RC-073

W.O.#: 60049-001-001-0001-00
Date Received: 10-17-12

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 other solid sample.

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

   The sample was analyzed and reported with a 10-fold dilution for Mercury due to high concentration of Mercury in the sample.

   The metals internal standard, Yttrium, was not used in the calculation of these data due to the native concentrations of Yttrium in the client samples.

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

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

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

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

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

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

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

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 7 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 serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration levels for the following analytes: Aluminum, Antimony, Calcium, Chromium, Iron, and Silicon. The Iron post digestion spike recovery is outside the 75-125% control limit possibly due to matrix effect.

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1R3M5	Mercury	1.0	109.9

12. The duplicate analyses for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

11/1/12
Date

alm/10-048noyhgn%

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-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 10/29/2012 08:55

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

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

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/29/2012 08:55

J1R3M5
1210048-01 (Other Solid)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**10400**		4.81	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Antimony	0.577	U	0.577	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Arsenic	**5.53**		0.962	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Barium	**102**		0.481	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Beryllium	**0.354**		0.192	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Boron	**2.89**		1.92	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Cadmium	**1.23**		0.192	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Calcium	**11800**		96.2	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Chromium	**67.8**		0.192	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Cobalt	**9.75**		1.92	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Copper	**85.0**		0.962	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Iron	**34900**		19.2	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Lead	**40.1**		0.481	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Magnesium	**6700**		72.1	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Manganese	**507**		4.81	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Molybdenum	**1.01**	B	1.92	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Nickel	**16.0**		3.85	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Potassium	**1850**		385	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Selenium	0.962	U	0.962	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Silicon	**710**		1.92	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Silver	0.192	U	0.192	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Sodium	**679**		48.1	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Vanadium	**86.9**		2.40	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Zinc	**160**		9.62	mg/kg wet	1	L210202	10/24/2012	10/25/2012	6010B
Mercury	**4.66**		0.281	mg/kg wet	10	L210167	10/22/2012	10/23/2012	7471A

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/29/2012 08:55

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 L210167 - SW 7471A Prep										
Blank (L210167-BLK1)				Prepared: 10/22/2012 Analyzed: 10/23/2012						
Mercury	0.0273	U	0.0273	mg/kg wet						
Duplicate (L210167-DUP1)		**Source: 1210048-01**		Prepared: 10/22/2012 Analyzed: 10/23/2012						
Mercury	4.12		0.243	mg/kg wet		4.66			12.2	20
Matrix Spike (L210167-MS1)		**Source: 1210048-01**		Prepared: 10/22/2012 Analyzed: 10/23/2012						
Mercury	3.90		0.265	mg/kg wet	0.14706	4.66	-516*	75-125		
Reference (L210167-SRM1)				Prepared: 10/22/2012 Analyzed: 10/23/2012						
Mercury	1.28		0.0290	mg/kg wet	1.2900		99.3	62.6-138		
Batch L210202 - SW 3050B										
Blank (L210202-BLK1)				Prepared: 10/24/2012 Analyzed: 10/25/2012						
Aluminum	4.90	U	4.90	mg/kg wet						
Antimony	0.588	U	0.588	mg/kg wet						
Arsenic	0.980	U	0.980	mg/kg wet						
Barium	0.490	U	0.490	mg/kg wet						
Beryllium	0.196	U	0.196	mg/kg wet						
Boron	1.96	U	1.96	mg/kg wet						
Cadmium	0.196	U	0.196	mg/kg wet						
Calcium	98.0	U	98.0	mg/kg wet						
Chromium	0.196	U	0.196	mg/kg wet						
Cobalt	1.96	U	1.96	mg/kg wet						
Copper	0.980	U	0.980	mg/kg wet						
Iron	19.6	U	19.6	mg/kg wet						
Lead	0.490	U	0.490	mg/kg wet						
Magnesium	73.5	U	73.5	mg/kg wet						
Manganese	4.90	U	4.90	mg/kg wet						
Molybdenum	1.96	U	1.96	mg/kg wet						
Nickel	3.92	U	3.92	mg/kg wet						
Potassium	392	U	392	mg/kg wet						
Selenium	0.980	U	0.980	mg/kg wet						
Silicon	1.96	U	1.96	mg/kg wet						
Silver	0.196	U	0.196	mg/kg wet						
Sodium	49.0	U	49.0	mg/kg wet						
Vanadium	2.45	U	2.45	mg/kg wet						
Zinc	9.80	U	9.80	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/29/2012 08:55

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 L210202 - SW 3050B										
Duplicate (L210202-DUP1)		**Source: 1210048-01**		Prepared: 10/24/2012 Analyzed: 10/25/2012						
Aluminum	10900		4.46	mg/kg wet		10400			5	20
Antimony	0.536	U	0.536	mg/kg wet		0.577 U				20
Arsenic	6.30		0.893	mg/kg wet		5.53			13	20
Barium	112		0.446	mg/kg wet		102			9	20
Beryllium	0.364		0.179	mg/kg wet		0.354			3	20
Boron	2.39		1.79	mg/kg wet		2.89			19	20
Cadmium	1.50		0.179	mg/kg wet		1.23			20	20
Calcium	12600		89.3	mg/kg wet		11800			7	20
Chromium	94.1		0.179	mg/kg wet		67.8			32*	20
Cobalt	9.79		1.79	mg/kg wet		9.75			0.5	20
Copper	100		0.893	mg/kg wet		85.0			16	20
Iron	35500		17.9	mg/kg wet		34900			2	20
Lead	43.5		0.446	mg/kg wet		40.1			8	20
Magnesium	6700		67.0	mg/kg wet		6700			0	20
Manganese	503		4.46	mg/kg wet		507			0.7	20
Molybdenum	0.979	B	1.79	mg/kg wet		1.01			3	20
Nickel	18.2		3.57	mg/kg wet		16.0			13	20
Potassium	1950		357	mg/kg wet		1850			5	20
Selenium	0.893	U	0.893	mg/kg wet		0.962 U				20
Silicon	626		1.79	mg/kg wet		710			13	20
Silver	0.179	U	0.179	mg/kg wet		0.192 U				20
Sodium	762		44.6	mg/kg wet		679			11	20
Vanadium	84.8		2.23	mg/kg wet		86.9			2	20
Zinc	175		8.93	mg/kg wet		160			9	20
Matrix Spike (L210202-MS1)		**Source: 1210048-01**		Prepared: 10/24/2012 Analyzed: 10/25/2012						
Aluminum	12400		4.90	mg/kg wet	196.08	10400	1010*	75-125		
Antimony	13.2		0.588	mg/kg wet	49.020	0.577 U	27*	75-125		
Arsenic	180		0.980	mg/kg wet	196.08	5.53	89	75-125		
Barium	317		0.490	mg/kg wet	196.08	102	110	75-125		
Beryllium	4.98		0.196	mg/kg wet	4.9020	0.354	94	75-125		
Boron	80.5		1.96	mg/kg wet	98.039	2.89	79	75-125		
Cadmium	5.85		0.196	mg/kg wet	4.9020	1.23	94	75-125		
Calcium	15600		98.0	mg/kg wet	2451.0	11800	153*	75-125		
Chromium	96.4		0.196	mg/kg wet	19.608	67.8	146*	75-125		
Cobalt	49.5		1.96	mg/kg wet	49.020	9.75	81	75-125		
Copper	110		0.980	mg/kg wet	24.510	85.0	100	75-125		

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/29/2012 08:55

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 L210202 - SW 3050B									
Matrix Spike (L210202-MS1)		**Source: 1210048-01**	Prepared: 10/24/2012 Analyzed: 10/25/2012						
Iron	36600	19.6	mg/kg wet	98.039	34900	1700*	75-125		
Lead	78.2	0.490	mg/kg wet	49.020	40.1	78	75-125		
Magnesium	9150	73.5	mg/kg wet	2451.0	6700	100	75-125		
Manganese	548	4.90	mg/kg wet	49.020	507	84	75-125		
Molybdenum	84.7	1.96	mg/kg wet	98.039	1.01	85	75-125		
Nickel	56.8	3.92	mg/kg wet	49.020	16.0	83	75-125		
Potassium	4560	392	mg/kg wet	2451.0	1850	111	75-125		
Selenium	164	0.980	mg/kg wet	196.08	0.962 U	84	75-125		
Silicon	689	1.96	mg/kg wet	98.039	710	-22*	75-125		
Silver	4.52	0.196	mg/kg wet	4.9020	0.192 U	92	75-125		
Sodium	3490	49.0	mg/kg wet	2451.0	679	115	75-125		
Vanadium	134	2.45	mg/kg wet	49.020	86.9	96	75-125		
Zinc	214	9.80	mg/kg wet	49.020	160	108	75-125		
Post Spike (L210202-PS1)		**Source: 1210048-01**	Prepared: 10/24/2012 Analyzed: 10/26/2012						
Aluminum	133000		ug/L	22000	108000	113	75-125		
Antimony	185		ug/L	200.00	2.31	91	75-125		
Calcium	140000		ug/L	20800	123000	81	75-125		
Chromium	1790		ug/L	1200.0	706	90	75-125		
Iron	377000		ug/L	22000	363000	60*	75-125		
Silicon	9860		ug/L	2200.0	7380	113	75-125		
Reference (L210202-SRM1)			Prepared: 10/24/2012 Analyzed: 10/25/2012						
Aluminum	10300	14.7	mg/kg wet	6670.0		155	0-200.89		
Antimony	35.1	1.76	mg/kg wet	53.000		66	0-235.8		
Arsenic	114	2.94	mg/kg wet	114.00		100	82.8-117.54		
Barium	316	1.47	mg/kg wet	307.00		103	79.8-120.2		
Beryllium	106	0.588	mg/kg wet	108.00		98	82.8-117.6		
Boron	78.7	5.88	mg/kg wet	85.100		92	67.5-132.8		
Cadmium	221	0.588	mg/kg wet	225.00		98	83.6-116.4		
Calcium	3340	294	mg/kg wet	3360.0		100	83.3-116.9		
Chromium	82.1	0.588	mg/kg wet	77.200		106	73.3-126.4		
Cobalt	161	5.88	mg/kg wet	166.00		97	80.7-118.7		
Copper	264	2.94	mg/kg wet	271.00		97	80.8-119.2		
Iron	8590	58.8	mg/kg wet	8420.0		102	78.6-121.1		
Lead	184	1.47	mg/kg wet	190.00		97	81.6-118.4		
Magnesium	8180	221	mg/kg wet	8570.0		95	83.2-116.7		
Manganese	825	14.7	mg/kg wet	965.00		85	69.3-130.5		

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/29/2012 08:55

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 L210202 - SW 3050B									
Reference (L210202-SRM1)			Prepared: 10/24/2012 Analyzed: 10/25/2012						
Molybdenum	229	5.88	mg/kg wet	235.00		97	76.2-123.8		
Nickel	219	11.8	mg/kg wet	221.00		99	79.6-120.8		
Potassium	14500	1180	mg/kg wet	14400		100	81.9-118.1		
Selenium	184	2.94	mg/kg wet	187.00		99	75.9-124.6		
Silicon	936	5.88	mg/kg wet	807.00		116	0-219.3		
Silver	81.2	0.588	mg/kg wet	83.500		97	82.7-117.1		
Sodium	9040	147	mg/kg wet	9730.0		93	82.5-117.2		
Vanadium	107	7.35	mg/kg wet	98.700		108	75.9-123.6		
Zinc	196	29.4	mg/kg wet	199.00		98	78.4-121.6		

Lionville Laboratory

Logbook #: 1154

SAMPLE DIGESTION RECORD

Digestion Batch #: L210202
Date/Time Initiated: 10/24/12 1705
Date/Time Completed: 10/24/12 2235
Analyst: CLA
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: 97°
BLOCK 1 3 2 (circle one)

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
1210048-01		0.52	50		TO	fine	Brown Dusty	NA	NA
L210202-DUP1		0.56	50			fine	Brown Dusty		
MS1	0.5	0.51	50			fine	Brown Dusty		
1210049-01		0.57	50			fine	Dark Sandy		
L210202-DUP2		0.57	50			fine	Dark Sandy		
MS2	0.5	0.55	50			fine	Dark sandy		
1210054-01		0.68	50			fine	Dark Sludge		
L210202-DUP3		0.57	50			fine	Dark sludge		
MS3	0.5	0.59	50			fine	Dark Sludge		
1210069-01		0.56	50			fine	Brown Sandy Soil		
L210202-DUP4		0.53	50			fine	Brown Sandy Soil		
MS4	0.5	0.51	50			fine	Brown Sandy Soil		
02		0.51	50			fine	Brown clay		
03		0.59	50			fine	Brown Soil		
04		0.58	50			fine	Brown Soil		
05		0.54	50			fine	Brown Clay		
06		0.55	50			fine	Brown Soil		
07		0.56	50			fine	Brown Soil		
08		0.58	50			fine	Brown Soil		
09		0.57	50			fine	Brown Soil		
10		0.65	50			fine	Brown Soil		
L210202-BLK		0.51	50			COARSE	Boiling chips		
SRM	*	0.51	50			fine	Pink Loamy		

CLA 10/24/12

Spiking IDs / Expiration Date:
MS#: 1200457

LCS#: * 1201014

Reagent IDs:
HNO_3 L08023
HCl L13029
H_2O_2 L11A03
1:1 HNO_3 037-066-02
1:1 HCl

File ID#:

Data Review By/Date:
CLA 10/25/12

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Signed\SPI\Metals Digestion log.doc

Page #:

Lionville Laboratory

MERCURY PREPARATION

Analyst: CB
Date 10/22/12
Start Time/Temp: 1725 / 94°
End Time/Temp: 1800 / 96°

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

Logbook # 1153
Prep Batch: L210167
Worksheet: HG102301
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 µg/L		0.500		10 mL	50	
2.0 µg/L		1.000		10 mL	50	
5.0 µg/L		2.500		10 mL	50	
10.0 µg/L		5.000		10 mL	50	
ICV		0.125	2.5	10 mL	50	
CCV		0.250	5.0	10 mL	50	
ICB/CCB				10 mL	50	
L210167-BLK1				0.33	50	
SRM1		✱	✱	0.31	50	
1210048-01				0.32	50	RAD I
L210167-DUP1				0.37	50	↓
MS1		0.500	1.0	0.34	50	↓
1210049-01				0.35	50	
L210167-DUP2				0.37	50	
MS2		0.500	1.0	0.36	50	
1210054-01				0.38	50	
L210167-DUP3				0.35	50	
MS3		0.500	1.0	0.39	50	
~~1210054-02~~						
cancelled 10/22/12						

cancel 10/22/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	10/22/12 1415
ICV/CCV/LCS	IV 1200532	NA

Reviewed By/Date: [signature] 10/24/12

se book # 1153 for std traceability information

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

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

WET CHEMISTRY

Lionville Laboratory, PADEP Lab ID# 15-00009
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Exton, PA 19341
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 10/30/2012 17:22

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R3M5	1210048-01	Other Solid	10/16/2012 08:55	10/17/2012 10:05

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-073 K4003
LVL#: 1210048 **Date Received:** 10-17-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 solid sample.

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

   Lionville Lab (LvL) is NELAP accredited by the State of Pennsylvania. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

3. Sample holding times as required by the method and/or contract were met with the exceptions of Nitrate, Nitrite and Orthophosphate .

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

5. The method blanks were within the method criteria.

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

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

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

9. Results for solid samples are reported on an "as-received" weight basis.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

11/12/12
Date

njp\i10-048

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 17:22

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Results reported from a dilution; related reporting limits are elevated due to the presence of an interference or a high target value.
B	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
*	Value outside QC acceptance criteria
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
Dry	Sample results reported on a dry weight basis
Wet	Sample results reported on a wet weight basis
RPD	Relative Percent Difference
LOD	Limit of Detection (LOD): the minimum estimated concentration of a target analyte that can be detected reliably. Concentrations at the LOD or between the LOD and LOQ are flagged estimated with either a 'J' qualifier or client-specific qualifier.
LOQ	Limit of Quantitation (LOQ): the minimum concentration of a target analyte that can be quantified reliably

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 17:22

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R3M5 (1210048-01) Other Solid										
Bromide	1.0	U	1.0	5.0	mg/kg wet	1	L210224	10/22/2012 15:30	10/24/2012 11:18	EPA 300.0 (1993)
Chloride	**7.5**		1.0	5.0	mg/kg wet	1	L210224	10/22/2012 15:30	10/24/2012 11:18	EPA 300.0 (1993)
Fluoride	1.0	U	1.0	5.0	mg/kg wet	1	L210224	10/22/2012 15:30	10/24/2012 11:18	EPA 300.0 (1993)
Nitrate	**16.8**		1.0	5.0	mg/kg wet	1	L210224	10/22/2012 15:30	10/24/2012 11:18	EPA 300.0 (1993)
Nitrite	**1.5**	B	1.0	5.0	mg/kg wet	1	L210224	10/22/2012 15:30	10/24/2012 11:18	EPA 300.0 (1993)
Orthophosphate	**10.3**		2.0	10.0	mg/kg wet	1	L210224	10/22/2012 15:30	10/24/2012 11:18	EPA 300.0 (1993)
Sulfate	**51.3**		1.0	5.0	mg/kg wet	1	L210224	10/22/2012 15:30	10/24/2012 11:18	EPA 300.0 (1993)
Nitrate/Nitrite as N	**4.12**		0.10	0.50	mg/kg wet	1	L210222	10/22/2012 15:30	10/23/2012 13:58	EPA 353.2
pH	**8.83**		0.10	0.10	pH Units	1	L210209	10/25/2012 18:20	10/25/2012 19:24	SW846 9045D

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

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 17:22

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210209 - Default Prep GenChem										
Duplicate (L210209-DUP1)	**Source: 1210048-01**			Prepared: 08/25/2012 18:20 Analyzed: 10/25/2012 19:27						
pH	8.76	0.10	0.10	pH Units		8.83			0.796	20
Reference (L210209-SRM1)				Prepared: 08/25/2012 19:00 Analyzed: 10/25/2012 20:02						
pH	9.96	0.10	0.10	pH Units	10.000		99.6	99-101		
Reference (L210209-SRM2)				Prepared: 08/25/2012 21:00 Analyzed: 10/25/2012 22:13						
pH	9.96	0.10	0.10	pH Units	10.000		99.6	99-101		
Reference (L210209-SRM3)				Prepared: 08/25/2012 21:00 Analyzed: 10/25/2012 22:40						
pH	7.04	0.10	0.10	pH Units	7.0000		101	99-101		
Batch L210222 - Default Prep GenChem										
Blank (L210222-BLK1)				Prepared: 10/22/2012 15:30 Analyzed: 10/23/2012 13:27						
Nitrate/Nitrite as N	0.10 U	0.10	0.50	mg/kg wet						
LCS (L210222-BS1)				Prepared: 10/22/2012 15:30 Analyzed: 10/23/2012 13:25						
Nitrate/Nitrite as N	5.11	0.10	0.50	mg/kg wet	5.0000		102	90-110		
Duplicate (L210222-DUP3)	**Source: 1210048-01**			Prepared: 10/22/2012 15:30 Analyzed: 10/23/2012 13:59						
Nitrate/Nitrite as N	3.77	0.10	0.50	mg/kg wet		4.12			8.89	20
Matrix Spike (L210222-MS3)	**Source: 1210048-01**			Prepared: 10/22/2012 15:30 Analyzed: 10/23/2012 14:12						
Nitrate/Nitrite as N	9.56	0.10	0.49	mg/kg wet	4.9423	4.12	110	75-125		
Batch L210224 - Default Prep GenChem										
Blank (L210224-BLK1)				Prepared: 10/22/2012 15:30 Analyzed: 10/24/2012 11:18						
Fluoride	1.0 U	1.0	5.0	mg/kg wet						
Chloride	1.0 U	1.0	5.0	mg/kg wet						
Bromide	1.0 U	1.0	5.0	mg/kg wet						
Orthophosphate	2.0 U	2.0	10.0	mg/kg wet						
Sulfate	1.0 U	1.0	5.0	mg/kg wet						
Nitrate	1.0 U	1.0	5.0	mg/kg wet						
Nitrite	1.0 U	1.0	5.0	mg/kg wet						

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 17:22

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210224 - Default Prep GenChem										
LCS (L210224-BS1)				Prepared: 10/22/2012 15:30 Analyzed: 10/24/2012 11:18						
Fluoride	49.7	1.0	5.0	mg/kg wet	50.000		99.4	80-120		
Chloride	46.3	1.0	5.0	mg/kg wet	50.000		92.6	80-120		
Bromide	47.2	1.0	5.0	mg/kg wet	50.000		94.4	80-120		
Orthophosphate	47.7	2.0	10.0	mg/kg wet	50.000		95.4	80-120		
Sulfate	48.3	1.0	5.0	mg/kg wet	50.000		96.6	80-120		
Nitrate	47.4	1.0	5.0	mg/kg wet	50.000		94.8	80-120		
Nitrite	47.4	1.0	5.0	mg/kg wet	50.000		94.8	80-120		
Duplicate (L210224-DUP1)		**Source: 1210048-01**		Prepared: 10/22/2012 15:30 Analyzed: 10/24/2012 11:18						
Fluoride	1.0 U	1.0	5.0	mg/kg wet		1.0 U				20
Chloride	6.3	1.0	5.0	mg/kg wet		7.5			16.4	20
Bromide	1.0 U	1.0	5.0	mg/kg wet		1.0 U				20
Orthophosphate	10.3	2.0	10.1	mg/kg wet		10.3			0.942	20
Sulfate	43.7	1.0	5.0	mg/kg wet		51.3			16.0	20
Nitrate	15.1	1.0	5.0	mg/kg wet		16.8			10.9	20
Nitrite	1.4 B	1.0	5.0	mg/kg wet		1.5			5.90	20
Matrix Spike (L210224-MS1)		**Source: 1210048-01**		Prepared: 10/22/2012 15:30 Analyzed: 10/24/2012 11:18						
Fluoride	48.5	1.0	4.9	mg/kg wet	49.423	1.0 U	98.2	75-125		
Chloride	64.0	1.0	4.9	mg/kg wet	49.423	7.5	114	75-125		
Bromide	47.9	1.0	4.9	mg/kg wet	49.423	1.0 U	97.0	75-125		
Orthophosphate	71.3	2.0	9.9	mg/kg wet	49.423	10.3	123	75-125		
Nitrate	69.2	1.0	4.9	mg/kg wet	49.423	16.8	106	75-125		
Nitrite	48.3	1.0	4.9	mg/kg wet	49.423	1.5	94.8	75-125		
Matrix Spike (L210224-MS2)		**Source: 1210048-01**		Prepared: 10/22/2012 15:30 Analyzed: 10/24/2012 11:18						
Sulfate	147 D	2.0	9.9	mg/kg wet	98.847	51.3	96.8	75-125		

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
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11 December 2012

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

Subject: Analytical Data Package

Dear Ms. Kessner:

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

LvLI Batch #	1210048
SDG #	K4003
SAF #	RC-073
Date Addon	10/17/12
# Samples	1
Matrix	SOIL
Volatiles	
Semivolatiles	X
Pest/PCB	
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	X
Inorganics	

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

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 30 pages.

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

CHAIN OF CUSTODY

* REVISION *

Lionville Laboratory Use Only: 1210048

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford SAF# RC-073
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O Johnson
QC: SW Del: SAL TAT: 21 Days
Date Rec'd: 10-17-12 Date Due:

		A	B		C			D			E				
Refrigerator #		1	1		1			1			1				
#/Type Container	Liquid														
	Solid	1AG	1AG		1AG			1			1				
Volume	Liquid														
	Solid	125	125		125			60			125				
Preservatives		–	–		–			–			–				
ANALYSES REQUESTED		ORGANIC						INORG							
		VOA	BNA	Pest/PCB	Herb	PAHs		Metal Hg	CN		TC Anions pH	Na NO3			

Lionville Laboratory Use Only

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected		8270 TCL	8081 8082		8310	TCLP BNA	TCLP Hg	METALS			ANIONS pH	N3N2			
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	01	J1R3M5 KADI	✓	✓	OTHER	6.16.12	0855		X	X		X	X	X	X			X	X			

Special Instructions:
(OTHER: Soil Pipeline Contents)
METALS = HSL + B, Mo, Si (NO TL)

Special Instructions:
11/13/12
1. TCLP BNA + TCLP Hg only added (Ant Hg held for TCLP BNA) per client. OS
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	[signature]	10/17/12	1005

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-073-216	Page 1 of 1
Collector ~~Q Stowe~~ H. Weber 10/16/12	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH	Price Code 9L
Project Designation 100-D/DR Burial Grounds & Remaining Sites - Other Quick	Sampling Location 100-D-50:1 Pipelines- Contents		SAF No. RC-073	Data Turnaround 21 Days
Ice Chest No. WCH-12-026	Field Logbook No. EL-1607-14	COA R00D502000	Method of Shipment Fed Ex	
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A 110542		Bill of Lading/Air Bill No. SEE OSRL	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Rad <DOT

Special Handling and/or Storage

Cool 4 Deg C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container	G/P	G/P	aG	aG	aG	aG	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1 10/16/12	1	1	0	0
Volume	60mL	~~60mL~~ 125	60mL 125	125mL	~~60mL~~ 125	~~60mL~~ 125	500mL	125mL	125mL	125mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2; pH - 9045 RCF	Semi-VOA - 8270A (TCL) 26025	PAHs - 8310	PCBs - 8082	Pesticides - 8081	See item (2) in Special Instructions.	Isotopic Uranium 10/16/12	Nickel-63; Strontium-89/90 -- Total Sr	Carbon-14; Tritium - H3

Sample No.	Matrix *	Sample Date	Sample Time										
J1R3M5	OTHER	10/16/12	0855	X	X	X	X	X	X				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber / H. Weber	10/16/12 0930	MJ Stankovich	10/16/12 0930
MJ Stankovich	10/16/12 1220	A. Freier	10-16-12 1220
A. Freier	10-16-12 1250	Fed Ex	
Fed Ex	10-17-12 1005	Victor Hernandez	10-17-12 1005

SPECIAL INSTRUCTIONS

Run sample with full (RC-075) QC

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

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

REVIEWED BY CMB DATE 11-16-12

Matrix *

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

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

WCH-EE-011

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-073

Date: 10/17/12

LvL Batch #: 1210048

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7992 0736 1748
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-12-026
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A
Person Contacted _____		Date _____	

SR-002-B.doc

SEMIVOLATILES

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

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/26/2012 15:32

Analytical Report for TCLP Semivolatiles by SW846 1311/8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R3M5	1210048-01	Other Solid	10/16/2012 08:55	10/17/2012 10:05

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-073 K4003
LVL #: 1210048 **Date Received:** 10-17-2012

SEMIVOLATILE - TCLP

One (1) leachate sample was generated from a soil sample collected on 10-16-2012.

The sample and associated QC samples were leached 11-13-2012, extracted 11-19-2012 and analyzed 11-25-2012 according to criteria set forth in Lionville Laboratory SOPs. The leaching procedure was based on SW846 Method 1311, the extraction procedure was based on SW846 Method 3520C, and the analysis procedure was based on SW846 Method 8270C.

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 leached outside of the recommended holding time of 14 days, at client request. The sample was extracted and analyzed within the recommended holding time.

3. The samples were extracted at 5-fold dilutions due to the leachate matrix; however, all TCLP regulatory limits were achieved.

4. Non-target compounds were not detected in this sample.

5. All obtainable surrogate recoveries were within acceptance criteria.

6. The method blanks were below the reporting limit for all target compounds.

7. All blank spike recoveries were within acceptance criteria.

8. All matrix spike recoveries were within acceptance criteria.

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

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

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

12. 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").

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. 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

12/13/12
Date

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.

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

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/26/2012 15:32

J1R3M5

1210048-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
TCLP Semivolatiles by SW846 1311/8270C									
1,4-Dichlorobenzene	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
2,4,5-Trichlorophenol	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
2,4,6-Trichlorophenol	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
2,4-Dinitrotoluene	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
2-Methylphenol	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
3- and/or 4-Methylphenol	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
Hexachlorobenzene	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
Hexachlorobutadiene	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
Hexachloroethane	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
Nitrobenzene	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
Pentachlorophenol	0.125	U	0.125	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
Pyridine	0.0500	U	0.0500	mg/L	1	L211152	11/19/2012	11/25/2012	8270C
Surrogate: 2-Fluorophenol	*67 %*		*21-100*			*L211152*	*11/19/2012*	*11/25/2012*	*8270C*
Surrogate: Phenol-d5	*68 %*		*10-94*			*L211152*	*11/19/2012*	*11/25/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*78 %*		*35-114*			*L211152*	*11/19/2012*	*11/25/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*73 %*		*43-116*			*L211152*	*11/19/2012*	*11/25/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*68 %*		*10-123*			*L211152*	*11/19/2012*	*11/25/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*87 %*		*33-141*			*L211152*	*11/19/2012*	*11/25/2012*	*8270C*

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

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/26/2012 15:32

TCLP Semivolatiles by SW846 1311/8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211152 - SW 3520C										
Blank (L211152-BLK1)				Prepared: 11/19/2012 Analyzed: 11/25/2012						
1,4-Dichlorobenzene	0.0500	U	0.0500	mg/L						
2,4,5-Trichlorophenol	0.0500	U	0.0500	mg/L						
2,4,6-Trichlorophenol	0.0500	U	0.0500	mg/L						
2,4-Dinitrotoluene	0.0500	U	0.0500	mg/L						
2-Methylphenol	0.0500	U	0.0500	mg/L						
3- and/or 4-Methylphenol	0.0500	U	0.0500	mg/L						
Hexachlorobenzene	0.0500	U	0.0500	mg/L						
Hexachlorobutadiene	0.0500	U	0.0500	mg/L						
Hexachloroethane	0.0500	U	0.0500	mg/L						
Nitrobenzene	0.0500	U	0.0500	mg/L						
Pentachlorophenol	0.125	U	0.125	mg/L						
Pyridine	0.0500	U	0.0500	mg/L						
Surrogate: 2-Fluorophenol	*0.259*			*mg/L*	*0.37500*		*69*	*21-100*		
Surrogate: Phenol-d5	*0.273*			*mg/L*	*0.37500*		*73*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.183*			*mg/L*	*0.25000*		*73*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.181*			*mg/L*	*0.25000*		*73*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.263*			*mg/L*	*0.37500*		*70*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.219*			*mg/L*	*0.25000*		*88*	*33-141*		
Blank (L211152-BLK2)				Prepared: 11/19/2012 Analyzed: 11/25/2012						
1,4-Dichlorobenzene	0.0500	U	0.0500	mg/L						
2,4,5-Trichlorophenol	0.0500	U	0.0500	mg/L						
2,4,6-Trichlorophenol	0.0500	U	0.0500	mg/L						
2,4-Dinitrotoluene	0.0500	U	0.0500	mg/L						
2-Methylphenol	0.0500	U	0.0500	mg/L						
3- and/or 4-Methylphenol	0.0500	U	0.0500	mg/L						
Hexachlorobenzene	0.0500	U	0.0500	mg/L						
Hexachlorobutadiene	0.0500	U	0.0500	mg/L						
Hexachloroethane	0.0500	U	0.0500	mg/L						
Nitrobenzene	0.0500	U	0.0500	mg/L						
Pentachlorophenol	0.125	U	0.125	mg/L						
Pyridine	0.0500	U	0.0500	mg/L						
Surrogate: 2-Fluorophenol	*0.249*			*mg/L*	*0.37500*		*66*	*21-100*		
Surrogate: Phenol-d5	*0.252*			*mg/L*	*0.37500*		*67*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.179*			*mg/L*	*0.25000*		*72*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.168*			*mg/L*	*0.25000*		*67*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.223*			*mg/L*	*0.37500*		*59*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.199*			*mg/L*	*0.25000*		*80*	*33-141*		

264 Welsh Pool Road
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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/26/2012 15:32

TCLP Semivolatiles by SW846 1311/8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211152 - SW 3520C									
LCS (L211152-BS1)			Prepared: 11/19/2012 Analyzed: 11/25/2012						
1,4-Dichlorobenzene	0.0984		mg/L	0.30000		33	30-100		
2,4,5-Trichlorophenol	0.231		mg/L	0.30000		77	45-125		
2,4,6-Trichlorophenol	0.217		mg/L	0.30000		72	40-125		
2,4-Dinitrotoluene	0.258		mg/L	0.30000		86	50-120		
2-Methylphenol	0.206		mg/L	0.30000		69	40-110		
3- and/or 4-Methylphenol	0.211		mg/L	0.30000		70	30-110		
Hexachlorobenzene	0.220		mg/L	0.30000		73	50-110		
Hexachlorobutadiene	0.109		mg/L	0.30000		36	30-100		
Hexachloroethane	0.0736		mg/L	0.30000		25	25-100		
Nitrobenzene	0.189		mg/L	0.30000		63	40-110		
Pentachlorophenol	0.293		mg/L	0.30000		98	20-130		
Pyridine	0.163		mg/L	0.30000		54	5-100		
Surrogate: 2-Fluorophenol	*0.267*		*mg/L*	*0.37500*		*71*	*21-100*		
Surrogate: Phenol-d5	*0.281*		*mg/L*	*0.37500*		*75*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.186*		*mg/L*	*0.25000*		*74*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.186*		*mg/L*	*0.25000*		*74*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.300*		*mg/L*	*0.37500*		*80*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.189*		*mg/L*	*0.25000*		*76*	*33-141*		
Matrix Spike (L211152-MS1)		**Source: 1210048-01**	Prepared: 11/19/2012 Analyzed: 11/25/2012						
1,4-Dichlorobenzene	0.108		mg/L	0.30000	0.0500 U	36	30-100		
2,4,5-Trichlorophenol	0.252		mg/L	0.30000	0.0500 U	84	45-125		
2,4,6-Trichlorophenol	0.241		mg/L	0.30000	0.0500 U	80	40-125		
2,4-Dinitrotoluene	0.286		mg/L	0.30000	0.0500 U	95	50-120		
2-Methylphenol	0.225		mg/L	0.30000	0.0500 U	75	40-110		
3- and/or 4-Methylphenol	0.222		mg/L	0.30000	0.0500 U	74	30-110		
Hexachlorobenzene	0.250		mg/L	0.30000	0.0500 U	83	50-110		
Hexachlorobutadiene	0.136		mg/L	0.30000	0.0500 U	45	30-100		
Hexachloroethane	0.0822		mg/L	0.30000	0.0500 U	27	25-100		
Nitrobenzene	0.208		mg/L	0.30000	0.0500 U	69	40-110		
Pentachlorophenol	0.350		mg/L	0.30000	0.125 U	117	20-130		
Pyridine	0.184		mg/L	0.30000	0.0500 U	61	5-100		
Surrogate: 2-Fluorophenol	*0.282*		*mg/L*	*0.37500*		*75*	*21-100*		
Surrogate: Phenol-d5	*0.283*		*mg/L*	*0.37500*		*76*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.204*		*mg/L*	*0.25000*		*82*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.203*		*mg/L*	*0.25000*		*81*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.315*		*mg/L*	*0.37500*		*84*	*10-123*		

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/26/2012 15:32

TCLP Semivolatiles by SW846 1311/8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211152 - SW 3520C									
Matrix Spike (L211152-MS1)		**Source: 1210048-01**	Prepared: 11/19/2012 Analyzed: 11/25/2012						
Surrogate: p-Terphenyl-d14	*0.207*		*mg/L*	*0.25000*		*83*	*33-141*		
Matrix Spike Dup (L211152-MSD1)		**Source: 1210048-01**	Prepared: 11/19/2012 Analyzed: 11/25/2012						
1,4-Dichlorobenzene	0.134		mg/L	0.30000	0.0500 U	45	30-100	21*	20
2,4,5-Trichlorophenol	0.257		mg/L	0.30000	0.0500 U	86	45-125	2	20
2,4,6-Trichlorophenol	0.242		mg/L	0.30000	0.0500 U	81	40-125	0.8	20
2,4-Dinitrotoluene	0.294		mg/L	0.30000	0.0500 U	98	50-120	3	20
2-Methylphenol	0.243		mg/L	0.30000	0.0500 U	81	40-110	7	20
3- and/or 4-Methylphenol	0.240		mg/L	0.30000	0.0500 U	80	30-110	8	20
Hexachlorobenzene	0.242		mg/L	0.30000	0.0500 U	81	50-110	4	20
Hexachlorobutadiene	0.159		mg/L	0.30000	0.0500 U	53	30-100	16	20
Hexachloroethane	0.108		mg/L	0.30000	0.0500 U	36	25-100	27*	20
Nitrobenzene	0.227		mg/L	0.30000	0.0500 U	76	40-110	9	20
Pentachlorophenol	0.338		mg/L	0.30000	0.125 U	113	20-130	3	20
Pyridine	0.195		mg/L	0.30000	0.0500 U	65	5-100	6	20
Surrogate: 2-Fluorophenol	*0.272*		*mg/L*	*0.37500*		*73*	*21-100*		
Surrogate: Phenol-d5	*0.280*		*mg/L*	*0.37500*		*75*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.210*		*mg/L*	*0.25000*		*84*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.199*		*mg/L*	*0.25000*		*79*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.293*		*mg/L*	*0.37500*		*78*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.192*		*mg/L*	*0.25000*		*77*	*33-141*		

Lionville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 1168

Start Date: 11/13/12 Start Time: 0950 Analyst: WJ SOP: SPI-1311.1	End Date: 11/14/12 End Time: 3:00 Analyst: WJ Method: 1311.1	Tumbler Speed: 30 RPM Leachate Batch #: L211099 Leachate Page: 1 of 1 Room Temp. (°C): Start 21 /Finish 21 **Room Temp. Acceptance Criteria:** **23°C ± 2°**

LvL #: 1210048 -01 Client ID#: J1R3M5 pH After 5 Min: 8.72 pH After Acid/Heat: 2.25 Extraction Fluid/pH: #1 4.91 1201342 Sample Wt.(g): 50g Extract Fluid Vol.(mL): 1000 mL pH After Extraction: 5.38	Initial Filtration Data and Comments: Solids: _____% / NA 001 * RAD I Initial Filtrate Added: _____
LvL #: L211099-BLK Client ID#: BLANK pH After 5 Min: NA pH After Acid/Heat: NA Extraction Fluid/pH: #1 4.91 Sample Wt.(g): NA Extract Fluid Vol.(mL): 1000 pH After Extraction: _____	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: _____
LvL # _____ Client ID#: _____ pH After 5 Min: _____ pH After Acid/Heat: _____ Extraction Fluid/pH: _____ Sample Wt.(g): _____ Extract Fluid Vol.(mL): _____ pH After Extraction: _____	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: _____
LvL #: _____ Client ID#: _____ pH After 5 Min: _____ pH After Acid/Heat: _____ Extraction Fluid/pH: _____ Sample Wt.(g): _____ Extract Fluid Vol.(mL): _____ pH After Extraction: _____	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: _____

Standard	ID	Prep Date	Expir Date	pH Acceptance Criteria
Fluid #1	1201342	10-24-12	4-24-13 ~~10-24-13~~	4.93 ± 0.05
Fluid # 2	—	—	—	2.88 ± 0.05

SPI-1311.1-A-0310 Reviewed By/Date [illegible] 11/19/12 Page #

PREPARATION BENCH SHEET

L211152

Lionville Laboratory

Printed: 11/26/2012 2:58:40PM

Matrix: Water **Prepared using: SVOCGCMS - SW 3520C** **Surrogate used: 1201164**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210048-01	1311/8270C TCLP SVOC	11/19/2012 13:50	200	1				500	WC-Hanford, Inc.	WCH
1210048-01RE1	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	WC-Hanford, Inc.	Added for BatchQC in: L211152
1211044-04	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 8, REPORT @ LOD
1211044-10	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 8, REPORT @ LOD
1211044-16	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 8, REPORT @ LOD
1211044-22	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 8, REPORT @ LOD
1211049-04	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211049-09	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211049-14	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211049-20	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211049-26	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211058-01	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	PA DEP	PADEP, Short List
1211058-02	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	PA DEP	PADEP, Short List
1211058-03	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	PA DEP	PADEP, Short List
1211058-04	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	PA DEP	PADEP, Short List
1211078-04	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-12	1311/8270C TCLP SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-12	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-13	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-21	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD

Revision for initial volume 1210048-01, BLK1, BLK2, BS1, MS1, MSD1 BL 11/20/12

Extracts Relinquished By Date Extracts Received By Date

PREPARATION BENCH SHEET

L211152

Lionville Laboratory

Printed: 11/26/2012 2:58:40PM

Matrix: Water **Prepared using: SVOCGCMS - SW 3520C** **Surrogate used: 1201164**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211078-27	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-33	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
L211152-BLK1	QC	11/19/2012 13:50	200	1				500		WCH Leach Blank
L211152-BLK2	QC	11/19/2012 13:50	200	1				500		LEACH bLANK l211099
L211152-BLK3	QC	11/19/2012 13:50	1000	1				500		Table 8, Report @LOD
L211152-BLK4	QC	11/19/2012 13:50	1000	1				500		Table 3, Report @LOD
L211152-BLK5	QC	11/19/2012 13:50	1000	1				500		PADEP, Short List
L211152-BS1	QC	11/19/2012 13:50	200	1	1201082		600	500		WCH Leach Blank Spike
L211152-BS3	QC	11/19/2012 13:50	1000	1	1201082		600	500		Table 8, Report @LOD
L211152-BS4	QC	11/19/2012 13:50	1000	1	1201082		600	500		Table 3, Report @LOD
L211152-BS5	QC	11/19/2012 13:50	1000	1	1201082		600	500		PADEP, Short List
L211152-MS1	QC	11/19/2012 13:50	200	1	1201082	1210048-01	600	500		WCH
L211152-MS3	QC	11/19/2012 13:50	1000	1	1201082	1211078-12	600	500		Table 3, Report @LOD
L211152-MSD1	QC	11/19/2012 13:50	200	1	1201082	1210048-01	600	500		WCH
L211152-MSD3	QC	11/19/2012 13:50	1000	1	1201082	1211078-12	600	500		Table 3, Report @LOD

Revision for initial volume 12 100y 8-01, BlK1, BlK2, BS1, MS1, MSD1 Bec 11/20/12

Extracts Relinquished By Date Extracts Received By Date

PREPARATION BENCH SHEET

L211152

Lionville Laboratory

Printed: 11/21/2012 1:28:58PM

Matrix: Water **Prepared using: SVOCGCMS - SW 3520C** **Surrogate used: 1201164**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210048-01	1311/8270C TCLP SVOC	11/19/2012 13:50	1000	1				500	WC-Hanford, Inc.	WCH
~~1210048-01RE1~~	~~8270C TCL SVOC~~	~~11/19/2012 13:50~~	~~1000~~	~~1~~				~~500~~	~~WC-Hanford, Inc.~~	Added for BatchQC in: L211152
1211044-04	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 8, REPORT @ LOD
1211044-10	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 8, REPORT @ LOD
1211044-16	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 8, REPORT @ LOD
1211044-22	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 8, REPORT @ LOD
1211049-04	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211049-09	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211049-14	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211049-20	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211049-26	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211058-01	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	PA DEP	PADEP, Short List
1211058-02	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	PA DEP	PADEP, Short List
1211058-03	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	PA DEP	PADEP, Short List
1211058-04	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	PA DEP	PADEP, Short List
1211078-04	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-12	1311/8270C TCLP SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-12	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-13	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-21	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD

Extracts Relinquished By — Date: 11/21/12 1320

Extracts Received By — Date: 11/21/12 1340

PREPARATION BENCH SHEET

L211152

Lionville Laboratory

Printed: 11/21/2012 1:28:58PM

000000021

Matrix: Water **Prepared using: SVOCGCMS - SW 3520C** **Surrogate used: 1201164**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211078-27	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
1211078-33	8270C TCL SVOC	11/19/2012 13:50	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 3, REPORT @LOD
L211152-BLK1	QC	11/19/2012 13:50	1000	1				500		WCH Leach Blank
L211152-BLK2	QC	11/19/2012 13:50	1000	1				500		LEACH bLANK l211099
L211152-BLK3	QC	11/19/2012 13:50	1000	1				500		Table 8, Report @LOD
L211152-BLK4	QC	11/19/2012 13:50	1000	1				500		Table 3, Report @LOD
L211152-BLK5	QC	11/19/2012 13:50	1000	1				500		PADEP, Short List
L211152-BS1	QC	11/19/2012 13:50	1000	1	1201082		600	500		WCH Leach Blank Spike
L211152-BS3	QC	11/19/2012 13:50	1000	1	1201082		600	500		Table 8, Report @LOD
L211152-BS4	QC	11/19/2012 13:50	1000	1	1201082		600	500		Table 3, Report @LOD
L211152-BS5	QC	11/19/2012 13:50	1000	1	1201082		600	500		PADEP, Short List
L211152-MS1	QC	11/19/2012 13:50	1000	1	1201082	1210048-01	600	500		WCH
L211152-MS3	QC	11/19/2012 13:50	1000	1	1201082	1211078-12	600	500		Table 3, Report @LOD
L211152-MSD1	QC	11/19/2012 13:50	1000	1	1201082	1210048-01	600	500		WCH
L211152-MSD3	QC	11/19/2012 13:50	1000	1	1201082	1211078-12	600	500		Table 3, Report @LOD

Extracts Relinquished By 11/21/12 1328 Date

Extracts Received By 11/21/12 1340 Date

METALS

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

WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/28/2012 06:55

Analytical Report for TCLP Metals by SW846 1311 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R3M5	1210048-01	Other Solid	10/16/2012 08:55	10/17/2012 10:05

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-073
LVL#: 1210048
SDG/SAF#: K4003/RC-073

W.O.#: 60049-001-001-0001-00
Date Received: 10-17-12

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.

1. This narrative covers the analysis of 1 TCLP leachate sample.

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

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

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

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

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

7. The preparation/method blank (MB) was within method criteria {less than the Limit of Quantitation, MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}.

8. The laboratory control sample (LCS) was within the 80-120% control limits.

9. The duplicate analysis was within the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL.

10. The TCLP extract from sample J1R3M5 was selected for the matrix spike (MS) for this analytical batch.

    The matrix spike (MS) concentration for Mercury was equivalent to the regulatory level (200 ppb) as per SW846 method 1311. The required spike concentration is above the linear range of

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.

the instrument, resulting in a 50-fold dilution. The MS recovery was greater than 50% as per method criteria.

11. 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.

12. 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.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

11/28/12
Date

alm/10-048tchgonly

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-073 Project Number: K4003 Project Manager: Joan Kessner	**Reported:** 11/28/2012 06:55

Notes and Definitions

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

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/28/2012 06:55

J1R3M5

1210048-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
TCLP Metals by SW846 1311 6000/7000 series									
Mercury	**0.000149**	B	0.000200	mg/L	1	L211151	11/19/2012	11/19/2012	7470

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WC-Hanford, Inc.	Project: RC-073	
2620 Fermi Avenue	Project Number: K4003	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/28/2012 06:55

TCLP Metals by SW846 1311 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 L211151 - SW 7470A Prep										
Blank (L211151-BLK1)				Prepared & Analyzed: 11/19/2012						
Mercury	0.000200	U	0.000200	mg/L						
Blank (L211151-BLK2)				Prepared & Analyzed: 11/19/2012						
Mercury	0.000200	U	0.000200	mg/L						
LCS (L211151-BS1)				Prepared & Analyzed: 11/19/2012						
Mercury	0.00546		0.000200	mg/L	0.0050000		109	80-120		
Duplicate (L211151-DUP1)		**Source: 1210048-01**		Prepared & Analyzed: 11/19/2012						
Mercury	0.000141	B	0.000200	mg/L		0.000149			5.52	20
Matrix Spike (L211151-MS1)		**Source: 1210048-01**		Prepared & Analyzed: 11/19/2012						
Mercury	0.204		0.0100	mg/L	0.20000	0.000149	102	50-1000		

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 11/19/12
Start Time/Temp: 1745/95°
End Time/Temp: 1950/96°

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

Logbook # 1153
Prep Batch: L211151
Worksheet: HG111902
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				35	35	
0.2 ug/l		0.070		35	35	
1.0 ug/l		0.350		35	35	
2.0 ug/l		0.700		35	35	
5.0 ug/l		1.750		35	35	
10.0 ug/l		3.500		35	35	
ICV		0.0875	2.5	35	35	
CCV		0.175	5.0	35	35	
ICB/CCB				35	35	
L211151-BLK1				35	35	
BS1		0.175	5.0	35	35	
BLK2	<			35	35	L211099
1210048-01	<			35	35	
L211151-DUP1	<			35	35	
MS1		0.700	200*	35	35	

[illegible] 11/19/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	11/19/12 1230
ICV/CCV/LCS	(I.V. 1200532)	N/A

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

se book # 1153 for std traceability information

Soil LCS True Value = N/A mg/Kg
Standard #

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

*used 1201234 (10 ug/ml)

Page #:

ME-HgCVAA-Prep0910

000000029
00000073

Lionville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 1168

Start Date: 11/13/12 Start Time: 0950 Analyst: WJ SOP: SPI-1311.1	End Date: 11/14/12 End Time: 3:00 Analyst: WJ Method: 1311.1	Tumbler Speed: 30 RPM Leachate Batch #: L211099 Leachate Page: 1 of 1 Room Temp. (°C): Start 21 /Finish 21 **Room Temp. Acceptance Criteria:** **23°C ± 2°**

LvL #: 1210048 -01 Client ID#: J1R3M5 pH After 5 Min: 8.72 pH After Acid/Heat: 2.25 Extraction Fluid/pH: #1 4.91 1201342 Sample Wt.(g): 50g Extract Fluid Vol.(mL): 1000 mL pH After Extraction: 5.38	Initial Filtration Data and Comments: Solids: ____% / NA 001 * RAD I Initial Filtrate Added:
LvL #: L211099-BLK Client ID#: BLANK pH After 5 Min: NA pH After Acid/Heat: NA Extraction Fluid/pH: #1 4.91 Sample Wt.(g): NA Extract Fluid Vol.(mL): 1000 pH After Extraction:	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:
LvL # Client ID#: pH After 5 Min: pH After Acid/Heat: Extraction Fluid/pH: Sample Wt.(g): Extract Fluid Vol.(mL): pH After Extraction:	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:
LvL #: Client ID#: pH After 5 Min: pH After Acid/Heat: Extraction Fluid/pH: Sample Wt.(g): Extract Fluid Vol.(mL): pH After Extraction:	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:

Standard	ID	Prep Date	Expir Date	pH Acceptance Criteria
Fluid #1	1201342	10-24-12	4-24-13 ~~10-24-13~~ WJ	4.93 ± 0.05
Fluid # 2	—	—	—	2.88 ± 0.05

SPI-1311.1-A-0310 Reviewed By/Date [illegible] 11/19/12 Page #