0076407

SAF-RC-029
Remaining Sites Confirmation Sampling - Soil
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt (2) H4-21

COMMENTS:

SDG K1026 SAF-RC-029

Waste Site: 100-F-50

RECEIVED
MAR 0 3 2008
EDMC

Date: 15 February 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-F-50
Subject: Radiochemistry - Data Package No. K1026-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1026 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16231	11/19/07	Soil	C	See note 1
J16232	11/19/07	Soil	C	See note 1
J16233	11/19/07	Soil	C	See note 1 & 2
J16234	11/19/07	Soil	C	See note 1

1 – Gross alpha/beta and gamma spectroscopy.
2 – Total strontium.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If

either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J16232/J16233) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. Three analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. K1026 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Three analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

Fluor Hanford Data Validation Contract #29776 (June 2006), *Validation Statement of Work*, through Washington Closure Hanford Work Order #WB6081.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K1026	REVIEWER: ELR	Project: 100-F-50	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7713-001 J16231

DATA SHEET

SDG	7713	Client/Case no	Hanford	SDG K1026	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711117-01	Client sample id	J16231		
Dept sample id	7713-001	Location/Matrix	100-F-50	SOLID	
Received	11/21/07	Collected/Weight	11/19/07 12:50	1053 g	
% solids	90.5	Custody/SAF No	RC-029-027	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	10.2	6.0	7.08	10.0		93A
Gross Beta	12587-47-2	15.8	4.1	5.45	15.0		93B
Potassium 40	13966-00-2	11.8	0.58	0.209			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	0.752	0.040	0.029	0.100		GAM
Radium 226	13982-63-3	0.422	0.050	0.046	0.100		GAM
Radium 228	15262-20-1	0.580	0.12	0.116	0.200		GAM
Europium 152	14683-23-9	0.292	0.051	0.064	0.100		GAM
Europium 154	15585-10-1	U		0.085	0.100	U	GAM
Europium 155	14391-16-3	U		0.070	0.100	U	GAM
Thorium 228	14274-82-9	0.585	0.035	0.035			GAM
Thorium 232	TH-232	0.580	0.12	0.116			GAM
Uranium 235	15117-96-1	U		0.116		U	GAM
Uranium 238	U-238	U		2.51		U	GAM
Americium 241	14596-10-2	U		0.041		U	GAM

Remaining Sites Confirm.Smpling-Soil

2/13/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/17/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7713-002 J16232

DATA SHEET

SDG	7713	Client/Case no	Hanford	SDG K1026	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711117-02	Client sample id	J16232		
Dept sample id	7713-002	Location/Matrix	100-F-50	SOLID	
Received	11/21/07	Collected/Weight	11/19/07 12:55	963 g	
% solids	89.4	Custody/SAF No	RC-029-027	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.74	5.0	8.20	10.0	U	93A
Gross Beta	12587-47-2	16.3	4.2	5.60	15.0		93B
Potassium 40	13966-00-2	11.9	0.79	0.444			GAM
Cobalt 60	10198-40-0	U		0.041	0.050	U	GAM
Cesium 137	10045-97-3	0.883	0.061	0.047	0.100		GAM
Radium 226	13982-63-3	0.384	0.070	0.076	0.100		GAM
Radium 228	15262-20-1	0.653	0.15	0.152	0.200		GAM
Europium 152	14683-23-9	0.342	0.073	0.096	0.100		GAM
Europium 154	15585-10-1	U		0.128	0.100	U	GAM
Europium 155	14391-16-3	U		0.125	0.100	U	GAM
Thorium 228	14274-82-9	0.480	0.044	0.052			GAM
Thorium 232	TH-232	0.653	0.15	0.152			GAM
Uranium 235	15117-96-1	U		0.162		U	GAM
Uranium 238	U-238	U		4.38		U	GAM
Americium 241	14596-10-2	U		0.324		U	GAM

Remaining Sites Confirm.Smpling-Soil

2/18/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/17/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7713-003 J16233

DATA SHEET

SDG	7713	Client/Case no	Hanford		SDG K1026
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711117-03	Client sample id	J16233		
Dept sample id	7713-003	Location/Matrix	100-F-50		SOLID
Received	11/21/07	Collected/Weight	11/19/07 13:00	961 g	
% solids	89.0	Custody/SAF No	RC-029-027	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	7.62	5.1	6.98	10.0		93A
Gross Beta	12587-47-2	18.2	3.0	3.70	15.0		93B
Total Strontium	SR-RAD	0.872	0.21	0.266	1.00		SR
Potassium 40	13966-00-2	12.2	0.71	0.264			GAM
Cobalt 60	10198-40-0	U		0.062	0.050	U	GAM
Cesium 137	10045-97-3	0.912	0.042	0.030	0.100		GAM
Radium 226	13982-63-3	0.398	0.051	0.049	0.100		GAM
Radium 228	15262-20-1	0.564	0.10	0.097	0.200		GAM
Europium 152	14683-23-9	0.365	0.050	0.061	0.100		GAM
Europium 154	15585-10-1	U		0.078	0.100	U	GAM
Europium 155	14391-16-3	U		0.089	0.100	U	GAM
Thorium 228	14274-82-9	0.529	0.035	0.037			GAM
Thorium 232	TH-232	0.564	0.10	0.097			GAM
Uranium 235	15117-96-1	U		0.116		U	GAM
Uranium 238	U-238	U		2.76		U	GAM
Americium 241	14596-10-2	U		0.150		U	GAM

Remaining Sites Confirm.Smpling-Soil

2/18/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/17/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7713-004 J16234

DATA SHEET

SDG	7713	Client/Case no	Hanford		SDG K1026
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711117-04	Client sample id	J16234		
Dept sample id	7713-004	Location/Matrix	100-F-50		SOLID
Received	11/21/07	Collected/Weight	11/19/07 13:05	1486 g	
% solids	97.4	Custody/SAF No	RC-029-027	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	5.79	5.8	7.89	10.0	U	93A
Gross Beta	12587-47-2	16.3	4.2	5.66	15.0		93B
Potassium 40	13966-00-2	11.4	0.61	0.260			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	0.188	0.029	0.027	0.100		GAM
Radium 226	13982-63-3	0.343	0.048	0.046	0.100		GAM
Radium 228	15262-20-1	0.613	0.087	0.082	0.200		GAM
Europium 152	14683-23-9	U		0.067	0.100	U	GAM
Europium 154	15585-10-1	U		0.087	0.100	U	GAM
Europium 155	14391-16-3	U		0.073	0.100	U	GAM
Thorium 228	14274-82-9	0.539	0.031	0.029			GAM
Thorium 232	TH-232	0.613	0.087	0.082			GAM
Uranium 235	15117-96-1	U		0.093		U	GAM
Uranium 238	U-238	U		2.97		U	GAM
Americium 241	14596-10-2	U		0.032		U	GAM

Remaining Sites Confirm.Smpling-Soil

2/18/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/17/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1026 was composed of four solid (soil) samples designated under SAF No. RC-029 with a Project Designation of: Remaining Sites Confirmation Sampling-Soil.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on December 6, 2007 and January 4, 2008.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.3 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."

Melissa Mannion
Melissa C. Mannion
Senior Program Manager

01/24/08
Date

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-029-027 | Page 1 of 2

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-50 K1026 (7713)		SAF No.: RC-029
Ice Chest No.: AFS-04-023	Field Logbook No.: EL-1601	COA: R00F50A000	Method of Shipment: FedEx
Shipped To: (EBERLINE SERVICES) ~~LIONVILLE~~ BA 11/15/07	Offsite Property No.: A080020		Bill of Lading/Air Bill No.: EL 05FC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	250mL	120mL	250mL	250mL	250mL	60mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Chloro-Herbicides EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total - 418.1)		

000016

Sample No.	Matrix *	Sample Date	Sample Time									
J16231	SOIL	11/19/07	1250	X								
J16232	SOIL	11/19/07	1255	X								
J16233	SOIL	11/19/07	1300	X								
J16234	SOIL	11/19/07	1305	X								
~~J16235~~	~~SOIL~~	BH 11/19/07										

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Welch-Koelling	11/19/07 1900	Received By/Stored In: BHudson BHudson	11/19/07 1400
Relinquished By/Removed From: BHUDSON BHudson	11/19/07 1510	Received By/Stored In: BH MG/07 3728 #2C	11/19/07 11/19/07 1510
Relinquished By/Removed From: 3728 #2C	11-20-07 0835	Received By/Stored In: BMSingleton	11-20-07 0835
Relinquished By/Removed From: BMSingleton	11-20-07 1320	Received By/Stored In: FED EX	
Relinquished By/Removed From: FED EX		Received By/Stored In:	11/21/07 Dy: 3b
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; ~~Gamma Spec - Add on [Americium-241]~~; Americium-241; Gross Alpha & Gross Beta; ~~Nickel-63; Isotopic Plutonium [Plutonium-238; Plutonium-239/240]; Strontium-89,90 — Total Sr; Technetium-99; Isotopic Uranium [Uranium-233/234, Uranium-235, Uranium-238]; Total Uranium~~ BH 11/15/07

(2) ICP Metals - 6010TR (SW846) [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)

samples from 3728 Ref # 2C
3728 Custodian removed samples for shipping on 11/20/07
Sampler unavailable to relinquish

Matrix *
Se=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W=Water
Oil=Oil
Air=Air
DS=Drum Solids
DL=Drum Liquids
Ta=Tap Water
WW=Wipe
Lq=Liquid
V=Vegetation
X=Other

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

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-50		DATA PACKAGE:	K1026	
VALIDATOR:	ELR	LAB: EB		DATE: 2/10/07	
			SDG: K1026		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
J16231	J16232	J16233	J16234		
					Soil

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... Yes (No) N/A

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A

Method blank results acceptable? ..... Yes No N/A

Analytes detected in method blank? ..... Yes No N/A

Field blank(s) analyzed? ..... Yes No N/A

Field blank results acceptable? ..... Yes No N/A

Analytes detected in field blank(s)? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A

LCS/BSS recoveries acceptable? ..... Yes No N/A

LCS/BSS traceable? (Levels D,E) ..... Yes No N/A

LCS/BSS expired? (Levels D,E) ..... Yes No N/A

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments:

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☒ N/A

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E) ..... ☒ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments:

11. Field QC Samples (Levels C, D E) ..... ☐ N/A

Field duplicate sample(s) analyzed? ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split sample(s) analyzed? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no FS or PAs

12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments:

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses? Yes No N/A

Results supported in raw data?(Levels D, E) Yes No N/A

Results Acceptable? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

MDA's meet required detection limits? Yes No N/A

Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: 3 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7712-016 Method Blank

METHOD BLANK

SDG	7713	Client/Case no	Hanford	SDG K1026	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711116-16	Client sample id	Method Blank		
Dept sample id	7712-016	Material/Matrix		SOLID	
		SAF No	RC-029		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-5.12	3.6	9.60	10.0	U	93A
Gross Beta	12587-47-2	0.652	3.7	6.32	15.0	U	93B

Remaining Sites Confirm.Smpling-Soil

QC-BLANK #64344

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/17/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7713-006 Method Blank

METHOD BLANK

SDG	7713	Client/Case no	Hanford	SDG K1026	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711117-06	Client sample id	Method Blank		
Dept sample id	7713-006	Material/Matrix		SOLID	
		SAF No	RC-029		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-1.88	3.9	9.06	10.0	U	93A
Gross Beta	12587-47-2	1.20	3.2	5.68	15.0	U	93B
Total Strontium	SR-RAD	0.002	0.10	0.213	1.00	U	SR
Potassium 40	13966-00-2	U		0.278		U	GAM
Cobalt 60	10198-40-0	U		0.019	0.050	U	GAM
Cesium 137	10045-97-3	U		0.018	0.100	U	GAM
Radium 226	13982-63-3	U		0.028	0.100	U	GAM
Radium 228	15262-20-1	U		0.052	0.200	U	GAM
Europium 152	14683-23-9	U		0.043	0.100	U	GAM
Europium 154	15585-10-1	U		0.043	0.100	U	GAM
Europium 155	14391-16-3	U		0.048	0.100	U	GAM
Thorium 228	14274-82-9	U		0.022		U	GAM
Thorium 232	TH-232	U		0.052		U	GAM
Uranium 235	15117-96-1	U		0.068		U	GAM
Uranium 238	U-238	U		1.66		U	GAM
Americium 241	14596-10-2	U		0.127		U	GAM

Remaining Sites Confirm.Smpling-Soil

QC-BLANK #63831

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/17/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7712-015

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7713

Contact Melissa C. Mannion

Client/Case no Hanford SDG K1026

Contract No. 630

Lab sample id R711116-15

Dept sample id 7712-015

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-029

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
Gross Alpha	99.3	17	11.2	10.0		93A	101	4.0	98	61-139	70-130
Gross Beta	101	7.6	5.40	15.0		93B	94.1	3.8	107	72-128	80-120

Remaining Sites Confirm.Smpling-Soil

QC-LCS #64343

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 01/17/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7713-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7713
Contact Melissa C. Mannion

Client/Case no Hanford SDG K1026
Contract No. 630

Lab sample id R711117-05
Dept sample id 7713-005

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No RC-029

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
Gross Alpha	99.6	17	11.0	10.0		93A	101	4.0	99	61-139	70-130
Gross Beta	92.6	7.3	5.69	15.0		93B	94.4	3.8	98	74-126	80-120
Total Strontium	9.43	0.53	0.241	1.00		SR	9.42	0.38	100	82-118	80-120
Cobalt 60	0.642	0.040	0.017	0.050		GAM	0.645	0.026	100	75-125	80-120
Cesium 137	0.701	0.035	0.022	0.100		GAM	0.662	0.026	106	74-126	80-120

Remaining Sites Confirm.Smpling-Soil

QC-LCS #63830

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/17/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7713-008 J16233

DUPLICATE

SDG	7713			Client/Case no	Hanford SDG K1026
Contact	Melissa C. Mannion			Contract	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R711117-08	Lab sample id	R711117-03	Client sample id	J16233
Dept sample id	7713-008	Dept sample id	7713-003	Location/Matrix	100-F-50 SOLID
		Received	11/21/07	Collected/Weight	11/19/07 13:00 961 g
% solids	89.0	% solids	89.0	Custody/SAF No	RC-029-027 RC-029

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
Total Strontium	0.800	0.20	0.260	1.00		SR	0.872	0.21	0.266		9	56	0.5

Remaining Sites Confirm.Smpling-Soil

QC-DUP#3 64084

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/17/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7713-009 J16233

DUPLICATE

SDG	7713			Client/Case no	Hanford SDG K1026
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R711117-09	Lab sample id	R711117-03	Client sample id	J16233
ept sample id	7713-009	Dept sample id	7713-003	Location/Matrix	100-F-50 SOLID
		Received	11/21/07	Collected/Weight	11/19/07 13:00 961 g
% solids	89.0	% solids	89.0	Custody/SAF No	RC-029-027 RC-029

NALYTE	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
ross Alpha	10.0	7.6	10.8	10.0	U	93A	7.62	5.1	6.98		27	162	0.5
ross Beta	20.6	5.9	8.92	15.0		93B	18.2	3.0	3.70		12	60	0.6

emaining Sites Confirm.Smpling-Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/17/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1026

7713-007 J16234

DUPLICATE

SDG	7713			Client/Case no	Hanford SDG K1026
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R711117-07	Lab sample id	R711117-04	Client sample id	J16234
Dept sample id	7713-007	Dept sample id	7713-004	Location/Matrix	100-F-50 SOLID
		Received	11/21/07	Collected/Weight	11/19/07 13:05 1486 g
% solids	97.4	% solids	97.4	Custody/SAF No	RC-029-027 RC-029

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
Gross Alpha	12.2	3.9	4.33	10.0		93A	5.79	5.8	7.89	U	71	125	1.7
Gross Beta	17.6	2.1	2.76	15.0		93B	16.3	4.2	5.66		8	52	0.4
Potassium 40	10.8	0.56	0.194			GAM	11.4	0.61	0.260		5	34	0.5
Cobalt 60	U		0.024	0.050	U	GAM	U		0.023	U	-		0.1
Cesium 137	0.176	0.025	0.025	0.100		GAM	0.188	0.029	0.027		7	45	0.4
Radium 226	0.350	0.045	0.042	0.100		GAM	0.343	0.048	0.046		2	43	0.1
Radium 228	0.546	0.097	0.094	0.200		GAM	0.613	0.087	0.082		12	46	0.7
Europium 152	U		0.064	0.100	U	GAM	U		0.067	U	-		0.1
Europium 154	U		0.081	0.100	U	GAM	U		0.087	U	-		0.1
Europium 155	U		0.050	0.100	U	GAM	U		0.073	U	-		0.5
Thorium 228	0.526	0.030	0.029			GAM	0.539	0.031	0.029		2	34	0.2
Thorium 232	0.546	0.097	0.094			GAM	0.613	0.087	0.082		12	46	0.7
Uranium 235	U		0.089		U	GAM	U		0.093	U	-		0.1
Uranium 238	U		2.80		U	GAM	U		2.97	U	-		0.1
Americium 241	U		0.030		U	GAM	U		0.032	U	-		0.1

Remaining Sites Confirm.Smpling-Soil

QC-DUP#4 63832

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/17/08

Date: 15 February 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil - Waste Site 100-F-50
Subject: Semivolatile - Data Package No. K1026-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1026 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16231	11/19/07	Soil	C	See note 1
J16232	11/19/07	Soil	C	See note 1
J16233	11/19/07	Soil	C	See note 1
J16234	11/19/07	Soil	C	See note 1
J16236	11/19/07	Soil	C	See note 1

1– Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two

times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, the bis(2-ethylhexyl)phthalate results in all samples were raised to the RQL, qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

One field (equipment) blank (J16236) was submitted for analysis. Di-n-butylphthalate was detected in the equipment blank. Under the WCH statement of work, no qualification is required. No other analytes were detected in the field blank.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J".

Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike and/or matrix spike duplicate recoveries outside QC limits, all bis(2-chloroethyl)ether (47%), 1,3-dichlorobenzene (42% & 47%), 1,4-dichlorobenzene (42%, 48%), 1,2-dichlorobenzene (44%), 2,2'-oxybis(1-chloropropene (42%), hexachloroethane (41% & 45%), nitrobenzene (42%), isophorone (53% & 57&), 2-nitrophenol (47%), 1,2,4-trichlorobenzene (41% & 48%) and 2-methylnaphthalene (53% & 56%) results were qualified as estimates and flagged "J".

Due to LCS recoveries outside QC limits, all isophorone (58%), bis(2-chloroethoxy)methane (48%), 4-chloroanaline (39%), 1,2,4-trichlorobenzene (53%), 2-methylnaphthalene (57%), 2,4-dinitrophenol (19%), 4,6-dinitro-2-methylphenol (33%) and pentachlorophenol (42%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the

recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J16232/J16233) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. Fourty semivolatile analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other undetected analytes met the RQL.

- **Completeness**

Data package No. K1026 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the bis(2-ethylhexyl)phthalate results in all samples were raised to the RQL, qualified as undetected and flagged "U".

- Due to matrix spike and/or matrix spike duplicate recoveries outside QC limits, all bis(2-chloroethyl)ether (47%), 1,3-dichlorobenzene (42% & 47%), 1,4-dichlorobenzene (42%, 48%), 1,2-dichlorobenzene (44%), 2,2'-oxybis(1-chloropropene (42%), hexachloroethane (41% & 45%), nitrobenzene (42%), isophorone (53% & 57&), 2-nitrophenol (47%), 1,2,4-trichlorobenzene (41% & 48%) and 2-methylnaphthalene (53% & 56%) results were qualified as estimates and flagged "J".

- Due to LCS recoveries outside QC limits, all isophorone (58%), bis(2-chloroethoxy)methane (48%), 4-chloroanaline (39%), 1,2,4-trichlorobenzene (53%), 2-methylnaphthalene (57%), 2,4-dinitrophenol (19%), 4,6-dinitro-2-methylphenol (33%), pentachlorophenol (42%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Fourty semivolatile analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K1026	REVIEWER: ELR	Project: 100-F-50	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U at RQL	All	Method blank contamination
bis(2-chloroethyl)ether 1,3-dichlorobenzene 1,4-dichlorobenzene 1,2-dichlorobenzene 2,2'-oxybis(1-chloropropene) Hexachloroethane Nitrobenzene Isophorone 2-nitrophenol 1,2,4-trichlorobenzene 2-methylnaphthalene	J	All	MS and/or MSD recovery
Isophorone bis(2-chloroethoxy)methane 4-chloroanaline 1,2,4-trichlorobenzene 2-methylnaphthalene 2,4-dinitrophenol 4,6-dinitro-2-methylphenol Pentachlorophenol	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

	Cust ID:	J16231	J16231	J16231	J16232	J16233	J16234
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	70 %	49 %	47 %	63 %	68 %	72 %
	2-Fluorobiphenyl	76 %	76 %	71 %	68 %	77 %	81 %
	Terphenyl-d14	123 %	94 %	93 %	80 %	100 %	107 %
	Phenol-d5	73 %	72 %	67 %	56 %	66 %	61 %
	2-Fluorophenol	68 %	62 %	64 %	58 %	69 %	67 %
	2,4,6-Tribromophenol	71 %	72 %	61 %	49 %	70 %	81 %
		fl	fl	fl	fl	fl	fl
Phenol		370 U	64 %	72 %	370 U	380 U	340 U
bis(2-Chloroethyl)ether		370 UJ	47 * %	52 %	370 UJ	380 UJ	340 UJ
2-Chlorophenol		370 U	68 %	78 %	370 U	380 U	340 U
1,3-Dichlorobenzene		370 UJ	42 * %	47 * %	370 UJ	380 UJ	340 UJ
1,4-Dichlorobenzene		370 UJ	42 * %	48 * %	370 UJ	380 UJ	340 UJ
1,2-Dichlorobenzene		370 UJ	44 * %	51 %	370 UJ	380 UJ	340 UJ
2-Methylphenol		370 U	67 %	75 %	370 U	380 U	340 U
2,2'-oxybis(1-Chloropropane)		370 UJ	42 * %	51 %	370 UJ	380 UJ	340 UJ
3/4 Methylphenol		370 U	72 %	78 %	370 U	380 U	340 U
N-Nitroso-di-n-propylamine		370 U	57 %	69 %	370 U	380 U	340 U
Hexachloroethane		370 UJ	41 * %	45 * %	370 UJ	380 UJ	340 UJ
Nitrobenzene		370 UJ	42 * %	50 %	370 UJ	380 UJ	340 UJ
Isophorone		370 UJ	53 * %	57 * %	370 UJ	380 UJ	340 UJ
2-Nitrophenol		370 UJ	47 * %	51 %	370 UJ	380 UJ	340 UJ
2,4-Dimethylphenol		370 U	59 %	63 %	370 U	380 U	340 U
bis(2-Chloroethoxy)methane		370 UJ	45 %	50 %	370 UJ	380 UJ	340 UJ
2,4-Dichlorophenol		370 U	57 %	60 %	370 U	380 U	340 U
1,2,4-Trichlorobenzene		370 UJ	41 * %	48 * %	370 UJ	380 UJ	340 UJ
Naphthalene		370 U	46 %	52 %	370 U	380 U	340 U
4-Chloroaniline		370 UJ	31 %	31 %	370 UJ	380 UJ	340 UJ
Hexachlorobutadiene		370 U	44 %	50 %	370 U	380 U	340 U
4-Chloro-3-methylphenol		370 U	63 %	66 %	370 U	380 U	340 U
2-Methylnaphthalene		370 UJ	53 * %	56 * %	370 UJ	380 UJ	340 UJ
Hexachlorocyclopentadiene		370 U	27 %	31 %	370 U	380 U	340 U
2,4,6-Trichlorophenol		370 U	65 %	62 %	370 U	380 U	340 U
2,4,5-Trichlorophenol		920 U	78 %	79 %	930 U	940 U	860 U

*= Outside of EPA CLP QC limits.

2/13/08

000000008

Cust ID:	J16231		J16231		J16231		J16232		J16233		J16234	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	370	U	69	*	73	*	370	U	380	U	340	U
2-Nitroaniline	920	U	79	*	85	*	930	U	940	U	860	U
Dimethylphthalate	370	U	80	*	85	*	370	U	380	U	340	U
Acenaphthylene	370	U	74	*	80	*	370	U	380	U	340	U
2,6-Dinitrotoluene	370	U	78	*	82	*	370	U	380	U	340	U
3-Nitroaniline	920	U	62	*	70	*	930	U	940	U	860	U
Acenaphthene	370	U	72	*	79	*	370	U	380	U	340	U
2,4-Dinitrophenol	920	UJ	69	*	61	*	930	UJ	940	UJ	860	UJ
4-Nitrophenol	920	U	80	*	78	*	930	U	940	U	860	U
Dibenzofuran	370	U	77	*	83	*	370	U	380	U	340	U
2,4-Dinitrotoluene	370	U	84	*	91	*	370	U	380	U	340	U
Diethylphthalate	370	U	82	*	90	*	370	U	380	U	340	U
4-Chlorophenyl-phenylether	370	U	76	*	81	*	370	U	380	U	340	U
Fluorene	370	U	78	*	83	*	370	U	380	U	340	U
4-Nitroaniline	920	U	66	*	68	*	930	U	940	U	860	U
4,6-Dinitro-2-methylphenol	920	UJ	84	*	78	*	930	UJ	940	UJ	860	UJ
N-Nitrosodiphenylamine (1)	370	U	68	*	71	*	370	U	380	U	340	U
4-Bromophenyl-phenylether	370	U	68	*	79	*	370	U	380	U	340	U
Hexachlorobenzene	370	U	87	*	94	*	370	U	380	U	340	U
Pentachlorophenol	920	UJ	68	*	51	*	930	UJ	940	UJ	860	UJ
Phenanthrene	370	U	76	*	86	*	370	U	380	U	340	U
Anthracene	370	U	81	*	87	*	370	U	380	U	340	U
Carbazole	370	U	75	*	78	*	370	U	380	U	340	U
Di-n-butylphthalate	370	U	85	*	96	*	370	U	26	J	340	U
Fluoranthene	370	U	80	*	80	*	23	J	38	J	21	J
Pyrene	23	J	82	*	88	*	370	U	40	J	340	U
Butylbenzylphthalate	370	U	82	*	90	*	370	U	380	U	340	U
3,3'-Dichlorobenzidine	370	U	34	*	39	*	370	U	380	U	340	U
Benzo(a)anthracene	370	U	79	*	86	*	370	U	19	J	340	U
Chrysene	26	J	80	*	84	*	25	J	44	J	340	U
bis(2-Ethylhexyl)phthalate	660 ~~90~~ 2/13/08 JB	U	80	*	91	*	660 ~~160~~ 2/13/08 JB	U	660 ~~450~~ 2/13/08 B	U	660 ~~100~~ 2/13/08 JB	U
Di-n-octyl phthalate	370	U	65	*	70	*	370	U	380	U	340	U
Benzo(b)fluoranthene	370	U	73	*	70	*	35	J	55	J	340	U
Benzo(k)fluoranthene	370	U	69	*	75	*	370	U	22	J	340	U
Benzo(a)pyrene	370	U	78	*	78	*	23	J	380	U	340	U
Indeno(1,2,3-cd)pyrene	370	U	102	*	91	*	370	U	380	U	340	U
Dibenz(a,h)anthracene	370	U	102	*	91	*	370	U	380	U	340	U
Benzo(g,h,i)perylene	370	U	101	*	87	*	370	U	380	U	340	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

2/13/08

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	Cust ID:	J16236	SBLKQL	SBLKQL BS
Sample Information	RFW#:	005	07LE0659-MB1	07LE0659-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	80 %	92 %	55 %
	2-Fluorobiphenyl	74 %	75 %	73 %
	Terphenyl-d14	102 %	94 %	77 %
	Phenol-d5	74 %	74 %	67 %
	2-Fluorophenol	78 %	77 %	63 %
	2,4,6-Tribromophenol	25 %	54 %	45 %
Phenol		330 U	330 U	72 %
bis(2-Chloroethyl)ether		330 U J	330 U	67 %
2-Chlorophenol		330 U	330 U	81 %
1,3-Dichlorobenzene		330 U J	330 U	64 %
1,4-Dichlorobenzene		330 U J	330 U	66 %
1,2-Dichlorobenzene		330 U J	330 U	70 %
2-Methylphenol		330 U	330 U	73 %
2,2'-oxybis(1-Chloropropane)		330 U J	330 U	58 %
3/4 Methylphenol		330 U	330 U	76 %
N-Nitroso-di-n-propylamine		330 U	330 U	67 %
Hexachloroethane		330 U J	330 U	69 %
Nitrobenzene		330 U J	330 U	51 %
Isophorone		330 U J	330 U	58 * %
2-Nitrophenol		330 U J	330 U	50 %
2,4-Dimethylphenol		330 U	330 U	54 %
bis(2-Chloroethoxy)methane		330 U J	330 U	48 %
2,4-Dichlorophenol		330 U	330 U	55 %
1,2,4-Trichlorobenzene		330 U J	330 U	53 * %
Naphthalene		330 U	330 U	54 %
4-Chloroaniline		330 U J	330 U	39 %
Hexachlorobutadiene		330 U	330 U	59 %
4-Chloro-3-methylphenol		330 U	330 U	64 %
2-Methylnaphthalene		330 U J	330 U	57 * %
Hexachlorocyclopentadiene		330 U	330 U	82 %
2,4,6-Trichlorophenol		330 U	330 U	56 %
2,4,5-Trichlorophenol		830 U	830 U	76 %

*= Outside of EPA CLP QC limits.

2/13/08

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Cust ID:	J16236		SBLKQL		SBLKQL BS	
RFW#:	005		07LE0659-MB1		07LE0659-MB1	
2-Chloronaphthalene	330	U	330	U	73	%
2-Nitroaniline	830	U	830	U	86	%
Dimethylphthalate	330	U	330	U	82	%
Acenaphthylene	330	U	330	U	81	%
2,6-Dinitrotoluene	330	U	330	U	86	%
3-Nitroaniline	830	U	830	U	76	%
Acenaphthene	330	U	330	U	77	%
2,4-Dinitrophenol	830	UJ	830	U	19 *	%
4-Nitrophenol	830	U	830	U	76	%
Dibenzofuran	330	U	330	U	81	%
2,4-Dinitrotoluene	330	U	330	U	89	%
Diethylphthalate	330	U	330	U	88	%
4-Chlorophenyl-phenylether	330	U	330	U	81	%
Fluorene	330	U	330	U	82	%
4-Nitroaniline	830	U	830	U	72	%
4,6-Dinitro-2-methylphenol	830	UJ	830	U	33 *	%
N-Nitrosodiphenylamine (1)	330	U	330	U	65	%
4-Bromophenyl-phenylether	330	U	330	U	70	%
Hexachlorobenzene	330	U	330	U	84	%
Pentachlorophenol	830	UJ	830	U	42	%
Phenanthrene	330	U	330	U	79	%
Anthracene	330	U	330	U	83	%
Carbazole	330	U	330	U	79	%
Di-n-butylphthalate	26	J	330	U	87	%
Fluoranthene	330	U	330	U	89	%
Pyrene	330	U	330	U	77	%
Butylbenzylphthalate	330	U	330	U	77	%
3,3'-Dichlorobenzidine	330	U	330	U	65	%
Benzo(a)anthracene	330	U	330	U	74	%
Chrysene	330	U	330	U	75	%
bis(2-Ethylhexyl)phthalate	160 ~~59~~ 34 JB	U	27	J	73	%
Di-n-octyl phthalate	330	U	330	U	69	%
Benzo(b)fluoranthene	330	U	330	U	72	%
Benzo(k)fluoranthene	330	U	330	U	77	%
Benzo(a)pyrene	330	U	330	U	75	%
Indeno(1,2,3-cd)pyrene	330	U	330	U	77	%
Dibenz(a,h)anthracene	330	U	330	U	78	%
Benzo(g,h,i)perylene	330	U	330	U	76	%

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

2/13/08

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0711L218
SDG/SAF # K1026/RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 11-21-2007

SEMIVOLATILE

Five (5) soil samples were collected on 11-19-2007.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 11-26-2007 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 12-03,04-2007.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were extracted and analyzed within required holding time.

2. Non-target compounds were detected in the samples.

3. All surrogate recoveries were within acceptance criteria.

4. Seventeen (17) of one hundred and twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report has been enclosed.

5. Five (5) of sixty-four (64) blank spike recoveries were outside acceptance criteria.

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

r:\group\data\2007\bna\tnu-hanford\0711-218ks2.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 21 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LIONVILLE LABORATORY INC.

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

8. 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").

9. LvLI 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.

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
Laboratory Manager
Lionville Laboratory Incorporated

12/6/07
Date

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 07MS254

Initiator: Shawn Saylor
Date: 12-6-07
Client: Thru Rung

Batch: 07IIL218
Samples: ms, msd, BS
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: SOLID
Prep Batch: 07IED659

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)

lowspike recoveries in the ms, msd & BS

2. Known or Probable Causes(s) acidic phenols subject to sporadic chromatographic behavior. Other sporadic all surrogate within criteria Recovery

3. Discussion and Proposed Action Other Description: narrate

__ 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: 12/6/07

__ 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: KDS 12-06-07 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 Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
✓	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	✓	X MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-029-027

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-50		SAF No.: RC-029
Ice Chest No.: ERC-99-027	Field Logbook No.: EL-1601	COA: R00F50A000	Method of Shipment: FedEx
Shipped To: BH 11/5/07 ~~FEDERLINE SERVICES~~ (LIONVILLE)	Offsite Property No.: A080057		Bill of Lading/Air Bill No.: SL 05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

020000

Preservation	None	None E	Cool 4C F	Cool 4C B	Cool 4C C	Cool 4C A	Cool 4C	Cool 4C D		
Type of Container	P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	250mL	120mL	250mL	250mL	250mL	60mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1		

Sample No.	Matrix *	Sample Date	Sample Time									
16231	SOIL	11/19/07	1250		X	X	X	X	X		X	
16232	SOIL	11/19/07	1255		X	X	X	X	X		X	
16233	SOIL	11/19/07	1300		X	X	X	X	X		X	
16234	SOIL	11/19/07	1305		X	X	X	X	X		X	
~~16235~~	~~SOIL~~	BH 11/19/07										

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	11/19/07 1400	B Hudson [signature]	11/19/07 1400
HUDSON [signature]	11/19/07 1510	3728 #2C	11/19/07 1510
3728 #2C	11-20-07 0825	[signature]	11-20-07 0825
[signature]	11-20-07 1500	FED EX	
FED EX	11/21/07 0955	[signature]	11/21/07 0955

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium
(2) ICP Metals - 6010TR (SW846) (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)

samples from 3728 Ref # 2C
3728 Custodian removed samples for shipping on 11/20/07
Sampler unavailable to relinquish

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

/CH-EE-011

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Washington Closure Hanford | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | RC-029-027 | Page 2 of 2

ollector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
roject Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-50		SAF No.: RC-029
e Chest No.: EPC-99-027	Field Logbook No.: EL-1601	COA: R00F50A000	Method of Shipment: FedEx
hipped To: ~~EBERLINE SERVICES~~ (LIONVILLE) RSH 11/15/07	Offsite Property No.: 4080057		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	250mL	120mL	250mL	250mL	250mL	60mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions	Chromium Hex - 7199	PCBs - 8082; Pesticides - 8081	Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1		

Sample No.	Matrix *	Sample Date	Sample Time										
16236	SOIL	11/19/07	1245		X				X				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Welch-Koelling	11/19/07 1400	BHUDSON BHudson	11/19/07 1400
BHUDSON BHudson	11/19/07 1510	3728 #2C	11/19/07 1510
3728 #2C	11-20-07 0825	Washington	11-20-07 0825
Washington	11-20-07 1500	FED EX	
FED EX	11-21-07 0955	Victor Hernandez	11-21-07 0955

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Americium-241]; Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium [Plutonium-238, Plutonium-239/240]; Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium [Uranium-233/234, Uranium-235, Uranium-238]; Total Uranium
(2) ICP Metals - 6010TR (SW846) [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)

samples from 3728 Ref# 2C
3728 Custodian removed samples for shipping on 11/20/07.
Sampler unavailable to relinquish

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

/CH-EE-011

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Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-50			DATA PACKAGE: K1026		
VALIDATOR: ELR		LAB: LLI		DATE: 2/10/08	
			SDG: K1026		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J16231	J16232	J16233	J16234	J16236	
					soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments:

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: bis(2-ethylhexyl)phthalate - U at RQL

FB di-n-butylphthalate in FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: MS - 11 out - J all no RAS

LCS - 8 out - J all

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD RPD values acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: 32 out 4/0 out
2/Rdx

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Date: 15 February 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil - Waste Site 100-F-50
Subject: Pesticide/PCB/Herbicide - Data Package No. K1026-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1026 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16231	11/19/07	Soil	C	See note 1
J16232	11/19/07	Soil	C	See note 1
J16233	11/19/07	Soil	C	See note 1
J16234	11/19/07	Soil	C	See note 1

1 – Pesticides by 8081, PCBs by 8082 & herbicides by 8151A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all

associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike, matrix spike and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (139%), the aroclor-1254 result in sample J16232 was qualified as an estimate and flagged "J".

Due to a matrix spike result outside QC limits (52%), all delta-BHC results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

Due to a surrogate recovery outside QC limits (142%), the aroclor-1254 result in sample J16232 was qualified as an estimate and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

Due to RPDs outside QC limits, all dichloroprop (35%), 2,4-D (43%) & 2,4-DB (85%) results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J16232/J16233) were submitted for analysis. Field duplicates are compared using the same criteria as for field duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other results met the RQL.

- **Completeness**

Data Package No. K1026 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the lack of a matrix spike, matrix spike and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (139%), the aroclor-1254 result in sample J16232 was qualified as an estimate and flagged "J".
- Due to a matrix spike result outside QC limits (52%), all delta-BHC results were qualified as estimates and flagged "J".
- Due to a surrogate recovery outside QC limits (142%), the aroclor-1254 result in sample J16232 was qualified as an estimate and flagged "J".

- Due to RPDs outside QC limits, all dichloroprop (35%), 2,4-D (43%) & 2,4-DB (85%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

Fluor Hanford Data Validation Contract #29776 (June 2006), *Validation Statement of Work*, through Washington Closure Hanford Work Order #WB6081.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PESTICIDE/PCB/HERBICIDE DATA QUALIFICATION SUMMARY*

SDG: K1026	REVIEWER: ELR	Project: 100-F-50	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS, MSD or LCS
Aroclor-1254	J	J16232	LCS recovery & surrogate recovery
Delta-BHC	J	All	MS recovery
Dichloroprop 2,4-D 2,4-DB	J	All	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

PCBs by GC

Report Date: 12/03/07 13:30

RFW Batch Number: 0711L218 Client: TNUHANFORD RC-029 K1026 Work Order: 11343606001 Page: 1

	Cust ID:	J16231	J16231	J16231	J16232	J16233	J16234
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	88 %	105 %	86 %	142 * %	94 %	90 %
	Decachlorobiphenyl	86 %	100 %	84 %	121 %	87 %	85 %
Aroclor-1016		15 U	91 %	77 %	15 U	15 U	14 U
Aroclor-1221		15 U	15 U	15 U	15 U	15 U	14 U
Aroclor-1232		15 U	15 U	15 U	15 U	15 U	14 U
Aroclor-1242		15 U	15 U	15 U	15 U	15 U	14 U
Aroclor-1248		15 U	15 U	15 U	15 U	15 U	14 U
Aroclor-1254		15 U	15 U	15 U	11 ~~U~~ J	15 U	14 U
Aroclor-1260		15 U	103 %	87 %	15 U	15 U	14 U

	Cust ID:	PBLKJT	PBLKJT BS
Sample Information	RFW#:	07LE0658-MB1	07LE0658-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	107 %	141 %
	Decachlorobiphenyl	112 %	140 %
Aroclor-1016		13 U	119 %
Aroclor-1221		13 U	13 U
Aroclor-1232		13 U	13 U
Aroclor-1242		13 U	13 U
Aroclor-1248		13 U	13 U
Aroclor-1254		13 U	13 U
Aroclor-1260		13 U	139 %

2/13/08

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

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Pesticide/PCBs by GC, CLP List

Report Date: 11/29/07 14:16

RFW Batch Number: 0711L218 Client: TNUHANFORD RC-029 K1026 Work Order: 11343606001 Page: 1

	Cust ID:	J16231	J16231	J16231	J16232	J16233	J16234
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	4.00	4.00	4.00	4.00	4.00	4.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	82 %	87 %	89 %	81 %	89 %	85 %
	Decachlorobiphenyl	86 %	85 %	90 %	84 %	88 %	83 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.5 U	65 %	68 %	1.5 U	1.5 U	1.4 U
gamma-BHC (Lindane)		1.5 U	79 %	83 %	1.5 U	1.5 U	1.4 U
Beta-BHC		1.5 U	95 %	97 %	1.5 U	1.5 U	1.4 U
Heptachlor		1.5 U	87 %	92 %	1.5 U	1.5 U	1.4 U
Delta-BHC		1.5 U J	52 * %	59 %	1.5 U J	1.5 U J	1.4 U J
Aldrin		1.5 U	82 %	86 %	1.5 U	1.5 U	1.4 U
Heptachlor epoxide		1.5 U	85 %	91 %	1.5 U	1.5 U	1.4 U
gamma-Chlordane		1.5 U	83 %	90 %	1.5 U	1.5 U	1.4 U
Endosulfan I		1.5 U	106 %	113 %	1.5 U	1.5 U	1.4 U
alpha-Chlordane		1.5 U	86 %	91 %	1.5 U	1.5 U	1.4 U
4,4'-DDE		1.5 U	112 %	121 %	1.5 U	1.5 U	1.4 J
Dieldrin		1.5 U	82 %	90 %	1.5 U	1.5 U	1.4 U
Endrin		1.5 U	89 %	96 %	1.5 U	1.5 U	1.4 U
4,4'-DDD		1.5 U	88 %	99 %	1.5 U	1.5 U	1.4 U
Endosulfan II		1.5 U	90 %	99 %	1.5 U	1.5 U	1.4 U
4,4'-DDT		1.5 U	90 %	99 %	1.5 U	1.5 U	1.4 U
Endrin aldehyde		1.5 U	86 %	95 %	1.5 U	1.5 U	1.4 U
Endosulfan sulfate		1.5 U	84 %	92 %	1.5 U	1.5 U	1.4 U
Methoxychlor		1.5 U	103 %	111 %	1.5 U	1.5 U	1.4 U
Endrin ketone		1.5 U	93 %	102 %	1.5 U	1.5 U	1.4 U
Toxaphene		15 U J	15 U	15 U	15 U J	15 U J	14 U J

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

2/13/08

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0000012

	Cust ID:	PBLKJT		PBLKJT BS	
Sample Information	RFW#:	07LE0658-MB1		07LE0658-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	1.00		1.00	
	Units:	UG/KG		UG/KG	
Surrogate: Tetrachloro-m-xylene		78	%	76	%
Decachlorobiphenyl		75	%	74	%
Alpha-BHC		0.33	U	77	%
gamma-BHC (Lindane)		0.33	U	88	%
Beta-BHC		0.33	U	85	%
Heptachlor		0.33	U	82	%
Delta-BHC		0.33	U	72	%
Aldrin		0.33	U	88	%
Heptachlor epoxide		0.33	U	88	%
gamma-Chlordane		0.33	U	89	%
Endosulfan I		0.33	U	107	%
alpha-Chlordane		0.33	U	90	%
4,4'-DDE		0.33	U	114	%
Dieldrin		0.33	U	90	%
Endrin		0.33	U	94	%
4,4'-DDD		0.33	U	95	%
Endosulfan II		0.33	U	93	%
4,4'-DDT		0.33	U	98	%
Endrin aldehyde		0.33	U	83	%
Endosulfan sulfate		0.33	U	86	%
Methoxychlor		0.33	U	89	%
Endrin ketone		0.33	U	94	%
Toxaphene		3.3	U	3.3	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

2/13/08

0000013

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RFW Batch Number: 0711L218 Client: TNUHANFORD RC-029 K1026 Work Order: 11343606001 Page: 1

	Cust ID:	J16231	J16231	J16231	J16232	J16233	J16234
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Surrogate:	DCAA	51 %	66 %	36 * %	60 %	124 %	46 %
		fl	fl	fl	fl	fl	fl
Dalapon		31 J	58 %	49 %	37 U	38 U	34 U
Dicamba		37 U	92 %	78 %	37 U	38 U	34 U
Dichloroprop		37 UJ	80 %	56 %	37 UJ	38 UJ	34 UJ
2,4-D		37 UJ	76 %	49 %	37 UJ	38 UJ	34 UJ
2,4,5-TP (Silvex)		18 U	87 %	75 %	19 U	19 U	17 U
2,4,5-T		18 U	87 %	63 %	19 U	19 U	17 U
Dinoseb		18 U	87 %	82 %	19 U	19 U	17 U
2,4-DB		18 UJ	77 %	32 %	19 UJ	19 UJ	17 UJ
Pentachlorophenol		18 U	97 %	101 %	19 U	19 U	17 U

	Cust ID:	PBLKJX	PBLKJX BS
Sample Information	RFW#:	07LE0672-MB1	07LE0672-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	ug/kg	ug/kg
Surrogate:	DCAA	69 %	75 %
		fl	fl
Dalapon		33 U	62 %
Dicamba		33 U	97 %
Dichloroprop		33 U	85 %
2,4-D		33 U	93 %
2,4,5-TP (Silvex)		17 U	93 %
2,4,5-T		17 U	96 %
Dinoseb		17 U	66 %
2,4-DB		17 U	83 %
Pentachlorophenol		17 U	66 %

✓ 2/13/08

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0711L218
SDG/SAF # K1026 / RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 11-21-2007

PCB

Four (4) soil samples were collected on 11-19-2007.

The samples and their associated QC samples were extracted on 11-26-2007 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 12-01-2007. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of the QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. The samples were extracted and analyzed within required holding time.
2. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
3. The method blank was below the reporting limits for all target compounds.
4. One (1) of sixteen (16) surrogate recoveries was outside acceptance criteria. However, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).
5. The blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. The initial calibrations associated with this data set were within acceptance criteria.

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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 10 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LvLI
LIONVILLE LABORATORY INC.

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

9. LvLI 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.

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
Laboratory Manager
Lionville Laboratory Incorporated

12/4/07
Date

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0711L218
SDG/SAF # K1026 / RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 11-21-2007

CHLORINATED PESTICIDES

Four (4) soil samples were collected on 11-19-2007.

The samples and their associated QC samples were extracted on 11-26-2007 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 11-28-2007. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of the QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. The samples were extracted and analyzed within required holding time.
2. The method blank was below the reporting limits for all target compounds.
3. All surrogate recoveries were within acceptance criteria.
4. The blank spike recoveries were within acceptance criteria.
5. One (1) of forty (40) matrix spike recoveries was outside acceptance criteria.
6. Samples J16231, J16232, J16233, and J16234 required 4-fold instrument dilution due to the matrix.
7. The initial calibrations associated with this data set were within acceptance criteria.
8. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. LvLI 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.

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 12 pages.

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LIONVILLE LABORATORY INC.

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
Laboratory Manager
Lionville Laboratory Incorporated

12/4/07
Date

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 07GC299

Initiator: CAC
Date: 12-01-07
Client: TNL

Batch: 07IIL218
Samples: 10 IMS
Method: SW846/MCAWW/CLP/

Parameter: 0608H
Matrix: SOIL
Prep Batch: 07CE0668

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)

Delta BHC recovery low

2. Known or Probable Causes(s)

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:

BS & MSD OK

Narrate. ID.

4. Project Manager Instructions...signature/date: 12/3/07
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
✓ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 12-04-07

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 Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0711L218
SDG/SAF # K1026/RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 11-21-2007

HERBICIDE

Four (4) soil samples were collected on 11-19-2007.

The samples and their associated QC samples were extracted on 12-03-2007 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 12-04,05-2007. The extraction and analysis procedures were based on method 8151A.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. All required holding times for extraction and analysis have been met.
2. The method blank was below the reporting limits for all target compounds.
3. One (1) of eight (8) surrogate recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report has been enclosed.
4. All blank spike recoveries were within acceptance criteria.
5. All matrix spike recoveries were within acceptance criteria.
6. The initial calibrations associated with this data set were within acceptance criteria.
7. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

r:\group\data\herb\tnu hanford\0711-218ks2.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 11 pages.

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LvLI
LIONVILLE LABORATORY INC.

8. LvLI 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.

9. 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 Incorporated

12/6/07
Date

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 07GC301

Initiator: CK
Date: 12/6/07
Client: TNV Hanford

Batch: 07111218
Samples: -001-T
Method: SW846/MCAWW/CLP/

Parameter: OHBGXB
Matrix: Soil
Prep Batch: 07LE0672

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)

_ Low Surr on 07111218-001-T. (36%). See attached.
_ All other QC okay.

2. Known or Probable Causes(s)

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:

All spikes in MSD OK
No impact on data
JD 12/6/07

4. Project Manager Instructions...signature/date: 12/6/07

__ 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: KAA 12-06-07

__ 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 Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
Welch-Koelling	Matt Perrott	372-9088	KESSNER, JH	8C	15 Days

Project Designation	Sampling Location	SAF No.
Remaining Sites Confirmation Sampling - Soil	100-F-50	RC-029

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-99-027	EL-1601	R00F50A000	FedEx

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
BH 11/5/07 ~~EBERLINE SERVICES~~ (LIONVILLE)	A080057	SL 05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000024

Preservation	None	None E	Cool 4C F	Cool 4C B	Cool 4C C	Cool 4C A	Cool 4C	Cool 4C D		
Type of Container	P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	250mL	120mL	250mL	250mL	250mL	60mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1		

Sample No.	Matrix *	Sample Date	Sample Time									
J16231	SOIL	11/19/07	1250		X	X	X	X	X		X	
J16232	SOIL	11/19/07	1255		X	X	X	X	X		X	
J16233	SOIL	11/19/07	1300		X	X	X	X	X		X	
J16234	SOIL	11/19/07	1305		X	X	X	X	X		X	
~~J16235~~	~~SOIL~~	BH 11/19/07										

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	11/19/07 1400	BHudson BHudson	11/19/07 1400
BHUDSON BHudson	11/19/07 1510	3728 #2C	11/19/07 1510
3728 #2C	11-20-07 0825	BWSingleton	11-20-07 0825
BWSingleton	11-20-07 1500	FED EX	
Fed Ex	11/21/07 0955	[signature]	11/21/07 0955

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Americium-241]; Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium [Plutonium-238, Plutonium-239/240]; Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium [Uranium-233/234, Uranium-235, Uranium-238]; Total Uranium
(2) ICP Metals - 6010TR (SW846) [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)

samples from 3728 Ref # 2C
3728 Custodian removed samples for shipping on 11/20/07
Sampler unavailable to relinquish

Matrix *
SoSoil
SEnSediment
SOnSolid
SlnSludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
LnLiquid
V=Vegetation
X=Other

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

WCH-EE-011

000000000

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 100-F-50		DATA PACKAGE: K1026	
VALIDATOR: ELR	LAB: LLI	DATE: 2/10/08	
		SDG: K1026	

ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)	8151A	

SAMPLES/MATRIX
J16231 J16232 J16233 J16234
Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... Yes No N/A

Surrogate recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: pest - surr - 32 - J 1254 no PAS

MS - delta BHC J all

no toxaphen MS/MSD/LCS - J all

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: dichloroprop (35%) 2,4-D (43%) 2,4-DB (85%) – Jall

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: all toxaphene cells

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries acceptable? ..... Yes No N/A

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Date: 15 February 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-F-50
Subject: Inorganics - Data Package No. K1026-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1026 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16231	11/19/07	Soil	C	See note 1
J16232	11/19/07	Soil	C	See note 1
J16233	11/19/07	Soil	C	See note 1
J16234	11/19/07	Soil	C	See note 1
J16236	11/19/07	Soil	C	See note 1

1 - ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, the calcium, sodium and zinc results in sample J16236 were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J16236) was submitted for analysis. Aluminum, barium, iron, magnesium, manganese, and silicon were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70%

and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J16232/J16233) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. K1026 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to method blank contamination, the calcium, sodium and zinc results in sample J16236 were qualified as undetected and flagged "UJ".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Fluor Hanford Data Validation Contract #29776 (June 2006), *Validation Statement of Work*, through Washington Closure Hanford Work Order #WB6081.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: K1026	REVIEWER: ELR	Project: 100-F-50	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium Sodium Zinc	UJ	J16236	Method blank contamination

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/03/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J16231	Silver, Total	0.31 u	MG/KG	0.31	3.0
		Aluminum, Total	4790	MG/KG	12.6	3.0
		Arsenic, Total	2.2	MG/KG	1.6	3.0
		Boron, Total	2.1	MG/KG	1.6	3.0
		Barium, Total	55.0	MG/KG	0.31	3.0
		Beryllium, Total	0.70	MG/KG	0.16	3.0
		Calcium, Total	3470	MG/KG	12.6	3.0
		Cadmium, Total	0.16 u	MG/KG	0.16	3.0
		Cobalt, Total	5.0	MG/KG	0.63	3.0
		Chromium, Total	6.5	MG/KG	0.63	3.0
		Copper, Total	11.9	MG/KG	0.63	3.0
		Iron, Total	17300	MG/KG	14.1	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1500	MG/KG	155	3.0
		Magnesium, Total	3350	MG/KG	7.8	3.0
		Manganese, Total	263	MG/KG	0.13	3.0
		Molybdenum, Total	0.94 u	MG/KG	0.94	3.0
		Sodium, Total	208	MG/KG	6.3	3.0
		Nickel, Total	8.2	MG/KG	0.63	3.0
		Lead, Total	6.1	MG/KG	0.94	3.0
		Antimony, Total	0.94 u	MG/KG	0.94	3.0
		Selenium, Total	1.9 u	MG/KG	1.9	3.0
		Silicon, Total	1920	MG/KG	12.6	3.0
		Vanadium, Total	44.4	MG/KG	0.44	3.0
		Zinc, Total	41.5	MG/KG	1.9	3.0

2/13/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/03/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J16232	Silver, Total	0.30 u	MG/KG	0.30	3.0
		Aluminum, Total	4760	MG/KG	11.8	3.0
		Arsenic, Total	2.1	MG/KG	1.5	3.0
		Boron, Total	2.6	MG/KG	1.5	3.0
		Barium, Total	66.2	MG/KG	0.30	3.0
		Beryllium, Total	0.75	MG/KG	0.15	3.0
		Calcium, Total	3640	MG/KG	11.8	3.0
		Cadmium, Total	0.15 u	MG/KG	0.15	3.0
		Cobalt, Total	5.3	MG/KG	0.59	3.0
		Chromium, Total	6.9	MG/KG	0.59	3.0
		Copper, Total	12.1	MG/KG	0.59	3.0
		Iron, Total	18600	MG/KG	13.3	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1320	MG/KG	146	3.0
		Magnesium, Total	3540	MG/KG	7.4	3.0
		Manganese, Total	287	MG/KG	0.12	3.0
		Molybdenum, Total	0.89 u	MG/KG	0.89	3.0
		Sodium, Total	178	MG/KG	5.9	3.0
		Nickel, Total	9.3	MG/KG	0.59	3.0
		Lead, Total	5.6	MG/KG	0.89	3.0
		Antimony, Total	0.89 u	MG/KG	0.89	3.0
		Selenium, Total	1.8 u	MG/KG	1.8	3.0
		Silicon, Total	1500	MG/KG	11.8	3.0
		Vanadium, Total	48.9	MG/KG	0.41	3.0
		Zinc, Total	47.2	MG/KG	1.8	3.0

2/13/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/03/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J16233	Silver, Total	0.31 u	MG/KG	0.31	3.0
		Aluminum, Total	4510	MG/KG	12.3	3.0
		Arsenic, Total	1.7	MG/KG	1.5	3.0
		Boron, Total	2.6	MG/KG	1.5	3.0
		Barium, Total	62.0	MG/KG	0.31	3.0
		Beryllium, Total	0.71	MG/KG	0.15	3.0
		Calcium, Total	3640	MG/KG	12.3	3.0
		Cadmium, Total	0.15 u	MG/KG	0.15	3.0
		Cobalt, Total	5.2	MG/KG	0.62	3.0
		Chromium, Total	6.6	MG/KG	0.62	3.0
		Copper, Total	10.9	MG/KG	0.62	3.0
		Iron, Total	17600	MG/KG	13.9	3.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	1340	MG/KG	152	3.0
		Magnesium, Total	3530	MG/KG	7.7	3.0
		Manganese, Total	279	MG/KG	0.12	3.0
		Molybdenum, Total	0.93 u	MG/KG	0.93	3.0
		Sodium, Total	199	MG/KG	6.2	3.0
		Nickel, Total	9.7	MG/KG	0.62	3.0
		Lead, Total	6.2	MG/KG	0.93	3.0
		Antimony, Total	0.93 u	MG/KG	0.93	3.0
		Selenium, Total	1.9 u	MG/KG	1.9	3.0
		Silicon, Total	2370	MG/KG	12.3	3.0
		Vanadium, Total	44.6	MG/KG	0.43	3.0
		Zinc, Total	41.0	MG/KG	1.9	3.0

2/13/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/03/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J16234	Silver, Total	0.30 u	MG/KG	0.30	3.0
		Aluminum, Total	5620	MG/KG	12.1	3.0
		Arsenic, Total	2.2	MG/KG	1.5	3.0
		Boron, Total	2.5	MG/KG	1.5	3.0
		Barium, Total	61.8	MG/KG	0.30	3.0
		Beryllium, Total	0.81	MG/KG	0.15	3.0
		Calcium, Total	3740	MG/KG	12.1	3.0
		Cadmium, Total	0.15 u	MG/KG	0.15	3.0
		Cobalt, Total	6.4	MG/KG	0.61	3.0
		Chromium, Total	7.6	MG/KG	0.61	3.0
		Copper, Total	12.8	MG/KG	0.61	3.0
		Iron, Total	21300	MG/KG	13.6	3.0
		Mercury, Total	0.008u	MG/KG	0.008	1.0
		Potassium, Total	2530	MG/KG	149	3.0
		Magnesium, Total	3980	MG/KG	7.6	3.0
		Manganese, Total	310	MG/KG	0.12	3.0
		Molybdenum, Total	0.91 u	MG/KG	0.91	3.0
		Sodium, Total	218	MG/KG	6.1	3.0
		Nickel, Total	9.7	MG/KG	0.61	3.0
		Lead, Total	4.9	MG/KG	0.91	3.0
		Antimony, Total	0.91 u	MG/KG	0.91	3.0
		Selenium, Total	1.8 u	MG/KG	1.8	3.0
		Silicon, Total	1700	MG/KG	12.1	3.0
		Vanadium, Total	53.1	MG/KG	0.42	3.0
		Zinc, Total	44.4	MG/KG	1.8	3.0

2/13/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/03/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J16236	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	45.0	MG/KG	3.7	1.0
		Arsenic, Total	0.46 u	MG/KG	0.46	1.0
		Boron, Total	0.46 u	MG/KG	0.46	1.0
		Barium, Total	1.2	MG/KG	0.09	1.0
		Beryllium, Total	0.05 u	MG/KG	0.05	1.0
		Calcium, Total	24.6 UJ	MG/KG	3.7	1.0
		Cadmium, Total	0.05 u	MG/KG	0.05	1.0
		Cobalt, Total	0.19 u	MG/KG	0.19	1.0
		Chromium, Total	0.19 u	MG/KG	0.19	1.0
		Copper, Total	0.19 u	MG/KG	0.19	1.0
		Iron, Total	83.6	MG/KG	4.2	1.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	45.6 u	MG/KG	45.6	1.0
		Magnesium, Total	7.8	MG/KG	2.3	1.0
		Manganese, Total	2.6	MG/KG	0.04	1.0
		Molybdenum, Total	0.28 u	MG/KG	0.28	1.0
		Sodium, Total	17.2 UJ	MG/KG	1.9	1.0
		Nickel, Total	0.19 u	MG/KG	0.19	1.0
		Lead, Total	0.28 u	MG/KG	0.28	1.0
		Antimony, Total	0.28 u	MG/KG	0.28	1.0
		Selenium, Total	0.56 u	MG/KG	0.56	1.0
		Silicon, Total	64.1	MG/KG	3.7	1.0
		Vanadium, Total	0.13 u	MG/KG	0.13	1.0
		Zinc, Total	0.84 UJ	MG/KG	0.56	1.0

2/13/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029
LVL#: 0711L218
SDG/SAF#: K1026/RC-029

W.O.#: 11343-606-001-9999-00
Date Received: 11-21-07

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analyses of 5 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were reported with 3-fold dilutions for ICP metals due to sample matrix.

   All samples were rerun on a different instrument for Potassium, Zinc, and Sodium, due to sample matrix.

   Sample results for Potassium were reported to the IDL as LOD determinations are still in progress for that instrument. The LOD's currently in use are achievable for the remainder of the analytes reported from that instrument.

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

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

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

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

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) for Potassium, less than the Limit of Quantitation (3-10X the LOD) for the remainder of the metals, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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 27 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

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

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for 3 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J16231	Aluminum	66,000	101.9
	Iron	66,000	105.7
	Silicon	6,300	95.9

12. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has 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.

    Potassium data has been reported to the Instrument Detection Limit (IDL), as LOD determinations are still in progress for that instrument. Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. LvLI 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 Incorporated

12/4/07
Date

alm/m11-218

LVLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-50	SAF No.: RC-029	
Ice Chest No.: ERC-99-027	Field Logbook No.: EL-1601	COA: R00F50A000	Method of Shipment: FedEx
Shipped To: BH 11/5/07 ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No.: A080057		Bill of Lading/Air Bill No.: SL 05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None E	Cool 4C F	Cool 4C B	Cool 4C C	Cool 4C A	Cool 4C	Cool 4C D		
Type of Container	P BH 11/5/07	G/P	G/P	aG	aG	aG	G BH 11/5/07	G		
No. of Container(s)		1	1	1	1	1		1		
Volume	1000mL	250mL	120mL	250mL	250mL	250mL	60mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Chlorn-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1		

000018

Sample No.	Matrix *	Sample Date	Sample Time									
H16231	SOIL	11/19/07	1250		X	X	X	X	X		X	
H16232	SOIL	11/19/07	1255		X	X	X	X	X		X	
H16233	SOIL	11/19/07	1300		X	X	X	X	X		X	
H16234	SOIL	11/19/07	1305		X	X	X	X	X		X	
~~H16235~~	~~SOIL~~	BH 11/19/07										

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From	Received By/Stored In	
[illegible]	B Hudson B Hudson	11/19/07 1400
Relinquished By/Removed From	Received By/Stored In	
B HUDSON B Hudson	3728 #2C	11/19/07 1510
Relinquished By/Removed From	Received By/Stored In	
3728 #2C	[illegible]	11-20-07 0825
Relinquished By/Removed From	Received By/Stored In	
[illegible]	FED EX	11-20-07 1500
Relinquished By/Removed From	Received By/Stored In	
FED EX	[illegible]	11/21/07 0955
Relinquished By/Removed From	Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}; Total Uranium
(2) ICP Metals - 6010TR (SW846) {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)

samples from 3728 Ref # 2C
3728 Custodian removed samples for shipping on 11/20/07.
Sampler unavailable to relinquish

Matrix *
S=Soil
SB=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

000000022

Washington Closure Hanford | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | RC-029-027

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-50		SAF No.: RC-029
Ice Chest No.: EPC-99-027	Field Logbook No.: EL-1601	COA: R00F50A000	Method of Shipment: FedEx
Shipped To: PSH 11/15/07 ~~EDERLINE SERVICES~~ (LIONVILLE)	Offsite Property No.: A080057		Bill of Lading/Air Bill No.: See OSRC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	Cool 4C	Cool 4C	[illegible]	Cool 4C	Cool 4C	Cool 4C			
Type of Container	P	G/P	G/P	aG	aG	aG	G	G			
No. of Container(s)	1	1	1	1	1	1	1	1			
Volume	1000mL	250mL	120mL	250mL	250mL	250mL	60mL	250mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time								
J16236	SOIL	11/19/07	1245		X				X		

000019

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	11/19/07 1400	BHUDSON BHudson	11/19/07 1400
BHUDSON BHudson	11/19/07 1510	3728 #2C	11/19/07 1510
3728 #2C	11-20-07 0825	[illegible]	11-20-07 0825
[illegible]	11-20-07 1500	FED EX	
FED EX	11-21-07 0955	[illegible]	11-21-07 0955
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}; Total Uranium
(2) ICP Metals - 6010TR (SW846) {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)

samples from 3728 Ref # 2C
3728 Custodian removed samples for shipping on 11/20/07
Sampler unavailable to relinquish

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

0000000023

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-50			DATA PACKAGE: K1026		
VALIDATOR: ELR		LAB: LLI		DATE: 2/10/08	
			SDG: K1026		

ANALYSES PERFORMED

SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		

SAMPLES/MATRIX

J16231	J16232	J16233	J16234	J16236
				Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: 3b- Calcium, Sodium, zinc - UJ

FB- al, barium, iron, magnesium, manganese, silicon

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

MSA performed as required? ..... Yes No N/A

MSA results acceptable? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

8. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/03/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	07L0596-MB1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	3.7 u	MG/KG	3.7	1.0
		Arsenic, Total	0.47 u	MG/KG	0.47	1.0
		Boron, Total	0.47 u	MG/KG	0.47	1.0
		Barium, Total	0.09 u	MG/KG	0.09	1.0
		Beryllium, Total	0.05 u	MG/KG	0.05	1.0
		Calcium, Total	9.5	MG/KG	3.7	1.0
		Cadmium, Total	0.05 u	MG/KG	0.05	1.0
		Cobalt, Total	0.19 u	MG/KG	0.19	1.0
		Chromium, Total	0.19 u	MG/KG	0.19	1.0
		Copper, Total	0.23	MG/KG	0.19	1.0
		Iron, Total	4.2 u	MG/KG	4.2	1.0
		Potassium, Total	46.1 u	MG/KG	46.1	1.0
		Magnesium, Total	2.3 u	MG/KG	2.3	1.0
		Manganese, Total	0.04	MG/KG	0.04	1.0
		Molybdenum, Total	0.28 u	MG/KG	0.28	1.0
		Sodium, Total	7.0	MG/KG	1.9	1.0
		Nickel, Total	0.19 u	MG/KG	0.19	1.0
		Lead, Total	0.28 u	MG/KG	0.28	1.0
		Antimony, Total	0.28 u	MG/KG	0.28	1.0
		Selenium, Total	0.56 u	MG/KG	0.56	1.0
		Silicon, Total	3.7 u	MG/KG	3.7	1.0
		Vanadium, Total	0.13 u	MG/KG	0.13	1.0
		Zinc, Total	1.4	MG/KG	0.56	1.0
BLANK1	07C0213-MB1	Mercury, Total	0.01 u	MG/KG	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/03/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J16231	Silver, Total	4.8	0.31u	5.2	92.3	3.0
		Aluminum, Total	5370	4790	209	279.9*	3.0
		Arsenic, Total	186	2.2	209	87.9	3.0
		Boron, Total	97.3	2.1	105	91.0	3.0
		Barium, Total	245	55.0	209	91.0	3.0
		Beryllium, Total	5.4	0.70	5.2	90.4	3.0
		Calcium, Total	5930	3470	2620	94.0	3.0
		Cadmium, Total	4.8	0.16u	5.2	92.3	3.0
		Cobalt, Total	52.0	5.0	52.3	89.9	3.0
		Chromium, Total	25.5	6.5	20.9	90.9	3.0
		Copper, Total	35.3	11.9	26.2	89.3	3.0
		Iron, Total	18200	17300	105	893.7*	3.0
		Mercury, Total	0.16	0.01u	0.15	107.1	1.0
		Potassium, Total	3800	1500	2620	88.0	3.0
		Magnesium, Total	6020	3350	2620	102.1	3.0
		Manganese, Total	305	263	52.3	81.1*	3.0
		Molybdenum, Total	95.2	0.94u	105	91.0	3.0
		Sodium, Total	2690	208	2620	95.1	3.0
		Nickel, Total	56.3	8.2	52.3	92.0	3.0
		Lead, Total	51.7	6.1	52.3	87.2	3.0
		Antimony, Total	39.7	0.94u	52.3	75.9	3.0
		Selenium, Total	164	1.9 u	209	78.2	3.0
		Silicon, Total	1970	1920	105	48.5*	3.0
		Vanadium, Total	93.1	44.4	52.3	93.1	3.0
		Zinc, Total	93.0	41.5	52.3	98.5	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/03/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J16231	Silver, Total	0.31u	0.31u	NC	3.0
		Aluminum, Total	4790	4780	0.063	3.0
		Arsenic, Total	2.2	2.7	20.4	3.0
		Boron, Total	2.1	1.6	27.0	3.0
		Barium, Total	55.0	56.7	3.0	3.0
		Beryllium, Total	0.70	0.68	2.3	3.0
		Calcium, Total	3470	3430	1.2	3.0
		Cadmium, Total	0.16u	0.16u	NC	3.0
		Cobalt, Total	5.0	4.8	4.1	3.0
		Chromium, Total	6.5	6.2	4.7	3.0
		Copper, Total	11.9	11.2	6.1	3.0
		Iron, Total	17300	17200	0.83	3.0
		Mercury, Total	0.01u	0.00u	NC	1.0
		Potassium, Total	1500	1420	5.4	3.0
		Magnesium, Total	3350	3200	4.3	3.0
		Manganese, Total	263	249	5.5	3.0
		Molybdenum, Total	0.94u	0.94u	NC	3.0
		Sodium, Total	208	247	17.2	3.0
		Nickel, Total	8.2	8.2	0.00	3.0
		Lead, Total	6.1	5.9	3.3	3.0
		Antimony, Total	0.94u	0.94u	NC	3.0
		Selenium, Total	1.9 u	1.9 u	NC	3.0
		Silicon, Total	1920	1430	29.1	3.0
		Vanadium, Total	44.4	46.0	3.5	3.0
		Zinc, Total	41.5	43.8	5.4	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/03/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	07L0596-LC1	Silver, LCS	47.3	50.0	MG/KG	94.6
		Aluminum, LCS	480	500	MG/KG	96.1
		Arsenic, LCS	913	1000	MG/KG	91.3
		Boron, LCS	463	500	MG/KG	92.5
		Barium, LCS	475	500	MG/KG	94.9
		Beryllium, LCS	23.7	25.0	MG/KG	94.8
		Calcium, LCS	2380	2500	MG/KG	95.4
		Cadmium, LCS	23.5	25.0	MG/KG	94.0
		Cobalt, LCS	238	250	MG/KG	95.4
		Chromium, LCS	47.6	50.0	MG/KG	95.2
		Copper, LCS	120	125	MG/KG	96.0
		Iron, LCS	484	500	MG/KG	96.9
		Potassium, LCS	2250	2500	MG/KG	90.0
		Magnesium, LCS	2320	2500	MG/KG	92.9
		Manganese, LCS	72.1	75.0	MG/KG	96.1
		Molybdenum, LCS	484	500	MG/KG	96.8
		Sodium, LCS	2260	2500	MG/KG	90.3
		Nickel, LCS	189	200	MG/KG	94.5
		Lead, LCS	237	250	MG/KG	94.8
		Antimony, LCS	292	300	MG/KG	97.3
		Selenium, LCS	890	1000	MG/KG	89.0
		Silicon, LCS	455	500	MG/KG	91.0
		Vanadium, LCS	237	250	MG/KG	94.8
		Zinc, LCS	91.4	100	MG/KG	91.4
LCS1	07C0213-LC1	Mercury, LCS	4.9	4.7	MG/KG	104.0

Date: 15 February 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-F-50
Subject: Wet Chemistry - Data Package No. K1026-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1026 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16231	11/19/07	Soil	C	See note 1
J16232	11/19/07	Soil	C	See note 1
J16233	11/19/07	Soil	C	See note 1
J16234	11/19/07	Soil	C	See note 1

1 – Chromium VI by 7196A and petroleum hydrocarbons by 9071/418.1.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI and 14 days for petroleum hydrocarbons.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less than twice the limit, all petroleum hydrocarbon results were qualified as estimates and flagged "J".

All other holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in

the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J16232/J16233) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All petroleum hydrocarbon results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package K1026 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by less than twice the limit, all petroleum hydrocarbon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Fluor Hanford Data Validation Contract #29776 (June 2006), *Validation Statement of Work*, through Washington Closure Hanford Work Order #WB6081.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K1026	REVIEWER: ELR	Project: 100-F-50	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Petroleum hydrocarbons	J	All	Hold time

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/05/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J16231	% Solids	90.2		%	0.01	1.0
		Chromium VI	0.44	u	MG/KG	0.44	2.0
		Petroleum Hydrocarbons	148	uJ	MG/KG	148	1.0
-002	J16232	% Solids	89.8		%	0.01	1.0
		Chromium VI	0.45	u	MG/KG	0.45	2.0
		Petroleum Hydrocarbons	148	uJ	MG/KG	148	1.0
-003	J16233	% Solids	88.4		%	0.01	1.0
		Chromium VI	0.45	u	MG/KG	0.45	2.0
		Petroleum Hydrocarbons	150	uJ	MG/KG	150	1.0
-004	J16234	% Solids	97.1		%	0.01	1.0
		Chromium VI	0.41	u	MG/KG	0.41	2.0
		Petroleum Hydrocarbons	137	uJ	MG/KG	137	1.0
-005	J16236	% Solids	100		%	0.01	1.0

2/13/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029 K1026
LVL#: 0711L218

W.O.#: 11343-606-001-9999-00
Date Received: 11-21-07

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

   LvLI 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. LvLI certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

   Elevated reporting limits for Chromium VI are the result of the necessity to dilute the samples to diminish background color in the sample digestates.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI'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 (MS) recoveries for Insoluble Chromium VI and Petroleum Hydrocarbons were within the 75-125% control limits however MS recovery for Soluble Chromium was above the control limits that may be attributed to the high background color and the necessity to dilute and a low spike level.

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

9. Results for soil samples are reported on a dry weight basis.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/6/07
Date

njp\11-218

The results presented in this report relate to the analytical testing and conditions of the samples upon 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 13 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

03

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
Welch-Koelling	Matt Perrott	372-9088	KESSNER, JH	8C	15 Days

Project Designation	Sampling Location	SAF No.
Remaining Sites Confirmation Sampling - Soil	100-F-50	RC-029

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
EBC-99-027	EL-1601	R00F50A000	FedEx

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
BH 11/5/07 ~~EBERLINE SERVICES~~ LIONVILLE	A080057	SEL 05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None E	Cool 4C F	Cool 4C B	Cool 4C C	Cool 4C A	Cool 4C	Cool 4C D		
Type of Container	P	G/P	G/P	aG	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	250mL	120mL	250mL	250mL	250mL	60mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1		

Sample No.	Matrix *	Sample Date	Sample Time									
J16231	SOIL	11/19/07	1250		X	X	X	X	X		X	
J16232	SOIL	11/19/07	1255		X	X	X	X	X		X	
J16233	SOIL	11/19/07	1300		X	X	X	X	X		X	
J16234	SOIL	11/19/07	1305		X	X	X	X	X		X	
~~J16235~~	~~SOIL~~	BH 11/19/07										

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	11/19/07 1400	BHudson [signature]	11/19/07 1400
BHUDSON [signature]	11/19/07 1510	3728 #2C	11/19/07 1510
3728 #2C	11-20-07 0825	[signature]	11-20-07 0825
[signature]	11-20-07 1500	FED EX	
FED EX	11/21/07 0955	[signature]	11/21/07 0955
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}; Total Uranium
(2) ICP Metals - 6010TR (SW846) {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)

samples from 3728 Ref # 2C
3728 Custodian removed samples for shipping on 11/20/07
Sampler unavailable to relinquish

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

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

WCH-EE-011

000013

00000011

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-029 K1026

RECEIVED
DEC 2007

DATE RECEIVED: 11/21/07 LVL LOT # :0711L218

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J16231						
% SOLIDS	001	S	07L%S145	11/19/07	11/23/07	11/23/07
CHROMIUM VI	001	S	07LVI094	11/19/07	11/23/07	11/23/07
PETROLEUM HYDROCARBO	001	S	07LHC041	11/19/07	12/04/07	12/05/07
J16232						
% SOLIDS	002	S	07L%S145	11/19/07	11/23/07	11/23/07
CHROMIUM VI	002	S	07LVI094	11/19/07	11/23/07	11/23/07
PETROLEUM HYDROCARBO	002	S	07LHC041	11/19/07	12/04/07	12/05/07
J16233						
% SOLIDS	003	S	07L%S145	11/19/07	11/23/07	11/23/07
CHROMIUM VI	003	S	07LVI094	11/19/07	11/23/07	11/23/07
PETROLEUM HYDROCARBO	003	S	07LHC041	11/19/07	12/04/07	12/05/07
J16234						
% SOLIDS	004	S	07L%S145	11/19/07	11/23/07	11/23/07
% SOLIDS	004 REP	S	07L%S145	11/19/07	11/23/07	11/23/07
CHROMIUM VI	004	S	07LVI094	11/19/07	11/23/07	11/23/07
CHROMIUM VI	004 REP	S	07LVI094	11/19/07	11/23/07	11/23/07
CHROMIUM VI	004 MS	S	07LVI094	11/19/07	11/23/07	11/23/07
CHROMIUM VI	004 MSD	S	07LVI094	11/19/07	11/23/07	11/23/07
PETROLEUM HYDROCARBO	004	S	07LHC041	11/19/07	12/04/07	12/05/07
PETROLEUM HYDROCARBO	004 REP	S	07LHC041	11/19/07	12/04/07	12/05/07
PETROLEUM HYDROCARBO	004 MS	S	07LHC041	11/19/07	12/04/07	12/05/07
J16236						
% SOLIDS	005	S	07L%S146	11/19/07	11/26/07	11/26/07

LAB QC:

CHROMIUM VI	MB1	S	07LVI094	N/A	11/23/07	11/23/07

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-029 K1026

DATE RECEIVED: 11/21/07 LVL LOT # :0711L218

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	MB1 BS	S	07LVI094	N/A	11/23/07	11/23/07
CHROMIUM VI	MB1 BSD	S	07LVI094	N/A	11/23/07	11/23/07
PETROLEUM HYDROCARBO	MB1	S	07LHC041	N/A	12/04/07	12/05/07
PETROLEUM HYDROCARBO	MB1 BS	S	07LHC041	N/A	12/04/07	12/05/07

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-50			DATA PACKAGE: K1026		
VALIDATOR: ELR		LAB: LLI		DATE: 2/10/08	
			SDG: K1026		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J16231 J16232 J16233 J16234					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A

Spike standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: all +pH 15 day <2x – J all

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: all TPH om

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/05/07

CLIENT: TNUHANFORD RC-029 K1026

LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	07LVI094-MB1	Chromium VI	0.20	u	MG/KG	0.20	1.0
BLANK10	07LHC041-MB1	Petroleum Hydrocarbons	133	u	MG/KG	133	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/05/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	J16234	Soluble Chromium VI	5.4	0.42u	4.1	142.7	2.0
		Insoluble Chromium VI	1110	0.42u	1090	102.5	100
		Petroleum Hydrocarbons	585	22.3	576	97.8	1.0
BLANK10	07LVI094-MB1	Soluble Chromium VI	3.9	0.20u	4.0	96.9	1.0
		Insoluble Chromium VI	1210	0.20u	1170	103.5	100
BLANK10	07LHC041-MB1	Petroleum Hydrocarbons	554	133 u	560	99.0	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/05/07

CLIENT: TNUHANFORD RC-029 K1026 LVL LOT #: 0711L218

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-004REP	J16234	% Solids	97.1	97.1	0.041	1.0
		Chromium VI	0.41u	0.41u	NC	2.0
		Petroleum Hydrocarbons	137 u	137 u	NC	1.0