0077279

SAF-RC-032
100-F Remaining Sites Burial Grounds - Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt (2) H4-21

COMMENTS:

SDG K1121 SAF-RC-032

Waste Site: 100-F-26:9

Date: 6 May 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol – Waste Subsite 100-F-26:9
Subject: Radiochemistry - Data Package No. K1121-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1121 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
J169W9	2/13/08	Soil	C	See note 1
J169X0	2/13/08	Soil	C	See note 1
J169X1	2/13/08	Soil	C	See note 1
J16945	2/13/08	Soil	C	See note 1
J16946	2/13/08	Soil	C	See note 1

1 – Gross alpha/beta & gamma spectroscopy.

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 laboratory 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.

Due to an RPD outside QC limits (36%), all thorium-232 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicates

No field duplicates were submitted for analysis.

- **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. Twenty-five analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. K1121 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 an RPD outside QC limits (36%), all thorium-232 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.

Twenty-five analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

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: K1121	REVIEWER: ELR	Project: 100-F-26:9	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-232	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

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1121

7769-001 J169W9

DATA SHEET

SDG	7769	Client/Case no	Hanford SDG K1121
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R802113-01	Client sample id	J169W9
Dept sample id	7769-001	Location/Matrix	100-F-26:9 Road Cross FS SOLID
Received	02/15/08	Collected/Weight	02/13/08 12:30 983 g
% solids	97.0	Custody/SAF No	RC-032-192 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	7.33	5.6	6.70	10.0		93A
Gross Beta	12587-47-2	18.4	4.6	6.05	15.0		93B
Potassium 40	13966-00-2	10.4	1.2	0.797			GAM
Cobalt 60	10198-40-0	U		0.065	0.050	U	GAM
Cesium 137	10045-97-3	U		0.072	0.100	U	GAM
Radium 226	13982-63-3	0.617	0.15	0.137	0.100		GAM
Radium 228	15262-20-1	0.821	0.27	0.296	0.200		GAM
Europium 152	14683-23-9	U		0.170	0.100	U	GAM
Europium 154	15585-10-1	U		0.230	0.100	U	GAM
Europium 155	14391-16-3	U		0.158	0.100	U	GAM
Thorium 228	14274-82-9	0.604	0.081	0.079			GAM
Thorium 232	TH-232	0.821	0.27	0.296		J	GAM
Uranium 235	15117-96-1	U		0.272		U	GAM
Uranium 238	U-238	U		8.13		U	GAM
Americium 241	14596-10-2	U		0.079		U	GAM
Silver 108m	14391-65-2	U		0.054		U	GAM
Barium 133	13981-41-4	U		0.078		U	GAM

100-F Remaining Sites Burial Grounds

5/5/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/22/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1121

7769-002 J169X0

DATA SHEET

SDG	7769	Client/Case no	Hanford SDG K1121
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R802113-02	Client sample id	J169X0
Dept sample id	7769-002	Location/Matrix	100-F-26:9 Road Cross FS SOLID
Received	02/15/08	Collected/Weight	02/13/08 12:40 911 g
% solids	95.0	Custody/SAF No	RC-032-192 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	13.7	7.2	7.07	10.0		93A
Gross Beta	12587-47-2	19.1	6.4	9.25	15.0		93B
Potassium 40	13966-00-2	12.0	1.2	0.705			GAM
Cobalt 60	10198-40-0	U		0.060	0.050	U	GAM
Cesium 137	10045-97-3	U		0.057	0.100	U	GAM
Radium 226	13982-63-3	0.369	0.12	0.124	0.100		GAM
Radium 228	15262-20-1	0.596	0.22	0.223	0.200		GAM
Europium 152	14683-23-9	U		0.148	0.100	U	GAM
Europium 154	15585-10-1	U		0.193	0.100	U	GAM
Europium 155	14391-16-3	U		0.168	0.100	U	GAM
Thorium 228	14274-82-9	0.571	0.082	0.089			GAM
Thorium 232	TH-232	0.596	0.22	0.223		J	GAM
Uranium 235	15117-96-1	U		0.272		U	GAM
Uranium 238	U-238	U		7.83		U	GAM
Americium 241	14596-10-2	U		0.161		U	GAM
Silver 108m	14391-65-2	U		0.048		U	GAM
Barium 133	13981-41-4	U		0.061		U	GAM

100-F Remaining Sites Burial Grounds

V
5/5/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/22/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1121

7769-003 J169X1

DATA SHEET

SDG	7769	Client/Case no	Hanford SDG K1121
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R802113-03	Client sample id	J169X1
Dept sample id	7769-003	Location/Matrix	100-F-26:9 Road Cross FS SOLID
Received	02/15/08	Collected/Weight	02/13/08 12:50 877 g
% solids	96.0	Custody/SAF No	RC-032-192 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	16.8	7.4	5.80	10.0		93A
Gross Beta	12587-47-2	26.2	4.7	5.39	15.0		93B
Potassium 40	13966-00-2	8.96	3.1	0.774			GAM
Cobalt 60	10198-40-0	U		0.090	0.050	U	GAM
Cesium 137	10045-97-3	U		0.085	0.100	U	GAM
Radium 226	13982-63-3	0.282	0.18	0.165	0.100		GAM
Radium 228	15262-20-1	0.833	0.40	0.349	0.200		GAM
Europium 152	14683-23-9	U		0.221	0.100	U	GAM
Europium 154	15585-10-1	U		0.281	0.100	U	GAM
Europium 155	14391-16-3	U		0.192	0.100	U	GAM
Thorium 228	14274-82-9	0.531	0.10	0.106			GAM
Thorium 232	TH-232	0.833	0.40	0.349		J	GAM
Uranium 235	15117-96-1	U		0.278		U	GAM
Uranium 238	U-238	U		10.7		U	GAM
Americium 241	14596-10-2	U		0.190		U	GAM
Silver 108m	14391-65-2	U		0.068		U	GAM
Barium 133	13981-41-4	U		0.091		U	GAM

100-F Remaining Sites Burial Grounds

5/5/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/22/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1121

7769-004 J16945

DATA SHEET

SDG	7769	Client/Case no	Hanford SDG K1121
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R802113-04	Client sample id	J16945
Dept sample id	7769-004	Location/Matrix	100-F-26:9 Road Cross FS SOLID
Received	02/15/08	Collected/Weight	02/13/08 13:00 951 g
% solids	89.6	Custody/SAF No	RC-032-192 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	14.4	6.5	5.59	10.0		93A
Gross Beta	12587-47-2	21.5	4.8	6.21	15.0		93B
Potassium 40	13966-00-2	9.18	2.0	1.10			GAM
Cobalt 60	10198-40-0	U		0.115	0.050	U	GAM
Cesium 137	10045-97-3	U		0.123	0.100	U	GAM
Radium 226	13982-63-3	0.316	0.25	0.219	0.100		GAM
Radium 228	15262-20-1	0.639	0.53	0.484	0.200		GAM
Europium 152	14683-23-9	U		0.319	0.100	U	GAM
Europium 154	15585-10-1	U		0.354	0.100	U	GAM
Europium 155	14391-16-3	U		0.232	0.100	U	GAM
Thorium 228	14274-82-9	0.682	0.18	0.193		J	GAM
Thorium 232	TH-232	0.639	0.53	0.484		U	GAM
Uranium 235	15117-96-1	U		0.428		U	GAM
Uranium 238	U-238	U		13.2		U	GAM
Americium 241	14596-10-2	U		0.105		U	GAM
Silver 108m	14391-65-2	U		0.086		U	GAM
Barium 133	13981-41-4	U		0.123		U	GAM

100-F Remaining Sites Burial Grounds

5/5/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/22/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1121

7769-005 J16946

DATA SHEET

SDG	7769	Client/Case no	Hanford SDG K1121
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R802113-05	Client sample id	J16946
Dept sample id	7769-005	Location/Matrix	100-F-26:9 Road Cross FS SOLID
Received	02/15/08	Collected/Weight	02/13/08 13:10 954 g
% solids	93.8	Custody/SAF No	RC-032-192 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	21.3	7.4	5.07	10.0		93A
Gross Beta	12587-47-2	19.1	4.3	5.26	15.0		93B
Potassium 40	13966-00-2	11.6	1.4	0.821			GAM
Cobalt 60	10198-40-0	U		0.068	0.050	U	GAM
Cesium 137	10045-97-3	U		0.064	0.100	U	GAM
Radium 226	13982-63-3	0.644	0.15	0.130	0.100		GAM
Radium 228	15262-20-1	0.640	0.24	0.268	0.200		GAM
Europium 152	14683-23-9	U		0.162	0.100	U	GAM
Europium 154	15585-10-1	U		0.213	0.100	U	GAM
Europium 155	14391-16-3	U		0.154	0.100	U	GAM
Thorium 228	14274-82-9	0.881	0.13	0.130			GAM
Thorium 232	TH-232	0.640	0.24	0.268		J	GAM
Uranium 235	15117-96-1	U		0.266		U	GAM
Uranium 238	U-238	U		8.08		U	GAM
Americium 241	14596-10-2	U		0.092		U	GAM
Silver 108m	14391-65-2	U		0.051		U	GAM
Barium 133	13981-41-4	U		0.063		U	GAM

100-F Remaining Sites Burial Grounds

5/5/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/22/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1121 was composed of five solid (soil) samples designated under SAF No. RC-032 with a Project Designation of: 100-F Remaining Sites Burial Grounds-Soil Full Protocol.

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 February 22, 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 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

02/22/08
Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-192	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code	Data Turnaround
T. Welch-Koelling	R.T. Coffman 528-6409	KESSNER, JH	8B	7DAY

Project Designation	Sampling Location	SAF No.
100-F Remaining Sites Burial Grounds - Soil Full Protocol	100-F-26:9 Road Cross FS Verification K1121 (7769)	RC-032

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
AFS-04-054	EFL-1174-4	R10F262000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A080169	SEE 08PC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	P	P	aG	aG	aG	G/P	P			
No. of Container(s)	2	1	1	1	1	1	1			
Volume	125mL	125mL	60mL	120mL	120mL	500mL	125mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	See item (2) in Special Instructions.	Gross Alpha; Gross Beta			

Sample No.	Matrix *	Sample Date	Sample Time									
J169W9	SOIL	2-13-08	1230						X	X		3
J169X0	SOIL		1240						X	X		4
J169X1	SOIL		1250						X	X		5
J16945	SOIL		1300						X	X		1
J16946	SOIL	2-13-08	1310						X	X		2

2-13-08 JRD

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
TOM WELCH-KOELLING	2-13-08 1400	JRDeBruigne JRDeBruigne	1400 2-13-08
JRDeBruigne JRDeBruigne	2-13-08 1445	1060/2B	1445 2-13-08
1060 #2B	2-14-08 1000	T.C. Edmondson T.C. Edmondson	2-14-08 1000
T.C. Edmondson T.C. Edmondson	2-14-08 1500	FED EX	
FED EX		Felix Kelly	2/15/08 1010

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Barium-133, Silver-108 metastable}

Sampler unavailable to relinquish samples from 1060 #2B. 1060 Custodian removed Samples for shipping on 2-14-08.

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

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

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-26:9		DATA PACKAGE:	K1121	
VALIDATOR:	ELR	LAB:	EB	DATE:	5/3/09
			SDG:	K1121	

ANALYSES PERFORMED					
Gross Alpha/Beta Total Uranium	Strontium-90 Radium-22	Technetium-99 Tritium	Alpha Spectroscopy	Gamma Spectroscopy	

SAMPLES/MATRIX				
J169W9	J169X0	J169X1	J1G945	J1G946
				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: _____

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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: _____

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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: _____

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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: _____

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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: thorium-232 - Jall (3676)

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 field QC

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: 29 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1121

7769-007 Method Blank

METHOD BLANK

SDG 7769	Client/Case no Hanford		SDG K1121
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R802113-07	Client sample id Method Blank		
Dept sample id 7769-007	Material/Matrix		SOLID
	SAF No RC-032		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-1.80	2.8	7.28	10.0	U	93A
Gross Beta	12587-47-2	-2.81	4.4	7.66	15.0	U	93B
Potassium 40	13966-00-2	U		1.21		U	GAM
Cobalt 60	10198-40-0	U		0.071	0.050	U	GAM
Cesium 137	10045-97-3	U		0.066	0.100	U	GAM
Radium 226	13982-63-3	U		0.113	0.100	U	GAM
Radium 228	15262-20-1	U		0.353	0.200	U	GAM
Europium 152	14683-23-9	U		0.168	0.100	U	GAM
Europium 154	15585-10-1	U		0.251	0.100	U	GAM
Europium 155	14391-16-3	U		0.147	0.100	U	GAM
Thorium 228	14274-82-9	U		0.089		U	GAM
Thorium 232	TH-232	U		0.353		U	GAM
Uranium 235	15117-96-1	U		0.237		U	GAM
Uranium 238	U-238	U		11.0		U	GAM
Americium 241	14596-10-2	U		0.247		U	GAM
Silver 108m	14391-65-2	U		0.056		U	GAM
Barium 133	13981-41-4	U		0.072		U	GAM

100-F Remaining Sites Burial Grounds

QC-BLANK #64765

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 02/22/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1121

7769-006 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7769 Client/Case no Hanford SDG K1121

Contact Melissa C. Mannion Contract No. 630

Lab sample id R802113-06 Client sample id Lab Control Sample

Dept sample id 7769-006 Material/Matrix SOLID

SAF No RC-032

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	129	18	5.20	10.0		93A	102	4.1	126	53-147	70-130
Gross Beta	96.1	7.5	5.58	15.0		93B	93.9	3.8	102	73-127	80-120
Cobalt 60	1.41	0.15	0.105	0.050		GAM	1.31	0.052	108	70-130	80-120
Cesium 137	1.48	0.14	0.111	0.100		GAM	1.38	0.055	107	71-129	80-120

100-F Remaining Sites Burial Grounds

QC-LCS #64764

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/22/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1121

7769-008 J16945

DUPLICATE

SDG 7769 Client/Case no Hanford SDG K1121

Contact Melissa C. Mannion Contract No. 630

DUPLICATE		ORIGINAL	
Lab sample id R802113-08	Lab sample id R802113-04	Client sample id J16945	
Dept sample id 7769-008	Dept sample id 7769-004	Location/Matrix 100-F-26:9 Road Cross FS	SOLID
	Received 02/15/08	Collected/Weight 02/13/08 13:00	951 g
% solids 89.6	% solids 89.6	Custody/SAF No RC-032-192	RC-032

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	8.56	6.4	8.67	10.0	U	93A	14.4	6.5	5.59		51	127	1.2
Gross Beta	17.4	4.5	5.84	15.0		93B	21.5	4.8	6.21		21	60	1.1
Potassium 40	7.82	1.9	1.30			GAM	9.18	2.0	1.10		16	58	0.8
Cobalt 60	U		0.128	0.050	U	GAM	U		0.115	U	-		0.1
Cesium 137	U		0.112	0.100	U	GAM	U		0.123	U	-		0.1
Radium 226	U		0.398	0.100	U	GAM	0.316	0.25	0.219		23	200	0.3
Radium 228	0.918	0.51	0.471	0.200		GAM	0.639	0.53	0.484		36	145	0.7
Europium 152	U		0.297	0.100	U	GAM	U		0.319	U	-		0.1
Europium 154	U		0.388	0.100	U	GAM	U		0.354	U	-		0.1
Europium 155	U		0.214	0.100	U	GAM	U		0.232	U	-		0.1
Thorium 228	0.686	0.19	0.195			GAM	0.682	0.18	0.193		1	66	0
Thorium 232	0.918	0.51	0.471			GAM	0.639	0.53	0.484		36	145	0.7
Uranium 235	U		0.405		U	GAM	U		0.428	U	-		0.1
Uranium 238	U		13.3		U	GAM	U		13.2	U	-		0
Americium 241	U		0.099		U	GAM	U		0.105	U	-		0.1
Silver 108m	U		0.089		U	GAM	U		0.086	U	-		0
Barium 133	U		0.124		U	GAM	U		0.123	U	-		0

100-F Remaining Sites Burial Grounds

QC-DUP#4 64766

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 02/22/08

Date: 6 May 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Subsite 100-F-26:9
Subject: PCB - Data Package No. K1121-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1121 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
J169W9	2/13/08	Soil	C	See note 1
J169X0	2/13/08	Soil	C	See note 1
J169X1	2/13/08	Soil	C	See note 1
J16945	2/13/08	Soil	C	See note 1
J16946	2/13/08	Soil	C	See note 1

1 – PCBs by 8182.

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 50% to 150%. 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.

All 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.

All 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.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **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. K1121 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

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

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

PCB DATA QUALIFICATION SUMMARY*

SDG: K1121	REVIEWER: ELR	Project: 100-F-26:9	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

PCBs by GC Report Date: 02/21/08 13:20

RFW Batch Number: 0802L604 Client: TNUHANFORD RC-032 K1121 Work Order: 11343606001 Page: 1

	Cust ID:	J169W9	J169X0	J169X0	J169X0	J169X1	J16945
Sample Information	RFW#:	001	002	002 MS	002 MSD	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		104 %	126 %	110 %	150 * %	111 %	120 %
Decachlorobiphenyl		61 %	78 %	67 %	97 %	73 %	81 %
Aroclor-1016		14 U	14 U	97 %	131 %	14 U	15 U
Aroclor-1221		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1232		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1242		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1248		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1254		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1260		14 U	14 U	90 %	120 %	14 U	15 U

	Cust ID:	J16946	PBLKMX	PBLKMX BS
Sample Information	RFW#:	005	08LE0083-MB1	08LE0083-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		114 %	109 %	104 %
Decachlorobiphenyl		83 %	97 %	90 %
Aroclor-1016		14 U	13 U	94 %
Aroclor-1221		14 U	13 U	13 U
Aroclor-1232		14 U	13 U	13 U
Aroclor-1242		14 U	13 U	13 U
Aroclor-1248		14 U	13 U	13 U
Aroclor-1254		92	13 U	13 U
Aroclor-1260		60	13 U	103 %

K 5/5/08

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

0000010

0000000005

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0802L604
SDG/SAF # K1121 / RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 02-15-2008

PCB

Five (5) soil samples were collected on 02-13-2008.

The samples and their associated QC samples were extracted on 02-19-2008 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 02-20-2008. 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 eighteen (18) 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.
8. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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

LIONVILLE LABORATORY INC.

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

2/26/08
Date

000013

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
T. Welch-Koelling	R.T. Coffman	528-6409	KESSNER, JH	8B	7 DAY

Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-26:9 Road Cross FS Verification	SAF No.: RC-032
Ice Chest No.: ERC-96-511	Field Logbook No.: EFL-1174-4; COA: R10F262000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080185	Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
NA TRE 2-14-08
Cool to 4°C

0000141

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	P	P	aG	aG	aG	G/P	P			
No. of Container(s)	2	1	1	1	1	1	1			
Volume	125mL	125mL	60mL	120mL	120mL	500mL	125mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	See item (2) in Special Instructions.	Gross Alpha; Gross Beta			

Sample No.	Matrix *	Sample Date	Sample Time	(1)	Cr Hex	PCBs	Semi-VOA	TPH	(2)	Gross Alpha/Beta			
169W9	SOIL	2-13-08	1230	X	X	X	X	X					3
169X0	SOIL		1240	X	X	X	X	X					4
169X1	SOIL		1250	X	X	X	X	X					5
16945	SOIL		1300	X	X	X	X	X					1
16946	SOIL	2-13-08	1310	X	X	X	X	X					2

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
T. Welch-Koelling	2-13-08 1400	JR DeBuigne	2-13-08 1400
JR DeBuigne	2-13-08 1445	1060 / 28	2-13-08 1445
1060 #28	2-14-08 1000	J R Edwardsen	2-14-08 1000
J R Edwardsen WCH	2-14-08 1500	FED EX	
Fed Ex	2-15-08 0935	[illegible signature]	2-15-08 0935

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Barium-133, Silver-108 metastable}

Sampler unavailable to relinquish samples from 1060 Ref #28. 1060 Custodian removed samples for shipping on 2-14-08.

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

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26:9			DATA PACKAGE: K1121		
VALIDATOR: ELR		LAB: LLI		DATE: 5/3/08	
			SDG: K1121		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J169W9 J169X0 J169X1 J1695 J1696					
					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: NO PAS

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:_____

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: _____

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: 6 May 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol – Waste Site 100-F-26:9
Subject: Inorganics - Data Package No. K1121-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1121 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
J169W9	2/13/08	Soil	C	See note 1
J169X0	2/13/08	Soil	C	See note 1
J169X1	2/13/08	Soil	C	See note 1
J16945	2/13/08	Soil	C	See note 1
J16946	2/13/08	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.

All preparation 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.

Due to matrix spike recoveries outside QC limits, all antimony (47%) and silicon

(349.7%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (17.2%), all silicon results were qualified as estimates and flagged "J".

All other 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

No field duplicates were submitted for analysis.

- **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. K1121 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 matrix spike recoveries outside QC limits, all antimony (47%) and silicon (349.7%) results were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits (17.2%), all silicon 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

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

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: K1121	REVIEWER: ELR	Project: 100-F-26:9	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony Silicon	J	All	MS recovery
Silicon	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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/26/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J169W9	Silver, Total	0.27 u	MG/KG	0.27	3.0
		Aluminum, Total	7340	MG/KG	11.0	3.0
		Arsenic, Total	2.1	MG/KG	1.4	3.0
		Boron, Total	23.2	MG/KG	1.4	3.0
		Barium, Total	192	MG/KG	0.27	3.0
		Beryllium, Total	0.20	MG/KG	0.14	3.0
		Calcium, Total	7080	MG/KG	11.0	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	6.0	MG/KG	0.55	3.0
		Chromium, Total	8.8	MG/KG	0.55	3.0
		Copper, Total	13.4	MG/KG	0.63	3.0
		Iron, Total	17000	MG/KG	12.3	3.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	973	MG/KG	135	3.0
		Magnesium, Total	3990	MG/KG	6.9	3.0
		Manganese, Total	274	MG/KG	0.11	3.0
		Molybdenum, Total	1.1	MG/KG	0.82	3.0
		Sodium, Total	284	MG/KG	5.5	3.0
		Nickel, Total	9.3	MG/KG	0.55	3.0
		Lead, Total	4.4	MG/KG	0.82	3.0
		Antimony, Total	0.82 u J	MG/KG	0.82	3.0
		Selenium, Total	1.6 u	MG/KG	1.6	3.0
		Silicon, Total	249 J	MG/KG	11.0	3.0
		Vanadium, Total	42.3	MG/KG	0.38	3.0
		Zinc, Total	33.1	MG/KG	1.6	3.0

5/5/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/26/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J169X0	Silver, Total	0.28 u	MG/KG	0.28	3.0
		Aluminum, Total	5810	MG/KG	11.4	3.0
		Arsenic, Total	2.3	MG/KG	1.4	3.0
		Boron, Total	3.7	MG/KG	1.4	3.0
		Barium, Total	81.1	MG/KG	0.28	3.0
		Beryllium, Total	0.14 u	MG/KG	0.14	3.0
		Calcium, Total	4380	MG/KG	11.4	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	6.2	MG/KG	0.57	3.0
		Chromium, Total	8.6	MG/KG	0.57	3.0
		Copper, Total	12.3	MG/KG	0.66	3.0
		Iron, Total	17200	MG/KG	12.8	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1040	MG/KG	140	3.0
		Magnesium, Total	3740	MG/KG	7.1	3.0
		Manganese, Total	272	MG/KG	0.11	3.0
		Molybdenum, Total	0.86 u	MG/KG	0.86	3.0
		Sodium, Total	158	MG/KG	5.7	3.0
		Nickel, Total	9.5	MG/KG	0.57	3.0
		Lead, Total	3.5	MG/KG	0.86	3.0
		Antimony, Total	0.86 u J	MG/KG	0.86	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	265 J	MG/KG	11.4	3.0
		Vanadium, Total	39.8	MG/KG	0.40	3.0
		Zinc, Total	33.8	MG/KG	1.7	3.0

5/5/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/26/08

CLIENT: TNUHANPORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J169X1	Silver, Total	0.25 u	MG/KG	0.25	3.0
		Aluminum, Total	5510	MG/KG	10	3.0
		Arsenic, Total	2.3	MG/KG	1.2	3.0
		Boron, Total	3.4	MG/KG	1.2	3.0
		Barium, Total	82.3	MG/KG	0.25	3.0
		Beryllium, Total	0.13	MG/KG	0.12	3.0
		Calcium, Total	4300	MG/KG	10	3.0
		Cadmium, Total	0.12 u	MG/KG	0.12	3.0
		Cobalt, Total	5.8	MG/KG	0.50	3.0
		Chromium, Total	8.2	MG/KG	0.50	3.0
		Copper, Total	13.1	MG/KG	0.57	3.0
		Iron, Total	15600	MG/KG	11.2	3.0
		Mercury, Total	0.008u	MG/KG	0.008	1.0
		Potassium, Total	908	MG/KG	123	3.0
		Magnesium, Total	3470	MG/KG	6.2	3.0
		Manganese, Total	273	MG/KG	0.1	3.0
		Molybdenum, Total	0.97	MG/KG	0.75	3.0
		Sodium, Total	148	MG/KG	5.0	3.0
		Nickel, Total	9.0	MG/KG	0.50	3.0
		Lead, Total	3.9	MG/KG	0.75	3.0
		Antimony, Total	0.75 uJ	MG/KG	0.75	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	236 J	MG/KG	10	3.0
		Vanadium, Total	37.0	MG/KG	0.35	3.0
		Zinc, Total	32.0	MG/KG	1.5	3.0

5/5/08

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/26/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J16945	Silver, Total	1.2		MG/KG	0.26	3.0
		Aluminum, Total	4920		MG/KG	10.2	3.0
		Arsenic, Total	1.3	u	MG/KG	1.3	3.0
		Boron, Total	1.9		MG/KG	1.3	3.0
		Barium, Total	66.5		MG/KG	0.26	3.0
		Beryllium, Total	0.13	u	MG/KG	0.13	3.0
		Calcium, Total	4130		MG/KG	10.2	3.0
		Cadmium, Total	0.13	u	MG/KG	0.13	3.0
		Cobalt, Total	4.8		MG/KG	0.51	3.0
		Chromium, Total	9.0		MG/KG	0.51	3.0
		Copper, Total	12.8		MG/KG	0.59	3.0
		Iron, Total	14300		MG/KG	11.5	3.0
		Mercury, Total	0.03		MG/KG	0.01	1.0
		Potassium, Total	875		MG/KG	126	3.0
		Magnesium, Total	3320		MG/KG	6.4	3.0
		Manganese, Total	214		MG/KG	0.10	3.0
		Molybdenum, Total	0.77	u	MG/KG	0.77	3.0
		Sodium, Total	117		MG/KG	5.1	3.0
		Nickel, Total	8.3		MG/KG	0.51	3.0
		Lead, Total	4.1		MG/KG	0.77	3.0
		Antimony, Total	0.77	u J	MG/KG	0.77	3.0
		Selenium, Total	1.5	u	MG/KG	1.5	3.0
		Silicon, Total	221	J	MG/KG	10.2	3.0
		Vanadium, Total	33.9		MG/KG	0.36	3.0
		Zinc, Total	36.0		MG/KG	1.5	3.0

5/5/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/26/08

CLIENT: TNUHANPORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J16946	Silver, Total	0.22 u	MG/KG	0.22	3.0
		Aluminum, Total	11900	MG/KG	18.0	6.0
		Arsenic, Total	1.3	MG/KG	1.1	3.0
		Boron, Total	28.6	MG/KG	1.1	3.0
		Barium, Total	329	MG/KG	0.22	3.0
		Beryllium, Total	0.27	MG/KG	0.11	3.0
		Calcium, Total	8740	MG/KG	9.0	3.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	4.7	MG/KG	0.45	3.0
		Chromium, Total	7.9	MG/KG	0.45	3.0
		Copper, Total	26.5	MG/KG	1.0	6.0
		Iron, Total	25200	MG/KG	20.2	6.0
		Mercury, Total	0.04	MG/KG	0.009	1.0
		Potassium, Total	1220	MG/KG	222	6.0
		Magnesium, Total	3910	MG/KG	5.6	3.0
		Manganese, Total	203	MG/KG	0.09	3.0
		Molybdenum, Total	0.86	MG/KG	0.68	3.0
		Sodium, Total	980	MG/KG	9.0	6.0
		Nickel, Total	9.4	MG/KG	0.45	3.0
		Lead, Total	16.9	MG/KG	0.68	3.0
		Antimony, Total	0.68 u J	MG/KG	0.68	3.0
		Selenium, Total	1.4 u J	MG/KG	1.4	3.0
		Silicon, Total	288	MG/KG	9.0	3.0
		Vanadium, Total	30.1	MG/KG	0.32	3.0
		Zinc, Total	42.3	MG/KG	1.4	3.0

5/5/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032
LVL#: 0802L604
SDG/SAF#: K1121/RC-032

W.O.#: 11343-606-001-9999-00
Date Received: 02-15-08

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.

   All samples were reported with 3-fold dilutions for ICP metals due to sample matrix. The samples were rerun on a different instrument for Aluminum, Copper, Iron, Potassium, and Sodium, including a 6-fold dilution on sample J16946, due to high concentrations and/or sample matrix.

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

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

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

6. The preparation/method blank for 1 analyte was outside method criteria. {less than the Limit of Quantitation (3-10X the LOD), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

   a). The MB result for Sodium was greater than the Limit of Quantitation (LOQ) {3-10x the (LOD) Limit of Detection} and only samples J169X0, J169X1, and J16945 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

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

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8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 17.2%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

9. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

10. 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
J169W9	Aluminum	126,000	104.5
	Iron	126,000	95.5
	Antimony	300	102.5
	Silicon	6,300	96.8

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. 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.

13. 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.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this 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

2/27/02
Date

jjw/m02-604

LVLI
LIONVILLE LABORATORY INC.

CHAIN OF CUSTODY/SAMPLE TRANSFER REQUEST

Collector: T. Welch-Koelling	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-26:9 Road Cross FS Verification		SAF No.: RC-032
Ice Chest No.: ERC-96-511	Field Logbook No.: EFL-1174-4	COA: R10F262000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / RICHLAND	Offsite Property No.: A080185		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
VA

Special Handling and/or Storage
VA TRE 2-14-08
Cool to 4°C

SAMPLE ANALYSIS

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	P	P	aG	aG	aG	G/P	P			
No. of Container(s)	2	1	1	1	1	1	1			
Volume	125mL	125mL	60mL	120mL	120mL	500mL	125mL			

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	See item (2) in Special Instructions	Gross Alpha; Gross Beta				
169W9	SOIL	2-13-08	1230	X	X	X	X	X						3
169X0	SOIL		1240	X	X	X	X	X						4
169X1	SOIL		1250	X	X	X	X	X						5
16945	SOIL		1300	X	X	X	X	X						1
16946	SOIL	2-13-08	1310	X	X	X	X	X						2

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DW Welch-Koelling	2-13-08 1400	JP DeBruyne JP DeBruyne	2-13-08 1400
JP DeBruyne JP DeBruyne	2-13-08 1445	1060 / 23	2-13-08 1445
1060 #28	2-14-08 1000	T Edenborn	2-14-08 1000
T Edenborn	2-14-08 1500	FED EX	
Fed Ex	2-15-08 0935	Kurt Neuenschwander	2-15-08 0935

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Barium-133, Silver-108 metastable}

Sampler unavailable to relinquish samples from 1060 Ref #28. 1060 Custodian removed samples for shipping on 2-14-08.

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

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

ICH-EE-011

000000025

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26:9			DATA PACKAGE: K1121		
VALIDATOR: ELR		LAB: LLI		DATE: 5/3/08	
			SDG: K1121		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J169W9 J169X0 J169X1 J1695S J1695C					
					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: no FB

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: Silicon (349.72) antimony (41.92) – MS – J all
LCS – Silicon (17.27%) – J all
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 02/26/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	08L0073-MB1	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Aluminum, Total	4.0 u	MG/KG	4.0	1.0
		Arsenic, Total	0.50 u	MG/KG	0.50	1.0
		Boron, Total	0.50 u	MG/KG	0.50	1.0
		Barium, Total	0.18	MG/KG	0.10	1.0
		Beryllium, Total	0.05 u	MG/KG	0.05	1.0
		Calcium, Total	9.1	MG/KG	4.0	1.0
		Cadmium, Total	0.05 u	MG/KG	0.05	1.0
		Cobalt, Total	0.20 u	MG/KG	0.20	1.0
		Chromium, Total	0.20 u	MG/KG	0.20	1.0
		Copper, Total	0.23 u	MG/KG	0.23	1.0
		Iron, Total	5.7	MG/KG	4.5	1.0
		Potassium, Total	49.3 u	MG/KG	49.3	1.0
		Magnesium, Total	2.9	MG/KG	2.5	1.0
		Manganese, Total	0.10	MG/KG	0.04	1.0
		Molybdenum, Total	0.30 u	MG/KG	0.30	1.0
		Sodium, Total	11.4	MG/KG	2.0	1.0
		Nickel, Total	0.20 u	MG/KG	0.20	1.0
		Lead, Total	0.30 u	MG/KG	0.30	1.0
		Antimony, Total	0.30 u	MG/KG	0.30	1.0
		Selenium, Total	0.60 u	MG/KG	0.60	1.0
		Silicon, Total	4.0 u	MG/KG	4.0	1.0
		Vanadium, Total	0.14 u	MG/KG	0.14	1.0
		Zinc, Total	0.60 u	MG/KG	0.60	1.0
BLANK1	08C0033-MB1	Mercury, Total	0.01 u	MG/KG	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/26/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J169W9	Silver, Total	4.1	0.27u	4.3	95.3	3.0
		Aluminum, Total	8140	7340	172	460.1*	3.0
		Arsenic, Total	162	2.1	172	93.1	3.0
		Boron, Total	102	23.2	86.1	90.9	3.0
		Barium, Total	387	192	172	113.4	3.0
		Beryllium, Total	4.3	0.20	4.3	95.3	3.0
		Calcium, Total	9080	7080	2150	93.2	3.0
		Cadmium, Total	4.0	0.14u	4.3	93.0	3.0
		Cobalt, Total	46.7	6.0	43.0	94.7	3.0
		Chromium, Total	26.4	8.8	17.2	102.3	3.0
		Copper, Total	35.6	13.4	21.5	103.3	3.0
		Iron, Total	16400	17000	86.1	-770. *	3.0
		Mercury, Total	0.16	0.00u	0.15	108.6	1.0
		Potassium, Total	3100	973	2150	99.0	3.0
		Magnesium, Total	6110	3990	2150	98.5	3.0
		Manganese, Total	307	274	43.0	77.7*	3.0
		Molybdenum, Total	78.5	1.1	86.1	89.9	3.0
		Sodium, Total	2530	284	2150	104.4	3.0
		Nickel, Total	50.6	9.3	43.0	96.0	3.0
		Lead, Total	45.7	4.4	43.0	96.0	3.0
		Antimony, Total	18.0	0.82u	43.0	41.9	3.0
		Selenium, Total	139	1.6 u	172	81.0	3.0
		Silicon, Total	550	249	86.1	349.7	3.0
		Vanadium, Total	80.7	42.3	43.0	89.3	3.0
		Zinc, Total	72.8	33.1	43.0	92.3	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/26/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J169W9	Silver, Total	0.27u	0.26u	NC	3.0
		Aluminum, Total	7340	7020	4.5	3.0
		Arsenic, Total	2.1	1.4	40.0	3.0
		Boron, Total	23.2	19.6	16.8	3.0
		Barium, Total	192	199	3.5	3.0
		Beryllium, Total	0.20	0.20	2.1	3.0
		Calcium, Total	7080	7020	0.83	3.0
		Cadmium, Total	0.14u	0.13u	NC	3.0
		Cobalt, Total	6.0	5.8	3.4	3.0
		Chromium, Total	8.8	7.8	12.0	3.0
		Copper, Total	13.4	12.5	6.9	3.0
		Iron, Total	17000	16500	9.8	3.0
		Mercury, Total	0.00u	0.00u	NC	1.0
		Potassium, Total	973	928	4.8	3.0
		Magnesium, Total	3990	3750	6.4	3.0
		Manganese, Total	274	267	2.3	3.0
		Molybdenum, Total	1.1	0.86	24.4	3.0
		Sodium, Total	284	266	6.5	3.0
		Nickel, Total	9.3	9.5	2.1	3.0
		Lead, Total	4.4	3.9	12.0	3.0
		Antimony, Total	0.82u	0.79u	NC	3.0
		Selenium, Total	1.6 u	1.6 u	NC	3.0
		Silicon, Total	249	292	16.0	3.0
		Vanadium, Total	42.3	38.9	8.4	3.0
		Zinc, Total	33.1	30.2	9.2	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 02/26/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	08L0073-LC1	Silver, LCS	47.1	50.0	MG/KG	94.2
		Aluminum, LCS	473	500	MG/KG	94.7
		Arsenic, LCS	907	1000	MG/KG	90.7
		Boron, LCS	455	500	MG/KG	91.0
		Barium, LCS	477	500	MG/KG	95.4
		Beryllium, LCS	23.7	25.0	MG/KG	94.8
		Calcium, LCS	2430	2500	MG/KG	97.4
		Cadmium, LCS	23.5	25.0	MG/KG	94.0
		Cobalt, LCS	238	250	MG/KG	95.3
		Chromium, LCS	47.9	50.0	MG/KG	95.8
		Copper, LCS	117	125	MG/KG	93.4
		Iron, LCS	468	500	MG/KG	93.6
		Potassium, LCS	2330	2500	MG/KG	93.2
		Magnesium, LCS	2360	2500	MG/KG	94.2
		Manganese, LCS	74.1	75.0	MG/KG	98.8
		Molybdenum, LCS	463	500	MG/KG	92.5
		Sodium, LCS	2360	2500	MG/KG	94.5
		Nickel, LCS	190	200	MG/KG	94.8
		Lead, LCS	237	250	MG/KG	94.8
		Antimony, LCS	277	300	MG/KG	92.3
		Selenium, LCS	867	1000	MG/KG	86.7
		Silicon, LCS	86.0	500	MG/KG	17.2
		Vanadium, LCS	241	250	MG/KG	96.3
		Zinc, LCS	94.0	100	MG/KG	94.0
LCS1	08C0033-LC1	Mercury, LCS	4.4	4.7	MG/KG	94.2

Date: 6 May 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Subsite 100-F-26:9
Subject: Wet Chemistry - Data Package No. K1121-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1121 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
J169W9	2/13/08	Soil	C	See note 1
J169X0	2/13/08	Soil	C	See note 1
J169X1	2/13/08	Soil	C	See note 1
J16945	2/13/08	Soil	C	See note 1
J16946	2/13/08	Soil	C	See note 1

1 – Chromium VI by 7196A & 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".

All 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

No field duplicates were submitted for analysis.

- **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 K1121 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

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

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

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: K1121	REVIEWER: ELR	Project: 100-F-26:9	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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/04/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J169W9	% Solids	96.8	%	0.01	1.0
		Chromium VI	0.36	MG/KG	0.21	1.0
		Petroleum Hydrocarbons	138 u	MG/KG	138	1.0
-002	J169X0	% Solids	94.0	%	0.01	1.0
		Chromium VI	0.21	MG/KG	0.21	1.0
		Petroleum Hydrocarbons	142 u	MG/KG	142	1.0
-003	J169X1	% Solids	95.4	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
		Petroleum Hydrocarbons	140 u	MG/KG	140	1.0
-004	J16945	% Solids	89.6	%	0.01	1.0
		Chromium VI	0.30	MG/KG	0.22	1.0
		Petroleum Hydrocarbons	149 u	MG/KG	149	1.0
-005	J16946	% Solids	93.2	%	0.01	1.0
		Chromium VI	0.30	MG/KG	0.22	1.0
		Petroleum Hydrocarbons	142 u	MG/KG	142	1.0

5/5/04

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032 K1121
LVL#: 0802L604

W.O.#: 11343-606-001-9999-00
Date Received: 02-15-08

INORGANIC NARRATIVE

1. This narrative covers the analyses of 5 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.

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 recoveries were within the 75-125% control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit with the exception of Chromium VI that was outside the control limit that may be attributed to sample inhomogeneity.

9. Results for soil 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

3/5/08
Date

njp\i02-604

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 12 pages.

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

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code	Data Turnaround
T. Welch-Koelling	R.T. Coffman 528-6409	KESSNER, JH	8D	7DAY
Project Designation	**Sampling Location**	**SAF No.**		
100-F Remaining Sites Burial Grounds - Soil Full Protocol	100-F-26:9 Road Cross FS Verification	RC-032		
Ice Chest No. ERC-96-511	**Field Logbook No.** EFL-1174-4 / **COA** R10F262000	**Method of Shipment** FED EX		
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A080185	**Bill of Lading/Air Bill No.** SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

HX TRE 2-14-08

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	P	P	aG	aG	aG	G/P	P			
No. of Container(s)	2	1	1	1	1	1	1			
Volume	125mL	125mL	60mL	120mL	120mL	500mL	125mL			

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	See item (2) in Special Instructions	Gross Alpha; Gross Beta				
J169W9	SOIL	2-13-08	1230	X	X	X	X	X						3
J169X0	SOIL		1240	X	X	X	X	X						4
J169X1	SOIL		1250	X	X	X	X	X						5
J16945	SOIL		1300	X	X	X	X	X						1
J16946	SOIL	2-13-08	1310	X	X	X	X	X						2

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
T. Welch-Koelling	2-13-08 1400	JP DeBruijne	2-13-08 1400
JP DeBruijne	2-13-08 1445	1060 / 28	2-13-08 1445
1060 #28	2-14-08 1000	T. Edmiston	2-14-08 1000
T. Edmiston	2-14-08 1500	FED EX	
FED EX	2-15-08 0935	[illegible]	2-15-08 0935

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133, Silver-108 metastable)

Sampler unavailable to relinquish samples from 1060 Ref #28. 1060 Custodian removed samples for shipping on 2-14-08.

Matrix *

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

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

WCH-EE-011

000000011

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26:9			DATA PACKAGE: K1121		
VALIDATOR: ELR		LAB: LLI		DATE: 5/30/08	
			SDG: K1121		
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					
J169W9 J169X0 J169X1 J1G945 J1G946					
					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: _____

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: _____

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: TPH - error

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/04/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	08LVI014-MB1	Chromium VI	0.20	u	MG/KG	0.20	1.0
BLANK10	08LHC006-MB1	Petroleum Hydrocarbons	133	u	MG/KG	133	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/04/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J169X0	Soluble Chromium VI	4.2	0.21	4.3	94.6	1.0
		Insoluble Chromium VI	1200	0.21	1280	93.5	100
-005	J16946	Petroleum Hydrocarbons	521	29.9	599	82.0	1.0
BLANK10	08LVI014-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.7	1.0
		Insoluble Chromium VI	1210	0.20u	1170	104.0	100
BLANK10	08LHC006-MB1	Petroleum Hydrocarbons	544	133 u	558	97.4	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/04/08

CLIENT: TNUHANFORD RC-032 K1121 LVL LOT #: 0802L604
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J169W9	% Solids	96.8	97.0	0.12	1.0
-002REP	J169X0	Chromium VI	0.21	0.21u	85.9	1.0
-005REP	J16946	Petroleum Hydrocarbons	142 u	142 u	NC	1.0

Date: 6 May 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Subsite 100-F-26:9
Subject: Semivolatile - Data Package No. K1121-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1121 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
J169W9	2/13/08	Soil	C	See note 1
J169X0	2/13/08	Soil	C	See note 1
J169X1	2/13/08	Soil	C	See note 1
J16945	2/13/08	Soil	C	See note 1
J16946	2/13/08	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".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **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 phenol (47%), bis(2-chloroethyl)ether (37% & 48%), 1,3-dichlorobenzene (44%), 1,4-dichlorobenzene (46%), 1,2-dichlorobenzene (48%), 2-methylphenol (57%), 2,2'-oxybis(1-chloropropane) (40%), 3/4 methylphenol (58%), n-nitroso-di-n-propylamine (43%), hexachloroethane (41%), nitrobenzene (37%), isophorone (44%), 2-nitrophenol (44%), 2,4-dimethylphenol (48%), 1,2,4-trichlorobenzene (46%), 4-chloro-3-methylphenol (56%), 2-methylnaphthalene (53%) and acenaphthylene (58%) results were qualified as estimates and flagged "J".

Due to LCS recoveries outside QC limits, all bis(2-chloroethyl)ether (39%), 1,4-dichlorobenzene (49%), 2-methylphenol (54%), 2,2'-oxybis(1-chloropropane) (37%), 3/4 methylphenol (59%), n-nitroso-di-n-propylamine (47%), hexachloroethane (44%), nitrobenzene (40%), isophorone (47%), 2,4-dimethylphenol (46%), bis(2-chloroethoxy)methane (43%), 1,2,4-trichlorobenzene (52%), naphthalene (46%), 4-chloroanaline (31%), 4-chloro-3-methylphenol (57%), 2-methylnaphthalene (54%), 2-nitroaniline (59%), 2,4-dinitrophenol (21%), 4,6-dinitro-2-methylnaphthalene (37%) and pentachlorophenol (46%) 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.

Due to RPDs outside QC limits, all hexachloroethane (33%), hexachlorocyclopentadiene (38%), acenaphthylene (30.6%), 3-nitroanaline (30.9%), 4-bromophenyl-phenylether (31%), hexachlorobenzene (31.8%), 3,3-dichlorobenzidine (43%) and ideno(1,2,3-cd)pyrene (30.2%) results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **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. Forty 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. K1121 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 matrix spike and/or matrix spike duplicate recoveries outside QC limits, all phenol (47%), bis(2-chloroethyl)ether (37% & 48%), 1,3-dichlorobenzene (44%), 1,4-dichlorobenzene (46%), 1,2-dichlorobenzene (48%), 2-methylphenol (57%), 2,2'-oxybis(1-chloropropane) (40%), 3/4 methylphenol (58%), n-nitroso-di-n-propylamine (43%), hexachloroethane (41%), nitrobenzene (37%), isophorone (44%), 2-nitrophenol (44%), 2,4-dimethylphenol (48%), 1,2,4-trichlorobenzene (46%), 4-chloro-3-methylphenol (56%), 2-methylnaphthalene (53%) and acenaphthylene (58%) results were qualified as estimates and flagged "J".

- Due to LCS recoveries outside QC limits, all bis(2-chloroethyl)ether (39%), 1,4-dichlorobenzene (49%), 2-methylphenol (54%), 2,2'-oxybis(1-chloropropane) (37%), 3/4 methylphenol (59%), n-nitroso-di-n-propylamine (47%), hexachloroethane (44%), nitrobenzene (40%), isophorone (47%), 2,4-dimethylphenol (46%), bis(2-chloroethoxy)methane (43%), 1,2,4-trichlorobenzene (52%), naphthalene (46%), 4-chloroanaline (31%), 4-chloro-3-methylphenol (57%), 2-methylnaphthalene (54%), 2-nitroaniline (59%), 2,4-dinitrophenol (21%), 4,6-dinitro-2-methylnaphthalene (37%) and pentachlorophenol (46%) results were qualified as estimates and flagged "J".

- Due to RPDs outside QC limits, all hexachloroethane (33%), hexachlorocyclopentadiene (38%), acenaphthylene (30.6%), 3-nitroanaline (30.9%), 4-bromophenyl-phenylether (31%), hexachlorobenzene (31.8%), 3,3-dichlorobenzidine (43%) and ideno(1,2,3-cd)pyrene (30.2%) 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.

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

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

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: K1121	REVIEWER: ELR	Project: 100-F-26.9	PAGE 1 OF 2
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Phenol bis(2-chloroethyl)ether 1,3-dichlorobenzene 1,4-dichlorobenzene 1,2-dichlorobenzene 2-methylphenol 2,2'-oxybis(1-chloropropane) 3/4 methylphenol n-nitroso-di-n-propylamine Hexachloroethane Nitrobenzene Isophorone 2-nitrophenol 2,4-dimethylphenol 1,2,4-trichlorobenzene 4-chloro-3-methylphenol 2-methylnaphthalene Acenaphthylene	J	All	MS and/or MSD recovery
bis(2-chloroethyl)ether 1,4-dichlorobenzene 2-methylphenol 2,2'-oxybis(1-chloropropane) 3/4 methylphenol n-nitroso-di-n-propylamine Hexachloroethane Nitrobenzene Isophorone 2,4-dimethylphenol bis(2-chloroethoxy)methane 1,2,4-trichlorobenzene Naphthalene 4-chloroanaline 4-chloro-3-methylphenol 2-methylnaphthalene 2-nitroaniline 2,4-dinitrophenol 4,6-dinitro-2-methylnaphthalene Pentachlorophenol	J	All	LCS recovery

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K1121	REVIEWER: ELR	Project: 100-F-26:9	PAGE 1 OF 2
Hexachloroethane Hexachlorocyclopentadiene Acenaphthylene 3-nitroanaline 4-bromophenyl-phenylether Hexachlorobenzene 3,3-dichlorobenzidine Ideno(1,2,3-cd)pyrene	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

	Cust ID:	J169W9	J169W9	J169W9	J169X0	J169X1	J16945
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	44 %	41 %	42 %	47 %	51 %	37 %
	2-Fluorobiphenyl	50 %	58 %	74 %	60 %	72 %	54 %
	Terphenyl-d14	68 %	77 %	91 %	78 %	85 %	75 %
	Phenol-d5	46 %	49 %	57 %	48 %	57 %	39 %
	2-Fluorophenol	44 %	50 %	54 %	49 %	58 %	38 %
	2,4,6-Tribromophenol	59 %	73 %	84 %	71 %	41 %	38 %
		fl	fl	fl	fl	fl	fl
Phenol		340 UJ	47 * %	61 %	350 UJ	350 UJ	370 UJ
bis(2-Chloroethyl)ether		340 UJ	37 * %	48 * %	350 UJ	350 UJ	370 UJ
2-Chlorophenol		340 U	54 %	66 %	350 U	350 U	370 U
1,3-Dichlorobenzene		340 UJ	44 * %	59 %	350 UJ	350 UJ	370 UJ
1,4-Dichlorobenzene		340 U	46 * %	59 %	350 U	350 U	370 U
1,2-Dichlorobenzene		340 U	48 * %	63 %	350 U	350 U	370 U
2-Methylphenol		340 U	57 * %	70 %	350 U	350 U	370 U
2,2'-oxybis(1-Chloropropane)		340 U	40 * %	47 * %	350 U	350 U	370 U
3/4 Methylphenol		340 U	58 * %	70 %	350 U	350 U	370 U
N-Nitroso-di-n-propylamine		340 U	43 * %	55 %	350 U	350 U	370 U
Hexachloroethane		340 U	41 * %	57 %	350 U	350 U	370 U
Nitrobenzene		340 U	37 * %	42 * %	350 U	350 U	370 U
Isophorone		340 U	44 * %	52 * %	350 U	350 U	370 U
2-Nitrophenol		340 UJ	44 * %	54 %	350 UJ	350 UJ	370 UJ
2,4-Dimethylphenol		340 UJ	48 * %	53 %	350 UJ	350 UJ	370 UJ
bis(2-Chloroethoxy)methane		340 UJ	41 %	48 %	350 UJ	350 UJ	370 UJ
2,4-Dichlorophenol		340 U	57 %	68 %	350 U	350 U	370 U
1,2,4-Trichlorobenzene		340 UJ	46 * %	57 * %	350 UJ	350 UJ	370 UJ
Naphthalene		340 UJ	41 %	49 %	350 UJ	350 UJ	370 UJ
4-Chloroaniline		340 UJ	24 %	27 %	350 UJ	350 UJ	370 UJ
Hexachlorobutadiene		340 U	53 %	65 %	350 U	350 U	370 U
4-Chloro-3-methylphenol		340 UJ	56 * %	67 %	350 UJ	350 UJ	370 UJ
2-Methylnaphthalene		340 UJ	53 * %	62 %	350 UJ	350 UJ	370 UJ
Hexachlorocyclopentadiene		340 UJ	28 %	41 %	350 UJ	350 UJ	370 UJ
2,4,6-Trichlorophenol		340 U	64 %	83 %	350 U	350 U	370 U
2,4,5-Trichlorophenol		860 U	66 %	86 %	890 U	870 U	930 U

*= Outside of EPA CLP QC limits.

5/5/08

00001613

00000008

Cust ID:	J169W9		J169W9		J169W9		J169X0		J169X1		J16945	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	340	U	55	%	74	%	350	U	350	U	370	U
2-Nitroaniline	860	U	61	%	74	%	890	U	870	U	930	U
Dimethylphthalate	340	U	66	%	86	%	350	U	350	U	370	U
Acenaphthylene	340	UJ	58 *	%	79	%	350	UJ	350	UJ	370	UJ
2,6-Dinitrotoluene	340	U	67	%	84	%	350	U	350	U	370	U
3-Nitroaniline	860	UJ	52	%	71	%	890	UJ	870	UJ	930	UJ
Acenaphthene	340	U	59	%	76	%	350	U	350	U	370	U
2,4-Dinitrophenol	860	UJ	39	%	48	%	890	UJ	870	UJ	930	UJ
4-Nitrophenol	860	U	58	%	60	%	890	U	870	U	930	U
Dibenzofuran	340	U	66	%	85	%	350	U	350	U	370	U
2,4-Dinitrotoluene	340	U	73	%	89	%	350	U	350	U	370	U
Diethylphthalate	340	U	67	%	85	%	350	U	350	U	370	U
4-Chlorophenyl-phenylether	340	U	69	%	87	%	350	U	350	U	370	U
Fluorene	340	U	63	%	81	%	350	U	350	U	370	U
4-Nitroaniline	860	U	60	%	76	%	890	U	870	U	930	U
4,6-Dinitro-2-methylphenol	860	UJ	56	%	71	%	890	UJ	870	UJ	930	UJ
N-Nitrosodiphenylamine (1)	340	U	51	%	69	%	350	U	350	U	370	U
4-Bromophenyl-phenylether	340	UJ	60	%	82	%	350	UJ	350	UJ	370	UJ
Hexachlorobenzene	340	UJ	74	%	102	%	350	UJ	350	UJ	370	UJ
Pentachlorophenol	860	UJ	50	%	49	%	890	UJ	870	UJ	930	UJ
Phenanthrene	340	U	62	%	80	%	27	J	350	U	370	U
Anthracene	340	U	64	%	84	%	350	U	350	U	370	U
Carbazole	340	U	61	%	81	%	350	U	350	U	370	U
Di-n-butylphthalate	340	U	63	%	81	%	350	U	350	U	370	U
Fluoranthene	340	U	63	%	82	%	63	J	350	U	370	U
Pyrene	340	U	65	%	83	%	63	J	350	U	370	U
Butylbenzylphthalate	340	U	64	%	80	%	350	U	350	U	370	U
3,3'-Dichlorobenzidine	340	UJ	27	%	42	%	350	UJ	350	UJ	370	UJ
Benzo(a)anthracene	340	U	64	%	82	%	30	J	350	U	370	U
Chrysene	340	U	65	%	83	%	46	J	350	U	370	U
bis(2-Ethylhexyl)phthalate	23	J	64	%	77	%	350	U	350	U	370	U
Di-n-octyl phthalate	340	U	53	%	60	%	350	U	350	U	370	U
Benzo(b)fluoranthene	340	U	61	%	79	%	25	J	350	U	370	U
Benzo(k)fluoranthene	340	U	61	%	71	%	41	J	350	U	370	U
Benzo(a)pyrene	340	U	64	%	79	%	32	J	350	U	370	U
Indeno(1,2,3-cd)pyrene	340	UJ	73	%	99	%	24	J	350	UJ	370	UJ
Dibenz(a,h)anthracene	340	U	73	%	98	%	350	U	350	U	370	U
Benzo(g,h,i)perylene	340	U	74	%	100	%	22	J	350	U	370	U

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

Rz 5/5/00

000114

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	Cust ID:	J16946		SBLKSP		SBLKSP BS	
Sample Information	RFW#:	005		08LE0084-MB1		08LE0084-MB1	
	Matrix:	SOIL		SOLID		SOLID	
	D.F.:	1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	55	%	51	%	44	%
	2-Fluorobiphenyl	64	%	59	%	71	%
	Terphenyl-d14	81	%	79	%	78	%
	Phenol-d5	53	%	52	%	51	%
	2-Fluorophenol	54	%	53	%	52	%
	2,4,6-Tribromophenol	44	%	31	%	48	%
		fl		fl		fl	
Phenol		360	U J	330	U	53	%
bis(2-Chloroethyl)ether		360	U J	330	U	39 *	%
2-Chlorophenol		360	U	330	U	57	%
1,3-Dichlorobenzene		360	U J	330	U	50	%
1,4-Dichlorobenzene		360	U	330	U	49 *	%
1,2-Dichlorobenzene		360	U	330	U	51	%
2-Methylphenol		360	U	330	U	54 *	%
2,2'-oxybis(1-Chloropropane)		360	U	330	U	37 *	%
3/4 Methylphenol		360	U	330	U	59 *	%
N-Nitroso-di-n-propylamine		360	U	330	U	47 *	%
Hexachloroethane		360	U	330	U	44 *	%
Nitrobenzene		360	U	330	U	40 *	%
Isophorone		360	U	330	U	47 *	%
2-Nitrophenol		360	U	330	U	52	%
2,4-Dimethylphenol		360	U	330	U	46 *	%
bis(2-Chloroethoxy)methane		360	U J	330	U	43	%
2,4-Dichlorophenol		360	U	330	U	58	%
1,2,4-Trichlorobenzene		360	U J	330	U	52 *	%
Naphthalene		23	J	330	U	46	%
4-Chloroaniline		360	U J	330	U	31	%
Hexachlorobutadiene		360	U	330	U	57	%
4-Chloro-3-methylphenol		360	U J	330	U	57 *	%
2-Methylnaphthalene		360	U J	330	U	54 *	%
Hexachlorocyclopentadiene		360	U J	330	U	61	%
2,4,6-Trichlorophenol		360	U	330	U	56	%
2,4,5-Trichlorophenol		890	U	830	U	73	%

*= Outside of EPA CLP QC limits.

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5/6/08

0100000000

Cust ID:	J16946		SBLKSP		SBLKSP BS		
RFW#:	005		08LE0084-MB1		08LE0084-MB1		
2-Chloronaphthalene	360	U	330	U	66		%
2-Nitroaniline	890	U	830	U	59	*	%
Dimethylphthalate	360	U	330	U	68		%
Acenaphthylene	360	U J	330	U	67		%
2,6-Dinitrotoluene	360	U	330	U	69		%
3-Nitroaniline	890	U J	830	U	56		%
Acenaphthene	360	U	330	U	64		%
2,4-Dinitrophenol	890	U J	830	U	21		%
4-Nitrophenol	890	U	830	U	57		%
Dibenzofuran	360	U	330	U	69		%
2,4-Dinitrotoluene	360	U	330	U	73		%
Diethylphthalate	360	U	330	U	66		%
4-Chlorophenyl-phenylether	360	U	330	U	69		%
Fluorene	360	U	330	U	66		%
4-Nitroaniline	890	U	830	U	54		%
4,6-Dinitro-2-methylphenol	890	U J	830	U	37	*	%
N-Nitrosodiphenylamine (1)	360	U	330	U	59		%
4-Bromophenyl-phenylether	360	U J	330	U	66		%
Hexachlorobenzene	360	U J	330	U	84		%
Pentachlorophenol	890	U J	830	U	46		%
Phenanthrene	140	J	330	U	67		%
Anthracene	20	J	330	U	70		%
Carbazole	360	U	330	U	65		%
Di-n-butylphthalate	360	U	330	U	65		%
Fluoranthene	130	J	330	U	72		%
Pyrene	310	J	330	U	68		%
Butylbenzylphthalate	360	U	330	U	67		%
3,3'-Dichlorobenzidine	360	U J	330	U	51		%
Benzo(a)anthracene	90	J	330	U	73		%
Chrysene	120	J	330	U	73		%
bis(2-Ethylhexyl)phthalate	21	J	330	U	68		%
Di-n-octyl phthalate	360	U	330	U	59		%
Benzo(b)fluoranthene	49	J	330	U	65		%
Benzo(k)fluoranthene	68	J	330	U	70		%
Benzo(a)pyrene	71	J	330	U	71		%
Indeno(1,2,3-cd)pyrene	47	J J	330	U	75		%
Dibenz(a,h)anthracene	360	U	330	U	74		%
Benzo(g,h,i)perylene	67	J	330	U	75		%

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

5/5/06

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0802L604
SDG/SAF # K1121/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 02-15-2008

SEMIVOLATILE

Five (5) soil samples were collected on 02-13-2008.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 02-20-2008 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 03-14,17-2008.

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. Twenty-three (23) of one hundred and twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. Fifteen (15) of sixty-four (64) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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

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

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

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LIONVILLE LABORATORY INC.

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

10. 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").

11. 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.

12. 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

3/19/08
Date

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 08MS038

Initiator: Shawn Saylor
Date: 3-18-08
Client: TN4 26032

Batch: 08021 604
Samples: ms, msd, BS
Method: SW846MCAWW/CLP/

Parameter: 8270
Matrix: SOLID
Prep Batch: 08LE00 84

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 spike recoveries in the ms, msd, & BS

2. Known or Probable Cause(s)

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: 3/18/08
✓ 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: RPD 3-20-08 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: _____

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code	Data Turnaround
T. Welch-Koelling	R.T. Coffman 528-6409	KESSNER, JH	8D	7DAY
Project Designation	**Sampling Location**	**SAF No.**		
100-F Remaining Sites Burial Grounds - Soil Full Protocol	100-F-26:9 Road Cross FS Verification	RC-032		
Ice Chest No.	**Field Logbook No.** / **COA**	**Method of Shipment**		
ERC-96-571	EFL-1174-4 / R10F262000	FED EX		
Shipped To	**Offsite Property No.**	**Bill of Lading/Air Bill No.**		
EBERLINE SERVICES / RICHLAND	A080185	SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA TRE 2-14-08

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	P	P	aG	aG	aG	G/P	P			
No. of Container(s)	2	1	1	1	1	1	1			
Volume	125mL	125mL	60mL	120mL	120mL	500mL	125mL			

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1	See item (2) in Special Instructions	Gross Alpha; Gross Beta				
169W9	SOIL	2-13-08	1230	X	X	X	X	X	X					3
169X0	SOIL		1240	X	X	X	X	X	X					4
169X1	SOIL		1250	X	X	X	X	X						5
16945	SOIL		1300	X	X	X	X	X						1
16946	SOIL	2-13-08	1310	X	X	X	X	X						2

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	2-13-08 1400	JP DeBruyne JP DeBruyne	2-13-08 1400
JP DeBruyne JP DeBruyne	2-13-08 1445	1060 / 2B	2-13-08 1445
1060 #2B	2-14-08 1000	[illegible]	2-14-08 1000
[illegible]	2-14-08 1500	FED EX	
FED EX	2-15-08 0935	[illegible]	2-15-08 0935

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Barium-133, Silver-108 metastable}

Sampler unavailable to relinquish samples from 1060 Ref #2B. 1060 custodian removed samples for shipping on 2-14-08.

Matrix *

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

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

CH-EE-011

0000000019

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26:9			DATA PACKAGE: K1121		
VALIDATOR: ELR		LAB: LLI		DATE: 5/3/08	
			SDG: K1121		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J16949 J16950 J16951 J16945 J16946					
					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: no 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/MSD — 18 out — J all
LCS — 20 out — J all
no PAS

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: RPD - 8 out - July

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: 40 ave

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: