0074042

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

RECEIVED
OCT 05 2007
EDMC

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H4-21

COMMENTS:

SDG K0691 SAF-RC-032

Waste Site: 100-F-26:10

Date: 21 September 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-F-26:10
Subject: Wet Chemistry - Data Package No. K0691-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0691 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	Date
J14CB7	1/22/07	Soil	C	See note 1
J14CB8	1/22/07	Soil	C	See note 1
J14CB9	1/22/07	Soil	C	See note 1
J14CC0	1/22/07	Soil	C	See note 1

1 – Chromium VI by 7196A.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). 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.

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 65% to 135%. 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 64% 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 135% 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 35%, 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 analytes met the RQL.

- **Completeness**

Data package K0691 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

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

DOE/RL-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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: K0691	REVIEWER: ELR	Project: 100-F-26:10	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 01/30/07

CLIENT: TNUHANFORD RC-032 K0691 LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J14CB7	% Solids	97.1	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-002	J14CB8	% Solids	96.5	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-003	J14CB9	% Solids	97.9	%	0.01	1.0
		Chromium VI	0.25	MG/KG	0.20	1.0
-004	J14CC0	% Solids	98.2	%	0.01	1.0
		Chromium VI	0.32	MG/KG	0.20	1.0

9/20/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032 K0691
LVL#: 0701L730

W.O.#: 11343-606-001-9999-00
Date Received: 01-24-07

INORGANIC NARRATIVE

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

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

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. 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 blank for Chromium VI was within the method criteria.

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

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

8. The replicate analysis for Percent Solids was within the 20% Relative Percent Difference (RPD) control limit however replicate analysis for Chromium VI was outside the control limit that may be attributed to sample inhomogeneity.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/1/07
Date

njp\i01-730

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 11 pages.

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-071	Page 1 of 1

Collector Coffman	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH	Price Code	Data Turnaround 15 DAY
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 100-F-26:10 (Road Cross) Verification		SAF No. RC-032	Air Quality ☐	
Ice Chest No. ERC-02-407	Field Logbook No. EFL-1174-3	COA R10F262000	Method of Shipment Fed Ex		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A070146		Bill of Lading/Air Bill No. See OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

None

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	P	P				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	250mL	125mL	60mL	120mL	120mL	500mL	125mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	Pesticides - 8081	See item (2) in Special Instructions. RTC	Nickel-63; Strontium-89,90 – Total Sr 1/22/07				
Sample No.	Matrix *	Sample Date	Sample Time								
J14CB7	SOIL	1-22-07	0730	X	X	X	X	X			
J14CB8	SOIL		0738	X	X	X	X	X			
J14CB9	SOIL		0745	X	X	X	X	X			
J14CC0	SOIL	1-22-07	0750	X	X	X	X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From RTCoffman / RTCoffman	Date/Time 1/22/07 A15	Received By/Stored In Refer #3C, 3728	Date/Time 1/22/07 A15
Relinquished By/Removed From Refer 3C, 3728	Date/Time 1/23/07 0830	Received By/Stored In RVocks	Date/Time 1/23/07 0830
Relinquished By/Removed From RVocks	Date/Time 1/23/07 0830	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 1-24-07 0935	Received By/Stored In	Date/Time 1-24-07 0935
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

NA

(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 {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref # 3C on 1/23/07

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

BHI-EE-011 (08/29/2005)

000012

0000000010

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26:00			DATA PACKAGE: K0691		
VALIDATOR: ELR		LAB: LLI		DATE: 9/19/07	
			SDG: K0691		
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					
J14CB7 J14CB8 J14CB9 J14CC0					
					soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. HOLDING TIMES (all levels)

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

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

Comments:

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:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/30/07

CLIENT: TNUHANFORD RC-032 K0691 LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	07LVI011-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/30/07

CLIENT: TNUHANFORD RC-032 X0691

LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J14CB7	Soluble Chromium VI	4.4	0.21u	4.1	104.1	1.0
		Insoluble Chromium VI	1190	0.21u	1180	100.7	100
BLANK10	07LVI011-MB1	Soluble Chromium VI	3.9	0.20u	4.0	97.0	1.0
		Insoluble Chromium VI	1260	0.20u	1270	99.4	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/30/07

CLIENT: TNUHANFORD RC-032 K0691 LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J14CB7	Chromium VI	0.21u	0.31	129.0	1.0
-004REP	J14CC0	% Solids	98.2	98.3	0.11	1.0

Date: 21 September 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol – Waste Site 100-F-26:10
Subject: Radiochemistry - Data Package No. K0691-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0691 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	Date
J14CB7	1/22/07	Soil	C	See note 1
J14CB8	1/22/07	Soil	C	See note 1
J14CB9	1/22/07	Soil	C	See note 1
J14CC0	1/22/07	Soil	C	See note 1

1 – Gamma spectroscopy, nickel-63, total strontium.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, Rev. 0, December 2001). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 65-135%. 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 35%, no qualification is required. If

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

All duplicate results were acceptable.

Field Duplicates

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. Six analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. K0691 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

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

REFERENCES

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

DOE/RL-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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: K0691	REVIEWER: ELR	Project: 100-F-26:10	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Annotated Laboratory Reports

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0691

7721-001 J14CB7

DATA SHEET

SDG	7721	Client/Case no	Hanford SDG K0691
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R701153-01	Client sample id	J14CB7
Dept sample id	7721-001	Location/Matrix	100F26:10RoadCrossVerif SOLID
Received	01/24/07	Collected/Weight	01/22/07 07:30 1007 g
% solids	97.6	Custody/SAF No	RC-032-071 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	-0.536	2.1	3.7	30	U	NI_L
Total Strontium	SR-RAD	0.058	0.16	0.32	1.0	U	SR
Potassium 40	13966-00-2	12.4	2.0	1.6			GAM
Cobalt 60	10198-40-0	U		0.12	0.050	U	GAM
Cesium 137	10045-97-3	U		0.095	0.10	U	GAM
Radium 226	13982-63-3	0.390	0.19	0.19	0.10		GAM
Radium 228	15262-20-1	U		0.75	0.20	U	GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.44	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.331	0.076	0.078			GAM
Thorium 232	TH-232	U		0.75		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM
Uranium 238	U-238	U		14		U	GAM
Americium 241	14596-10-2	U		0.086		U	GAM
Silver 108m	14391-65-2	U		0.053		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

9/20/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/06/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0691

7721-002 J14CB8

DATA SHEET

SDG	7721	Client/Case no	Hanford SDG K0691
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R701153-02	Client sample id	J14CB8
Dept sample id	7721-002	Location/Matrix	100F26:10RoadCrossVerif SOLID
Received	01/24/07	Collected/Weight	01/22/07 07:38 832 g
% solids	97.2	Custody/SAF No	RC-032-071 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	-0.166	2.2	3.7	30	U	NI_L
Total Strontium	SR-RAD	0.003	0.15	0.31	1.0	U	SR
Potassium 40	13966-00-2	10.6	1.3	0.79			GAM
Cobalt 60	10198-40-0	U		0.070	0.050	U	GAM
Cesium 137	10045-97-3	U		0.068	0.10	U	GAM
Radium 226	13982-63-3	0.450	0.13	0.14	0.10		GAM
Radium 228	15262-20-1	0.767	0.31	0.34	0.20		GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.28	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	0.503	0.070	0.073			GAM
Thorium 232	TH-232	0.767	0.31	0.34			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		8.9		U	GAM
Americium 241	14596-10-2	U		0.32		U	GAM
Silver 108m	14391-65-2	U		0.047		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

R 9/20/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/06/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0691

7721-003 J14CB9

DATA SHEET

SDG	7721	Client/Case no	Hanford	SDG_K0691	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R701153-03	Client sample id	J14CB9		
Dept sample id	7721-003	Location/Matrix	100F26:10RoadCrossVerif	SOLID	
Received	01/24/07	Collected/Weight	01/22/07 07:45	804 g	
% solids	98.2	Custody/SAF No	RC-032-071	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	-0.671	2.2	3.7	30	U	NI_L
Total Strontium	SR-RAD	0.019	0.17	0.33	1.0	U	SR
Potassium 40	13966-00-2	12.3	1.1	0.49			GAM
Cobalt 60	10198-40-0	U		0.049	0.050	U	GAM
Cesium 137	10045-97-3	U		0.046	0.10	U	GAM
Radium 226	13982-63-3	0.429	0.12	0.11	0.10		GAM
Radium 228	15262-20-1	0.633	0.23	0.21	0.20		GAM
Europium 152	14683-23-9	U		0.13	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Thorium 228	14274-82-9	0.470	0.059	0.057			GAM
Thorium 232	TH-232	0.633	0.23	0.21			GAM
Uranium 235	15117-96-1	U		0.21		U	GAM
Uranium 238	U-238	U		5.9		U	GAM
Americium 241	14596-10-2	U		0.067		U	GAM
Silver 108m	14391-65-2	U		0.037		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

9/20/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/06/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0691

7721-004 J14CC0

DATA SHEET

SDG	7721	Client/Case no	Hanford	SDG_K0691
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R701153-04	Client sample id	J14CC0	
Dept sample id	7721-004	Location/Matrix	100F26:10RoadCrossVerif	SOLID
Received	01/24/07	Collected/Weight	01/22/07 07:50	940 g
% solids	98.3	Custody/SAF No	RC-032-071	RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	0.082	2.1	3.6	30	U	NI_L
Total Strontium	SR-RAD	-0.096	0.12	0.28	1.0	U	SR
Potassium 40	13966-00-2	14.1	2.0	1.6			GAM
Cobalt 60	10198-40-0	U		0.14	0.050	U	GAM
Cesium 137	10045-97-3	U		0.10	0.10	U	GAM
Radium 226	13982-63-3	0.292	0.19	0.20	0.10		GAM
Radium 228	15262-20-1	1.20	0.68	0.56	0.20		GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.45	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.253	0.080	0.084			GAM
Thorium 232	TH-232	1.20	0.68	0.56			GAM
Uranium 235	15117-96-1	U		0.16		U	GAM
Uranium 238	U-238	U		14		U	GAM
Americium 241	14596-10-2	U		0.090		U	GAM
Silver 108m	14391-65-2	U		0.054		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

9/20/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/06/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0691 was composed of four 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 6, 2007.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.3 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Senior Program Manager

02/08/07

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-071	Page 1 of 1

Collector Coffman	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 100-F-26:10 (Road Cross) Verification	SAF No. RC-032	Price Code SK Air Quality ☐
Ice Chest No. GRP-04-008	Field Logbook No. EFL-1174-3	COA R10F262000	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES, LIONVILLE	Offsite Property No. A070122		Bill of Lading/Air Bill No. See OSPC

Data Turnaround: 15 DAY

KO69D (7721) 4/1/2/07

POSSIBLE SAMPLE HAZARDS/REMARKS

None

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	P	P				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	250mL	125mL	60mL	120mL	120mL	500mL	125mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.	Nickel-63; Strontium-89,90 -- Total Sr				
Sample No. / Matrix * / Sample Date / Sample Time											
J14CB7 / SOIL / 1-22-07 / 0730						X	X				
J14CB8 / SOIL / ↓ / 0738						X	X				
J14CB9 / SOIL / ↓ / 0745						X	X				
J14CC0 / SOIL / 1-22-07 / 0750						X	X				

RTC 1/22/07

000015

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From RTCoffman / RTCoffman	Date/Time 1915 1/22/07	Received By/Stored In REFRIG #3C, 3728	Date/Time 1915 1/22/07
Relinquished By/Removed From 3728 #3C 1/23/07 WCH	Date/Time 0815	Received By/Stored In R Voeks 1/23/07	Date/Time 0815
Relinquished By/Removed From R Voeks 1/23/07	Date/Time 0815	Received By/Stored In FedEx	Date/Time
Relinquished By/Removed From FED EX	Date/Time	Received By/Stored In 01/24/07	Date/Time 9:50
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

NA

(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 {Silver-108 metastable}

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-26110		DATA PACKAGE:	K0691	
VALIDATOR:	ELR	LAB: ~~EKE~~ EB		DATE:	9/19/07
			SDG:	K0691	

ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	M1-6		

SAMPLES/MATRIX				
J14CB7	J14CB8	J14CB9	J14CC0	
				Soil

1. Completeness ..... ☐ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

Comments:

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

Comments: _____

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

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

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

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

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

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

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

Comments: no 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: 6 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0691

7721-006 Method Blank

METHOD BLANK

SDG	7721	Client/Case no	Hanford	SDG K0691	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R701153-06	Client sample id	Method Blank		
Dept sample id	7721-006	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
Nickel 63	13981-37-8	0.616	2.0	3.4	30	U	NI_L
Total Strontium	SR-RAD	-0.048	0.14	0.31	1.0	U	SR
Potassium 40	13966-00-2	U		2.0		U	GAM
Cobalt 60	10198-40-0	U		0.089	0.050	U	GAM
Cesium 137	10045-97-3	U		0.087	0.10	U	GAM
Radium 226	13982-63-3	U		0.27	0.10	U	GAM
Radium 228	15262-20-1	U		0.35	0.20	U	GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	U		0.12		U	GAM
Thorium 232	TH-232	U		0.35		U	GAM
Uranium 235	15117-96-1	U		0.29		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.22		U	GAM
Silver 108m	14391-65-2	U		0.061		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

QC-BLANK #60140

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/06/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0691

7721-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7721

Contact Melissa C. Mannion

Client/Case no Hanford SDG K0691

Contract No. 630

Lab sample id R701153-05

Dept sample id 7721-005

Client sample id Lab Control Sample

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
Nickel 63	267	8.5	4.3	30		NI_L	268	11	100	83-117	80-120
Total Strontium	11.7	0.57	0.23	1.0		SR	10.6	0.42	110	81-119	80-120
Cobalt 60	2.56	0.19	0.090	0.050		GAM	2.58	0.10	99	74-126	80-120
Cesium 137	2.44	0.17	0.12	0.10		GAM	2.49	0.10	98	75-125	80-120

100-F RemainSitesBurialGrnds-Soil FP

QC-LCS #60139

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 02/06/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0691

7721-007 J14CC0

DUPLICATE

SDG	7721			Client/Case no	Hanford SDG K0691
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R701153-07	Lab sample id	R701153-04	Client sample id	J14CC0
ept sample id	7721-007	Dept sample id	7721-004	Location/Matrix	100F26:10RoadCrossVerif SOLID
		Received	01/24/07	Collected/Weight	01/22/07 07:50 940 g
% solids	98.3	% solids	98.3	Custody/SAF No	RC-032-071 RC-032

NALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
ickel 63	0.775	2.0	3.4	30	U	NI_L	0.082	2.1	3.6	U	-		0.5
otal Strontium	-0.021	0.16	0.30	1.0	U	SR	-0.096	0.12	0.28	U	-		0.7
otassium 40	16.0	2.2	1.3			GAM	14.1	2.0	1.6		13	44	0.9
obalt 60	U		0.14	0.050	U	GAM	U		0.14	U	-		0
esium 137	U		0.13	0.10	U	GAM	U		0.10	U	-		0.4
adium 226	0.288	0.19	0.21	0.10		GAM	0.292	0.19	0.20		1	143	0
adium 228	U		0.60	0.20	U	GAM	1.20	0.68	0.56		67	155	1.3
uropium 152	U		0.16	0.10	U	GAM	U		0.16	U	-		0
uropium 154	U		0.45	0.10	U	GAM	U		0.45	U	-		0
uropium 155	U		0.11	0.10	U	GAM	U		0.10	U	-		0.1
horium 228	0.310	0.092	0.093			GAM	0.253	0.080	0.084		20	72	0.8
horium 232	U		0.60		U	GAM	1.20	0.68	0.56		67	155	1.3
ranium 235	U		0.16		U	GAM	U		0.16	U	-		0
ranium 238	U		16		U	GAM	U		14	U	-		0.2
nericium 241	U		0.091		U	GAM	U		0.090	U	-		0
ilver 108m	U		0.059		U	GAM	U		0.054	U	-		0.1

)0-F RemainSitesBurialGrnds-Soil FP

:-DUP#4 60141

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	02/06/07

Date: 21 September 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-F-26:10
Subject: Semivolatile - Data Package No. K0691-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0691 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	Date
J14CB7	1/22/07	Soil	C	See note 1
J14CB8	1/22/07	Soil	C	See note 1
J14CB9	1/22/07	Soil	C	See note 1
J14CC0	1/22/07	Soil	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were met.

- **Method Blanks**

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

Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in samples J14CB8 and J14CC0 were raised to the RQL, qualified as undetected and flagged "U".

All other 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.

All 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 an RPD outside QC limits, all 2,4-dinitrophenol (40%) results were qualified as estimates and flagged "J".

All other 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 required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. No semivolatile RQLs were specified.

- **Completeness**

Data package No. K0691 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in samples J14CB8 and J14CC0 were raised to the RQL, qualified as undetected and flagged "U".

- Due to an RPD outside QC limits, all 2,4-dinitrophenol (40%) 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

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

DOE/RL-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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: K0691	REVIEWER: ELR	Project: 100-F-26:10	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U at RQL	J14CB8, J14CC0	Method blank contamination
2,4-dinitrophenol	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

Lionville Laboratory, Inc.
Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0701L730 Client: TNUHANFORD RC-032 K0691 Work Order: 11343606001 Report Date: 02/08/07 09:34 Page: 1a

	Cust ID:	J14CB7	J14CB8	J14CB9	J14CC0	J14CC0	J14CC0
Sample Information	RFW#:	001	002	003	004	004 MS	004 MSD
	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	73 %	68 %	68 %	64 %	71 %	66 %
	2-Fluorobiphenyl	76 %	69 %	71 %	65 %	80 %	79 %
	Terphenyl-d14	97 %	92 %	93 %	81 %	88 %	86 %
	Phenol-d5	87 %	80 %	74 %	74 %	87 %	80 %
	2-Fluorophenol	85 %	76 %	75 %	73 %	84 %	76 %
	2,4,6-Tribromophenol	73 %	74 %	69 %	44 %	75 %	67 %
Phenol		340 U	350 U	340 U	340 U	76 %	73 %
bis(2-Chloroethyl)ether		340 U	350 U	340 U	340 U	73 %	68 %
2-Chlorophenol		340 U	350 U	340 U	340 U	75 %	70 %
1,3-Dichlorobenzene		340 U	350 U	340 U	340 U	70 %	64 %
1,4-Dichlorobenzene		340 U	350 U	340 U	340 U	70 %	64 %
1,2-Dichlorobenzene		340 U	350 U	340 U	340 U	74 %	68 %
2-Methylphenol		340 U	350 U	340 U	340 U	74 %	74 %
2,2'-oxybis(1-Chloropropane)		340 U	350 U	340 U	340 U	73 %	68 %
3/4 Methylphenol		340 U	350 U	340 U	340 U	75 %	72 %
N-Nitroso-di-n-propylamine		340 U	350 U	340 U	340 U	76 %	71 %
Hexachloroethane		340 U	350 U	340 U	340 U	68 %	62 %
Nitrobenzene		340 U	350 U	340 U	340 U	69 %	65 %
Isophorone		340 U	350 U	340 U	340 U	81 %	79 %
2-Nitrophenol		340 U	350 U	340 U	340 U	70 %	69 %
2,4-Dimethylphenol		340 U	350 U	340 U	340 U	58 %	57 %
bis(2-Chloroethoxy)methane		340 U	350 U	340 U	340 U	74 %	73 %
2,4-Dichlorophenol		340 U	350 U	340 U	340 U	73 %	71 %
1,2,4-Trichlorobenzene		340 U	350 U	340 U	340 U	70 %	66 %
Naphthalene		340 U	350 U	340 U	340 U	69 %	67 %
4-Chloroaniline		340 U	350 U	340 U	340 U	33 %	35 %
Hexachlorobutadiene		340 U	350 U	340 U	340 U	76 %	73 %
4-Chloro-3-methylphenol		340 U	350 U	340 U	340 U	74 %	70 %
2-Methylnaphthalene		340 U	350 U	340 U	340 U	74 %	73 %
Hexachlorocyclopentadiene		340 U	350 U	340 U	340 U	61 %	61 %
2,4,6-Trichlorophenol		340 U	350 U	340 U	340 U	72 %	69 %
2,4,5-Trichlorophenol		860 U	860 U	850 U	850 U	80 %	80 %

*= Outside of EPA CLP QC limits.

9/20/07

000011

000000007

Cust ID:	J14CB7		J14CB8		J14CB9		J14CC0		J14CC0		J14CC0	
RFW#:	001		002		003		004		004 MS		004 MSD	
2-Chloronaphthalene	340	U	350	U	340	U	340	U	78	%	78	%
2-Nitroaniline	860	U	860	U	850	U	850	U	81	%	82	%
Dimethylphthalate	340	U	350	U	340	U	340	U	79	%	79	%
Acenaphthylene	340	U	350	U	340	U	340	U	78	%	78	%
2,6-Dinitrotoluene	340	U	350	U	340	U	340	U	80	%	80	%
3-Nitroaniline	860	U	860	U	850	U	850	U	52	%	56	%
Acenaphthene	340	U	350	U	340	U	340	U	76	%	75	%
2,4-Dinitrophenol	860	UJ	860	UJ	850	UJ	850	UJ	42	%	28	%
4-Nitrophenol	860	U	860	U	850	U	850	U	68	%	61	%
Dibenzofuran	340	U	350	U	340	U	340	U	78	%	79	%
2,4-Dinitrotoluene	340	U	350	U	340	U	340	U	80	%	79	%
Diethylphthalate	340	U	350	U	340	U	340	U	78	%	79	%
4-Chlorophenyl-phenylether	340	U	350	U	340	U	340	U	79	%	80	%
Fluorene	340	U	350	U	340	U	340	U	76	%	76	%
4-Nitroaniline	860	U	860	U	850	U	850	U	74	%	72	%
4,6-Dinitro-2-methylphenol	860	U	860	U	850	U	850	U	57	%	42	%
N-Nitrosodiphenylamine (1)	340	U	350	U	340	U	340	U	69	%	72	%
4-Bromophenyl-phenylether	340	U	350	U	340	U	340	U	73	%	76	%
Hexachlorobenzene	340	U	350	U	340	U	340	U	81	%	85	%
Pentachlorophenol	860	U	860	U	850	U	850	U	66	%	54	%
Phenanthrene	340	U	350	U	340	U	340	U	78	%	80	%
Anthracene	340	U	350	U	340	U	340	U	81	%	84	%
Carbazole	340	U	350	U	340	U	340	U	81	%	83	%
Di-n-butylphthalate	340	U	350	U	340	U	39	J	77	%	78	%
Fluoranthene	340	U	350	U	340	U	340	U	82	%	83	%
Pyrene	340	U	350	U	340	U	340	U	80	%	82	%
Butylbenzylphthalate	340	U	350	U	340	U	340	U	83	%	87	%
3,3'-Dichlorobenzidine	340	U	350	U	340	U	340	U	54	%	61	%
Benzo(a)anthracene	340	U	350	U	340	U	340	U	79	%	82	%
Chrysene	340	U	350	U	340	U	340	U	79	%	83	%
bis(2-Ethylhexyl)phthalate	340	U	330 ~~21~~ ~~JB~~ U		340	U	330 ~~21~~ ~~JB~~ U		83	%	86	%
Di-n-octyl phthalate	340	U	350	U	340	U	340	U	81	%	83	%
Benzo(b)fluoranthene	340	U	350	U	340	U	340	U	75	%	78	%
Benzo(k)fluoranthene	340	U	350	U	340	U	340	U	78	%	81	%
Benzo(a)pyrene	340	U	350	U	340	U	340	U	81	%	84	%
Indeno(1,2,3-cd)pyrene	340	U	350	U	340	U	340	U	85	%	88	%
Dibenz(a,h)anthracene	340	U	350	U	340	U	340	U	85	%	88	%
Benzo(g,h,i)perylene	340	U	350	U	340	U	340	U	85	%	86	%

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

9/20/07

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Lionville Laboratory, Inc.
Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0701L730 Client: TNUHANFORD RC-032 K0691 Work Order: 11343606001 Report Date: 02/08/07 09:34 Page: 2a

	Cust ID:	SBLKIA		SBLKIA BS	
Sample Information	RFW#:	07LE0069-MB1		07LE0069-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	1.00		1.00	
	Units:	ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	72	%	68	%
	2-Fluorobiphenyl	77	%	75	%
	Terphenyl-d14	94	%	79	%
	Phenol-d5	84	%	80	%
	2-Fluorophenol	84	%	78	%
	2,4,6-Tribromophenol	50	%	43	%
Phenol		330	U	73	%
bis(2-Chloroethyl)ether		330	U	70	%
2-Chlorophenol		330	U	71	%
1,3-Dichlorobenzene		330	U	67	%
1,4-Dichlorobenzene		330	U	67	%
1,2-Dichlorobenzene		330	U	71	%
2-Methylphenol		330	U	71	%
2,2'-oxybis(1-Chloropropane)		330	U	70	%
3/4 Methylphenol		330	U	71	%
N-Nitroso-di-n-propylamine		330	U	72	%
Hexachloroethane		330	U	66	%
Nitrobenzene		330	U	66	%
Isophorone		330	U	79	%
2-Nitrophenol		330	U	67	%
2,4-Dimethylphenol		330	U	54	%
bis(2-Chloroethoxy)methane		330	U	73	%
2,4-Dichlorophenol		330	U	70	%
1,2,4-Trichlorobenzene		330	U	67	%
Naphthalene		330	U	66	%
4-Chloroaniline		330	U	34	%
Hexachlorobutadiene		330	U	73	%
4-Chloro-3-methylphenol		330	U	73	%
2-Methylnaphthalene		330	U	72	%
Hexachlorocyclopentadiene		330	U	58	%
2,4,6-Trichlorophenol		330	U	51	%
2,4,5-Trichlorophenol		830	U	73	%

*= Outside of EPA CLP QC limits.

VK 9/20/07

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Cust ID:	SBLKIA		SBLKIA BS	
RFW#:	07LE0069-MB1		07LE0069-MB1	
2-Chloronaphthalene	330	U	73	%
2-Nitroaniline	830	U	78	%
Dimethylphthalate	330	U	78	%
Acenaphthylene	330	U	74	%
2,6-Dinitrotoluene	330	U	78	%
3-Nitroaniline	830	U	57	%
Acenaphthene	330	U	72	%
2,4-Dinitrophenol	830	U	71	%
4-Nitrophenol	830	U	70	%
Dibenzofuran	330	U	74	%
2,4-Dinitrotoluene	330	U	80	%
Diethylphthalate	330	U	78	%
4-Chlorophenyl-phenylether	330	U	76	%
Fluorene	330	U	74	%
4-Nitroaniline	830	U	79	%
4,6-Dinitro-2-methylphenol	830	U	77	%
N-Nitrosodiphenylamine (1)	330	U	66	%
4-Bromophenyl-phenylether	330	U	69	%
Hexachlorobenzene	330	U	78	%
Pentachlorophenol	830	U	65	%
Phenanthrene	330	U	76	%
Anthracene	330	U	78	%
Carbazole	330	U	82	%
Di-n-butylphthalate	330	U	78	%
Fluoranthene	330	U	82	%
Pyrene	330	U	72	%
Butylbenzylphthalate	330	U	80	%
3,3'-Dichlorobenzidine	330	U	59	%
Benzo(a)anthracene	330	U	77	%
Chrysene	330	U	77	%
bis(2-Ethylhexyl)phthalate	20	J	82	%
Di-n-octyl phthalate	330	U	81	%
Benzo(b)fluoranthene	330	U	77	%
Benzo(k)fluoranthene	330	U	75	%
Benzo(a)pyrene	330	U	80	%
Indeno(1,2,3-cd)pyrene	330	U	79	%
Dibenz(a,h)anthracene	330	U	79	%
Benzo(g,h,i)perylene	330	U	79	%

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

9/20/07

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0701L730
SDG/SAF # K0691/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 01-24-2007

SEMIVOLATILE

Four (4) soil samples were collected on 01-22-2007.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 01-25-2007 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 02-07-2007.

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

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

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

3. All surrogate recoveries were within acceptance criteria.

4. All matrix spike recoveries were within acceptance criteria.

5. All blank spike recoveries were within acceptance criteria.

6. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.

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

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 8 pages.

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

LvLI
LIONVILLE LABORATORY INC.

9. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. 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.

for Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/13/07
Date

sorn\gorup\data\bna\tmu-hanford\0701-730.doc

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-071	Page 1 of 1

Collector: Coffman	Company Contact: R.T. Coffman — Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround: 15 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-26:10 (Road Cross) Verification	SAF No.: RC-032	Air Quality ☐
Ice Chest No.: ERC-02-407	Field Logbook No.: EFL-1174-3 — COA: R10F262000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A070146	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

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	P	P			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	250mL	125mL	60mL	120mL	120mL	500mL	125mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	Pesticides - 8081	See item (2) in Special Instructions. RTC	Nickel-63; Strontium-89,90 -- Total Sr 1/22/07			
Sample No.	Matrix *	Sample Date	Sample Time								
J14CB7	SOIL	1-22-07	0730	X	X	X	X	X			
J14CB8	SOIL		0738	X	X	X	X	X			
J14CB9	SOIL		0745	X	X	X	X	X			
J14CC0	SOIL	1-22-07	0750	X	X	X	X	X			

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RTCoffman / RTCoffman	1/22/07 1915	Refer #3C, 3728	1/22/07 1915
Refer 3C, 3728	1/23/07 0830	RVocks	1/23/07 0830
RVocks	1/23/07 0830	Fed Ex	
Fed Ex	1-24-07 0935		1-24-07 0935

SPECIAL INSTRUCTIONS

NA

(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 (Silver-108 metastable)

Personnel not available to relinquish samples from 3728 Ref# 3C on 1/23/07

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26:10			DATA PACKAGE: K0691		
VALIDATOR: ELR		LAB: LLI		DATE: 9/19/07	
			SDG: K0691		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J14CB7 J14CB8 J14CB9 J14CC0					
					soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: bis(2-ethylhexyl)phthalate - UJ BB + CO

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: 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: 2,4-dinitrophenol – 40% – J all

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: no RQL specified

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 21 September 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol – Waste Site 118-F-26:10
Subject: PCB/Pesticide - Data Package No. K0691-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0691 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	Date
J14CB7	1/22/07	Soil	C	See note 1
J14CB8	1/22/07	Soil	C	See note 1
J14CB9	1/22/07	Soil	C	See note 1
J14CC0	1/22/07	Soil	C	See note 1

1 – Pesticides by 8081A and PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

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

All holding times were acceptable.

- **Method Blank**

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

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

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

All other accuracy results were acceptable.

Surrogate Recovery

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

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 35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

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

All other 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 analytes met the RQL.

- **Completeness**

Data Package No. K0691 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 the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

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

REFERENCES

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

DOE/RL-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

PESTICIDE/PCB DATA QUALIFICATION SUMMARY*

SDG: K0691	REVIEWER: ELR	Project: 100-F-26:10	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS/MSD/LCS

* - 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.

PCBs by GC

Report Date: 02/08/07 17:27

RFW Batch Number: 0701L730 Client: TNUHANFORD RC-032 K0691 Work Order: 11343606001 Page: 1

000000005

	Cust ID:	J14CB7	J14CB8	J14CB8	J14CB8	J14CB9	J14CC0
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	91 %	90 %	107 %	103 %	95 %	91 %
	Decachlorobiphenyl	102 %	101 %	112 %	108 %	104 %	97 %
Aroclor-1016		14 U	14 U	100 %	97 %	14 U	14 U
Aroclor-1221		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1232		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1242		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1248		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1254		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1260		14 U	14 U	112 %	110 %	14 U	14 U

000010

	Cust ID:	PBLKWQ	PBLKWQ BS
Sample Information	RFW#:	07LE0068-MB1	07LE0068-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	92 %	105 %
	Decachlorobiphenyl	103 %	113 %
Aroclor-1016		13 U	102 %
Aroclor-1221		13 U	13 U
Aroclor-1232		13 U	13 U
Aroclor-1242		13 U	13 U
Aroclor-1248		13 U	13 U
Aroclor-1254		13 U	13 U
Aroclor-1260		13 U	116 %

9/20/07

2/4/7

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

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 02/08/07 14:41

RFW Batch Number: 0701L730 Client: TNUHANFORD RC-032 K0691 Work Order: 11343606001 Page: 1

	Cust ID:	J14CB7	J14CB7	J14CB7	J14CB8	J14CB9	J14CC0
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	4.00	4.00	4.00	4.00	4.00	4.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	98 %	109 %	108 %	103 %	104 %	97 %
	Decachlorobiphenyl	89 %	103 %	90 %	90 %	92 %	81 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.4 U	108 %	106 %	1.4 U	1.4 U	1.4 U
gamma-BHC (Lindane)		1.4 U	112 %	109 %	1.4 U	1.4 U	1.4 U
Beta-BHC		1.4 U	117 %	113 %	1.4 U	1.4 U	1.4 U
Heptachlor		1.4 U	116 %	113 %	1.4 U	1.4 U	1.4 U
Delta-BHC		1.4 U	108 %	113 %	1.4 U	1.4 U	1.4 U
Aldrin		1.4 U	112 %	108 %	1.4 U	1.4 U	1.4 U
Heptachlor epoxide		1.4 U	117 %	111 %	1.4 U	1.4 U	1.4 U
gamma-Chlordane		1.4 U	114 %	109 %	1.4 U	1.4 U	1.4 U
Endosulfan I		1.4 U	122 * %	113 %	1.4 U	1.4 U	1.4 U
alpha-Chlordane		1.4 U	116 %	109 %	1.4 U	1.4 U	1.4 U
4,4'-DDE		1.4 U	123 * %	115 %	1.4 U	1.4 U	1.4 U
Dieldrin		1.4 U	114 %	107 %	1.4 U	1.4 U	1.4 U
Endrin		1.4 U	125 %	118 %	1.4 U	1.4 U	1.4 U
4,4'-DDD		1.4 U	115 %	107 %	1.4 U	1.4 U	1.4 U
Endosulfan II		1.4 U	119 %	112 %	1.4 U	1.4 U	1.4 U
4,4'-DDT		1.4 U	121 %	113 %	1.4 U	1.5	1.4 U
Endrin aldehyde		1.4 U	107 %	103 %	1.4 U	1.4 U	1.4 U
Endosulfan sulfate		1.4 U	119 %	112 %	1.4 U	1.4 U	1.4 U
Methoxychlor		1.4 U	127 %	117 %	3.0	2.5	2.9
Endrin ketone		1.4 U	118 %	112 %	1.4 U	1.4 U	1.4 U
Toxaphene		14 U J	14 U	14 U	14 U J	14 U J	14 U J

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

9/20/07

0000011

0000000006

	Cust ID:	PBLKWQ	PBLKWQ BS
Sample Information	RFW#:	07LE0068-MB1	07LE0068-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG

Surrogate:	Tetrachloro-m-xylene	76	%	93	%
	Decachlorobiphenyl	84	%	97	%

Alpha-BHC	0.33	U	112	%
gamma-BHC (Lindane)	0.33	U	113	%
Beta-BHC	0.33	U	106	%
Heptachlor	0.33	U	108	%
Delta-BHC	0.33	U	114	%
Aldrin	0.33	U	108	%
Heptachlor epoxide	0.33	U	107	%
gamma-Chlordane	0.33	U	108	%
Endosulfan I	0.33	U	115	%
alpha-Chlordane	0.33	U	107	%
4,4'-DDE	0.33	U	118	%
Dieldrin	0.33	U	107	%
Endrin	0.33	U	113	%
4,4'-DDD	0.33	U	110	%
Endosulfan II	0.33	U	107	%
4,4'-DDT	0.33	U	111	%
Endrin aldehyde	0.33	U	88	%
Endosulfan sulfate	0.33	U	104	%
Methoxychlor	0.33	U	97	%
Endrin ketone	0.33	U	103	%
Toxaphene	3.3	U	3.3	U

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

VR 9/20/07

2/4/7

000000007

000012

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0701L730
SDG/SAF # K0691/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 01-24-2007

PCB

Four (4) soil samples were collected on 01-22-2007.

The samples and their associated QC samples were extracted on 01-25-2007 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 02-08-2007. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

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

1. 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. All surrogate recoveries were within acceptance criteria.

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.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

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 and holds over 20 additional state accreditations. 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.

Jaiy Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/12/07
Date

som\r:\group\data\pest\tmu hanford\0701-730.pcb

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

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0701L730
SDG/SAF # K0691/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 01-24-2007

CHLORINATED PESTICIDES

Four (4) soil samples were collected on 01-22-2007.

The samples and their associated QC samples were extracted on 01-25-2007 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 02-01-2007. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A.

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. All 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. All surrogate recoveries were within acceptance criteria.

5. All blank spike recoveries were within acceptance criteria.

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

7. All samples required a 4-fold dilution due to high concentration of target compounds. The reporting limits were adjusted to reflect the necessary dilution.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

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

LvLI
LIONVILLE LABORATORY INC.

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

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

10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/12/07
Date

som\r:\group\data\pest\tnu hanford\0701-730s.pst

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 07CC040

Initiator: CC
Date: 2/8/07
Client: TAU

Batch: 0701L730
Samples: 001-S
Method: SW846/MCAWW/CLP/

Parameter: 0608H
Matrix: Soil
Prep Batch: 07LE0068

1. Reason for SDR

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

b. General Discrepancy

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

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

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

- 1 matrix Spike recoveries is 001-S (see attached form).
- Does not affect ability to detect target compounds.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

Narrative

4. Project Manager Instructions...signature/date: 2/8/07

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

5. Final Action...signature/date: _____ Other Explanation:

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

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

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

QA-105-A-0805

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-071	Page 1 of 1

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: 15 DA		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-26:10 (Road Cross) Verification	SAF No.: RC-032	Air Quality ☐
Ice Chest No.: ERC-02-407	Field Logbook No.: EFL-1174-3	COA: R10F262000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A070146		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

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	P	P				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	250mL	125mL	60mL	120mL	120mL	500mL	125mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	Pesticides - 8081	See item (2) in Special Instructions. RTC	Nickel-63; Strontium-89,90 – Total Sr 1/22/07				

Sample No.	Matrix *	Sample Date	Sample Time										
J14CB7	SOIL	1-22-07	0730	X	X	X	X	X					
J14CB8	SOIL		0738	X	X	X	X	X					
J14CB9	SOIL		0745	X	X	X	X	X					
J14CC0	SOIL	1-22-07	0750	X	X	X	X	X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT COFFMAN / RT Coffman	1/22/07 1915	Refer #3C, 3728	1/22/07 1915
Refer 3C, 3728	1/23/07 0830	R Vocks	1/23/07 0830
R Vocks	1/23/07 0830	Fed Ex	
Fed Ex	1-24-07 0935		1-24-07 0935

SPECIAL INSTRUCTIONS

NA

(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 (Silver-108 metastable)

Personnel not available to relinquish samples from 3728
Ref# 3C on 1/23/07

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solid
DL=Drum Liquid
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

PHLEF 011 (08/30/2005)

000019

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26:10			DATA PACKAGE: K0691		
VALIDATOR: ELR		LAB: LLI		DATE: 9/19/07	
			SDG: K0691		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J14CB7	J14CB8	J14CB9	J14CC0		
					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

no toxaphene MS, MSD, LCS – J all

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

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: 21 September 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-F-26:10
Subject: Inorganic - Data Package No. K0691-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0691 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	Date
J14CB7	1/22/07	Soil	C	See note 1
J14CB8	1/22/07	Soil	C	See note 1
J14CB9	1/22/07	Soil	C	See note 1
J14CC0	1/22/07	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, Rev. 0, December 2001). 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 "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

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

Due to method blank contamination, all detected boron and cadmium results were qualified as undetected and flagged "UJ".

All other 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 75% to 125%. 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 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less

than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (53.7%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (21.3%), all silicon results were qualified as estimate 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 35%, 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 (46.3%), all silicon results were qualified as estimates and flagged "J".

All other 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. K0691 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be

valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, all detected boron and cadmium results were qualified as undetected and flagged "UJ".
- Due to a matrix spike recovery outside QC limits (53.7%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (21.3%), all silicon results were qualified as estimate and flagged "J".
- Due to an RPD outside QC limits (46.3%), 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

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

DOE/RL-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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: K0691	REVIEWER: ELR	Project: 100-F-26:10	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Boron Cadmium	UJ	All detected samples	Method blank contamination
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery & 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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/02/07

CLIENT: TNUHANFORD RC-032 K0691 LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J14CB7	Silver, Total	0.15 u	MG/KG	0.15	3.0
		Aluminum, Total	4800	MG/KG	6.2	3.0
		Arsenic, Total	8.5	MG/KG	0.90	3.0
		Boron, Total	1.6 UJ	MG/KG	0.55	3.0
		Barium, Total	54.1	MG/KG	0.03	3.0
		Beryllium, Total	0.29	MG/KG	0.03	3.0
		Calcium, Total	3980	MG/KG	3.6	3.0
		Cadmium, Total	0.09 u	MG/KG	0.09	3.0
		Cobalt, Total	5.2	MG/KG	0.15	3.0
		Chromium, Total	7.5	MG/KG	0.35	3.0
		Copper, Total	11.8	MG/KG	0.20	3.0
		Iron, Total	12300	MG/KG	7.1	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	964	MG/KG	6.2	3.0
		Magnesium, Total	3180	MG/KG	1.3	3.0
		Manganese, Total	257	MG/KG	0.12	3.0
		Molybdenum, Total	0.47 u	MG/KG	0.47	3.0
		Sodium, Total	116	MG/KG	0.73	3.0
		Nickel, Total	8.8	MG/KG	0.64	3.0
		Lead, Total	24.9	MG/KG	0.47	3.0
		Antimony, Total	0.73 uJ	MG/KG	0.73	3.0
		Selenium, Total	1.3 u	MG/KG	1.3	3.0
		Silicon, Total	466 J	MG/KG	1.9	3.0
		Vanadium, Total	26.4	MG/KG	0.17	3.0
		Zinc, Total	30.5	MG/KG	0.12	3.0

K
9/20/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/02/07

CLIENT: TNUHANFORD RC-032 K0691

LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J14CB8	Silver, Total	0.15 u	MG/KG	0.15	3.0
		Aluminum, Total	4630	MG/KG	6.2	3.0
		Arsenic, Total	7.1	MG/KG	0.91	3.0
		Boron, Total	1.1 U J	MG/KG	0.56	3.0
		Barium, Total	48.0	MG/KG	0.03	3.0
		Beryllium, Total	0.23	MG/KG	0.03	3.0
		Calcium, Total	3970	MG/KG	3.7	3.0
		Cadmium, Total	0.11 U J	MG/KG	0.09	3.0
		Cobalt, Total	4.7	MG/KG	0.15	3.0
		Chromium, Total	7.2	MG/KG	0.35	3.0
		Copper, Total	10.9	MG/KG	0.21	3.0
		Iron, Total	11100	MG/KG	7.2	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	864	MG/KG	6.2	3.0
		Magnesium, Total	3070	MG/KG	1.3	3.0
		Manganese, Total	234	MG/KG	0.12	3.0
		Molybdenum, Total	0.47 u	MG/KG	0.47	3.0
		Sodium, Total	120	MG/KG	0.73	3.0
		Nickel, Total	9.0	MG/KG	0.65	3.0
		Lead, Total	19.7	MG/KG	0.47	3.0
		Antimony, Total	0.73 u J	MG/KG	0.73	3.0
		Selenium, Total	1.3 u	MG/KG	1.3	3.0
		Silicon, Total	743 J	MG/KG	1.9	3.0
		Vanadium, Total	21.5	MG/KG	0.18	3.0
		Zinc, Total	28.7	MG/KG	0.12	3.0

9/20/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/02/07

CLIENT: TNUHANFORD RC-032 K0691 LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J14CB9	Silver, Total	0.14 u	MG/KG	0.14	3.0
		Aluminum, Total	3890	MG/KG	6.1	3.0
		Arsenic, Total	2.4	MG/KG	0.90	3.0
		Boron, Total	0.55 u	MG/KG	0.55	3.0
		Barium, Total	53.0	MG/KG	0.03	3.0
		Beryllium, Total	0.16	MG/KG	0.03	3.0
		Calcium, Total	4340	MG/KG	3.6	3.0
		Cadmium, Total	0.12 UJ	MG/KG	0.09	3.0
		Cobalt, Total	3.8	MG/KG	0.14	3.0
		Chromium, Total	7.4	MG/KG	0.35	3.0
		Copper, Total	10.8	MG/KG	0.20	3.0
		Iron, Total	9770	MG/KG	7.1	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	587	MG/KG	6.1	3.0
		Magnesium, Total	2930	MG/KG	1.3	3.0
		Manganese, Total	215	MG/KG	0.12	3.0
		Molybdenum, Total	0.47	MG/KG	0.46	3.0
		Sodium, Total	119	MG/KG	0.72	3.0
		Nickel, Total	9.5	MG/KG	0.64	3.0
		Lead, Total	5.2	MG/KG	0.46	3.0
		Antimony, Total	0.72 u J	MG/KG	0.72	3.0
		Selenium, Total	1.2 u	MG/KG	1.2	3.0
		Silicon, Total	439 J	MG/KG	1.9	3.0
		Vanadium, Total	21.0	MG/KG	0.17	3.0
		Zinc, Total	40.5	MG/KG	0.12	3.0

9/20/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/02/07

CLIENT: TNUHANFORD RC-032 K0691 LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J14CC0	Silver, Total	0.14 u	MG/KG	0.14	3.0
		Aluminum, Total	4360	MG/KG	6.1	3.0
		Arsenic, Total	2.6	MG/KG	0.89	3.0
		Boron, Total	0.55 u	MG/KG	0.55	3.0
		Barium, Total	34.4	MG/KG	0.03	3.0
		Beryllium, Total	0.16	MG/KG	0.03	3.0
		Calcium, Total	4000	MG/KG	3.6	3.0
		Cadmium, Total	0.15 UJ	MG/KG	0.09	3.0
		Cobalt, Total	4.3	MG/KG	0.14	3.0
		Chromium, Total	7.8	MG/KG	0.35	3.0
		Copper, Total	10.0	MG/KG	0.20	3.0
		Iron, Total	10900	MG/KG	7.0	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	649	MG/KG	6.1	3.0
		Magnesium, Total	3160	MG/KG	1.3	3.0
		Manganese, Total	221	MG/KG	0.12	3.0
		Molybdenum, Total	0.46 u	MG/KG	0.46	3.0
		Sodium, Total	117	MG/KG	0.72	3.0
		Nickel, Total	10.5	MG/KG	0.63	3.0
		Lead, Total	6.3	MG/KG	0.46	3.0
		Antimony, Total	0.72 uJ	MG/KG	0.72	3.0
		Selenium, Total	1.2 u	MG/KG	1.2	3.0
		Silicon, Total	484 J	MG/KG	1.8	3.0
		Vanadium, Total	24.6	MG/KG	0.17	3.0
		Zinc, Total	26.0	MG/KG	0.12	3.0

9/20/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032
LVL#: 0701L730
SDG/SAF#: K0691/RC-032

W.O.#: 11343-606-001-9999-00
Date Received: 01-24-07

METALS CASE NARRATIVE

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

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

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

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

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). Samples J14CB9 and J14CC0 were rerun due to a power failure that shut down the instrument without a valid CCV/CCB after these samples.

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

6. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 21.3%. 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.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 21 pages.

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

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
J14CB7	Aluminum	66,000	101.1
	Iron	66,000	96.5
	Antimony	300	105.8
	Silicon	6,300	105.2

11. The duplicate analyses for 4 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 Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

13. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. 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

2/6/07
Date

jjw/m01-730

LVLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-071	Page 1 of 1

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code	Data Turnaround: 15 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-26:10 (Road Cross) Verification		SAF No.: RC-032	Air Quality ☐	
Ice Chest No.: ERC-02-407	Field Logbook No.: EFL-1174-3	COA: R10F262000	Method of Shipment: Fed Ex		
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A070146		Bill of Lading/Air Bill No.: See OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

None

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	P	P			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	250mL	125mL	60mL	120mL	120mL	500mL	125mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	Pesticides - 8081	See item (2) in Special Instructions. RTC	Nickel-63; Strontium-89,90 -- Total Sr 1/22/07			
Sample No.	Matrix *	Sample Date	Sample Time								
J14CB7	SOIL	1-22-07	0730	X	X	X	X	X			
J14CB8	SOIL		0738	X	X	X	X	X			
J14CB9	SOIL		0745	X	X	X	X	X			
J14CC0	SOIL	1-22-07	0750	X	X	X	X	X			

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT COFFMAN / RT Coffman	1/22/07 1915	Refer #3C, 3728	1/22/07 1915
Refer 3C, 3728	1/23/07 0830	RVocks	1/23/07 0830
RVocks WCH	1/23/07 0830	Fed Ex	
Fed Ex	1-24-07 0935		1-24-07 0935

SPECIAL INSTRUCTIONS

NA

(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 (Silver-108 metastable)

Personnel not available to relinquish samples from 3728
Ref# 3C on 1/23/07

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

BHI-EE-011 (08/29/2005)

000072

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26:10			DATA PACKAGE: K0691		
VALIDATOR: ELR		LAB: LLI		DATE: 9/19/07	
			SDG: K0691		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J14CB7	J14CB8	J14CB9	J14CC0		
					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: boron all detects > UJ all no FB
Cadmium - all detects

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: MS - antimony 53.7% - J all no PAS
LCS - silicon - 21.3% - J all

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: Silicon - 46.3% - Jal

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 02/02/07

CLIENT: TNUHANFORD RC-032 K0691 LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	07L0051-MB1	Silver, Total	0.05 u	MG/KG	0.05	1.0
		Aluminum, Total	2.1 u	MG/KG	2.1	1.0
		Arsenic, Total	0.31 u	MG/KG	0.31	1.0
		Boron, Total	0.40	MG/KG	0.19	1.0
		Barium, Total	0.03	MG/KG	0.01	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	3.9	MG/KG	1.2	1.0
		Cadmium, Total	0.05	MG/KG	0.03	1.0
		Cobalt, Total	0.05 u	MG/KG	0.05	1.0
		Chromium, Total	0.18	MG/KG	0.12	1.0
		Copper, Total	0.07 u	MG/KG	0.07	1.0
		Iron, Total	2.4 u	MG/KG	2.4	1.0
		Potassium, Total	2.4	MG/KG	2.1	1.0
		Magnesium, Total	0.58	MG/KG	0.46	1.0
		Manganese, Total	0.04 u	MG/KG	0.04	1.0
		Molybdenum, Total	0.16 u	MG/KG	0.16	1.0
		Sodium, Total	3.9	MG/KG	0.25	1.0
		Nickel, Total	0.22 u	MG/KG	0.22	1.0
		Lead, Total	0.16 u	MG/KG	0.16	1.0
		Antimony, Total	0.25 u	MG/KG	0.25	1.0
		Selenium, Total	0.43 u	MG/KG	0.43	1.0
		Silicon, Total	1.3	MG/KG	0.64	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.14	MG/KG	0.04	1.0
BLANK1	07C0014-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/02/07

CLIENT: TNUHANFORD RC-032 K0691 LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J14CB7	Silver, Total	4.6	0.15u	4.9	93.9	3.0
		Aluminum, Total	6420	4800	194	832.4*	3.0
		Arsenic, Total	192	8.5	194	94.1	3.0
		Boron, Total	89.6	1.6	97.2	90.5	3.0
		Barium, Total	240	54.1	194	95.5	3.0
		Beryllium, Total	4.9	0.29	4.9	94.1	3.0
		Calcium, Total	6550	3980	2430	105.7	3.0
		Cadmium, Total	4.6	0.09u	4.9	93.9	3.0
		Cobalt, Total	51.6	5.2	48.6	95.5	3.0
		Chromium, Total	27.7	7.5	19.4	104.1	3.0
		Copper, Total	35.8	11.8	24.3	98.8	3.0
		Iron, Total	14600	12300	97.2	2328 *	3.0
		Mercury, Total	0.18	0.02u	0.17	107.8	1.0
		Potassium, Total	3280	964	2430	95.3	3.0
		Magnesium, Total	5980	3180	2430	115.3	3.0
		Manganese, Total	311	257	48.6	110.3*	3.0
		Molybdenum, Total	90.2	0.47u	97.2	92.8	3.0
		Sodium, Total	2360	116	2430	92.2	3.0
		Nickel, Total	57.2	8.8	48.6	99.8	3.0
		Lead, Total	69.4	24.9	48.6	91.6	3.0
		Antimony, Total	26.1	0.73u	48.6	53.7	3.0
		Selenium, Total	181	1.3 u	194	93.1	3.0
		Silicon, Total	896	466	97.2	442.4*	3.0
		Vanadium, Total	76.1	26.4	48.6	102.3	3.0
		Zinc, Total	80.2	30.5	48.6	102.3	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/02/07

CLIENT: TNUHANFORD RC-032 K0691 LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J14CB7	Silver, Total	0.15u	0.15u	NC	3.0
		Aluminum, Total	4800	4850	1.0	3.0
		Arsenic, Total	6.5	6.5	26.7	3.0
		Boron, Total	1.6	0.55u	~~NC~~ 200 corrected value pw 2/2/07	3.0
		Barium, Total	54.1	48.4	11.1	3.0
		Beryllium, Total	0.29	0.23	23.8	3.0
		Calcium, Total	3980	3450	14.4	3.0
		Cadmium, Total	0.09u	0.09u	NC	3.0
		Cobalt, Total	5.2	4.7	10.1	3.0
		Chromium, Total	7.5	7.6	1.3	3.0
		Copper, Total	11.8	10.2	14.5	3.0
		Iron, Total	12300	11100	10.7	3.0
		Mercury, Total	0.02u	0.01u	NC	1.0
		Potassium, Total	964	899	6.9	3.0
		Magnesium, Total	3180	3090	2.8	3.0
		Manganese, Total	257	228	12.0	3.0
		Molybdenum, Total	0.47u	0.47u	NC	3.0
		Sodium, Total	116	114	2.1	3.0
		Nickel, Total	8.8	8.4	4.7	3.0
		Lead, Total	24.9	21.6	14.2	3.0
		Antimony, Total	0.73u	0.73u	NC	3.0
		Selenium, Total	1.3 u	1.3 u	NC	3.0
		Silicon, Total	466	747	46.3	3.0
		Vanadium, Total	26.4	22.8	14.6	3.0
		Zinc, Total	30.5	28.0	8.5	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 02/02/07

CLIENT: TNUHANFORD RC-032 K0691

LVL LOT #: 0701L730

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	07L0051-LC1	Silver, LCS	47.1	50.0	MG/KG	94.2
		Aluminum, LCS	487	500	MG/KG	97.4
		Arsenic, LCS	935	1000	MG/KG	93.5
		Boron, LCS	457	500	MG/KG	91.5
		Barium, LCS	466	500	MG/KG	93.3
		Beryllium, LCS	24.1	25.0	MG/KG	96.4
		Calcium, LCS	2450	2500	MG/KG	98.1
		Cadmium, LCS	23.9	25.0	MG/KG	95.6
		Cobalt, LCS	234	250	MG/KG	93.5
		Chromium, LCS	48.9	50.0	MG/KG	97.8
		Copper, LCS	120	125	MG/KG	95.8
		Iron, LCS	470	500	MG/KG	93.9
		Potassium, LCS	2260	2500	MG/KG	90.3
		Magnesium, LCS	2370	2500	MG/KG	94.8
		Manganese, LCS	73.8	75.0	MG/KG	98.4
		Molybdenum, LCS	466	500	MG/KG	93.2
		Sodium, LCS	2260	2500	MG/KG	90.6
		Nickel, LCS	190	200	MG/KG	95.0
		Lead, LCS	240	250	MG/KG	96.1
		Antimony, LCS	289	300	MG/KG	96.4
		Selenium, LCS	912	1000	MG/KG	91.2
		Silicon, LCS	107	500	MG/KG	21.3
		Vanadium, LCS	234	250	MG/KG	93.7
		Zinc, LCS	94.1	100	MG/KG	94.1
LCS1	07C0014-LC1	Mercury, LCS	3.0	2.8	MG/KG	106.2