

SAF-RC-020
100-BC Burial Grounds –
Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02

mip 03/27/06
INITIAL/DATE

COMMENTS:

SDG K0164 SAF-RC-020

Waste Site: 118-C-3:3

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APR 24 2006
EDMC

Date: 9 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 118-C-3:3
Subject: Radiochemistry - Data Package No. K0164-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0164 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
J10V62	1/4/06	Soil	C	See note 1
J10V63	1/4/06	Soil	C	See note 1
J10V64	1/4/06	Soil	C	See note 1
J10V66	1/4/06	Soil	C	See note 1
J10V67	1/4/06	Soil	C	See note 1

1 – Gross alpha/beta, alpha spectroscopy (isotopic uranium) and gamma spectroscopy.

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

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

DATA QUALITY PARAMETERS

• Holding Times

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

All holding times were acceptable.

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· Preparation (Method) Blanks

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

· Accuracy

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

All accuracy results were acceptable.

· Laboratory Duplicates

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

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

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J10V66/J10V67) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicates were acceptable.

• **Detection Levels**

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

• **Completeness**

Data package No. K0164 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

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

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REFERENCES

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

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

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Appendix 1
Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with the BHI 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.

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Appendix 2

Summary of Data Qualification

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RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0164	REVIEWER: TLI	PROJECT: 118-C-3:3	PAGE <u>1</u> OF <u>1</u>
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.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: WASHINGTON CLOSURE HANFORD											
Laboratory: EB											
Case		SDG: K0164									
Sample Number		J10V62		J10V63		J10V64		J10V66		J10V67	
Remarks		Duplicate									
Sample Date		1/4/06		1/4/06		1/4/06		1/4/06		1/4/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross alpha		3.91		7.05		8.11		11.4		7.94	
Gross beta		18.7		18.5		22.6		18.5		19.3	
Uranium-233/234	1	0.482		0.625		0.620		0.587		0.595	
Uranium-235	1	0.015	U	0.051		0.020	U	0.022	U	0.028	
Uranium-238	1	0.564		0.580		0.564		0.602		0.676	
Potassium-40		9.42		6.86		9.14		U	U	10.1	
Cobalt 60	0.05	U	U*	U	U*	U	U*	U	U*	U	U*
Cesium 137	0.05	U	U*	U	U*	U	U*	U	U*	U	U*
Radium-226		0.474		U	U	0.437		U	U	0.390	
Radium-228		0.717		U	U	U	U	U	U	0.384	
Europium 152	0.1	U	U*	U	U*	U	U*	U	U*	U	U*
Europium 154	0.1	U	U*	U	U*	U	U*	U	U*	U	U*
Europium 155	0.1	U	U*	U	U*	U	U*	U	U*	U	U*
Thorium-228		0.617		U	U	U	U	0.464		0.532	
Thorium-232		0.717		U	U	U	U	U	U	0.384	
Uranium-235(gea)		U	U	U	U	U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U	U	U	U	U
Americium-241(gea)		U	U	U	U	U	U	U	U	U	U

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* - RQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0164

7700-001

J10V62

DATA SHEET

SDG <u>7700</u>	Client/Case no <u>Hanford</u>	SDG <u>K0164</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601030-01</u>	Client sample id <u>J10V62</u>	
Dept sample id <u>7700-001</u>	Location/Matrix <u>118-C-3:3 French Drains SOLID</u>	
Received <u>01/06/06</u>	Collected/Weight <u>01/04/06 10:00 529.8 g</u>	
* solids <u>92.2</u>	Custody/SAF No <u>RC-020-003</u>	<u>RC-020</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	3.91	2.9	3.7	10		93A
Gross Beta	12587-47-2	18.7	4.8	6.5	15		93B
Uranium 233/234	U-233/234	0.482	0.080	0.033	1.0		U
Uranium 235	15117-96-1	0.015	0.015	0.028	1.0	U	U
Uranium 238	U-238	0.564	0.086	0.023	1.0		U
Potassium 40	13966-00-2	9.42	3.8	0.90			GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.076	0.10	U	GAM
Radium 226	13982-63-3	0.474	0.18	0.15	0.10		GAM
Radium 228	15262-20-1	0.717	0.32	0.30	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.26	0.10	U	GAM
Europium 155	14391-16-3	U		0.21	0.10	U	GAM
Thorium 228	14274-82-9	0.617	0.14	0.12			GAM
Thorium 232	TH-232	0.717	0.32	0.30			GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		10		U	GAM
Americium 241	14596-10-2	U		0.31		U	GAM

100-BC Burial Grounds - Soil

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3/3/06

DATA SHEETS
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 SUMMARY DATA SECTION
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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0164

7700-002

J10V63

DATA SHEET

SDG <u>7700</u>	Client/Case no <u>Hanford</u>	SDG <u>K0164</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601030-02</u>	Client sample id <u>J10V63</u>	
Dept sample id <u>7700-002</u>	Location/Matrix <u>118-C-3:3 French Drains SOLID</u>	
Received <u>01/06/06</u>	Collected/Weight <u>01/04/06 12:46 546.6 g</u>	
% solids <u>93.1</u>	Custody/SAF No <u>RC-020-003 RC-020</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	7.05	3.4	3.4	10		93A
Gross Beta	12587-47-2	18.5	4.3	5.5	15		93B
Uranium 233/234	U-233/234	0.625	0.086	0.031	1.0		U
Uranium 235	15117-96-1	0.051	0.027	0.026	1.0		U
Uranium 238	U-238	0.580	0.086	0.031	1.0		U
Potassium 40	13966-00-2	6.86	1.2	0.92			GAM
Cobalt 60	10198-40-0	U		0.098	0.050	U	GAM
Cesium 137	10045-97-3	U		0.091	0.10	U	GAM
Radium 226	13982-63-3	U		0.21	0.10	U	GAM
Radium 228	15262-20-1	U		0.42	0.20	U	GAM
Europium 152	14683-23-9	U		0.27	0.10	U	GAM
Europium 154	15585-10-1	U		0.32	0.10	U	GAM
Europium 155	14391-16-3	U		0.21	0.10	U	GAM
Thorium 228	14274-82-9	U		0.15		U	GAM
Thorium 232	TH-232	U		0.42		U	GAM
Uranium 235	15117-96-1	U		0.33		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM

100-BC Burial Grounds - Soil

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0164

7700-003

J10V64

DATA SHEET

SDG <u>7700</u>	Client/Case no <u>Hanford</u>	SDG <u>K0164</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601030-03</u>	Client sample id <u>J10V64</u>	
Dept sample id <u>7700-003</u>	Location/Matrix <u>118-C-3:3 French Drains</u>	<u>SOLID</u>
Received <u>01/06/06</u>	Collected/Weight <u>01/04/06 14:42</u>	<u>626.1 g</u>
% solids <u>89.0</u>	Custody/SAF No <u>RC-020-003</u>	<u>RC-020</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	8.11	3.6	3.4	10		93A
Gross Beta	12587-47-2	22.6	4.6	5.6	15		93B
Uranium 233/234	U-233/234	0.620	0.094	0.032	1.0		U
Uranium 235	15117-96-1	0.020	0.024	0.031	1.0	U	U
Uranium 238	U-238	0.564	0.087	0.032	1.0		U
Potassium 40	13966-00-2	9.14	1.4	0.76			GAM
Cobalt 60	10198-40-0	U		0.078	0.050	U	GAM
Cesium 137	10045-97-3	U		0.070	0.10	U	GAM
Radium 226	13982-63-3	0.437	0.15	0.15	0.10		GAM
Radium 228	15262-20-1	U		1.1	0.20	U	GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.23	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	U		0.63		U	GAM
Thorium 232	TH-232	U		1.1		U	GAM
Uranium 235	15117-96-1	U		0.29		U	GAM
Uranium 238	U-238	U		8.9		U	GAM
Americium 241	14596-10-2	U		0.36		U	GAM

100-BC Burial Grounds - Soil

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0164

7700-005

J10V67

DATA SHEET

SDG <u>7700</u>	Client/Case no <u>Hanford</u>	SDG <u>K0164</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601030-05</u>	Client sample id <u>J10V67</u>	
Dept sample id <u>7700-005</u>	Location/Matrix <u>118-C-3:3 French Drains</u>	<u>SOLID</u>
Received <u>01/06/06</u>	Collected/Weight <u>01/04/06 16:15</u>	<u>622.9 g</u>
% solids <u>92.0</u>	Custody/SAF No <u>RC-020-003</u>	<u>RC-020</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	7.94	3.8	4.1	10		93A
Gross Beta	12587-47-2	19.3	4.6	5.9	15		93B
Uranium 233/234	U-233/234	0.595	0.088	0.032	1.0		U
Uranium 235	15117-96-1	0.028	0.021	0.027	1.0		U
Uranium 238	U-238	0.676	0.089	0.022	1.0		U
Potassium 40	13966-00-2	10.1	1.8	1.2			GAM
Cobalt 60	10198-40-0	U		<u>0.11</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.10	0.10	U	GAM
Radium 226	13982-63-3	0.390	0.16	<u>0.19</u>	0.10		GAM
Radium 228	15262-20-1	0.384	0.34	<u>0.41</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.21</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.34</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.21</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.532	0.14	0.16			GAM
Thorium 232	TH-232	0.384	0.34	0.41		U	GAM
Uranium 235	15117-96-1	U		0.33		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.23		U	GAM

100-BC Burial Grounds - Soil

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
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Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0164

7700-004

J10V66

DATA SHEET

SDG <u>7700</u>	Client/Case no <u>Hanford</u>	SDG <u>K0164</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601030-04</u>	Client sample id <u>J10V66</u>	
Dept sample id <u>7700-004</u>	Location/Matrix <u>118-C-3:3 French Drains</u>	<u>SOLID</u>
Received <u>01/06/06</u>	Collected/Weight <u>01/04/06 16:10</u>	<u>613.1 g</u>
% solids <u>92.2</u>	Custody/SAF No <u>RC-020-003</u>	<u>RC-020</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	11.4	4.2	3.7	10		93A
Gross Beta	12587-47-2	18.5	5.6	7.9	15		93B
Uranium 233/234	U-233/234	0.587	0.086	0.029	1.0		U
Uranium 235	15117-96-1	0.022	0.022	0.028	1.0	U	U
Uranium 238	U-238	0.602	0.086	0.029	1.0		U
Potassium 40	13966-00-2	U		14		U	GAM
Cobalt 60	10198-40-0	U		0.085	0.050	U	GAM
Cesium 137	10045-97-3	U		0.070	0.10	U	GAM
Radium 226	13982-63-3	U		0.56	0.10	U	GAM
Radium 228	15262-20-1	U		0.99	0.20	U	GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.26	0.10	U	GAM
Europium 155	14391-16-3	U		0.19	0.10	U	GAM
Thorium 228	14274-82-9	0.464	0.18	0.12			GAM
Thorium 232	TH-232	U		0.99		U	GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		8.5		U	GAM
Americium 241	14596-10-2	U		0.24		U	GAM

100-BC Burial Grounds - Soil

DATA SHEETS

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SUMMARY DATA SECTION

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Report date <u>02/08/06</u>

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0164 was composed of five solid (soil) samples designated under SAF No. RC-020 with a Project Designation of: 100-BC Burial Grounds – Soil Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on January 17, 2006 and February 8, 2006.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Isotopic Uranium 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.

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 C. Mannion
Senior Program Manager

2/10/06

Date

Collector Doug Bowers/C. Martinez	Company Contact Doug Bowers	Telephone No. 509-531-0701	Project Coordinator KESSNER, JH.	Price Code	Data Turnaround
Project Designation 100-BC Burial Grounds - Soil Full Protocol	Sampling Location 118-C-3:3 (French Drains)	SAF No. RC-020	Air Quality <input type="checkbox"/> 7 days		
Ice Chest No. AFS-04-040	Field Logbook No. EFL-1173-6	COA C11BX4A000	Method of Shipment Fed ex		
Shipped To EBERLINE SERVICES UNIONVILLE	Offsite Property No. A060188	Bill of Lading/Air Bill No. See OSPC			

POSSIBLE SAMPLE HAZARDS/REMARKS none < POT limits Special Handling and/or Storage Cool 4 degrees centigrade RTS 1-5-06 None 000018	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
	Type of Container	G/P	G/P	aG	aG	G/P					
	No. of Container(s)	1	1	1	1	1					
	Volume	250g	250mL	250mL	250mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 607	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.						RCF

Sample No.	Matrix *	Sample Date	Sample Time								
J10V62	SOIL	01/24/06	1000	N/A	N/A	N/A	N/A	✓			J10W02
J10V63	SOIL	01/04/06	1246	N/A	N/A	N/A	N/A	✓			
J10V64	SOIL	01/04/06	1442	N/A	N/A	N/A	N/A	✓			
J10V65	SOIL	01/04/06	1600		24/06/05						
J10V66	SOIL	01/04/06	1610	N/A	N/A	N/A	N/A	✓			

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *
Relinquished By/Removed From Doug Bowers Date/Time 1-7-06/1650	Received By/Stored In 100BC sample RMISA Date/Time 1-7-06/1650			(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 - 7470 (CV) (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable) (2) Analyze for gross A, gross B from available material Personnel not available to Relinquish samples from 3728 Ref # 18 on 1/5/06	S=Soil SE=Substrate 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	
Relinquished By/Removed From 100BC Sample RMISA Date/Time 1-5-06	Received By/Stored In Kevin Singleton Date/Time 1-5-06					
Relinquished By/Removed From Kevin Singleton Date/Time 1-5-06	Received By/Stored In REF 1B Date/Time 1-5-06					
Relinquished By/Removed From REF 1B Date/Time 1-5-06 1420	Received By/Stored In RZ Steffler R.Z. Steffler Date/Time 1-5-06 1420					
Relinquished By/Removed From RZ Steffler R.Z. Steffler Date/Time 1-5-06 1430	Received By/Stored In Fed Ex Date/Time 1-5-06 1430					
Relinquished By/Removed From Fed Ex Date/Time	Received By/Stored In RFM Date/Time 01/06/06 9:45					

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

Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-020-003		Page 2 of 2		
Collector Doug Bowers/C. Martinez			Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		Data Turnaround	
Project Designation 100-BC Burial Grounds - Soil Full Protocol			Sampling Location 118-C-3:3 (French Drains)			SAP No. RC-020		Air Quality <input type="checkbox"/>		7 days		
Ice Chest No. <i>AFS-04-040</i>			Field Logbook No. EFL-1173-6		COA C11BX4A000		Method of Shipment Fed ex					
Shipped To <u>EBERLINE SERVICES</u> NIONVILLE			Offsite Property No. <i>A060188</i>			Bill of Lading/Air Bill No. <i>See OSLC</i>						
POSSIBLE SAMPLE HAZARDS/REMARKS <i>none</i>				Preservation	None	Cool 4C	Cool 4C	Cool 4C	None			
Special Handling and/or Storage <i>Cool 4 degrees centigrade</i>				Type of Container	G/P	G/P	aG	aG	G/P			
				No. of Container(s)	1	1	1	1	1			
				Volume	250g	250mL	250mL	250mL	500mL			
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.				
				<i>RCF</i>								
Sample No.	Matrix *	Sample Date	Sample Time									
J10V67	SOIL	01/04/06	1615	N/A	N/A	N/A	N/A	✓	J10W02			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From <i>Doug</i>		Date/Time <i>1-4-06/1650</i>		Received By/Stored In <i>1000 sample NUSA</i>		Date/Time <i>1-4-06/1650</i>		(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 - 7470 - (CV) (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable) <i>(2) analyze for gross alpha, gross beta from available material</i> Personnel not available to relinquish samples from 3728 Ref # 1B on 1-5-06				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
Relinquished By/Removed From <i>1000 Sample RMSA</i>		Date/Time <i>1-5-06</i>		Received By/Stored In <i>Kevin Single</i>		Date/Time <i>1-5-06</i>						
Relinquished By/Removed From <i>Kevin Single</i>		Date/Time <i>1-5-06</i>		Received By/Stored In <i>Ref 1B</i>		Date/Time <i>1-5-06</i>						
Relinquished By/Removed From <i>Ref 1B</i>		Date/Time <i>1-5-06</i>		Received By/Stored In <i>R2 Staffer R. J. Staff</i>		Date/Time <i>1-5-06</i>						
Relinquished By/Removed From <i>R2 Staffer R. J. Staff</i>		Date/Time <i>1-5-06</i>		Received By/Stored In <i>FLD EX</i>		Date/Time						
Relinquished By/Removed From <i>FLD EX</i>		Date/Time		Received By/Stored In <i>MFU</i>		Date/Time <i>01/06/06</i>						
LABORATORY SECTION		Received By						Date/Time				
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time				

Appendix 5

Data Validation Supporting Documentation

000020

**APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	118-C-3:3		DATA PACKAGE: 20164		
VALIDATOR:	727	LAB: EBS	DATE: 3/2/06		
			SDG: 20164		
ANALYSES PERFORMED					
Gross Alpha/Beta Total Uranium	Strontium-90 Radium-22	Technetium-99 Tritium	Alpha Spectroscopy	Gamma Spectroscopy	
SAMPLES/MATRIX					
	J10062	J10063	J10064	J10066	J10067
					So. 1

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: _____

090021

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: _____

000022

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

000023

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: _____

000024

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

Duplicates Analyzed at required frequency? Yes No N/A

RPD Values Acceptable? Yes No N/A

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

Comments: _____

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

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

Field duplicate RPD values acceptable? Yes No N/A

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

Field split RPD values acceptable? Yes No N/A

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

Performance audit sample results acceptable? Yes No N/A

Comments: _____

no FS/PAF

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A

Comments: _____

000025

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

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

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

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

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

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

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

Comments: 29 over

Appendix 6

Additional Documentation Requested by Client

000027

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0164

7700-007

Method Blank

METHOD BLANK

SDG <u>7700</u>	Client/Case no <u>Hanford</u>	<u>SDG K0164</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601030-07</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7700-007</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-020</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.990	1.5	4.1	10	U	93A
Gross Beta	12587-47-2	0.064	3.1	5.6	15	U	93B
Potassium 40	13966-00-2	U		2.3		U	GAM
Cobalt 60	10198-40-0	U		<u>0.11</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.086	0.10	U	GAM
Radium 226	13982-63-3	U		<u>0.16</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>0.37</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.19</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.28</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.21</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.11		U	GAM
Thorium 232	TH-232	U		0.37		U	GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		9.6		U	GAM
Americium 241	14596-10-2	U		0.23		U	GAM

100-BC Burial Grounds - Soil

QC-BLANK #55674

000028

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0164

7700-010

Method Blank

METHOD BLANK

SDG <u>7700</u>	Client/Case no <u>Hanford</u>	SDG <u>K0164</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601030-10</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7700-010</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-020</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	-0.009	0.026	0.048	1.0	U	U
Uranium 235	15117-96-1	-0.005	0.010	0.040	1.0	U	U
Uranium 238	U-238	-0.004	0.017	0.041	1.0	U	U

100-BC Burial Grounds - Soil

QC-BLANK #55871

000029

Lab id <u>EBRLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0164

7700-006

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7700</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R601030-06</u> Dept sample id <u>7700-006</u>	Client/Case no <u>Hanford</u> SDG <u>K0164</u> Contract <u>No. 630</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>RC-020</u>
---	---

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	‡	(TOTAL)	LIMITS
Gross Alpha	164	15	4.4	10	93A	229	9.2	<u>72</u>	76-124	70-130
Gross Beta	210	10	5.7	15	93B	217	8.7	97	76-124	70-130
Cobalt 60	3.52	0.22	<u>0.10</u>	0.050	GAM	3.22	0.13	109	73-127	80-120
Cesium 137	2.37	0.17	<u>0.14</u>	0.10	GAM	2.38	0.095	100	74-126	80-120

100-BC Burial Grounds - Soil

QC-LCS #55673

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

000030

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0164

7700-009

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7700</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R601030-09</u> Dept sample id <u>7700-009</u>	Client/Case no <u>Hanford</u> SDG <u>K0164</u> Contract No. <u>630</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>RC-020</u>
---	---

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	%	(TOTAL)	LIMITS
Uranium 233/234	19.0	0.66	0.29	1.0	U	19.3	0.77	98	89-111	80-120
Uranium 235	15.9	0.59	0.030	1.0	U	15.7	0.63	101	89-111	80-120
Uranium 238	19.9	0.68	0.28	1.0	U	21.0	0.84	95	90-110	80-120

100-BC Burial Grounds - Soil

QC-LCS #55870

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

000031

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0164

7700-008

J10V64

DUPLICATE

SDG <u>7700</u>	Client/Case no <u>Hanford</u>	SDG <u>K0164</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R601030-08</u>	Lab sample id <u>R601030-03</u>	Client sample id <u>J10V64</u>
Dept sample id <u>7700-008</u>	Dept sample id <u>7700-003</u>	Location/Matrix <u>118-C-3:3 French Drains SOLID</u>
	Received <u>01/06/06</u>	Collected/Weight <u>01/04/06 14:42 626.1 g</u>
% solids <u>89.0</u>	% solids <u>89.0</u>	Custody/SAF No <u>RC-020-003 RC-020</u>

ANALYTE	DUPLICATE		MDA		RDL		QUALI- FIERS	TEST	ORIGINAL		MDA		QUALI- FIERS	RPD %	3σ TOT	DER σ
	pCi/g	2σ ERR (COUNT)	pCi/g	pCi/g	pCi/g	pCi/g			pCi/g	2σ ERR (COUNT)	pCi/g					
Gross Alpha	7.81	3.6	3.4	10			93A		8.11	3.6	3.4		4	105	0.1	
Gross Beta	22.3	4.8	6.0	15			93B		22.6	4.6	5.6		1	55	0.1	
Potassium 40	8.98	1.5	1.0				GAM		9.14	1.4	0.76		2	47	0.1	
Cobalt 60	U		<u>0.13</u>	0.050	U		GAM		U		<u>0.078</u>	U	-		0.7	
Cesium 137	U		<u>0.12</u>	0.10	U		GAM		U		<u>0.070</u>	U	-		0.7	
Radium 226	0.505	0.29	<u>0.19</u>	0.10			GAM		0.437	0.15	<u>0.15</u>		14	109	0.4	
Radium 228	U		<u>0.58</u>	0.20	U		GAM		U		<u>1.1</u>	U	-		0.8	
Europlum 152	U		<u>0.38</u>	0.10	U		GAM		U		<u>0.17</u>	U	-		1.0	
Europlum 154	U		<u>0.41</u>	0.10	U		GAM		U		<u>0.23</u>	U	-		0.8	
Europlum 155	U		<u>0.20</u>	0.10	U		GAM		U		<u>0.18</u>	U	-		0.1	
Thorium 228	U		1.1		U		GAM		U		0.63	U	-		0.7	
Thorium 232	U		0.58		U		GAM		U		1.1	U	-		0.8	
Uranium 235	U		0.36		U		GAM		U		0.29	U	-		0.3	
Uranium 238	U		15		U		GAM		U		8.9	U	-		0.7	
Americium 241	U		0.13		U		GAM		U		0.36	U	-		1.2	

100-BC Burial Grounds - Soil

QC-DUP#3 55675

DUPLICATES

Page 1

SUMMARY DATA SECTION

Page 12

000032

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0164

7700-011

J10V64

DUPLICATE

SDG <u>7700</u> Contact <u>Melissa C. Mannion</u> Duplicates Lab sample id <u>R601030-11</u> Dept sample id <u>7700-011</u> % solids <u>89.0</u>	Client/Case no <u>Hanford</u> SDG <u>K0164</u> Contract No. <u>630</u> ORIGINAL Lab sample id <u>R601030-03</u> Dept sample id <u>7700-003</u> Received <u>01/06/06</u> % solids <u>89.0</u>
Client sample id <u>J10V64</u> Location/Matrix <u>118-C-3:3 French Drains SOLID</u> Collected/Weight <u>01/04/06 14:42 626.1 g</u> Custody/SAF No <u>RC-020-003</u> <u>RC-020</u>	

ANALYTE	DUPLICATE		2σ ERR		MDA	RDL	QUALI-	TEST	ORIGINAL		2σ ERR		MDA	QUALI-	RPD	3σ	DER
	pCi/g		(COUNT)		pCi/g	pCi/g	FIERS		pCi/g	(COUNT)	pCi/g	FIERS	%	TOT	σ		
Uranium 233/234	0.634		0.090		0.028	1.0		U	0.620	0.094		0.032		2	33	0.2	
Uranium 235	0.029		0.022		0.027	1.0		U	0.020	0.024		0.031	U	37	200	0.6	
Uranium 238	0.595		0.084		0.023	1.0		U	0.564	0.087		0.032		5	33	0.5	

100-BC Burial Grounds - Soil

QC-DUP#3 55872

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>02/08/06</u>

000033

Date: 9 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 118-C-3:3
Subject: Inorganics - Data Package No. K0164-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0164 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
J10V62	1/4/06	Soil	C	See note 1
J10V63	1/4/06	Soil	C	See note 1
J10V64	1/4/06	Soil	C	See note 1
J10V65	1/4/06	Soil	C	See note 1
J10V66	1/4/06	Soil	C	See note 1
J10V67	1/4/06	Soil	C	See note 1

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

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

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and 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.

000001

• 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 antimony results were qualified as estimates and flagged "UJ".

Due to method blank contamination, the molybdenum result in samples J10V63 and J10V67 were qualified as estimates and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J10V65) was submitted for analysis. Aluminum, barium, calcium, chromium, iron, potassium, manganese, magnesium, sodium, silicon, vanadium and zinc were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

• Accuracy

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations.

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Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a MS recovery outside QC limits (140.3%), all calcium results were qualified as estimates and flagged "J".

Due to a MS recovery outside QC limits (48.5%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (67.1%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

• **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J10V66/J10V67) were submitted for analysis. Field duplicates are assessed using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

• **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to

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ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. K0164 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 antimony results were qualified as estimates and flagged "UJ".
- Due to method blank contamination, the molybdenum result in samples J10V63 and J10V67 were qualified as estimates and flagged "UJ".
- Due to a MS recovery outside QC limits (140.3%), all calcium results were qualified as estimates and flagged "J".
- Due to a MS recovery outside QC limits (48.5%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (67.1%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI 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-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

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Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with BHI 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).

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Appendix 2
Summary of Data Qualification

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METALS DATA QUALIFICATION SUMMARY*

SDG: K0164	REVIEWER: TLI	Project: 118-C-3:3	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	UJ	J10V63, J10V64 J10V66, J10V67	Blank contamination
Molybdenum	UJ	J10V63, J10V67	Blank contamination
Calcium Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

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

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: WASHINGTON CLOSURE HANFORD																		
Lab: LLI		SDG: K0164																
Sample Number	J10V62			J10V63			J10V64			J10V65			J10V66			J10V67		
Remarks													E. Blank			Duplicate		
Sample Date	1/4/06			1/4/06			1/4/06			1/4/06			1/4/06					
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q			
Silver	0.2	0.14	U	0.14	U	0.14	U	0.13	U	0.14	U	0.13	U					
Aluminum		5060		5090		7580		55.0		4460		4600						
Arsenic	10	3.0		2.7		3.4		0.31	U	1.7		2.2						
Boron		1.0		0.64		1.4		0.24	U	0.94		0.98						
Barium	2	47.5		50.8		80.0		1.3		50.1		68.2						
Beryllium		0.66		0.69		0.50		0.009	U	0.48		0.54						
Calcium		7120	J	7300	J	6950	J	31.6	J	5140	J	5160	J					
Cadmium	0.2	0.07	U	0.07	U	0.07	U	0.06	U	0.07	U	0.07	U					
Cobalt		7.1		7.4		6.7		0.11	U	5.6		5.8						
Chromium	1	7.3		5.6		16.4		0.18		6.8		7.4						
Copper		14.6		38.3		15.1		0.11	U	13.6		14.1						
Iron		21000		22700		18300		562		16600		16800						
Mercury	0.2	0.80		0.02	U	0.02	U	0.02	U	0.01	U	0.02						
Potassium		907		704		1150		59.0		796		917						
Magnesium		4470		3830		5510		8.8		3290		3470						
Manganese		297		291		287		9.2		264		265						
Molybdenum		0.13	U	0.25	UJ	0.13	U	0.12	U	0.13	U	0.27	UJ					
Sodium		162		151		1172		7.5		120		130						
Nickel		10.1		8.2		14.4		1.2	U	8.4		8.9						
Lead	5	5.7		7.9		5.6		0.28	U	5.4		6.5						
Antimony		0.39	UJ	0.57	UJ	0.56	UJ	0.36	UJ	0.43	UJ	0.59	UJ					
Selenium	1	0.35	U	0.35	U	0.36	U	0.32	U	0.37		0.34	U					
Silicon		467	J	457	J	736	J	59.2	J	693	J	693	J					
Vanadium		48.7		46.8		32.8		0.1		38.1		40.9						
Zinc	1	50.2		41.6		45.2		1.2		34.3		37.4						

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/17/06

CLIENT: TNUHANFORD RC-020 K0164
 WORK ORDER: 11143-606-001-9999-00

LVL LOT #: 0601L051

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10V62	Silver, Total	0.14	u MG/KG	0.14	1.0
		Aluminum, Total	5060	MG/KG	3.0	1.0
		Arsenic, Total	3.0	MG/KG	0.33	1.0
		Boron, Total	1.0	MG/KG	0.26	1.0
		Barium, Total	47.5	MG/KG	0.02	1.0
		Beryllium, Total	0.66	MG/KG	0.01	1.0
		Calcium, Total	7120	J MG/KG	1.2	1.0
		Cadmium, Total	0.07	u MG/KG	0.07	1.0
		Cobalt, Total	7.1	MG/KG	0.12	1.0
		Chromium, Total	7.3	MG/KG	0.16	1.0
		Copper, Total	14.6	MG/KG	0.12	1.0
		Iron, Total	21000	MG/KG	3.1	1.0
		Mercury, Total	0.80	MG/KG	0.02	1.0
		Potassium, Total	907	MG/KG	52.3	1.0
		Magnesium, Total	4470	MG/KG	1.3	1.0
		Manganese, Total	297	MG/KG	0.02	1.0
		Molybdenum, Total	0.13	u MG/KG	0.13	1.0
		Sodium, Total	162	MG/KG	2.7	1.0
		Nickel, Total	10.1	MG/KG	1.2	1.0
		Lead, Total	5.7	MG/KG	0.30	1.0
		Antimony, Total	0.39	u J MG/KG	0.39	1.0
		Selenium, Total	0.35	u MG/KG	0.35	1.0
		Silicon, Total	467	J MG/KG	0.79	1.0
		Vanadium, Total	48.7	MG/KG	0.09	1.0
		Zinc, Total	50.2	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/17/06

CLIENT: TNUHANFORD RC-020 K0164
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L051

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J10V63	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	5090	MG/KG	2.9	1.0
		Arsenic, Total	2.7	MG/KG	0.33	1.0
		Boron, Total	0.64	MG/KG	0.26	1.0
		Barium, Total	50.8	MG/KG	0.02	1.0
		Beryllium, Total	0.69	MG/KG	0.01	1.0
		Calcium, Total	7300	J MG/KG	1.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	7.4	MG/KG	0.12	1.0
		Chromium, Total	5.6	MG/KG	0.15	1.0
		Copper, Total	38.3	MG/KG	0.12	1.0
		Iron, Total	22700	MG/KG	3.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	704	MG/KG	52.2	1.0
		Magnesium, Total	3830	MG/KG	1.3	1.0
		Manganese, Total	291	MG/KG	0.02	1.0
		Molybdenum, Total	0.25 U	J MG/KG	0.13	1.0
		Sodium, Total	151	MG/KG	2.7	1.0
		Nickel, Total	8.2	MG/KG	1.2	1.0
		Lead, Total	7.9	MG/KG	0.30	1.0
		Antimony, Total	0.57 U	J MG/KG	0.39	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0
		Silicon, Total	457	J MG/KG	0.79	1.0
		Vanadium, Total	46.8	MG/KG	0.09	1.0
		Zinc, Total	41.6	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/17/06

CLIENT: TNUHANFORD RC-020 K0164
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L051

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J10V64	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	7580	MG/KG	3.1	1.0
		Arsenic, Total	3.4	MG/KG	0.34	1.0
		Boron, Total	1.4	MG/KG	0.27	1.0
		Barium, Total	80.0	MG/KG	0.02	1.0
		Beryllium, Total	0.50	MG/KG	0.01	1.0
		Calcium, Total	6950 J	MG/KG	1.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	6.7	MG/KG	0.12	1.0
		Chromium, Total	16.4	MG/KG	0.16	1.0
		Copper, Total	15.1	MG/KG	0.12	1.0
		Iron, Total	18300	MG/KG	3.2	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1150	MG/KG	54.0	1.0
		Magnesium, Total	5510	MG/KG	1.4	1.0
		Manganese, Total	287	MG/KG	0.02	1.0
		Molybdenum, Total	0.13 u	MG/KG	0.13	1.0
		Sodium, Total	172	MG/KG	2.8	1.0
		Nickel, Total	14.4	MG/KG	1.3	1.0
		Lead, Total	5.8	MG/KG	0.31	1.0
		Antimony, Total	0.56 J	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	736 J	MG/KG	0.82	1.0
		Vanadium, Total	32.8	MG/KG	0.09	1.0
		Zinc, Total	45.2	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/17/06

CLIENT: TNUANFORD RC-020 K0164

LVL LOT #: 0601L051

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J10V65	Silver, Total	0.13	u MG/KG	0.13	1.0
		Aluminum, Total	55.0	MG/KG	2.7	1.0
		Arsenic, Total	0.31	u MG/KG	0.31	1.0
		Boron, Total	0.24	u MG/KG	0.24	1.0
		Barium, Total	1.3	MG/KG	0.02	1.0
		Beryllium, Total	0.009	u MG/KG	0.009	1.0
		Calcium, Total	31.6	J MG/KG	1.1	1.0
		Cadmium, Total	0.06	u MG/KG	0.06	1.0
		Cobalt, Total	0.11	u MG/KG	0.11	1.0
		Chromium, Total	0.18	MG/KG	0.14	1.0
		Copper, Total	0.11	u MG/KG	0.11	1.0
		Iron, Total	562	MG/KG	2.9	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Potassium, Total	59.0	MG/KG	48.6	1.0
		Magnesium, Total	8.8	MG/KG	1.2	1.0
		Manganese, Total	9.2	MG/KG	0.02	1.0
		Molybdenum, Total	0.12	u MG/KG	0.12	1.0
		Sodium, Total	7.5	MG/KG	2.5	1.0
		Nickel, Total	1.2	u MG/KG	1.2	1.0
		Lead, Total	0.28	u MG/KG	0.28	1.0
		Antimony, Total	0.36	u MG/KG	0.36	1.0
		Selenium, Total	0.32	u MG/KG	0.32	1.0
		Silicon, Total	59.2	J MG/KG	0.74	1.0
		Vanadium, Total	0.1	MG/KG	0.08	1.0
		Zinc, Total	1.2	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/17/06

CLIENT: TNUHANFORD RC-020 K0164

LVL LOT #: 0601L051

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J10V66	Silver, Total	0.14	u MG/KG	0.14	1.0
		Aluminum, Total	4460	MG/KG	2.9	1.0
		Arsenic, Total	1.7	MG/KG	0.33	1.0
		Boron, Total	0.94	MG/KG	0.26	1.0
		Barium, Total	50.1	MG/KG	0.02	1.0
		Beryllium, Total	0.48	MG/KG	0.01	1.0
		Calcium, Total	5140	J MG/KG	1.1	1.0
		Cadmium, Total	0.07	u MG/KG	0.07	1.0
		Cobalt, Total	5.6	MG/KG	0.12	1.0
		Chromium, Total	6.8	MG/KG	0.15	1.0
		Copper, Total	13.6	MG/KG	0.12	1.0
		Iron, Total	16600	MG/KG	3.1	1.0
		Mercury, Total	0.01	u MG/KG	0.01	1.0
		Potassium, Total	796	MG/KG	52.1	1.0
		Magnesium, Total	3290	MG/KG	1.3	1.0
		Manganese, Total	264	MG/KG	0.02	1.0
		Molybdenum, Total	0.13	u MG/KG	0.13	1.0
		Sodium, Total	120	MG/KG	2.7	1.0
		Nickel, Total	8.4	MG/KG	1.2	1.0
		Lead, Total	5.4	MG/KG	0.30	1.0
		Antimony, Total	0.43	J MG/KG	0.39	1.0
		Selenium, Total	0.37	MG/KG	0.35	1.0
		Silicon, Total	693	J MG/KG	0.79	1.0
		Vanadium, Total	38.1	MG/KG	0.09	1.0
		Zinc, Total	34.3	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/17/06

CLIENT: TNUHANFORD RC-020 K0164

LVL LOT #: 0601L051

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J10V67	Silver, Total	0.13	u MG/KG	0.13	1.0
		Aluminum, Total	4600	MG/KG	2.9	1.0
		Arsenic, Total	2.2	MG/KG	0.33	1.0
		Boron, Total	0.98	MG/KG	0.26	1.0
		Barium, Total	68.2	MG/KG	0.02	1.0
		Beryllium, Total	0.54	MG/KG	0.01	1.0
		Calcium, Total	5160	MG/KG	1.1	1.0
		Cadmium, Total	0.07	u MG/KG	0.07	1.0
		Cobalt, Total	5.8	MG/KG	0.11	1.0
		Chromium, Total	7.4	MG/KG	0.15	1.0
		Copper, Total	14.1	MG/KG	0.11	1.0
		Iron, Total	16800	MG/KG	3.1	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Potassium, Total	917	MG/KG	51.7	1.0
		Magnesium, Total	3470	MG/KG	1.3	1.0
		Manganese, Total	265	MG/KG	0.02	1.0
		Molybdenum, Total	0.27	u MG/KG	0.12	1.0
		Sodium, Total	130	MG/KG	2.7	1.0
		Nickel, Total	8.9	MG/KG	1.2	1.0
		Lead, Total	6.6	MG/KG	0.30	1.0
		Antimony, Total	0.59	u MG/KG	0.38	1.0
		Selenium, Total	0.34	u MG/KG	0.34	1.0
		Silicon, Total	693	MG/KG	0.79	1.0
		Vanadium, Total	40.9	MG/KG	0.09	1.0
		Zinc, Total	37.4	MG/KG	0.05	1.0

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Analytical Report

Client: TNU-HANFORD RC-020
LVL#: 0601L051
SDG/SAF#: K0164/RC-020

W.O.#: 11343-606-001-9999-00
Date Received: 01-06-06

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were rerun for Aluminum, Potassium, Sodium, and Nickel due to high concentrations and sample matrix.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 67.1%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.
10. The matrix spike (MS) recoveries for 6 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

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 26 pages.

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<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
J10V62	Aluminum	42,000	97.7
	Calcium	22,000	90.7
	Iron	42,000	103.2
	Antimony	100	99.2
	Silicon	2,100	91.8

12. The duplicate analyses for 4 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
14. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

for Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

jjw/m01-051

1/20/06
Date



000020

Collector Doug Bowers/C. Martinez	Company Contact Doug Bowers	Telephone No. 509-531-0701	Project Coordinator KESSNER, JH	Price Code	Data Turnaround
Project Designation 100-BC Burial Grounds - Soil Full Protocol	Sampling Location 118-C-3:3 (French Drains)	SAF No. RC-020	Air Quality <input type="checkbox"/> 7 days		
Ice Chest No. AFS-04-023	Field Logbook No. EFL-1173-6	COA CI1BX4A000	Method of Shipment Fed ex		
Shipped To EBERLINE SERVICES LIONVILLE		Office Property No. A060206	Bill of Lading/Air Bill No. See OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS none < POT limits Special Handling and/or Storage Cool 4 degrees centigrade 0000021	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None				
	Type of Container	G/P	G/P	gG	gG	GP				
	No. of Container(s)	1	1	1	1					
	Volume	250g	250mL	250mL	250mL	500mL				
SAMPLE ANALYSIS		See Item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 802	Semi-VOCs - 8270A (TCL)	See Item (2) in Special Instructions.				RCF

Sample No.	Matrix *	Sample Date	Sample Time							
J10V62	SOIL	01/04/06	1000	✓	✓	✓	✓	6		J10W02
J10V63	SOIL	01/04/06	1246	✓	✓	✓	✓			
J10V64	SOIL	01/04/06	1442	✓	✓	✓	✓			
J10V65	SOIL	01/04/06	1600	✓	N/A	N/A	✓			
J10V66	SOIL	01/04/06	1610	✓	✓	✓	✓			

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix * S=Soil SS=Solids SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Time W=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From <i>Doug Bowers</i>	Date/Time 1-4-06/1450	Received By/Stored In <i>100 BC sample RUSA</i>	Date/Time 1-4-06/1650	(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 - 7470 - (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 # 18 on 1/5/06		
Relinquished By/Removed From <i>100 BC Sample RUSA</i>	Date/Time 1-5-06	Received By/Stored In <i>Kevin Singleton</i>	Date/Time 0800			
Relinquished By/Removed From <i>Kevin Singleton</i>	Date/Time 0955	Received By/Stored In <i>RCF 1B</i>	Date/Time 0955			
Relinquished By/Removed From <i>Ref 1B</i>	Date/Time 1-5-06	Received By/Stored In <i>R2 Staffler R. J. Staffler</i>	Date/Time 1428			
Relinquished By/Removed From <i>R2 Staffler R. J. Staffler</i>	Date/Time 1-5-06	Received By/Stored In <i>Fed Ex</i>	Date/Time 1135			
Relinquished By/Removed From <i>Fed Ex</i>	Date/Time 1-6-06	Received By/Stored In <i>V. Hernandez</i>	Date/Time 0915			

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

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-020-003		Page 2 of 2			
Collector Doug Bowers/C. Martinez		Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code Data Turnaround			
Project Designation 100-BC Burial Grounds - Soil Full Protocol		Sampling Location 118-C-3-3 (French Drains)		SAF No. RC-020		Air Quality <input type="checkbox"/>		7 days			
Ice Chest No. AFS-04-023		Field Labbook No. EFL-1173-6		COA C11BX4A000		Method of Shipment Fed ex					
Shipped To EBERLINE SERVICES (LIONVILLE)		Offsite Property No. A060206		Bill of Lading/Air Bill No. See OSLC							
POSSIBLE SAMPLE HAZARDS/REMARKS none < Dot limits				Preservation		Type of Container		No. of Container(s)		Volume	
				None		Cool 4C		Cool 4C		Cool 4C	
				None		G/P		G/P		G/P	
				None		1		1		1	
				250g		250mL		250mL		250mL	
				500mL							
SAMPLE ANALYSIS				See Item (1) in Special Instructions		Chromium Hex - 7196		PCBs - 8082		Semi-VOA - 1270A (TCL)	
				See Item (2) in Special Instructions							
										RCF	
Sample No.		Matrix *		Sample Date		Sample Time					
J10V67		SOIL		01/04/06		1615				J10W12	
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(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 - 7470 - (CV) (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-154), Gamma Spec - Add-on (Silver-108 undetectable)			
Doug Bowers		1-4-06/1650		100BC sample R.M.S.A		1-7-06/1650					
100BC Sample R.M.S.A		1-5-06		Kevin Singley		1-5-06					
Kevin Singley		1-5-06		REF 1B		1-5-06					
Ref 1B		1-5-06		RZ Stettler R.Z. Stettler		1-5-06					
RZ Stettler R.Z. Stettler		1-5-06		FED EX							
RZ Stettler		1-6-06		RZ Stettler		1-6-06		Personnel not available to relinquish samples from 3728 Ref # 1B on 1-5-06			
RZ Stettler		0915		RZ Stettler		0915					
LABORATORY SECTION		Received By		Title		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

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Appendix 5

Data Validation Supporting Documentation

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	118-C-3:3		DATA PACKAGE: K0160		
VALIDATOR:	TCT	LAB:	LLI	DATE: 3/2/06	
			SDG:	K0164	
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J10062 J10063 J10064 J10065 J10066 J10067					
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: moly - 63+67 - UJ
antimony - 63, 64, 66, 67 - UJ

FB - al, barium, calcium, chromium, Fe, K, magnesium, manganese, Na,
silicon, Vanadium, zinc

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 calcium - 140% - Jall
antimony - 48.5 - Jall

LCS Silicon - 67.1% - Jall

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

- Duplicate RPD values acceptable? Yes No N/A
- Duplicate results acceptable? Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E)..... Yes No N/A
- MS/MSD standards expired? (Levels D, E)..... Yes No N/A
- Field duplicate RPD values acceptable?..... Yes No N/A
- Field split RPD values acceptable? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

- ICP serial dilution samples analyzed? Yes No N/A
- ICP serial dilution %D values acceptable?..... Yes No N/A
- ICP post digestion spike required?..... Yes No N/A
- ICP post digestion spike values acceptable? Yes No N/A
- Standards traceable? Yes No N/A
- Standards expired? Yes No N/A
- Transcription/calculation errors?..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

Duplicate injections performed as required?.....	Yes	No	N/A
Duplicate injection %RSD values acceptable?.....	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?.....	Yes	No	N/A
Standards traceable?.....	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?.....	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?.....	Yes	No	N/A

Comments: _____

8. HOLDING TIMES (all levels)

Samples properly preserved?.....	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

- Results reported for all requested analyses? Yes No N/A
- Results supported in the raw data? (Levels D, E) Yes No N/A
- Samples properly prepared? (Levels D, E) Yes No N/A
- Detection limits meet RDL? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/17/06

CLIENT: TNUHANFORD RC-020 X0164

LVL LOT #: 0601L051

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0019-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	3.0 u	MG/KG	3.0	1.0
		Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Boron, Total	0.27 u	MG/KG	0.27	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	1.5 u	MG/KG	1.5	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.16 u	MG/KG	0.16	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	3.2 u	MG/KG	3.2	1.0
		Potassium, Total	54.0 u	MG/KG	54.0	1.0
		Magnesium, Total	1.4 u	MG/KG	1.4	1.0
		Manganese, Total	0.02 u	MG/KG	0.02	1.0
		Molybdenum, Total	0.15 u	MG/KG	0.15	1.0
		Sodium, Total	2.8 u	MG/KG	2.8	1.0
		Nickel, Total	1.3 u	MG/KG	1.3	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.44 u	MG/KG	0.44	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	0.82 u	MG/KG	0.82	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.05 u	MG/KG	0.05	1.0
BLANK1	06C0006-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/17/06

CLIENT: TNUHANFORD RC-020 K0164

LVL LOT #: 0601L051

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J10V62	Silver, Total	4.3	0.14u	4.8	89.6	1.0
		Aluminum, Total	5450	5060	192	202.6*	1.0
		Arsenic, Total	172	3.0	192	88.1	1.0
		Boron, Total	84.8	1.0	96.1	87.2	1.0
		Barium, Total	224	47.5	192	91.7	1.0
		Beryllium, Total	5.2	0.66	4.8	94.5	1.0
		Calcium, Total	10500	7120	2400	140.3	1.0
		Cadmium, Total	3.8	0.07u	4.8	79.2	1.0
		Cobalt, Total	51.2	7.1	48.0	91.9	1.0
		Chromium, Total	25.7	7.3	19.2	95.8	1.0
		Copper, Total	32.5	14.6	24.0	99.6	1.0
		Iron, Total	20700	21000	96.1	-370. *	1.0
		Mercury, Total	0.90	0.80	0.16	61.9*	1.0
		Potassium, Total	2930	907	2400	84.2	1.0
		Magnesium, Total	6520	4470	2400	85.3	1.0
		Manganese, Total	341	297	48.0	90.8*	1.0
		Molybdenum, Total	88.1	0.13u	96.1	91.7	1.0
		Sodium, Total	2290	162	2400	88.5	1.0
		Nickel, Total	49.8	10.1	48.0	82.7	1.0
		Lead, Total	49.6	5.7	48.0	91.5	1.0
		Antimony, Total	23.3	0.39u	48.0	48.5	1.0
		Selenium, Total	160	0.35u	192	83.5	1.0
		Silicon, Total	828	467	96.1	385.8*	1.0
		Vanadium, Total	90.0	48.7	48.0	86.0	1.0
		Zinc, Total	99.9	50.2	48.0	103.5	1.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/17/06

CLIENT: TNUHANFORD RC-020 K0154
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 06D1L051

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE	RPD	
-001REP	J10V62	Silver, Total	0.14u	0.14u	NC	1.0
		Aluminum, Total	5060	5080	0.35	1.0
		Arsenic, Total	3.0	3.2	6.5	1.0
		Boron, Total	1.0	1.1	9.5	1.0
		Barium, Total	47.5	50.2	5.5	1.0
		Beryllium, Total	0.66	0.66	3.1	1.0
		Calcium, Total	7120	8680	19.7	1.0
		Cadmium, Total	0.07u	0.07u	NC	1.0
		Cobalt, Total	7.1	7.6	6.8	1.0
		Chromium, Total	7.3	8.2	11.6	1.0
		Copper, Total	14.6	16.9	14.6	1.0
		Iron, Total	21000	21400	1.7	1.0
		Mercury, Total	0.80	1.0	23.5	1.0
		Potassium, Total	907	914	0.86	1.0
		Magnesium, Total	4470	4510	0.84	1.0
		Manganese, Total	297	308	2.7	1.0
		Molybdenum, Total	0.13u	0.19	NC	1.0
		Sodium, Total	162	161	1.1	1.0
		Nickel, Total	10.1	10.6	4.8	1.0
		Lead, Total	5.7	6.3	10.0	1.0
		Antimony, Total	0.39u	0.42	NC	1.0
		Selenium, Total	0.35u	0.35u	NC	1.0
		Silicon, Total	467	572	20.1	1.0
		Vanadium, Total	48.7	51.8	6.2	1.0
		Zinc, Total	80.2	54.4	8.0	1.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/17/06

CLIENT: TNUHANFORD RC-020 K0164
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L051

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0019-LC1	Silver, LCS	47.6	50.0	MG/KG	95.2
		Aluminum, LCS	459	500	MG/KG	91.8
		Arsenic, LCS	921	1000	MG/KG	92.1
		Boron, LCS	466	500	MG/KG	93.1
		Barium, LCS	472	500	MG/KG	94.5
		Beryllium, LCS	24.2	25.0	MG/KG	96.8
		Calcium, LCS	2410	2500	MG/KG	96.3
		Cadmium, LCS	24.0	25.0	MG/KG	96.0
		Cobalt, LCS	243	250	MG/KG	97.2
		Chromium, LCS	49.3	50.0	MG/KG	98.6
		Copper, LCS	120	125	MG/KG	96.2
		Iron, LCS	486	500	MG/KG	97.2
		Potassium, LCS	2230	2500	MG/KG	89.0
		Magnesium, LCS	2320	2500	MG/KG	93.0
		Manganese, LCS	74.1	75.0	MG/KG	98.8
		Molybdenum, LCS	485	500	MG/KG	97.0
		Sodium, LCS	2240	2500	MG/KG	89.6
		Nickel, LCS	179	200	MG/KG	89.4
		Lead, LCS	236	250	MG/KG	94.5
		Antimony, LCS	274	300	MG/KG	91.4
		Selenium, LCS	872	1000	MG/KG	87.2
		Silicon, LCS	335	500	MG/KG	67.1
		Vanadium, LCS	243	250	MG/KG	97.3
		Zinc, LCS	94.2	100	MG/KG	94.2
LCS1	06C0006-LC1	Mercury, LCS	6.6	6.2	MG/KG	106.3

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Date: 9 March 2006
To: Washington Closure Hanford (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 118-C-3:3
Subject: PCB - Data Package No. K0164-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0164 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
J10V62	1/4/06	Soil	C	See note 1
J10V63	1/4/06	Soil	C	See note 1
J10V64	1/4/06	Soil	C	See note 1
J10V66	1/4/06	Soil	C	See note 1
J10V67	1/4/06	Soil	C	See note 1

1 - PCBs by 8082

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

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and 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

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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.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows

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

All surrogate results were acceptable.

• **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J10V66/J10V67) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicates were acceptable.

• **Analytical Detection Levels**

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

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Completeness

Data Package No. K0164 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

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

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

000004

Appendix 1

Glossary of Data Reporting Qualifiers

000005

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).

000006

Appendix 2

Summary of Data Qualification

000007

PCB DATA QUALIFICATION SUMMARY*

SDG: K0164	REVIEWER: TLI	PROJECT: 118-C-3:3	PAGE <u>1</u> OF <u>1</u>
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.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: WASHINGTON CLOSURE HANFORD											
Laboratory: LLI		SDG: K0164									
Sample Number		J10V62		J10V63		J10V64		J10V66		J10V67	
Remarks		Duplicate									
Sample Date		1/4/06		1/4/06		1/4/06		1/4/06		1/4/06	
Extraction Date		1/7/06		1/7/06		1/7/06		1/7/06		1/7/06	
Analysis Date		1/9/06		1/10/06		1/10/06		1/10/06		1/10/06	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	14	U	14	U	15	U	14	U	14	U
Aroclor-1221	100	14	U	14	U	15	U	14	U	14	U
Aroclor-1232	100	14	U	14	U	15	U	14	U	14	U
Aroclor-1242	100	14	U	14	U	15	U	14	U	14	U
Aroclor-1248	100	14	U	14	U	15	U	14	U	14	U
Aroclor-1254	100	5.1		14	U	15	U	14	U	14	U
Aroclor-1260	100	14	U	14	U	15	U	4.1		6.5	

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Sample Information	Cust ID:	J10V62	J10V62	J10V62	J10V63	J10V64	J10V66
	RFW#:	001	001 MS	001 MSD	002	003	005
	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	80 %	78 %	77 %	73 %	71 %	62 %
	Decachlorobiphenyl	83 %	83 %	81 %	78 %	74 %	71 %
		-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----
Aroclor-1016		14 U	91 %	90 %	14 U	15 U	14 U
Aroclor-1221		14 U	14 U	14 U	14 U	15 U	14 U
Aroclor-1232		14 U	14 U	14 U	14 U	15 U	14 U
Aroclor-1242		14 U	14 U	14 U	14 U	15 U	14 U
Aroclor-1248		14 U	14 U	14 U	14 U	15 U	14 U
Aroclor-1254		5.1 J	I	I	14 U	15 U	14 U
Aroclor-1260		14 U	100 %	97 %	14 U	15 U	4.1 J

000011

Sample Information	Cust ID:	J10V67	PBLKZP	PBLKZP BS
	RFW#:	006	06LE0017-MB1	06LE0017-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	74 %	70 %	75 %
	Decachlorobiphenyl	75 %	74 %	76 %
		-----fl-----	-----fl-----	-----fl-----
Aroclor-1016		14 U	13 U	86 %
Aroclor-1221		14 U	13 U	13 U
Aroclor-1232		14 U	13 U	13 U
Aroclor-1242		14 U	13 U	13 U
Aroclor-1248		14 U	13 U	13 U
Aroclor-1254		14 U	13 U	13 U
Aroclor-1260		6.5 J	13 U	98 %

PK
3/3/06
7/1/06

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

000000004

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012



Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0601L051
SDG/SAF # K0164/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 01-06-2006

PCB

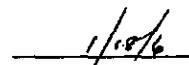
Five (5) soil samples were collected on 01-04-2006.

The samples and their associated QC samples were extracted on 01-07-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 01-09,10-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. The samples were extracted and analyzed within required holding time.
3. 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.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
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


Date

sonv:\group\data\pest\tnu hanford\0601-051.pcb.s
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.

000013

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-020-003		Page 1 of 2		
Collector Doug Bowers/C. Martinez		Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code Data Turnaround		
Project Designation 100-BC Burial Grounds - Soil Full Protocol		Sampling Location 118-C-33 (French Drains)		SAF No. RC-020		Air Quality <input type="checkbox"/> 7 days				
Ice Chest No. AFS-04-023		Field Logbook No. EPL-1173-6		COA C11BX4A000		Method of Shipment Fed ex				
Shipped To EBERLINE SERVICES (LIONVILLE)		Offsite Property No. A060206				Bill of Lading/Air Bill No. See OSLC				
POSSIBLE SAMPLE HAZARDS/REMARKS none < DOT limits			Preservation	None	Cool 4C	Cool 4C	Cool 4C	None		
Special Handling and/or Storage Cool 4 degrees centigrade			Type of Container	G/P	G/P	aG	aG	G/P		
			No. of Container(s)	1	1	1	1			
			Volume	250g	250ml	250ml	250ml	500ml		
SAMPLE ANALYSIS			See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.			
Sample No.	Matrix *	Sample Date	Sample Time							
J10V62	SOIL	01/04/06	1000	✓	✓	✓	✓	6	J10V02	
J10V63	SOIL	01/04/06	1246	✓	✓	✓	✓			
J10V64	SOIL	01/04/06	1442	✓	✓	✓	✓			
J10V65	SOIL	01/04/06	1600	✓	N/A	N/A	✓			
J10V66	SOIL	01/04/06	1610	✓	✓	✓	✓			
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From Doug Bowers		Date/Time 1-4-06/1650	Received By/Stored In 100 BC sample RMA		Date/Time 1-4-06/1650	(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 - 7470 - (CV) (2) Gamma Spectroscopy (TCL) (Gross-137, Cobalt-60, Europium-152, Europium-154, Europium-164); Gamma Spec - Add on (Silver-108 not detectable) Personnel not available to relinquish samples from 3728 Ref # 1B on 1/5/06				S=Soil SS=Soilment SL=Sludge W=Water O=Oil A=Air DS=Dry Solids DL=Dry Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From 100 BC Sample RMA		Date/Time 1-5-06	Received By/Stored In Kevin Singha		Date/Time 1-5-06					
Relinquished By/Removed From Kevin Singha		Date/Time 1-5-06	Received By/Stored In Ref 1B		Date/Time 1-5-06					
Relinquished By/Removed From Ref 1B		Date/Time 1-5-06	Received By/Stored In R2 Staffler R. J.		Date/Time 1-5-06					
Relinquished By/Removed From R2 Staffler R. J.		Date/Time 1-5-06	Received By/Stored In Fed Ex		Date/Time 1-5-06					
Relinquished By/Removed From Fed Ex		Date/Time 1-6-06	Received By/Stored In K. Heenan		Date/Time 1-6-06					
LABORATORY SECTION	Received By		Title						Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By						Date/Time	

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-020-003		Page 2 of 2		
Collector Doug Bowers/C. Martinez		Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		Data Turnaround	
Project Designation 100-BC Burial Grounds - Soil Full Protocol		Sampling Location 118-C-3:3 (French Drains)		SAF No. RC-020		Air Quality <input type="checkbox"/>		7 days			
Ice Chest No. AFS-04-023		Field Logbook No. EFL-1173-6		COA C11BX4A000		Method of Shipment Fed ex					
Shipped To EBERLINE SERVICES <u>LIONVILLE</u>		Offsite Property No. A060206		Bill of Lading/Air Bill No. See 051C							
POSSIBLE SAMPLE HAZARDS/REMARKS none < dot limits			Preservation	Non	Cool 4C	Cool 4C	Cool 4C	Non			
Special Handling and/or Storage Cool 4 degrees centigrade			Type of Container	G/P	G/P	gG	gG	G/P			
			No. of Container(s)	1	1	1	1	1			
			Volume	250g	250mL	250mL	250mL	500mL			
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VDA - K270A (TCL)	See item (2) in Special Instructions.			
000015	Sample No.	Matrix *	Sample Date	Sample Time							RCF
	J10V67	SOIL	01/04/06	1615	✓	✓	✓	✓			J10W12
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From Doug Bowers 1-4-06/1650		Date/Time		Received By/Stored In 100BC sample R.M.S.A. 1-4-06/1650		Date/Time		(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 - 7470 - (CV) (2) Gamma Spectroscopy (PCL-140) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Gadolinium-156); Gamma Spec - Add-on (Silver-108 metastable) Personnel not available to relinquish samples from 3728 Ref # 1B on 1/5/06			
Relinquished By/Removed From 100BC Sample R.S.M.A. 1-5-06		Date/Time 0800		Received By/Stored In Kevin Simplek 1-5-06		Date/Time 0800					
Relinquished By/Removed From Kevin Simplek 1-5-06		Date/Time 0955		Received By/Stored In REF 1B 1-5-06		Date/Time 0955					
Relinquished By/Removed From Ref 1B 1-5-06		Date/Time 1428		Received By/Stored In RZ Staffer R.Z. Staffer 1-5-06		Date/Time 1428					
Relinquished By/Removed From RZ Staffer R.Z. Staffer 1-5-06		Date/Time 1435		Received By/Stored In FEB EX 1-5-06		Date/Time 1435					
Relinquished By/Removed From RZ Staffer 1-6-06		Date/Time 0915		Received By/Stored In R. Hernandez 1-6-06		Date/Time 0915					
LABORATORY SECTION		Received By		Title		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Appendix 5

Data Validation Supporting Documentation

000016

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	118-C-3:3		DATA PACKAGE: K0164		
VALIDATOR:	T&I	LAB:	LLP	DATE: 3/2/06	
			SDG:	K0164	
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J10V62 J10V63 J10V64 J10V66 J10V67					
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 PB

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 P/B

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)

- Fluorilic ® (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: 9 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 118-C-3:3
Subject: Semivolatile - Data Package No. K0164-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0164 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
J10V62	1/4/06	Soil	C	See note 1
J10V63	1/4/06	Soil	C	See note 1
J10V64	1/4/06	Soil	C	See note 1
J10V65	1/4/06	Soil	C	See note 1
J10V66	1/4/06	Soil	C	See note 1
J10V67	1/4/06	Soil	C	See note 1

1 – Semivolatiles by 8270C.

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

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and 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

000001

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

All holding times were met.

• **Method Blanks**

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

All method blank results were acceptable.

Field Blanks

One equipment blank (J10V65) was submitted for analysis. Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

• **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.

000002

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 RPDs outside QC limits, all 2,4-dimethylphenol (35%) and 2,4-dinitrophenol (57%) results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J10V66/J10V67) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicates were acceptable.

000003

Analytical Detection Levels

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

Completeness

Data package No. K0164 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

Due to RPDs outside QC limits, all 2,4-dimethylphenol (35%) and 2,4-dinitrophenol (57%) results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

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

REFERENCES

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

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

000004

Appendix 1

Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with the BHI 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).

000006

Appendix 2

Summary of Data Qualification

000007

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K0164		REVIEWER: Project: 18-C-33	PAGE: 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
2,4-Dimethylphenol 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.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: WASHINGTON CLOSURE HANFORD																
Laboratory: LLI		SDG: K0164														
Sample Number	J10V62			J10V63			J10V64			J10V65			J10V66		J10V67	
Remarks										E. Blank					Duplicate	
Sample Date	1/4/06			1/4/06			1/4/06			1/4/06			1/4/06		1/4/06	
Extraction Date	1/7/06			1/7/06			1/7/06			1/7/06			1/7/06		1/7/06	
Analysis Date	1/10/06			1/12/06			1/12/06			1/12/06			1/12/06		1/12/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q			
Phenol	660	360	U	360	U	370	U	330	U	360	U	360	U			
bis(2-Chloroethyl)ether	660	360	U	360	U	370	U	330	U	360	U	360	U			
2-Chlorophenol	660	360	U	360	U	370	U	330	U	360	U	360	U			
1,3-Dichlorobenzene	660	360	U	360	U	370	U	330	U	360	U	360	U			
1,4-Dichlorobenzene	660	360	U	360	U	370	U	330	U	360	U	360	U			
1,2-Dichlorobenzene	660	360	U	360	U	370	U	330	U	360	U	360	U			
2-Methylphenol	660	360	U	360	U	370	U	330	U	360	U	360	U			
2,2'-oxybis(1-chloropropane)	660	360	U	360	U	370	U	330	U	360	U	360	U			
3 and/or 4-Methylphenol	660	360	U	360	U	370	U	330	U	360	U	360	U			
N-Nitroso-di-n-propylamine	660	360	U	360	U	370	U	330	U	360	U	360	U			
Hexachloroethane	660	360	U	360	U	370	U	330	U	360	U	360	U			
Nitrobenzene	660	360	U	360	U	370	U	330	U	360	U	360	U			
Isophorone	660	360	U	360	U	370	U	330	U	360	U	360	U			
2-Nitrophenol	660	360	U	360	U	370	U	330	U	360	U	360	U			
2,4-Dimethylphenol	660	360	UJ	360	UJ	370	UJ	330	UJ	360	UJ	360	UJ			
bis(2-Chloroethoxy)methane	660	360	U	360	U	370	U	330	U	360	U	360	U			
2,4-Dichlorophenol	660	360	U	360	U	370	U	330	U	360	U	360	U			
1,2,4-Trichlorobenzene	660	360	U	360	U	370	U	330	U	360	U	360	U			
Naphthalene	660	360	U	360	U	370	U	330	U	360	U	360	U			
4-Chloroaniline	660	360	U	360	U	370	U	330	U	360	U	360	U			
Hexachlorobutadiene	660	360	U	360	U	370	U	330	U	360	U	360	U			
4-Chloro-3-methylphenol	660	360	U	360	U	370	U	330	U	360	U	360	U			
2-Methylnaphthalene	660	360	U	360	U	370	U	330	U	360	U	360	U			
Hexachlorocyclopentadiene	660	360	U	360	U	370	U	330	U	360	U	360	U			
2,4,6-Trichlorophenol	660	360	U	360	U	370	U	330	U	360	U	360	U			
2,4,5-Trichlorophenol*	660	900	U	890	U	940	U	830	U	900	U	900	U			
2-Chloronaphthalene	660	360	U	360	U	370	U	330	U	360	U	360	U			
2-Nitroaniline*	660	900	U	890	U	940	U	830	U	900	U	900	U			
Dimethylphthalate	660	360	U	360	U	370	U	330	U	360	U	360	U			
Acenaphthylene	660	360	U	360	U	370	U	330	U	360	U	360	U			
2,6-Dinitrotoluene	660	360	U	360	U	370	U	330	U	360	U	360	U			

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000010

Project: WASHINGTON CLOSURE HANFORD													
Laboratory: LLI		SDG: K0164											
Sample Number	J10V62		J10V63		J10V64		J10V65		J10V66		J10V67		
Remarks							E. Blank				Duplicate		
Sample Date	1/4/06		1/4/06		1/4/06		1/4/06		1/4/06		1/4/06		
Extraction Date	1/7/06		1/7/06		1/7/06		1/7/06		1/7/06		1/7/06		
Analysis Date	1/10/06		1/12/06		1/12/06		1/12/06		1/12/06		1/12/06		
Semivolatiles (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	900	U	890	U	940	U	830	U	900	U	900	U
Acenaphthene	660	360	U	360	U	370	U	330	U	360	U	360	U
2,4-Dinitrophenol*	660	900	UJ	890	UJ	940	UJ	830	UJ	900	UJ	900	UJ
4-Nitrophenol*	660	900	U	890	U	940	U	830	U	900	U	900	U
Dibenzofuran	660	360	U	360	U	370	U	330	U	360	U	360	U
2,4-Dinitrotoluene	660	360	U	360	U	370	U	330	U	360	U	360	U
Diethylphthalate	660	360	U	360	U	370	U	330	U	360	U	360	U
4-Chlorophenyl-phenyl ether	660	360	U	360	U	370	U	330	U	360	U	360	U
Fluorene	660	360	U	360	U	370	U	330	U	360	U	360	U
4-Nitroaniline*	660	900	U	890	U	940	U	830	U	900	U	900	U
4,6-Dinitro-2-methylphenol*	660	900	U	890	U	940	U	830	U	900	U	900	U
N-Nitrosodiphenylamine	660	360	U	360	U	370	U	330	U	360	U	360	U
4-Bromophenyl-phenyl ether	660	360	U	360	U	370	U	330	U	360	U	360	U
Hexachlorobenzene	660	360	U	360	U	370	U	330	U	360	U	360	U
Pentachlorophenol*	660	900	U	890	U	940	U	830	U	900	U	900	U
Phenanthrene	660	360	U	360	U	370	U	330	U	110		59	
Anthracene	660	360	U	360	U	370	U	330	U	360	U	360	U
Carbazole	660	360	U	360	U	370	U	330	U	360	U	360	U
Di-n-butylphthalate	660	19		360	U	370	U	26		360	U	360	U
Fluoranthene	660	18		360	U	370	U	330	U	160		85	
Pyrene	660	19		360	U	370	U	330	U	170		100	
Butylbenzylphthalate	660	360	U	360	U	370	U	330	U	360	U	360	U
3,3'-Dichlorobenzidine	660	360	U	360	U	370	U	330	U	360	U	360	U
Benzo(a)anthracene	660	360	U	360	U	370	U	330	U	75		48	
Chrysene	660	360	U	360	U	370	U	330	U	100		60	
bis(2-Ethylhexyl)phthalate	660	65		21		24		32		39		44	
Di-n-octylphthalate	660	360	U	360	U	370	U	330	U	360	U	360	U
Benzo(b)fluoranthene	660	360	U	360	U	370	U	330	U	59		35	
Benzo(k)fluoranthene	660	360	U	360	U	370	U	330	U	68		43	
Benzo(a)pyrene	660	360	U	360	U	370	U	330	U	73		47	
Indeno(1,2,3-cd)pyrene	660	360	U	360	U	370	U	330	U	52		34	
Dibenz(a,h)anthracene	660	360	U	360	U	370	U	330	U	360	U	360	U
Benzo(g,h,i)perylene	660	360	U	360	U	370	U	330	U	59		38	

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000011

	Cust ID:	J10V62	J10V62	J10V62	J10V63	J10V64	J10V65
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate	Nitrobenzene-d5	64 %	68 %	84 %	69 %	72 %	82 %
Recovery	2-Fluorobiphenyl	69 %	71 %	83 %	72 %	74 %	82 %
	Terphenyl-d14	86 %	85 %	112 %	88 %	97 %	97 %
	Phenol-d5	68 %	73 %	85 %	69 %	78 %	85 %
	2-Fluorophenol	65 %	71 %	87 %	69 %	75 %	84 %
	2,4,6-Tribromophenol	65 %	73 %	86 %	55 %	63 %	67 %
-----fl-----fl-----fl-----fl-----fl-----fl-----fl							
	Phenol	360 U	81 %	95 %	360 U	370 U	330 U
	bis(2-Chloroethyl) ether	360 U	80 %	96 %	360 U	370 U	330 U
	2-Chlorophenol	360 U	81 %	96 %	360 U	370 U	330 U
	1,3-Dichlorobenzene	360 U	74 %	91 %	360 U	370 U	330 U
	1,4-Dichlorobenzene	360 U	73 %	89 %	360 U	370 U	330 U
	1,2-Dichlorobenzene	360 U	78 %	94 %	360 U	370 U	330 U
	2-Methylphenol	360 U	76 %	91 %	360 U	370 U	330 U
	2,2'-oxybis(1-Chloropropane)	360 U	77 %	91 %	360 U	370 U	330 U
	4-Methylphenol	360 U	76 %	90 %	360 U	370 U	330 U
	N-Nitroso-di-n-propylamine	360 U	79 %	91 %	360 U	370 U	330 U
	Hexachloroethane	360 U	73 %	87 %	360 U	370 U	330 U
	Nitrobenzene	360 U	77 %	93 %	360 U	370 U	330 U
	Isophorone	360 U	82 %	98 %	360 U	370 U	330 U
	2-Nitrophenol	360 U	77 %	92 %	360 U	370 U	330 U
	2,4-Dimethylphenol	360 U ^J	55 %	78 %	360 U ^J	370 U ^J	330 U ^J
	bis(2-Chloroethoxy)methane	360 U	78 %	96 %	360 U	370 U	330 U
	2,4-Dichlorophenol	360 U	79 %	93 %	360 U	370 U	330 U
	1,2,4-Trichlorobenzene	360 U	75 %	91 %	360 U	370 U	330 U
	Naphthalene	360 U	75 %	90 %	360 U	370 U	330 U
	4-Chloroaniline	360 U	80 %	96 %	360 U	370 U	330 U
	Hexachlorobutadiene	360 U	82 %	100 %	360 U	370 U	330 U
	4-Chloro-3-methylphenol	360 U	80 %	96 %	360 U	370 U	330 U
	2-Methylnaphthalene	360 U	79 %	95 %	360 U	370 U	330 U
	Hexachlorocyclopentadiene	360 U	74 %	78 %	360 U	370 U	330 U
	2,4,6-Trichlorophenol	360 U	79 %	94 %	360 U	370 U	330 U
	2,4,5-Trichlorophenol	900 U	82 %	96 %	890 U	940 U	830 U

*= Outside of EPA CLP QC limits.

000012

R 3/3/06

Cust ID: J10V62 J10V62 J10V62 J10V63 J10V64 J10V65

RFW#: 001 001 MS 001 MSD 002 003 004

2-Chloronaphthalene	360 U	78 %	93 %	360 U	370 U	330 U
2-Nitroaniline	900 U	83 %	99 %	890 U	940 U	830 U
Dimethylphthalate	360 U	82 %	101 %	360 U	370 U	330 U
Acenaphthylene	360 U	79 %	94 %	360 U	370 U	330 U
2,6-Dinitrotoluene	360 U	84 %	102 %	360 U	370 U	330 U
3-Nitroaniline	900 U	90 %	113 %	890 U	940 U	830 U
Acenaphthene	360 U	80 %	96 %	360 U	370 U	330 U
2,4-Dinitrophenol	900 U J	43 %	77 %	890 U J	940 U J	830 U J
4-Nitrophenol	900 U	88 %	109 %	890 U	940 U	830 U
Dibenzofuran	360 U	81 %	99 %	360 U	370 U	330 U
2,4-Dinitrotoluene	360 U	90 %	115 %	360 U	370 U	330 U
Diethylphthalate	360 U	84 %	106 %	360 U	370 U	330 U
4-Chlorophenyl-phenylether	360 U	81 %	100 %	360 U	370 U	330 U
Fluorene	360 U	81 %	101 %	360 U	370 U	330 U
4-Nitroaniline	900 U	87 %	113 %	890 U	940 U	830 U
4,6-Dinitro-2-methylphenol	900 U	81 %	104 %	890 U	940 U	830 U
N-Nitrosodiphenylamine (1)	360 U	64 %	77 %	360 U	370 U	330 U
4-Bromophenyl-phenylether	360 U	68 %	83 %	360 U	370 U	330 U
Hexachlorobenzene	360 U	80 %	95 %	360 U	370 U	330 U
Pentachlorophenol	900 U	85 %	108 %	890 U	940 U	830 U
Phenanthrene	360 U	81 %	98 %	360 U	370 U	330 U
Anthracene	360 U	82 %	101 %	360 U	370 U	330 U
Carbazole	360 U	86 %	103 %	360 U	370 U	330 U
Di-n-butylphthalate	19 J	87 %	105 %	360 U	370 U	26 J
Fluoranthene	18 J	89 %	101 %	360 U	370 U	330 U
Pyrene	19 J	89 %	119 %	360 U	370 U	330 U
Butylbenzylphthalate	360 U	94 %	123 %	360 U	370 U	330 U
3,3'-Dichlorobenzidine	360 U	85 %	104 %	360 U	370 U	330 U
Benzo(a)anthracene	360 U	84 %	103 %	360 U	370 U	330 U
Chrysene	360 U	82 %	102 %	360 U	370 U	330 U
bis(2-Ethylhexyl)phthalate	65 J	90 %	118 %	21 J	24 J	32 J
Di-n-octyl phthalate	360 U	87 %	111 %	360 U	370 U	330 U
Benzo(b)fluoranthene	360 U	80 %	100 %	360 U	370 U	330 U
Benzo(k)fluoranthene	360 U	78 %	96 %	360 U	370 U	330 U
Benzo(a)pyrene	360 U	77 %	96 %	360 U	370 U	330 U
Indeno(1,2,3-cd)pyrene	360 U	82 %	105 %	360 U	370 U	330 U
Dibenz(a,h)anthracene	360 U	81 %	104 %	360 U	370 U	330 U
Benzo(g,h,i)perylene	360 U	80 %	103 %	360 U	370 U	330 U

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

R 3/3/06

000013

0000000007

Cust ID: J10V66 J10V67 SBLKSI SBLKSI BS

RFW#: 005 006 06LE0016-MB1 06LE0016-MB1

2-Chloronaphthalene	360 U	360 U	330 U	84 %
2-Nitroaniline	900 U	900 U	830 U	91 %
Dimethylphthalate	360 U	360 U	330 U	92 %
Acenaphthylene	360 U	360 U	330 U	86 %
2,6-Dinitrotoluene	360 U	360 U	330 U	94 %
3-Nitroaniline	900 U	900 U	830 U	103 %
Acenaphthene	360 U	360 U	330 U	85 %
2,4-Dinitrophenol	900 U J	900 U J	830 U	57 %
4-Nitrophenol	900 U	900 U	830 U	99 %
Dibenzofuran	360 U	360 U	330 U	88 %
2,4-Dinitrotoluene	360 U	360 U	330 U	100 %
Diethylphthalate	360 U	360 U	330 U	95 %
4-Chlorophenyl-phenylether	360 U	360 U	330 U	89 %
Fluorene	360 U	360 U	330 U	88 %
4-Nitroaniline	900 U	900 U	830 U	98 %
4,6-Dinitro-2-methylphenol	900 U	900 U	830 U	97 %
N-Nitrosodiphenylamine (1)	360 U	360 U	330 U	72 %
4-Bromophenyl-phenylether	360 U	360 U	330 U	78 %
Hexachlorobenzene	360 U	360 U	330 U	89 %
Pentachlorophenol	900 U	900 U	830 U	103 %
Phenanthrene	110 J	59 J	330 U	86 %
Anthracene	360 U	360 U	330 U	89 %
Carbazole	360 U	360 U	330 U	86 %
Di-n-butylphthalate	360 U	360 U	330 U	93 %
Fluoranthene	160 J	85 J	330 U	86 %
Pyrene	170 J	100 J	330 U	106 %
Butylbenzylphthalate	360 U	360 U	330 U	105 %
3,3'-Dichlorobenzidine	360 U	360 U	330 U	96 %
Benzo(a)anthracene	75 J	48 J	330 U	92 %
Chrysene	100 J	60 J	330 U	90 %
bis(2-Ethylhexyl)phthalate	39 J	44 J	330 U	104 %
Di-n-octyl phthalate	360 U	360 U	330 U	96 %
Benzo(b)fluoranthene	59 J	35 J	330 U	89 %
Benzo(k)fluoranthene	68 J	43 J	330 U	88 %
Benzo(a)pyrene	73 J	47 J	330 U	87 %
Indeno(1,2,3-cd)pyrene	52 J	34 J	330 U	96 %
Dibenz(a,h)anthracene	360 U	360 U	330 U	95 %
Benzo(g,h,i)perylene	59 J	38 J	330 U	95 %

000015

VR
3/3/06

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

RRRRRRRR

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000016



Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0601L051
SDG/SAF # **K0164** /RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 01-06-2006

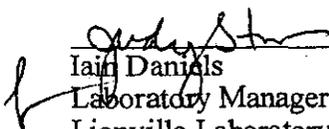
SEMIVOLATILE

Six (6) soil samples were collected on 01-04-2006.

The samples and there associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 01-07-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 01-10,12-2006.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. All matrix spike recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. Internal standard area and retention time criteria were met.
8. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
9. LvLI is NELAP accredited by the state of Pennsylvania 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.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

1/17/06
Date

som\goup\data\bna\tnu-hanford\0601-051.doc
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 20 pages.

000017

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-020-003		Page 2 of 2	
Collector Doug Bowers/C. Martinez		Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code Data Turnaround	
Project Designation 100-BC Burial Grounds - Soil Full Protocol		Sampling Location 118-C-3:3 (French Drains)		SAF No. RC-020		Air Quality <input type="checkbox"/>		7 days	
Ice Chest No. AFS-04-023		Field Logbook No. EFL-1173-6		COA C11BX4A000		Method of Shipment Fed ex			
Shipped To EBERLINE SERVICES <u>LIONVILLE</u>		Offsite Property No. A060206		Bill of Lading/Air Bill No. See 051C					
POSSIBLE SAMPLE HAZARDS/REMARKS none < dot limits			Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	
Special Handling and/or Storage Cool 4 degrees centigrade			Type of Container	G/P	G/P	uG	uG	G/P	
000019			No. of Container(s)	1	1	1	1	1	
			Volume	250g	250mL	250mL	250mL	500mL	
SAMPLE ANALYSIS			Soil item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOLA - K298A (TCL)	Soil item (2) in Special Instructions		RCF
Sample No.	Matrix *	Sample Date	Sample Time						
J10V87	SOIL	01/04/06	1615	✓	✓	✓	✓		J10V87
CHAIN OF POSSESSION			Sign/Print Names				SPECIAL INSTRUCTIONS		
Relinquished By/Removed From Doug Bowers 1-4-06/1650		Date/Time		Received By/Stored In 100BC sample R.M.S.A		Date/Time		Matrix *	
Relinquished By/Removed From 100BC Sample R.S.M.A		Date/Time 1-5-06		Received By/Stored In Kevin Simplek		Date/Time 1-5-06		S=Soil SB=Soilmat SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dryer Solids DL=Dryer Liquids T=Tissue Wl=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From Kevin Simplek		Date/Time 1-5-06		Received By/Stored In Ref IB		Date/Time 1-5-06		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 - 7470 - (CV)	
Relinquished By/Removed From Ref IB		Date/Time 1-5-06		Received By/Stored In RZ Steffler R.Z. Steffler		Date/Time 1-5-06		2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-156); Gamma Spec - Add-on (Silver-108 untraceable)	
Relinquished By/Removed From RZ Steffler R.Z. Steffler		Date/Time 1-5-06		Received By/Stored In Fed Ex		Date/Time		Personnel not available to relinquish samples from 3728 Ref # 18 on 1-5-06	
Relinquished By/Removed From RZ Steffler		Date/Time 1-6-06		Received By/Stored In W. H. H. H.		Date/Time 0915			
LABORATORY SECTION	Received By	Title				Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time			

Appendix 5
Data Validation Supporting Documentation

000020

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	128-C-3:3		DATA PACKAGE: K0164		
VALIDATOR:	TCL	LAB: LUP	DATE: 3/3/06		
			SDG:	K0164	
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J10V62 J10V63 J10V64 J10V65 J10V66					
J10V67					
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: _____

000021

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:

di-n-butyl phthalate & bis(2-ethylhexyl) phthalate in F8

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:

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-dimethylphenol - 3570 - J all
2,4-dinitrophenol - 5790 - J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? Yes No N/A
Internal 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	<u>N/A</u>
Compound quantitation acceptable? (Levels D, E).....	Yes	No	<u>N/A</u>
Results reported for all requested analyses?.....	<u>Yes</u>	No	<u>N/A</u>
Results supported in the raw data? (Levels D, E).....	Yes	No	<u>N/A</u>
Samples properly prepared? (Levels D, E).....	Yes	No	<u>N/A</u>
Laboratory properly identified and coded all TIC? (Levels D, E).....	Yes	No	<u>N/A</u>
Detection limits meet RDL?.....	Yes	<u>No</u>	<u>N/A</u>
Transcription/calculation errors? (Levels D, E).....	Yes	No	<u>N/A</u>

Comments: 48 over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed?	Yes	No	<u>N/A</u>
GPC check performed?	Yes	No	<u>N/A</u>
GPC check recoveries acceptable?.....	Yes	No	<u>N/A</u>
GPC calibration performed?.....	Yes	No	<u>N/A</u>
GPC calibration check performed?	Yes	No	<u>N/A</u>
GPC calibration check retention times acceptable?	Yes	No	<u>N/A</u>
Check/calibration materials traceable?.....	Yes	No	<u>N/A</u>
Check/calibration materials Expired?.....	Yes	No	<u>N/A</u>
Analytical batch QC given similar cleanup?	Yes	No	<u>N/A</u>
Transcription/Calculation Errors?.....	Yes	No	<u>N/A</u>

Comments:

Date: 9 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 118-C-3:3
Subject: Wet Chemistry - Data Package No. K0164-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0164 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
J10V62	1/4/06	Soil	C	See note 1
J10V63	1/4/06	Soil	C	See note 1
J10V64	1/4/06	Soil	C	See note 1
J10V66	1/4/06	Soil	C	See note 1
J10V67	1/4/06	Soil	C	See note 1

1 – Chromium VI by 7196A.

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

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and 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".

000001

All holding times were acceptable.

• **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

• **Accuracy**

Matrix Spike and Laboratory Control Sample

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

All accuracy results were acceptable.

• **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample

000002

and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J10V66/J10V67) were submitted for analysis. Field duplicates are analyzed using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

• **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

• **Completeness**

Data package K0164 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

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

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

000003

Appendix 1

Glossary of Data Reporting Qualifiers

000004

Qualifiers which may be applied by data validators in compliance with BHI 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).

000005

Appendix 2

Summary of Data Qualification

000006

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0164	REVIEWER: TLI	PROJECT: 118-C-3:3	PAGE <u>1</u> OF <u>1</u>
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.

000007

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000008

Project: WASHINGTON CLOSURE HANFORD											
Lab: LLI			SDG: K0164								
Sample Number			J10V62		J10V63		J10V64		J10V66		J10V67
Remarks											Duplicate
Sample Date			1/4/06		1/4/06		1/4/06		1/4/06		1/4/06
Wet Chemistry			RQL	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI			0.5	0.22		0.26		0.31		0.54	0.42

600000

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/18/06

CLIENT: INUHANFORD RC-020 K0164
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L051

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10V62	% Solids	92.1	%	0.01	1.0
		Chromium VI	0.22	MG/KG	0.22	1.0
-002	J10V63	% Solids	93.2	%	0.01	1.0
		Chromium VI	0.26	MG/KG	0.22	1.0
-003	J10V64	% Solids	89.2	%	0.01	1.0
		Chromium VI	0.31	MG/KG	0.22	1.0
-004	J10V65	% Solids	100	%	0.01	1.0
-005	J10V66	% Solids	92.4	%	0.01	1.0
		Chromium VI	0.54	MG/KG	0.22	1.0
-006	J10V67	% Solids	92.4	%	0.01	1.0
		Chromium VI	0.42	MG/KG	0.22	1.0

K
 3/3/08

000010

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000011



Analytical Report

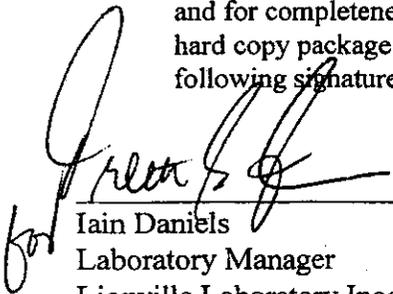
Client: TNU-HANFORD RC-029 K0164
LVL#: 0601L051

W.O.#: 11343-606-001-9999-00
Date Received: 01-06-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 6 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.
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 Chromium VI was outside the 20% Relative Percent Difference (RPD) 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.


for Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated


Date

njp001-051

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

000012

02

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-020-003		Page 1 of 2		
Collector Doug Bowers/C. Martinez		Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		Date Turnaround 10	
Project Designation 100-BC Burial Grounds - Soil Full Protocol		Sampling Location 118-C-3:3 (French Drains)		SAF No. RC-020		Air Quality <input type="checkbox"/>		7 days			
Ice Chest No. AFS-04-023		Field Logbook No. EFL-1173-6		COA CI1BX4A000		Method of Shipment Fed ex					
Shipped To EBERLINE SERVICES (LIONVILLE)		Offsite Property No. A060206		BIN of Lading/Air BIN No. See OSPC							
POSSIBLE SAMPLE HAZARDS/REMARKS <i>none < POT limits</i>				Preservation	None	Cool 4C	Cool 4C	Cool 4C	None		
Special Handling and/or Storage <i>Cool 4 degrees centigrade</i>				Type of Container	G/P	G/P	nG	nG	GP		
0000013				No. of Container(s)	1	1	1	1			
				Volume	250g	250mL	250mL	250mL	500mL		
SAMPLE ANALYSIS				See Item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See Item (2) in Special Instructions.	RCF		
Sample No.	Matrix *	Sample Date	Sample Time								
J10V62	SOIL	01/04/06	1000	✓	✓	✓	✓	6			J10V02
J10V63	SOIL	01/04/06	1246	✓	✓	✓	✓				
J10V64	SOIL	01/04/06	1442	✓	✓	✓	✓				
J10V65	SOIL	01/04/06	1600	✓	N/A	N/A	✓				
J10V66	SOIL	01/04/06	1610	✓	✓	✓	✓				
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From <i>Doug Bowers</i>		Date/Time <i>1-4-06/1650</i>		Received By/Stored In <i>100 BC sample R5MA</i>		Date/Time <i>1-4-06/1650</i>		(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 - 7470 - (CV) (2) Gamma Spectrometry (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-164); Gamma Spas - Add on (Silver-106 not detectable) Personnel not available to relinquish samples from 3728. Ref # 1B on 1/5/06 <i>01/04/06</i>			
Relinquished By/Removed From <i>100 BC Sample R5MA</i>		Date/Time <i>0800</i>		Received By/Stored In <i>Kevin Singler</i>		Date/Time <i>0800</i>					
Relinquished By/Removed From <i>Kevin Singler</i>		Date/Time <i>0955</i>		Received By/Stored In <i>REF 1B</i>		Date/Time <i>0955</i>					
Relinquished By/Removed From <i>Ref 1B</i>		Date/Time <i>1-5-06</i>		Received By/Stored In <i>KE Steffler R. J. Hill</i>		Date/Time <i>1-5-06</i>					
Relinquished By/Removed From <i>KE Steffler R. J. Hill</i>		Date/Time <i>1-5-06</i>		Received By/Stored In <i>Fed Ex</i>		Date/Time <i>1-5-06</i>					
Relinquished By/Removed From <i>Fed Ex</i>		Date/Time <i>0915</i>		Received By/Stored In <i>1/5/06</i>		Date/Time <i>0915</i>					
LABORATORY SECTION	Received By	Title	Date/Time								
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time								

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-020-003	Page 2 of 2		
Collector Doug Bowers/C. Martinez		Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH	Price Code	Data Turnaround	
Project Designation 100-BC Burial Grounds - Soil Full Protocol		Sampling Location 118-C-33 (French Drains)		SAF No. RC-020		Air Quality <input type="checkbox"/>	7 days		
Ice Chest No. AFS-04-023		Field Logbook No. EFL-1173-6		COA C11BX4A000		Method of Shipment Fed ex			
Shipped To EBERLINE SERVICES (LIONVILLE)		Offsite Property No. A060206		Bill of Lading/Air Bill No. See OSLC					
POSSIBLE SAMPLE HAZARDS/REMARKS none < Dot limits			Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	
Special Handling and/or Storage Cool 4 degrees centigrade			Type of Container	G/P	G/P	aG	aG	G/P	
			No. of Container(s)	1	1	1	1	1	
			Volume	250g	250ml	250mL	250ml	500mL	
SAMPLE ANALYSIS 000014			See item (1) in Special Instructions	Chromium Hex - 7196	PCNs - 8082	Semi-VDA - 8270A (TCL)	See item (2) in Special Instructions		
Sample No.	Matrix *	Sample Date	Sample Time						
J10V67	SOIL	01/04/06	1615					J10WP2	
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From Doug Bowers/Doug Bowers		Date/Time 1-4-06/1650		Received By/Stored In 100BC sample R.M.S.A		Date/Time 1-4-06/1645		(1) ICF Metals - 6010 (Check 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 - 7470 - (CV) (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-156); Gamma Spec - Add-on (Silver-108 not detectable) Personnel not available to relinquish samples from 3728 Ref # 1B on 1/5/06	S=Soil SS=Substrate SO=Soil SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Timex WI=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From 100BC Sample R.M.S.A		Date/Time 0800 1-5-06		Received By/Stored In Kevin Simplek		Date/Time 0800 1-5-06			
Relinquished By/Removed From Kevin Simplek		Date/Time 0955 1-5-06		Received By/Stored In KEF 1B		Date/Time 0955 1-5-06			
Relinquished By/Removed From KEF 1B		Date/Time 1428 1-5-06		Received By/Stored In RZ Steffler R.Z. Steffler		Date/Time 1428 1-5-06			
Relinquished By/Removed From R.Z. Steffler R.Z. Steffler		Date/Time 1435 with 1-5-06		Received By/Stored In Fed Ex		Date/Time			
Relinquished By/Removed From Fed Ex		Date/Time 0915 1-6-06		Received By/Stored In V. Hernandez		Date/Time 0915 1-6-06			
LABORATORY SECTION	Received By	Title				Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time			

Appendix 5

Data Validation Supporting Documentation

000015

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	118-C-313		DATA PACKAGE: K0164		
VALIDATOR:	TLI	LAB:	LLI	DATE:	
			SDG:	K0164	
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					
J10V62 J10V63 J10V64 J10V66 J10V67					
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 FR

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

Spike samples analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

Spike 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 PR

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

000020

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/18/06

CLIENT: TNUHANFORD RC-020 K0164
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L051

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	D6LVI002-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

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06

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/18/06

CLIENT: TNUHANFORD RC-020 K0164
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L051

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J10V62	Soluble Chromium VI	4.6	0.22	4.3	100.9	1.0
		Insoluble Chromium VI	1520	0.22	1280	119.1	100
BLANK10	06LVI002-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.8	1.0
		Insoluble Chromium VI	1400	0.20u	1230	113.8	100

000022

07

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/18/06

CLIENT: TNUHANFORD RC-020 K0164

LVL LOT #: 0601L051

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J10V62	Chromium VI	0.22	0.28	24.0	1.0

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08