0074999

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

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H4-21

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COMMENTS:

SDG K1005 SAF-RC-020

Waste Site: 100-B-21:2

Date: 17 December 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 100-B-21:2
Subject: Radiochemistry - Data Package No. K1005-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1005 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J15W21	10/22/07	Soil	C	See note 1
J15W22	10/22/07	Soil	C	See note 1
J15W23	10/22/07	Soil	C	See note 1
J15W24	10/22/07	Soil	C	See note 1
J15W25	10/22/07	Soil	C	See note 1
J15W26	10/22/07	Soil	C	See note 1
J15W27	10/22/07	Soil	C	See note 1
J15W28	10/22/07	Soil	C	See note 1
J15W29	10/22/07	Soil	C	See note 1
J15W30	10/22/07	Soil	C	See note 1
J15W31	10/22/07	Soil	C	See note 1
J15W32	10/22/07	Soil	C	See note 1
J15W33	10/22/07	Soil	C	See note 1
J15W34	10/22/07	Soil	C	See note 1

1 – Gross alpha/beta 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. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

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

All accuracy results were acceptable.

- **Laboratory Duplicates**

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

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J15W23/J15W34) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

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

- **Completeness**

Data package No. K1005 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

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

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K1005	REVIEWER: ELR	Project: 100-B-21:2	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Annotated Laboratory Reports

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-001 J15W21

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-01	Client sample id	J15W21		
Dept sample id	7899-001	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 10:05	1059 g	
% solids	98.3	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	14.4	6.6	6.53	10.0		93A
Gross Beta	12587-47-2	13.5	4.3	5.95	15.0		93B
Potassium 40	13966-00-2	14.6	0.65	0.269			GAM
Cobalt 60	10198-40-0	U		0.029	0.050	U	GAM
Cesium 137	10045-97-3	U		0.051	0.100	U	GAM
Radium 226	13982-63-3	0.553	0.054	0.049	0.100		GAM
Radium 228	15262-20-1	0.743	0.12	0.114	0.200		GAM
Europium 152	14683-23-9	U		0.075	0.100	U	GAM
Europium 154	15585-10-1	U		0.090	0.100	U	GAM
Europium 155	14391-16-3	U		0.068	0.100	U	GAM
Thorium 228	14274-82-9	0.688	0.039	0.036			GAM
Thorium 232	TH-232	0.743	0.12	0.114			GAM
Uranium 235	15117-96-1	U		0.115		U	GAM
Uranium 238	U-238	U		3.07		U	GAM
Americium 241	14596-10-2	U		0.045		U	GAM
Silver 108m	14391-65-2	U		0.021		U	GAM

100-BC Burial Grounds - Soil

12/16/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-002 J15W22

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-02	Client sample id	J15W22		
Dept sample id	7899-002	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 10:20	914 g	
% solids	96.5	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	14.3	7.2	8.21	10.0		93A
Gross Beta	12587-47-2	19.8	4.8	6.30	15.0		93B
Potassium 40	13966-00-2	15.8	0.90	0.349			GAM
Cobalt 60	10198-40-0	U		0.031	0.050	U	GAM
Cesium 137	10045-97-3	0.093	0.036	0.038	0.100		GAM
Radium 226	13982-63-3	0.729	0.057	0.044	0.100		GAM
Radium 228	15262-20-1	0.971	0.15	0.137	0.200		GAM
Europium 152	14683-23-9	U		0.093	0.100	U	GAM
Europium 154	15585-10-1	U		0.104	0.100	U	GAM
Europium 155	14391-16-3	U		0.108	0.100	U	GAM
Thorium 228	14274-82-9	0.964	0.048	0.044			GAM
Thorium 232	TH-232	0.971	0.15	0.137			GAM
Uranium 235	15117-96-1	U		0.156		U	GAM
Uranium 238	U-238	U		3.74		U	GAM
Americium 241	14596-10-2	U		0.209		U	GAM
Silver 108m	14391-65-2	U		0.024		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-003 J15W23

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-03	Client sample id	J15W23		
Dept sample id	7899-003	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 10:40	808 g	
% solids	96.1	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	23.0	9.4	10.7	10.0		93A
Gross Beta	12587-47-2	23.7	4.6	5.52	15.0		93B
Potassium 40	13966-00-2	16.3	0.91	0.490			GAM
Cobalt 60	10198-40-0	U		0.041	0.050	U	GAM
Cesium 137	10045-97-3	U		0.045	0.100	U	GAM
Radium 226	13982-63-3	1.31	0.11	0.095	0.100		GAM
Radium 228	15262-20-1	1.78	0.20	0.165	0.200		GAM
Europium 152	14683-23-9	U		0.112	0.100	U	GAM
Europium 154	15585-10-1	U		0.139	0.100	U	GAM
Europium 155	14391-16-3	U		0.175	0.100	U	GAM
Thorium 228	14274-82-9	1.74	0.071	0.056			GAM
Thorium 232	TH-232	1.78	0.20	0.165			GAM
Uranium 235	15117-96-1	U		0.188		U	GAM
Uranium 238	U-238	U		4.91		U	GAM
Americium 241	14596-10-2	U		0.075		U	GAM
Silver 108m	14391-65-2	U		0.030		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-004 J15W24

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-04	Client sample id	J15W24		
Dept sample id	7899-004	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 10:55	802 g	
% solids	95.2	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	31.9	9.7	8.79	10.0		93A
Gross Beta	12587-47-2	23.8	4.7	5.54	15.0		93B
Potassium 40	13966-00-2	17.0	0.92	0.373			GAM
Cobalt 60	10198-40-0	U		0.035	0.050	U	GAM
Cesium 137	10045-97-3	U		0.042	0.100	U	GAM
Radium 226	13982-63-3	1.06	0.086	0.077	0.100		GAM
Radium 228	15262-20-1	1.32	0.17	0.167	0.200		GAM
Europium 152	14683-23-9	U		0.106	0.100	U	GAM
Europium 154	15585-10-1	U		0.116	0.100	U	GAM
Europium 155	14391-16-3	U		0.138	0.100	U	GAM
Thorium 228	14274-82-9	1.41	0.061	0.055			GAM
Thorium 232	TH-232	1.32	0.17	0.167			GAM
Uranium 235	15117-96-1	U		0.186		U	GAM
Uranium 238	U-238	U		4.26		U	GAM
Americium 241	14596-10-2	U		0.270		U	GAM
Silver 108m	14391-65-2	U		0.030		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-005 J15W25

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-05	Client sample id	J15W25		
Dept sample id	7899-005	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 12:15	826 g	
% solids	97.2	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	36.9	9.6	5.84	10.0		93A
Gross Beta	12587-47-2	23.2	6.4	8.97	15.0		93B
Potassium 40	13966-00-2	15.3	1.1	0.602			GAM
Cobalt 60	10198-40-0	U		0.048	0.050	U	GAM
Cesium 137	10045-97-3	U		0.057	0.100	U	GAM
Radium 226	13982-63-3	0.896	0.12	0.113	0.100		GAM
Radium 228	15262-20-1	1.25	0.25	0.229	0.200		GAM
Europium 152	14683-23-9	U		0.132	0.100	U	GAM
Europium 154	15585-10-1	U		0.182	0.100	U	GAM
Europium 155	14391-16-3	U		0.155	0.100	U	GAM
Thorium 228	14274-82-9	1.18	0.068	0.066			GAM
Thorium 232	TH-232	1.25	0.25	0.229			GAM
Uranium 235	15117-96-1	U		0.233		U	GAM
Uranium 238	U-238	U		5.68		U	GAM
Americium 241	14596-10-2	U		0.414		U	GAM
Silver 108m	14391-65-2	U		0.039		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-006 J15W26

DATA SHEET

SDG	7899	Client/Case no	Hanford		SDG K1005
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-06	Client sample id	J15W26		
Dept sample id	7899-006	Location/Matrix	100-B-21:2 Asbestos Line		SOLID
Received	10/24/07	Collected/Weight	10/22/07 12:35	939 g	
% solids	91.4	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	30.1	8.8	6.36	10.0		93A
Gross Beta	12587-47-2	20.4	4.7	5.93	15.0		93B
Potassium 40	13966-00-2	15.4	0.90	0.482			GAM
Cobalt 60	10198-40-0	U		0.043	0.050	U	GAM
Cesium 137	10045-97-3	U		0.045	0.100	U	GAM
Radium 226	13982-63-3	1.69	0.096	0.078	0.100		GAM
Radium 228	15262-20-1	1.90	0.20	0.185	0.200		GAM
Europium 152	14683-23-9	U		0.123	0.100	U	GAM
Europium 154	15585-10-1	U		0.152	0.100	U	GAM
Europium 155	14391-16-3	U		0.122	0.100	U	GAM
Thorium 228	14274-82-9	1.99	0.067	0.057			GAM
Thorium 232	TH-232	1.90	0.20	0.185			GAM
Uranium 235	15117-96-1	U		0.187		U	GAM
Uranium 238	U-238	U		5.10		U	GAM
Americium 241	14596-10-2	U		0.062		U	GAM
Silver 108m	14391-65-2	U		0.034		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-007 J15W27

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-07	Client sample id	J15W27		
Dept sample id	7899-007	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 12:50	878 g	
% solids	98.2	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	19.3	7.1	5.74	10.0		93A
Gross Beta	12587-47-2	21.5	6.3	8.95	15.0		93B
Potassium 40	13966-00-2	14.7	0.78	0.361			GAM
Cobalt 60	10198-40-0	U		0.035	0.050	U	GAM
Cesium 137	10045-97-3	0.067	0.019	0.026	0.100		GAM
Radium 226	13982-63-3	0.909	0.083	0.068	0.100		GAM
Radium 228	15262-20-1	1.15	0.16	0.137	0.200		GAM
Europium 152	14683-23-9	U		0.116	0.100	U	GAM
Europium 154	15585-10-1	U		0.121	0.100	U	GAM
Europium 155	14391-16-3	U		0.101	0.100	U	GAM
Thorium 228	14274-82-9	1.15	0.053	0.042			GAM
Thorium 232	TH-232	1.15	0.16	0.137			GAM
Uranium 235	15117-96-1	U		0.154		U	GAM
Uranium 238	U-238	U		4.46		U	GAM
Americium 241	14596-10-2	U		0.060		U	GAM
Silver 108m	14391-65-2	U		0.024		U	GAM

100-BC Burial Grounds - Soil

12/14/07

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-008 J15W28

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-08	Client sample id	J15W28		
Dept sample id	7899-008	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 13:10	946 g	
% solids	97.7	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	16.2	8.4	9.82	10.0		93A
Gross Beta	12587-47-2	21.9	4.5	5.68	15.0		93B
Potassium 40	13966-00-2	16.2	0.82	0.295			GAM
Cobalt 60	10198-40-0	U		0.028	0.050	U	GAM
Cesium 137	10045-97-3	U		0.045	0.100	U	GAM
Radium 226	13982-63-3	0.781	0.069	0.061	0.100		GAM
Radium 228	15262-20-1	1.12	0.13	0.117	0.200		GAM
Europium 152	14683-23-9	U		0.086	0.100	U	GAM
Europium 154	15585-10-1	U		0.086	0.100	U	GAM
Europium 155	14391-16-3	U		0.111	0.100	U	GAM
Thorium 228	14274-82-9	1.10	0.048	0.044			GAM
Thorium 232	TH-232	1.12	0.13	0.117			GAM
Uranium 235	15117-96-1	U		0.185		U	GAM
Uranium 238	U-238	U		3.44		U	GAM
Americium 241	14596-10-2	U		0.216		U	GAM
Silver 108m	14391-65-2	U		0.023		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-009 J15W29

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-09	Client sample id	J15W29		
Dept sample id	7899-009	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 13:25	917 g	
% solids	97.9	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	12.1	6.9	8.96	10.0		93A
Gross Beta	12587-47-2	17.1	4.2	5.65	15.0		93B
Potassium 40	13966-00-2	16.7	1.1	0.525			GAM
Cobalt 60	10198-40-0	U		0.049	0.050	U	GAM
Cesium 137	10045-97-3	U		0.052	0.100	U	GAM
Radium 226	13982-63-3	0.798	0.10	0.087	0.100		GAM
Radium 228	15262-20-1	0.980	0.21	0.195	0.200		GAM
Europium 152	14683-23-9	U		0.123	0.100	U	GAM
Europium 154	15585-10-1	U		0.178	0.100	U	GAM
Europium 155	14391-16-3	U		0.145	0.100	U	GAM
Thorium 228	14274-82-9	0.950	0.068	0.066			GAM
Thorium 232	TH-232	0.980	0.21	0.195			GAM
Uranium 235	15117-96-1	U		0.218		U	GAM
Uranium 238	U-238	U		5.70		U	GAM
Americium 241	14596-10-2	U		0.403		U	GAM
Silver 108m	14391-65-2	U		0.039		U	GAM

100-BC Burial Grounds - Soil

12/11/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-010 J15W30

DATA SHEET

SDG	7899	Client/Case no	Hanford SDG K1005
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R710146-10	Client sample id	J15W30
Dept sample id	7899-010	Location/Matrix	100-B-21:2 Asbestos Line SOLID
Received	10/24/07	Collected/Weight	10/22/07 13:50 963 g
% solids	98.0	Custody/SAF No	RC-020-085 RC-020

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	15.4	7.5	8.99	10.0		93A
Gross Beta	12587-47-2	22.2	4.4	5.54	15.0		93B
Potassium 40	13966-00-2	15.4	0.95	0.396			GAM
Cobalt 60	10198-40-0	U		0.045	0.050	U	GAM
Cesium 137	10045-97-3	U		0.042	0.100	U	GAM
Radium 226	13982-63-3	0.697	0.085	0.077	0.100		GAM
Radium 228	15262-20-1	1.12	0.18	0.161	0.200		GAM
Europium 152	14683-23-9	U		0.109	0.100	U	GAM
Europium 154	15585-10-1	U		0.145	0.100	U	GAM
Europium 155	14391-16-3	U		0.112	0.100	U	GAM
Thorium 228	14274-82-9	1.02	0.058	0.052			GAM
Thorium 232	TH-232	1.12	0.18	0.161			GAM
Uranium 235	15117-96-1	U		0.164		U	GAM
Uranium 238	U-238	U		5.20		U	GAM
Americium 241	14596-10-2	U		0.054		U	GAM
Silver 108m	14391-65-2	U		0.031		U	GAM

100-BC Burial Grounds - Soil

12/10/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-011 J15W31

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-11	Client sample id	J15W31		
Dept sample id	7899-011	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 14:30	968 g	
% solids	98.1	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	17.4	8.0	9.39	10.0		93A
Gross Beta	12587-47-2	21.2	6.0	8.99	15.0		93B
Potassium 40	13966-00-2	15.9	0.74	0.329			GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Cesium 137	10045-97-3	0.078	0.033	0.040	0.100		GAM
Radium 226	13982-63-3	0.799	0.065	0.055	0.100		GAM
Radium 228	15262-20-1	1.18	0.17	0.155	0.200		GAM
Europium 152	14683-23-9	U		0.123	0.100	U	GAM
Europium 154	15585-10-1	U		0.112	0.100	U	GAM
Europium 155	14391-16-3	U		0.137	0.100	U	GAM
Thorium 228	14274-82-9	1.12	0.049	0.040			GAM
Thorium 232	TH-232	1.18	0.17	0.155			GAM
Uranium 235	15117-96-1	U		0.144		U	GAM
Uranium 238	U-238	U		3.83		U	GAM
Americium 241	14596-10-2	U		0.058		U	GAM
Silver 108m	14391-65-2	U		0.023		U	GAM

100-BC Burial Grounds - Soil

12/11/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-012 J15W32

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R710146-12	Client sample id	J15W32	
Dept sample id	7899-012	Location/Matrix	100-B-21:2 Asbestos Line	SOLID
Received	10/24/07	Collected/Weight	10/22/07 14:50	911 g
% solids	97.5	Custody/SAF No	RC-020-085	RC-020

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	17.0	8.9	11.6	10.0		93A
Gross Beta	12587-47-2	16.3	5.6	8.70	15.0		93B
Potassium 40	13966-00-2	15.9	0.86	0.286			GAM
Cobalt 60	10198-40-0	U		0.031	0.050	U	GAM
Cesium 137	10045-97-3	0.050	0.026	0.031	0.100		GAM
Radium 226	13982-63-3	0.771	0.057	0.045	0.100		GAM
Radium 228	15262-20-1	1.08	0.14	0.126	0.200		GAM
Europium 152	14683-23-9	U		0.089	0.100	U	GAM
Europium 154	15585-10-1	U		0.092	0.100	U	GAM
Europium 155	14391-16-3	U		0.108	0.100	U	GAM
Thorium 228	14274-82-9	1.05	0.046	0.039			GAM
Thorium 232	TH-232	1.08	0.14	0.126			GAM
Uranium 235	15117-96-1	U		0.146		U	GAM
Uranium 238	U-238	U		3.69		U	GAM
Americium 241	14596-10-2	U		0.210		U	GAM
Silver 108m	14391-65-2	U		0.023		U	GAM

100-BC Burial Grounds - Soil

12/16/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-013 J15W33

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-13	Client sample id	J15W33		
Dept sample id	7899-013	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 15:05	926 g	
% solids	98.3	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	9.66	6.2	8.28	10.0		93A
Gross Beta	12587-47-2	15.9	4.2	5.60	15.0		93B
Potassium 40	13966-00-2	16.6	0.91	0.388			GAM
Cobalt 60	10198-40-0	U		0.043	0.050	U	GAM
Cesium 137	10045-97-3	U		0.062	0.100	U	GAM
Radium 226	13982-63-3	0.828	0.082	0.074	0.100		GAM
Radium 228	15262-20-1	1.24	0.20	0.171	0.200		GAM
Europium 152	14683-23-9	U		0.109	0.100	U	GAM
Europium 154	15585-10-1	U		0.139	0.100	U	GAM
Europium 155	14391-16-3	U		0.186	0.100	U	GAM
Thorium 228	14274-82-9	1.23	0.059	0.050			GAM
Thorium 232	TH-232	1.24	0.20	0.171			GAM
Uranium 235	15117-96-1	U		0.166		U	GAM
Uranium 238	U-238	U		4.77		U	GAM
Americium 241	14596-10-2	U		0.055		U	GAM
Silver 108m	14391-65-2	U		0.031		U	GAM

100-BC Burial Grounds - Soil

12/11/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-014 J15W34

DATA SHEET

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-14	Client sample id	J15W34		
Dept sample id	7899-014	Location/Matrix	100-B-21:2 Asbestos Line	SOLID	
Received	10/24/07	Collected/Weight	10/22/07 10:45	833 g	
% solids	96.1	Custody/SAF No	RC-020-085	RC-020	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	21.4	9.3	11.3	10.0		93A
Gross Beta	12587-47-2	24.6	6.0	8.68	15.0		93B
Potassium 40	13966-00-2	16.4	0.77	0.314			GAM
Cobalt 60	10198-40-0	U		0.038	0.050	U	GAM
Cesium 137	10045-97-3	U		0.040	0.100	U	GAM
Radium 226	13982-63-3	1.50	0.093	0.076	0.100		GAM
Radium 228	15262-20-1	1.71	0.18	0.168	0.200		GAM
Europium 152	14683-23-9	U		0.100	0.100	U	GAM
Europium 154	15585-10-1	U		0.123	0.100	U	GAM
Europium 155	14391-16-3	U		0.129	0.100	U	GAM
Thorium 228	14274-82-9	1.76	0.062	0.049			GAM
Thorium 232	TH-232	1.71	0.18	0.168			GAM
Uranium 235	15117-96-1	U		0.174		U	GAM
Uranium 238	U-238	U		4.55		U	GAM
Americium 241	14596-10-2	U		0.070		U	GAM
Silver 108m	14391-65-2	U		0.028		U	GAM

100-BC Burial Grounds - Soil

12/11/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1005 was composed of fourteen 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 document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on November 8, 2007.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

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

Mel Mannion
Melissa C. Mannion
Senior Program Manager

11/13/07
Date

Washington Closure Hanford

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez \T. welsh-Koelling	C. Martinez	509-539-2816	KESSNER, JH	8K	15 days

Project Designation	Sampling Location	SAF No.
100-BC Burial Grounds - Soil Full Protocol	100-B-21:2 (2-in asbestos line) K1005 (7899)	RC-020

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
EPC-99-065	EFL1173-14	R10B212000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A080010	see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Preservation	None	Cool 4C	Cool 4C	None	None
Type of Container	G/P	G/P	aG	G/P	aG
No. of Container(s)	1	1	1	1	1
Volume	250mL	125mL	250mL	500mL	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta

000026

Sample No.	Matrix *	Sample Date	Sample Time					
J15W21	SOIL	10/22/07	1005				✓	✓
J15W22	SOIL		1020				✓	✓
J15W23	SOIL		1040				✓	✓
J15W24	SOIL		1055				✓	✓
J15W25	SOIL	10/22/07	1215				✓	✓

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Tutight Lewis / J. Bellen	10/22/07 1515	C. Martinez/C. Martinez	1515 10/22/07
C. Martinez/C. Martinez	10/22/07 1630	3728 2B	1630 10/22/07
3728 2B	10-23-07 1000	KM Singleton	10-23-07 1000
KM Singleton	10-23-07 1500	FED EX	WCH
FED EX			10/24/07 09:15

SPECIAL INSTRUCTIONS 10/22/07

(1) ~~ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)~~
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Sampler unavailable to relinquish samples from 3728 Ref #2B. 3728 Custodian removed samples for shipping on 10/23/07.

Matrix *

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

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

FORM 2: 01

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez \ T. welsh-Koelling	C. Martinez	509-539-2816	KESSNER, JH	8K	15 days

Project Designation	Sampling Location	SAF No.
100-BC Burial Grounds - Soil Full Protocol	100-B-21:2 (2-in asbestos line) K1005 (7899)	RC-020

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-99-065	EFL1173-14	R10B212000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A080010	see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Preservation	None	Cool 4C	Cool 4C	None	None
Type of Container	G/P	G/P	aG	G/P	aG
No. of Container(s)	1	1	1	1	1
Volume	250mL	125mL	250mL	500mL	60mL

SAMPLE ANALYSIS

	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta

000027

Sample No.	Matrix *	Sample Date	Sample Time					
J15W26	SOIL	10/22/07	1235				✓	✓
J15W27	SOIL		1250				✓	✓
J15W28	SOIL		1310				✓	✓
J15W29	SOIL		1325				✓	✓
J15W30	SOIL	10/22/07	1350				✓	✓

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	10/22/07 1515	C. Martinez / C. Martinez	1515 10/22/07
C. Martinez / C. Martinez	10/22/07 1630	3728 2B	1630 10/22/07
3728 2B	10-23-07 1000	KM Singleton	10-23-07 1000
KM Singleton	10-23-07 1500	FED EX	
FED EX			10/24/07 09:15

SPECIAL INSTRUCTIONS [illegible] 10/22/07

(1) ~~ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)~~
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Sampler unavailable to relinquish samples from 3728 Ref # 2B
3728 Custodian removed samples for shipping on 10/23/07.

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

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

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez T. welsh Isoelling	C. Martinez	509-539-2816	KESSNER, JH	8K	15 days

Project Designation	Sampling Location	SAF No.
100-BC Burial Grounds - Soil Full Protocol	100-B-21:2 (2-in asbestos line) K1005 (7899)	RC-020

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-99-065	EFL1173-14	R10B212000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A080010	see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Preservation	None	Cool 4C	Cool 4C	None	None					
Type of Container	G/P	G/P	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1					
Volume	250mL	125mL	250mL	500mL	60mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	~~Semi-VOA - 8270A (TCL)~~	See item (2) in Special Instructions	Gross Alpha & Gross Beta					

000028

Sample No.	Matrix *	Sample Date	Sample Time									
			1430									
J15W31	SOIL	10/22/07	~~1005~~	10/22/07			✓	✓				
J15W32	SOIL		1450				✓	✓				
J15W33	SOIL		1505				✓	✓				
J15W34	SOIL	10/22/07	1045				✓	✓				
J15W35	~~SOIL~~	10/22/07	~~1025~~									

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	10/22/07 1515	c.martinez/c.martinez	1515 10/22/07
c.martinez/c.martinez	10/22/07 1630	3728 2B	1630 10/22/07
3728 2B	10-23-07 1000	[illegible]	10-23-07 1000
[illegible]	10-23-07 1500	FEDEX	
FED EX		[illegible]	10/24/07 04:15

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR ~~(Client List)~~ {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV).
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Sampler unavailable to relinquish samples from 3728 Ref # 2B 3728 Custodian removed samples for shipping on 10/23/07.

(Cm) 10/22/07

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solid
DL=Drum Liquid
T=Tissue
WI=Wipe
L=Liquid
[illegible]

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

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-B-21:2		DATA PACKAGE:	K1005	
VALIDATOR:	ELR	LAB: EB		DATE: 12/16/07	
			SDG: K1005		

ANALYSES PERFORMED

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

SAMPLES/MATRIX

J15W21	J15W22	J15W23	J15W24	J15W25	J15W26
J15W27	J15W28	J15W29	J15W30	J15W31	J15W32
J15W33	J15W34				
					Soil

1. Completeness ..... ☐ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

Comments:

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

Comments: _____

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

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

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

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

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

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

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

Comments: NO FS or PAS

12. Holding Times (All levels)

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

Comments: _____

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

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

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

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

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

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

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

Comments: 37 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-016 Method Blank

METHOD BLANK

SDG	7899	Client/Case no	Hanford	SDG K1005	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R710146-16	Client sample id	Method Blank		
Dept sample id	7899-016	Material/Matrix		SOLID	
		SAF No	RC-020		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-2.34	3.0	7.78	10.0	U	93A
Gross Beta	12587-47-2	-1.62	5.4	9.05	15.0	U	93B
Potassium 40	13966-00-2	U		0.415		U	GAM
Cobalt 60	10198-40-0	U		0.019	0.050	U	GAM
Cesium 137	10045-97-3	U		0.018	0.100	U	GAM
Radium 226	13982-63-3	U		0.039	0.100	U	GAM
Radium 228	15262-20-1	U		0.072	0.200	U	GAM
Europium 152	14683-23-9	U		0.042	0.100	U	GAM
Europium 154	15585-10-1	U		0.045	0.100	U	GAM
Europium 155	14391-16-3	U		0.049	0.100	U	GAM
Thorium 228	14274-82-9	U		0.027		U	GAM
Thorium 232	TH-232	U		0.072		U	GAM
Uranium 235	15117-96-1	U		0.071		U	GAM
Uranium 238	U-238	U		1.74		U	GAM
Americium 241	14596-10-2	U		0.093		U	GAM
Silver 108m	14391-65-2	U		0.013		U	GAM

100-BC Burial Grounds - Soil

QC-BLANK #63320

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-015

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7899

Contact Melissa C. Mannion

Client/Case no Hanford SDG K1005

Contract No. 630

Lab sample id R710146-15

Dept sample id 7899-015

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-020

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	114	18	9.88	10.0		93A	111	4.4	103	60-140	70-130
Gross Beta	106	7.8	5.69	15.0		93B	113	4.5	94	76-124	80-120
Cobalt 60	1.04	0.080	0.027	0.050		GAM	0.993	0.040	105	73-127	80-120
Cesium 137	1.05	0.071	0.048	0.100		GAM	1.04	0.042	101	74-126	80-120

100-BC Burial Grounds - Soil

QC-LCS #63319

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/08/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1005

7899-017 J15W27

DUPLICATE

SDG	7899			Client/Case no	Hanford SDG K1005
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R710146-17	Lab sample id	R710146-07	Client sample id	J15W27
Dept sample id	7899-017	Dept sample id	7899-007	Location/Matrix	100-B-21:2 Asbestos Line SOLID
		Received	10/24/07	Collected/Weight	10/22/07 12:50 878 g
% solids	98.2	% solids	98.2	Custody/SAF No	RC-020-085 RC-020

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Gross Alpha	21.9	8.1	7.80	10.0		93A	19.3	7.1	5.74		13	89	0.4
Gross Beta	19.6	4.8	6.26	15.0		93B	21.5	6.3	8.95		9	66	0.4
Potassium 40	14.5	0.97	0.344			GAM	14.7	0.78	0.361		1	34	0.1
Cobalt 60	U		0.038	0.050	U	GAM	U		0.035	U	-		0.1
Cesium 137	0.098	0.034	0.036	0.100		GAM	0.067	0.019	0.026		38	78	1.4
Radium 226	0.784	0.080	0.073	0.100		GAM	0.909	0.083	0.068		15	38	1.2
Radium 228	1.20	0.18	0.152	0.200		GAM	1.15	0.16	0.137		4	44	0.3
Europium 152	U		0.101	0.100	U	GAM	U		0.116	U	-		0.2
Europium 154	U		0.121	0.100	U	GAM	U		0.121	U	-		0
Europium 155	U		0.133	0.100	U	GAM	U		0.101	U	-		0.4
Thorium 228	1.13	0.055	0.044			GAM	1.15	0.053	0.042		2	33	0.2
Thorium 232	1.20	0.18	0.152			GAM	1.15	0.16	0.137		4	44	0.3
Uranium 235	U		0.138		U	GAM	U		0.154	U	-		0.2
Uranium 238	U		4.39		U	GAM	U		4.46	U	-		0
Americium 241	U		0.047		U	GAM	U		0.060	U	-		0.3
Silver 108m	U		0.027		U	GAM	U		0.024	U	-		0.2

100-BC Burial Grounds - Soil

QC-DUP#7 63321

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	11/08/07

Date: 17 December 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 100-B-21:2
Subject: Semivolatile - Data Package No. K1005-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1005 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J15W21	10/22/07	Soil	C	See note 1
J15W22	10/22/07	Soil	C	See note 1
J15W23	10/22/07	Soil	C	See note 1
J15W24	10/22/07	Soil	C	See note 1
J15W25	10/22/07	Soil	C	See note 1
J15W26	10/22/07	Soil	C	See note 1
J15W27	10/22/07	Soil	C	See note 1
J15W28	10/22/07	Soil	C	See note 1
J15W29	10/22/07	Soil	C	See note 1
J15W30	10/22/07	Soil	C	See note 1
J15W31	10/22/07	Soil	C	See note 1
J15W32	10/22/07	Soil	C	See note 1
J15W33	10/22/07	Soil	C	See note 1
J15W34	10/22/07	Soil	C	See note 1
J15W35	10/22/07	Soil	C	See note 1

1 – Semivolatiles by 8270C.

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

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were met.

- **Method Blanks**

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

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

All other method blank results were acceptable.

Field Blanks

One field (equipment) blank (J15W35) was submitted for analysis. Di-n-butylphthalate was detected in the equipment blank. Under the WCH statement of work, no qualification is required. No other analytes were detected in the field blank

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike and/or matrix spike duplicate recoveries outside QC limits, all 1,2,4-trichlorobenzene (52% & 54%) and 2-methylnaphthalene (58%) results were qualified as estimates and flagged "J".

Due to LCS recoveries outside QC limits, all 4-chloroanaline (43%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

Due to surrogate recoveries outside QC limits, the 2,4-dichlorophenol, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, pentachlorophenol, bis(2-chloroethyl)ether, bis(2-chloroethoxy)methane, 4-chlorophenyl phenyl ether, 4-bromophenyl phenyl ether results in sample J15W35 were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J15W23/J15W34) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. K1005 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

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

- Due to matrix spike and/or matrix spike duplicate recoveries outside QC limits, all 1,2,4-trichlorobenzene (52% & 54%) and 2-methylnaphthalene (58%) results were qualified as estimates and flagged "J".

- Due to LCS recoveries outside QC limits, all 4-chloroanaline (43%) results were qualified as estimates and flagged "J".

- Due to surrogate recoveries outside QC limits, the 2,4-dichlorophenol, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, pentachlorophenol, bis(2-chloroethyl)ether, bis(2-chloroethoxy)methane, 4-chlorophenyl phenyl ether, 4-bromophenyl phenyl ether results in sample J15W35 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.

One-hundred twenty semivolatile analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K1005	REVIEWER: ELR	Project: 100-B-21:2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U at RQL	All	Method blank contamination
1,2,4-trichlorobenzene 2-methylnaphthalene	J	All	MS and/or MSD recovery
4-chloroanaline	J	All	LCS recovery
2,4-dichlorophenol 2,4,6-trichlorophenol 2,4,5-trichlorophenol pentachlorophenol bis(2-chloroethyl)ether bis(2-chloroethoxy)methane 4-chlorophenyl phenyl ether 4-bromophenyl phenyl ether	J	J15W35	Surrogate recovery

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

Appendix 3

Annotated Laboratory Reports

	Cust ID:	J15W21	J15W21	J15W21	J15W22	J15W23	J15W24
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	84 %	59 %	58 %	66 %	62 %	66 %
	2-Fluorobiphenyl	89 %	85 %	89 %	76 %	69 %	75 %
	Terphenyl-d14	140 * %	108 %	109 %	119 %	117 %	124 %
	Phenol-d5	72 %	81 %	86 %	55 %	56 %	59 %
	2-Fluorophenol	90 %	89 %	93 %	66 %	61 %	65 %
	2,4,6-Tribromophenol	75 %	73 %	69 %	75 %	78 %	75 %
		fl	fl	fl	fl	fl	fl
Phenol		340 U	86 %	87 %	340 U	350 U	340 U
bis(2-Chloroethyl)ether		340 U	68 %	75 %	340 U	350 U	340 U
2-Chlorophenol		340 U	80 %	88 %	340 U	350 U	340 U
1,3-Dichlorobenzene		340 U	68 %	71 %	340 U	350 U	340 U
1,4-Dichlorobenzene		340 U	67 %	71 %	340 U	350 U	340 U
1,2-Dichlorobenzene		340 U	71 %	73 %	340 U	350 U	340 U
2-Methylphenol		340 U	77 %	91 %	340 U	350 U	340 U
2,2'-oxybis(1-Chloropropane)		340 U	76 %	79 %	340 U	350 U	340 U
3/4 Methylphenol		340 U	91 %	102 %	340 U	350 U	340 U
N-Nitroso-di-n-propylamine		340 U	84 %	88 %	340 U	350 U	340 U
Hexachloroethane		340 U	68 %	68 %	340 U	350 U	340 U
Nitrobenzene		340 U	52 %	55 %	340 U	350 U	340 U
Isophorone		340 U	63 %	67 %	340 U	350 U	340 U
2-Nitrophenol		340 U	56 %	59 %	340 U	350 U	340 U
2,4-Dimethylphenol		340 U	54 %	62 %	340 U	350 U	340 U
bis(2-Chloroethoxy)methane		340 U	54 %	59 %	340 U	350 U	340 U
2,4-Dichlorophenol		340 U	57 %	65 %	340 U	350 U	340 U
1,2,4-Trichlorobenzene		340 U J	52 * %	54 * %	340 U J	350 U J	340 U J
Naphthalene		340 U	56 %	60 %	340 U	350 U	340 U
4-Chloroaniline		340 U J	36 %	42 %	340 U J	350 U J	340 U J
Hexachlorobutadiene		340 U	56 %	57 %	340 U	350 U	340 U
4-Chloro-3-methylphenol		340 U	64 %	72 %	340 U	350 U	340 U
2-Methylnaphthalene		340 U J	58 * %	61 %	340 U J	350 U J	340 U J
Hexachlorocyclopentadiene		340 U	48 %	62 %	340 U	350 U	340 U
2,4,6-Trichlorophenol		340 U	79 %	85 %	340 U	350 U	340 U
2,4,5-Trichlorophenol		850 U	80 %	95 %	860 U	870 U	860 U

*= Outside of EPA CLP QC limits.

R 12/12/07

000000008

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RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	340	U	74	%	87	%	340	U	350	U	340	U
2-Nitroaniline	850	U	92	%	106	%	860	U	870	U	860	U
Dimethylphthalate	340	U	87	%	101	%	340	U	350	U	340	U
Acenaphthylene	340	U	80	%	93	%	340	U	350	U	340	U
2,6-Dinitrotoluene	340	U	87	%	99	%	340	U	350	U	340	U
3-Nitroaniline	850	U	74	%	85	%	860	U	870	U	860	U
Acenaphthene	340	U	76	%	92	%	340	U	350	U	340	U
2,4-Dinitrophenol	850	U	87	%	99	%	860	U	870	U	860	U
4-Nitrophenol	850	U	111	%	126	%	860	U	870	U	860	U
Dibenzofuran	340	U	85	%	102	%	340	U	350	U	340	U
2,4-Dinitrotoluene	340	U	95	%	111	%	340	U	350	U	340	U
Diethylphthalate	340	U	89	%	104	%	340	U	350	U	340	U
4-Chlorophenyl-phenylether	340	U	85	%	97	%	340	U	350	U	340	U
Fluorene	340	U	84	%	97	%	340	U	350	U	340	U
4-Nitroaniline	850	U	98	%	108	%	860	U	870	U	860	U
4,6-Dinitro-2-methylphenol	850	U	83	%	89	%	860	U	870	U	860	U
N-Nitrosodiphenylamine (1)	340	U	67	%	76	%	340	U	350	U	340	U
4-Bromophenyl-phenylether	340	U	70	%	77	%	340	U	350	U	340	U
Hexachlorobenzene	340	U	81	%	90	%	340	U	350	U	340	U
Pentachlorophenol	850	U	79	%	81	%	860	U	870	U	860	U
Phenanthrene	340	U	84	%	94	%	340	U	350	U	340	U
Anthracene	340	U	90	%	99	%	340	U	350	U	340	U
Carbazole	340	U	87	%	101	%	340	U	350	U	340	U
Di-n-butylphthalate	22	J	89	%	102	%	340	U	350	U	17	J
Fluoranthene	340	U	89	%	96	%	340	U	350	U	340	U
Pyrene	340	U	96	%	102	%	340	U	350	U	340	U
Butylbenzylphthalate	340	U	102	%	109	%	340	U	350	U	340	U
3,3'-Dichlorobenzidine	340	U	60	%	67	%	340	U	350	U	340	U
Benzo(a)anthracene	340	U	90	%	96	%	340	U	350	U	340	U
Chrysene	340	U	86	%	95	%	340	U	350	U	340	U
bis(2-Ethylhexyl)phthalate	660 ~~75~~ 12/14/97 JB	U	98	%	108	%	660 ~~87~~ 12/14/97 JB	U	660 ~~27~~ 12/14/97 JB	U	660 ~~83~~ 12/14/97 JB	U
Di-n-octyl phthalate	340	U	88	%	102	%	340	U	350	U	340	U
Benzo(b)fluoranthene	340	U	85	%	95	%	340	U	350	U	340	U
Benzo(k)fluoranthene	340	U	83	%	94	%	340	U	350	U	340	U
Benzo(a)pyrene	340	U	86	%	95	%	340	U	350	U	340	U
Indeno(1,2,3-cd)pyrene	340	U	95	%	101	%	340	U	350	U	340	U
Dibenz(a,h)anthracene	340	U	95	%	102	%	340	U	350	U	340	U
Benzo(g,h,i)perylene	340	U	93	%	98	%	340	U	350	U	340	U

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

12/16/97

000000009

	Cust ID:	J15W25		J15W26		J15W27		J15W28		J15W29		J15W30	
Sample Information	RFW#:	005		006		007		008		009		010	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	61	%	67	%	57	%	59	%	57	%	49	%
	2-Fluorobiphenyl	74	%	66	%	60	%	61	%	58	%	55	%
	Terphenyl-d14	114	%	90	%	99	%	90	%	93	%	95	%
	Phenol-d5	58	%	62	%	54	%	55	%	55	%	47	%
	2-Fluorophenol	67	%	81	%	68	%	66	%	67	%	53	%
	2,4,6-Tribromophenol	103	%	81	%	66	%	70	%	72	%	55	%
			fl		fl		fl		fl		fl		fl
Phenol		340	U	340	U	340	U	340	U	340	U	340	U
bis(2-Chloroethyl)ether		340	U	340	U	340	U	340	U	340	U	340	U
2-Chlorophenol		340	U	340	U	340	U	340	U	340	U	340	U
1,3-Dichlorobenzene		340	U	340	U	340	U	340	U	340	U	340	U
1,4-Dichlorobenzene		340	U	340	U	340	U	340	U	340	U	340	U
1,2-Dichlorobenzene		340	U	340	U	340	U	340	U	340	U	340	U
2-Methylphenol		340	U	340	U	340	U	340	U	340	U	340	U
2,2'-oxybis(1-Chloropropane)		340	U	340	U	340	U	340	U	340	U	340	U
3/4 Methylphenol		340	U	340	U	340	U	340	U	340	U	340	U
N-Nitroso-di-n-propylamine		340	U	340	U	340	U	340	U	340	U	340	U
Hexachloroethane		340	U	340	U	340	U	340	U	340	U	340	U
Nitrobenzene		340	U	340	U	340	U	340	U	340	U	340	U
Isophorone		340	U	340	U	340	U	340	U	340	U	340	U
2-Nitrophenol		340	U	340	U	340	U	340	U	340	U	340	U
2,4-Dimethylphenol		340	U	340	U	340	U	340	U	340	U	340	U
bis(2-Chloroethoxy)methane		340	U	340	U	340	U	340	U	340	U	340	U
2,4-Dichlorophenol		340	U	340	U	340	U	340	U	340	U	340	U
1,2,4-Trichlorobenzene		340	U J	340	U J	340	U J	340	U J	340	U J	340	U J
Naphthalene		340	U	340	U	340	U	340	U	340	U	340	U
4-Chloroaniline		340	U J	340	U J	340	U J	340	U J	340	U J	340	U J
Hexachlorobutadiene		340	U	340	U	340	U	340	U	340	U	340	U
4-Chloro-3-methylphenol		340	U	340	U	340	U	340	U	340	U	340	U
2-Methylnaphthalene		340	U J	340	U J	340	U J	340	U J	340	U J	340	U J
Hexachlorocyclopentadiene		340	U	340	U	340	U	340	U	340	U	340	U
2,4,6-Trichlorophenol		340	U	340	U	340	U	340	U	340	U	340	U
2,4,5-Trichlorophenol		850	U	850	U	850	U	850	U	850	U	850	U

*= Outside of EPA CLP QC limits.

12/14/07

0000010

0000013

RFW#:	005	006	007	008	009	010
2-Chloronaphthalene	340 U	340 U	340 U	340 U	340 U	340 U
2-Nitroaniline	850 U	850 U	850 U	850 U	850 U	850 U
Dimethylphthalate	340 U	340 U	340 U	340 U	340 U	340 U
Acenaphthylene	340 U	340 U	340 U	340 U	340 U	340 U
2,6-Dinitrotoluene	340 U	340 U	340 U	340 U	340 U	340 U
3-Nitroaniline	850 U	850 U	850 U	850 U	850 U	850 U
Acenaphthene	340 U	340 U	340 U	340 U	340 U	340 U
2,4-Dinitrophenol	850 U	850 U	850 U	850 U	850 U	850 U
4-Nitrophenol	850 U	850 U	850 U	850 U	850 U	850 U
Dibenzofuran	340 U	340 U	340 U	340 U	340 U	340 U
2,4-Dinitrotoluene	340 U	340 U	340 U	340 U	340 U	340 U
Diethylphthalate	340 U	340 U	340 U	340 U	340 U	340 U
4-Chlorophenyl-phenylether	340 U	340 U	340 U	340 U	340 U	340 U
Fluorene	340 U	340 U	340 U	340 U	340 U	340 U
4-Nitroaniline	850 U	850 U	850 U	850 U	850 U	850 U
4,6-Dinitro-2-methylphenol	850 U	850 U	850 U	850 U	850 U	850 U
N-Nitrosodiphenylamine (1)	340 U	340 U	340 U	340 U	340 U	340 U
4-Bromophenyl-phenylether	340 U	340 U	340 U	340 U	340 U	340 U
Hexachlorobenzene	340 U	340 U	340 U	340 U	340 U	340 U
Pentachlorophenol	850 U	850 U	850 U	850 U	850 U	850 U
Phenanthrene	340 U	340 U	340 U	340 U	340 U	340 U
Anthracene	340 U	340 U	340 U	340 U	340 U	340 U
Carbazole	340 U	340 U	340 U	340 U	340 U	340 U
Di-n-butylphthalate	340 U	340 U	340 U	340 U	340 U	340 U
Fluoranthene	340 U	340 U	340 U	340 U	340 U	340 U
Pyrene	340 U	340 U	340 U	340 U	340 U	340 U
Butylbenzylphthalate	340 U	340 U	340 U	340 U	340 U	340 U
3,3'-Dichlorobenzidine	340 U	340 U	340 U	340 U	340 U	340 U
Benzo(a)anthracene	340 U	340 U	340 U	340 U	340 U	340 U
Chrysene	340 U	340 U	340 U	340 U	340 U	340 U
bis(2-Ethylhexyl)phthalate	660 ~~96~~ 12/14/07 JB U	660 ~~32~~ 12/14/07 JB U	660 ~~10~~ 12/14/07 JB U	660 ~~40~~ 12/14/07 JB U	660 ~~67~~ 12/14/07 JB U	660 ~~4~~ JB U
Di-n-octyl phthalate	340 U	340 U	340 U	340 U	340 U	340 U
Benzo(b)fluoranthene	340 U	340 U	340 U	340 U	340 U	340 U
Benzo(k)fluoranthene	340 U	340 U	340 U	340 U	340 U	340 U
Benzo(a)pyrene	340 U	340 U	340 U	340 U	340 U	340 U
Indeno(1,2,3-cd)pyrene	340 U	340 U	340 U	340 U	340 U	340 U
Dibenz(a,h)anthracene	340 U	340 U	340 U	340 U	340 U	340 U
Benzo(g,h,i)perylene	340 U	340 U	340 U	340 U	340 U	340 U

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

12/14/07

000000014

000000011

	Cust ID:	J15W31	J15W32	J15W33	J15W34	J15W35	SBLKPO
Sample Information	RFW#:	011	012	013	014	015	07LE0595-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	50 %	49 %	67 %	48 %	66 %	92 %
	2-Fluorobiphenyl	57 %	52 %	77 %	50 %	67 %	96 %
	Terphenyl-d14	88 %	91 %	119 %	85 %	94 %	140 * %
	Phenol-d5	45 %	50 %	63 %	42 %	62 %	72 %
	2-Fluorophenol	52 %	59 %	65 %	49 %	69 %	84 %
	2,4,6-Tribromophenol	62 %	51 %	86 %	58 %	18 * %	30 %
		fl	fl	fl	fl	fl	fl
Phenol		340 U	340 U	340 U	350 U	330 U	330 U
bis(2-Chloroethyl)ether		340 U	340 U	340 U	350 U	330 U J	330 U
2-Chlorophenol		340 U	340 U	340 U	350 U	330 U	330 U
1,3-Dichlorobenzene		340 U	340 U	340 U	350 U	330 U	330 U
1,4-Dichlorobenzene		340 U	340 U	340 U	350 U	330 U	330 U
1,2-Dichlorobenzene		340 U	340 U	340 U	350 U	330 U	330 U
2-Methylphenol		340 U	340 U	340 U	350 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		340 U	340 U	340 U	350 U	330 U	330 U
3/4 Methylphenol		340 U	340 U	340 U	350 U	330 U	330 U
N-Nitroso-di-n-propylamine		340 U	340 U	340 U	350 U	330 U	330 U
Hexachloroethane		340 U	340 U	340 U	350 U	330 U	330 U
Nitrobenzene		340 U	340 U	340 U	350 U	330 U	330 U
Isophorone		340 U	340 U	340 U	350 U	330 U	330 U
2-Nitrophenol		340 U	340 U	340 U	350 U	330 U	330 U
2,4-Dimethylphenol		340 U	340 U	340 U	350 U	330 U	330 U
bis(2-Chloroethoxy)methane		340 U	340 U	340 U	350 U	330 U J	330 U
2,4-Dichlorophenol		340 U	340 U	340 U	350 U	330 U J	330 U
1,2,4-Trichlorobenzene		340 U J	340 U J	340 U J	350 U J	330 U J	330 U
Naphthalene		340 U	340 U	340 U	350 U	330 U	330 U
4-Chloroaniline		340 U J	340 U J	340 U J	350 U J	330 U J	330 U
Hexachlorobutadiene		340 U	340 U	340 U	350 U	330 U	330 U
4-Chloro-3-methylphenol		340 U	340 U	340 U	350 U	330 U	330 U
2-Methylnaphthalene		340 U J	340 U J	340 U J	350 U J	330 U J	330 U
Hexachlorocyclopentadiene		340 U	340 U	340 U	350 U	330 U	330 U
2,4,6-Trichlorophenol		340 U	340 U	340 U	350 U	330 U J	330 U
2,4,5-Trichlorophenol		850 U	850 U	850 U	870 U	830 U J	830 U

*= Outside of EPA CLP QC limits.

K 12/10/07

0000015

0000012

RFW#:	011	012	013	014	015	07LE0595-MB1
2-Chloronaphthalene	340 U	340 U	340 U	350 U	330 U	330 U
2-Nitroaniline	850 U	850 U	850 U	870 U	830 U	830 U
Dimethylphthalate	340 U	340 U	340 U	350 U	330 U	330 U
Acenaphthylene	340 U	340 U	340 U	350 U	330 U	330 U
2,6-Dinitrotoluene	340 U	340 U	340 U	350 U	330 U	330 U
3-Nitroaniline	850 U	850 U	850 U	870 U	830 U	830 U
Acenaphthene	340 U	340 U	340 U	350 U	330 U	330 U
2,4-Dinitrophenol	850 U	850 U	850 U	870 U	830 U	830 U
4-Nitrophenol	850 U	850 U	850 U	870 U	830 U	830 U
Dibenzofuran	340 U	340 U	340 U	350 U	330 U	330 U
2,4-Dinitrotoluene	340 U	340 U	340 U	350 U	330 U	330 U
Diethylphthalate	340 U	340 U	340 U	350 U	330 U	330 U
4-Chlorophenyl-phenylether	340 U	340 U	340 U	350 U	330 U J	330 U
Fluorene	340 U	340 U	340 U	350 U	330 U	330 U
4-Nitroaniline	850 U	850 U	850 U	870 U	830 U	830 U
4,6-Dinitro-2-methylphenol	850 U	850 U	850 U	870 U	830 U	830 U
N-Nitrosodiphenylamine (1)	340 U	340 U	340 U	350 U	330 U	330 U
4-Bromophenyl-phenylether	340 U	340 U	340 U	350 U	330 U J	330 U
Hexachlorobenzene	340 U	340 U	340 U	350 U	330 U	330 U
Pentachlorophenol	850 U	850 U	850 U	870 U	830 U J	830 U
Phenanthrene	340 U	340 U	340 U	350 U	330 U	330 U
Anthracene	340 U	340 U	340 U	350 U	330 U	330 U
Carbazole	340 U	340 U	340 U	350 U	330 U	330 U
Di-n-butylphthalate	340 U	340 U	340 U	350 U	32 J	330 U
Fluoranthene	340 U	340 U	340 U	350 U	330 U	330 U
Pyrene	340 U	340 U	340 U	21 J	330 U	330 U
Butylbenzylphthalate	340 U	340 U	340 U	350 U	330 U	330 U
3,3'-Dichlorobenzidine	340 U	340 U	340 U	350 U	330 U	330 U
Benzo(a)anthracene	340 U	340 U	340 U	350 U	330 U	330 U
Chrysene	340 U	340 U	340 U	350 U	330 U	330 U
bis(2-Ethylhexyl)phthalate	660 ~~34~~ 12/14/07 JB U	660 ~~40~~ 12/14/07 JB U	660 ~~5~~ 12/14/07 JB U	660 ~~20~~ 12/14/07 JB U	660 ~~50~~ 12/14/07 JB U	43 J
Di-n-octyl phthalate	340 U	340 U	340 U	350 U	330 U	330 U
Benzo(b)fluoranthene	340 U	340 U	340 U	350 U	330 U	330 U
Benzo(k)fluoranthene	340 U	340 U	340 U	350 U	330 U	330 U
Benzo(a)pyrene	340 U	340 U	340 U	350 U	330 U	330 U
Indeno(1,2,3-cd)pyrene	340 U	340 U	340 U	350 U	330 U	330 U
Dibenz(a,h)anthracene	340 U	340 U	340 U	350 U	330 U	330 U
Benzo(g,h,i)perylene	340 U	340 U	340 U	350 U	330 U	330 U

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

12/14/07

Cust ID: SBLKPO BS

Sample Information

RFW#: 07LE0595-MB1
Matrix: SOIL
D.F.: 1.00
Units: ug/Kg

Surrogate Recovery	Nitrobenzene-d5	59	%
	2-Fluorobiphenyl	92	%
	Terphenyl-d14	102	%
	Phenol-d5	79	%
	2-Fluorophenol	86	%
	2,4,6-Tribromophenol	99	%

Phenol	78	%
bis(2-Chloroethyl)ether	69	%
2-Chlorophenol	80	%
1,3-Dichlorobenzene	75	%
1,4-Dichlorobenzene	75	%
1,2-Dichlorobenzene	77	%
2-Methylphenol	77	%
2,2'-oxybis(1-Chloropropane)	71	%
3/4 Methylphenol	83	%
N-Nitroso-di-n-propylamine	86	%
Hexachloroethane	72	%
Nitrobenzene	52	%
Isophorone	63	%
2-Nitrophenol	60	%
2,4-Dimethylphenol	50	%
bis(2-Chloroethoxy)methane	57	%
2,4-Dichlorophenol	65	%
1,2,4-Trichlorobenzene	60	%
Naphthalene	57	%
4-Chloroaniline	43	%
Hexachlorobutadiene	67	%
4-Chloro-3-methylphenol	65	%
2-Methylnaphthalene	63	%
Hexachlorocyclopentadiene	79	%
2,4,6-Trichlorophenol	95	%
2,4,5-Trichlorophenol	99	%

*= Outside of EPA CLP QC limits.

12/14/07

000014

000017

RFW#: 07LE0595-MB1

2-Chloronaphthalene	86	%
2-Nitroaniline	93	%
Dimethylphthalate	93	%
Acenaphthylene	91	%
2,6-Dinitrotoluene	93	%
3-Nitroaniline	84	%
Acenaphthene	88	%
2,4-Dinitrophenol	75	%
4-Nitrophenol	91	%
Dibenzofuran	95	%
2,4-Dinitrotoluene	104	%
Diethylphthalate	98	%
4-Chlorophenyl-phenylether	97	%
Fluorene	97	%
4-Nitroaniline	102	%
4,6-Dinitro-2-methylphenol	92	%
N-Nitrosodiphenylamine (1)	77	%
4-Bromophenyl-phenylether	85	%
Hexachlorobenzene	104	%
Pentachlorophenol	78	%
Phenanthrene	98	%
Anthracene	96	%
Carbazole	106	%
Di-n-butylphthalate	103	%
Fluoranthene	110	%
Pyrene	88	%
Butylbenzylphthalate	97	%
3,3'-Dichlorobenzidine	83	%
Benzo(a)anthracene	94	%
Chrysene	94	%
bis(2-Ethylhexyl)phthalate	94	%
Di-n-octyl phthalate	92	%
Benzo(b)fluoranthene	97	%
Benzo(k)fluoranthene	93	%
Benzo(a)pyrene	97	%
Indeno(1,2,3-cd)pyrene	101	%
Dibenz(a,h)anthracene	104	%
Benzo(g,h,i)perylene	93	%

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

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12/16/07

000000018

000000015

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0710L095
SDG/SAF # K1005/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 10-24-2007

SEMIVOLATILE

Fifteen (15) soil samples were collected on 10-22-2007.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 10-25-2007 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 11-01,02,09-2007.

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

1. Samples were extracted and analyzed within required holding time.
2. Non-target compounds were detected in the samples.
3. Three (3) of one hundred and fourteen (114) surrogate recoveries were outside acceptance criteria.
4. Three (3) of one hundred and twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report has been enclosed.
5. All blank spike recoveries were within acceptance criteria.
6. The method blank was below the reporting limit for all target compounds.
7. Internal standard area and retention time criteria were met.

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 36 pages.

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

LIONVILLE LABORATORY INC.

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

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

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

Judy Stone

Liain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/15/07
Date

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 07MS236

Initiator: Sharon Saylor
Date: 11-12-07
Client: TMU RC020 K1005

Batch: 07IOL095
Samples: ms, msd
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: Solid
Prep Batch: 07IEO595

1. Reason for SDR

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

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

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

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

low recovery of 1,2,4-trichlorobenzene in the ms + msd, and low recovery of 2-methylnaphthalene in the ms but BS is OK

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description: none

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

4. Project Manager Instructions...signature/date: [signature] 11/12/07
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: KAA 11-15-07 Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

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

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

QA-105-A-0805

Collector: C. Martinez / T. Welsh-Koelling	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100-B-21:2 (2-in asbestos line)		SAF No.: RC-020
Ice Chest No.: AFS-04-123	Field Logbook No.: EFL1173-14	COA: R10B212000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES/ LIONVILLE	Offsite Property No.: A080048		Bill of Lading/Air Bill No.: see OSPC

Price Code: 8L

Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Preservation	None	Cool 4C	Cool 4C	None	None						
Type of Container	G/P	G/P	aG	G/P	aG						
No. of Container(s)	1	1	1	1	1						
Volume	250mL	125mL	250mL	500mL	60mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta						
Sample No. / Matrix* / Sample Date / Sample Time											
J15W21 / SOIL / 10/22/07 / 1005	✓	✓	✓								
J15W22 / SOIL / 1020	✓	✓	✓								
J15W23 / SOIL / 1040	✓	✓	✓								
J15W24 / SOIL / 1055	✓	✓	✓								
J15W25 / SOIL / 10/22/07 / 1215	✓	✓	✓								

000023

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: T. Welsh-Koelling	10/22/07 1515	c. Martinez/c. Martinez	10/22/07 1515
Relinquished By/Removed From: c. Martinez/c. Martinez	10/22/07 1630	3728 2B	10/22/07 1630
Relinquished By/Removed From: 3728 2B	10-23-07 0930	[illegible]	10-23-07 0930
Relinquished By/Removed From: [illegible]	10-23-07 1500	FED EX	
Relinquished By/Removed From: FED EX	10-24-07 / 10:00	[illegible]	10-24-07 / 10:00
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)
(2) ~~Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add on [Silver-108 metastable]~~ [illegible] 10/22/07

Sampler unavailable to relinquish samples from 3728 Ref # 2B
Custodian removed samples for shipping on 10/23/07

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

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

WCH-EF 011

00000018

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez / T. Welsh-Koelling	C. Martinez	509-339-2816	KESSNER, JH	8L	15 days

Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100-B-21:2 (2-in asbestos line)		SAF No.: RC-020
Ice Chest No.: AFS-04-123	Field Logbook No.: EFL1173-14	COA: R10B212000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080048		Bill of Lading/Air Bill No.: see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Preservation	None	Cool 4C	Cool 4C	None	None						
Type of Container	G/P	G/P	aG	G/P	aG						
No. of Container(s)	1	1	1	1	1						
Volume	250mL	125mL	250mL	500mL	60mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta						
Sample No. / Matrix * / Sample Date / Sample Time											
J15W26 / SOIL / 10/22/07 / 1235	✓	✓	✓								
J15W27 / SOIL / 1250	✓	✓	✓								
J15W28 / SOIL / 1310	✓	✓	✓								
J15W29 / SOIL / 1325	✓	✓	✓								
J15W30 / SOIL / 10/22/07 / 1350	✓	✓	✓								

000024

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	10/22/07 1515	C. Martinez / C. Martinez	10/22/07 1515
C. Martinez / C. Martinez	10/22/07 1630	3728 2B	10/22/07 1630
3728 2B	10-23-07 0930	K.M. Singleton	10-23-07 0930
K.M. Singleton	10-23-07 1500	FED EX	
[illegible]	10-24-07 1000	[illegible]	10-24-07 1000

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) ~~Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable)~~ [illegible] 10/22/07

Sampler unavailable to relinquish samples from 3728 Ref # 2B. 3728 Custodian removed samples for shipping on 10/23/07.

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

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

000000019

Collector: C. Martinez \ T. Welsh-Koelling	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100-B-21:2 (2-in asbestos line)		SAF No.: RC-020
Ice Chest No.: AES-04-123	Field Logbook No.: EFL1173-14	COA: R10B212000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A080048		Bill of Lading/Air Bill No.: see OSPC

Price Code: 8L

Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Preservation	None	Cool 4C	Cool 4C	None	None							
Type of Container	G/P	G/P	aG	G/P	aG							
No. of Container(s)	1	1	1	1	1							
Volume	250mL	125mL	250mL	500mL	60mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta							
Sample No. / Matrix * / Sample Date / Sample Time												
15W31 / SOIL / 10/22/07 / 1430	✓	✓	✓									
15W32 / SOIL / " / 1450	✓	✓	✓									
15W33 / SOIL / " / 1505	✓	✓	✓									
15W34 / SOIL / " / 1045	✓	✓	✓									
15W35 / SOIL / 10/22/07 / 1025	✓	N/A	✓									

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: [illegible] Date/Time: 10/22/07 1515	Received By/Stored In: c. martinez/c. martinez Date/Time: 10/22/07 1515
Relinquished By/Removed From: c. martinez/c. martinez Date/Time: 10/22/07 1630	Received By/Stored In: 3728 2B Date/Time: 10/22/07 1630
Relinquished By/Removed From: 3728 2B Date/Time: 10-23-07 0930	Received By/Stored In: [illegible] Date/Time: 10-23-07 0930
Relinquished By/Removed From: [illegible] Date/Time: 10-23-07 1300	Received By/Stored In: FED EX Date/Time:
Relinquished By/Removed From: [illegible] Date/Time: 10-24-07/1000	Received By/Stored In: [illegible] Date/Time: 10-24-07/1000
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)
(2) ~~Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Silver-108 metastable]~~ CW 10/22/07

Sampler unavailable to relinquish samples from 3728 Ref# 2B. 3728 Custodian removed samples for shipping on 10/23/07.

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

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

CH-EE-11

000000025

000000020

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-B-21:2			DATA PACKAGE: K1005		
VALIDATOR: ELR		LAB: LLI		DATE: 12/16/07	
			SDG: K1005		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J15W21	J15W22	J15W23	J15W24	J15W25	
J15W26	J15W27	J15W28	J15W29	J15W30	
J15W31	J15W32	J15W33	J15W34	J15W35	
					soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

FB – di-n-butylphthalate

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: Surr – 35 – 2,4,6-tribromophenol (187.) – J all acids

MS/MSD – 1,2,4-trichlorobenzene, 2-methylnaphthalene, – J all

LCS – 4chloroaniline (47%) – J all

no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

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

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

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

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

Comments: _____

7. HOLDING TIMES (all levels)

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

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

Comments: 120 over

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 17 December 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 100-B-21:2
Subject: Inorganics - Data Package No. K1005-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1005 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J15W21	10/22/07	Soil	C	See note 1
J15W22	10/22/07	Soil	C	See note 1
J15W23	10/22/07	Soil	C	See note 1
J15W24	10/22/07	Soil	C	See note 1
J15W25	10/22/07	Soil	C	See note 1
J15W26	10/22/07	Soil	C	See note 1
J15W27	10/22/07	Soil	C	See note 1
J15W28	10/22/07	Soil	C	See note 1
J15W29	10/22/07	Soil	C	See note 1
J15W30	10/22/07	Soil	C	See note 1
J15W31	10/22/07	Soil	C	See note 1
J15W32	10/22/07	Soil	C	See note 1
J15W33	10/22/07	Soil	C	See note 1
J15W34	10/22/07	Soil	C	See note 1
J15W35	10/22/07	Soil	C	See note 1

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

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

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

Due to method blank contamination, the calcium, copper, magnesium, sodium and zinc results in sample J15W35 were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J15W35) was submitted for analysis. Aluminum, boron, barium, iron, potassium, manganese, lead and silicon were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J15W23/J15W34) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPD for silicon (38%) was outside QC limits. Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

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

the RQL.

- **Completeness**

Data package No. K1005 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to method blank contamination, the calcium, copper, magnesium, sodium and zinc results in sample J15W35 were qualified as undetected and flagged "UJ".

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

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K1005	REVIEWER: ELR	Project: 100-B-21:2	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium Copper Magnesium Sodium Zinc	UJ	J15W35	Method Blank contamination

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

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

IENT: TNU-HANFORD RC-020 K1005

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

LVL LOT #: 0710L095

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
01	J15W21	Silver, Total	0.30 u	MG/KG	0.30	3.0
		Aluminum, Total	4910	MG/KG	12.0	3.0
		Arsenic, Total	1.8	MG/KG	1.5	3.0
		Boron, Total	1.6	MG/KG	1.5	3.0
		Barium, Total	49.4	MG/KG	0.30	3.0
		Beryllium, Total	0.15 u	MG/KG	0.15	3.0
		Calcium, Total	4880	MG/KG	12.0	3.0
		Cadmium, Total	0.30 u	MG/KG	0.30	3.0
		Cobalt, Total	5.3	MG/KG	0.60	3.0
		Chromium, Total	6.9	MG/KG	0.60	3.0
		Copper, Total	17.4	MG/KG	0.60	3.0
		Iron, Total	14100	MG/KG	13.4	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	704	MG/KG	12.0	3.0
		Magnesium, Total	3490	MG/KG	7.5	3.0
		Manganese, Total	250	MG/KG	0.12	3.0
		Molybdenum, Total	0.90 u	MG/KG	0.90	3.0
		Sodium, Total	189	MG/KG	6.0	3.0
		Nickel, Total	8.7	MG/KG	0.60	3.0
		Lead, Total	3.0	MG/KG	0.90	3.0
		Antimony, Total	0.90 u	MG/KG	0.90	3.0
		Selenium, Total	1.8 u	MG/KG	1.8	3.0
		Silicon, Total	2080	MG/KG	12.0	3.0
		Vanadium, Total	32.7	MG/KG	0.42	3.0
		Zinc, Total	29.8	MG/KG	1.8	3.0

12/16/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

.IENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
02	J15W22	Silver, Total	0.29 u	MG/KG	0.29	3.0
		~~Aluminum, Total~~	~~7780~~	~~MG/KG~~	~~11.6~~	~~3.0~~
		Arsenic, Total	4.1	MG/KG	1.6	3.0
		Boron, Total	2.4	MG/KG	1.5	3.0
		Barium, Total	83.2	MG/KG	0.29	3.0
		Beryllium, Total	0.15 u	MG/KG	0.15	3.0
		Calcium, Total	6130	MG/KG	11.6	3.0
		Cadmium, Total	0.29 u	MG/KG	0.29	3.0
		Cobalt, Total	7.9	MG/KG	0.58	3.0
		Chromium, Total	10.8	MG/KG	0.58	3.0
		Copper, Total	20.6	MG/KG	0.58	3.0
		Iron, Total	23800	MG/KG	13.1	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1430	MG/KG	11.6	3.0
		Magnesium, Total	4840	MG/KG	7.3	3.0
		Manganese, Total	359	MG/KG	0.12	3.0
		Molybdenum, Total	0.87 u	MG/KG	0.87	3.0
		Sodium, Total	281	MG/KG	5.8	3.0
		Nickel, Total	13.6	MG/KG	0.58	3.0
		Lead, Total	6.8	MG/KG	0.87	3.0
		Antimony, Total	0.87 u	MG/KG	0.87	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	2510	MG/KG	11.6	3.0
		Vanadium, Total	44.5	MG/KG	0.41	3.0
		Zinc, Total	46.0	MG/KG	1.7	3.0

12/16/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

LIENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
003	J15W23	Silver, Total	0.39	MG/KG	0.29	3.0
		Aluminum, Total	9310	MG/KG	11.6	3.0
		Arsenic, Total	6.9	MG/KG	1.4	3.0
		Boron, Total	1.7	MG/KG	1.4	3.0
		Barium, Total	80.0	MG/KG	0.29	3.0
		Beryllium, Total	0.19	MG/KG	0.14	3.0
		Calcium, Total	6340	MG/KG	11.6	3.0
		Cadmium, Total	0.29 u	MG/KG	0.29	3.0
		Cobalt, Total	8.0	MG/KG	0.58	3.0
		Chromium, Total	19.7	MG/KG	0.58	3.0
		Copper, Total	21.1	MG/KG	0.58	3.0
		Iron, Total	23000	MG/KG	13.0	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1280	MG/KG	11.6	3.0
		Magnesium, Total	5080	MG/KG	7.2	3.0
		Manganese, Total	371	MG/KG	0.12	3.0
		Molybdenum, Total	0.87	MG/KG	0.87	3.0
		Sodium, Total	236	MG/KG	5.8	3.0
		Nickel, Total	17.6	MG/KG	0.58	3.0
		Lead, Total	7.2	MG/KG	0.87	3.0
		Antimony, Total	0.87 u	MG/KG	0.87	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	1280	MG/KG	11.6	3.0
		Vanadium, Total	48.6	MG/KG	0.41	3.0
		Zinc, Total	43.0	MG/KG	1.7	3.0

12/10/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

LIENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
04	J15W24	Silver, Total	0.30 u	MG/KG	0.30	3.0
		~~Aluminum, Total~~	~~9590~~	~~MG/KG~~	~~11.8~~	~~3.0~~
		Arsenic, Total	5.7	MG/KG	1.5	3.0
		Boron, Total	2.2	MG/KG	1.5	3.0
		Barium, Total	86.1	MG/KG	0.30	3.0
		Beryllium, Total	0.18	MG/KG	0.15	3.0
		Calcium, Total	8080	MG/KG	11.8	3.0
		Cadmium, Total	0.30 u	MG/KG	0.30	3.0
		Cobalt, Total	7.6	MG/KG	0.59	3.0
		Chromium, Total	16.3	MG/KG	0.59	3.0
		Copper, Total	21.2	MG/KG	0.59	3.0
		Iron, Total	22400	MG/KG	13.3	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1370	MG/KG	11.8	3.0
		Magnesium, Total	5160	MG/KG	7.4	3.0
		Manganese, Total	353	MG/KG	0.12	3.0
		Molybdenum, Total	0.89 u	MG/KG	0.89	3.0
		Sodium, Total	308	MG/KG	5.9	3.0
		Nickel, Total	15.8	MG/KG	0.59	3.0
		Lead, Total	6.5	MG/KG	0.89	3.0
		Antimony, Total	0.89 u	MG/KG	0.89	3.0
		Selenium, Total	1.8 u	MG/KG	1.8	3.0
		Silicon, Total	2090	MG/KG	11.8	3.0
		Vanadium, Total	49.5	MG/KG	0.41	3.0
		Zinc, Total	42.9	MG/KG	1.8	3.0

12/11/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

LIENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
005	J15W25	Silver, Total	0.30 u	MG/KG	0.30	3.0
		Aluminum, Total	8390	MG/KG	11.9	3.0
		Arsenic, Total	6.0	MG/KG	1.5	3.0
		Boron, Total	2.7	MG/KG	1.5	3.0
		Barium, Total	107	MG/KG	0.30	3.0
		Beryllium, Total	0.15 u	MG/KG	0.15	3.0
		Calcium, Total	6140	MG/KG	11.9	3.0
		Cadmium, Total	0.30 u	MG/KG	0.30	3.0
		Cobalt, Total	7.3	MG/KG	0.60	3.0
		Chromium, Total	12.0	MG/KG	0.60	3.0
		Copper, Total	18.5	MG/KG	0.60	3.0
		Iron, Total	24000	MG/KG	13.4	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1480	MG/KG	11.9	3.0
		Magnesium, Total	4070	MG/KG	7.4	3.0
		Manganese, Total	346	MG/KG	0.12	3.0
		Molybdenum, Total	2.5	MG/KG	0.89	3.0
		Sodium, Total	278	MG/KG	6.0	3.0
		Nickel, Total	12.2	MG/KG	0.60	3.0
		Lead, Total	5.6	MG/KG	0.89	3.0
		Antimony, Total	0.89 u	MG/KG	0.89	3.0
		Selenium, Total	1.8 u	MG/KG	1.8	3.0
		Silicon, Total	1630	MG/KG	11.9	3.0
		Vanadium, Total	59.4	MG/KG	0.42	3.0
		Zinc, Total	41.9	MG/KG	1.8	3.0

12/16/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

LIENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
006	J15W26	Silver, Total	0.29 u	MG/KG	0.29	3.0
		Aluminum, Total	8880	MG/KG	11.6	3.0
		Arsenic, Total	7.9	MG/KG	1.5	3.0
		Boron, Total	2.5	MG/KG	1.5	3.0
		Barium, Total	85.9	MG/KG	0.29	3.0
		Beryllium, Total	0.15 u	MG/KG	0.15	3.0
		Calcium, Total	10000	MG/KG	11.6	3.0
		Cadmium, Total	0.29 u	MG/KG	0.29	3.0
		Cobalt, Total	8.2	MG/KG	0.58	3.0
		Chromium, Total	18.3	MG/KG	0.58	3.0
		Copper, Total	24.0	MG/KG	0.58	3.0
		Iron, Total	23200	MG/KG	13.1	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1160	MG/KG	11.6	3.0
		Magnesium, Total	4800	MG/KG	7.3	3.0
		Manganese, Total	366	MG/KG	0.12	3.0
		Molybdenum, Total	0.97	MG/KG	0.87	3.0
		Sodium, Total	434	MG/KG	5.8	3.0
		Nickel, Total	18.3	MG/KG	0.58	3.0
		Lead, Total	5.9	MG/KG	0.87	3.0
		Antimony, Total	0.87 u	MG/KG	0.87	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	3030	MG/KG	11.6	3.0
		Vanadium, Total	52.7	MG/KG	0.41	3.0
		Zinc, Total	38.6	MG/KG	1.7	3.0

12/14/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

IENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
07	J15W27	Silver, Total	0.27 u	MG/KG	0.27	3.0
		~~Aluminum, Total~~	~~7760~~	~~MG/KG~~	~~10.6~~	~~3.0~~
		Arsenic, Total	4.0	MG/KG	1.3	3.0
		Boron, Total	2.1	MG/KG	1.3	3.0
		Barium, Total	75.7	MG/KG	0.27	3.0
		Beryllium, Total	0.13 u	MG/KG	0.13	3.0
		Calcium, Total	4410	MG/KG	10.6	3.0
		Cadmium, Total	0.27 u	MG/KG	0.27	3.0
		Cobalt, Total	7.4	MG/KG	0.53	3.0
		Chromium, Total	11.6	MG/KG	0.53	3.0
		Copper, Total	17.3	MG/KG	0.53	3.0
		Iron, Total	21000	MG/KG	11.9	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1490	MG/KG	10.6	3.0
		Magnesium, Total	4200	MG/KG	6.6	3.0
		Manganese, Total	324	MG/KG	0.11	3.0
		Molybdenum, Total	0.80 u	MG/KG	0.80	3.0
		Sodium, Total	225	MG/KG	5.3	3.0
		Nickel, Total	11.7	MG/KG	0.53	3.0
		Lead, Total	5.5	MG/KG	0.80	3.0
		Antimony, Total	0.80 u	MG/KG	0.80	3.0
		Selenium, Total	1.6 u	MG/KG	1.6	3.0
		Silicon, Total	1670	MG/KG	10.6	3.0
		Vanadium, Total	43.9	MG/KG	0.37	3.0
		Zinc, Total	41.1	MG/KG	1.6	3.0

12/16/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

LIENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
008	J15W28	Silver, Total	0.27 u	MG/KG	0.27	3.0
		Aluminum, Total	7450	MG/KG	10.8	3.0
		Arsenic, Total	4.3	MG/KG	1.4	3.0
		Boron, Total	2.1	MG/KG	1.4	3.0
		Barium, Total	75.2	MG/KG	0.27	3.0
		Beryllium, Total	0.14 u	MG/KG	0.14	3.0
		Calcium, Total	4920	MG/KG	10.8	3.0
		Cadmium, Total	0.27 u	MG/KG	0.27	3.0
		Cobalt, Total	7.3	MG/KG	0.54	3.0
		Chromium, Total	10.8	MG/KG	0.54	3.0
		Copper, Total	16.4	MG/KG	0.54	3.0
		Iron, Total	20400	MG/KG	12.2	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1510	MG/KG	10.8	3.0
		Magnesium, Total	4280	MG/KG	6.8	3.0
		Manganese, Total	331	MG/KG	0.11	3.0
		Molybdenum, Total	0.81 u	MG/KG	0.81	3.0
		Sodium, Total	232	MG/KG	5.4	3.0
		Nickel, Total	11.2	MG/KG	0.54	3.0
		Lead, Total	6.0	MG/KG	0.81	3.0
		Antimony, Total	0.81 u	MG/KG	0.81	3.0
		Selenium, Total	1.6 u	MG/KG	1.6	3.0
		Silicon, Total	2690	MG/KG	10.8	3.0
		Vanadium, Total	38.0	MG/KG	0.38	3.0
		Zinc, Total	41.9	MG/KG	1.6	3.0

12/16/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

LIENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
009	J15W29	Silver, Total	0.30 u	MG/KG	0.30	3.0
		Aluminum, Total	10000	MG/KG	11.9	3.0
		Arsenic, Total	5.6	MG/KG	1.5	3.0
		Boron, Total	2.6	MG/KG	1.5	3.0
		Barium, Total	91.1	MG/KG	0.30	3.0
		Beryllium, Total	0.15 u	MG/KG	0.15	3.0
		Calcium, Total	5780	MG/KG	11.9	3.0
		Cadmium, Total	0.30 u	MG/KG	0.30	3.0
		Cobalt, Total	8.3	MG/KG	0.59	3.0
		Chromium, Total	14.4	MG/KG	0.59	3.0
		Copper, Total	19.9	MG/KG	0.59	3.0
		Iron, Total	24100	MG/KG	12.4	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1800	MG/KG	11.9	3.0
		Magnesium, Total	5800	MG/KG	7.4	3.0
		Manganese, Total	352	MG/KG	0.12	3.0
		Molybdenum, Total	0.89 u	MG/KG	0.89	3.0
		Sodium, Total	287	MG/KG	5.9	3.0
		Nickel, Total	18.2	MG/KG	0.59	3.0
		Lead, Total	5.8	MG/KG	0.89	3.0
		Antimony, Total	0.89 u	MG/KG	0.89	3.0
		Selenium, Total	1.8 u	MG/KG	1.8	3.0
		Silicon, Total	1070	MG/KG	11.9	3.0
		Vanadium, Total	49.9	MG/KG	0.42	3.0
		Zinc, Total	45.0	MG/KG	1.8	3.0

12/11/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

LIENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
010	J15N30	Silver, Total	0.29 u	MG/KG	0.29	3.0
		Aluminum, Total	9150	MG/KG	11.5	3.0
		Arsenic, Total	5.1	MG/KG	1.4	3.0
		Boron, Total	2.4	MG/KG	1.4	3.0
		Barium, Total	86.5	MG/KG	0.29	3.0
		Beryllium, Total	0.14 u	MG/KG	0.14	3.0
		Calcium, Total	5440	MG/KG	11.5	3.0
		Cadmium, Total	0.29 u	MG/KG	0.29	3.0
		Cobalt, Total	7.9	MG/KG	0.58	3.0
		Chromium, Total	12.5	MG/KG	0.58	3.0
		Copper, Total	19.8	MG/KG	0.58	3.0
		Iron, Total	22600	MG/KG	13.0	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	2020	MG/KG	11.5	3.0
		Magnesium, Total	5020	MG/KG	7.2	3.0
		Manganese, Total	338	MG/KG	0.12	3.0
		Molybdenum, Total	0.87 u	MG/KG	0.87	3.0
		Sodium, Total	212	MG/KG	5.8	3.0
		Nickel, Total	13.2	MG/KG	0.58	3.0
		Lead, Total	5.9	MG/KG	0.87	3.0
		Antimony, Total	0.87 u	MG/KG	0.87	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	2210	MG/KG	11.5	3.0
		Vanadium, Total	42.2	MG/KG	0.40	3.0
		Zinc, Total	42.0	MG/KG	1.7	3.0

12/14/07

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

LIENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
011	J15W31	Silver, Total	0.28 u	MG/KG	0.28	3.0
		Aluminum, Total	6550	MG/KG	11.3	3.0
		Arsenic, Total	3.5	MG/KG	1.4	3.0
		Boron, Total	1.4 u	MG/KG	1.4	3.0
		Barium, Total	65.0	MG/KG	0.28	3.0
		Beryllium, Total	0.14 u	MG/KG	0.14	3.0
		Calcium, Total	4620	MG/KG	11.3	3.0
		Cadmium, Total	0.28 u	MG/KG	0.28	3.0
		Cobalt, Total	6.5	MG/KG	0.56	3.0
		Chromium, Total	10.4	MG/KG	0.56	3.0
		Copper, Total	15.2	MG/KG	0.56	3.0
		Iron, Total	18500	MG/KG	12.7	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1010	MG/KG	11.3	3.0
		Magnesium, Total	3660	MG/KG	7.1	3.0
		Manganese, Total	297	MG/KG	0.11	3.0
		Molybdenum, Total	0.85 u	MG/KG	0.85	3.0
		Sodium, Total	233	MG/KG	5.6	3.0
		Nickel, Total	11.3	MG/KG	0.56	3.0
		Lead, Total	4.5	MG/KG	0.85	3.0
		Antimony, Total	0.85 u	MG/KG	0.85	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	2670	MG/KG	11.3	3.0
		Vanadium, Total	35.0	MG/KG	0.40	3.0
		Zinc, Total	34.4	MG/KG	1.7	3.0

12/16/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

IENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
12	J15W32	Silver, Total	0.27 u	MG/KG	0.27	3.0
		~~Aluminum, Total~~	~~9390~~	~~MG/KG~~	~~11.0~~	~~3.0~~
		Arsenic, Total	4.6	MG/KG	1.4	3.0
		Boron, Total	2.5	MG/KG	1.4	3.0
		Barium, Total	89.8	MG/KG	0.27	3.0
		Beryllium, Total	0.14 u	MG/KG	0.14	3.0
		Calcium, Total	5970	MG/KG	11.0	3.0
		Cadmium, Total	0.33	MG/KG	0.27	3.0
		Cobalt, Total	8.6	MG/KG	0.55	3.0
		Chromium, Total	15.8	MG/KG	0.55	3.0
		Copper, Total	20.6	MG/KG	0.55	3.0
		Iron, Total	24800	MG/KG	12.4	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1680	MG/KG	11.0	3.0
		Magnesium, Total	5450	MG/KG	6.9	3.0
		Manganese, Total	363	MG/KG	0.11	3.0
		Molybdenum, Total	0.83	MG/KG	0.82	3.0
		Sodium, Total	247	MG/KG	5.5	3.0
		Nickel, Total	17.8	MG/KG	0.55	3.0
		Lead, Total	6.3	MG/KG	0.82	3.0
		Antimony, Total	0.82 u	MG/KG	0.82	3.0
		Selenium, Total	1.6 u	MG/KG	1.6	3.0
		Silicon, Total	1120	MG/KG	11.0	3.0
		Vanadium, Total	53.3	MG/KG	0.38	3.0
		Zinc, Total	48.7	MG/KG	1.6	3.0

12/11/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

IENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
13	J15W33	Silver, Total	0.30 u	MG/KG	0.30	3.0
		~~Aluminum, Total~~	~~8300~~	~~MG/KG~~	~~11.9~~	~~3.0~~
		Arsenic, Total	4.8	MG/KG	1.5	3.0
		Boron, Total	1.7	MG/KG	1.5	3.0
		Barium, Total	86.3	MG/KG	0.30	3.0
		Beryllium, Total	0.15 u	MG/KG	0.15	3.0
		Calcium, Total	10900	MG/KG	11.9	3.0
		Cadmium, Total	0.31	MG/KG	0.30	3.0
		Cobalt, Total	6.6	MG/KG	0.59	3.0
		Chromium, Total	13.5	MG/KG	0.59	3.0
		Copper, Total	18.4	MG/KG	0.59	3.0
		Iron, Total	20600	MG/KG	13.3	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1250	MG/KG	11.9	3.0
		Magnesium, Total	4930	MG/KG	7.4	3.0
		Manganese, Total	287	MG/KG	0.12	3.0
		Molybdenum, Total	0.89 u	MG/KG	0.89	3.0
		Sodium, Total	248	MG/KG	5.9	3.0
		Nickel, Total	12.8	MG/KG	0.59	3.0
		Lead, Total	6.5	MG/KG	0.89	3.0
		Antimony, Total	0.89 u	MG/KG	0.89	3.0
		Selenium, Total	1.8 u	MG/KG	1.8	3.0
		Silicon, Total	2390	MG/KG	11.9	3.0
		Vanadium, Total	41.0	MG/KG	0.41	3.0
		Zinc, Total	42.3	MG/KG	1.8	3.0

12/11/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

IENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
24	J15W34	Silver, Total	0.29 u	MG/KG	0.29	3.0
		Aluminum, Total	8180	MG/KG	11.6	3.0
		Arsenic, Total	5.7	MG/KG	1.4	3.0
		Boron, Total	1.4 u	MG/KG	1.4	3.0
		Barium, Total	74.6	MG/KG	0.29	3.0
		Beryllium, Total	0.14 u	MG/KG	0.14	3.0
		Calcium, Total	5930	MG/KG	11.6	3.0
		Cadmium, Total	0.31	MG/KG	0.29	3.0
		Cobalt, Total	7.4	MG/KG	0.58	3.0
		Chromium, Total	16.1	MG/KG	0.58	3.0
		Copper, Total	18.9	MG/KG	0.58	3.0
		Iron, Total	21400	MG/KG	13.0	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1170	MG/KG	11.6	3.0
		Magnesium, Total	4870	MG/KG	7.2	3.0
		Manganese, Total	339	MG/KG	0.12	3.0
		Molybdenum, Total	1.0	MG/KG	0.87	3.0
		Sodium, Total	228	MG/KG	5.8	3.0
		Nickel, Total	16.5	MG/KG	0.58	3.0
		Lead, Total	6.3	MG/KG	0.87	3.0
		Antimony, Total	0.87 u	MG/KG	0.87	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	1900	MG/KG	11.6	3.0
		Vanadium, Total	43.3	MG/KG	0.40	3.0
		Zinc, Total	43.9	MG/KG	1.7	3.0

12/10/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/05/07

IENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
·15	J15W35	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	51.0	MG/KG	3.6	1.0
		Arsenic, Total	0.45 u	MG/KG	0.45	1.0
		Boron, Total	0.54	MG/KG	0.45	1.0
		Barium, Total	1.4	MG/KG	0.09	1.0
		Beryllium, Total	0.04 u	MG/KG	0.04	1.0
		Calcium, Total	28.9 UJ	MG/KG	3.6	1.0
		Cadmium, Total	0.09 u	MG/KG	0.09	1.0
		Cobalt, Total	0.18 u	MG/KG	0.18	1.0
		Chromium, Total	0.18 u	MG/KG	0.18	1.0
		Copper, Total	0.26 UJ	MG/KG	0.18	1.0
		Iron, Total	94.7	MG/KG	4.0	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	24.2	MG/KG	3.6	1.0
		Magnesium, Total	7.3 UJ	MG/KG	2.2	1.0
		Manganese, Total	3.3	MG/KG	0.04	1.0
		Molybdenum, Total	0.27 u	MG/KG	0.27	1.0
		Sodium, Total	11.6 UJ	MG/KG	1.8	1.0
		Nickel, Total	0.18 u	MG/KG	0.18	1.0
		Lead, Total	0.35	MG/KG	0.27	1.0
		Antimony, Total	0.27 u	MG/KG	0.27	1.0
		Selenium, Total	0.54 u	MG/KG	0.54	1.0
		Silicon, Total	76.3	MG/KG	3.6	1.0
		Vanadium, Total	0.13 u	MG/KG	0.13	1.0
		Zinc, Total	2.1 UJ	MG/KG	0.54	1.0

12/16/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-020
LVL#: 0710L095
SDG/SAF#: H1005/RC-020

W.O.#: 11343-606-001-9999-00
Date Received: 10-24-07

METALS CASE NARRATIVE

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

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

1. This narrative covers the analyses of 15 soil samples.

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

   All samples, with the exception of sample J15W35, were reported with 3-fold dilutions for ICP metals due to sample matrix.

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

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

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

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

   a). The MB result for Sodium was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and samples J15W21 and J15W35 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

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 4U pages.

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

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

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

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

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J15W21	Aluminum	66,000	98.0
	Iron	66,000	112.7
	Silicon	6,300	90.2

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

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/9/07
Date

jjw/m10-095

LVLI
LIONVILLE LABORATORY INC.

Collector: C. Martinez / T. Welsh-Koelling	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100-B-21:2 (2-in asbestos line)		SAF No.: RC-020
Ice Chest No.: AFS-04-123	Field Logbook No.: EFL1173-14	COA: R10B212000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080048		Bill of Lading/Air Bill No.: see OSPC

Price Code: 8L

Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

000028

SAMPLE ANALYSIS					
Preservation	None	Cool 4C	Cool 4C	None	None
Type of Container	G/P	G/P	aG	G/P	aG
No. of Container(s)	1	1	1	1	1
Volume	250mL	125mL	250mL	500mL	60mL
	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions	Gross Alpha & Gross Beta

Sample No.	Matrix *	Sample Date	Sample Time										
15W21	SOIL	10/22/07	1005	✓	✓	✓							
15W22	SOIL		1020	✓	✓	✓							
15W23	SOIL		1040	✓	✓	✓							
15W24	SOIL		1055	✓	✓	✓							
15W25	SOIL	10/22/07	1215	✓	✓	✓							

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From	Date/Time 10/22/07 1515	Received By/Stored In	Date/Time 1515
Relinquished By/Removed From	Date/Time 1630	Received By/Stored In	Date/Time 1630
Relinquished By/Removed From	Date/Time 10-23-07 0930	Received By/Stored In	Date/Time 10-23-07 0930
Relinquished By/Removed From	Date/Time 10-23-07 1100	Received By/Stored In FED EX	Date/Time
Relinquished By/Removed From	Date/Time 10-24-07 / 10:00	Received By/Stored In	Date/Time 10-24-07 / 10:00
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) ~~Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}~~ 10/22/07

Sampler unavailable to relinquish samples from 3728 Ref # 2B Custodian removed samples for shipping on 10/23/07.

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

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

CH-EE 011

8788888

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez / T. Welsh-Koelling	C. Martinez	509-539-2816	KESSNER, JH	8L	15 days

Project Designation	Sampling Location	SAF No.
100-BC Burial Grounds - Soil Full Protocol	100-B-21:2 (2-in asbestos line)	RC-020

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
AFS-04-123	EFL1173-14	R10B212000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A080048	see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

000029

Preservation	None	Cool 4C	Cool 4C	None	None							
Type of Container	G/P	G/P	aG	G/P	aG							
No. of Container(s)	1	1	1	1	1							
Volume	250mL	125mL	250mL	500mL	60mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta							
Sample No.	Matrix *	Sample Date	Sample Time									
J15W26	SOIL	10/22/07	1235	✓	✓	✓						
J15W27	SOIL		1250	✓	✓	✓						
J15W28	SOIL		1310	✓	✓	✓						
J15W29	SOIL		1325	✓	✓	✓						
J15W30	SOIL	10/22/07	1350	✓	✓	✓						

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	10/22/07 1515	c.martinez/c.martinez	1515 10/22/07
c.martinez/c.martinez	10/22/07 1630	3728 2B	1630 10/22/07
3728 2B	10-23-07 0930	KMSingleton	10-23-07 0930
KMSingleton	10-23-07 1500	FED EX	
[illegible]	10-24-07 1000	[illegible]	10-24-07 1000

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) ~~Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Sb-ar-108 metastable}~~ 10/22/07

Sampler unavailable to relinquish samples from 3728 Ref # 2B. 3728 Custodian removed samples for shipping on 10/23/07.

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

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

889888841

Collector: C. Martinez \T. Welsh-Koelling	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100-B-21:2 (2-in asbestos line)		SAF No.: RC-020
Ice Chest No.: AES-04-123	Field Logbook No.: EFL1173-14	COA: R10B212000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A080048		Bill of Lading/Air Bill No.: see OSPC

Price Code: 8L

Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: None

000030

SAMPLE ANALYSIS													
Preservation				None	Cool 4C	Cool 4C	None	None					
Type of Container				G/P	G/P	aG	G/P	aG					
No. of Container(s)				1	1	1	1	1					
Volume				250mL	125mL	250mL	500mL	60mL					
				See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta					
Sample No.	Matrix *		Sample Date	Sample Time									
15W31	SOIL		10/22/07	1430	✓	✓	✓						
15W32	SOIL			1450	✓	✓	✓						
15W33	SOIL			1505	✓	✓	✓						
15W34	SOIL			1045	✓	✓	✓						
15W35	SOIL		10/22/07	1025	✓	N/A	✓						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: [signature]	10/22/07 1515	Received By/Stored In: [signature]	1515
Relinquished By/Removed From: C. Martinez/C. Martinez	10/22/07 1630	Received By/Stored In: 3728 2B	10/22/07 1630
Relinquished By/Removed From: 3728 2B 10-23-07	0930	Received By/Stored In: [signature] 10-23-07	0930
Relinquished By/Removed From: [signature] 10-23-07	1500	Received By/Stored In: FED EX	
Relinquished By/Removed From: [signature]	10-24-07/1000	Received By/Stored In: [signature]	10-24-07/1000
Relinquished By/Removed From:		Received By/Stored In:	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) ~~Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}~~ CM 10/22/07

Sampler unavailable to relinquish samples from 3728 Ref # 2B
3728 Custodian removed samples for shipping on 10/23/07.

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

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

CH-EE-11

2798888842

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-B-21:2			DATA PACKAGE: K1005		
VALIDATOR: ELR		LAB: LLI		DATE: 12/16/07	
			SDG: K1005		

ANALYSES PERFORMED

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

SAMPLES/MATRIX

J1SW21	J1SW22	J1SW23	J1SW24	J1SW25
J1SW26	J1SW27	J1SW28	J1SW29	J1SW30
J1SW31	J1SW32	J1SW33	J1SW34	J1SW35
				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: 35 - calcium, copper, magnesium, sodium, zinc - UJ - Mn

EB - 35 - al, boron, barium, iron, potassium, manganese, lead, silicon

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: 23/34 - Silicon - 387a - FD

6. ICP QUALITY CONTROL (Levels D and E)

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/05/07

:LIENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
LANK1	07L0548-MB1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	3.7 u	MG/KG	3.7	1.0
		Arsenic, Total	0.47 u	MG/KG	0.47	1.0
		Boron, Total	0.47 u	MG/KG	0.47	1.0
		Barium, Total	0.09 u	MG/KG	0.09	1.0
		Beryllium, Total	0.05 u	MG/KG	0.05	1.0
		Calcium, Total	11.6	MG/KG	3.7	1.0
		Cadmium, Total	0.09 u	MG/KG	0.09	1.0
		Cobalt, Total	0.19 u	MG/KG	0.19	1.0
		Chromium, Total	0.19 u	MG/KG	0.19	1.0
		Copper, Total	0.30	MG/KG	0.19	1.0
		Iron, Total	7.9	MG/KG	4.2	1.0
		Potassium, Total	3.7 u	MG/KG	3.7	1.0
		Magnesium, Total	2.4	MG/KG	2.3	1.0
		Manganese, Total	0.25	MG/KG	0.04	1.0
		Molybdenum, Total	0.28 u	MG/KG	0.28	1.0
		Sodium, Total	9.5	MG/KG	1.9	1.0
		Nickel, Total	0.19 u	MG/KG	0.19	1.0
		Lead, Total	0.28 u	MG/KG	0.28	1.0
		Antimony, Total	0.28 u	MG/KG	0.28	1.0
		Selenium, Total	0.56 u	MG/KG	0.56	1.0
		Silicon, Total	3.7 u	MG/KG	3.7	1.0
		Vanadium, Total	0.13 u	MG/KG	0.13	1.0
		Zinc, Total	0.68	MG/KG	0.56	1.0
LANK1	07C0200-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/05/07

.IENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

MPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
01	J15W21	Silver, Total	4.7	0.30u	5.0	94.0	3.0
		Aluminum, Total	6100	4910	199	597.5*	3.0
		Arsenic, Total	183	1.8	199	91.2	3.0
		Boron, Total	93.8	1.6	99.6	92.6	3.0
		Barium, Total	238	49.4	199	94.7	3.0
		Beryllium, Total	4.6	0.15u	5.0	92.0	3.0
		Calcium, Total	7960	4880	2490	124.0	3.0
		Cadmium, Total	4.7	0.30u	5.0	94.0	3.0
		Cobalt, Total	52.2	5.3	49.8	94.2	3.0
		Chromium, Total	26.5	6.9	19.9	98.5	3.0
		Copper, Total	41.0	17.4	24.9	94.8	3.0
		Iron, Total	16700	14100	99.6	2668 *	3.0
		Mercury, Total	0.17	0.02u	0.15	109.7	1.0
		Potassium, Total	2930	704	2490	89.4	3.0
		Magnesium, Total	6190	3490	2490	108.3	3.0
		Manganese, Total	309	250	49.8	117.3*	3.0
		Molybdenum, Total	90.0	0.90u	99.6	90.4	3.0
		Sodium, Total	2610	189	2490	97.2	3.0
		Nickel, Total	55.0	8.7	49.8	93.0	3.0
		Lead, Total	47.9	3.0	49.8	90.2	3.0
		Antimony, Total	38.1	0.90u	49.8	76.5	3.0
		Selenium, Total	157	1.8 u	199	79.0	3.0
		Silicon, Total	2330	2080	99.6	249.2*	3.0
		Vanadium, Total	84.1	32.7	49.8	103.2	3.0
		Zinc, Total	79.7	29.8	49.8	100.2	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/05/07

.IENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

MPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
01REP	J15W21	Silver, Total	0.30u	0.30u	NC	3.0
		Aluminum, Total	4910	5100	3.7	3.0
		Arsenic, Total	1.8	2.3	24.4	3.0
		Boron, Total	1.6	1.5 u	~~NC~~ 200	3.0
		Barium, Total	49.4	44.6	10.2 corrected value per	3.0
		Beryllium, Total	0.15u	0.15u	NC 11/8/07	3.0
		Calcium, Total	4880	4850	0.64	3.0
		Cadmium, Total	0.30u	0.30u	NC	3.0
		Cobalt, Total	5.3	5.7	7.3	3.0
		Chromium, Total	6.9	8.0	14.8	3.0
		Copper, Total	17.4	17.0	2.3	3.0
		Iron, Total	14100	16600	16.2	3.0
		Mercury, Total	0.02u	0.01u	NC	1.0
		Potassium, Total	704	710	0.79	3.0
		Magnesium, Total	3490	3560	1.9	3.0
		Manganese, Total	250	252	0.64	3.0
		Molybdenum, Total	0.90u	0.90u	NC	3.0
		Sodium, Total	189	216	13.4	3.0
		Nickel, Total	8.7	8.8	1.1	3.0
		Lead, Total	3.0	2.5	18.2	3.0
		Antimony, Total	0.90u	0.90u	NC	3.0
		Selenium, Total	1.8 u	1.8 u	NC	3.0
		Silicon, Total	2080	2060	0.89	3.0
		Vanadium, Total	32.7	39.4	18.6	3.0
		Zinc, Total	29.8	29.0	2.7	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/05/07

LIENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
CS1	07L0548-LC1	Silver, LCS	45.9	50.0	MG/KG	91.8
		Aluminum, LCS	467	500	MG/KG	93.5
		Arsenic, LCS	872	1000	MG/KG	87.2
		Boron, LCS	442	500	MG/KG	88.5
		Barium, LCS	465	500	MG/KG	93.0
		Beryllium, LCS	22.7	25.0	MG/KG	90.8
		Calcium, LCS	2280	2500	MG/KG	91.2
		Cadmium, LCS	22.3	25.0	MG/KG	89.2
		Cobalt, LCS	229	250	MG/KG	91.8
		Chromium, LCS	45.7	50.0	MG/KG	91.4
		Copper, LCS	118	125	MG/KG	94.4
		Iron, LCS	484	500	MG/KG	96.9
		Potassium, LCS	2240	2500	MG/KG	89.5
		Magnesium, LCS	2240	2500	MG/KG	89.6
		Manganese, LCS	69.9	75.0	MG/KG	93.2
		Molybdenum, LCS	436	500	MG/KG	87.2
		Sodium, LCS	2300	2500	MG/KG	92.2
		Nickel, LCS	180	200	MG/KG	90.2
		Lead, LCS	225	250	MG/KG	90.1
		Antimony, LCS	261	300	MG/KG	87.0
		Selenium, LCS	836	1000	MG/KG	83.6
		Silicon, LCS	422	500	MG/KG	84.4
		Vanadium, LCS	231	250	MG/KG	92.4
		Zinc, LCS	90.1	100	MG/KG	90.1
CS1	07C0200-LC1	Mercury, LCS	4.9	4.7	MG/KG	103.8

Date: 17 December 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 100-B-21:2
Subject: Wet Chemistry - Data Package No. K1005-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1005 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J15W21	10/22/07	Soil	C	See note 1
J15W22	10/22/07	Soil	C	See note 1
J15W23	10/22/07	Soil	C	See note 1
J15W24	10/22/07	Soil	C	See note 1
J15W25	10/22/07	Soil	C	See note 1
J15W26	10/22/07	Soil	C	See note 1
J15W27	10/22/07	Soil	C	See note 1
J15W28	10/22/07	Soil	C	See note 1
J15W29	10/22/07	Soil	C	See note 1
J15W30	10/22/07	Soil	C	See note 1
J15W31	10/22/07	Soil	C	See note 1
J15W32	10/22/07	Soil	C	See note 1
J15W33	10/22/07	Soil	C	See note 1
J15W34	10/22/07	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. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

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

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

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for anlysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J15W23/J15W34) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package K1005 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

WETCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K1005	REVIEWER: ELR	Project: 100-B-21:2	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/29/07

LIENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
001	J15W21	% Solids	98.4	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
002	J15W22	% Solids	97.3	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
003	J15W23	% Solids	95.9	%	0.01	1.0
		Chromium VI	0.23	MG/KG	0.21	1.0
004	J15W24	% Solids	97.4	%	0.01	1.0
		Chromium VI	0.27	MG/KG	0.20	1.0
005	J15W25	% Solids	97.8	%	0.01	1.0
		Chromium VI	0.32	MG/KG	0.20	1.0
006	J15W26	% Solids	98.3	%	0.01	1.0
		Chromium VI	0.23	MG/KG	0.20	1.0
007	J15W27	% Solids	98.2	%	0.01	1.0
		Chromium VI	0.31	MG/KG	0.20	1.0
008	J15W28	% Solids	97.9	%	0.01	1.0
		Chromium VI	0.29	MG/KG	0.20	1.0
009	J15W29	% Solids	98.0	%	0.01	1.0
		Chromium VI	0.22	MG/KG	0.20	1.0
010	J15W30	% Solids	98.1	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0

12/16/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/29/07

IENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
11	J15W31	% Solids	98.4	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
12	J15W32	% Solids	97.6	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
13	J15W33	% Solids	98.3	%	0.01	1.0
		Chromium VI	0.26	MG/KG	0.20	1.0
14	J15W34	% Solids	96.1	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
15	J15W35	% Solids	100	%	0.01	1.0

12/16/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-020
LVL#: 0710L095

W.O.#: 11343-606-001-9999-00
Date Received: 10-24-07

INORGANIC NARRATIVE

1. This narrative covers the analyses of 15 soil samples.

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

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

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

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

5. The method 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 analyses for Percent Solids and Chromium VI were within the 20% Relative Percent Difference (RPD) control limit.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/1/07
Date

njp\i10-095

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 17 pages.

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

Collector: C. Martinez / T. Welsh-Koelling	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100-B-21:2 (2-in asbestos line)		SAF No.: RC-020
Ice Chest No.: AFS-04-123	Field Logbook No.: EFL1173-14	COA: R10B212000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080048		Bill of Lading/Air Bill No.: see OSPC

Price Code: 8L

Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Preservation	None	Cool 4C	Cool 4C	None	None	
Type of Container	G/P	G/P	aG	G/P	aG	
No. of Container(s)	1	1	1	1	1	
Volume	250mL	125mL	250mL	500mL	60mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta	

Sample No.	Matrix *	Sample Date	Sample Time										
15W21	SOIL	10/22/07	1005	✓	✓	✓							
15W22	SOIL		1020	✓	✓	✓							
15W23	SOIL		1040	✓	✓	✓							
15W24	SOIL		1055	✓	✓	✓							
15W25	SOIL	10/22/07	1215	✓	✓	✓							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: T. Welsh-Koelling	10/22/07 1515	c. martinez/c. martinez	1515 10/22/07
Relinquished By/Removed From: c. martinez/c. martinez	10/22/07 1630	3728 2B	1630 10/22/07
Relinquished By/Removed From: 3728 2B	10-23-07 0930	[illegible]	10-23-07 0930
Relinquished By/Removed From: [illegible]	10-23-07 1500	FED EX	
Relinquished By/Removed From: FED EX	10-24-07 / 10:00	[illegible]	10-24-07 / 10:00
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) ~~Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add on {Silver-108 metastable}~~ 10/22/07

Sampler unavailable to relinquish samples from 3728 Ref # 2B
Custodian removed samples for shipping on 10/23/07.

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

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

ICH-EF 011

000014

000000014

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez / T. Welsh-Koelling	C. Martinez	509-539-2816	KESSNER, JH	8L	15 days

Project Designation	Sampling Location	SAF No.
100-BC Burial Grounds - Soil Full Protocol	100-B-21:2 (2-in asbestos line)	RC-020

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
AFS-04-123	EFL1173-14	R10B212000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A080048	see OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

None

Preservation	None	Cool 4C	Cool 4C	None	None							
Type of Container	G/P	G/P	aG	G/P	aG							
No. of Container(s)	1	1	1	1	1							
Volume	250mL	125mL	250mL	500mL	60mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta							
Sample No. / Matrix * / Sample Date / Sample Time												
J15W26 / SOIL / 10/22/07 / 1235	✓	✓	✓									
J15W27 / SOIL / / 1250	✓	✓	✓									
J15W28 / SOIL / / 1310	✓	✓	✓									
J15W29 / SOIL / / 1325	✓	✓	✓									
J15W30 / SOIL / 10/22/07 / 1350	✓	✓	✓									

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Tyler Kowalski	10/22/07 1515	Received By/Stored In: C. Martinez / C. Martinez	1515 10/22/07
Relinquished By/Removed From: C. Martinez / C. Martinez	10/22/07 1630	Received By/Stored In: 3728 2B	1630 10/22/07
Relinquished By/Removed From: 3728 2B	10-23-07 0930	Received By/Stored In: KM Singleton	10-23-07 0930
Relinquished By/Removed From: KM Singleton	10-23-07 1500	Received By/Stored In: FED EX	UCH
Relinquished By/Removed From: [illegible]	10-24-07 1000	Received By/Stored In: [illegible]	10-24-07 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Chem 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}~~ 10/22/07

Sampler unavailable to relinquish samples from 3728 Ref# 2B. 3728 Custodian removed samples for shipping on 10/23/07.

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

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

000000015

000000015

Collector: C. Martinez / T. Welsh-Koelling	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 100-B-21:2 (2-in asbestos line)		SAF No.: RC-020
Chest No.: AFS-04-123	Field Logbook No.: EFL1173-14	COA: R10B212000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A080048		Bill of Lading/Air Bill No.: see OSPC

Price Code: BL

Data Turnaround: 15 days

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: None

Preservation	None	Cool 4C	Cool 4C	None	None						
Type of Container	G/P	G/P	aG	G/P	aG						
No. of Container(s)	1	1	1	1	1						
Volume	250mL	125mL	250mL	500mL	60mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Gross Alpha & Gross Beta						

Sample No.	Matrix *	Sample Date	Sample Time										
5W31	SOIL	10/22/07	1430	✓	✓	✓							
5W32	SOIL		1450	✓	✓	✓							
5W33	SOIL		1505	✓	✓	✓							
5W34	SOIL		1045	✓	✓	✓							
5W35	SOIL	10/22/07	1025	✓	N/A	✓							

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: [illegible] Date/Time: 10/22/07 1516	Received By/Stored In: [illegible] Date/Time: 1515	
Relinquished By/Removed From: C. Martinez/C. Martinez 10/22/07 Date/Time: 1630	Received By/Stored In: 3728 2B Date/Time: 10/22/07 1630	
Relinquished By/Removed From: 3728 2B 10-23-07 Date/Time: 0930	Received By/Stored In: [illegible] 10-23-07 Date/Time: 0930	
Relinquished By/Removed From: [illegible] 10-23-07 Date/Time: 1500	Received By/Stored In: FEDEX Date/Time:	
Relinquished By/Removed From: [illegible] 10-24-07 Date/Time: 1000	Received By/Stored In: [illegible] 10-24-07 Date/Time: 1000	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)
(2) ~~Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Silver-108 metastable]~~ 10/22/07

Sampler unavailable to relinquish samples from 3728 Ref # 2B 3728 Custodian removed samples for shipping on 10/23/07.

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

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

TH-EE-411

000016

000000016

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-BC-100-03-21:2			DATA PACKAGE: K1005		
VALIDATOR:		LAB: LLF		DATE: 12/16/07	
			SDG: K1005		

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				
J1SW22	J1SW23	J1SW24	J1SW25	J1SW26
J1SW27	J1SW28	J1SW29	J1SW30	J1SW31
J1SW32	J1SW33	J1SW34	J1SW21	
				soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. HOLDING TIMES (all levels)

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/29/07

LIENT: TNU-HANFORD RC-020 LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
LANK10	07LVI086-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/29/07

LIENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

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

AMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
001	J15W21	Soluble Chromium VI	4.4	0.20u	4.1	108.0	1.0
		Insoluble Chromium VI	1180	0.20u	1200	98.1	100
~~LANK10~~	~~07LVI086-MB1~~	~~Soluble Chromium VI~~	~~4.0~~	~~0.20u~~	~~4.0~~	~~99.4~~	~~1.0~~
		Insoluble Chromium VI	1130	0.20u	1110	101.8	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/29/07

.IENT: TNU-HANFORD RC-020

LVL LOT #: 0710L095

)RK ORDER: 11343-606-001-9999-00

AMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
)01REP	J15W21	% Solids	98.4	98.5	0.081	1.0
		Chromium VI	0.20u	0.20u	NC	1.0