0074167

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

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H4-21

COMMENTS:

SDG K0916 SAF-RC-032

Waste Site: 100-F-26:14

RECEIVED
OCT 17 2007
EDMC

Date: 17 September 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-F-26:14
Subject: Wet Chemistry - Data Package No. K0916-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0916 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J15BV6	8/9/07	Soil	C	See note 1
J15BV7	8/9/07	Soil	C	See note 1
J15BV8	8/9/07	Soil	C	See note 1
J15BV9	8/9/07	Soil	C	See note 1
J15BW0	8/9/07	Soil	C	See note 1

1 – Chromium VI by 7196A.

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

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

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

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 65% to 135%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 64% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 135% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J15BV8/J15BV9) 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 K0916 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0916	REVIEWER: ELR	Project: 100-F-26:14	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 08/17/07

ENT: TNU-HANFORD RC-032 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
1	J15BV6	% Solids	99.5	%	0.01	1.0
		Chromium VI	0.32	MG/KG	0.20	1.0
2	J15BV7	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.25	MG/KG	0.20	1.0
3	J15BV8	% Solids	99.6	%	0.01	1.0
		Chromium VI	0.28	MG/KG	0.20	1.0
4	J15BV9	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.50	MG/KG	0.20	1.0
5	J15BW0	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.36	MG/KG	0.20	1.0

R 9/14/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032 K0916
LVL#: 0708L750

W.O.#: 11343-606-001-9999-00
Date Received: 08-14-07

INORGANIC NARRATIVE

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

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

   LvLI is NELAP accredited by the State of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvLI certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

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

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

5. The method blank for Chromium VI was within the method criteria .

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

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

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/23/07
Date

njp\08-750

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 11 pages.

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

ICNI WCH-KOELLING	R.T. Coffman 528-6409	KESSNER, JH	Price Code 8B / Date Turnaround 3 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-26:14 Shallow Zone/Verification	SAF No. RC-032	
Ice Chest No. AFS-04-006	Field Logbook No. EFL-1174-3 / COA R10F262000	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A070393	Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA

Preservation	None	Cool 4C	None	None							
Type of Container	P	P	P	G/P							
No. of Container(s)	1	1	1	1							
Volume	250mL	125mL	500mL	60mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	Nickel-63; Strontium-89,90 -- Total Sr							

210000

Sample No.	Matrix *	Sample Date	Sample Time											
J15BV6	SOIL	8-9-07	07:15	✓	✓									A1
J15BV7	SOIL	8-9-07	07:30	✓	✓									A2
J15BV8	SOIL	8-9-07	07:45	✓	✓									A3
J15BV9	SOIL	8-9-07	07:45	✓	✓									A3D
J15BW0	SOIL	8-9-07	08:00	✓	✓									A4

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 8-9-07 10:00	Received By/Stored In	Date/Time 1000 8-9-07
Relinquished By/Removed From	Date/Time 1330 8-9-07	Received By/Stored In	Date/Time 1330 8-9-07
Relinquished By/Removed From 3728 3A	Date/Time 8-13-07 0900	Received By/Stored In	Date/Time 8-13-07 0900
Relinquished By/Removed From	Date/Time WCH 8-13-07 1300	Received By/Stored In FED EX	Date/Time
Relinquished By/Removed From FED EX	Date/Time 8-14-07 0915	Received By/Stored In	Date/Time 8-14-07 0915
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

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

Sampler unavailable to relinquish samples from 3728 Ref# 3A. 3728 Custodian removed samples for shipping on 8/13/07.

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-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-26:14		DATA PACKAGE:	K0916	
VALIDATOR:	ELR	LAB: LLF		DATE: 9/13/07	
			SDG: K0916		

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		
J15BV6	J15BV7	J15BV8
J15VB9	J15BW0	
		Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. HOLDING TIMES (all levels)

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/17/07

ENT: TNU-HANFORD RC-032 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
NK10	07LVI065-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 08/17/07

ENT: TNU-HANFORD RC-032 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
5	J15BW0	Soluble Chromium VI	4.5	0.36	4.0	102.0	1.0
		Insoluble Chromium VI	1140	0.36	1170	97.1	100
NK10	07LVI065-MB1	Soluble Chromium VI	4.0	0.20u	4.0	101.1	1.0
		Insoluble Chromium VI	1200	0.20u	1170	103.2	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 08/17/07

ENT: TNU-HANFORD RC-032 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
1REP	J15BV6	% Solids	99.5	99.6	0.14	1.0
5REP	J15BW0	Chromium VI	0.36	0.28	27.8	1.0

Date: 17 September 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol – Waste Site 100-F-26:14
Subject: Radiochemistry - Data Package No. K0916-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0916 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J15BV6	8/9/07	Soil	C	See note 1
J15BV7	8/9/07	Soil	C	See note 1
J15BV8	8/9/07	Soil	C	See note 1
J15BV9	8/9/07	Soil	C	See note 1
J15BW0	8/9/07	Soil	C	See note 1

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

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

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
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 65-135%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 35%, no qualification is required. If

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

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J15BV8/J15BV9) 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. No analytes exceeded the RQL.

- **Completeness**

Data package No. K0916 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with 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: K0916	REVIEWER: ELR	Project: 100-F-26:14	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 K0916

7847-001 J15BV6

DATA SHEET

SDG	7847	Client/Case no	Hanford SDG K0916
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R708086-01	Client sample id	J15BV6
Dept sample id	7847-001	Location/Matrix	100-F-26:14 Shallow Zone SOLID
Received	08/14/07	Collected/Weight	08/09/07 07:15 1061 g
% solids	99.3	Custody/SAF No	RC-032-140 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	0.128	2.1	3.60	30.0	U	NI_L
Total Strontium	SR-RAD	-0.005	0.096	0.200	1.00	U	SR
Potassium 40	13966-00-2	14.4	0.78	0.332			GAM
Cobalt 60	10198-40-0	U		0.043	0.050	U	GAM
Cesium 137	10045-97-3	0.118	0.030	0.035	0.100		GAM
Radium 226	13982-63-3	0.413	0.072	0.074	0.100		GAM
Radium 228	15262-20-1	0.753	0.16	0.146	0.200		GAM
Europium 152	14683-23-9	0.113	0.058	0.086	0.100		GAM
Europium 154	15585-10-1	U		0.124	0.100	U	GAM
Europium 155	14391-16-3	U		0.103	0.100	U	GAM
Thorium 228	14274-82-9	0.619	0.045	0.046			GAM
Thorium 232	TH-232	0.753	0.16	0.146			GAM
Uranium 235	15117-96-1	U		0.149		U	GAM
Uranium 238	U-238	U		4.01		U	GAM
Americium 241	14596-10-2	U		0.277		U	GAM
Silver 108m	14391-65-2	U		0.026		U	GAM
Barium 133	13981-41-4	U		0.041		U	GAM

100-F Remaining Sites Burial Grounds

9/14/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/21/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0916

7847-002 J15BV7

DATA SHEET

SDG	7847	Client/Case no	Hanford SDG K0916
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R708086-02	Client sample id	J15BV7
Dept sample id	7847-002	Location/Matrix	100-F-26:14 Shallow Zone SOLID
Received	08/14/07	Collected/Weight	08/09/07 07:30 1113 g
% solids	99.1	Custody/SAF No	RC-032-140 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	3.24	2.2	3.50	30.0	U	NI_L
Total Strontium	SR-RAD	0.148	0.15	0.263	1.00	U	SR
Potassium 40	13966-00-2	13.3	0.83	0.360			GAM
Cobalt 60	10198-40-0	0.055	0.042	0.043	0.050		GAM
Cesium 137	10045-97-3	0.263	0.045	0.044	0.100		GAM
Radium 226	13982-63-3	0.433	0.079	0.085	0.100		GAM
Radium 228	15262-20-1	0.590	0.17	0.176	0.200		GAM
Europium 152	14683-23-9	0.525	0.090	0.105	0.100		GAM
Europium 154	15585-10-1	U		0.135	0.100	U	GAM
Europium 155	14391-16-3	U		0.117	0.100	U	GAM
Thorium 228	14274-82-9	0.645	0.049	0.054			GAM
Thorium 232	TH-232	0.590	0.17	0.176			GAM
Uranium 235	15117-96-1	U		0.169		U	GAM
Uranium 238	U-238	U		4.53		U	GAM
Americium 241	14596-10-2	U		0.307		U	GAM
Silver 108m	14391-65-2	U		0.030		U	GAM
Barium 133	13981-41-4	U		0.044		U	GAM

100-F Remaining Sites Burial Grounds

VK 9/11/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/21/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0916

7847-004 J15BV9

DATA SHEET

SDG	7847	Client/Case no	Hanford SDG K0916
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R708086-04	Client sample id	J15BV9
Dept sample id	7847-004	Location/Matrix	100-F-26:14 Shallow Zone SOLID
Received	08/14/07	Collected/Weight	08/09/07 07:45 994 g
% solids	99.5	Custody/SAF No	RC-032-140 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	-0.286	2.0	3.44	30.0	U	NI_L
Total Strontium	SR-RAD	0.019	0.11	0.220	1.00	U	SR
Potassium 40	13966-00-2	13.4	0.79	0.369			GAM
Cobalt 60	10198-40-0	U		0.036	0.050	U	GAM
Cesium 137	10045-97-3	0.085	0.030	0.035	0.100		GAM
Radium 226	13982-63-3	0.416	0.056	0.054	0.100		GAM
Radium 228	15262-20-1	0.660	0.13	0.128	0.200		GAM
Europium 152	14683-23-9	U		0.102	0.100	U	GAM
Europium 154	15585-10-1	U		0.127	0.100	U	GAM
Europium 155	14391-16-3	U		0.094	0.100	U	GAM
Thorium 228	14274-82-9	0.779	0.060	0.056			GAM
Thorium 232	TH-232	0.660	0.13	0.128			GAM
Uranium 235	15117-96-1	U		0.148		U	GAM
Uranium 238	U-238	U		4.36		U	GAM
Americium 241	14596-10-2	U		0.120		U	GAM
Silver 108m	14391-65-2	U		0.027		U	GAM
Barium 133	13981-41-4	U		0.055		U	GAM

100-F Remaining Sites Burial Grounds

9/16/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/21/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0916

7847-003 J15BV8

DATA SHEET

SDG	7847	Client/Case no	Hanford SDG K0916
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R708086-03	Client sample id	J15BV8
Dept sample id	7847-003	Location/Matrix	100-F-26:14 Shallow Zone SOLID
Received	08/14/07	Collected/Weight	08/09/07 07:45 1068 g
% solids	99.4	Custody/SAF No	RC-032-140 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	-0.310	2.2	3.73	30.0	U	NI_L
Total Strontium	SR-RAD	-0.097	0.14	0.302	1.00	U	SR
Potassium 40	13966-00-2	13.4	0.74	0.245			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	0.076	0.024	0.027	0.100		GAM
Radium 226	13982-63-3	0.484	0.049	0.043	0.100		GAM
Radium 228	15262-20-1	0.609	0.11	0.108	0.200		GAM
Europium 152	14683-23-9	U		0.062	0.100	U	GAM
Europium 154	15585-10-1	U		0.075	0.100	U	GAM
Europium 155	14391-16-3	U		0.083	0.100	U	GAM
Thorium 228	14274-82-9	0.599	0.034	0.034			GAM
Thorium 232	TH-232	0.609	0.11	0.108			GAM
Uranium 235	15117-96-1	U		0.162		U	GAM
Uranium 238	U-238	U		2.80		U	GAM
Americium 241	14596-10-2	U		0.145		U	GAM
Silver 108m	14391-65-2	U		0.017		U	GAM
Barium 133	13981-41-4	U		0.029		U	GAM

100-F Remaining Sites Burial Grounds

9/11/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/21/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0916

7847-005 J15BW0

DATA SHEET

SDG	7847	Client/Case no	Hanford SDG K0916
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R708086-05	Client sample id	J15BW0
Dept sample id	7847-005	Location/Matrix	100-F-26:14 Shallow Zone SOLID
Received	08/14/07	Collected/Weight	08/09/07 08:00 1117 g
% solids	99.5	Custody/SAF No	RC-032-140 RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	1.45	2.0	3.38	30.0	U	NI_L
Total Strontium	SR-RAD	0.006	0.14	0.269	1.00	U	SR
Potassium 40	13966-00-2	14.6	0.60	0.199			GAM
Cobalt 60	10198-40-0	0.089	0.037	0.031	0.050		GAM
Cesium 137	10045-97-3	0.061	0.026	0.030	0.100		GAM
Radium 226	13982-63-3	0.414	0.045	0.043	0.100		GAM
Radium 228	15262-20-1	0.708	0.10	0.092	0.200		GAM
Europium 152	14683-23-9	U		0.058	0.100	U	GAM
Europium 154	15585-10-1	U		0.077	0.100	U	GAM
Europium 155	14391-16-3	U		0.064	0.100	U	GAM
Thorium 228	14274-82-9	0.646	0.033	0.028			GAM
Thorium 232	TH-232	0.708	0.10	0.092			GAM
Uranium 235	15117-96-1	U		0.105		U	GAM
Uranium 238	U-238	U		2.90		U	GAM
Americium 241	14596-10-2	U		0.043		U	GAM
Silver 108m	14391-65-2	U		0.018		U	GAM
Barium 133	13981-41-4	U		0.027		U	GAM

100-F Remaining Sites Burial Grounds

9/16/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/21/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0916 was composed of five solid (soil) samples designated under SAF No. RC-032 with a Project Designation of: 100-F Remaining Sites Burial Grounds – Soil Full Protocol.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on August 21, 2007.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.3 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

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

Melissa Mannion — 08/22/7

Melissa C. Mannion
Senior Program Manager

Date

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
TONI WELCH-KOELLING	R.T. Coffman	528-6409	KESSNER, JH	4B	7 DAY

Project Designation	Sampling Location	SAF No.
100-F Remaining Sites Burial Grounds - Soil Full Protocol	100-F-26:14 Shallow Zone/Verification K0916 (7847)	RC-032

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-01-037	EFL-1174-3	R10F262000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES LIONVILLE	A070369	See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA

Preservation	None	Cool 4C	None	None							
Type of Container	P	P	P	~~GP~~ P JRD 7-18-07							
No. of Container(s)	1	1	1	1							
Volume	250mL	125mL	500mL	~~60mL~~ JRD 7-18-07 125 mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	Nickel-63; Strontium-89,90 -- Total Sr							

000017

Sample No.	Matrix *	Sample Date	Sample Time										
J15BV6	SOIL	8-9-07	0715										A1
J15BV7	SOIL	8-9-07	0730										A2
J15BV8	SOIL	8-9-07	0745										A3
J15BV9	SOIL	8-9-07	0745										A3D
J15BW0	SOIL	8-9-07	0800										A4

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
TONI WELCH-KOELLING	8-9-07 10:00	JRDeRuiyne JRDeRuiyne	8-9-07 1000
JRDeRuiyne JRDeRuiyne	8-9-07 1330	3728/34	8-9-07 1330
3728/34	8-13-07 0900	[illegible]	8-13-07 0900
[illegible]	8-13-07 WCH 1500	FED EX	
FED EX		[illegible]	08/14/07 9:00

SPECIAL INSTRUCTIONS

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

Sampler unavailable to relinquish samples from 3728 Ref# 34. 3728 Custodian removed samples for shipping on 8/13/07.

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-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26114			DATA PACKAGE: K0916		
VALIDATOR: ELR		LAB: EB		DATE: 9/13/07	
			SDG: K0916		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	Ni-63		
SAMPLES/MATRIX					
J15VB6	J15VB7	J15VB8	J15VB9	J15BW0	
					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: _____

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0916

7847-007

Method Blank

METHOD BLANK

SDG	7847	Client/Case no	Hanford	SDG K0916	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R708086-07	Client sample id	Method Blank		
Dept sample id	7847-007	Material/Matrix		SOLID	
		SAF No	RC-032		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	0.700	1.8	2.94	30.0	U	NI_L
Total Strontium	SR-RAD	-0.108	0.15	0.326	1.00	U	SR
Potassium 40	13966-00-2	U		0.511		U	GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	U		0.019	0.100	U	GAM
Radium 226	13982-63-3	U		0.043	0.100	U	GAM
Radium 228	15262-20-1	U		0.097	0.200	U	GAM
Europium 152	14683-23-9	U		0.052	0.100	U	GAM
Europium 154	15585-10-1	U		0.058	0.100	U	GAM
Europium 155	14391-16-3	U		0.039	0.100	U	GAM
Thorium 228	14274-82-9	U		0.030		U	GAM
Thorium 232	TH-232	U		0.097		U	GAM
Uranium 235	15117-96-1	U		0.073		U	GAM
Uranium 238	U-238	U		2.52		U	GAM
Americium 241	14596-10-2	U		0.021		U	GAM
Silver 108m	14391-65-2	U		0.016		U	GAM
Barium 133	13981-41-4	U		0.021		U	GAM

100-F Remaining Sites Burial Grounds

QC-BLANK 62435

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/21/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0916

7847-006

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7847
Contact Melissa C. Mannion

Client/Case no Hanford SDG K0916
Contract No. 630

Lab sample id R708086-06
Dept sample id 7847-006

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No RC-032

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Nickel 63	264	6.3	2.96	30.0		NI_L	266	11	99	83-117	80-120
Total Strontium	11.9	0.58	0.218	1.00		SR	10.4	0.42	114	80-120	80-120
Cobalt 60	0.799	0.063	0.026	0.050		GAM	0.769	0.031	104	73-127	80-120
Cesium 137	0.766	0.062	0.048	0.100		GAM	0.786	0.031	97	74-126	80-120

100-F Remaining Sites Burial Grounds

QC-LCS 62434

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 08/21/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0916

7847-008 J15BV6

DUPLICATE

SDG	7847			Client/Case no	Hanford SDG K0916
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
ab sample id	R708086-08	Lab sample id	R708086-01	Client sample id	J15BV6
pt sample id	7847-008	Dept sample id	7847-001	Location/Matrix	100-F-26:14 Shallow Zone SOLID
		Received	08/14/07	Collected/Weight	08/09/07 07:15 1061 g
% solids	99.3	% solids	99.3	Custody/SAF No	RC-032-140 RC-032

ALYTE	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
ckel 63	1.55	2.0	3.35	30.0	U	NI_L	0.128	2.1	3.60	U	-		1.0
tal Strontium	-0.078	0.11	0.255	1.00	U	SR	-0.005	0.096	0.200	U	-		1.0
tassium 40	15.2	0.87	0.400			GAM	14.4	0.78	0.332		5	34	0.5
balt 60	U		0.045	0.050	U	GAM	U		0.043	U	-		0.1
sium 137	0.126	0.047	0.046	0.100		GAM	0.118	0.030	0.035		7	76	0.3
dium 226	0.391	0.068	0.070	0.100		GAM	0.413	0.072	0.074		5	49	0.3
dium 228	0.751	0.14	0.138	0.200		GAM	0.753	0.16	0.146		0	53	0
ropium 152	0.110	0.059	0.086	0.100		GAM	0.113	0.058	0.086		3	116	0.1
ropium 154	U		0.131	0.100	U	GAM	U		0.124	U	-		0.1
ropium 155	U		0.110	0.100	U	GAM	U		0.103	U	-		0.1
orium 228	0.586	0.047	0.050			GAM	0.619	0.045	0.046		5	36	0.5
orium 232	0.751	0.14	0.138			GAM	0.753	0.16	0.146		0	53	0
anium 235	U		0.162		U	GAM	U		0.149	U	-		0.1
anium 238	U		4.65		U	GAM	U		4.01	U	-		0.2
ericium 241	U		0.295		U	GAM	U		0.277	U	-		0.1
lver 108m	U		0.026		U	GAM	U		0.026	U	-		0
rium 133	U		0.041		U	GAM	U		0.041	U	-		0

0-F Remaining Sites Burial Grounds

-DUP#1 62436

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	08/21/07

Date: 17 September 2007
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-F-26:14
Subject: Inorganic - Data Package No. K0916-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0916 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J15BV6	8/9/07	Soil	C	See note 1
J15BV7	8/9/07	Soil	C	See note 1
J15BV8	8/9/07	Soil	C	See note 1
J15BV9	8/9/07	Soil	C	See note 1
J15BW0	8/9/07	Soil	C	See note 1

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

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

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 74% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all antimony (69.6%) and vanadium (71.8%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to the RPD outside QC limits (64.8%), all silicon results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J15BV8/J15BV9) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPD for barium (147%), chromium (62%), aluminum (96%), calcium (127%), copper (84%), iron (67%), potassium (76%), magnesium (76%), manganese (64%), silicon (54%), vanadium (74%) and zinc (59%) were 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. K0916 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to matrix spike recoveries outside QC limits, all antimony (69.6%) and vanadium (71.8%) results were qualified as estimates and flagged "J".

- Due to the RPD outside QC limits (64.8%), all silicon results were qualified as estimates and flagged "J".

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

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: K0916	REVIEWER: ELR	Project: 100-F-26:14	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony Vanadium	J	All	MS recovery
Silicon	J	All	RPD

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

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/22/07

ENT: TNUHANFORD RC-032 K0916 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
1	J15BV6	Silver, Total	0.27 u	MG/KG	0.27	3.0
		Aluminum, Total	5740	MG/KG	4.9	3.0
		Arsenic, Total	2.0	MG/KG	1.2	3.0
		Boron, Total	1.1 u	MG/KG	1.1	3.0
		Barium, Total	55.8	MG/KG	0.06	3.0
		Beryllium, Total	0.20	MG/KG	0.03	3.0
		Calcium, Total	5260	MG/KG	2.1	3.0
		Cadmium, Total	0.15 u	MG/KG	0.15	3.0
		Cobalt, Total	6.0	MG/KG	0.24	3.0
		Chromium, Total	9.1	MG/KG	0.30	3.0
		Copper, Total	12.5	MG/KG	0.27	3.0
		Iron, Total	15400	MG/KG	7.1	3.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Potassium, Total	912	MG/KG	9.5	3.0
		Magnesium, Total	3670	MG/KG	2.4	3.0
		Manganese, Total	251	MG/KG	0.21	3.0
		Molybdenum, Total	0.47 u	MG/KG	0.47	3.0
		Sodium, Total	211	MG/KG	2.1	3.0
		Nickel, Total	9.8	MG/KG	0.80	3.0
		Lead, Total	5.9	MG/KG	0.98	3.0
		Antimony, Total	0.65 u J	MG/KG	0.65	3.0
		Selenium, Total	1.3 u	MG/KG	1.3	3.0
		Silicon, Total	578 J	MG/KG	2.5	3.0
		Vanadium, Total	39.7 J	MG/KG	0.24	3.0
		Zinc, Total	35.3	MG/KG	0.12	3.0

R 9/14/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/22/07

NT: TNUHANFORD RC-032 K0916 LVL LOT #: 0708L750

ORDER: 11343-606-001-9999-00

LE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
	J15BV7	Silver, Total	0.26 u	MG/KG	0.26	3.0
		Aluminum, Total	5850	MG/KG	4.8	3.0
		Arsenic, Total	3.1	MG/KG	1.2	3.0
		Boron, Total	1.6	MG/KG	1.0	3.0
		Barium, Total	58.5	MG/KG	0.06	3.0
		Beryllium, Total	0.20	MG/KG	0.03	3.0
		Calcium, Total	4230	MG/KG	2.0	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	6.6	MG/KG	0.23	3.0
		Chromium, Total	9.5	MG/KG	0.29	3.0
		Copper, Total	12.5	MG/KG	0.26	3.0
		Iron, Total	16700	MG/KG	6.8	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1060	MG/KG	9.2	3.0
		Magnesium, Total	3820	MG/KG	2.3	3.0
		Manganese, Total	291	MG/KG	0.20	3.0
		Molybdenum, Total	0.46 u	MG/KG	0.46	3.0
		Sodium, Total	170	MG/KG	2.0	3.0
		Nickel, Total	10.0	MG/KG	0.77	3.0
		Lead, Total	4.8	MG/KG	0.95	3.0
		Antimony, Total	0.69 J	MG/KG	0.63	3.0
		Selenium, Total	1.2 u	MG/KG	1.2	3.0
		Silicon, Total	880 J	MG/KG	2.5	3.0
		Vanadium, Total	40.2 J	MG/KG	0.23	3.0
		Zinc, Total	35.9	MG/KG	0.11	3.0

JR 9/16/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/22/07

ENT: TNUHANFORD RC-032 K0916 LVL LOT #: 0708L750

ORDER: 11343-606-001-9999-00

PLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
3	J15BV8	Silver, Total	0.27 u	MG/KG	0.27	3.0
		Aluminum, Total	6920	MG/KG	5.0	3.0
		Arsenic, Total	1.8	MG/KG	1.2	3.0
		Boron, Total	31.6	MG/KG	1.1	3.0
		Barium, Total	216	MG/KG	0.06	3.0
		Beryllium, Total	0.33	MG/KG	0.03	3.0
		Calcium, Total	7630	MG/KG	2.1	3.0
		Cadmium, Total	0.15 u	MG/KG	0.15	3.0
		Cobalt, Total	6.0	MG/KG	0.24	3.0
		Chromium, Total	8.0	MG/KG	0.30	3.0
		Copper, Total	13.2	MG/KG	0.27	3.0
		Iron, Total	13000	MG/KG	7.1	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	815	MG/KG	9.5	3.0
		Magnesium, Total	3820	MG/KG	2.4	3.0
		Manganese, Total	228	MG/KG	0.21	3.0
		Molybdenum, Total	0.51	MG/KG	0.48	3.0
		Sodium, Total	481	MG/KG	2.1	3.0
		Nickel, Total	9.5	MG/KG	0.81	3.0
		Lead, Total	4.1	MG/KG	0.98	3.0
		Antimony, Total	0.83 J	MG/KG	0.66	3.0
		Selenium, Total	1.3 u	MG/KG	1.3	3.0
		Silicon, Total	1610 J	MG/KG	2.6	3.0
		Vanadium, Total	34.2 J	MG/KG	0.24	3.0
		Zinc, Total	29.1	MG/KG	0.12	3.0

9/14/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/22/07

INT: TNUHANFORD RC-032 K0916 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
1	J15BV9	Silver, Total	0.26 u	MG/KG	0.26	3.0
		Aluminum, Total	2430	MG/KG	4.8	3.0
		Arsenic, Total	1.2 u	MG/KG	1.2	3.0
		Boron, Total	1.0 u	MG/KG	1.0	3.0
		Barium, Total	32.6	MG/KG	0.06	3.0
		Beryllium, Total	0.08	MG/KG	0.03	3.0
		Calcium, Total	1690	MG/KG	2.1	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	2.7	MG/KG	0.23	3.0
		Chromium, Total	4.2	MG/KG	0.29	3.0
		Copper, Total	5.4	MG/KG	0.26	3.0
		Iron, Total	6500	MG/KG	6.9	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	364	MG/KG	9.3	3.0
		Magnesium, Total	1720	MG/KG	2.3	3.0
		Manganese, Total	118	MG/KG	0.20	3.0
		Molybdenum, Total	0.46 u	MG/KG	0.46	3.0
		Sodium, Total	90.6	MG/KG	2.0	3.0
		Nickel, Total	4.2	MG/KG	0.78	3.0
		Lead, Total	1.9	MG/KG	0.95	3.0
		Antimony, Total	0.79 J	MG/KG	0.64	3.0
		Selenium, Total	1.2 u	MG/KG	1.2	3.0
		Silicon, Total	923 J	MG/KG	2.5	3.0
		Vanadium, Total	15.8 J	MG/KG	0.23	3.0
		Zinc, Total	16.6	MG/KG	0.12	3.0

9/14/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/22/07

ENT: TNUHANFORD RC-032 K0916 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
5	J15BW0	Silver, Total	0.26 u	MG/KG	0.26	3.0
		Aluminum, Total	4310	MG/KG	4.8	3.0
		Arsenic, Total	2.4	MG/KG	1.2	3.0
		Boron, Total	1.3	MG/KG	1.0	3.0
		Barium, Total	49.0	MG/KG	0.06	3.0
		Beryllium, Total	0.16	MG/KG	0.03	3.0
		Calcium, Total	3000	MG/KG	2.0	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	5.0	MG/KG	0.23	3.0
		Chromium, Total	6.9	MG/KG	0.29	3.0
		Copper, Total	11.1	MG/KG	0.26	3.0
		Iron, Total	11000	MG/KG	6.8	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	700	MG/KG	9.2	3.0
		Magnesium, Total	3000	MG/KG	2.3	3.0
		Manganese, Total	200	MG/KG	0.20	3.0
		Molybdenum, Total	0.46 u	MG/KG	0.46	3.0
		Sodium, Total	130	MG/KG	2.0	3.0
		Nickel, Total	8.1	MG/KG	0.77	3.0
		Lead, Total	2.6	MG/KG	0.94	3.0
		Antimony, Total	0.63 u J	MG/KG	0.63	3.0
		Selenium, Total	1.2 u	MG/KG	1.2	3.0
		Silicon, Total	932 J	MG/KG	2.5	3.0
		Vanadium, Total	25.1 J	MG/KG	0.23	3.0
		Zinc, Total	27.7	MG/KG	0.11	3.0

9/14/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032
LVL#: 0708L750
SDG/SAF#: K0916/RC-032

W.O.#: 11343-606-001-9999-00
Date Received: 08-14-07

METALS CASE NARRATIVE

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

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

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

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

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

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

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

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

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

   a). The MB result for Sodium was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and samples J15BV7, J15BV9, and J15BW0 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 23 pages.

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

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

9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 78.8%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

10. The matrix spike (MS) recoveries for 5 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J15BV6	Aluminum	66,000	101.2
	Iron	66,000	98.9
	Antimony	300	105.5
	Silicon	6,300	99.2
	Vanadium	3,000	102.6

12. The duplicate analyses for 6 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/24/07
Date

jwm08-750

LIONVILLE LABORATORY INC.

LONI WELCH-KOELLING	R.T. Coffman 528-6409	KESSNER, JH	Price Code: 8B
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-26:14 Shallow Zone/Verification	SAF No.: RC-032	Data Turnaround: 3 DAY (8-14-07)
Ice Chest No.: AFS-04-006	Field Logbook No.: EFL-1174-3 / COA: R10F262000	Method of Shipment: FED EX	
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A070395	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA

Preservation	None	Cool 4C	None	None								
Type of Container	P	P	P	G/P								
No. of Container(s)	1	1	1	1								
Volume	250mL	125mL	500mL	60mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	Nickel-63; Strontium-89,90 -- Total Sr								

Sample No.	Matrix *	Sample Date	Sample Time											
J15BV6	SOIL	8-9-07	07:15	✓	✓									A1
J15BV7	SOIL	8-9-07	07:30	✓	✓									A2
J15BV8	SOIL	8-9-07	07:45	✓	✓									A3
J15BV9	SOIL	8-9-07	07:45	✓	✓									A3D
J15BW0	SOIL	8-9-07	08:00	✓	✓									A4

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
LONI WELCH-KOELLING	8-9-07 10:00	JRDeBrigan	8-9-07 1000
JRDeBrigan	8-9-07 1330	3728 Box	8-9-07 1330
3728 Box	8-13-07 0900	KMSingleton	8-13-07 0900
KMSingleton	8-13-07 1500 WCH	FED EX	
FED EX	8-14-07 0915		8-14-07 0915

SPECIAL INSTRUCTIONS

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

Sampler unavailable to relinquish samples from 3728 Ref# 3A. 3728 Custodian removed samples for shipping on 8/13/07.

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-EE-011

0000018

0000022

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-26:14			DATA PACKAGE: K0916		
VALIDATOR: ELR		LAB: LLR		DATE: 9/13/07	
			SDG: K0916		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J15BV6	J15BV7	J15BV8	J15BV9	J15BW0	
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: MS Vanadium - 71.9% antimony - 69.9% - J all

no PA

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: Silicon – 64.8% – J all

RD – barium 147% chromium – 62% al – 96% calcium – 127%
copper – 84% iron – 67% potassium – 76% magnesium – 76%
manganese 64% silicon 54% vanadium – 74% zinc – 55%

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 08/22/07

:ENT: TNUHANFORD RC-032 K0916 LVL LOT #: 0708L750

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

:PLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
ANK1	07L0411-MB1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	2.9	MG/KG	1.6	1.0
		Arsenic, Total	0.40 u	MG/KG	0.40	1.0
		Boron, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	0.11	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	10.7	MG/KG	0.69	1.0
		Cadmium, Total	0.05	MG/KG	0.05	1.0
		Cobalt, Total	0.14	MG/KG	0.08	1.0
		Chromium, Total	0.10	MG/KG	0.1	1.0
		Copper, Total	0.09 u	MG/KG	0.09	1.0
		Iron, Total	3.9	MG/KG	2.3	1.0
		Potassium, Total	5.7	MG/KG	3.1	1.0
		Magnesium, Total	2.8	MG/KG	0.79	1.0
		Manganese, Total	0.07 u	MG/KG	0.07	1.0
		Molybdenum, Total	0.16 u	MG/KG	0.16	1.0
		Sodium, Total	9.0	MG/KG	0.68	1.0
		Nickel, Total	0.26 u	MG/KG	0.26	1.0
		Lead, Total	0.32 u	MG/KG	0.32	1.0
		Antimony, Total	0.21 u	MG/KG	0.21	1.0
		Selenium, Total	0.42 u	MG/KG	0.42	1.0
		Silicon, Total	8.4	MG/KG	0.84	1.0
		Vanadium, Total	0.08	MG/KG	0.08	1.0
		Zinc, Total	0.79	MG/KG	0.04	1.0
ANK1	07C0155-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 08/22/07

IENT: TNUHANFORD RC-032 K0916 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
01	J15BV6	Silver, Total	4.6	0.27u	4.9	93.9	3.0
		Aluminum, Total	5620	5740	197	-60. *	3.0
		Arsenic, Total	187	2.0	197	93.8	3.0
		Boron, Total	94.1	1.1 u	98.5	95.5	3.0
		Barium, Total	244	55.8	197	95.3	3.0
		Beryllium, Total	4.9	0.20	4.9	95.8	3.0
		Calcium, Total	8810	6260	2460	103.5	3.0
		Cadmium, Total	4.8	0.15u	4.9	98.0	3.0
		Cobalt, Total	52.7	6.0	49.3	94.7	3.0
		Chromium, Total	27.5	9.1	19.7	93.4	3.0
		Copper, Total	38.5	12.5	24.6	105.7	3.0
		Iron, Total	13600	15400	98.5	-1800. *	3.0
		Mercury, Total	0.20	0.02	0.16	112.1	1.0
		Potassium, Total	3140	912	2460	90.3	3.0
		Magnesium, Total	5830	3670	2460	87.7	3.0
		Manganese, Total	288	251	49.3	75.3*	3.0
		Molybdenum, Total	89.6	0.47u	98.5	91.0	3.0
		Sodium, Total	2500	211	2460	93.0	3.0
		Nickel, Total	56.7	9.8	49.3	95.1	3.0
		Lead, Total	51.6	5.9	49.3	92.7	3.0
		Antimony, Total	34.3	0.65u	49.3	69.6	3.0
		Selenium, Total	159	1.3 u	197	80.8	3.0
		Silicon, Total	1110	578	98.5	540.3*	3.0
		Vanadium, Total	75.1	39.7	49.3	71.8	3.0
		Zinc, Total	79.6	35.3	49.3	89.9	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 08/22/07

ENT: TNUHANFORD RC-032 K0916 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
1REP	J15BV6	Silver, Total	0.27u	0.27u	NC	3.0
		Aluminum, Total	5740	4960	14.5	3.0
		Arsenic, Total	2.0	2.4	18.2	3.0
		Boron, Total	1.1 u	1.1 u	NC	3.0
		Barium, Total	55.8	46.6	18.0	3.0
		Beryllium, Total	0.20	0.19	9.1	3.0
		Calcium, Total	6260	5830	7.2	3.0
		Cadmium, Total	0.15u	0.15u	NC	3.0
		Cobalt, Total	6.0	5.3	12.4	3.0
		Chromium, Total	9.1	7.5	19.3	3.0
		Copper, Total	12.5	11.9	4.9	3.0
		Iron, Total	15400	12600	20.2	3.0
		Mercury, Total	0.02	0.10	133.3	1.0
		Potassium, Total	912	849	7.2	3.0
		Magnesium, Total	3670	3380	8.2	3.0
		Manganese, Total	251	234	7.2	3.0
		Molybdenum, Total	0.47u	0.47u	NC	3.0
		Sodium, Total	211	165	24.3	3.0
		Nickel, Total	9.8	8.8	10.8	3.0
		Lead, Total	5.9	3.9	40.8	3.0
		Antimony, Total	0.65u	0.65u	NC	3.0
		Selenium, Total	1.3 u	1.3 u	NC	3.0
		Silicon, Total	578	1130	64.8	3.0
		Vanadium, Total	39.7	28.5	32.8	3.0
		Zinc, Total	35.3	31.5	11.4	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 08/22/07

ENT: TNUHANFORD RC-032 K0916 LVL LOT #: 0708L750

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

PLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
1	07L0411-LC1	Silver, LCS	44.1	48.6	MG/KG	90.7
		Aluminum, LCS	447	486	MG/KG	92.1
		Arsenic, LCS	869	971	MG/KG	89.5
		Boron, LCS	433	486	MG/KG	89.1
		Barium, LCS	438	486	MG/KG	90.2
		Beryllium, LCS	22.6	24.3	MG/KG	93.0
		Calcium, LCS	2270	2430	MG/KG	93.5
		Cadmium, LCS	22.5	24.3	MG/KG	92.6
		Cobalt, LCS	226	243	MG/KG	92.9
		Chromium, LCS	45.2	48.6	MG/KG	93.0
		Copper, LCS	111	121	MG/KG	91.4
		Iron, LCS	454	486	MG/KG	93.6
		Potassium, LCS	2160	2430	MG/KG	89.2
		Magnesium, LCS	2180	2430	MG/KG	89.9
		Manganese, LCS	68.6	72.8	MG/KG	94.2
		Molybdenum, LCS	432	486	MG/KG	88.9
		Sodium, LCS	2120	2430	MG/KG	87.5
		Nickel, LCS	179	194	MG/KG	92.3
		Lead, LCS	225	243	MG/KG	92.8
		Antimony, LCS	260	291	MG/KG	89.2
		Selenium, LCS	827	971	MG/KG	85.2
		Silicon, LCS	382	486	MG/KG	78.8
		Vanadium, LCS	222	243	MG/KG	91.2
		Zinc, LCS	90.2	97.1	MG/KG	92.9
1	07C0155-LC1	Mercury, LCS	2.6	2.8	MG/KG	91.1