

SAF-RC-030
Remaining Sites Confirmation Sampling -
Other Solid
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02

MJP 04/06/06
INITIAL/DATE

COMMENTS:

SDG K0170

SAF-RC-030

Waste Site: 100-D-66

RECEIVED
APR 24 2006
EDMC

Date: 22 March 2006
 To: Washington Closure Hanford Inc. (technical representative)
 From: TechLaw, Inc.
 Project: Remaining Sites Confirmation Sampling – Other Solid - Waste Site 100-D-66
 Subject: PCB - Data Package No. K0170-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0170 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
J110VL7	1/9/06	Solid	C	See note 1
J110VL8	1/9/06	Solid	C	See note 1

1 – PCBs by 8082

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

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

DATA QUALITY OBJECTIVES

• Holding Times

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

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

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Due to the holding time being exceeded by less than twice the limit, all PCB results were qualified as estimates and flagged "J".

• **Method Blank**

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

• **Accuracy**

Matrix Spike & Laboratory Control Sample

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

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated

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with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

· **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J110VL7/J110VL8) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicates were acceptable.

· **Analytical Detection Levels**

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

· **Completeness**

Data Package No. K0170 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%.

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MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the holding time being exceeded by less than twice the limit, all PCB results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

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

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Appendix 1
Glossary of Data Reporting Qualifiers

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

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

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Appendix 2
Summary of Data Qualification

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PCB DATA QUALIFICATION SUMMARY*

SDG: K0170		REVIEWER: [REDACTED]	Project: 100-D-66	PAGE 1 OF 1
COMMENTS:				
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON	
All	J	All	Holding time	

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

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: WASHINGTON CLOSURE HANFORD					
Laboratory: LLI		SDG: K0170			
Sample Number		J10VL7		J10VL8	
Remarks		Duplicate			
Sample Date		1/9/06		1/9/06	
Extraction Date		2/1/06		2/1/06	
Analysis Date		2/3/06		2/3/06	
PCB	RQL	Result	Q	Result	Q
Aroclor-1016	100	38	UJ	38	UJ
Aroclor-1221	100	38	UJ	38	UJ
Aroclor-1232	100	38	UJ	38	UJ
Aroclor-1242	100	38	UJ	38	UJ
Aroclor-1248	100	38	UJ	38	UJ
Aroclor-1254	100	38	UJ	38	UJ
Aroclor-1260	100	38	UJ	38	UJ

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

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Sample Information	Cust ID:	J10VL7	J10VL7	J10VL7	J10VL8	PBLKAX	PBLKAX BS
	RFW#:	001	001 MS	001 MSD	002	06LE0076-MB1	06LE0076-MB1
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	73 %	69 %	68 %	66 %	80 %	89 %
	Decachlorobiphenyl	89 %	85 %	82 %	80 %	85 %	90 %
		-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----
Aroclor-1016		38 U	73 %	82 %	38 U	33 U	107 %
Aroclor-1221		38 U	38 U	38 U	38 U	33 U	33 U
Aroclor-1232		38 U	38 U	38 U	38 U	33 U	33 U
Aroclor-1242		38 U	38 U	38 U	38 U	33 U	33 U
Aroclor-1248		38 U	38 U	38 U	38 U	33 U	33 U
Aroclor-1254		38 U	38 U	38 U	38 U	33 U	33 U
Aroclor-1260		38 U	108 %	129 %	38 U	33 U	114 %

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R 3/20/06

JS 2/9/06

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

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Case Narrative

Client: TNU-HANFORD RC-030
LVL #: 0601L178
SDG/SAF # K0170/RC-030

W.O. #: 11343-606-001-9999-00
Date Received: 01-31-2006

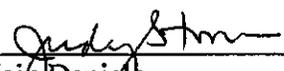
PCB

Two (2) solid samples were collected on 01-09-2006.

The samples and their associated QC samples were extracted on 02-01-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 02-03-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy with the exception of item # 2.
2. Samples were received outside the required extraction holding time. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/10/06
Date

son\vr\group\data\pest\tnu hanford\0601-178.pcb

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 11 pages.

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Collector STANKOVICH/HUDSON	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KESSNER, JH	Price Code 9C	Data Turnaround 15 Days
Project Designation Remaining Sites Confirmation Sampling - Other Solid	Sampling Location 100-D-66	SAF No. RC-030	Air Quality <input type="checkbox"/>		
Ice Chest No. AFS-04-044	Field Logbook No. EL-1578-9	COA CIODR16700	Method of Shipment Fed Ex		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060191	Bill of Lading/Air Bill No. See 05PC			

POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage Cool 4°C	Preservation	None	None	Cool 4C	Cool 4C	Cool 4C				
	Type of Container	G/P	G/P	aG	G	G				
	No. of Container(s)	1	10	10	10	10				
	Volume	500mL 250	60mL	60mL	60mL	60mL				

SAMPLE ANALYSIS SDG # K0169	See Item (1) in Special Instructions	See Item (2) in Special Instructions	PCBs - 8082, 8081, 8080, 8079, 8078, 8077, 8076, 8075	VOA - 8260A (TCL)	TPH (Total) 418.1					
										13848

Sample No.	Matrix *	Sample Date	Sample Time							
J10VL7	OTHER SOLID	1-9-06	0915	X	X	X				
J10VL8	OTHER SOLID	1-9-06	0915	X	X	X				
J10VME	Other Solid	1-9-06	0920							

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *
Relinquished By/Removed From B. Hudson	Date/Time 1/9/06	Received By/Stored In 3728-3C	Date/Time 1-9-06 1420	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Phosphorus-Selenium-89/90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium (2) ICP Metals - 6010A (SW-846) (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) Trans-ship sample jar from Eberline to Lionville after radiological analysis SAMPLES TO BE STORED IN A MANNER THAT MEETS REQUIREMENT FOR PCB ANALYSIS		S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dry Solids DL=Dry Liquids T=Tissue WJ=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From 3728-3C	Date/Time 1-10-06	Received By/Stored In R2 Stehler	Date/Time 1-10-06			
Relinquished By/Removed From R2 Stehler	Date/Time 1-10-06	Received By/Stored In Fed Ex	Date/Time 1-10-06			
Relinquished By/Removed From Fed Ex	Date/Time 1-31-06	Received By/Stored In MFA	Date/Time 01/11/06 09:15			
Relinquished By/Removed From MFA	Date/Time 1-31-06 0910	Received By/Stored In J. [Signature]	Date/Time 1-31-06 0910			

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

Lionville Laboratory, Inc.
 PCB ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD RC-030 K0170



DATE RECEIVED: 01/31/06

LVL LOT #

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J10VL7	001	SO	06LE0076	01/09/06	02/01/06	02/03/06
J10VL7	001 MS	SO	06LE0076	01/09/06	02/01/06	02/03/06
J10VL7	001 MSD	SO	06LE0076	01/09/06	02/01/06	02/03/06
J10VL8	002	SO	06LE0076	01/09/06	02/01/06	02/03/06

LAB QC:

PBLKAX	MB1	S	06LE0076	N/A	02/01/06	02/03/06
PBLKAX	MB1 BS	S	06LE0076	N/A	02/01/06	02/03/06

78 2/9/06

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Appendix 5
Data Validation Supporting Documentation

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PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-D-66		DATA PACKAGE: K0176		
VALIDATOR:	TLP	LAB:	LCI	DATE: 3/20/66	
			SDG:	K0170	
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J10VL7 J10VL8					
solid SKT 3/20/66					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

DDT and endrin breakdowns acceptable? Yes No **N/A**

Comments: _____

PCB DATA VALIDATION CHECKLIST

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

Calibration blanks analyzed? (Levels D, E) Yes No N/A
Calibration blank results acceptable? (Levels D, E) Yes No N/A
Laboratory blanks analyzed? Yes No N/A
Laboratory blank results acceptable? Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments: NO FB

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

Surrogates analyzed? Yes No N/A
Surrogate recoveries acceptable? Yes No N/A
Surrogates traceable? (Levels D, E) Yes No N/A
Surrogates expired? (Levels D, E) Yes No N/A
MS/MSD samples analyzed? Yes No N/A
MS/MSD results acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards expired? (Levels D, E) Yes No N/A
LCS/BSS samples analyzed? Yes No N/A
LCS/BSS results acceptable? Yes No N/A
Standards traceable? (Levels D, E) Yes No N/A
Standards expired? (Levels D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable? Yes No N/A
Comments: NO FB

PCB DATA VALIDATION CHECKLIST

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

- Chromatographic performance acceptable? Yes No N/A
- Positive results resolved acceptably? Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

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

Comments: _____
_____ *all PCB < 2x HT Tall* _____

PCB DATA VALIDATION CHECKLIST

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

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

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

- Fluorilicil ® (or other absorbent) cleanup performed?..... Yes No N/A
- Lot check performed?..... Yes No N/A
- Check recoveries acceptable?..... Yes No N/A
- GPC cleanup performed?..... Yes No N/A
- GPC check performed?..... Yes No N/A
- GPC check recoveries acceptable?..... Yes No N/A
- GPC calibration performed?..... Yes No N/A
- GPC calibration check performed?..... Yes No N/A
- GPC calibration check retention times acceptable?..... Yes No N/A
- Check/calibration materials traceable?..... Yes No N/A
- Check/calibration materials Expired?..... Yes No N/A
- Analytical batch QC given similar cleanup?..... Yes No N/A
- Transcription/Calculation Errors?..... Yes No N/A

Comments: _____

Date: 22 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Other Solid - Waste Site 100-D-66
Subject: Radiochemistry - Data Package No. K0170-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0169 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
J110VL7	1/9/06	Solid	C	See note 1
J110VL8	1/9/06	Solid	C	See note 1

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

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

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

DATA QUALITY PARAMETERS

• Holding Times

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

All holding times were acceptable.

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- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

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

All accuracy results were acceptable.

- **Laboratory Duplicates**

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

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

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J110VL7/J110VL8) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPDs for radium-226 (59%) and potassium-40 (39%) were outside QC limits. Under the WCH statement of work, no qualification is required. All other field duplicates were acceptable.

• **Detection Levels**

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

• **Completeness**

Data package No. K0170 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

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

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REFERENCES

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

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

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Appendix 1

Glossary of Data Reporting Qualifiers

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

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

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Appendix 2
Summary of Data Qualification

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RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0170	REVIEWER: TLI	PROJECT: 100-D-66	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

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

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: WASHINGTON CLOSURE HANFORD					
Laboratory: EB					
Case	SDG: K0170				
Sample Number	J10VL7		J10VL8		
Remarks	Duplicate				
Sample Date	1/9/06		1/9/06		
Radiochemistry	RQL	Result	Q	Result	Q
Gross alpha		1.98	U	2.79	U
Gross beta		75.8		89.4	
Total Strontium	1	0.864		0.707	
Uranium-233/234	1	0.440		0.605	
Uranium-235	1	0.012	U	0.037	
Uranium-238	1	0.391		0.602	
Potassium-40		6.53		9.74	
Cobalt 60	0.05	20.2		18.8	
Cesium 137	0.05	4.19		3.71	
Radium-226		0.772		0.421	
Radium-228		U	U	U	U
Europium 152	0.1	74.1		73.3	
Europium 154	0.1	6.61		6.84	
Europium 155	0.1	U	U*	U	U*
Thorium-228		U	U	0.351	
Thorium-232		U	U	U	U
Uranium-235(gea)		U	U	U	U
Uranium-238(gea)		U	U	U	U
Americium-241(gea)		U	U	U	U

* - RQL exceeded

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

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0170

7708-001

J10VL7

DATA SHEET

<u>SDG 7708</u>	<u>Client/Case no Hanford</u>	<u>SDG K0170</u>
<u>Contact Melissa C. Mannion</u>	<u>Contract No. 630</u>	
<u>Lab sample id R601055-01</u>	<u>Client sample id J10VL7</u>	
<u>Dept sample id 7708-001</u>	<u>Location/Matrix 100-D-66</u>	<u>SOLID</u>
<u>Received 01/11/06</u>	<u>Collected/Weight 01/09/06 09:15 248.8 g</u>	
<u>* solids 100.0</u>	<u>Custody/SAF No RC-030-046</u>	<u>RC-030</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	1.98	2.8	4.1	10	U	93A
Gross Beta	12587-47-2	75.8	6.5	5.6	15		93B
Total Strontium	SR-RAD	0.864	0.19	0.23	1.0		SR
Uranium 233/234	U-233/234	0.440	0.080	0.031	1.0		U
Uranium 235	15117-96-1	0.012	0.016	0.030	1.0	U	U
Uranium 238	U-238	0.391	0.073	0.025	1.0		U
Potassium 40	13966-00-2	6.53	1.1	0.78			GAM
Cobalt 60	10198-40-0	20.2	0.44	<u>0.21</u>	0.050		GAM
Cesium 137	10045-97-3	4.19	0.30	<u>0.35</u>	0.10		GAM
Radium 226	13982-63-3	0.772	0.40	<u>0.52</u>	0.10		GAM
Radium 228	15262-20-1	U		<u>1.2</u>	0.20	U	GAM
Europium 152	14683-23-9	74.1	0.96	<u>0.79</u>	0.10		GAM
Europium 154	15585-10-1	6.61	0.71	<u>0.72</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.65</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.30		U	GAM
Thorium 232	TH-232	U		1.2		U	GAM
Uranium 235	15117-96-1	U		0.79		U	GAM
Uranium 238	U-238	U		36		U	GAM
Americium 241	14596-10-2	U		0.54		U	GAM

Remaining Sites Confirmation Smping

R
3/29/06

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SUMMARY DATA SECTION
Page 14

000011

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/09/06</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0170

7708-002

J10VL8

DATA SHEET

SDG <u>7708</u>	Client/Case no <u>Hanford</u>	SDG <u>K0170</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601055-02</u>	Client sample id <u>J10VL8</u>	
Dept sample id <u>7708-002</u>	Location/Matrix <u>100-D-66</u>	<u>SOLID</u>
Received <u>01/11/06</u>	Collected/Weight <u>01/09/06 09:15</u>	<u>235.4 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-030-046</u>	<u>RC-030</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	2.79	3.1	3.9	10	U	93A
Gross Beta	12587-47-2	89.4	7.1	5.5	15		93B
Total Strontium	SR-RAD	0.707	0.17	0.21	1.0		SR
Uranium 233/234	U-233/234	0.605	0.084	0.026	1.0		U
Uranium 235	15117-96-1	0.037	0.027	0.025	1.0		U
Uranium 238	U-238	0.602	0.084	0.026	1.0		U
Potassium 40	13966-00-2	9.74	1.1	0.81			GAM
Cobalt 60	10198-40-0	18.8	0.34	0.16	0.050		GAM
Cesium 137	10045-97-3	3.71	0.24	0.27	0.10		GAM
Radium 226	13982-63-3	0.421	0.31	0.42	0.10		GAM
Radium 228	15262-20-1	U		0.98	0.20	U	GAM
Europium 152	14683-23-9	73.3	0.84	0.66	0.10		GAM
Europium 154	15585-10-1	6.84	0.59	0.56	0.10		GAM
Europium 155	14391-16-3	U		0.67	0.10	U	GAM
Thorium 228	14274-82-9	0.351	0.15	0.24			GAM
Thorium 232	TH-232	U		0.98		U	GAM
Uranium 235	15117-96-1	U		0.76		U	GAM
Uranium 238	U-238	U		31		U	GAM
Americium 241	14596-10-2	U		1.0		U	GAM

Remaining Sites Confirmation Smping

K
3/20/06

000012

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/09/06</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0170 was composed of two other solid samples designated under SAF No. RC-030 with a Project Designation of: Remaining Sites Confirmation Sampling – Other Solid.

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 January 27, 2006 and February 9, 2006.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analysis

WCH requested total strontium analysis on January 30, 2006. No problems were encountered during the course of the analyses.

2.3 Isotopic Uranium Analysis

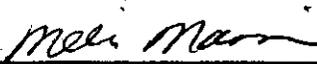
No problems were encountered during the course of the analyses.

2.4 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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



Melissa C. Mannion
Senior Program Manager

2/10/6

Date

Appendix 5
Data Validation Supporting Documentation

000016

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: _____

000018

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 PMS OIFS

K-40 - (3770) 19-224 (5970)

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A

Comments: _____

000021

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: 2-over

Appendix 6

Additional Documentation Requested by Client

000023

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0170

7708-004

Method Blank

METHOD BLANK

SDG <u>7708</u>	Client/Case no <u>Hanford</u>	SDG <u>K0170</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601055-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7708-004</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-030</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.046	2.0	4.2	10	U	93A
Gross Beta	12587-47-2	-2.54	4.6	8.0	15	U	93B
Uranium 233/234	U-233/234	-0.005	0.020	0.049	1.0	U	U
Uranium 235	15117-96-1	0.012	0.025	0.047	1.0	U	U
Uranium 238	U-238	0	0.010	0.039	1.0	U	U
Potassium 40	13966-00-2	U		0.47		U	GAM
Cobalt 60	10198-40-0	U		0.046	0.050	U	GAM
Cesium 137	10045-97-3	U		0.042	0.10	U	GAM
Radium 226	13982-63-3	U		0.079	0.10	U	GAM
Radium 228	15262-20-1	U		0.17	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.11</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.14</u>	0.10	U	GAM
Europium 155	14391-16-3	U		0.062	0.10	U	GAM
Thorium 228	14274-82-9	U		0.051		U	GAM
Thorium 232	TH-232	U		0.17		U	GAM
Uranium 235	15117-96-1	U		0.12		U	GAM
Uranium 238	U-238	U		5.3		U	GAM
Americium 241	14596-10-2	U		0.036		U	GAM

Remaining Sites Confirmation Smping

QC-BLANK #55717

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/09/06</u>

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0170

7708-007

Method Blank

METHOD BLANK

SDG <u>7708</u>	Client/Case no <u>Hanford</u>	<u>SDG K0170</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R601055-07</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7708-007</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-030</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.008	0.13	0.29	1.0	U	SR

Remaining Sites Confirmation Smplng

QC-BLANK #55895

000025

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/09/06</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0170

7708-003

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7708</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> <u>SDG K0170</u> Contract No. <u>630</u>	
Lab sample id <u>R601055-03</u> Dept sample id <u>7708-003</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>RC-030</u>	

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	%	(TOTAL)	LIMITS
Gross Alpha	195	17	3.0	10	93A	214	8.6	91	70-130	70-130
Gross Beta	195	10	5.6	15	93B	197	7.9	99	76-124	70-130
Uranium 233/234	18.1	0.71	0.33	1.0	U	18.6	0.74	97	89-111	80-120
Uranium 235	16.1	0.66	0.029	1.0	U	15.1	0.60	107	88-112	80-120
Uranium 238	17.0	0.68	0.31	1.0	U	20.2	0.81	<u>84</u>	90-110	80-120
Cobalt 60	1.27	0.19	<u>0.10</u>	0.050	GAM	1.24	0.050	102	67-133	80-120
Cesium 137	1.11	0.15	<u>0.13</u>	0.10	GAM	1.11	0.044	100	69-131	80-120

Remaining Sites Confirmation Smplng

QC-LCS #55716

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>02/09/06</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0170

7708-006

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7708</u>	Client/Case no <u>Hanford</u> <u>SDG K0170</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>
Lab sample id <u>R601055-06</u>	Client sample id <u>Lab Control Sample</u>
Dept sample id <u>7708-006</u>	Material/Matrix _____ <u>SOLID</u>
	SAF No <u>RC-030</u>

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
Total Strontium	12.0	0.61	0.25	1.0		SR	10.8	0.43	111	80-120	80-120

Remaining Sites Confirmation Smplng

QC-LCS #55894

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>02/09/06</u>

000027

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0170

7708-005

J10VL8

DUPLICATE

<p>SDG <u>7708</u></p> <p>Contact <u>Melissa C. Mannion</u></p> <p align="center">DUPLICATE</p> <p>Lab sample id <u>R601055-05</u></p> <p>Dept sample id <u>7708-005</u></p> <p>‡ solids <u>100.0</u></p>	<p>Client/Case no <u>Hanford</u> <u>SDG K0170</u></p> <p>Contract No. <u>630</u></p> <p align="center">ORIGINAL</p> <p>Lab sample id <u>R601055-02</u></p> <p>Dept sample id <u>7708-002</u></p> <p>Received <u>01/11/06</u></p> <p>‡ solids <u>100.0</u></p>
<p>Client sample id <u>J10VL8</u></p> <p>Location/Matrix <u>100-D-66</u> <u>SOLID</u></p> <p>Collected/Weight <u>01/09/06 09:15</u> <u>235.4 g</u></p> <p>Custody/SAF No <u>RC-030-046</u> <u>RC-030</u></p>	

ANALYTE	DUPLICATE		2σ ERR		MDA	RDL	QUALI- FIERS	TEST	ORIGINAL		2σ ERR		MDA	QUALI- FIERS	RPD ‡	3σ TOT	DER σ
	pCi/g	(COUNT)	pCi/g	(COUNT)					pCi/g	(COUNT)	pCi/g	(COUNT)					
Gross Alpha	2.48	3.2	4.3	10		10	U	93A	2.79	3.1	3.9	U		-		0.1	
Gross Beta	91.4	7.4	6.0	15		15		93B	89.4	7.1	5.5			2	36	0.2	
Uranium 233/234	0.627	0.096	0.037	1.0		1.0		U	0.605	0.084	0.026			4	33	0.3	
Uranium 235	0.025	0.025	0.031	1.0		1.0	U	U	0.037	0.027	0.025			39	178	0.7	
Uranium 238	0.444	0.082	0.032	1.0		1.0		U	0.602	0.084	0.026			30	35	2.6	
Potassium 40	8.84	0.89	0.70					GAM	9.74	1.1	0.81			10	39	0.7	
Cobalt 60	19.4	0.30	<u>0.16</u>	0.050		0.050		GAM	18.8	0.34	<u>0.16</u>			3	32	0.3	
Cesium 137	4.06	0.26	<u>0.27</u>	0.10		0.10		GAM	3.71	0.24	<u>0.27</u>			9	35	0.8	
Radium 226	0.420	0.24	<u>0.33</u>	0.10		0.10		GAM	0.421	0.31	<u>0.42</u>			0	143	0	
Radium 228	U		<u>0.85</u>	0.20		0.20	U	GAM	U		<u>0.98</u>	U		-		0.2	
Europium 152	75.7	0.76	<u>0.63</u>	0.10		0.10		GAM	73.3	0.84	<u>0.66</u>			3	32	0.3	
Europium 154	6.68	0.55	<u>0.53</u>	0.10		0.10		GAM	6.84	0.59	<u>0.56</u>			2	37	0.2	
Europium 155	U		<u>0.57</u>	0.10		0.10	U	GAM	U		<u>0.67</u>	U		-		0.2	
Thorium 228	0.445	0.15	0.22					GAM	0.351	0.15	0.24			24	86	0.8	
Thorium 232	U		0.85				U	GAM	U		0.98	U		-		0.2	
Uranium 235	U		0.64				U	GAM	U		0.76	U		-		0.2	
Uranium 238	U		29				U	GAM	U		31	U		-		0.1	
Americium 241	U		0.78				U	GAM	U		1.0	U		-		0.3	

Remaining Sites Confirmation Smplng

QC-DUP#2 55718

DUPLICATES

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>02/09/06</u>

000028

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0170

7708-008

J10VL8

DUPLICATE

SDG <u>7708</u>	Client/Case no <u>Hanford</u>	SDG <u>K0170</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R601055-08</u>	Lab sample id <u>R601055-02</u>	Client sample id <u>J10VL8</u>
Dept sample id <u>7708-008</u>	Dept sample id <u>7708-002</u>	Location/Matrix <u>100-D-66</u> <u>SOLID</u>
	Received <u>01/11/06</u>	Collected/Weight <u>01/09/06 09:15</u> <u>235.4 g</u>
% solids <u>100.0</u>	% solids <u>100.0</u>	Custody/SAF No <u>RC-030-046</u> <u>RC-030</u>

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
Total Strontium	0.567	0.17	0.23	1.0		SR	0.707	0.17	0.21		22	60	1.1

Remaining Sites Confirmation Smping

QC-DUP#2 55896

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>02/09/06</u>

000029

Date: 22 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Other Solid - Waste Site 100-D-66
Subject: Inorganics - Data Package No. K0170-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0170 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
J110VL7	1/9/06	Solid	C	See note 1
J110VL8	1/9/06	Solid	C	See note 1

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

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

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

DATA QUALITY PARAMETERS

• Holding Times

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

All holding times were acceptable.

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

Due to a matrix spike recovery outside QC limits (64.8%), all silver results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (56.2%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (53.7%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

· **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J10VL7/J10VL8) were submitted for analysis. Field duplicates are assessed using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

· **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All selenium results and the silver result in sample J10VL8 exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

· **Completeness**

Data package No. K0170 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%.

000003

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to a matrix spike recovery outside QC limits (64.8%), all silver results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits (56.2%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (53.7%), all silicon results were qualified as estimates and flagged "J".

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

All selenium results and the silver result in sample J10VL8 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

000005

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

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

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Appendix 2
Summary of Data Qualification

000007

METALS DATA QUALIFICATION SUMMARY*

SDG: K0170	REVIEWER: [REDACTED]	Project: 100-D-66	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Silver Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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000010

Project: WASHINGTON CLOSURE HANFORD							
Lab: LLI		SDG: K0170					
Sample Numbr		J10VL7		J10VL8			
Remarks		Duplicate					
Sample Date		1/9/06		1/9/06			
Inorganics	RQL	Result	Q	Result	Q	Result	Q
Silver	0.2	1.3	J	0.45	UJ		
Aluminum		7590		7890			
Arsenic	10	3.2		3.0			
Boron		1.9		1.6			
Barium	2	187		201			
Beryllium		0.16		0.13			
Calcium		73200		77500			
Cadmium	0.2	4.9		4.5			
Cobalt		7.4		7.9			
Chromium	1	37.8		36.5			
Copper		34.9		35.2			
Iron		21200		22000			
Mercury	0.2	0.48		0.47			
Potassium		703		664			
Magnesium		8260		8460			
Manganese		332		334			
Molybdenum		0.43	U	0.42	U		
Sodium		476		514			
Nickel		21.6		22.8			
Lead	5	6.4		6.3			
Antimony		1.3	UJ	1.3	UJ		
Selenium	1	1.2	U	1.2	U		
Silicon		3220	J	2690	J		
Vanadium		72.1		78.1			
Zinc	1	459		476			

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/10/06

CLIENT: TNUHANFORD RC-030 K0170
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L178

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10VL7	Silver, Total	1.3 J	MG/KG	0.46	3.0
		Aluminum, Total	7590	MG/KG	6.0	3.0
		Arsenic, Total	3.2	MG/KG	1.1	3.0
		Boron, Total	1.9	MG/KG	0.88	3.0
		Barium, Total	187	MG/KG	0.07	3.0
		Beryllium, Total	0.16	MG/KG	0.03	3.0
		Calcium, Total	73200	MG/KG	3.9	3.0
		Cadmium, Total	4.9	MG/KG	0.23	3.0
		Cobalt, Total	7.4	MG/KG	0.39	3.0
		Chromium, Total	37.8	MG/KG	0.52	3.0
		Copper, Total	34.9	MG/KG	0.39	3.0
		Iron, Total	21200	MG/KG	10.5	3.0
		Mercury, Total	0.48	MG/KG	0.02	1.0
		Potassium, Total	703	MG/KG	18.1	3.0
		Magnesium, Total	8260	MG/KG	4.4	3.0
		Manganese, Total	332	MG/KG	0.07	3.0
		Molybdenum, Total	0.43 u	MG/KG	0.43	3.0
		Sodium, Total	476	MG/KG	0.56	3.0
		Nickel, Total	21.6	MG/KG	0.43	3.0
		Lead, Total	6.4	MG/KG	1.0	3.0
		Antimony, Total	1.3 u J	MG/KG	1.3	3.0
		Selenium, Total	1.2 u	MG/KG	1.2	3.0
		Silicon, Total	3220 J	MG/KG	2.7	3.0
		Vanadium, Total	72.1	MG/KG	0.29	3.0
		Zinc, Total	459	MG/KG	0.16	3.0

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 3/29/06

000011

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/10/06

CLIENT: TNUHANFORD RC-030 K0170
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L178

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J10VLS	Silver, Total	0.45	uJ MG/KG	0.45	3.0
		Aluminum, Total	7890	MG/KG	5.9	3.0
		Arsenic, Total	3.0	MG/KG	1.1	3.0
		Boron, Total	1.6	MG/KG	0.87	3.0
		Barium, Total	201	MG/KG	0.06	3.0
		Beryllium, Total	0.13	MG/KG	0.03	3.0
		Calcium, Total	77500	MG/KG	3.9	3.0
		Cadmium, Total	4.5	MG/KG	0.23	3.0
		Cobalt, Total	7.9	MG/KG	0.39	3.0
		Chromium, Total	36.5	MG/KG	0.52	3.0
		Copper, Total	35.2	MG/KG	0.39	3.0
		Iron, Total	22000	MG/KG	10.4	3.0
		Mercury, Total	0.47	MG/KG	0.02	1.0
		Potassium, Total	664	MG/KG	17.9	3.0
		Magnesium, Total	8460	MG/KG	4.4	2.0
		Manganese, Total	334	MG/KG	0.06	3.0
		Molybdenum, Total	0.42	u MG/KG	0.42	3.0
		Sodium, Total	514	MG/KG	0.55	3.0
		Nickel, Total	22.8	MG/KG	0.42	3.0
		Lead, Total	6.3	MG/KG	1.0	3.0
		Antimony, Total	1.3	uJ MG/KG	1.3	3.0
		Selenium, Total	1.2	u MG/KG	1.2	3.0
		Silicon, Total	2690	J MG/KG	2.7	3.0
		Vanadium, Total	78.1	MG/KG	0.29	3.0
		Zinc, Total	476	MG/KG	0.16	3.0

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 3/20/06

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



Analytical Report

Client: TNU-HANFORD RC-030
LVL#: 0601L178
SDG/SAF#: K0170/RC-030

W.O.#: 11343-606-001-9999-00
Date Received: 01-31-06

METALS CASE NARRATIVE

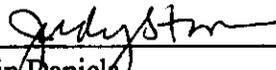
1. This narrative covers the analyses of 2 solid samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were reported with 3-fold dilutions for ICP metals due to high concentrations and sample matrix.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 53.7%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.
10. The matrix spike (MS) recoveries for 7 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:

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 18 pages.

000014

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
J10VL7	Silver	600	95.8
	Aluminum	66,000	93.8
	Calcium	66,000	75.7
	Iron	66,000	89.3
	Antimony	300	92.9
	Silicon	6,300	93.7
	Zinc	600	85.9

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


 Iain Daniels
 Laboratory Manager
 Lionville Laboratory Incorporated

2/13/04
 Date

jjw/m01-178



000015

00000007

06012110

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-030-046	Page 1 of 1
Collector STANKOVICH/HUDSON	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KESSNER, JH		Price Code 9C	Data Turnaround 15 Days
Project Designation Remaining Sites Confirmation Sampling - Other Solid	Sampling Location 100-D-66	SAF No. RC-030	Air Quality <input type="checkbox"/>			
Ice Chest No. AFS-04-044	Field Logbook No. EL-1578-9	COA C10DR16700	Method of Shipment Fed Ex			
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060191	Bill of Lading/Air Bill No. See OSPC				

POSSIBLE SAMPLE HAZARDS/REMARKS < DOT limits Special Handling and/or Storage Cool 4°C 000016	Preservation	None	None	Cool 4C	Cool 4C	Cool 4C				
	Type of Container	G/P	G/P	1G	1G	1G				
	No. of Container(s)	1	10	0	0	0				
	Volume	~400mL 250	60mL	60mL	60mL	60mL				RCF
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.	PCBs - 8082; dioxins - 8081; Chloro-herbicides - EPA8131	VOA - 8160A (TCL)	TPH (Total) - 418.1				13848

Sample No.	Matrix *	Sample Date	Sample Time							
J10VL7	OTHER SOLID	1-9-06	0915	X	X	X				
J10VL8	OTHER SOLID	1-9-06	0916	X	X	X				
J10VMO	OTHER SOLID	1-9-06	0920	X	X	X				

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *
Relinquished By/Removed From Mike Hudson Date/Time 1/9/06 1420	Received By/Stored In 3728-3C Date/Time 1-9-06 1420	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Americium-244, Gross Alpha & Gross Beta; Nickel-63, Isotopic Phosphorus, Cesium-137, Total Gm Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium (2) ICP Metals - 6010A (SW-846) (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) Trans-ship sample jar from Eberline to Lionville after radiological analysis SAMPLES TO BE STORED IN A MANNER THAT MEETS REQUIREMENT FOR PCB ANALYSIS				S=Soil SE=Sediment SO=Solid SH=Sludge W=Water O=Oil A=Air OS=Drum Solids OL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From 3728-3C Date/Time 1-10-06 1300	Received By/Stored In R2 Steffler R.P. Steffler Date/Time 1-10-06 1300					
Relinquished By/Removed From R2 Steffler R.P. Steffler Date/Time 1-10-06 1330	Received By/Stored In Fed Ex Date/Time					
Relinquished By/Removed From Fed Ex Date/Time	Received By/Stored In MFLA Date/Time 01/11/06 09:15					
Relinquished By/Removed From Alex Lebecky Date/Time 1/30/06 16:00	Received By/Stored In Date/Time					
Relinquished By/Removed From Fed Ex Date/Time 1-31-06-0910	Received By/Stored In Date/Time 1-31-06 0910					
LABORATORY SECTION	Received By	Title		Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By		Date/Time		

Appendix 5
Data Validation Supporting Documentation

000017

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-D-66		DATA PACKAGE: K0170		
VALIDATOR:	TLI	LAB:	LLP	DATE:	3/16/08
			SDG:	K0170	
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J10VL7 J10VL8					
Solid <i>SLT</i> 3/16/08					

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 Silver 64% Antimony 42.4% - J all
LCS Silicon 53.7% - J all
no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Comments: Selenium - all over
Silver - L8 over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/10/06

CLIENT: TNUHANFORD RC-030 K0170
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L178

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0079-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	1.8 u	MG/KG	1.8	1.0
		Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Boron, Total	0.27 u	MG/KG	0.27	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	2.8 u	MG/KG	1.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.16 u	MG/KG	0.16	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	3.2 u	MG/KG	3.2	1.0
		Potassium, Total	5.5 u	MG/KG	5.5	1.0
		Magnesium, Total	1.4 u	MG/KG	1.4	1.0
		Manganese, Total	0.02 u	MG/KG	0.02	1.0
		Molybdenum, Total	0.13 u	MG/KG	0.13	1.0
		Sodium, Total	0.46 u	MG/KG	0.17	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.40 u	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	0.82 u	MG/KG	0.82	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.05 u	MG/KG	0.05	1.0
BLANK1	06C0022-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/10/06

CLIENT: TNUHANFORD RC-030 K0170
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L178

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J10VL7	Silver, Total	4.8	1.3	5.4	64.8	3.0
		Aluminum, Total	8780	7590	216	549.4*	3.0
		Arsenic, Total	196	3.2	216	89.2	3.0
		Boron, Total	96.9	1.9	108	88.0	3.0
		Barium, Total	394	187	216	96.1	3.0
		Beryllium, Total	5.2	0.16	5.4	93.3	3.0
		Calcium, Total	79000	73200	2700	215.6*	3.0
		Cadmium, Total	9.7	4.9	5.4	88.9	3.0
		Cobalt, Total	58.4	7.4	54.0	94.4	3.0
		Chromium, Total	61.3	37.8	21.6	108.8	3.0
		Copper, Total	60.6	34.9	27.0	95.2	3.0
		Iron, Total	21900	21200	108	610.7*	3.0
		Mercury, Total	0.87	0.48	0.36	110.6	1.0
		Potassium, Total	3290	703	2700	95.8	3.0
		Magnesium, Total	11100	8260	2700	104.9	3.0
		Manganese, Total	396	332	54.0	118.5*	3.0
		Molybdenum, Total	97.4	0.43u	108	90.3	3.0
		Sodium, Total	3110	476	2700	97.6	3.0
		Nickel, Total	73.7	21.6	54.0	96.5	3.0
		Lead, Total	55.3	6.4	54.0	90.6	3.0
		Antimony, Total	22.9	1.3 u	54.0	42.4	3.0
		Selenium, Total	186	1.2 u	216	86.3	3.0
		Silicon, Total	4570	3220	108	1253 *	3.0
		Vanadium, Total	124	72.1	54.0	96.1	3.0
		Zinc, Total	546	459	54.0	160.9*	3.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/10/06

CLIENT: TNUHANFORD RC-030 K0170
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L178

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATS	RPD	
-001REP	J10VL7	Silver, Total	1.3	0.52	86.0	3.0
		Aluminum, Total	7590	7580	0.22	3.0
		Arsenic, Total	3.2	2.6	20.7	3.0
		Boron, Total	1.9	1.2	45.2	3.0
		Barium, Total	187	186	0.27	3.0
		Beryllium, Total	0.16	0.12	33.6	3.0
		Calcium, Total	73200	72500	0.89	3.0
		Cadmium, Total	4.9	4.5	8.5	3.0
		Cobalt, Total	7.4	6.8	8.5	3.0
		Chromium, Total	37.8	36.2	4.3	3.0
		Copper, Total	34.9	33.4	4.4	3.0
		Iron, Total	21200	21300	0.58	3.0
		Mercury, Total	0.48	0.57	17.8	1.0
		Potassium, Total	703	695	1.1	3.0
		Magnesium, Total	8260	7940	3.9	3.0
		Manganese, Total	332	311	6.7	3.0
		Molybdenum, Total	0.43u	0.42u	NC	3.0
		Sodium, Total	476	490	2.9	3.0
		Nickel, Total	21.6	20.0	7.7	3.0
		Lead, Total	6.4	5.8	9.8	3.0
		Antimony, Total	1.3 u	1.3 u	NC	3.0
		Selenium, Total	1.2 u	1.2 u	NC	3.0
		Silicon, Total	3220	2810	13.6	3.0
		Vanadium, Total	72.1	72.3	0.28	3.0
		Zinc, Total	459	409	11.4	3.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 02/10/06

CLIENT: TNUHANFORD RC-030 K0170
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L178

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0079-LC1	Silver, LCS	47.2	50.0	MG/KG	94.4
		Aluminum, LCS	474	500	MG/KG	94.9
		Arsenic, LCS	904	1000	MG/KG	90.4
		Boron, LCS	457	500	MG/KG	91.4
		Barium, LCS	468	500	MG/KG	93.6
		Beryllium, LCS	24.0	25.0	MG/KG	96.0
		Calcium, LCS	2440	2500	MG/KG	97.4
		Cadmium, LCS	23.8	25.0	MG/KG	95.2
		Cobalt, LCS	241	250	MG/KG	96.3
		Chromium, LCS	49.1	50.0	MG/KG	98.2
		Copper, LCS	120	125	MG/KG	96.1
		Iron, LCS	491	500	MG/KG	98.3
		Potassium, LCS	2240	2500	MG/KG	89.5
		Magnesium, LCS	2330	2500	MG/KG	93.3
		Manganese, LCS	74.0	75.0	MG/KG	98.7
		Molybdenum, LCS	485	500	MG/KG	97.1
		Sodium, LCS	2240	2500	MG/KG	89.5
		Nickel, LCS	191	200	MG/KG	95.7
		Lead, LCS	239	250	MG/KG	95.5
		Antimony, LCS	277	300	MG/KG	92.3
		Selenium, LCS	840	1000	MG/KG	84.0
		Silicon, LCS	269	500	MG/KG	53.7
		Vanadium, LCS	243	250	MG/KG	97.2
		Zinc, LCS	94.2	100	MG/KG	94.2
LCS1	06C0022-LC1	Mercury, LCS	6.3	6.2	MG/KG	101.7

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