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**SAF-B03-015**  
**Remaining Sites Confirmation**  
**Sampling-Soil**  
**FINAL VALIDATION PACKAGE**

**MAIL COMPLETE COPY OF VALIDATION PACKAGE TO:**

Jeanette Duncan (2)

*BJ 12/08*  
INITIAL/DATE

**RECEIVED**  
JAN 26 2005  
**EDMC**

**SAF-B03-015**

**SDG H 2767**

**Sample Location/Waste Site: 1607-F4 Septic System**

Date: 16 November 2004  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 1607-F4  
Subject: Inorganic - Data Package No. H2767-LLI (SDG No. H2767)

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. H2767 -LLI 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	Waste Site	Analysis
J01XL1	10/6/04	Soil	C	1607-F4	See note 1
J01XL2	10/6/04	Soil	C	1607-F4	See note 1
J01XL3	10/6/04	Soil	C	1607-F4	See note 1

1- ICP metals; mercury by 7471A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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.

Due to preparation blank contamination, the chromium result in sample J01XL1 was qualified as an estimate and flagged "UJ".

Due to preparation blank contamination, the sodium result in sample J01XL1 was qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J01XL1) was submitted for analysis. Aluminum, barium, beryllium, calcium, cobalt, chromium, copper, iron, potassium, magnesium, manganese, molybdenum, sodium, nickel, lead, silicon, vanadium and zinc were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery

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

Due to a matrix spike recovery outside QC limits (62%), all antimony results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (155%), all silicon results were qualified as estimates and flagged "J".

All other matrix spike recovery 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

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All reported results met the analyte specific RQL.

- **Completeness**

Data package No. H2767-LLI was submitted for validation and verified for

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completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

### **MAJOR DEFICIENCIES**

None found.

### **MINOR DEFICIENCIES**

Due to preparation blank contamination, the chromium result in sample J01XL1 was qualified as an estimate and flagged "UJ". Due to preparation blank contamination, the sodium result in sample J01XL1 was qualified as an estimate and flagged "UJ". Due to a matrix spike recovery outside QC limits (62%), all antimony results were qualified as estimates and flagged "J". Due to a matrix spike recovery outside QC limits (155%), all silicon results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

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

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

**Appendix 2**

**Summary of Data Qualification**

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INORGANIC DATA QUALIFICATION SUMMARY\*

SDG: H2767	REVIEWER: TLI	DATE: 11/16/04	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium Sodium	UJ	JO1XL1	Blank contamination
Antimony Silicon	J	All	MS

\* - 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: BECHTEL-HANFORD									
Laboratory: LLI									
Case	SDG: H2767		J01XL1	J01XL2	J01XL3				
Sample Number	E. Blank		10/6/04	10/6/04	10/6/04	Result	Q	Result	Q
Remarks			10/6/04	10/6/04	10/6/04	Result	Q	Result	Q
Sample Date			10/6/04	10/6/04	10/6/04	Result	Q	Result	Q
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.08	U	0.09	U	0.08	U		
Aluminum		54.4		5920		5650			
Arsenic		0.34	U	2.5		2.3			
Boron		0.48	U	1.4		1.5			
Barium	20	1.3		66.7		74.6			
Beryllium		0.04		0.35		0.37			
Calcium		26.9		2960		3160			
Cadmium	0.2	0.03	U	0.14		0.03			
Cobalt		0.08		6.1		6.8			
Chromium	1	0.29	UJ	9.3		8.5			
Copper		0.16		14.1		12.4			
Iron		1620		17100		19000			
Mercury	0.2	0.02	U	0.02	U	0.02			
Potassium		19.4		1190		1040			
Magnesium		11.6		3710		3680			
Manganese		24.1		282		360			
Molybdenum		0.24		0.35		0.36			
Sodium		8.5	UJ	118		123			
Nickel		0.26		9.7		9.8			
Lead	5	0.29		5.0		5.1			
Antimony		0.28	UJ	0.29	UJ	0.26	UJ		
Selenium	1	0.37	U	0.38	U	0.33	U		
Silicon		54.0	J	456	J	376	J		
Vanadium		0.17		40.4		48.9			
Zinc		2.5		84.0		49.2			

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/21/04

CLIENT: TNUHANFORD B03-015 H2767  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0410L851

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J01XL1	Silver, Total	0.08	u MG/KG	0.08	1.0
		Aluminum, Total	54.4	MG/KG	0.76	1.0
		Arsenic, Total	0.34	u MG/KG	0.34	1.0
		Boron, Total	0.48	u MG/KG	0.48	1.0
		Barium, Total	1.3	MG/KG	0.02	1.0
		Beryllium, Total	0.04	MG/KG	0.009	1.0
		Calcium, Total	26.9	MG/KG	0.65	1.0
		Cadmium, Total	0.03	u MG/KG	0.03	1.0
		Cobalt, Total	0.08	MG/KG	0.07	1.0
		Chromium, Total	0.29	MG/KG	0.06	1.0
		Copper, Total	0.16	MG/KG	0.05	1.0
		Iron, Total	1620	MG/KG	2.1	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Potassium, Total	19.4	MG/KG	3.3	1.0
		Magnesium, Total	11.6	MG/KG	0.62	1.0
		Manganese, Total	24.1	MG/KG	0.009	1.0
		Molybdenum, Total	0.24	MG/KG	0.12	1.0
		Sodium, Total	8.5	MG/KG	0.22	1.0
		Nickel, Total	0.26	MG/KG	0.11	1.0
		Lead, Total	0.29	MG/KG	0.18	1.0
		Antimony, Total	0.28	u MG/KG	0.28	1.0
		Selenium, Total	0.37	u MG/KG	0.37	1.0
		Silicon, Total	54.0	MG/KG	0.47	1.0
		Vanadium, Total	0.17	MG/KG	0.06	1.0
		Zinc, Total	2.5	MG/KG	0.04	1.0

Handwritten notes: "0.29" with "u" above and "mg" below; "0.26" with "u" above and "mg" below; "8.5" with "u" above and "mg" below.

Handwritten signature and date: "JR" and "11/16/04".

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/21/04

CLIENT: TNUHANFORD B03-015 H2767  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0410L851

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J01XL2	Silver, Total	0.09	u MG/KG	0.09	1.0
		Aluminum, Total	5920	MG/KG	0.79	1.0
		Arsenic, Total	2.5	MG/KG	0.35	1.0
		Boron, Total	1.4	MG/KG	0.50	1.0
		Barium, Total	66.7	MG/KG	0.02	1.0
		Beryllium, Total	0.35	MG/KG	0.01	1.0
		Calcium, Total	2960	MG/KG	0.68	1.0
		Cadmium, Total	0.14	MG/KG	0.03	1.0
		Cobalt, Total	6.1	MG/KG	0.08	1.0
		Chromium, Total	9.3	MG/KG	0.06	1.0
		Copper, Total	14.1	MG/KG	0.05	1.0
		Iron, Total	17100	MG/KG	2.2	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Potassium, Total	1190	MG/KG	3.4	1.0
		Magnesium, Total	3710	MG/KG	0.65	1.0
		Manganese, Total	282	MG/KG	0.01	1.0
		Molybdenum, Total	0.35	MG/KG	0.13	1.0
		Sodium, Total	118	MG/KG	0.23	1.0
		Nickel, Total	9.7	MG/KG	0.12	1.0
		Lead, Total	5.0	MG/KG	0.19	1.0
		Antimony, Total	0.29	u MG/KG	0.29	1.0
		Selenium, Total	0.38	u MG/KG	0.38	1.0
		Silicon, Total	456	MG/KG	0.49	1.0
		Vanadium, Total	40.4	MG/KG	0.06	1.0
		Zinc, Total	84.0	MG/KG	0.04	1.0

*jr*  
 11/16/04

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/21/04

CLIENT: TNUHANFORD B03-015 H2767

LVL LOT #: 0410L851

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J01XL3	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Aluminum, Total	5650	MG/KG	0.69	1.0
		Arsenic, Total	2.3	MG/KG	0.31	1.0
		Boron, Total	1.5	MG/KG	0.44	1.0
		Barium, Total	74.6	MG/KG	0.02	1.0
		Beryllium, Total	0.37	MG/KG	0.009	1.0
		Calcium, Total	3160	MG/KG	0.59	1.0
		Cadmium, Total	0.03	MG/KG	0.03	1.0
		Cobalt, Total	6.8	MG/KG	0.07	1.0
		Chromium, Total	8.5	MG/KG	0.05	1.0
		Copper, Total	12.4	MG/KG	0.04	1.0
		Iron, Total	19000	MG/KG	2.0	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Potassium, Total	1040	MG/KG	3.0	1.0
		Magnesium, Total	3680	MG/KG	0.57	1.0
		Manganese, Total	360	MG/KG	0.009	1.0
		Molybdenum, Total	0.36	MG/KG	0.11	1.0
		Sodium, Total	123	MG/KG	0.20	1.0
		Nickel, Total	9.8	MG/KG	0.10	1.0
		Lead, Total	5.1	MG/KG	0.16	1.0
		Antimony, Total	0.26 u	J MG/KG	0.26	1.0
		Selenium, Total	0.33 u	MG/KG	0.33	1.0
		Silicon, Total	376	J MG/KG	0.43	1.0
		Vanadium, Total	48.9	MG/KG	0.05	1.0
		Zinc, Total	49.2	MG/KG	0.03	1.0

*[Handwritten signature]*  
11/12/04

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**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

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## Analytical Report

Client: TNU-HANFORD B03-015  
LVL#: 0410L851  
SDG/SAF#: H2767/B03-015

W.O.#: 11343-606-001-9999-00  
Date Received: 10-08-04

### METALS CASE NARRATIVE

1. This narrative covers the analyses of 3 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
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. The preparation/method blanks for 2 analytes were outside method criteria. {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
  - a). The MB results for Calcium and Sodium were greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and sample J01XL1 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.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

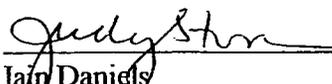
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 19 pages.

000015

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

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
J01XL3	Aluminum	20,000	112.6
	Iron	20,000	107.0
	Antimony	100	105.0
	Silicon	2,200	98.1

12. The duplicate analyses for 3 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. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

for   
 Iain Daniels  
 Laboratory Manager  
 Lionville Laboratory Incorporated  
 gmb/m10-851

10/21/04  
 Date



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**Bechtel Hanford Inc.**  
 Collector: Stankovich/Rivers  
 Project Designation: Remaining Sites Confirmation Sampling-Soil  
 Ice Chest No. ERC 02 501  
 Shipped To: LVL  
 --SUNGLINE SERVICES (Formerly TMT)  
 POSSIBLE SAMPLE HAZARDS/REMARKS

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**  
 Company Contact: M Stankovich  
 Telephone No. 531-7620  
 Project Coordinator: KESSNER, JH  
 SAF No. B03-015  
 Method of Shipment: Fed Ex  
 Field Logbook No. EL 1578-3  
 COA C607F46700  
 Offsite Property No. A050011  
 Bill of Lading/Air Bill No. SEAEPK

**SAMPLE ANALYSIS**

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	See Item (1) in Special Instructions	G/P	G/P	(I.P)	gG	gG	uCi	G	G
501XL1	SOIL	10-6-04	1235	COOL 4°C		1	250mL	PCBs - 8082; Pesticides - 8081; Cadmium - 8083; Herbicides - 8084; 10/4/04								
501XL3	SOIL	10-6-04	1230			1	250mL									
501XL2	SOIL	10-6-04	1230			1	250mL									
	SOIL		1240			1	250mL									
			10-6-02			1	250mL									

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
CHRISTINA CHAPMAN	10/6/04 1415	3728 RAB	10/6/04 1415
REF LAB 3728	10/7/04 1000	SIGALE	10/7/04 1000
SIGALE	10/7/04 1000	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
REF LAB	10-8-04 1000		10-8-04 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

**SPECIAL INSTRUCTIONS**

(1) Gamma Spectroscopy (TCL Ltd) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Americium-241, Americium-243, Gross Alpha & Gross Beta; Nickel-63, Potassium-40, Phosphorus-32, Phosphorus-33, Phosphorus-33/34, Strontium-90, Strontium-90/91, Tritium-3H

(2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chlorine, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Personnel not available to Relinquish samples from 3728 Ref # 23 on 10/7/04

**LABORATORY SECTION**  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

**FINAL SAMPLE DISPOSITION**  
 Disposal Method: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Disposed By: \_\_\_\_\_

**Appendix 5**

**Data Validation Supporting Documentation**

000018

**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

ALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	JWS 1607-F4		DATA PACKAGE: H2767		
VALIDATOR:	JLF	LAB:	LLI	DATE: 11/12/04	
			SDG:	H2767	
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
JOIXLI		JOIXL3		JOIXL2	

**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: LB - CR LI Sodium LI - UI

LI-EB

FB Al, Beryll, Barium, Bismuth, Cobalt, CR, Cu, Fe, K, Mg, manganese  
 moly, Na, Nickel, Pb, Silicon, Vanadium Zinc

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

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

Comments: MS antimony - ~~15590~~ 16220 - J  
silicon - (15590) ~~16220~~ all - J  
14200

UG 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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Appendix 6**

**Additional Documentation Requested by Client**

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/21/04

CLIENT: TNUHANFORD B03-015 H2767

LVL LOT #: 0410L851

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK1	04L0634-MB1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	2.0	MG/KG	0.81	1.0
		Arsenic, Total	0.36 u	MG/KG	0.36	1.0
		Boron, Total	0.51 u	MG/KG	0.51	1.0
		Barium, Total	0.06	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	4.5	MG/KG	0.69	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Cobalt, Total	0.08 u	MG/KG	0.08	1.0
		Chromium, Total	0.15	MG/KG	0.06	1.0
		Copper, Total	0.05 u	MG/KG	0.05	1.0
		Iron, Total	2.3 u	MG/KG	2.3	1.0
		Potassium, Total	3.5 u	MG/KG	3.5	1.0
		Magnesium, Total	1.9	MG/KG	0.66	1.0
		Manganese, Total	0.01	MG/KG	0.01	1.0
		Molybdenum, Total	0.13 u	MG/KG	0.13	1.0
		Sodium, Total	2.1	MG/KG	0.23	1.0
		Nickel, Total	0.12 u	MG/KG	0.12	1.0
		Lead, Total	0.19 u	MG/KG	0.19	1.0
		Antimony, Total	0.30 u	MG/KG	0.30	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Silicon, Total	0.50 u	MG/KG	0.50	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.05	MG/KG	0.04	1.0
BLANK1	04C0232-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/21/04

CLIENT: TNUHANFORD B03-015 H2767

LVL LOT #: 0410L851

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	J01XL3	Silver, Total	4.6	0.08u	4.8	95.8	1.0
		Aluminum, Total	6430	5650	193	401.2*	1.0
		Arsenic, Total	180	2.3	193	92.2	1.0
		Boron, Total	90.1	1.5	96.4	91.9	1.0
		Barium, Total	258	74.6	193	95.3	1.0
		Beryllium, Total	4.9	0.37	4.8	94.4	1.0
		Calcium, Total	5410	3160	2410	93.1	1.0
		Cadmium, Total	4.5	0.03	4.8	93.1	1.0
		Cobalt, Total	51.8	6.8	48.2	93.4	1.0
		Chromium, Total	27.1	8.5	19.3	96.4	1.0
		Copper, Total	36.1	12.4	24.1	98.3	1.0
		Iron, Total	19500	19000	96.4	485.2*	1.0
		Mercury, Total	0.18	0.02	0.15	109.6	1.0
		Potassium, Total	3380	1040	2410	97.0	1.0
		Magnesium, Total	6050	3680	2410	98.4	1.0
		Manganese, Total	406	360	48.2	97.3*	1.0
		Molybdenum, Total	91.4	0.36	96.4	94.4	1.0
		Sodium, Total	2420	123	2410	95.4	1.0
		Nickel, Total	55.0	9.8	48.2	93.8	1.0
		Lead, Total	49.9	5.1	48.2	92.9	1.0
		Antimony, Total	30.1	0.26u	48.2	62.4	1.0
		Selenium, Total	174	0.33u	193	90.0	1.0
		Silicon, Total	526	376	96.4	155.7	1.0
		Vanadium, Total	94.4	48.9	48.2	94.4	1.0
		Zinc, Total	93.6	49.2	48.2	92.1	1.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/21/04

CLIENT: TNUHANFORD B03-015 H2767

LVL LOT #: 0410L851

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-002REP	J01XL3	Silver, Total	0.08u	0.09u	NC	1.0
		Aluminum, Total	5650	5930	4.9	1.0
		Arsenic, Total	2.3	2.2	4.4	1.0
		Boron, Total	1.5	2.2	37.8	1.0
		Barium, Total	74.6	80.4	7.5	1.0
		Beryllium, Total	0.37	0.40	8.8	1.0
		Calcium, Total	3160	3300	4.3	1.0
		Cadmium, Total	0.03	0.07	64.3	1.0
		Cobalt, Total	6.8	6.9	1.5	1.0
		Chromium, Total	8.5	9.1	6.8	1.0
		Copper, Total	12.4	12.7	2.4	1.0
		Iron, Total	19000	20000	5.2	1.0
		Mercury, Total	0.02	0.02	28.6	1.0
		Potassium, Total	1040	1090	4.3	1.0
		Magnesium, Total	3680	3750	1.8	1.0
		Manganese, Total	360	364	1.4	1.0
		Molybdenum, Total	0.36	0.38	5.2	1.0
		Sodium, Total	123	138	11.4	1.0
		Nickel, Total	9.8	9.5	3.1	1.0
		Lead, Total	5.1	5.2	1.9	1.0
		Antimony, Total	0.26u	0.29u	NC	1.0
		Selenium, Total	0.33u	0.38u	NC	1.0
		Silicon, Total	376	457	19.4	1.0
		Vanadium, Total	48.9	52.4	6.9	1.0
		Zinc, Total	49.2	51.4	4.4	1.0

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SECRET

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/21/04

CLIENT: TNUHANFORD B03-015 H2767

LVL LOT #: 0410L851

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

SAMPLE	SITE ID	ANALYTE	SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
=====	=====	=====	=====	=====	=====	=====
LCS1	04L0634-LC1	Silver, LCS	48.8	50.0	MG/KG	97.6
		Aluminum, LCS	498	500	MG/KG	99.5
		Arsenic, LCS	952	1000	MG/KG	95.2
		Boron, LCS	484	500	MG/KG	96.8
		Barium, LCS	503	500	MG/KG	100.6
		Beryllium, LCS	24.7	25.0	MG/KG	98.8
		Calcium, LCS	2520	2500	MG/KG	100.7
		Cadmium, LCS	24.5	25.0	MG/KG	98.0
		Cobalt, LCS	248	250	MG/KG	99.2
		Chromium, LCS	50.0	50.0	MG/KG	100
		Copper, LCS	122	125	MG/KG	97.4
		Iron, LCS	494	500	MG/KG	98.9
		Potassium, LCS	2430	2500	MG/KG	97.1
		Magnesium, LCS	2480	2500	MG/KG	99.0
		Manganese, LCS	76.4	75.0	MG/KG	101.9
		Molybdenum, LCS	498	500	MG/KG	99.6
		Sodium, LCS	2440	2500	MG/KG	97.5
		Nickel, LCS	199	200	MG/KG	99.4
		Lead, LCS	248	250	MG/KG	99.3
		Antimony, LCS	289	300	MG/KG	96.4
		Selenium, LCS	934	1000	MG/KG	93.4
		Silicon, LCS	497	500	MG/KG	99.3
		Vanadium, LCS	245	250	MG/KG	98.0
		Zinc, LCS	97.9	100	MG/KG	97.9
LCS1	04C0232-LC1	Mercury, LCS	6.5	6.2	MG/KG	104.2

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Date: 16 November 2004  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 1607-F4  
Subject: Wet Chemistry - Data Package No. H2767-LLI (SDG No. H2767)

## INTRODUCTION

This memo presents the results of data validation on Data Package No. H2767-LLI 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	Waste Site	Analysis
J01XL1	10/6/04	Soil	C	1607-F4	See note 1
J01XL2	10/6/04	Soil	C	1607-F4	See note 1
J01XL3	10/6/04	Soil	C	1607-F4	See note 1

1 - Chromium VI by 7196A

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). Appendices 1 through 6 provide the following information as indicated below:

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

## DATA QUALITY PARAMETERS

- **Holding Times**

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

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and

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"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

One field blank (J01XL1) was submitted for analysis. No analytes were detected in the field blank.

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

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All undetected chromium VI results exceeded the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2767-LLI 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**

All undetected chromium VI results exceeded the RQL. Under the BHI statement of work, no qualification is required.

## **REFERENCES**

FHI, Contract #20266, *Validation Statement of Work*, Bechtel Hanford Incorporated, July 7, 2003.

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

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

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

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**Appendix 2**  
**Summary of Data Qualification**

**000007**

WET CHEMISTRY DATA QUALIFICATION SUMMARY\*

SDG: H2767	REVIEWER: TLI	DATE: 11/16/04	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**

**000009**



Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/19/04

CLIENT: TNU-HANFORD B03-015 H2767  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0410L851

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J01XL1	% Solids	99.9	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-002	J01XL3	% Solids	97.9	%	0.01	1.0
		Chromium VI	0.26	MG/KG	0.20	1.0
-003	J01XL2	% Solids	96.3	%	0.01	1.0
		Chromium VI	0.27	MG/KG	0.21	1.0

*js*  
 11/16/04

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000012**



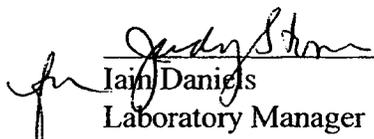
## Analytical Report

Client: TNU-HANFORD B03-015 H2767  
LVL#: 0410L851

W.O.#: 11343-606-001-9999-00  
Date Received: 10-08-04

### INORGANIC NARRATIVE

1. This narrative covers the analyses of 3 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.
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 Sample (LCS) for Chromium VI was within the laboratory control limits.
7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.
8. The replicate analysis for Chromium VI was within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
Jaim Danieles  
Laboratory Manager  
Lionville Laboratory Incorporated

10/21/04  
Date

njp\10-851

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.

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**Appendix 5**

**Data Validation Supporting Documentation**

**000015**

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	RWS 1607-FY		DATA PACKAGE: H2767		
VALIDATOR:	TLI	LAB:	LLI	DATE: 11/12/04	
			SDG:	H2767	
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	<b>Chromium-VI</b>	pH	NO <sub>3</sub> /NO <sub>2</sub>
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
JOIXL1 JOIXL3 JOIXL2					
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 DATA VALIDATION CHECKLISTS

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  
Spike standards NIST traceable? (Levels D, E)..... Yes No N/A  
Spike standards expired? (Levels D, E)..... Yes No N/A  
LCS/BSS samples analyzed? ..... Yes No N/A  
LCS/BSS results acceptable?..... Yes No N/A  
Standards traceable? (Levels D, E)..... Yes No N/A  
Standards expired? (Levels D, E) ..... Yes No N/A  
Transcription/calculation errors? (Levels D, E)..... Yes No N/A  
Performance audit sample(s) analyzed?..... Yes No N/A  
Performance audit sample results acceptable?..... Yes No N/A

Comments: NO PAS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS**

**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 DATA VALIDATION CHECKLISTS

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: LI error  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Appendix 6**

**Additional Documentation Requested by Client**

**000020**

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/19/04

CLIENT: TNU-HANFORD B03-015 H2767  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0410L851

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	04LVI032-MB1	Chromium VI	0.20	u MG/KG	0.20	1.0

000021

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/19/04

CLIENT: TNU-HANFORD B03-015 H2767  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0410L851

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J01XL1	Soluble Chromium VI	4.0	0.20u	4.0	100.1	1.0
		Insoluble Chromium VI	1250	0.20u	1090	114.4	100
BLANK10	04LVI032-MB1	Soluble Chromium VI	4.1	0.20u	4.0	102.6	1.0
		Insoluble Chromium VI	1140	0.20u	1090	104.3	100

000022

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/19/04

CLIENT: TNU-HANFORD B03-015 H2767  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0410L851

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-----	-----	-----	-----	-----	-----	-----
-001REP	J01XL1	Chromium VI	0.20u	0.20u	NC	1.0

000023

Date: 16 November 2004  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 1607-F4  
Subject: PCB/Pesticide - Data Package No. H2767-LLI (SDG No. H2767)

## INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2767-LLI prepared by Lionville Laboratory Incorporated (LLI). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Waste Site	Analysis
J01XL1	10/6/04	Soil	C	1607-F4	See note 1
J01XL2	10/6/04	Soil	C	1607-F4	See note 1
J01XL3	10/6/04	Soil	C	1607-F4	See note 1

1 - PCBs by 8082 and pesticides by 8081A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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.

000001

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

All holding times were acceptable.

- **Method Blank**

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

All method blank target compound results were acceptable.

#### Field Blanks

One equipment blank (J01X71) was submitted for analysis. No analytes were detected in the equipment blank.

- **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 50% to 150% (laboratory CLP limits for chlorinated pesticides). If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the lack of an MS, MSD and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

000002

All other accuracy spike results were acceptable.

#### Surrogate Recovery

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

All surrogate results were acceptable.

- Precision

#### Matrix Spike/Matrix Spike Duplicate Samples

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

Due to the lack of an MS and MSD analysis, all toxaphene results were qualified as estimates and flagged "J".

All other matrix spike/matrix spike duplicate results were acceptable.

#### Field Duplicate Samples

No field duplicates were submitted for analysis.

000003

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Remaining Waste Sites RQLs to ensure that laboratory detection levels meet the required criteria. Toxaphene and methoxychlor were reported above the RQL. Under the BHI statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data Package No. H2767-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

### **MAJOR DEFICIENCIES**

None found.

### **MINOR DEFICIENCIES**

Due to the lack of an MS, MSD and LCS analysis, all toxaphene results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the 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.

Toxaphene and methoxychlor were reported above the RQL. Under the BHI statement of work, no qualification is required.

### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

**000005**

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

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

**Appendix 2**

**Summary of Data Qualification**

000007

PESTICIDE/PCB DATA QUALIFICATION SUMMARY\*

SDG: H2767	REVIEWER: TLI	DATE: 11/16/04	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS, MSD or LCS

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

000008

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000009**

PEST/PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD  
 Laboratory: Lionville Laboratory Inc.

Case: J01XL1 J01XL2 J01XL3  
 SDG: H2767

Sample Number	J01XL1	J01XL2	J01XL3				
Remarks	E. Blank						
Sample Date	10/6/04	10/6/04	10/6/04				
Extraction Date	10/14/04	10/14/04	10/14/04				
Analysis Date	10/17/04	10/17/04	10/17/04				
PCB	RQL	Result	Q	Result	Q	Result	Q
Aroclor-1016	20	13	U	14	U	14	U
Aroclor-1221	20	13	U	14	U	14	U
Aroclor-1232	20	13	U	14	U	14	U
Aroclor-1242	20	13	U	14	U	14	U
Aroclor-1248	20	13	U	14	U	14	U
Aroclor-1254	20	13	U	14	U	14	U
Aroclor-1260	20	13	U	14	U	14	U
Sample Date	10/6/04	10/6/04	10/6/04				
Extraction Date	10/14/04	10/14/04	10/14/04				
Analysis Date	10/18/04	10/18/04	10/18/04				
Pesticide	RQL	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.7	U	1.7	U	1.7	U
Beta-BHC	5	1.7	U	1.7	U	1.7	U
Delta-BHC	5	1.7	U	1.7	U	1.7	U
Gamma-BHC (Lindane)	5	1.7	U	1.7	U	1.7	U
Heptachlor	5	1.7	U	1.7	U	1.7	U
Aldrin	5	1.7	U	1.7	U	1.7	U
Heptachlor Epoxide	5	1.7	U	1.7	U	1.7	U
Endosulfan I	5	1.7	U	1.7	U	1.7	U
Dieldrin	5	3.3	U	3.5	U	3.4	U
4,4'-DDE	5	3.3	U	3.5	U	3.4	U
Endrin	5	3.3	U	3.5	U	3.4	U
Endosulfan II	5	3.3	U	3.5	U	3.4	U
4,4'-DDD	5	3.3	U	3.5	U	3.4	U
Endosulfan Sulfate	5	3.3	U	3.5	U	3.4	U
4,4'-DDT	5	3.3	U	3.5	U	3.4	U
Methoxychlor	5	17	U	17	U	17	U
Endrin Ketone	5	3.3	U	3.5	U	3.4	U
Endrin Aldehyde	5	3.3	U	3.5	U	3.4	U
alpha-Chlordane	5	1.7	U	1.7	U	1.7	U
gamma-Chlordane	5	1.7	U	1.7	U	1.7	U
Toxaphene	5	170	UJ	170	UJ	170	UJ

000010

Lionville Laboratory, Inc.

Report Date: 10/21/04 14:56  
 RFW Batch Number: 0410L851 Client: TNUHANFORD B03-015 H2767 Work Order: 11343606001 Page: 1  
 PCBs by GC

Cust ID: J01XL1 J01XL3 J01XL3 J01XL2 PBLKYJ  
 RFW#: 001 002 MS 002 MSD 003 04LE1274-MB1  
 Matrix: SOIL SOIL SOIL SOIL SOIL SOIL  
 D.F.: 1.00 1.00 1.00 1.00 1.00 1.00  
 Units: UG/KG UG/KG UG/KG UG/KG UG/KG UG/KG

Surrogate:	Tetrachloro-m-xylene	Decachlorobiphenyl	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260
	90 %	90 %	110 %	124 * %	164 * %	140 * %			
	91 %	84 %	93 %	108 %	144 * %	149 * %			
	13 U	14 U	117 %	134 %	14 U	13 U			
	13 U	14 U	14 U	14 U	14 U	13 U			
	13 U	14 U	14 U	14 U	14 U	13 U			
	13 U	14 U	14 U	14 U	14 U	13 U			
	13 U	14 U	14 U	14 U	14 U	13 U			
	13 U	14 U	14 U	14 U	14 U	13 U			
	13 U	14 U	104 %	122 %	14 U	13 U			

Cust ID: PBLKYJ BS

Sample Information  
 RFW#: 04LE1274-MB1  
 Matrix: SOIL  
 D.F.: 1.00  
 Units: UG/KG

Surrogate:	Tetrachloro-m-xylene	Decachlorobiphenyl	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260
	79 %	87 %	86 %	13 U	86 %				

*Handwritten:* RFW 11/16/04

*Handwritten:* 10/21/04

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

Sample Information	Cust ID:	J01XL1	J01XL3	J01XL3	J01XL3	J01XL3	J01XL3	J01XL2	PBLKYJ
Surrogate: Tetrachloro-m-xylene		001	002	002 MS	002 MSD	003	04LE1274-MB1		
Decachlorobiphenyl		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Alpha-BHC	117 %	1.00	1.00	1.00	1.00	1.00	1.00		
Beta-BHC	126 * %	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG		
Delta-BHC	84 %								
Gamma-BHC (Lindane)	84 %								
Heptachlor	1.7 U								
Aldrin	1.7 U								
Heptachlor epoxide	1.7 U								
Endosulfan I	1.7 U								
Dieldrin	1.7 U								
4,4'-DDE	3.3 U								
Endrin	3.3 U								
Endosulfan II	3.3 U								
4,4'-DDD	3.3 U								
Endosulfan sulfate	3.3 U								
4,4'-DDT	3.3 U								
Methoxychlor	17 U								
Endrin ketone	3.3 U								
Endrin aldehyde	3.3 U								
alpha-Chlordane	1.7 U								
Gamma-Chlordane	1.7 U								
Toxaphene	170 U J								

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

*Handwritten:* 11/16/04



**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000014**



Analytical Report

Client: TNU HANFORD B03-015

LVL#: 0410L851

SDG/SAF#: H2767/B03-015

W.O.#: 11343-606-001-9999-00

Date Received: 10-08-2004

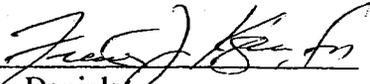
PCB

Three (3) soil samples were collected on 10-06-2004.

The samples and their associated QC samples were extracted on 10-14-2004 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 10-17-2004. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Samples and their associated QC samples received Silica Gel, Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3630C, 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. Five (5) of fourteen (14) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. Confirmation was not required because target compounds were not detected in the samples.
9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
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

10/22/04  
Date

son\group\data\pest\tnu hanford\0410-851.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 8 pages.

000015

00000002

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 0400567

Initiator: Beegle Sombro  
 Date: 12/10/04  
 Client: DMU

Batch: 0410L851  
 Samples: Blank 003  
 Method: SWB46/MCAWW/CLPI

Parameter: CP03  
 Matrix: Soil  
 Prep Batch: 04LE074

## 1. Reason for SDR

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

### b. General Discrepancy

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

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

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

⊕ High surrogate recovery in blank and sample 003. both are clean.

## 2. Known or Probable Causes(s)

## 3. Discussion and Proposed Action

Other Description: Nonuck

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

## 4. Project Manager Instructions...signature/date:

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

## 5. Final Action...signature/date:

Other Explanation:

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

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

### Route Distribution of Completed SDR

- Initiator
- Lab General Manager: M. Taylor
- Project Mgr. Stone/Johnson/Haslett
- Technical Mgr. Wesson/Daniels
- QA (file): Alberts
- Data Management: Feldman
- Sample Prep: Beegle/Kiger

### Route Distribution of Completed SDR

- Metals: Beegle
- Inorganic: Perrone
- GC/LC: Kiger
- MS: Rychlak/Layman
- Log-in: Melnic
- Admin: Soos
- Other: \_\_\_\_\_

000016



## Analytical Report

Client: TNU HANFORD B03-015  
LVL#: 0410L851  
SDG/SAF#: H2767/B03-015

W.O.#: 11343-606-001-9999-00  
Date Received: 10-08-2004

### CHLORINATED PESTICIDES

Three (3) soil samples were collected on 10-06-2004.

The samples and their associated QC samples were extracted on 10-14-2004 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 10-19-2004. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A.

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 LVL's sample acceptance policy.
2. Samples were extracted and analyzed within the holding time.
3. Samples and their associated QC samples received a Copper-Sulfur cleanup according to Lionville Laboratory SOPs based on SW846 method 3660A.
4. The method blank was below the reporting limits for all target compounds.
5. One (1) of fourteen (14) surrogate recoveries was outside acceptance criteria. However, the surrogate recovery criteria were met (i.e., no more than one outlier per sample).
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

10/22/04  
Date

son\vr\group\data\pest\tnu hanford\0410-851.pes

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

000017

00000002



**Appendix 5**

**Data Validation Supporting Documentation**

**000019**

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT: <i>RWS 1607-F4</i>			DATA PACKAGE: <i>H 2767</i>		
VALIDATOR: <i>TLI</i>	LAB: <i>LLI</i>		DATE: <i>11/12/04</i>		
			SDG: <i>H2767</i>		
ANALYSES PERFORMED					
<i>SW-846 8081</i>	SW-846 8081 (TCLP)	<i>SW-846 8082</i>	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
<i>J01XL1 J01XL3 J01XL2</i>					
<i>soil</i>					

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: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**PESTICIDE/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: \_\_\_\_\_

L1 - E3

**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 PK

curr - ok

toxapha - NO MS, MSD or LCS - Fall

PESTICIDE/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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*foxaphen - no MS or MSD - J all*

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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PESTICIDE/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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

fluoracil + methoxychlor are -

**9. SAMPLE CLEANUP (Levels D and E)**

Fluoracil ® (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: 16 November 2004  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 1607-F4  
Subject: Semivolatile - Data Package No. H2767-LLI (SDG No. H2767)

## INTRODUCTION

This memo presents the results of data validation on Data Package No. H2767-LLI 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	Waste Site	Analysis
J01XL1	10/6/04	Soil	C	1607-F4	See note 1
J01XL2	10/6/04	Soil	C	1607-F4	See note 1
J01XL3	10/6/04	Soil	C	1607-F4	See note 1

1- Semivolatiles by 8270C.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). Appendices 1 through 5 provide the following information as indicated below:

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

## **DATA QUALITY OBJECTIVES**

- **Holding Times**

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

000001

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

All holding times were met.

- **Method Blanks**

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

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

All other method blank results were acceptable.

#### Field Blanks

One equipment blank (J01XL1) was submitted for analysis. Diethylphthalate, di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

#### Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five

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

All surrogate results were acceptable.

- **Precision**

#### Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample.

Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

#### Field Duplicate Samples

No field duplicates were submitted for analysis.

000003

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. Twenty-four analytes exceeded the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2767-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

### **MAJOR DEFICIENCIES**

None found.

### **MINOR DEFICIENCIES**

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

Twenty-four analytes exceeded the RQL in all samples. Under the BHI statement of work, no qualification is required.

### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

000004

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

**000005**

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

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

**Appendix 2**  
**Summary of Data Qualification**

000007

SEMIVOLATILE DATA QUALIFICATION SUMMARY\*

SDG: H2767	REVIEWER: TLI	DATE: 11/16/04	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
bis(2-ethylhexyl)phthalate	U	All	Blank contamination

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

000008

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000009**

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD  
 Laboratory: LLI  
 Case: SDG: H2767

Sample Number	Remarks	J01XL1		J01XL2		J01XL3	
		Result	Q	Result	Q	Result	Q
	E. Blank						
Sample Date		10/6/04		10/6/04		10/6/04	
Extraction Date		10/18/04		10/18/04		10/18/04	
Analysis Date		10/20/04		10/20/04		10/20/04	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q
Phenol	660	330 U		350 U		340 U	
bis(2-Chloroethyl)ether	660	330 U		350 U		340 U	
2-Chlorophenol	660	330 U		350 U		340 U	
1,3-Dichlorobenzene	660	330 U		350 U		340 U	
1,4-Dichlorobenzene	660	330 U		350 U		340 U	
1,2-Dichlorobenzene	660	330 U		350 U		340 U	
2-methylphenol	660	330 U		350 U		340 U	
2,2'-oxybis(1-chloropropane)	660	330 U		350 U		340 U	
3 and/or 4-Methylphenol	660	330 U		350 U		340 U	
N-Nitroso-di-n-propylamine	660	330 U		350 U		340 U	
Hexachloroethane	660	330 U		350 U		340 U	
Nitrobenzene	660	330 U		350 U		340 U	
Isophorone	660	330 U		350 U		340 U	
2-Nitrophenol	660	330 U		350 U		340 U	
2,4-Dimethylphenol	660	330 U		350 U		340 U	
bis(2-Chloroethoxy)methane	660	330 U		350 U		340 U	
2,4-Dichlorophenol	660	330 U		350 U		340 U	
1,2,4-Trichlorobenzene	660	330 U		350 U		340 U	
Naphthalene	660	330 U		350 U		340 U	
4-Chloroaniline	660	330 U		350 U		340 U	
Hexachlorobutadiene	660	330 U		350 U		340 U	
4-Chloro-3-methylphenol	660	330 U		350 U		340 U	
2-Methylnaphthalene	660	330 U		350 U		340 U	
Hexachlorocyclopentadiene	660	330 U		350 U		340 U	
2,4,6-Trichlorophenol	660	330 U		350 U		340 U	
2,4,5-Trichlorophenol*	660	830 U		860 U		850 U	
2-Chloronaphthalene	660	330 U		350 U		340 U	
2-Nitroaniline*	660	830 U		860 U		850 U	
Dimethylphthalate	660	330 U		350 U		340 U	
Acenaphthylene	660	330 U		350 U		340 U	
2,6-Dinitrotoluene	660	330 U		350 U		340 U	

000010

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

Project: BECHTEL-HANFORD		J01XL1	J01XL2	J01XL3				
Laboratory: LLI		SDG: H2767						
Sample Number	Remarks	Result	Q	Result	Q	Result	Q	
	E. Blank							
Sample Date	10/6/04		10/6/04	10/6/04				
Extraction Date	10/18/04		10/18/04	10/18/04				
Analysis Date	10/20/04		10/20/04	10/20/04				
Semivolatile (8270C)	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	830 U	860 U	850 U				
Acenaphthene	660	330 U	350 U	340 U				
2,4-Dinitrophenol*	660	830 U	860 U	850 U				
4-Nitrophenol*	660	830 U	860 U	850 U				
Dibenzofuran	660	330 U	350 U	340 U				
2,4-Dinitrotoluene	660	330 U	350 U	340 U				
Diethylphthalate	660	35	350 U	340 U				
4-Chlorophenyl-phenyl ether	660	330 U	350 U	340 U				
Fluorene	660	330 U	350 U	340 U				
4-Nitroaniline*	660	830 U	860 U	850 U				
4,6-Dinitro-2-methylphenol*	660	830 U	860 U	850 U				
N-Nitrosodiphenylamine	660	330 U	350 U	340 U				
4-Bromophenyl-phenyl ether	660	330 U	350 U	340 U				
Hexachlorobenzene	660	330 U	350 U	340 U				
Pentachlorophenol*	660	830 U	860 U	850 U				
Phenanthrene	660	330 U	350 U	340 U				
Anthracene	660	330 U	350 U	340 U				
Carbazole	660	330 U	350 U	340 U				
Di-n-butylphthalate	660	27	20	340 U				
Fluoranthene	660	330 U	350 U	340 U				
Pyrene	660	330 U	350 U	340 U				
Butylbenzylphthalate	660	330 U	350 U	340 U				
3,3'-Dichlorobenzidine	660	330 U	350 U	340 U				
Benzo(a)anthracene	660	330 U	340 U	340 U				
Chrysene	660	330 U	340 U	340 U				
bis(2-Ethylhexyl)phthalate	660	660 U	660 U	660 U				
Di-n-octylphthalate	660	330 U	19	340 U				
Benzo(b)fluoranthene	660	330 U	350 U	340 U				
Benzo(k)fluoranthene	660	330 U	350 U	340 U				
Benzo(a)pyrene	660	330 U	350 U	340 U				
Indeno(1,2,3-cd)pyrene	660	330 U	350 U	340 U				
Dibenz(a,h)anthracene	660	330 U	350 U	340 U				
Benzo(g,h,i)perylene	660	330 U	350 U	340 U				

000011

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

\* RQL exceeded



Chemical Name	001	002	003	003 MS	003 MSD	04LE1282-MB1
2-Chloronaphthalene	330 U	340 U	350 U	350 U	350 U	330 U
2-Nitroaniline	830 U	850 U	860 U	860 U	860 U	830 U
Dimethylphthalate	330 U	340 U	350 U	350 U	350 U	330 U
Acenaphthylene	330 U	340 U	350 U	350 U	350 U	330 U
2,6-Dinitrotoluene	330 U	340 U	350 U	350 U	350 U	330 U
3-Nitroaniline	830 U	850 U	860 U	860 U	860 U	830 U
Acenaphthene	330 U	340 U	350 U	75 %	66 %	330 U
2,4-Dinitrophenol	830 U	850 U	860 U	860 U	860 U	830 U
4-Nitrophenol	830 U	850 U	860 U	84 %	77 %	830 U
Dibenzofuran	330 U	340 U	350 U	350 U	350 U	330 U
2,4-Dinitrotoluene	330 U	340 U	350 U	87 %	89 %	330 U
Diethylphthalate	35 J	340 U	350 U	350 U	350 U	330 U
4-Chlorophenyl-phenylether	330 U	340 U	350 U	350 U	350 U	330 U
Fluorene	330 U	340 U	350 U	350 U	350 U	330 U
4-Nitroaniline	830 U	850 U	860 U	860 U	860 U	830 U
4,6-Dinitro-2-methylphenol	830 U	850 U	860 U	860 U	860 U	830 U
N-Nitrosodiphenylamine (1)	330 U	340 U	350 U	350 U	350 U	330 U
4-Bromophenyl-phenylether	330 U	340 U	350 U	350 U	350 U	330 U
Hexachlorobenzene	330 U	340 U	350 U	350 U	350 U	330 U
Pentachlorophenol	830 U	850 U	860 U	25 %	29 %	830 U
Phenanthrene	330 U	340 U	350 U	350 U	350 U	330 U
Anthracene	330 U	340 U	350 U	350 U	350 U	330 U
Carbazole	330 U	340 U	350 U	350 U	350 U	330 U
Di-n-butylphthalate	27 J	340 U	20 J	24 J	26 J	330 U
Fluoranthene	330 U	340 U	350 U	350 U	350 U	330 U
Pyrene	330 U	340 U	350 U	86 %	87 %	330 U
Butylbenzylphthalate	330 U	340 U	350 U	350 U	350 U	330 U
3,3'-Dichlorobenzidine	330 U	340 U	350 U	350 U	350 U	330 U
Benzo(a)anthracene	330 U	340 U	350 U	350 U	350 U	330 U
Chrysene	330 U	340 U	350 U	350 U	350 U	330 U
bis(2-Ethylhexyl)phthalate	330 U	340 U	350 U	30 JB	25 JB	46 J
Di-n-octyl phthalate	330 U	340 U	350 U	350 U	310 J	330 U
Benzo(b)fluoranthene	330 U	340 U	350 U	350 U	350 U	330 U
Benzo(k)fluoranthene	330 U	340 U	350 U	350 U	350 U	330 U
Benzo(a)pyrene	330 U	340 U	350 U	350 U	350 U	330 U
Indeno(1,2,3-cd)pyrene	330 U	340 U	350 U	350 U	350 U	330 U
Dibenz(a,h)anthracene	330 U	340 U	350 U	350 U	350 U	330 U
Benzo(g,h,i)perylene	330 U	340 U	350 U	350 U	350 U	330 U

per 11/16/09  
 L60 27 JB U  
 L60 28 JB U  
 L60 19 J  
 L60 20 JB

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



Cust ID: SBLKX BS

RFW#: 04LE1282-MB1

2-Chloronaphthalene	330	U
2-Nitroaniline	830	U
Dimethylphthalate	330	U
Acenaphthylene	330	U
2,6-Dinitrotoluene	330	U
3-Nitroaniline	830	U
Acenaphthene	75	%
2,4-Dinitrophenol	830	U
4-Nitrophenol	64	%
Dibenzofuran	330	U
2,4-Dinitrotoluene	64	%
Diethylphthalate	330	U
4-Chlorophenyl-phenylether	330	U
Fluorene	330	U
4-Nitroaniline	830	U
4,6-Dinitro-2-methylphenol	830	U
N-Nitrosodiphenylamine (1)	330	U
4-Bromophenyl-phenylether	330	U
Hexachlorobenzene	330	U
Pentachlorophenol	63	%
Phenanthrene	330	U
Anthracene	330	U
Carbazole	330	U
Di-n-butylphthalate	330	U
Fluoranthene	330	U
Pyrene	94	%
Butylbenzylphthalate	330	U
3,3'-Dichlorobenzidine	330	U
Benzo(a)anthracene	330	U
Chrysene	330	U
bis(2-Ethylhexyl)phthalate	330	U
Di-n-octyl phthalate	330	U
Benzo(b)fluoranthene	330	U
Benzo(k)fluoranthene	330	U
Benzo(a)pyrene	330	U
Indeno(1,2,3-cd)pyrene	330	U
Dibenz(a,h)anthracene	330	U
Benzo(g,h,i)perylene	330	U

*Handwritten:* ✓ 11/14/04

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

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000016**



Client: TNU HANFORD B03-015  
LVL#: 0410L851  
SDG/SAF#: H2767/B03-015

W.O.#: 11343-606-001-9999-00

Date Received: 10-08-2004

### SEMIVOLATILE

Three (3) soil samples were collected on 10-06-2004.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on method 3540C on 10-18-2004 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 10-20,21-2004.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. All matrix spike recoveries were within acceptance criteria.
6. One (1) of eleven (11) blank spike recoveries was outside acceptance criteria.
7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
10. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

10/22/04  
Date

som\group\data\bna\tnu-hanford\0410-851.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

000017

00000002



**Appendix 5**

**Data Validation Supporting Documentation**

**000019**

**GC/MS ORGANIC DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	RWS 1607-FY		DATA PACKAGE: H2767		
VALIDATOR:	TLI	LAB:	LLI	DATE: 11/12/04	
			SDG:	H2767	
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	<b>SW-846 8270</b>		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
JOIXL1 JOIXL2 JOIXL3					
Soil					

**1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE**

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

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

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

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

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

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

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Calibration blanks analyzed? (Levels D, E)..... Yes No N/A  
 Calibration blank results acceptable? (Levels D, E)..... Yes No N/A  
 Laboratory blanks analyzed?..... Yes No N/A  
 Laboratory blank results acceptable?..... Yes No N/A  
 Field/trip blanks analyzed? (Levels C, D, E)..... Yes No N/A  
 Field/trip blank results acceptable? (Levels C, D, E)..... Yes No N/A  
 Transcription/calculation errors? (Levels D, E)..... Yes No N/A  
 Comments: Dis(2-ethylhexyl)phthalate - to CRDI + U all

LI-FB decyl phthalate, di-n-butyl phthalate, bis(2-ethylhexyl)phthalate

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

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

**GC/MS ORGANIC DATA VALIDATION CHECKLIST**

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

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**6. SYSTEM PERFORMANCE (Levels D and E)**

Internal standards analyzed? ..... Yes No  N/A  
Internal standard areas acceptable? ..... Yes No  N/A  
Internal standard retention times acceptable? ..... Yes No  N/A  
Standards traceable? ..... Yes No  N/A  
Standards expired? ..... Yes No  N/A  
Transcription/calculation errors? ..... Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**7. HOLDING TIMES (all levels)**

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A  
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A  
Results reported for all requested analyses? ..... Yes No N/A  
Results supported in the raw data? (Levels D, E) ..... Yes No N/A  
Samples properly prepared? (Levels D, E) ..... Yes No N/A  
Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A  
Detection limits meet RDL? ..... Yes No N/A  
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A  
Comments: 24 over

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**9. SAMPLE CLEANUP (Levels D and E)**

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

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date: 16 November 2004  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 1607-F4  
Subject: Radiochemistry - Data Package No. H2767-EB (SDG No. H2767)

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. H2767 prepared by Eberline Services Inc. (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	Waste Site	Analysis
J01XL2	10/6/04	Soil	C	1607-F4	See note 1
J01XL3	10/6/04	Soil	C	1607-F4	See note 1

- 1 - Gamma spectroscopy
- 2 - Gross alpha/beta.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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.

**000001**

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

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

All accuracy results were acceptable.

- **Laboratory Duplicates**

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

000002

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 Duplicate

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All reported results met the analyte specific RQL.

- **Completeness**

Data package No. H2767 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**

FHI, Contract #20266, *Validation Statement of Work*, Bechtel Hanford Incorporated, July 7, 2003.

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

000003

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

**000004**

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.

**Appendix 2**

**Summary of Data Qualification**

**000006**

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY\*

SDG: H2767	REVIEWER: TLI	DATE: 11/16/04	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

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

000007

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000008**

Project: BECHTEL-HANFORD									
Laboratory: EB									
Case	SDG: H2767		J01XL2		J01XL3				
Sample Number	J01XL2		J01XL3						
Remarks									
Sample Date	10/6/04		10/6/04						
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha		4.92		11.5					
Gross Beta		16.4		19.9					
Potassium-40		14.8		12.7					
Cobalt 60	0.05	U	U	U					
Cesium 137	0.05	U	U	0.027					
Radium-226		0.557		0.482					
Radium-228		0.799		0.696					
Europium 152	0.1	U	U	U					
Europium 154	0.1	U	U	U					
Europium 155	0.1	U	U	U					
Thorium-228		0.664		0.623					
Thorium-232		0.799		0.696					
Uranium-235(gea)		U	U	U					
Uranium-238(gea)		U	U	U					
Americium-241(gea)		U	U	U					

000008A

\* - 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 H2767

R410049-03

J01XL2

DATA SHEET

SDG <u>7123</u>	Client/Case no <u>Hanford</u>	SDG <u>H2767</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R410049-03</u>	Client sample id <u>J01XL2</u>	
Dept sample id <u>7123-003</u>	Location/Matrix <u>1607-F4</u>	<u>SOLID</u>
Received <u>10/08/04</u>	Collected/Weight <u>10/06/04 12:40</u>	<u>1165 g</u>
% solids <u>96.7</u>	Custody/SAF No <u>B03-015-257</u>	<u>B03-015</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	4.92	2.9	2.8	10		93A
Gross Beta	12587-47-2	16.4	4.3	5.8	15		93B
Potassium 40	13966-00-2	14.8	0.27	0.12			GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	U		0.011	0.10	U	GAM
Radium 226	13982-63-3	0.557	0.026	0.024	0.10		GAM
Radium 228	15262-20-1	0.799	0.056	0.055	0.20		GAM
Europium 152	14683-23-9	U		0.029	0.10	U	GAM
Europium 154	15585-10-1	U		0.040	0.10	U	GAM
Europium 155	14391-16-3	U		0.041	0.10	U	GAM
Thorium 228	14274-82-9	0.664	0.015	0.014			GAM
Thorium 232	TH-232	0.799	0.056	0.055			GAM
Uranium 235	15117-96-1	U		0.045		U	GAM
Uranium 238	U-238	U		1.5		U	GAM
Americium 241	14596-10-2	U		0.091		U	GAM

Remaining Sites Conf. Sampling-Soil

*R* 11/16/04

000009

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>11/01/04</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H2767**

R410049-02

J01XL3

**DATA SHEET**

SDG <u>7123</u>	Client/Case no <u>Hanford</u>	SDG <u>H2767</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R410049-02</u>	Client sample id <u>J01XL3</u>	
Dept sample id <u>7123-002</u>	Location/Matrix <u>1607-F4</u>	<u>SOLID</u>
Received <u>10/08/04</u>	Collected/Weight <u>10/06/04 12:30</u>	<u>1226 g</u>
% solids <u>97.9</u>	Custody/SAF No <u>B03-015-257</u>	<u>B03-015</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	11.5	4.6	3.2	10		93A
Gross Beta	12587-47-2	19.9	5.1	5.5	15		93B
Potassium 40	13966-00-2	12.7	0.16	0.065			GAM
Cobalt 60	10198-40-0	U		0.007	0.050	U	GAM
Cesium 137	10045-97-3	0.027	0.007	0.008	0.10		GAM
Radium 226	13982-63-3	0.482	0.015	0.013	0.10		GAM
Radium 228	15262-20-1	0.696	0.033	0.032	0.20		GAM
Europium 152	14683-23-9	U		0.017	0.10	U	GAM
Europium 154	15585-10-1	U		0.025	0.10	U	GAM
Europium 155	14391-16-3	U		0.035	0.10	U	GAM
Thorium 228	14274-82-9	0.623	0.010	0.008			GAM
Thorium 232	TH-232	0.696	0.033	0.032			GAM
Uranium 235	15117-96-1	U		0.049		U	GAM
Uranium 238	U-238	U		1.2		U	GAM
Americium 241	14596-10-2	U		0.027		U	GAM

Remaining Sites Conf. Sampling-Soil

*R*  
11/16/04

000010

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>11/01/04</u>

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000011**

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2767 was composed of two soil samples designated under SAF No. B03-015 with a Project Designation of: Remaining Sites Confirmation Sampling - Soil.

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 BHI via e-mail on November 2, 2004. The electronic data deliverable (EDD) was transmitted to BHI via e-mail on November 3, 2004.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Gamma Spectroscopy Analyses

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*  
\_\_\_\_\_  
FOR Melissa C. Mannion  
Senior Program Manager

*11/3/04*  
\_\_\_\_\_  
Date

Shipped To: EBERLINE SERVICES (Formerly TMA)  
 POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4c

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	See item (1) in Special Instructions	See item (2) in Special Instructions	G/P	G/P	G/P	aG	aG	aG	TPH (Total) - 418.1
J01X41	SOIL	10-6-04	1235													
J01X43	SOIL	10-6-04	1230													
J01X42	SOIL	10-6-04	1230													
	SOIL		1240													

000013 SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	See item (1) in Special Instructions	See item (2) in Special Instructions	G/P	G/P	G/P	aG	aG	aG	TPH (Total) - 418.1
J01X41	SOIL	10-6-04	1235													
J01X43	SOIL	10-6-04	1230													
J01X42	SOIL	10-6-04	1230													
	SOIL		1240													

Chain of Possession	Sign/Print Names	Date/Time
Relinquished By/Removed From: CHRIS RIVERA	Received By/Stored In: 3728 Ref 2B	10/1/04 1415
Relinquished By/Removed From: REF 2B 3728	Received By/Stored In: SIGALE	10/04 1000
Relinquished By/Removed From: [Signature]	Received By/Stored In: FED EX	
Relinquished By/Removed From: [Signature]	Received By/Stored In: [Signature]	10/8/04 10:30
Relinquished By/Removed From: [Signature]	Received By/Stored In: [Signature]	10/8/04
Relinquished By/Removed From: [Signature]	Received By/Stored In: [Signature]	

LABORATORY SECTION: Received By: Title: Date/Time:  
 FINAL SAMPLE DISPOSITION: Disposal Method: Disposed By: Date/Time:  
 Personnel not available to Relinquish samples from 3728 Ref # 2B on 10/17/04

**Appendix 5**  
**Data Validation Supporting Documentation**

**000014**

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	RWS	1607-F4	DATA PACKAGE: H2767		
VALIDATOR:	TLT	LAB:	SDG:	DATE: 11/12/09	
			H2767		
ANALYSES PERFORMED					
Gross Alpha/Beta Total Uranium	Strontium-90 Radium-22	Technetium-99 Tritium	Alpha Spectroscopy	Gamma Spectroscopy	
SAMPLES/MATRIX					
J01XL2 J01XL3					
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 FR

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- 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: \_\_\_\_\_

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- 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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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**

**000021**

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H2767**

R410049-05

Method Blank

**METHOD BLANK**

SDG <u>7123</u>	Client/Case no <u>Hanford</u>	SDG <u>H2767</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R410049-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7123-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B03-015</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	-0.568	1.4	3.3	10	U	93A
Gross Beta	12587-47-2	1.09	4.0	6.8	15	U	93B
Potassium 40	13966-00-2	U		0.074		U	GAM
Cobalt 60	10198-40-0	U		0.008	0.050	U	GAM
Cesium 137	10045-97-3	U		0.007	0.10	U	GAM
Radium 226	13982-63-3	U		0.013	0.10	U	GAM
Radium 228	15262-20-1	U		0.028	0.20	U	GAM
Europium 152	14683-23-9	U		0.018	0.10	U	GAM
Europium 154	15585-10-1	U		0.023	0.10	U	GAM
Europium 155	14391-16-3	U		0.011	0.10	U	GAM
Thorium 228	14274-82-9	U		0.008		U	GAM
Thorium 232	TH-232	U		0.028		U	GAM
Uranium 235	15117-96-1	U		0.020		U	GAM
Uranium 238	U-238	U		0.86		U	GAM
Americium 241	14596-10-2	U		0.007		U	GAM

Remaining Sites Conf. Sampling-Soil

QC-BLANK #49370

000022

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>11/01/04</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H2767

R410049-04

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7123</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> SDG <u>H2767</u> Contract <u>No. 630</u>
Lab sample id <u>R410049-04</u> Dept sample id <u>7123-004</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>B03-015</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
Gross Alpha	204	15	2.6	10	93A	214	8.6	95	69-131	70-130
Gross Beta	221	11	6.5	15	93B	224	9.0	99	76-124	70-130
Cobalt 60	0.944	0.096	<u>0.061</u>	0.050	GAM	0.993	0.040	95	73-127	80-120
Cesium 137	1.02	0.078	0.055	0.10	GAM	0.966	0.039	106	73-127	80-120

Remaining Sites Conf. Sampling-Soil

QC-LCS #49369
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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>11/01/04</u>

**000023**

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2767

R410049-06

J01XL3

DUPLICATE

SDG <u>7123</u>	Client/Case no <u>Hanford</u>	SDG <u>H2767</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R410049-06</u>	Lab sample id <u>R410049-02</u>	Client sample id <u>J01XL3</u>
Dept sample id <u>7123-006</u>	Dept sample id <u>7123-002</u>	Location/Matrix <u>1607-F4</u> <u>SOLID</u>
	Received <u>10/08/04</u>	Collected/Weight <u>10/06/04 12:30</u> <u>1226 g</u>
% solids <u>97.9</u>	% solids <u>97.9</u>	Custody/SAF No <u>B03-015-257</u> <u>B03-015</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 PROT TOT LIMIT
Gross Alpha	15.7	4.9	4.4	10		93A	11.5	4.6	3.2		31	86
Gross Beta	19.6	4.7	6.0	15		93B	19.9	5.1	5.5		2	62
Potassium 40	12.3	0.50	0.20			GAM	12.7	0.16	0.065		3	32
Cobalt 60	U		0.023	0.050	U	GAM	U		0.007	U	-	
Cesium 137	0.030	0.017	0.021	0.10		GAM	0.027	0.007	0.008		11	102
Radium 226	0.499	0.042	0.039	0.10		GAM	0.482	0.015	0.013		3	35
Radium 228	0.802	0.11	0.092	0.20		GAM	0.696	0.033	0.032		14	39
Europium 152	U		0.052	0.10	U	GAM	U		0.017	U	-	
Europium 154	U		0.079	0.10	U	GAM	U		0.025	U	-	
Europium 155	U		0.057	0.10	U	GAM	U		0.035	U	-	
Thorium 228	0.613	0.029	0.027			GAM	0.623	0.010	0.008		2	33
Thorium 232	0.802	0.11	0.092			GAM	0.696	0.033	0.032		14	39
Uranium 235	U		0.082		U	GAM	U		0.049	U	-	
Uranium 238	U		2.5		U	GAM	U		1.2	U	-	
Americium 241	U		0.082		U	GAM	U		0.027	U	-	

Remaining Sites Conf. Sampling-Soil

QC-DUP#2 49371

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>11/01/04</u>

000024