

SAF-B04-001
ERDF - Semiannual Leachate Analysis
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan

JD
INITIAL/DATE

Tom Lazarski

H9-03

TL } 3/3/05
INITIAL/DATE

Rich Weiss

RW
INITIAL/DATE

SDG H2612

SAF-B04-001

RECEIVED
MAR 16 2005

EDMC

Date: 28 October 2004
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: ERDF - Semiannual Leachate Analysis
Subject: Inorganics - Data Package No. H2612-LLI (SDG No. H2612)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2612-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	Analysis
J01K71	6/7/04	Water	C	See note 1
J01K72	6/7/04	Water	C	See note 1

1- ICP metals by 6010B.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility, Hanford Site, 200 Areas - Amended Record of Decision, Decision Responsiveness Summary. 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 OBJECTIVES

- **Holding Times**

Analytical holding times for ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within six (6) months for ICP metals.

All holding times were met.

000001

- **Blanks**

Preparation (Method) 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 (in ug/L) 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 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 laboratory blank contamination, all zinc results were qualified as estimated and flagged "J".

All other preparation blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 25% and a sample result below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

000002

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 20% for water samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples J01K71/J01K72) were submitted to LLI for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the DOE Environmental Restoration Disposal Facility, Hanford Site, 200 Areas - Amended Record of Decision, Decision Responsiveness Summary minimum detection limits (MDLs) to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific MDL.

- **Completeness**

Data package SDG No. H2612 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

000003

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to laboratory blank contamination, all zinc results were qualified as estimated 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

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

EPA, 1999, *Amended Record of Decision, Decision Summary and Responsiveness Summary for the Environmental Restoration Disposal Facility*, Hanford Site - 200 Area, Benton County, Washington, March 1999, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

The DOE referenced document was issued prior to the current revision of the validation procedures identified in the FHI validation statement of work. The DOE document referenced validation procedures (WHC-SD-ED-SPP-001, *Data Validation Procedures for Radiological Analysis*, Westinghouse Hanford Company, Richland, WA 1993 and WHC-SD-ED-SPP-002, *Data Validation Procedures for Chemical Analysis*, Westinghouse Hanford Company, Richland, WA 1993) have been superseded by the revisions. This has been accepted by all affected parties and the reference will be changed as the DOE document is revised.

000004

Appendix 1

Glossary of Data Reporting Qualifiers

000005

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

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

000006

Appendix 2

Summary of Data Qualification

000007

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: H2612	REVIEWER: TLI	DATE: 10/28/04	PAGE_1_OF_1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Zinc	J	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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/02/04

CLIENT: TNUHANFORD B04-001 H2612
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J01K71	Arsenic, Total	7.7	UG/L	3.5	1.0
		Barium, Total	84.0	UG/L	0.30	1.0
		Chromium, Total	34.8	UG/L	1.2	1.0
		Lead, Total	3.1 u	UG/L	3.1	1.0
		Selenium, Total	3.9	UG/L	3.6	1.0
		Tin, Total	3.7 u	UG/L	3.7	1.0
		Vanadium, Total	19.7	UG/L	1.0	1.0
		Zinc, Total	4.9 J	UG/L	1.3	1.0
-003	J01K72	Arsenic, Total	7.1	UG/L	3.5	1.0
		Barium, Total	81.7	UG/L	0.30	1.0
		Chromium, Total	33.1	UG/L	1.2	1.0
		Lead, Total	3.1 u	UG/L	3.1	1.0
		Selenium, Total	3.6	UG/L	3.6	1.0
		Tin, Total	3.7 u	UG/L	3.7	1.0
		Vanadium, Total	19.9	UG/L	1.0	1.0
		Zinc, Total	4.7 J	UG/L	1.3	1.0

Handwritten signature
 10/26/04

000011

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012

B04-001-001
Price Code 7N
Data Turnaround 45 Days
Air Quality

Project Coordinator
KESSNER, JH
SAF No.
B04-001

Company Contact
T LAZARSKI
Telephone No.
372-9216

Sampling Location
ERDF LEACHATE
Field Logbook No.
EL 1517-4

Method of Shipment
FEDEX
COA
RERDF22560

Bill of Lading/Air Bill No.
SEE OSPC

Offsite Property No.
A040 185

Shipped To
RECSA FOR
EBERLINE SERVICES (Formerly TMA)

Bechtel Hanford Inc.
Collector
NIELSON/FAHLBERG
Project Designation
ERDF - Semiannual Leachate Analysis
Ice Chest No. **ERC 99-055**
Shipped To
RECSA FOR
EBERLINE SERVICES (Formerly TMA)

POSSIBLE SAMPLE HAZARDS/REMARKS
HISTORICAL DATA INDICATES <2K pCi/g. NO ACTIVITY REPORT
REQUIRED
Special Handling and/or Storage
Cool 4°C

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		Type of Container	No. of Container(s)	Volume	IIC or IIS204 to pH <2 Cool aGs*	IIC or IIS204 to pH <2 Cool aGs*	IIN03 to pH <2	Cool 4C	Cool 4C	Cool 4C	IIN03 to pH <2	IIC to pH <2	None
				VOA - R360A (TCL) [Carbon tetrachloride]	VOA - R360A (TCL) [Carbon tetrachloride]												
J01K70	WATER	6.7.04	0650				3	20mL				P	P				
J01K71	WATER	6.7.04	0945				3	40mL				P	P				
J01K72	WATER	6.07.04	0945				3	40mL				P	P				

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Barium, Chromium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Tin)
(2) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Sulfate)

Sign/Print Names	Date/Time
Received By/Stored In	Date/Time

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



Analytical Report

Client: TNU-HANFORD B04-001
LVL#: 0406L790
SDG/SAF#: H2612/B04-001

W.O.#: 11343-606-001-9999-00
Date Received: 06-08-04

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 water samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

All samples were redigested for Zinc after the MB in the original digestion batch was found to be contaminated.
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.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. The preparation/method blank for 1 analyte was outside method criteria. {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

a). The MB result for Zinc was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and all samples 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.

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 14 pages.

000014

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/2/04
Date

jjw/m06-790



000015

Appendix 5

Data Validation Supporting Documentation Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	ERDF		DATA PACKAGE: H2612		
VALIDATOR:	TLI	LAB:	LLI	DATE: 10/7/04	
			SDG:	H2612	
ANALYSES PERFORMED					
<u>SW-846/ICP</u>	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J01K71 J01K72					
water					

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: zinc - J all - blank NO FB

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

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

Comments: NO PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

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

Comments: _____

000019

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: _____

000020

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

000022

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/02/04

CLIENT: TNUHANFORD B04-001 H2612
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
BLANK1	04L0408-MB1	Arsenic, Total	3.5	u UG/L	3.5	1.0
		Barium, Total	1.9	UG/L	0.30	1.0
		Chromium, Total	1.2	u UG/L	1.2	1.0
		Lead, Total	3.1	u UG/L	3.1	1.0
		Selenium, Total	3.6	u UG/L	3.6	1.0
		Tin, Total	3.7	u UG/L	3.7	1.0
		Vanadium, Total	1.0	u UG/L	1.0	1.0
BLANK1	04L0414-MB1	Zinc, Total	4.1	UG/L	1.3	1.0

000023

8

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/02/04

CLIENT: TNUHANFORD B04-001 H2612
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-003	J01K72	Arsenic, Total	1940	7.1	2000	96.9	1.0
		Barium, Total	1950	81.7	2000	93.6	1.0
		Chromium, Total	219	33.1	200	92.9	1.0
		Lead, Total	466	3.1 u	500	93.1	1.0
		Selenium, Total	1980	3.6	2000	98.9	1.0
		Tin, Total	947	3.7 u	1000	94.7	1.0
		Vanadium, Total	488	19.9	500	93.6	1.0
		Zinc, Total	496	4.7	500	98.2	1.0

000024

9

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/02/04

CLIENT: TNUHANFORD B04-001 H2612
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-002REP	J01K71	Arsenic, Total	7.7	6.8	12.4	1.0
		Barium, Total	84.0	81.0	3.6	1.0
		Chromium, Total	34.8	34.3	1.4	1.0
		Lead, Total	3.1 u	3.1 u	NC	1.0
		Selenium, Total	3.9	3.6 u	NC	1.0
		Tin, Total	3.7 u	3.7 u	NC	1.0
		Vanadium, Total	19.7	19.0	3.6	1.0
		Zinc, Total	4.9	5.9	18.5	1.0

Handwritten: 200
 7/2/04

000025

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/02/04

CLIENT: TNUHANFORD B04-001 H2612
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	SPIKED		UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	04L0408-LC1	Arsenic, LCS	9490	10000	UG/L	94.9
		Barium, LCS	4760	5000	UG/L	95.2
		Chromium, LCS	474	500	UG/L	94.8
		Lead, LCS	2360	2500	UG/L	94.4
		Selenium, LCS	9670	10000	UG/L	96.7
		Tin, LCS	4760	5000	UG/L	95.2
		Vanadium, LCS	2350	2500	UG/L	94.1
LCS1	04L0414-LC1	Zinc, LCS	1010	1000	UG/L	101.3

000026

11

Date: 28 October 2004
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: ERDF - Semiannual Leachate Analysis
Subject: Radiochemistry - Data Package No. H2612-EB (SDG No. H2612)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2612-EB which was prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J01K71	6/7/04	Water	C	See note 1
J01K72	6/7/04	Water	C	See note 1

1 - Gross alpha and beta; carbon-14; technetium-99; iodine-129; total radium and total uranium.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility, Hanford Site, 200 Areas - Amended Record of Decision, Decision Responsiveness Summary. 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 OBJECTIVES

- **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

- **Laboratory (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 required detection limit (RDL), 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 minimum detectable activity (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 laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) 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, rejected, or not qualified, depending on the activity of the individual sample.

All accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection limit (CRDL) and the RPD is less than 20 percent, the results are acceptable. If either activities are less than five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the

000002

CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. 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 Samples

One pair of field duplicate samples (samples J01K71/J01K72) were submitted to EB for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the DOE Environmental Restoration Disposal Facility, Hanford Site, 200 Areas - Amended Record of Decision, Decision Responsiveness Summary minimum detection limits (MDLs) to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific MDL.

- **Completeness**

Data package SDG No. H2612 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

000003

REFERENCES

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

EPA, 1999, *Amended Record of Decision, Decision Summary and Responsiveness Summary for the Environmental Restoration Disposal Facility*, Hanford Site - 200 Area, Benton County, Washington, March 1999, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

The DOE referenced document was issued prior to the current revision of the validation procedures identified in the FHI validation statement of work. The DOE document referenced validation procedures (WHC-SD-ED-SPP-001, *Data Validation Procedures for Radiological Analysis*, Westinghouse Hanford Company, Richland, WA 1993 and WHC-SD-ED-SPP-002, *Data Validation Procedures for Chemical Analysis*, Westinghouse Hanford Company, Richland, WA 1993) have been superceded by the revisions. This has been accepted by all affected parties and the reference will be changed as the DOE document is revised.

Appendix 1

Glossary of Data Reporting Qualifiers

000005

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.

000006

Appendix 2

Summary of Data Qualification

000007

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H2612	REVIEWER: TLI	DATE: 10/28/04	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.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2612

R406059-01

J01K71

DATA SHEET

SDG <u>7042</u>	Client/Case no <u>Hanford</u>	SDG <u>H2612</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R406059-01</u>	Client sample id <u>J01K71</u>	
Dept sample id <u>7042-001</u>	Location/Matrix <u>ERDF LEACHATE</u>	<u>WATER</u>
Received <u>06/08/04</u>	Collected/Volume <u>06/07/04 09:45</u>	<u>6.25 L</u>
% solids <u>100.0</u>	Custody/SAF No <u>B04-001-001</u>	<u>B04-001</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	526	39	7.5			93A
Gross Beta	12587-47-2	515	17	7.9			93B
Carbon 14	14762-75-5	27.2	70	120	200	U	C
Technetium 99	14133-76-7	717	110	12	15		TC
Total Uranium (ug/L)	7440-61-1	756	97	<u>1.7</u>	0.10		U_T
Total Radium	ALPHA-RA	<u>-0.246</u>	0.18	0.61	1.0	U	RAT
Iodine 129	15046-84-1	-1.10	1.5	3.5	5.0	U	I

ERDF-Semiannual Leachate Analysis

R
10/24/04

DATA SHEETS

Page 1

SUMMARY DATA SECTION

Page 15

000011

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/02/04</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2612

R406059-02

J01K72

DATA SHEET

SDG <u>7042</u>	Client/Case no <u>Hanford</u>	SDG <u>H2612</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R406059-02</u>	Client sample id <u>J01K72</u>	
Dept sample id <u>7042-002</u>	Location/Matrix <u>ERDF LEACHATE</u>	<u>WATER</u>
Received <u>06/08/04</u>	Collected/Volume <u>06/07/04 09:45</u>	<u>6.25 L</u>
% solids <u>100.0</u>	Custody/SAF No <u>B04-001-001</u>	<u>B04-001</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	422	36	10			93A
Gross Beta	12587-47-2	514	17	6.7			93B
Carbon 14	14762-75-5	29.2	70	120	200	U	C
Technetium 99	14133-76-7	628	22	11	15		TC
Total Uranium (ug/L)	7440-61-1	751	96	<u>1.7</u>	0.10		U_T
Total Radium	ALPHA-RA	-0.067	0.12	0.56	1.0	U	RAT
Iodine 129	15046-84-1	-0.524	1.6	3.6	5.0	U	I

ERDF-Semiannual Leachate Analysis

pa
6/26/04

000012

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/02/04</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2612 was composed of two water samples designated under SAF No. B04-001 with a Project Designation of: ERDF – Semiannual Leachate Analysis.

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 July 22, 2004 and September 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 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Iodine-129 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Radium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

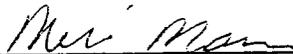
Due to a sample duplicate (RPD = 70%) failure the Tc-99 samples were reanalyzed. The data from the reanalysis is reported herein. No problems were encountered during the course of the reanalyses.

2.6 Total Uranium Analyses

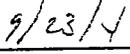
No problems were encountered during the course of the analyses.

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
Senior Program Manager



Date

000014

Bechtel Hanford Inc.
 Collector: NIELSON/FAHLBERG
 Project Designation: ERDF - Semiannual Leachate Analysis
 Icc Chest No.: **ERC 01030**
 Telephone No.: 372-9216
 Company Contact: T LAZARSKI
 Sampling Location: ERDF LEACHATE
 Field Logbook No.: EL 1517-4
 COA: RERDF22560
 Project Coordinator: KESSNER, JH
 SAF No.: B04-001
 Method of Shipment: FED EX
 Price Code: 7N
 Air Quality: | |
 Data Turnaround: 45 Days

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 Bill of Lading/Air Bill No.: SEE OSPC
 Offsite Property No.: **A040 152**

Shipped To: EBELINE SERVICES (Formerly TMA)
 POSSIBLE SAMPLE HAZARDS/REMARKS: HISTORICAL DATA INDICATES <2K pCi/g. NO ACTIVITY REPORT REQUIRED
 Special Handling and/or Storage: None

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	IC/ICSO4 to pH <2 Coo		IC/ICSO4 to pH <2 Coo		Cool 4C	Cool 4C	Cool 4C	Cool 4C	IIN03 to pH <2	IIN03 to pH <2	IIC to pH <2	None
					aGs*	3	aGs*	3								
J01K70	WATER	6-7-04	0650		VOA - R200A (ICL) (Carbon tetrachloride)	20ml.	VOA - R260A (ICL) (Carbon tetrachloride)	40ml.	500ml.	500ml.	500ml.	500ml.	500ml.	500ml.	250ml.	
J01K71	WATER	6-7-04	0945													
J01K72	WATER	6-07-04	0945													

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Barium, Chromium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Tin)
 (2) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Sulfate)

Relinquished By/Removed From	Date/Time	1430	Received By/Stored In	Date/Time
R. F. ...	6-7-04		Fed Ex	
...	6/29 9:40		...	6/29 9:40

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
...

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

Appendix 5

Data Validation Supporting Documentation

000016

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: ERDF			DATA PACKAGE: H2612		
VALIDATOR: TLF	LAB: E3	DATE: 10/12/04			
			SDG: H2612		
ANALYSES PERFORMED					
<u>Gross Alpha/Beta</u> Total Uranium	Strontium-90 Radium-22	Technetium-99 Tritium	Alpha Spectroscopy C14 TC99	Gamma Spectroscopy <u>total Radium</u>	E-129
SAMPLES/MATRIX					
JO1K71		JO1K72			
Water					

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: _____

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: _____ *LOFS or PJ*

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

000023

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2612

R406059-04

Method Blank

METHOD BLANK

SDG <u>7042</u>	Client/Case no <u>Hanford</u>	SDG <u>H2612</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R406059-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7042-004</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B04-001</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.713	0.85	2.6		U	93A
Gross Beta	12587-47-2	-0.794	4.1	7.0		U	93B
Carbon 14	14762-75-5	-13.3	71	120	200	U	C
Total Uranium (ug/L)	7440-61-1	0	0.007	0.017	0.10	U	U_T
Total Radium	ALPHA-RA	<u>-0.151</u>	0.093	0.58	1.0	U	RAT
Iodine 129	15046-84-1	0.300	1.4	3.2	5.0	U	I

ERDF-Semiannual Leachate Analysis

QC-BLANK #47843

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>09/02/04</u>

000024

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2612

R406059-08

Method Blank

METHOD BLANK

SDG <u>7042</u>	Client/Case no <u>Hanford</u>	SDG <u>H2612</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R406059-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7042-008</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B04-001</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Technetium 99	14133-76-7	-0.553	3.2	11	15	U	TC

ERDF-Semiannual Leachate Analysis

QC-BLANK 48351

000025

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/02/04</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2612

R406059-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7042</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> SDG <u>H2612</u> Contract <u>No. 630</u>
Lab sample id <u>R406059-03</u> Dept sample id <u>7042-003</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix <u>WATER</u> SAF No <u>B04-001</u>

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	213	15	2.9			93A	200	8.0	106	66-134	70-130
Gross Beta	206	11	6.0			93B	205	8.2	100	75-125	80-120
Carbon 14	22400	250	120	200		C	23900	960	94	85-115	80-120
Total Uranium (ug/L)	85.0	11	<u>0.17</u>	0.10		U_T	82.5	3.3	103	75-125	80-120
Total Radium	46.4	11	<u>0.61</u>	1.0		RAT	56.0	2.2	83	69-131	80-120
Iodine 129	488	9.8	<u>9.0</u>	5.0		I	464	19	105	90-110	80-120

ERDF-Semiannual Leachate Analysis

QC-LCS #47842

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>09/02/04</u>

000026

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2612

R406059-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7042</u>	Client/Case no <u>Hanford</u>	SDG <u>H2612</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R406059-07</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7042-007</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B04-001</u>	

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Technetium 99	2150	58	12	15	TC	2180	87	99	84-116	80-120

ERDF-Semiannual Leachate Analysis

QC-LCS 48350

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>09/02/04</u>

000027

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2612

R406059-05

J01K71

DUPLICATE

SDG <u>7042</u>		Client/Case no <u>Hanford</u>	SDG <u>H2612</u>
Contact <u>Melissa C. Mannion</u>		Contract No. <u>630</u>	
DUPLICATE	ORIGINAL		
Lab sample id <u>R406059-05</u>	Lab sample id <u>R406059-01</u>	Client sample id <u>J01K71</u>	
Dept sample id <u>7042-005</u>	Dept sample id <u>7042-001</u>	Location/Matrix <u>ERDF LEACHATE</u>	<u>WATER</u>
	Received <u>06/08/04</u>	Collected/Volume <u>06/07/04 09:45</u>	<u>6.25 L</u>
	% solids <u>100.0</u>	Custody/SAF No <u>B04-001-001</u>	<u>B04-001</u>

ANALYTE	DUPLICATE		MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL		MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
	pCi/L	2σ ERR (COUNT)					pCi/L	2σ ERR (COUNT)					
Gross Alpha	518	38	9.3			93A	526	39	7.5		2	45	
Gross Beta	585	18	6.6			93B	515	17	7.9		13	33	
Carbon 14	-7.31	71	120	200	U	C	27.2	70	120	U	-		
Total Uranium (ug/L)	794	100	<u>1.7</u>	0.10		U_T	756	97	<u>1.7</u>		5	33	
Total Radium	0.061	0.099	0.25	1.0	U	RAT	-0.246	0.18	0.61	U	-		
Iodine 129	-1.58	1.8	4.2	5.0	U	I	-1.10	1.5	3.5	U	-		

ERDF-Semiannual Leachate Analysis

QC-DUP#1 47844

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>09/02/04</u>

000028

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2612

R406059-10

J01K72

DUPLICATE

SDG <u>7042</u>	Client/Case no <u>Hanford</u>	SDG <u>H2612</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R406059-10</u>	Lab sample id <u>R406059-02</u>	Client sample id <u>J01K72</u>
Dept sample id <u>7042-010</u>	Dept sample id <u>7042-002</u>	Location/Matrix <u>ERDF LEACHATE</u> <u>WATER</u>
	Received <u>06/08/04</u>	Collected/Volume <u>06/07/04 09:45</u> <u>6.25 L</u>
	% solids <u>100.0</u>	Custody/SAF No <u>B04-001-001</u> <u>B04-001</u>

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Technetium 99	641	21	11	15		TC	628	22	11		2	22	

ERDF-Semiannual Leachate Analysis

DUPLICATES

Page 2

SUMMARY DATA SECTION

Page 13

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>09/02/04</u>

000029

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2612

R406059-06

J01K71

MATRIX SPIKE

SDG <u>7042</u>	Client/Case no <u>Hanford</u>	SDG <u>H2612</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
MATRIX SPIKE	ORIGINAL	
Lab sample id <u>R406059-06</u>	Lab sample id <u>R406059-01</u>	Client sample id <u>J01K71</u>
Dept sample id <u>7042-006</u>	Dept sample id <u>7042-001</u>	Location/Matrix <u>ERDF LEACHATE</u> <u>WATER</u>
	Received <u>06/08/04</u>	Collected/Volume <u>06/07/04 09:45</u> <u>6.25 L</u>
	% solids <u>100.0</u>	Custody/SAF No <u>B04-001-001</u> <u>B04-001</u>

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC 3σ % (TOTAL)	LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	86800	880	<u>220</u>	200	X C	95700	3800	27.2	70	91	85-115	60-140

ERDF-Semiannual Leachate Analysis

QC-MS#1 47845

MATRIX SPIKES

Page 1

SUMMARY DATA SECTION

Page 14

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-MS</u>
Version <u>3.06</u>
Report date <u>09/02/04</u>

000030

Date: 28 October 2004
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: ERDF - Semiannual Leachate Analysis
Subject: Wet Chemistry - Data Package No. H2612-LLI (SDG No. H2612)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2612-LLI prepared by Lionville Laboratory Inc.(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	Analysis
J01K71	6/7/04	Water	C	See note 1
J01K72	6/7/04	Water	C	See note 1

1 - Specific conductance - 9050A, total dissolved solids - 160.1, IC anions - 300.0.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility, Hanford Site, 200 Areas - Amended Record of Decision, Decision Responsiveness Summary. 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 OBJECTIVES

- **Holding Times**

Analytical holding times are assessed to ascertain whether the holding time requirements have been met by the laboratory. The holding time requirements are as follows: 28 days for specific conductance and 7 days for TDS, and 2 days for IC anions.

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".

Holding times were met for all parameters and samples.

- **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 Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike

Matrix spike 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 recoveries must fall within the range of 75% to 125%. Samples with a spike recovery of less than 30% and a sample value below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

000002

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 20% for water samples. If RPD values are out of specification and the sample concentration is greater than five times the project quantitation limit (MDL) or CRQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the MDL/CRQL and the sample concentration is less than five times the MDL/CRQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the MDL/CRQL or plus or minus the MDL/CRQL for positive sample results less than five times the MDL/CRQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were within the required control limits.

Field Duplicate Samples

One pair of field duplicate samples (samples J01K71/J01K72) were submitted to LLI for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the DOE Environmental Restoration Disposal Facility, Hanford Site, 200 Areas - Amended Record of Decision, Decision Responsiveness Summary minimum detection limits (MDLs) to ensure that laboratory detection levels meet the required criteria. All nitrite results exceeded the MDL. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific MDL.

- **Completeness**

Data package No. H2612 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

000003

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All nitrite results exceeded the MDL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

EPA, 1999, *Amended Record of Decision, Decision Summary and Responsiveness Summary for the Environmental Restoration Disposal Facility*, Hanford Site - 200 Area, Benton County, Washington, March 1999, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

The DOE referenced document was issued prior to the current revision of the validation procedures identified in the FHI validation statement of work. The DOE document referenced validation procedures (WHC-SD-ED-SPP-001, *Data Validation Procedures for Radiological Analysis*, Westinghouse Hanford Company, Richland, WA 1993 and WHC-SD-ED-SPP-002, *Data Validation Procedures for Chemical Analysis*, Westinghouse Hanford Company, Richland, WA 1993) have been superceded by the revisions. This has been accepted by all affected parties and the reference will be changed as the DOE document is revised.

000004

Appendix 1

Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with BHI procedures 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 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. 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 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 QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

000006

Appendix 2

Summary of Data Qualification

000007

GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H2612	REVIEWER: TLI	DATE: 10/28/04	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.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/21/04

CLIENT: TNUHANFORD B04-001 H2612
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J01K71	Bromide by IC	0.78	MG/L	0.25	1.0
		Chloride by IC	178	MG/L	25.0	100
		Fluoride by IC	0.26	MG/L	0.25	1.0
		Nitrite by IC	1.25 u	MG/L	1.25	5.0
		Nitrate by IC	309	MG/L	25.0	100
		Sulfate by IC	391	MG/L	25.0	100
		Specific Conductance	2250	US/CM	1.0	1.0
		Total Dissolved Solids	1820	MG/L	5.00	1.0
-003	J01K72	Bromide by IC	0.69	MG/L	0.25	1.0
		Chloride by IC	176	MG/L	25.0	100
		Fluoride by IC	0.27	MG/L	0.25	1.0
		Nitrite by IC	1.25 u	MG/L	1.25	5.0
		Nitrate by IC	294	MG/L	25.0	100
		Sulfate by IC	380	MG/L	25.0	100
		Specific Conductance	2470	US/CM	1.0	1.0
		Total Dissolved Solids	1810	MG/L	5.00	1.0

PL
 10/24/04

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012



Analytical Report

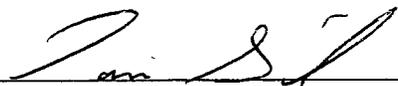
Client: TNU-HANFORD B04-001 H2612
LVL#: 0406L790

W.O.#: 11343-606-001-9999-00
Date Received: 06-08-04

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 water samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

Elevated reporting limits for Nitrite are the result of the necessity to dilute the samples to diminish co-elution effects.
3. Sample holding times as required by the method and/or contract were met (see the sample chronology summary for analyses times for short hold samples).
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Total Dissolved Solids (TDS) was within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries for Bromide, Chloride, Fluoride, Nitrite, Nitrate and Sulfate were within the 75-125% control limits.
8. The replicate analyses for Bromide, Chloride, Fluoride, Nitrite, Nitrate, Sulfate, TDS and Specific Conductance were within the 20% RPD control limit.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

6/29/04
Date

njpl06-790

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 14 pages.

000013

03

Collector: NIELSON/FAHLBERG
 Project Designation: ERDF - Semiannual Leachate Analysis
 Ice Chest No.: ERC 99-055
 Method of Shipment: FED EX
 Field Logbook No.: EL 1517-4
 COA: RERDF22560
 Bill of Lading/Air Bill No.: SEE OSPC

Shipped To: **RECEIVED FOR**
 EBERLINE SERVICES (Formerly TMA)
 OFFSITE PROPERTY NO.: **A040 185**
 POSSIBLE SAMPLE HAZARDS/REMARKS
 HISTORICAL DATA INDICATES <2K pCi/g. NO ACTIVITY REPORT
 REQUIRED
 Special Handling and/or Storage: **COOL 4C**

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	HCl or H2SO4 to pH <2 Cool		HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2	None
					aGs*	aGs*							
J01K70	WATER	6.7.04	0650		3	3	500mL	500mL	500mL	500mL	1000mL	250mL	None
J01K71	WATER	6.7.04	0945		3	3	500mL	500mL	500mL	500mL	1000mL	250mL	None
J01K72	WATER	6.07.04	0945		3	3	500mL	500mL	500mL	500mL	1000mL	250mL	None

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Volume	HCl or H2SO4 to pH <2 Cool	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2	None	Special Instructions
J01K70	WATER	6.7.04	0650		20mL	40mL	500mL	500mL	500mL	500mL	1000mL	250mL	None	Conductivity - 9050 See item (2) in Special Instructions.
J01K71	WATER	6.7.04	0945		20mL	40mL	500mL	500mL	500mL	500mL	1000mL	250mL	None	Gross Alpha: Technetium-99 Gross Beta: Iodine-129 Total Uranium: Iodine-129 Total Radium: Iodine-129
J01K72	WATER	6.07.04	0945		20mL	40mL	500mL	500mL	500mL	500mL	1000mL	250mL	None	Conductivity - 9050 See item (2) in Special Instructions.

CHAIN OF POSSESSION		Sign/Print Names		Date/Time	
Relinquished By/Removed From	<i>R. Fellers</i>	Received By/Stored In	<i>Fed Ex</i>	Date/Time	1430
Relinquished By/Removed From	<i>F. O. G.</i>	Received By/Stored In	<i>Victor Alvarez</i>	Date/Time	6/7/04
Relinquished By/Removed From		Received By/Stored In		Date/Time	6/18/04
Relinquished By/Removed From		Received By/Stored In		Date/Time	6/18/04
Relinquished By/Removed From		Received By/Stored In		Date/Time	6/18/04
Relinquished By/Removed From		Received By/Stored In		Date/Time	6/18/04
Relinquished By/Removed From		Received By/Stored In		Date/Time	6/18/04
Relinquished By/Removed From		Received By/Stored In		Date/Time	6/18/04

LABORATORY SECTION: Received By: Title: Date/Time:
 FINAL SAMPLE DISPOSITION: Disposed By: Disposal Method: Date/Time:
 BHI-EE-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

000015

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	ERDT		DATA PACKAGE: H2612 H2612		
VALIDATOR:	TLI	LAB:	LLI	DATE: 10/12/04	
			SDG: H2612		
ANALYSES PERFORMED					
<u>Anions/IC</u>	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO ₃ /NO ₂
Sulfate	<u>TDS</u>	TKN	Phosphate	<u>SC</u>	
SAMPLES/MATRIX					
J01K71 J01K72					
water					

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: NO FB

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 FA

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: nitrite on

Appendix 6

Additional Documentation Requested by Client

000020

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/21/04

CLIENT: TNUHANFORD B04-001 H2612
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
BLANK10	04LIC032-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	04LSP021-MB1	Specific Conductance	1.0 u	US/CM	1.0	1.0
BLANK10	04LSS101-MB1	Total Dissolved Solids	5.00 u	MG/L	5.00	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/21/04

CLIENT: TNUHANFORD B04-001 H2612
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	J01K71	Bromide by IC	25.3	0.78	25.0	97.9	5.0
		Chloride by IC	1170	178	1000	99.1	200
		Fluoride by IC	24.8	0.26	25.0	98.2	5.0
		Nitrite by IC	27.1	1.25u	25.0	108.6	5.0
		Nitrate by IC	1330	309	1000	102.2	200
		Sulfate by IC	1420	391	1000	102.5	200
BLANK10	04LIC032-MB1	Bromide by IC	4.9	0.25u	5.0	98.7	1.0
		Chloride by IC	4.7	0.25u	5.0	94.8	1.0
		Fluoride by IC	4.8	0.25u	5.0	96.7	1.0
		Nitrite by IC	4.73	0.25u	5.00	94.6	1.0
		Nitrate by IC	5.09	0.25u	5.00	101.8	1.0
		Sulfate by IC	4.9	0.25u	5.0	97.4	1.0
BLANK10	04LSP021-MB1	Specific Conductance	696	1.0 u	718	96.9	1.0
BLANK10	04LSS101-MB1	Total Dissolved Solids	99.0	5.00u	100	99.0	1.0
		Total Dissolved Solids	101	5.00u	100	101.0	1.0

000022

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 06/21/04

CLIENT: TNUHANFORD B04-001 H2612
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	SPIKE#1 SPIKE#2		%DIFF
			%RECOV	%RECOV	
BLANK10	04LSS101-MB1	Total Dissolved Solids	99.0	101.0	2.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/21/04

CLIENT: TNUHANFORD B04-001 H2612
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0406L790

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE RPD		
-002REP	J01K71	Bromide by IC	0.78	1.2 u	NC	5.0
		Chloride by IC	178	177	0.024	100
		Fluoride by IC	0.26	1.2 u	NC	5.0
		Nitrite by IC	1.25u	1.25u	NC	5.0
		Nitrate by IC	309	306	0.99	100
		Sulfate by IC	391	395	1.0	100
		Total Dissolved Solids	1820	1820	0.17	1.0
-003REP	J01K72	Specific Conductance	2470	2450	0.86	1.0

000024

Date: 28 October 2004
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: ERDF - Semiannual Leachate Analysis
Subject: Volatiles - Data Package No. H2612-LLI (SDG No. H2612)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2612-LLI prepared by Lionville Laboratory Inc. (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	Media	Validation	Analysis
J01K70	6/7/04	Water	C	See note 1
J01K71	6/7/04	Water	C	See note 1
J01K72	6/7/04	Water	C	See note 1

1 - Volatiles by EPA 8260B (carbon tetrachloride).

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility, Hanford Site, 200 Areas - Amended Record of Decision, Decision Responsiveness Summary. 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 are assessed to ascertain whether the holding time requirements were met by the laboratory. Preserved water samples must be analyzed within: 14 days of the date of sample collection for preserved VOA samples and 7 days for unpreserved samples. If holding times are exceeded, but not by greater than twice 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 twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the sample not being properly preserved (pH > 2) and the holding time being exceeded (8 days), all VOA results in sample J01K72 were rejected and flagged "R".

- **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 of a given matrix. 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 project quantitation limit (PQL) and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the PQL, qualified as undetected and flagged "U".

All method blank results were acceptable.

Field Blanks

One trip blank (J01K70) was submitted for analysis. No analytes were detected in the trip blank.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Laboratory Control Sample

Matrix spike/matrix spike duplicate and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within established laboratory quality 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 analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification.

All surrogate recovery 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 by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/- 20% for water samples and +/- 35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. 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

One pair of field duplicate samples (samples J01K71/J01K72) were submitted to LLI for analysis. The duplicate sample results were compared using the validation

000003

guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the DOE Environmental Restoration Disposal Facility, Hanford Site, 200 Areas - Amended Record of Decision, Decision Responsiveness Summary minimum detection limits (MDLs) to ensure that laboratory detection levels meet the required criteria. All volatile organic results exceeded the MDL. Under the BHI validation SOW, no qualification is required.

- **Completeness**

Data package No. H2612-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 67% based on the rejected of all data in sample J01K72.

MAJOR DEFICIENCIES

Due to the sample not being properly preserved (pH > 2) and the holding time being exceeded (8 days), all VOA results in sample J01K72 were rejected and flagged "R". Rejected data is invalid and should not be reported.

MINOR DEFICIENCIES

All volatile organic results exceeded the MDL. Under the BHI validation SOW, no qualification is required.

REFERENCES

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

EPA, 1999, *Amended Record of Decision, Decision Summary and Responsiveness Summary for the Environmental Restoration Disposal Facility, Hanford Site - 200 Area, Benton County, Washington, March 1999*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

The DOE referenced document was issued prior to the current revision of the validation procedures identified in the FHI validation statement of work. The DOE document referenced validation procedures (WHC-SD-ED-SPP-001, *Data Validation Procedures for Radiological Analysis*, Westinghouse Hanford Company, Richland, WA 1993 and WHC-SD-ED-SPP-002, *Data Validation Procedures for Chemical Analysis*, Westinghouse Hanford Company, Richland, WA 1993) have been superseded by the revisions. This has been accepted by all affected parties and the reference will be changed as the DOE document is revised.

Appendix 1

Glossary of Data Reporting Qualifiers

000006

Qualifiers which may be applied by data validator 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 sample quantitation limit corrected for 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).

000007

Appendix 2
Summary of Data Qualification

000008

VOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: H2612	REVIEWER: TLI	DATE: 10/28/04	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Carbon tetrachloride	R	J01K72	Holding time and sample preservation

* - 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.

000009

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000010

Sample Information	RFW#:	Matrix:	D.F.:	Units:	J01K70	J01K71	J01K72	J01K72	J01K72	J01K72	VBLKKS
1,2-Dichloroethane-d4	001	WATER	1.00	UG/L	89 %	93 %	95 %	93 %	92 %	95 %	
Toluene-d8					94 %	96 %	95 %	94 %	92 %	94 %	
Bromofluorobenzene					92 %	94 %	91 %	93 %	91 %	93 %	
Carbon Tetrachloride					5 U	5 U	5 U	96 %	92 %	5 U	

Cust ID: VBLKKS BS

Sample Information
 RFW#: 04LVG186-MB1
 Matrix: WATER
 D.F.: 1.00
 Units: UG/L

Surrogate Recovery	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Carbon Tetrachloride
	88 %	91 %	90 %	86 %

* = Outside of EPA CLP QC limits.

RE
10/26/04

000012

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013



REVISION

Client: TNU-HANFORD B04-001
LVL #: 0406L790
SDG/SAF # H2612/B04-001

W.O. #: 11343-606-001-9999-00
Date Received: 06-08-2004

GC/MS VOLATILE

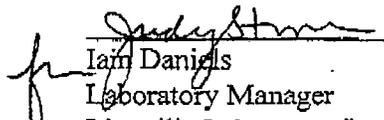
This case narrative has been revised to correct statement # 8.

Three (3) water samples were collected on 06-07-2004.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for Carbon Tetrachloride on 06-15-2004.

The following is a summary of the QC results accompanying these 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 analyzed within required holding time.
3. Non-target compounds were not detected in the samples.
4. All surrogate recoveries were within EPA QC limits..
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. Internal standard area and retention time criteria were met.
8. The pH for sample J01K72 exceeded 2.0, which indicates that the sample may not have been properly preserved. All samples were analyzed within seven days of receipt.
9. "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."

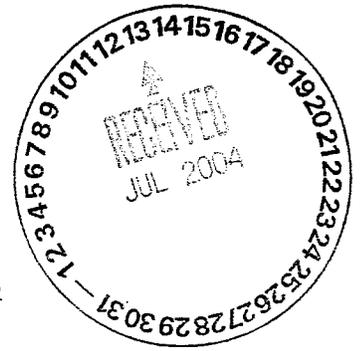

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/20/04
Date

son\group\data\vol\tnu-hanford\0406-790.dvw

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 10 pages.

02



Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B04-001 H2612

DATE RECEIVED: 06/08/04

LVL LOT # :0406L790

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J01K70	001	W	04LVG186	06/07/04	N/A	06/15/04
J01K71	002	W	04LVG186	06/07/04	N/A	06/15/04
J01K72	003	W	04LVG186	06/07/04	N/A	06/15/04
J01K72	003 MS	W	04LVG186	06/07/04	N/A	06/15/04
J01K72	003 MSD	W	04LVG186	06/07/04	N/A	06/15/04

LAB QC:

VBLKKS	MB1	W	04LVG186	N/A	N/A	06/15/04
VBLKKS	MB1 BS	W	04LVG186	N/A	N/A	06/15/04

000017

Appendix 5

Data Validation Supporting Documentation

000018

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	ERDF		DATA PACKAGE: H2612		
VALIDATOR:	FLP	LAB: LLI	DATE: 10/7/04		
			SDG: H2612		
ANALYSES PERFORMED					
SW-846 8260 B	SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)	
SAMPLES/MATRIX					
J01K70 J01K71 J01K72					
with					

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: _____

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 PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? Yes No N/A
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: _____

UR - ~~at least~~ 8 day hold w/no
72 preservation

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: all 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: _____
