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

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan

mjp 10/11/05
INITIAL/DATE

Tom Lazarski

H9-03

mjp 10/11/05
INITIAL/DATE

Rich Weiss

mjp 10/11/05
INITIAL/DATE

SDG H3213

SAF-B04-001

RECEIVED
OCT 27 2005

EDMC

Date: 29 September 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: ERDF - Semiannual Leachate Analysis
Subject: General Organic - Data Package No. H3213-LLI

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H3213 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	Date
J037M0	6/13/05	Water	C	See note 1
J037M1	6/13/05	Water	C	See note 1

1- Formaldehyde by EPA 8315A.

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 and DOE/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA. 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 prepared within 3 days of sample collection and analyzed within 3 days of preparation. 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

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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.

- **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.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **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

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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.

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Field Duplicate Samples

One pair of field duplicate samples (samples J037M0/J037M1) 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/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision minimum detection limits (MDLs) to ensure that laboratory detection levels meet the required criteria. All results met the MDL.

· **Completeness**

Data package No. H3213-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

None found.

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.

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DOE/RL-2001-44, Rev. 0, *Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA.*

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.

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Appendix 1
Glossary of Data Reporting Qualifiers

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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).

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Appendix 2
Summary of Data Qualification

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GENERAL ORGANIC DATA QUALIFICATION SUMMARY*

SDG: H3213	REVIEWER: TLI	PROJECT: ERDF	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

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

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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FORMALDEHYDE ANALYSIS, WATER MATRIX, (UG/L)

Project: BECHTEL-HANFORD			
Laboratory: LLI			
Case:	SDG: H3213		
Sample Number	J037M0	J037M1	
Remarks		Duplicate	
Sample Date	06/13/05	06/13/05	
Analysis Date	06/15/05	06/15/05	
Formaldehyde (8315A)	MDL	Q	Q
	5000	25.0 U	25.0 U
Formaldehyde			

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

RFW Batch Number: 0506L739

Client: TNUHANFORD B04-001 H3213 Work Order: 11343606001 Page: 1

Sample Information	Cust ID:	J037M0	J037M0	J037M0	J037M1	BLK	BLK BS
RFW#: 001		001 MS	001 MSD	002		05LLC006-MB1	05LLC006-MB1
Matrix: WATER		WATER	WATER	WATER		WATER	WATER
D.F.: 1.00		1.00	1.00	1.00		1.00	1.00
Units: ug/L		ug/L	ug/L	ug/L		ug/L	ug/L

=====
 Formaldehyde 25.0 U 113 % 102 % 25.0 U 25.0 U 104 %
 =====

Cust ID: BLK BSD

Sample Information
 RFW#: 05LLC006-MB1
 Matrix: WATER
 D.F.: 1.00
 Units: ug/L

=====
 Formaldehyde 103 %
 =====

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

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9/28/05

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Case Narrative

Client: TNU HANFORD B04-001
LVL #: 0506L739
SDG/SAF#: H3213/B04-001

W.O. #: 11343-606-001-9999-00
Date Received: 06-14-2005

FORMALDEHYDE

Two (2) water samples were collected on 06-13-2005.

The samples and their associated QC samples were extracted on 06-15-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 06-16-2005. The extraction and analysis procedures were based on method 8315A.

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 LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. The method blank was below the reporting limits for all target compounds.
4. Surrogates are not currently employed in the methodology.
5. The blank spike recoveries were within acceptance criteria.
6. The matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
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.
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/8/05
Date

son\vr\group\data\cls\tnu\0506-739.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 7 pages.

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Bechtel Hanford Inc. **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** **B04-001-2** **Page 1 of 1**

Collector: **GALE, SJ** Telephone No.: **372-9216** Project Coordinator: **KESSNER, JH** Data Turnaround: **45 Days**

Project Designation: **ERDF - Semiannual Leachate Analysis** Company Contact: **T LAZARSKI** Price Code: **7N** Air Quality:

Ice Chest No.: **AFS-01-018** Sampling Location: **ERDF LEACHATE** SAF No.: **B04-001** Method of Shipment: **FED EX**

Field Logbook No.: **EL-1518-2** COA: **REDF22560** Bill of Lading/Air Bill No.: **SEE OSPC**

Shipped To: **EBERLINE SERVICES (LIONVILLE)**

POSSIBLE SAMPLE HAZARDS/REMARKS: **HISTORICAL DATA INDICATES <2K pCi/g. NO ACTIVITY REPORT REQUIRED**

Special Handling and/or Storage: **Cool. 4°C**

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Sample No.	Matrix *	Sample Date	Sample Time	Preservation		Cool 4C	HNO3 to pH <2	Cool 4C	HNO3 to pH <2	Cool 4C	HCl to pH <2	None
				Type of Container	No. of Container(s)							
J037M0	WATER	6-13-05	1100	1	3	500mL	G/P	1	G/P	1	G/P	G/P
J037M1	WATER	6-13-05	1105	1	3	500mL	G/P	1	G/P	1	G/P	G/P
J037M2	WATER	6-13-05		1	3	500mL	G/P	1	G/P	1	G/P	G/P
J037M3	WATER	6-13-05		1	3	500mL	G/P	1	G/P	1	G/P	G/P
J037M4	WATER	6-13-05		1	3	500mL	G/P	1	G/P	1	G/P	G/P

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Barium, Chromium, Vanadium, Zine); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Tin)

(2) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Sulfate)

Chain of Possession	Signature/Print Names	Date/Time
Relinquished By/Removed From: GALE, SJ	Received By/Stored In: GALE, SJ	Date/Time: 6/13/05 1155
Relinquished By/Removed From: GALE, SJ	Received By/Stored In: FEDEX	Date/Time: 6/13/05 1230
Relinquished By/Removed From: FEDEX	Received By/Stored In: FEDEX	Date/Time: 6/13/05 1230
Relinquished By/Removed From: FEDEX	Received By/Stored In: FEDEX	Date/Time: 6/14/05 0950
Relinquished By/Removed From: FEDEX	Received By/Stored In: FEDEX	Date/Time: 6/14/05 0950
Relinquished By/Removed From: FEDEX	Received By/Stored In: FEDEX	Date/Time: 6/14/05 0950
Relinquished By/Removed From: FEDEX	Received By/Stored In: FEDEX	Date/Time: 6/14/05 0950

LABORATORY SECTION Received By: _____ Date/Time: _____

FINAL SAMPLE DISPOSITION Disposal Method: _____ Date/Time: _____

Dispersed By: _____

Appendix 5

Data Validation Supporting Documentation

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GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	ERDF		DATA PACKAGE: H3213		
VALIDATOR:	TUI	LAB:	LLI	DATE: 9/22/03	
			SDG: H3213		
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
J037M0 J037M1					
water <i>59.1</i> 7/20					

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)

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: _____

GENERAL 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: no FB

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 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 STD so used LCS per guidelines

GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: _____

6. HOLDING TIMES (all levels)

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

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, 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: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluorilic ® (or other absorbant) cleanup performed? Yes No N/A
Lot check performed?..... Yes No N/A
Check recoveries acceptable? Yes No N/A
Check materials traceable?..... Yes No N/A
Check 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: 29 September 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: ERDF - Semiannual Leachate Analysis
Subject: Inorganics - Data Package No. H3213-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3213-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	Date
J037M0	6/13/05	Water	C	See note 1
J037M1	6/13/05	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 and DOE/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA. 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
- 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.

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· **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 "UJ".

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

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125% and a sample result less than the IDL, no qualification is required.

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".

Due to an RPD outside QC limits (94.4%), all zinc results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples J037M0/J037M1) 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. The RPD for zinc was outside QC limits (30.6%). Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the DOE/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision minimum detection limits (MDLs) to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific MDL.

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Completeness

Data package SDG No. H3213 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 laboratory blank contamination, all zinc results were qualified as estimated and flagged "UJ". Due to an RPD outside QC limits (94.4%), all zinc 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

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.

DOE/RL-2001-44, Rev. 0, *Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA*.

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.

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Appendix 1
Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with 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

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METALS DATA QUALIFICATION SUMMARY*

SDG: H3213	REVIEWER: TLI	Project: ERDF	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Zinc	UJ	All	Method blank contamination
Zinc	J	All	RPD

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

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/28/05

CLIENT: TNUHANFORD B04-001 H3213

LVL LOT #: 0506L740

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	J037M0	Arsenic, Total	30.5	u UG/L	30.5	1.0
		Barium, Total	100	UG/L	2.6	1.0
		Chromium, Total	30.8	UG/L	10.8	1.0
		Lead, Total	32.7	u UG/L	32.7	1.0
		Selenium, Total	30.7	u UG/L	30.7	1.0
		Tin, Total	16.0	u UG/L	16.0	1.0
		Vanadium, Total	24.5	UG/L	5.4	1.0
		Zinc, Total	19.8	u UG/L	1.6	1.0
-002	J037M1	Arsenic, Total	30.5	u UG/L	30.5	1.0
		Barium, Total	94.5	UG/L	2.6	1.0
		Chromium, Total	34.8	UG/L	10.8	1.0
		Lead, Total	32.7	u UG/L	32.7	1.0
		Selenium, Total	30.7	u UG/L	30.7	1.0
		Tin, Total	16.0	u UG/L	16.0	1.0
		Vanadium, Total	24.0	UG/L	5.4	1.0
		Zinc, Total	15.4	u UG/L	1.6	1.0

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Analytical Report

Client: TNU-HANFORD B04-001
LVL#: 0506L740
SDG/SAF#: H3213/B04-001

W.O.#: 11343-606-001-9999-00
Date Received: 06-14-05

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.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LVL'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), 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 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.
10. All matrix spike (MS) recoveries were within 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

000013 15 pages.

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.

RD CDL
Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

gmb/m06-740

Aug 1 2005
Date



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Bechtel Hanford Inc. **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** **B04-001-2** **Page 1 of 1**

Collector: **GALE, SJ** Telephone No. **372-9216** **Price Code 7N** **Data Turnaround 45 Days**

Project Designation: **ERDF - Semiannual Leachate Analysis** Project Coordinator: **KESSNER, JH** **Air Quality**

Ice Chest No. **ERC 96 012** COA **REIRDF22560** Method of Shipment: **FED EX**

Shipped To: **EBERLINE SERVICES (LIONVILLE)** Bill of Lading/Air Bill No. **A050243** SEE OSCP

POSSIBLE SAMPLE HAZARDS/REMARKS
HISTORICAL DATA INDICATES <2K pCi/g, NO ACTIVITY REPORT REQUIRED
SPH 2
Special Handling and/or Storage

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Cool 4C	HCl or H2SO4 to pH <2 Coo	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C	HNO3 to pH <2	Cool 4C	HCl to pH <2	HNO3 to pH <2	Cool 4C	None
J037M0	WATER	6/30/05	1100	aG	500mL	3	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	1000mL
J037M1	WATER	6/30/05	1105	aGs*	40mL	40mL	40mL	40mL	40mL	40mL	40mL	40mL	40mL	40mL	40mL	40mL
J037M2	WATER	6/30/05	1140	Carbonyls - 8315 (Formaldehyde)	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL
J037M3	WATER	6-6-05	0715	VDA - 8260A (TCL) (Carbon tetrachloride)	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL	500mL

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Sign/Print Names	Received By/Stored In	Date/Time
<i>[Signature]</i>	6-6-05 1320	REF ZA	REF ZA	6-6-05 1320
<i>[Signature]</i>	6-13-05 0715	REF ZA	REF ZA	6-13-05 0715
<i>[Signature]</i>	6-13-05 1300	REF ZA	REF ZA	6-13-05 1300
<i>[Signature]</i>	6-14-05 0950	REF ZA	REF ZA	6-14-05 0950

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)

NOTE: X* = 1 EACH 1000 ml

Sample No.	Matrix *	Sample Date	Sample Time	ICP Metals	IC Anions	Other
J037M0	WATER	6/30/05	1100	X	X	X
J037M1	WATER	6/30/05	1105	X	X	X
J037M2	WATER	6/30/05	1140	X*	X*	X*
J037M3	WATER	6-6-05	0715	X	X	X

LABORATORY SECTION Received By: _____ Title: _____ Date/Time: _____

FINAL SAMPLE DISPOSITION Disposal Method: _____ Disposed By: _____ Date/Time: _____

Appendix 5

Data Validation Supporting Documentation Documentation

000016

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF	DATA PACKAGE: #3213				
VALIDATOR: TLI	LAB: LLT		DATE: 9/20/05		
			SDG:		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J037M0		J037M1			
<i>Water</i> 3/21 <i>9/20</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 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 - UJ 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 PA

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: zinc RPD 94% - J all

FR Zinc FD - 30.6% - J all
9/20/02

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

000022

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/28/05

CLIENT: TNUHANFORD B04-001 H3213
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0506L740

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK1	05L0341-MB1	Arsenic, Total	30.5	u UG/L	30.5	1.0
		Barium, Total	2.6	u UG/L	2.6	1.0
		Chromium, Total	10.8	u UG/L	10.8	1.0
		Lead, Total	32.7	u UG/L	32.7	1.0
		Selenium, Total	30.7	u UG/L	30.7	1.0
		Tin, Total	16.0	u UG/L	16.0	1.0
		Vanadium, Total	5.4	u UG/L	5.4	1.0
		Zinc, Total	5.5	UG/L	1.6	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/28/05

CLIENT: TNUHANFORD B04-001 H3213

LVL LOT #: 0506L740

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	J037M1	Arsenic, Total	2190	30.5 u	2000	109.4	1.0
		Barium, Total	2190	94.5	2000	104.7	1.0
		Chromium, Total	250	34.8	200	107.6	1.0
		Lead, Total	535	32.7 u	500	107.0	1.0
		Selenium, Total	2160	30.7 u	2000	108.0	1.0
		Tin, Total	1100	16.0 u	1000	109.5	1.0
		Vanadium, Total	535	24.0	500	102.1	1.0
		Zinc, Total	530	15.4	500	103.0	1.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/28/05

CLIENT: TNUHANFORD B04-001 H3213

LVL LOT #: 0506L740

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	J037M0	Arsenic, Total	30.5 u	30.5 u	NC	1.0
		Barium, Total	100	104	3.1	1.0
		Chromium, Total	30.8	33.7	9.0	1.0
		Lead, Total	32.7 u	32.7 u	NC	1.0
		Selenium, Total	30.7 u	30.7 u	NC	1.0
		Tin, Total	16.0 u	16.0 u	NC	1.0
		Vanadium, Total	24.5	26.2	6.7	1.0
		Zinc, Total	19.8	7.1	94.4	1.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/28/05

CLIENT: TNUHANFORD B04-001 H3213
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0506L740

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
=====	=====	=====	=====	=====	=====	=====
LCS1	05L0341-LC1	Arsenic, LCS	9820	10000	UG/L	98.2
		Barium, LCS	4920	5000	UG/L	98.4
		Chromium, LCS	506	500	UG/L	101.2
		Lead, LCS	2460	2500	UG/L	98.3
		Selenium, LCS	9780	10000	UG/L	97.8
		Tin, LCS	4990	5000	UG/L	99.7
		Vanadium, LCS	2410	2500	UG/L	96.4
		Zinc, LCS	983	1000	UG/L	98.3

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Date: 29 September 2005
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: ERDF - Semiannual Leachate Analysis
Subject: Radiochemistry - Data Package No. H3213

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H3213, 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	Date
J037M0	6/13/05	Water	C	See note 1
J037M1	6/13/05	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 and DOE/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA. 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
- 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.

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- **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

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equal to two times the CRDL is used for soil samples and less than or equal to the 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 J037M0/J037M1) was submitted to EB for analysis. The duplicate sample results were compared using the same validation guidelines as for laboratory duplicates. All field duplicate results were acceptable.

• **Detection Levels**

Reported analytical detection levels are compared against the DOE/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision 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. H3213 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.

DOE/RL-2001-44, Rev. 0, *Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA*.

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.

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Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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Appendix 2
Summary of Data Qualification

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RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H3213	REVIEWER: TLI	PROJECT: ERDF	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

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

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3213

R506130-01

J037M0

DATA SHEET

SDG <u>7281</u>	Client/Case no <u>Hanford</u>	SDG <u>H3213</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R506130-01</u>	Client sample id <u>J037M0</u>	
Dept sample id <u>7281-001</u>	Location/Matrix <u>ERDF LEACHATE</u>	<u>WATER</u>
Received <u>06/15/05</u>	Collected/Volume <u>06/13/05 11:00</u>	<u>7.0 L</u>
	Custody/SAF No <u>B04-001-2</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	414	39	<u>8.0</u>	3.0		93A
Gross Beta	12587-47-2	736	21	<u>6.7</u>	4.0		93B
Carbon 14	14762-75-5	75.8	72	120	200	U	C
Technetium 99	14133-76-7	808	15	3.5	15		TC
Total Uranium (ug/L)	7440-61-1	1090	140	<u>2.2</u>	0.10		U_T
Total Radium	ALPHA-RA	0.054	0.18	0.31	1.0	U	RAT
Iodine 129	15046-84-1	-0.366	1.5	3.3	5.0	U	I

ERDF-Semiannual Leachate Analysis

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9/28/05

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>08/31/05</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3213

R506130-02

J037M1

DATA SHEET

SDG <u>7281</u>	Client/Case no <u>Hanford</u>	SDG <u>H3213</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R506130-02</u>	Client sample id <u>J037M1</u>	
Dept sample id <u>7281-002</u>	Location/Matrix <u>ERDF LEACHATE</u>	<u>WATER</u>
Received <u>06/15/05</u>	Collected/Volume <u>06/13/05 11:05</u>	<u>7.0 L</u>
	Custody/SAF No <u>B04-001-2</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	445	40	<u>10</u>	3.0		93A
Gross Beta	12587-47-2	704	21	<u>7.7</u>	4.0		93B
Carbon 14	14762-75-5	67.7	73	120	200	U	C
Technetium 99	14133-76-7	814	22	6.2	15		TC
Total Uranium (ug/L)	7440-61-1	1030	130	<u>2.2</u>	0.10		U_T
Total Radium	ALPHA-RA	0.060	0.10	0.31	1.0	U	RAT
Iodine 129	15046-84-1	.0.410	1.5	3.4	5.0	U	I

ERDF-Semiannual Leachate Analysis

Handwritten:
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 9/28/01

DATA SHEETS

Page 2

SUMMARY DATA SECTION

Page 16

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>08/31/05</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H3213 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 August 16 and 31, 2005.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis

The C-14 samples were reanalyzed because the matrix spike (54%) failed. No problems were encountered during the course of the reanalyses.

2.3 Iodine-129 Analysis

No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analysis

No problems were encountered during the course of the analyses.

2.5 Total Radium Analysis

No problems were encountered during the course of the analyses.

2.6 Total Uranium Analysis

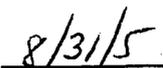
No problems were encountered during the course of the analyses.

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

Collector GALE, SI
 Project Designation ERDF - Semiannual Leachate Analysis
 Project Coordinator KESSNER, JH
 SAF No. B04-001
 Method of Shipment FED EX
 Telephone No. 372-9216
 Sampling Location ERDF LEACHATE
 Field Logbook No. EL-1518-2
 COA RERDF22560
 Offsite Property No. A050255

Shipped To **EBERLINE SERVICES** LIONVILLE
 POSSIBLE SAMPLE HAZARDS/REMARKS
 HISTORICAL DATA INDICATES <2K pCi/g. NO ACTIVITY REPORT
 REQUIRED
 Special Handling and/or Storage
 Bill of Lading/Air Bill No. SEE OSPC

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Cool 4C	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
J037M0	WATER	6-13-05	1100	aG	500mL	3	1	1	P	P	G/P	G/P	G/P
J037M1	WATER	6-13-05	1105	Carboys - 8315 (Formaldehyde tetrachloride)	500mL	40mL	500mL	500mL	500mL	500mL	1000mL	250mL	1000mL
J037M2	WATER												
J037M3	WATER												

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 FED EX	Date/Time 06/15/05 9:10
Received By/Removed From FED EX	Date/Time 06/15/05
Received By/Stored In FED EX	Date/Time
Received By/Removed From	Date/Time
Received By/Stored In	Date/Time
Received By/Removed From	Date/Time
Received By/Stored In	Date/Time
Received By/Removed From	Date/Time
Received By/Stored In	Date/Time

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

Appendix 5

Data Validation Supporting Documentation

000016

**APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF	DATA PACKAGE: H3213				
VALIDATOR: TLI	LAB: ER		DATE: 9/29/05		
			SDG: H320		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	F-129	tot Radon	C-14
SAMPLES/MATRIX					
J037M0					
J037M1					
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: _____

000017

3. Continuing Calibration (Levels D, E)

N/A

Calibration checked within required frequency? Yes No N/A

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

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

Calibration check standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

4. Background Counts (Levels D, E)

N/A

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

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

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

Comments: _____

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

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

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

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

Field blank results acceptable? Yes No N/A

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

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

Comments: no FB

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

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

LCS/BSS recoveries acceptable? Yes No N/A

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

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

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

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

Comments: _____

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

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

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

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

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

Comments: _____

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

Tracer added? Yes No N/A

Tracer recovery acceptable? Yes No N/A

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

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

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

Comments: _____

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

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

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

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

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

Comments: _____

A00020

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

Duplicates Analyzed at required frequency? Yes No N/A

RPD Values Acceptable? Yes No N/A

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

Comments: _____

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

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

Field duplicate RPD values acceptable? Yes No N/A

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

Field split RPD values acceptable? Yes No N/A

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

Performance audit sample results acceptable? Yes No N/A

Comments: _____ *NO FS/PAS*

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A

Comments: _____

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

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

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

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

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

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

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

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000023

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3213

R506130-04

Method Blank

METHOD BLANK

SDG <u>7281</u>	Client/Case no <u>Hanford</u>	SDG <u>H3213</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R506130-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7281-004</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	QUALIFIERS	TEST
Gross Alpha	12587-46-1	-0.090	1.3	<u>3.5</u>	3.0	U	93A
Gross Beta	12587-47-2	-2.22	3.8	<u>7.0</u>	4.0	U	93B
Technetium 99	14133-76-7	-0.031	1.5	5.5	15	U	TC
Total Uranium (ug/L)	7440-61-1	0	0.009	0.022	0.10	U	U_T
Total Radium	ALPHA-RA	-0.080	0.10	0.47	1.0	U	RAT
Iodine 129	15046-84-1	0.629	1.3	2.8	5.0	U	I

ERDF-Semiannual Leachate Analysis

QC-BLANK 53522

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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>08/31/05</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3213

R506130-08

Method Blank

METHOD BLANK

SDG <u>7281</u>	Client/Case no <u>Hanford</u>	SDG <u>H3213</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R506130-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7281-008</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B04-001</u>	

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Carbon 14	14762-75-5	6.54	73	120	200	U	C

ERDF-Semiannual Leachate Analysis

QC-BLANK 54108

METHOD BLANKS

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SUMMARY DATA SECTION

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Lab id <u>EBRINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>08/31/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3213

R506130-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7281</u>	Client/Case no <u>Hanford</u>	<u>SDG H3213</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R506130-03</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7281-003</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	99.7	13	<u>4.8</u>	3.0	93A	128	5.1	78	71-129	70-130
Gross Beta	123	9.2	<u>7.0</u>	4.0	93B	125	5.0	98	75-125	80-120
Technetium 99	1090	26	5.1	15	TC	1090	44	100	83-117	80-120
Total Uranium (ug/L)	72.5	8.6	<u>0.22</u>	0.10	U_T	82.5	3.3	88	79-121	80-120
Total Radium	42.6	2.1	0.62	1.0	RAT	56.0	2.2	<u>76</u>	90-110	80-120
Iodine 129	383	7.9	<u>14</u>	5.0	I	464	19	<u>83</u>	91-109	80-120

ERDF-Semiannual Leachate Analysis

QC-LCS 53521

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

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000026

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>08/31/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3213

R506130-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7281</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R506130-07</u> Dept sample id <u>7281-007</u>	Client/Case no <u>Hanford</u> <u>SDG H3213</u> Contract No. <u>630</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
Carbon 14	15500	540	<u>280</u>	200	C	15900	640	97	83-117	80-120

ERDF-Semiannual Leachate Analysis

QC-LCS 54107

000027

Lab id EBRINE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LCS
 Version 3.06
 Report date 08/31/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3213

R506130-05

J037M0

DUPLICATE

SDG 7281

Contact Melissa C. Mannion

DUPLICATE

Lab sample id R506130-05

Dept sample id 7281-005

ORIGINAL

Lab sample id R506130-01

Dept sample id 7281-001

Received 06/15/05

Client/Case no Hanford SDG H3213

Contract No. 630

Client sample id J037M0

Location/Matrix ERDF LEACHATE WATER

Collected/Volume 06/13/05 11:00 7.0 L

Custody/SAF No B04-001-2 B04-001

ANALYTE	DUPLICATE		MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL		MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT LIMIT	PROT
	pCi/L	2σ ERR (COUNT)					pCi/L	2σ ERR (COUNT)					
Gross Alpha	386	37	<u>11</u>	3.0		93A	414	39	<u>8.0</u>		7	47	
Gross Beta	698	21	<u>7.8</u>	4.0		93B	736	21	<u>6.7</u>		5	32	
Technetium 99	799	34	6.5	15		TC	808	15	3.5		1	22	
Total Uranium (ug/L)	1100	140	<u>2.2</u>	0.10		U_T	1090	140	<u>2.2</u>		1	33	
Total Radium	0.047	0.097	0.30	1.0	U	RAT	0.054	0.18	0.31	U	-	-	
Iodine 129	-0.487	1.8	4.1	5.0	U	I	-0.366	1.5	3.3	U	-	-	

ERDF-Semiannual Leachate Analysis

QC-DUP#1 53523

DUPLICATES

Page 1

SUMMARY DATA SECTION

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000028

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-DUP
 Version 3.06
 Report date 08/31/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3213

R506130-09

J037M0

DUPLICATE

SDG <u>7281</u> Contact <u>Melissa C. Mannion</u> DUPLICATE Lab sample id <u>R506130-09</u> Dept sample id <u>7281-009</u>	ORIGINAL Lab sample id <u>R506130-01</u> Dept sample id <u>7281-001</u> Received <u>06/15/05</u>	Client/Case no <u>Hanford</u> <u>SDG H3213</u> Contract No. <u>630</u> Client sample id <u>J037M0</u> Location/Matrix <u>ERDF LEACHATE</u> <u>WATER</u> Collected/Volume <u>06/13/05 11:00</u> <u>7.0 L</u> Custody/SAF No <u>B04-001-2</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 PROT TOT LIMIT
Carbon 14	89.4	75	120	200	U	C	75.8	72	120	U	-	

ERDF-Semiannual Leachate Analysis

DUPLICATES

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SUMMARY DATA SECTION

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000029

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>08/31/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3213

R506130-10

J037M0

MATRIX SPIKE

SDG <u>7281</u>	Client/Case no <u>Hanford</u>	SDG <u>H3213</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
MATRIX SPIKE	ORIGINAL	
Lab sample id <u>R506130-10</u>	Lab sample id <u>R506130-01</u>	Client sample id <u>J037M0</u>
Dept sample id <u>7281-010</u>	Dept sample id <u>7281-001</u>	Location/Matrix <u>ERDF LEACHATE</u> <u>WATER</u>
	Received <u>06/15/05</u>	Collected/Volume <u>06/13/05 11:00</u> <u>7.0 L</u>
		Custody/SAF No <u>B04-001-2</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)	LIMITS LIMITS
Carbon 14	25200	860	<u>350</u>	200	X C	31900	1300	75.8	72	<u>79</u>	86-114 60-140

ERDF-Semiannual Leachate Analysis

MATRIX SPIKES

Page 1

SUMMARY DATA SECTION

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Lab id <u>EBRLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-MS</u>
Version <u>3.06</u>
Report date <u>08/31/05</u>

Date: 29 September 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: ERDF - Semiannual Leachate Analysis
Subject: Volatiles - Data Package No. H3213-LLI

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H3213 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	Date
J037M0	6/13/05	Water	C	See note 1
J037M1	6/13/05	Water	C	See note 1
J037M4	6/6/05	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 and DOE/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA. 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

000001

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".

All holding times were acceptable.

- **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 (JO37M4) 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

000002

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.

000003

Field Duplicate Samples

One pair of field duplicate samples (samples J037M0/J037M1) was 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/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision 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. H3213-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 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.

000004

DOE/RL-2001-44, Rev. 0, *Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA.*

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.

000005

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: H3213	REVIEWER: TLI	PROJECT: ERDF	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.

000009

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000010

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (UG/L)

Project: BECHTEL-HANFORD			
Laboratory: LLI			
Case:	J037M0	J037M1	J037M4
Sample Number	J037M0	Duplicate	T. Blank
Remarks		06/13/05	06/06/05
Sample Date	06/13/05	06/15/05	06/15/05
Analysis Date	06/15/05	Result	Q
VOA	MDL	Result	Q
Carbon Tetrachloride	0.71	5 U	5 U

000011

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

Lionville Laboratory, Inc.

Volatiles By GC/MS, Special List

00000000

Sample Information	RFW#:	Matrix:	D.F.:	Units:	J037M0	J037M0	J037M0	J037M0	J037M1	J037M4	VBLKWG
1,2-Dichloroethane-d4	90	%	1.00	UG/L	97	%	105	%	91	%	93
Surrogate	101	%	1.00	UG/L	96	%	98	%	99	%	101
Recovery	99	%	1.00	UG/L	100	%	106	%	98	%	102
Carbon Tetrachloride	5	U	1.00	UG/L	106	%	107	%	5	U	5

Cust ID: VBLKWG BS

Sample Information
 RFW#: 05LVX138-MB1
 Matrix: WATER
 D.F.: 1.00
 Units: UG/L

1,2-Dichloroethane-d4	92	%	1.00	UG/L	96	%	106	%	98	%	102
Surrogate	96	%	1.00	UG/L	96	%	106	%	98	%	102
Recovery	99	%	1.00	UG/L	100	%	106	%	98	%	102
Carbon Tetrachloride	112	%	1.00	UG/L	106	%	107	%	5	U	5

*= Outside of EPA CLP QC limits.

R 9/28/05

000012

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013



Case Narrative

Client: TNU-HANFORD B04-001
LVL #: 0506L740
SDG/SAF # H3213/B04-001

W.O. #: 11343-606-001-9999-00
Date Received: 06-14-2005

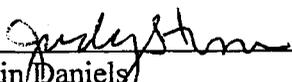
GC/MS VOLATILE

Three (3) water samples were collected on 06-06,13-2005.

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 client specified volatile target compound Carbon Tetrachloride on 06-15-2005.

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 LvLI's sample acceptance policy.
2. Samples were analyzed within required holding time.
3. A non-target, the Methylene Chloride was detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. The matrix spike recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. Internal standard area and retention time criteria were met.
8. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
9. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
10. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/28/08
Date

son\group\data\voal\tnu-hanford\0506-740.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 13 pages. 000014

Collector: GALE, SJ
 Project Designation: ERDF - Semiannual Leachate Analysis
 Project Coordinator: KESSNER, JH
 SAF No.: B04-001
 Method of Shipment: FED EX
 Telephone No.: 372-9216
 Sampling Location: ERDF LEACHATE
 Field Logbook No.: EL-1518-2
 COA: RERDF22560
 Bill of Lading/Air Bill No.: SEE OSCP

Shipped To: EBERLINE SERVICES (IONVILLE)
 POSSIBLE SAMPLE HAZARDS/REMARKS: HISTORICAL DATA INDICATES <2K pCi/g. NO ACTIVITY REPORT REQUIRED <PH 2
 Special Handling and/or Storage: N/A
 Offsite Property No.: A050243
 See OSCP

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		Cool 4C	HCl or H2SO4 to pH <2 Cool	IN03 to pH <2	Cool 4C	Cool 4C	Cool 4C	IN03 to pH <2	HCl to pH <2	None
				Type of Container	No. of Container(s)									
J037M0	WATER	6/3/05	1100	aG	1	500mL	3	1	1	P	500mL	2	G/P	G/P
J037M1	WATER	6/3/05	1105	Carbonyle - R115 (Formaldehyde)	1	500mL	40mL	500mL	1	P	500mL	1000mL	G/P	1000mL
J037M2	WATER	6/3/05	1140	See Item (1) in Special Instructions.	1	500mL	40mL	500mL	1	P	500mL	1000mL	G/P	1000mL
J037M3	WATER	6-6-05	0715	See Item (2) in Special Instructions.	1	500mL	40mL	500mL	1	P	500mL	1000mL	G/P	1000mL

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)

NOTE: X* = 1 EACH 1000 ml

Received By/Removed From	Date/Time						
SALE	6-6-05 1320	REF ZA	6-6-05 1320	SALE	6-6-05 1300	REF ZA	6-14-05 0950
SALE	6-6-05 0715						
SALE	6-6-05 1300						
SALE	6-14-05 0950						

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

Appendix 5

Data Validation Supporting Documentation

000016

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	ERDF		DATA PACKAGE: H3213		
VALIDATOR:	TLD	LAB: LLP	DATE: 9/24/05		
			SDG: H3213		
ANALYSES PERFORMED					
SW-846 8260	SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)	
SAMPLES/MATRIX					
J037M0		J037M1	J037M4		
water site 9/25					

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: _____

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: _____

Date: 29 September 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: ERDF - Semiannual Leachate Analysis
Subject: Wet Chemistry - Data Package No. H3213-LLI

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H3213 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	Date
J037M0	6/13/05	Water	C	See note 1
J037M1	6/13/05	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 and DOE/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA. 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
- 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

"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".

Due to an RPD outside QC limits (25.5%), all sulfate results were qualified as estimates and flagged "J".

All other laboratory duplicate results were within the required control limits.

Field Duplicate Samples

One pair of field duplicate samples (samples J037M0/J037M1) 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. The RPD for sulfate (22%) was outside QC limits. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the DOE/RL-2001-44, Rev. 0, Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision minimum detection limits (MDLs) to ensure that laboratory detection levels meet the required criteria. All undetected results exceeded the MDL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H3213 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 an RPD outside QC limits (25.5%), all sulfate results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All undetected 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.

DOE/RL-2001-44, Rev. 0, *Proposed Plan for an Amendment to the Environmental Restoration Disposal Facility Record of Decision, Hanford Site, Richland, WA.*

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).

Appendix 2
Summary of Data Qualification

000007

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H3213	REVIEWER: TLI	Project: ERDF	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Sulfate	J	All	RPD

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

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: BECHTEL-HANFORD		J037M1	
Laboratory: Lionville Laboratory, Inc.		Duplicate	
Case	SDG: H3213	06/13/05	
Sample Number	J037M0	CRDL	Q
Remarks		Result	Result
Sample Date	06/13/05	0.25	0.90
General Chemistry		0.1	288
Bromide		0.05	0.26
Chloride		0.05	0.25
Fluoride		2.50	U
Nitrite		0.05	2.50
Nitrate		0.05	U
Sulfate		477	458
Specific conductance*		0.25	632
Total dissolved solids		0.15	507
		4.70	2980
			2120

* Units are UMGHOS/CM

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.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/13/05

CLIENT: TNUHANFORD B04-001 H3213
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0506L739

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J037M0	Bromide by IC	0.90	MG/L	0.25	1.0
		Chloride by IC	288	MG/L	25.0	100
		Fluoride by IC	0.26	MG/L	0.25	1.0
		Nitrite by IC	2.50 u	MG/L	2.50	10.0
		Nitrate by IC	477	MG/L	25.0	100
		Sulfate by IC	632	J MG/L	25.0	100
-002	J037M1	Bromide by IC	0.92	MG/L	0.25	1.0
		Chloride by IC	242	MG/L	25.0	100
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	2.50 u	MG/L	2.50	10.0
		Nitrate by IC	458	MG/L	25.0	100
		Sulfate by IC	507	J MG/L	25.0	100

R 9/28/05

000011

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/13/05

CLIENT: TNUHANFORD B04-001 H3213
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0506L740

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J037M0	Specific Conductance	3120	US/CM	1.0	1.0
		Total Dissolved Solids	2200	MG/L	10.0	1.0
-002	J037M1	Specific Conductance	2980	US/CM	1.0	1.0
		Total Dissolved Solids	2120	MG/L	10.0	1.0

✓
9/28/05

000012

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013



Analytical Report

Client: TNU-HANFORD B04-001 H3213
LVL#: 0506L740

W.O.#: 11343-606-001-9999-00
Date Received: 06-14-05

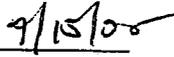
INORGANIC NARRATIVE

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.

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

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 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 was within the 20% Relative Percent Difference (RPD) control limit.
7. The replicate analysis for Specific Conductance was within the 20% RPD control limit.
8. 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


Date

njpi06-740

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 12 pages.

000014

02



Analytical Report

Client: TNU-HANFORD B04-001 H3213
LVL#: 0506L739

W.O.#: 11343-606-001-9999-00
Date Received: 06-14-05

INORGANIC NARRATIVE

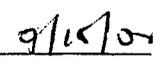
1. This narrative covers the analyses of 2 water samples.
2. The samples were prepared and analyzed in accordance with the method checked on the attached glossary.

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

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.
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 and Nitrate were within the 20% Relative Percent Difference (RPD) control limit however replicate analysis for Sulfate was outside the control limits at 25.5%.
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


Date

njpl06-739

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 12 pages.

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00000121

Bechtel Hanford Inc. **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** **B04-001-2** **Page 1 of 1**

Collector: **GALE, SJ** Project Coordinator: **KESSNER, JH** Price Code: **7N** Data Turnaround: **45 Days**

Project Designation: **ERDf - Semiannual Leachate Analysis** SAF No.: **D04-001** Air Quality:

Ice Chest No.: **AFS-01-018** Method of Shipment: **FED EX**

Company Contact: **T LAZARSKI** Telephone No.: **372-9216**

Sampling Location: **ERDF LEACHATE**

Field Logbook No.: **EL-1518-2** COA: **RERDF22560**

Shipped To: **EDERLINE SERVICES (LIONVILLE)**

Offsite Property No.: **A050242**

Bill of Lading/Air Bill No.: **SEE OSPC**

POSSIBLE SAMPLE HAZARDS/REMARKS
HISTORICAL DATA INDICATES <K pCi/g, NO ACTIVITY REPORT REQUIRED

Special Handling and/or Storage: **Cool 4°C**

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		Cool 4C	HCl or H2SO4 to pH < 2 Cool	HNO3 to pH < 2	Cool 4C	Cool 4C	Cool 4C	HCl to pH < 2	None
				Type of Container	No. of Container(s)								
J037M0	WATER	6-13-05	1100	1	3	500mL	40mL	500mL	500mL	500mL	500mL	250mL	1000mL
J037M1	WATER	6-13-05	1105	1	3	500mL	40mL	500mL	500mL	500mL	500mL	250mL	1000mL
J037M2	WATER	6-13-05	1105	1	3	500mL	40mL	500mL	500mL	500mL	500mL	250mL	1000mL
J037M3	WATER	6-13-05	1105	1	3	500mL	40mL	500mL	500mL	500mL	500mL	250mL	1000mL

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Matrix *	Sample Date	Sample Time	Received By/Stored In	Date/Time
<i>[Signature]</i>	6-13-05 1155	WATER	6-13-05	1100	<i>[Signature]</i>	6-13-05 1155
<i>[Signature]</i>	6-13-05 1230	WATER	6-13-05	1105	FED EX	6-13-05 1230
<i>[Signature]</i>	6-14-05 0950	WATER	6-13-05	1105	<i>[Signature]</i>	6-14-05 0950
<i>[Signature]</i>	6-14-05 0950	WATER	6-13-05	1105	<i>[Signature]</i>	6-14-05 0950

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)

LABORATORY SECTION Received By: _____ Title: _____

FINAL SAMPLE DISPOSITION Disposed By: _____ Date/Time: _____

Bechtel Hanford Inc. Page 1 of 1
B04-001-2 Price Code **7N** Data Turnaround **45 Days**
 Collector **GALE, SJ** Project Coordinator **KESSNER, JH**
 Project Designation **ERDF - Semiannual Leachate Analysis** SAF No. **D04-001** Air Quality
 Ice Chest No. **ERC 96 012** COA **REKDJ22560** Method of Shipment **FED EX**

Shipped To **EBERLINE SERVICES (LIONVILLE)** Bill of Lading/Air Bill No. **A050293**
SEE OSCP

POSSIBLE SAMPLE HAZARDS/REMARKS
HISTORICAL DATA INDICATES <2K pCi/g. NO ACTIVITY REPORT REQUIRED
SPH 2
Special Handling and/or Storage
NA

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Cool 4C	HCl or H2SO4 to pH <2 Cool	HNO3 to pH <2	Cool 4C	Cool 4C	HCl to pH <2	None
J037M0	WATER	6/30/05	1100	aG	500mL	3	1	1	P	G/P	G/P
J037M1	WATER	6/30/05	1105	Carbonyls - 8315 (Formaldehyde)	500mL	40mL	500mL	500mL	P	G/P	G/P
J037M2	WATER	6/30/05	1140	VOA - P260A (TCL) (Carbon tetrachloride)	500mL	500mL	500mL	500mL	1	2	4
J037M3	WATER	6-6-05	0715	See Item (1) in Special Instructions.	500mL	500mL	500mL	500mL	1	1	1000mL

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
<i>[Signature]</i>	6/6/05 1320	REF 2A	6/6/05 1320
<i>[Signature]</i>	6/30/05 0715	<i>[Signature]</i>	6/30/05 0715
<i>[Signature]</i>	6/30/05 1300	FED EX	
<i>[Signature]</i>	6-14-05 0950	<i>[Signature]</i>	6/14/05 0950
<i>[Signature]</i>		<i>[Signature]</i>	

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)
NOTE: X* = 1 EACH 1000 ml

Matrix *
 S=Soil SE=Soil/Sludg
 SO=Solid SI=Sludge W=Water O=Oil A=Air
 US=Drum Solids DL=Drum Liquids T=Tar
 Wt=Wipe L=Liquid V=Vegetation X=Other

LABORATORY SECTION Received By
 FINAL SAMPLE DISPOSITION Disposal Method

Disposed By
 Date/Time

Appendix 5

Data Validation Supporting Documentation

000018

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	ERDF		DATA PACKAGE: H3213		
VALIDATOR:	TLI	LAB: LLI	DATE: 9/21/05		
		SDG: H3213			
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO ₃ /NO ₂
Sulfate	TDS	TKN	Phosphate	<i>(Signature)</i>	
SAMPLES/MATRIX					
J037M0 J037M1					
<i>Soft water</i> 7/200					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

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

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

Initial calibrations acceptable? Yes No N/A

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

ICV and CCV checks acceptable? Yes No N/A

Standards traceable? Yes No N/A

Standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

- ICB and CCB checks performed for all applicable analyses? (Levels D, E) Yes No N/A
- ICB and CCB results acceptable? (Levels D, E) Yes No N/A
- Laboratory blanks analyzed? Yes No N/A
- Laboratory blank results acceptable? Yes No N/A
- Field blanks analyzed? (Levels C, D, E) Yes No N/A
- Field blank results acceptable? (Levels C, D, E) Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: no FB

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

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

Comments: no DATS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: subject 25.570 - 5 all

FD - 50150 2290

6. HOLDING TIMES (all levels)

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Comments: all undetect over

Appendix 6

Additional Documentation Requested by Client

000023

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/13/05

CLIENT: TNUHANFORD B04-001 H3213
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0506L739

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LIC044-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
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	05LICA44-MB1	Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0

000024

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/13/05

CLIENT: TNUHANFORD B04-001 H3213
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0506L739

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J037M0	Bromide by IC	10.2	0.90	10.0	93.0	2.0
		Chloride by IC	1330	288	1000	103.7	200
		Fluoride by IC	9.8	0.26	10.0	95.5	2.0
		Nitrite by IC	101	2.50u	100	101.3	20.0
		Nitrate by IC	1590	477	1000	111.2	200
		Sulfate by IC	1610	632	1000	97.3	200
BLANK10	05LIC044-MB1	Bromide by IC	4.9	0.25u	5.0	97.9	1.0
		Chloride by IC	4.6	0.25u	5.0	92.9	1.0
		Fluoride by IC	4.8	0.25u	5.0	96.4	1.0
		Sulfate by IC	4.9	0.25u	5.0	97.3	1.0
BLANK10	05LICA44-MB1	Nitrite by IC	4.86	0.25u	5.00	97.1	1.0
		Nitrate by IC	4.84	0.25u	5.00	96.8	1.0

000025

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/13/05

CLIENT: TNOHANFORD B04-001 H3213
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0506L739

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE RPD		DILUTION FACTOR (REP)
-----	-----	-----	-----	-----	-----	-----
-001REP	J037M0	Bromide by IC	0.90	0.90	0.11	1.0
		Chloride by IC	288	245	16.1	100
		Fluoride by IC	0.26	0.25u	NC	1.0
		Nitrite by IC	2.50u	2.50u	NC	10.0
		Nitrate by IC	477	445	7.0	100
		Sulfate by IC	632	489	25.5	100

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/13/05

CLIENT: TNUHANFORD B04-001 H3213
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0506L740

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LSP014-MB1	Specific Conductance	1.0	u US/CM	1.0	1.0
BLANK10	05LSSA64-MB1	Total Dissolved Solids	5.00	u MG/L	5.00	1.0

000027

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/13/05

CLIENT: TNUHANFORD B04-001 H3213

LVL LOT #: 0506L740

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
BLANK10	05LSP014-MB1	Specific Conductance	727	1.0 u	718	101.3	1.0
BLANK10	05LSSA64-MB1	Total Dissolved Solids	98.0	5.00u	100	98.0	1.0
		Total Dissolved Solids	103	5.00u	100	103.0	1.0

000028

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 07/13/05

CLIENT: TNUHANFORD B04-001 H3213
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0506L740

SAMPLE	SITE ID	ANALYTE	SPIKE#1		SPIKE#2	
			%RECOV	%RECOV	%RECOV	%DIFF
BLANK10	05LSSA64-MB1	Total Dissolved Solids	98.0	103.0	5.0	

000029

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/13/05

CLIENT: TNUHANFORD B04-001 H3213

LVL LOT #: 0506L740

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J037M0	Specific Conductance	3120	3140	0.55	1.0

000030