SAF-RC-008
ERDF Groundwater Well Samples
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt H4-21

COMMENTS:

SDG K3987 SAF-RC-008

ERDF GROUNDWATER WELL SAMPLES – Sept. 2012

Date: 20 November 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: ERDF Groundwater Well Samples – September 2012
Subject: Inorganics - Data Package No. K3987-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3987 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B2LXB4	9/11/12	Water	C	See note 1
B2LXB2	9/11/12	Water	C	See note 1
B2LX83	9/11/12	Water	C	See note 1
B2LX82	9/11/12	Water	C	See note 1
B2LX87	9/11/12	Water	C	See note 1
B2LX89	9/11/12	Water	C	See note 1
B2LX90	9/11/12	Water	C	See note 1
B2LX88	9/11/12	Water	C	See note 1
B2LXB1	9/11/12	Water	C	See note 1
B2LXB3	9/11/12	Water	C	See note 1

1 - ICP metals by 6010B.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-198, Rev. 0, "Groundwater Protection Plan for the Environmental Restoration Disposal Facility". Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

Holding Times & Sample Preservation

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 sample preservation and holding times were met.

- **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 method blank contamination, all detected aluminum results were qualified as undetected and flagged "UJ".

Due to method blank contamination, the barium result in samples B2LXB4, B2LXB2 and B2LX90 were qualified as undetected and flagged "UJ".

Due to method blank contamination, the manganese result in samples B2LXB4, B2LX87, B2LX89, B2LXB1 and B2LXB3 were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field Blanks

Two trip blanks (B2LXB2 & B2LXB4) and two equipment blanks (B2LX88 & B2LX90) were submitted for analysis. Sodium was detected in sample B2LX90. Under the WCH statement of work, no qualification is required.

- **Accuracy`**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 25% and a sample result below the instrument detection limit (IDL) are rejected and flagged

"UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

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 ample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were acceptable.

Field Duplicate Samples

No field duplicate samples were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All laboratory detection levels met the analyte specific RQL.

- **Completeness**

Data package No. K3987 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, all detected aluminum results were qualified as undetected and flagged "UJ".

- Due to method blank contamination, the barium result in samples B2LXB4, B2LXB2 and B2LX90 were qualified as undetected and flagged "UJ".

- Due to method blank contamination, the manganese result in samples B2LXB4, B2LX87, B2LX89, B2LXB1 and B2LXB3 were qualified as undetected and flagged "UJ".

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

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

WCH-198, Rev 0, *Groundwater Protection Plan for the Environmental Restoration Disposal Facility*, February 2008.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

INORGANICS ORGANIC DATA QUALIFICATION SUMMARY*

SDG: K3987	**REVIEWER: ELR**	**Project: ERDF**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES	REASON
Barium	UJ	B2LXB4, B2LXB2 B2LX90	Method blank Contamination
Manganese	UJ	B2LXB4, B2LX87 B2LX89, B2LXB1 B2LXB3	Method blank contamination
Aluminum	UJ	All (except B2LX90)	Method blank contamination

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

Appendix 3

Annotated Laboratory Reports

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	**Reported:** 09/18/2012 13:46

B2LXB4
1209032-01 (Water)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory		11/20/12				
Metals by SW846 6000/7000 series									
Aluminum	**14.3**	B UJ	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	4.00	U	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	**0.395**	B UJ	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	1000	U	1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	50.0	U	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	750	U	750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	**0.527**	B UJ	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	4000	U	4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	500	U	500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	25.0	U	25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/18/2012 13:46

B2LXB2

1209032-02 (Water)

11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Aluminum	**10.9**	B UJ	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	4.00	U	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	**0.300**	B UJ	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	1000	U	1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	50.0	U	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	750	U	750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	4000	U	4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	500	U	500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	25.0	U	25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/18/2012 13:46

B2LX83
1209032-03 (Water)

11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Aluminum	25.4	B UJ	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	3.08	B	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	40.4		5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	42800		1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	17.9		2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	276		50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	12600		750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	10.6		5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	5500		4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	5.78		5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	19900		500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	37.0		25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

000000041

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	**Reported:** 09/18/2012 13:46

B2LX82
1209032-04 (Water)

V 11/20/12

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**22.1**	B V3	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	**3.32**	B	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	**38.8**		5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	**40900**		1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	**17.2**		2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	**284**		50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	**12100**		750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	**7.93**		5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	**5270**		4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	**4.77**	B	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	**19100**		500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	**35.6**		25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

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WC-Hanford, Inc.	Project: RC-008	
2620 Fermi Avenue	Project Number: K3987	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/18/2012 13:46

B2LX87
1209032-05 (Water)

11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**12.9**	B UJ	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	**2.38**	B	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	**58.0**		5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	**51100**		1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	**3.51**		2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	50.0	U	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	**16000**		750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	**1.06**	B UJ	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	**5400**		4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	**4.55**	B	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	**20000**		500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	**35.5**		25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/18/2012 13:46

B2LX89
1209032-06 (Water)

11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**32.8**	B UJ	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	**2.07**	B	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	**59.3**		5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	**52200**		1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	**4.35**		2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	**30.7**	B	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	**16400**		750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	**2.11**	B UJ	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	**5510**		4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	**3.63**	B	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	**20400**		500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	**36.2**		25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/18/2012 13:46

B2LX90
1209032-07 (Water)

✓ 10/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	50.0	U	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	4.00	U	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	**0.352**	B UJ	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	1000	U	1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	50.0	U	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	750	U	750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	4000	U	4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	**31.5**	B	500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	25.0	U	25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

LIONVILLE LABORATORY
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264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-008	
2620 Fermi Avenue	Project Number: K3987	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/18/2012 13:46

B2LX88
1209032-08 (Water)

√ 11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**12.9**	B UJ	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	4.00	U	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	1000	U	1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	50.0	U	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	750	U	750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	4000	U	4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	500	U	500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	25.0	U	25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/18/2012 13:46

B2LXB1
1209032-09 (Water)

V 11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Aluminum	**16.5**	B UJ	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	**2.09**	B	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	**75.7**		5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	**67400**		1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	**2.51**		2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	50.0	U	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	**22100**		750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	**0.533**	B UJ	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	**5640**		4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	**4.96**	B	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	**19100**		500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	**34.2**		25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/18/2012 13:46

B2LXB3
1209032-10 (Water)

11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**24.8**	B U5	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Antimony	6.00	U	6.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Arsenic	**2.25**	B	4.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Barium	**76.9**		5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cadmium	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Calcium	**68200**		1000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Chromium	**2.59**		2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Cobalt	20.0	U	20.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Copper	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Iron	50.0	U	50.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Lead	5.00	U	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Magnesium	**22400**		750	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Manganese	**0.986**	B U5	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Nickel	40.0	U	40.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Potassium	**5750**		4000	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Selenium	**4.86**	B	5.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Silver	2.00	U	2.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Sodium	**19500**		500	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Tin	1.00	U	1.00	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Vanadium	**35.0**		25.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B
Zinc	10.0	U	10.0	ug/L	1	L209093	09/14/2012	09/17/2012	6010B

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-008
LVL#: 1209032
SDG/SAF#: K3987/RC-008

W.O.#: 60049-001-001-0001-00
Date Received: 09-12-12

METALS

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

1. This narrative covers the analyses of 10 water samples.

2. The samples were prepared and analyzed in accordance with methods listed on the data report forms.

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

4. Please refer to the Sample Receipt Check List for any sample discrepancies in 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 LOQ).

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation, samples greater than 20X MB value}.

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

9. All laboratory control samples (LCS) were within the 80-120% control limits.

10. All matrix spike (MS) recoveries were within the 75-125% control limits.

11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample result for Aluminum was less than ten times the MDL.

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 pages.

12. For the purposes of this report, the data have been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

13. LvL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

_____ _____

Iain Daniels
Laboratory Manager
Lionville Laboratory

Date

alm/09-032

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-017
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50199	Ice Chest No.	N/A GNS-179
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	7989 4096 4322
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4029

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LXB4	N	W	SEP 11 2012	0745	1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB4	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LXB4	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LXB4	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LXB4	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB4	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LXB4	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LXB4	N	W			3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C
B2LXB2	Y	W	SEP 11 2012	0745	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			SEP 11 2012	FED EX			SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
FedEx		9-12-12	1010	VICTOR HERNANDEZ		9-12-12	1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 8/2/2012

A-6004-842 (REV 2)

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-018
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 Jul 94	Ice Chest No.	N/A FWS-179
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	~~N/A~~ 7989 4096 4322
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4029

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LX83	N	W	SEP 11 2012	1030	1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LX83	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LX83	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LX83	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LX83	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LX83	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LX83	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX83	N	W			3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C
B2LX82	Y	W	SEP 11 2012	1030	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2

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Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			1400 SEP 11 2012	FED EX			SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
Ed Eo			9-12-12 1010	Victor Hernandez			9-12-12 1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 8/2/2012

A-6004-842 (REV 2)

000000005

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-012
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50/94	Ice Chest No.	N/A GWS-179
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	9.11.12 ~~N/A~~ 798940964322
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4029

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI

**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).

**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LX87	Y	W	SEP 11 2012	0941	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX89	N	W			1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LX89	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LX89	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LX89	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LX89	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LX89	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LX89	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX89	N	W	SEP 11 2012	0941	3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C

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Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			1900 SEP 11 2012	FED EX			SEP 11 2012
Fed Ex		9-12-12	1010	Victor Hernandez		9-12-12	1010

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C.# RC-008Q-013
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50 194	Ice Chest No.	N/A GWS-246
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	~~N/A~~ 7989 4091 7544
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4028

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LX90	N	W	SEP 11 2012	0900	1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool-4C
B2LX90	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool-4C
B2LX90	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LX90	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool-4C
B2LX90	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool-4C
B2LX90	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool-4C
B2LX90	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX90	N	W			3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool-4C
B2LX88	Y	W	SEP 11 2012	0700	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			1500 SEP 11 2012	FED EX			SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
Fed Ex		9-12-12	1010	Victor Hernandez		9-12-12	1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 8/2/2012

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-016
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50194	Ice Chest No.	N/A 6 INS-246
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	~~N/A~~ 7989 4091 7514
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4028

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI

**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).

**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LXB1	Y	W	SEP 11 2012	0858	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LXB3	N	W			1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB3	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LXB3	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LXB3	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LXB3	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB3	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LXB3	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LXB3	N	W	SEP 11 2012	0858	3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C

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Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			1400 SEP 11 2012	FED EX			SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
FED EX		9-12-12	1010	VICTOR HERNANDEZ		9-12-12	1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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Appendix 5

Data Validation Supporting Documentation Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF			DATA PACKAGE: B3987		
VALIDATOR: ELR		LAB: LLI		DATE: 11/18/12	
			SDG: B3987		

ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		

SAMPLES/MATRIX			
B2LXB4	B2LXB2	B2LX83	B2LX82
B2LX87	B2LX89	B2LX90	B2LX8F
B2LXB1	B2LXB3		
			Water

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: al - UJ all detects
boron - B4, B2, 90 - UJ
manganese - B4, 87, 89 B1, B3

B4, B2 - OK 88/90 - ok 90 - sodium

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

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

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

Transcription/calculation errors? ..... Yes No N/A

Comments: _____

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

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/18/2012 13:46

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209093 - SW 3005A										
Blank (L209093-BLK1)				Prepared: 09/14/2012 Analyzed: 09/17/2012						
Aluminum	45.6	B	50.0	ug/L						
Antimony	6.00	U	6.00	ug/L						
Arsenic	4.00	U	4.00	ug/L						
Barium	0.504	B	5.00	ug/L						
Cadmium	2.00	U	2.00	ug/L						
Calcium	183	B	1000	ug/L						
Chromium	2.00	U	2.00	ug/L						
Cobalt	20.0	U	20.0	ug/L						
Copper	10.0	U	10.0	ug/L						
Iron	50.0	U	50.0	ug/L						
Lead	5.00	U	5.00	ug/L						
Magnesium	750	U	750	ug/L						
Manganese	0.685	B	5.00	ug/L						
Nickel	40.0	U	40.0	ug/L						
Potassium	4000	U	4000	ug/L						
Selenium	5.00	U	5.00	ug/L						
Silver	2.00	U	2.00	ug/L						
Sodium	500	U	500	ug/L						
Tin	1.00	U	1.00	ug/L						
Vanadium	25.0	U	25.0	ug/L						
Zinc	10.0	U	10.0	ug/L						
LCS (L209093-BS1)				Prepared: 09/14/2012 Analyzed: 09/17/2012						
Aluminum	4970		50.0	ug/L	5000.0		99	80-120		
Antimony	3110		6.00	ug/L	3000.0		104	80-120		
Arsenic	10500		4.00	ug/L	10000		105	80-120		
Barium	5190		5.00	ug/L	5000.0		104	80-120		
Cadmium	224		2.00	ug/L	250.00		89	80-120		
Calcium	25600		1000	ug/L	25000		103	80-120		
Chromium	510		2.00	ug/L	500.00		102	80-120		
Cobalt	2530		20.0	ug/L	2500.0		101	80-120		
Copper	1290		10.0	ug/L	1250.0		104	80-120		
Iron	5220		50.0	ug/L	5000.0		104	80-120		
Lead	2500		5.00	ug/L	2500.0		100	80-120		
Magnesium	25600		750	ug/L	25000		102	80-120		
Manganese	776		5.00	ug/L	750.00		104	80-120		
Nickel	2020		40.0	ug/L	2000.0		101	80-120		

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264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/18/2012 13:46

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209093 - SW 3005A										
LCS (L209093-BS1)				Prepared: 09/14/2012 Analyzed: 09/17/2012						
Potassium	25300		4000	ug/L	25000		101	80-120		
Selenium	10400		5.00	ug/L	10000		104	80-120		
Silver	519		2.00	ug/L	500.00		104	80-120		
Sodium	25700		500	ug/L	25000		103	80-120		
Tin	5220		1.00	ug/L	5000.0		104	80-120		
Vanadium	2590		25.0	ug/L	2500.0		103	80-120		
Zinc	1030		10.0	ug/L	1000.0		103	80-120		
Duplicate (L209093-DUP1)		Source: 1209032-01		Prepared: 09/14/2012 Analyzed: 09/17/2012						
Aluminum	10.8	B	50.0	ug/L		14.3			28*	20
Antimony	6.00	U	6.00	ug/L		6.00 U				20
Arsenic	4.00	U	4.00	ug/L		4.00 U				20
Barium	5.00	U	5.00	ug/L		0.395				20
Cadmium	2.00	U	2.00	ug/L		2.00 U				20
Calcium	1000	U	1000	ug/L		1000 U				20
Chromium	2.00	U	2.00	ug/L		2.00 U				20
Cobalt	20.0	U	20.0	ug/L		20.0 U				20
Copper	10.0	U	10.0	ug/L		10.0 U				20
Iron	50.0	U	50.0	ug/L		50.0 U				20
Lead	5.00	U	5.00	ug/L		5.00 U				20
Magnesium	750	U	750	ug/L		750 U				20
Manganese	5.00	U	5.00	ug/L		0.527				20
Nickel	40.0	U	40.0	ug/L		40.0 U				20
Potassium	4000	U	4000	ug/L		4000 U				20
Selenium	5.00	U	5.00	ug/L		5.00 U				20
Silver	2.00	U	2.00	ug/L		2.00 U				20
Sodium	30.3	B	500	ug/L		500 U				20
Tin	1.00	U	1.00	ug/L		1.00 U				20
Vanadium	25.0	U	25.0	ug/L		25.0 U				20
Zinc	10.0	U	10.0	ug/L		10.0 U				20

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/18/2012 13:46

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209093 - SW 3005A									
Matrix Spike (L209093-MS1)		**Source: 1209032-01**	Prepared: 09/14/2012 Analyzed: 09/17/2012						
Aluminum	2020	50.0	ug/L	2000.0	14.3	100	75-125		
Antimony	529	6.00	ug/L	500.00	6.00 U	106	75-125		
Arsenic	2080	4.00	ug/L	2000.0	4.00 U	104	75-125		
Barium	2070	5.00	ug/L	2000.0	0.395	103	75-125		
Cadmium	46.4	2.00	ug/L	50.000	2.00 U	93	75-125		
Calcium	24800	1000	ug/L	25000	1000 U	99	75-125		
Chromium	202	2.00	ug/L	200.00	2.00 U	101	75-125		
Cobalt	513	20.0	ug/L	500.00	20.0 U	103	75-125		
Copper	263	10.0	ug/L	250.00	10.0 U	105	75-125		
Iron	1050	50.0	ug/L	1000.0	50.0 U	105	75-125		
Lead	505	5.00	ug/L	500.00	5.00 U	101	75-125		
Magnesium	24900	750	ug/L	25000	750 U	100	75-125		
Manganese	517	5.00	ug/L	500.00	0.527	103	75-125		
Nickel	512	40.0	ug/L	500.00	40.0 U	102	75-125		
Potassium	24800	4000	ug/L	25000	4000 U	99	75-125		
Selenium	2060	5.00	ug/L	2000.0	5.00 U	103	75-125		
Silver	52.6	2.00	ug/L	50.000	2.00 U	105	75-125		
Sodium	24700	500	ug/L	25000	500 U	99	75-125		
Tin	1020	1.00	ug/L	1000.0	1.00 U	102	75-125		
Vanadium	531	25.0	ug/L	500.00	25.0 U	106	75-125		
Zinc	528	10.0	ug/L	500.00	10.0 U	106	75-125		

Date: 20 November 2012
To: Washington Closure Hanford (technical representative)
From: ELR Consulting
Project: ERDF Groundwater Well Samples – September 2012
Subject: Volatiles - Data Package No. K3987-LLI

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. K3987 prepared by Lionville Laboratory Inc. (LLI). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B2LXB4	9/11/12	Water	C	See note 1
B2LX83	9/11/12	Water	C	See note 1
B2LX89	9/11/12	Water	C	See note 1
B2LX90	9/11/12	Water	C	See note 1
B2LXB3	9/11/12	Water	C	See note 1

1 - Volatiles by EPA 8260B.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-198, Rev. 0, "Groundwater Protection Plan for the Environmental Restoration Disposal Facility". Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times & Sample Preservation**

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 samples and 7 days for unpreserved samples.

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

detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

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 equipment blank (B2LXB4) was submitted for analysis. No analytes were detected in the field blank.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Laboratory Control Sample

Matrix spike/matrix spike duplicate and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike/matrix spike duplicate is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/- 20% for water samples and +/- 35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

No field duplicate samples were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required detection limits (RDLs) to ensure that laboratory detection levels meet the required criteria. All results met the RDL.

Completeness

Data package No. K3987 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

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services.*

WCH-198, Rev 0, *Groundwater Protection Plan for the Environmental Restoration Disposal Facility*, February 2008.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

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

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

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

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

Appendix 2

Summary of Data Qualification

VOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: K3987	REVIEWER: ELR	Project: ERDF	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Annotated Laboratory Reports

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

B2LXB4
1209032-01 (Water)

11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethene (total)	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloropropane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Butanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Hexanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
4-Methyl-2-pentanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Acetone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Benzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromodichloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromoform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromomethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Disulfide	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Tetrachloride	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chlorobenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloromethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Dibromochloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Ethylbenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Methylene Chloride	6.00	U	6.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Styrene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Tetrachloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Toluene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Trichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Vinyl chloride	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Xylenes, total	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*100 %*		*60-140*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

B2LXB4

1209032-01 (Water)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*95 %*	*65-120*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*95 %*	*75-130*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

11/20/12

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

B2LX83
1209032-03 (Water)

✓ 11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethene (total)	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloropropane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Butanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Hexanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
4-Methyl-2-pentanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Acetone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Benzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromodichloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromoform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromomethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Disulfide	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Tetrachloride	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chlorobenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloromethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Dibromochloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Ethylbenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Methylene Chloride	6.00	U	6.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Styrene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Tetrachloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Toluene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Trichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Vinyl chloride	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Xylenes, total	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*111 %*		*60-140*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

000000020

264 Welsh Pool Road
Exton, PA 19341
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WC-Hanford, Inc.	Project: RC-008	
2620 Fermi Avenue	Project Number: K3987	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 13:20

B2LX83

1209032-03 (Water)

V 11/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*99 %*	*65-120*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*97 %*	*75-130*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	**Reported:** 09/17/2012 13:20

B2LX89
1209032-06 (Water)

11/20/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethene (total)	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloropropane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Butanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Hexanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
4-Methyl-2-pentanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Acetone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Benzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromodichloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromoform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromomethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Disulfide	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Tetrachloride	**2.02**	J	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chlorobenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloromethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Dibromochloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Ethylbenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Methylene Chloride	6.00	U	6.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Styrene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Tetrachloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Toluene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Trichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Vinyl chloride	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Xylenes, total	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*110 %*		*60-140*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-008	
2620 Fermi Avenue	Project Number: K3987	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 13:20

B2LX89

1209032-06 (Water)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory					
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*96 %*	*65-120*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*91 %*	*75-130*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

✓ 11/20/12

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

B2LX90

1209032-07 (Water)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethene (total)	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloropropane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Butanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Hexanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
4-Methyl-2-pentanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Acetone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Benzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromodichloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromoform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromomethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Disulfide	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Tetrachloride	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chlorobenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloromethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Dibromochloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Ethylbenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Methylene Chloride	**2.23**	J	6.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Styrene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Tetrachloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Toluene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Trichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Vinyl chloride	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Xylenes, total	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*108 %*		*60-140*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	**Reported:** 09/17/2012 13:20

B2LX90
1209032-07 (Water)

✓ 11/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*96 %*	*65-120*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*93 %*	*75-130*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

B2LXB3

1209032-10 (Water)

V ulrodz

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1,2-Trichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,1-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloroethene (total)	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
1,2-Dichloropropane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Butanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
2-Hexanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
4-Methyl-2-pentanone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Acetone	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Benzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromodichloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromoform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Bromomethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Disulfide	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Carbon Tetrachloride	**1.21**	J	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chlorobenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloroform	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Chloromethane	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
cis-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Dibromochloromethane	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Ethylbenzene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Methylene Chloride	6.00	U	6.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Styrene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Tetrachloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,2-Dichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Toluene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
trans-1,3-Dichloropropene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Trichloroethene	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Vinyl chloride	10.0	U	10.0	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Xylenes, total	5.00	U	5.00	ug/L	1	L209091	09/13/2012	09/13/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*110 %*		*60-140*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

000000026

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	**Reported:** 09/17/2012 13:20

B2LXB3

1209032-10 (Water)

11/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory					
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*97 %*	*65-120*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*95 %*	*75-130*			*L209091*	*09/13/2012*	*09/13/2012*	*8260B*

000000027

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-008 K3987
LVL #: 1209032

W.O. #: 60049-001-001-0001-00
Date Received: 09-12-2012

GC/MS VOLATILE

Five (5) water samples were collected on 09-11-2012.

The samples and associated QC samples were prepared and analyzed 09-13-2012 according to criteria set forth in Lionville Laboratory SOPs. The preparation procedure was based on SW846 Method 5030B and the analysis procedure was based on SW846 Method 8260B for TCL Volatile target compounds.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. Discrepancies from the sample acceptance policy have been recorded on the Sample Receipt Checklist.
2. Samples were analyzed within holding time.
3. Non-target compounds were not detected in these samples.
4. All obtainable surrogate recoveries were within QC acceptance criteria.
5. All obtainable matrix spike recoveries were within QC acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. The method blank was below the reporting limit for all target analytes.
8. All initial calibrations associated with this data set were within acceptance criteria using the mean RSD described in method 8000B. Per method 8000B/8260B, the attached Table 1 provides the mean RSD and indicates the target compounds where the RSD exceeded 15%; results for the indicated target compounds are considered to have greater uncertainty.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. All internal standard area and retention time criteria were met.

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 pages.

11. Manual integrations are performed according to SOP QA-125 to produce quality data with 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").

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

for Iain Daniels
LvL Laboratory Manager

9/27/12
Date

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-017 Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50199	Ice Chest No.	N/A GWS-1709
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	9-11-12 ~~N/A~~ 7989 4096 4322
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4029

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LXB4	N	W	SEP 11 2012	0745	1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB4	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LXB4	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LXB4	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LXB4	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB4	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LXB4	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LXB4	N	W			3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C
B2LXB2	Y	W	SEP 11 2012	0745	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2

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Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			SEP 11 2012 1400	FED EX			SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
FedEx		9-12-12	1010	Victor Hernandez		9-12-12	1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 8/2/2012

A-6004-842 (REV 2)

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-018
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 Jul 94	Ice Chest No.	N/A FWS-179
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	~~N/A~~ 7989 4096 4322
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4029

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI

**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).

**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LX83	N	W	SEP 11 2012	1030	1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LX83	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LX83	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LX83	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LX83	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LX83	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LX83	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX83	N	W			3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C
B2LX82	Y	W	SEP 11 2012	1030	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			1400 SEP 11 2012	FEDEX			SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
Ed Eo			9-12-12 1010	Victor Hernandez			9-12-12 1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 8/2/2012

A-6004-842 (REV 2)

000000005

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-012
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50194	Ice Chest No.	N/A GWS-179
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	9.11.12 ~~N/A~~ 7989 4096 4322
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4029

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LX87	Y	W	SEP 11 2012	0941	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX89	N	W			1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool-4C
B2LX89	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool-4C
B2LX89	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LX89	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool-4C
B2LX89	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool-4C
B2LX89	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool-4C
B2LX89	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX89	N	W	SEP 11 2012	0941	3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool-4C

25

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall		[signature]	SEP 11 2012 1900	FED EX			SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
Fed Ex		9-12-12	1010	Victor Hernandez		9-12-12	1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 8/2/2012

A-6004-842 (REV 2)

000000006

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-013
		Page 1 of 1

Collector	F.M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50 194	Ice Chest No.	N/A GWS-246
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	7989 4091 7544
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4028

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LX90	N	W	SEP 11 2012	0700	1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LX90	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LX90	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LX90	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LX90	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LX90	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LX90	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX90	N	W			3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C
B2LX88	Y	W	SEP 11 2012	0700	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F.M. Hall			1500 SEP 11 2012	FEDEX			SEP 11 2012
Fed Ex			9-12-12 1010	VICTOR HERNANDEZ			9-12-12 1010

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 8/2/2012

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-016
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50194	Ice Chest No.	N/A 6WS-246
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A 7789409175414
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4028

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LXB1	Y	W	SEP 11 2012	0858	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LXB3	N	W			1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB3	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LXB3	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LXB3	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LXB3	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB3	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LXB3	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LXB3	N	W	SEP 11 2012	0858	3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C

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Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			1400 SEP 11 2012		FED EX		SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
FED EX		9-12-12	1010	VICTOR HERNANDEZ		9-12-12	1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 8/2/2012

A-6004-842 (REV 2)

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Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

05) 9/12/12

CLIENT: ~~CHPRC~~ WC Hanford

Project ~~NSAF/SD~~ W/Release #: RC-008Q

Date: 9/12/12

LvL Batch #: 1209032

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FED EX		Airbill # 7989 4091 7544 ⊥ 4096 4322
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	*Comments:*
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	Temp 2.4 2.1	°C	Cooler # GWS-246 ~~GWS-179~~ 9-12-12 GWS-179
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No PH <2	
12. Samples received within hold times?	☑ Yes	~~☑ No~~ ~~PH on Sample #01, 06, 07, 010~~ NO pH	
Short holds taken to wet lab?	~~☑ Yes~~	☐ No	☐ N/A
13. VOA, TOC, TOX free of headspace?	☑ Yes	☑ No	☐ N/A
14. QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☐ ~~N/A~~
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☐ Yes	☑ No	
16. Project Manager contacted concerning any discrepancies?	☑ Yes	☐ No	☐ N/A

Person Contacted ~~J. STONE~~ Q. Johnson 05) 9/12/12

Date 9-12-12

SR-002-B.doc

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Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	ERDF		DATA PACKAGE:	B3987	
VALIDATOR:	ELR	LAB:	LLI	DATE:	11/18/12
			SDG:	B3987	

ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)

SAMPLES/MATRIX
B2LXB4 B2LX83 B2LX89 B2LX80
B2LXB3
Water

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

Iinternal 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:

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:

Appendix 6

Additional Documentation Requested by Client

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209091 - SW 5030B										
Blank (L209091-BLK1)				Prepared & Analyzed: 09/13/2012						
1,1,1-Trichloroethane	5.00	U	5.00	ug/L						
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/L						
1,1,2-Trichloroethane	5.00	U	5.00	ug/L						
1,1-Dichloroethane	5.00	U	5.00	ug/L						
1,1-Dichloroethene	5.00	U	5.00	ug/L						
1,2-Dichloroethane	5.00	U	5.00	ug/L						
1,2-Dichloroethene (total)	5.00	U	5.00	ug/L						
1,2-Dichloropropane	5.00	U	5.00	ug/L						
2-Butanone	10.0	U	10.0	ug/L						
2-Hexanone	10.0	U	10.0	ug/L						
4-Methyl-2-pentanone	10.0	U	10.0	ug/L						
Acetone	10.0	U	10.0	ug/L						
Benzene	5.00	U	5.00	ug/L						
Bromodichloromethane	5.00	U	5.00	ug/L						
Bromoform	5.00	U	5.00	ug/L						
Bromomethane	10.0	U	10.0	ug/L						
Carbon Disulfide	5.00	U	5.00	ug/L						
Carbon Tetrachloride	5.00	U	5.00	ug/L						
Chlorobenzene	5.00	U	5.00	ug/L						
Chloroethane	10.0	U	10.0	ug/L						
Chloroform	5.00	U	5.00	ug/L						
Chloromethane	10.0	U	10.0	ug/L						
cis-1,2-Dichloroethene	5.00	U	5.00	ug/L						
cis-1,3-Dichloropropene	5.00	U	5.00	ug/L						
Dibromochloromethane	5.00	U	5.00	ug/L						
Ethylbenzene	5.00	U	5.00	ug/L						
Methylene Chloride	6.00	U	6.00	ug/L						
Styrene	5.00	U	5.00	ug/L						
Tetrachloroethene	5.00	U	5.00	ug/L						
trans-1,2-Dichloroethene	5.00	U	5.00	ug/L						
Toluene	5.00	U	5.00	ug/L						
trans-1,3-Dichloropropene	5.00	U	5.00	ug/L						
Trichloroethene	5.00	U	5.00	ug/L						
Vinyl chloride	10.0	U	10.0	ug/L						
Xylenes, total	5.00	U	5.00	ug/L						
Surrogate: 1,2-Dichloroethane-d4	*53.6*			*ug/L*	*50.000*		*107*	*60-140*		

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264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209091 - SW 5030B									
Blank (L209091-BLK1)			Prepared & Analyzed: 09/13/2012						
Surrogate: Toluene-d8	*48.6*		*ug/L*	*50.000*		*97*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*48.7*		*ug/L*	*50.000*		*97*	*75-130*		
LCS (L209091-BS1)			Prepared & Analyzed: 09/13/2012						
1,1,1-Trichloroethane	52.9	5.00	ug/L	50.000		106	70-130		
1,1,2,2-Tetrachloroethane	44.8	5.00	ug/L	50.000		90	65-130		
1,1,2-Trichloroethane	46.8	5.00	ug/L	50.000		94	70-125		
1,1-Dichloroethane	51.0	5.00	ug/L	50.000		102	70-130		
1,1-Dichloroethene	48.4	5.00	ug/L	50.000		97	65-140		
1,2-Dichloroethane	53.9	5.00	ug/L	50.000		108	60-140		
1,2-Dichloroethene (total)	99.6	5.00	ug/L	100.00		100	70-130		
1,2-Dichloropropane	51.4	5.00	ug/L	50.000		103	75-125		
2-Butanone	47.6	10.0	ug/L	50.000		95	20-200		
2-Hexanone	52.3	10.0	ug/L	50.000		105	20-200		
4-Methyl-2-pentanone	42.5	10.0	ug/L	50.000		85	45-150		
Acetone	71.8	10.0	ug/L	50.000		144	20-220		
Benzene	50.5	5.00	ug/L	50.000		101	75-125		
Bromodichloromethane	53.3	5.00	ug/L	50.000		107	65-130		
Bromoform	49.7	5.00	ug/L	50.000		99	70-120		
Bromomethane	49.1	10.0	ug/L	50.000		98	50-150		
Carbon Disulfide	47.6	5.00	ug/L	50.000		95	50-150		
Carbon Tetrachloride	55.5	5.00	ug/L	50.000		111	65-130		
Chlorobenzene	48.7	5.00	ug/L	50.000		97	75-125		
Chloroethane	53.2	10.0	ug/L	50.000		106	65-140		
Chloroform	54.3	5.00	ug/L	50.000		109	75-125		
Chloromethane	49.7	10.0	ug/L	50.000		99	50-135		
cis-1,2-Dichloroethene	51.0	5.00	ug/L	50.000		102	70-125		
cis-1,3-Dichloropropene	45.3	5.00	ug/L	50.000		91	70-125		
Dibromochloromethane	49.7	5.00	ug/L	50.000		99	70-130		
Ethylbenzene	50.6	5.00	ug/L	50.000		101	75-125		
Methylene Chloride	47.7	6.00	ug/L	50.000		95	55-150		
Styrene	50.9	5.00	ug/L	50.000		102	75-130		
Tetrachloroethene	49.5	5.00	ug/L	50.000		99	70-130		
trans-1,2-Dichloroethene	48.6	5.00	ug/L	50.000		97	70-130		
Toluene	48.8	5.00	ug/L	50.000		98	70-130		
trans-1,3-Dichloropropene	50.2	5.00	ug/L	50.000		100	70-130		
Trichloroethene	50.5	5.00	ug/L	50.000		101	75-125		

000000029

LIONVILLE LABORATORY
A division of Fibertec Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209091 - SW 5030B									
LCS (L209091-BS1)			Prepared & Analyzed: 09/13/2012						
Vinyl chloride	50.6	10.0	ug/L	50.000		101	55-135		
Xylenes, total	152	5.00	ug/L	150.00		101	70-130		
Surrogate: 1,2-Dichloroethane-d4	*51.8*		*ug/L*	*50.000*		*104*	*60-140*		
Surrogate: Toluene-d8	*47.9*		*ug/L*	*50.000*		*96*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*49.2*		*ug/L*	*50.000*		*98*	*75-130*		
Matrix Spike (L209091-MS1)		Source: 1209032-03	Prepared & Analyzed: 09/13/2012						
1,1,1-Trichloroethane	50.2	5.00	ug/L	50.000	5.00 U	100	70-130		
1,1,2,2-Tetrachloroethane	44.2	5.00	ug/L	50.000	5.00 U	88	65-130		
1,1,2-Trichloroethane	46.5	5.00	ug/L	50.000	5.00 U	93	70-125		
1,1-Dichloroethane	49.1	5.00	ug/L	50.000	5.00 U	98	70-130		
1,1-Dichloroethene	47.3	5.00	ug/L	50.000	5.00 U	95	65-140		
1,2-Dichloroethane	51.3	5.00	ug/L	50.000	5.00 U	103	60-140		
1,2-Dichloroethene (total)	97.4	5.00	ug/L	100.00	5.00 U	97	70-130		
1,2-Dichloropropane	50.1	5.00	ug/L	50.000	5.00 U	100	75-125		
2-Butanone	42.9	10.0	ug/L	50.000	10.0 U	86	20-200		
2-Hexanone	41.0	10.0	ug/L	50.000	10.0 U	82	20-200		
4-Methyl-2-pentanone	41.5	10.0	ug/L	50.000	10.0 U	83	45-150		
Acetone	40.7	10.0	ug/L	50.000	10.0 U	81	20-220		
Benzene	49.3	5.00	ug/L	50.000	5.00 U	99	75-125		
Bromodichloromethane	50.6	5.00	ug/L	50.000	5.00 U	101	65-130		
Bromoform	48.1	5.00	ug/L	50.000	5.00 U	96	70-120		
Bromomethane	46.8	10.0	ug/L	50.000	10.0 U	94	50-150		
Carbon Disulfide	46.9	5.00	ug/L	50.000	5.00 U	94	50-150		
Carbon Tetrachloride	53.8	5.00	ug/L	50.000	5.00 U	108	65-130		
Chlorobenzene	47.8	5.00	ug/L	50.000	5.00 U	96	75-125		
Chloroethane	51.5	10.0	ug/L	50.000	10.0 U	103	65-140		
Chloroform	54.1	5.00	ug/L	50.000	5.00 U	108	75-125		
Chloromethane	45.5	10.0	ug/L	50.000	10.0 U	91	50-135		
cis-1,2-Dichloroethene	47.3	5.00	ug/L	50.000	5.00 U	95	70-125		
cis-1,3-Dichloropropene	41.9	5.00	ug/L	50.000	5.00 U	84	70-125		
Dibromochloromethane	49.6	5.00	ug/L	50.000	5.00 U	99	70-130		
Ethylbenzene	50.4	5.00	ug/L	50.000	5.00 U	101	75-125		
Methylene Chloride	47.8	6.00	ug/L	50.000	6.00 U	96	55-150		
Styrene	50.0	5.00	ug/L	50.000	5.00 U	100	75-130		
Tetrachloroethene	48.8	5.00	ug/L	50.000	5.00 U	98	70-130		
trans-1,2-Dichloroethene	50.1	5.00	ug/L	50.000	5.00 U	100	70-130		

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LIONVILLE LABORATORY
A division of Fibertine Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209091 - SW 5030B									
Matrix Spike (L209091-MS1)		**Source: 1209032-03**		Prepared & Analyzed: 09/13/2012					
Toluene	46.9	5.00	ug/L	50.000	5.00 U	94	70-130		
trans-1,3-Dichloropropene	47.3	5.00	ug/L	50.000	5.00 U	95	70-130		
Trichloroethene	49.7	5.00	ug/L	50.000	5.00 U	99	75-125		
Vinyl chloride	45.9	10.0	ug/L	50.000	10.0 U	92	55-135		
Xylenes, total	150	5.00	ug/L	150.00	5.00 U	100	70-130		
Surrogate: 1,2-Dichloroethane-d4	*52.7*		*ug/L*	*50.000*		*105*	*60-140*		
Surrogate: Toluene-d8	*48.9*		*ug/L*	*50.000*		*98*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*49.7*		*ug/L*	*50.000*		*99*	*75-130*		
Matrix Spike Dup (L209091-MSD1)		**Source: 1209032-03**		Prepared & Analyzed: 09/13/2012					
1,1,1-Trichloroethane	52.2	5.00	ug/L	50.000	5.00 U	104	70-130	4	20
1,1,2,2-Tetrachloroethane	45.3	5.00	ug/L	50.000	5.00 U	91	65-130	2	20
1,1,2-Trichloroethane	46.7	5.00	ug/L	50.000	5.00 U	93	70-125	0.4	20
1,1-Dichloroethane	51.7	5.00	ug/L	50.000	5.00 U	103	70-130	5	20
1,1-Dichloroethene	46.6	5.00	ug/L	50.000	5.00 U	93	65-140	1	20
1,2-Dichloroethane	53.3	5.00	ug/L	50.000	5.00 U	107	60-140	4	20
1,2-Dichloroethene (total)	97.1	5.00	ug/L	100.00	5.00 U	97	70-130	0.3	20
1,2-Dichloropropane	48.9	5.00	ug/L	50.000	5.00 U	98	75-125	2	20
2-Butanone	45.3	10.0	ug/L	50.000	10.0 U	91	20-200	6	20
2-Hexanone	44.3	10.0	ug/L	50.000	10.0 U	89	20-200	8	20
4-Methyl-2-pentanone	44.1	10.0	ug/L	50.000	10.0 U	88	45-150	6	20
Acetone	38.2	10.0	ug/L	50.000	10.0 U	76	20-220	6	20
Benzene	50.0	5.00	ug/L	50.000	5.00 U	100	75-125	1	20
Bromodichloromethane	52.9	5.00	ug/L	50.000	5.00 U	106	65-130	4	20
Bromoform	50.5	5.00	ug/L	50.000	5.00 U	101	70-120	5	20
Bromomethane	45.5	10.0	ug/L	50.000	10.0 U	91	50-150	3	20
Carbon Disulfide	47.0	5.00	ug/L	50.000	5.00 U	94	50-150	0.3	20
Carbon Tetrachloride	56.7	5.00	ug/L	50.000	5.00 U	113	65-130	5	20
Chlorobenzene	48.7	5.00	ug/L	50.000	5.00 U	97	75-125	2	20
Chloroethane	47.2	10.0	ug/L	50.000	10.0 U	94	65-140	9	20
Chloroform	54.7	5.00	ug/L	50.000	5.00 U	109	75-125	1	20
Chloromethane	44.4	10.0	ug/L	50.000	10.0 U	89	50-135	2	20
cis-1,2-Dichloroethene	47.8	5.00	ug/L	50.000	5.00 U	96	70-125	1	20
cis-1,3-Dichloropropene	43.1	5.00	ug/L	50.000	5.00 U	86	70-125	3	20
Dibromochloromethane	49.3	5.00	ug/L	50.000	5.00 U	99	70-130	0.5	20
Ethylbenzene	50.2	5.00	ug/L	50.000	5.00 U	100	75-125	0.5	20
Methylene Chloride	48.3	6.00	ug/L	50.000	6.00 U	97	55-150	1	20

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 09/17/2012 13:20

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209091 - SW 5030B									
Matrix Spike Dup (L209091-MSD1)		**Source: 1209032-03**	Prepared & Analyzed: 09/13/2012						
Styrene	50.0	5.00	ug/L	50.000	5.00 U	100	75-130	0.04	20
Tetrachloroethene	49.1	5.00	ug/L	50.000	5.00 U	98	70-130	0.6	20
trans-1,2-Dichloroethene	49.4	5.00	ug/L	50.000	5.00 U	99	70-130	1	20
Toluene	47.8	5.00	ug/L	50.000	5.00 U	96	70-130	2	20
trans-1,3-Dichloropropene	49.0	5.00	ug/L	50.000	5.00 U	98	70-130	4	20
Trichloroethene	50.9	5.00	ug/L	50.000	5.00 U	102	75-125	2	20
Vinyl chloride	44.7	10.0	ug/L	50.000	10.0 U	89	55-135	3	20
Xylenes, total	152	5.00	ug/L	150.00	5.00 U	101	70-130	0.9	20
Surrogate: 1,2-Dichloroethane-d4	*53.0*		*ug/L*	*50.000*		*106*	*60-140*		
Surrogate: Toluene-d8	*48.9*		*ug/L*	*50.000*		*98*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*49.1*		*ug/L*	*50.000*		*98*	*75-130*		

000000032

Date: 20 November 2012
To: Washington Closure Hanford (technical representative)
From: ELR Consulting
Project: ERDF Groundwater Well Samples – September 2012
Subject: Wet Chemistry - Data Package No. K3987-LLI

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. K3987 prepared by Lionville Laboratory Inc. (LLI). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B2LXB4	9/11/12	Water	C	See note 1
B2LX83	9/11/12	Water	C	See note 1
B2LX89	9/11/12	Water	C	See note 1
B2LX90	9/11/12	Water	C	See note 1
B2LXB3	9/11/12	Water	C	See note 1

1 - Total dissolved solids - 160.1, nitrate/nitrite by 353.2, alkalinity by 310.1, total organic halides (TOX) by 9020B & IC anions - 300.0.

Data validation was conducted in accordance with the WCH validation statement of work and WCH-198, Rev. 0, "Groundwater Protection Plan for the Environmental Restoration Disposal Facility". Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times & Sample Preparation**

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 TOX, chloride, fluoride, bromide, sulfate and nitrate/nitrite; 14 days for alkalinity; 7 days for TDS; and 2 days for nitrate, nitrite and phosphate.

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

Due to the samples not being properly preserved (headspace), all TOX results were qualified as estimates and flagged "J".

All other holding time and sample preservation parameters were met.

- **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

One equipment blank (B1LXB4) was submitted for analysis. Total dissolved solids were detected in the field blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike Analysis & Blank Spike Analysis

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.

Due to the lack of a matrix spike analysis, all alkalinity and total dissolved solids results were qualified as estimates and flagged "J".

All other accuracy recovery 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 project quantitation limit (MDL) or CRQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the MDL/CRQL and the sample concentration is less than five times the MDL/CRQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the MDL/CRQL or plus or minus the MDL/CRQL for positive sample results less than five times the MDL/CRQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were acceptable.

Field Duplicate Samples

No field duplicate samples were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the minimum detection limits (MDLs) to ensure that laboratory detection levels meet the required criteria. All results met the MDLs.

- **Completeness**

Data package No. K3987 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the samples not being properly preserved (headspace), all TOX results were qualified as estimates and flagged "J".

- Due to the lack of a matrix spike analysis, all alkalinity and total dissolved solids results were qualified as estimates and flagged "J".

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

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

WCH-198, Rev 0, *Groundwater Protection Plan for the Environmental Restoration Disposal Facility*, February 2008.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a 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

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K3987	**REVIEWER: ELR**	**Project: ERDF**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
TOX	J	All	Sample preservation (headspace)
Alkalinity TDS	J	All	No MS analysis

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

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 10/11/2012 16:32

11/20/12

Wet Chemistry

Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
B2LXB4 (1209032-01) Water									
Total Alkalinity	0.2 U J	0.2	0.5	mg/L	1	L209097	09/14/2012 11:00	09/14/2012 13:15	SM 2320B
Total Dissolved Solids	**12.0** B J	5.0	20.0	mg/L	1	L209077	09/12/2012 15:40	09/12/2012 15:40	SM 2540C
Bromide	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Chloride	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Fluoride	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrite	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Orthophosphate	0.20 U	0.20	1.00	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Sulfate	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate/Nitrite as N	0.010 U	0.010	0.050	mg/L	1	L209174	09/21/2012 10:00	09/21/2012 11:51	EPA 353.2
Total Organic Halides	20.0 U J	20.0	100	ug/L	1	L210065	10/03/2012 06:20	10/03/2012 19:30	9020B
B2LX83 (1209032-03) Water									
Total Alkalinity	**143** J	0.2	0.5	mg/L	1	L209097	09/14/2012 11:00	09/14/2012 13:15	SM 2320B
Total Dissolved Solids	**269** J	5.0	20.0	mg/L	1	L209077	09/12/2012 15:40	09/12/2012 15:40	SM 2540C
Bromide	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Chloride	**12.8** D	0.50	2.50	mg/L	5	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Fluoride	**0.32** B	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate	**23.1** D	0.50	2.50	mg/L	5	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrite	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Orthophosphate	0.20 U	0.20	1.00	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Sulfate	**27.1** D	0.50	2.50	mg/L	5	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate/Nitrite as N	**5.20** D	0.100	0.500	mg/L	10	L209174	09/21/2012 10:00	09/21/2012 11:55	EPA 353.2
Total Organic Halides	20.0 U J	20.0	100	ug/L	1	L210065	10/03/2012 06:20	10/03/2012 19:30	9020B

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
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Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 10/11/2012 16:32

Wet Chemistry

11/20/12

Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
B2LX89 (1209032-06) Water									
Total Alkalinity	**145** J	0.2	0.5	mg/L	1	L209097	09/14/2012 11:00	09/14/2012 13:15	SM 2320B
Total Dissolved Solids	**441** J	5.0	20.0	mg/L	1	L209077	09/12/2012 15:40	09/12/2012 15:40	SM 2540C
Bromide	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Chloride	**20.6** D	0.50	2.50	mg/L	5	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Fluoride	**0.32** B	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate	**53.6** D	1.00	5.00	mg/L	10	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrite	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Orthophosphate	0.20 U	0.20	1.00	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Sulfate	**29.9** D	0.50	2.50	mg/L	5	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate/Nitrite as N	**11.9** D	0.200	1.00	mg/L	20	L209174	09/21/2012 10:00	09/21/2012 11:57	EPA 353.2
Total Organic Halides	20.0 U J	20.0	100	ug/L	1	L210065	10/03/2012 06:20	10/03/2012 19:30	9020B
B2LX90 (1209032-07) Water									
Total Alkalinity	0.2 U J	0.2	0.5	mg/L	1	L209097	09/14/2012 11:00	09/14/2012 13:15	SM 2320B
Total Dissolved Solids	**5.0** B J	5.0	20.0	mg/L	1	L209077	09/12/2012 15:40	09/12/2012 15:40	SM 2540C
Bromide	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Chloride	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Fluoride	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrite	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Orthophosphate	0.20 U	0.20	1.00	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Sulfate	0.10 U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate/Nitrite as N	0.010 U	0.010	0.050	mg/L	1	L209174	09/21/2012 10:00	09/21/2012 11:58	EPA 353.2
Total Organic Halides	20.0 U J	20.0	100	ug/L	1	L210065	10/03/2012 06:20	10/03/2012 19:30	9020B

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
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Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	**Reported:** 10/11/2012 16:32

Wet Chemistry

11/20/12

Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
B2LXB3 (1209032-10) Water										
Total Alkalinity	**134**	J	0.2	0.5	mg/L	1	L209097	09/14/2012 11:00	09/14/2012 13:15	SM 2320B
Total Dissolved Solids	**476**	J	5.0	20.0	mg/L	1	L209077	09/12/2012 15:40	09/12/2012 15:40	SM 2540C
Bromide	0.10	U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Chloride	**16.7**	D	0.50	2.50	mg/L	5	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Fluoride	**0.32**	B	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate	**153**	D	5.00	25.0	mg/L	50	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrite	0.10	U	0.10	0.50	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Orthophosphate	0.20	U	0.20	1.00	mg/L	1	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Sulfate	**27.7**	D	0.50	2.50	mg/L	5	L209104	09/12/2012 09:23	09/12/2012 17:58	EPA 300.0 (1993)
Nitrate/Nitrite as N	**34.1**	D	1.00	5.00	mg/L	100	L209174	09/21/2012 10:00	09/21/2012 12:02	EPA 353.2
Total Organic Halides	20.0	U J	20.0	100	ug/L	1	L210065	10/03/2012 06:20	10/03/2012 19:30	9020B

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
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Case Narrative

Client: WC-HANFORD RC-008 K3987
LVL#: 1209032

Date Received: 09-12-12

INORGANIC NARRATIVE

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

2. The samples were prepared and analyzed in accordance with the methods indicated on the data summary report.

   Lionville Lab (LvL) is NELAP accredited by the State of Pennsylvania. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

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

4. The results presented in this report are derived from samples that met LvL'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 were within the applicable control limits as noted in the Analytical Report.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit with the exception of TDS which was at 52.6%.

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

10/26/12
Date

njp\i09-032

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

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-017
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50199	Ice Chest No.	N/A GNS-1709
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	7989 4096 4322
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4029

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LXB4	N	W	SEP 11 2012	0745	1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB4	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LXB4	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LXB4	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LXB4	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB4	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LXB4	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LXB4	N	W			3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C
B2LXB2	Y	W	SEP 11 2012	0745	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			SEP 11 2012 1400		FED EX		SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
Fed Ex		9-12-12	1010	VICTOR HERNANDEZ		9-12-12	1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-018 Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 Jul 94	Ice Chest No.	N/A EWS-179
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	~~N/A~~ 7989 4096 4322
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4029

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LX83	N	W	SEP 11 2012	1030	1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LX83	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LX83	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LX83	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LX83	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LX83	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LX83	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX83	N	W			3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C
B2LX82	Y	W	SEP 11 2012	1030	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			1400 SEP 11 2012	FED EX			SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
			9-12-12 1010	VICTOR HERNANDEZ			9-12-12 1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-012
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50194	Ice Chest No.	N/A GWS-179
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	9.11.12 ~~N/A~~ 7989 4096 4322
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4029

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LX87	Y	W	SEP 11 2012	0941	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX89	N	W			1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool-4C
B2LX89	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool-4C
B2LX89	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LX89	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool-4C
B2LX89	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool-4C
B2LX89	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool-4C
B2LX89	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX89	N	W	SEP 11 2012	0941	3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool-4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			SEP 11 2012 1900	FED EX			SEP 11 2012
Relinquished By: Fed Ex			9-12-12 1010	Received By: Victor Hernandez			9-12-12 1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-013
		Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50 194	Ice Chert No.	N/A GWS-246
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	~~N/A~~ 7989 4091 7544
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4028

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LX90	N	W	SEP 11 2012	0900	1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LX90	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LX90	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LX90	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LX90	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LX90	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LX90	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LX90	N	W			3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C
B2LX88	Y	W	SEP 11 2012	0900	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			SEP 11 2012 1500	FEDEX			SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
FedEx		9-12-12	1010	VICTOR HERNANDEZ		9-12-12	1010
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-008Q-016 Page 1 of 1

Collector	F. M. Hall	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	RC-008Q	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302326ES20
Project Title	ERDF, September 2012	Logbook No.	HNF-N-506 50194	Ice Chest No.	N/A 6WS-246
Shipped To (Lab)	Lionville Laboratory Incorporated	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	~~N/A~~ 7989 4091 7544
Protocol	GPP	Priority:	45 Days	Offsite Property No.	N/A 4028

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and Scot Fitzgerald (509-373-7495).
**Sample Management will send all results to Mike Peloquin.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2LXB1	Y	W	SEP 11 2012	0858	1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LXB3	N	W			1x1-L aGs*	TOX - 9020	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB3	N	W			1x500-mL G/P	TDS - 160.1	7 Days	Cool~4C
B2LXB3	N	W			1x20-mL P	Activity Scan	6 Months	None
B2LXB3	N	W			1x250-mL G/P	2320_ALKALINITY: Alkalinity (1)	14 Days	Cool~4C
B2LXB3	N	W			1x500-mL G/P	NO2/NO3 - 353.2	28 Days	H2SO4 to pH <2/Cool~4C
B2LXB3	N	W			1x500-mL P	IC Anions - 300.0	48 Hours	Cool~4C
B2LXB3	N	W			1x500-mL G/P	6010_METALS_ICP_TR: List-3 (8)	6 Months	HNO3 to pH <2
B2LXB3	N	W	SEP 11 2012	0858	3x40-mL aGs*	VOA - 8260A (TCL)	14 Days	HCl or H2SO4 to pH <2/Cool~4C

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Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
F. M. Hall			SEP 11 2012 1400		FED EX		SEP 11 2012
Relinquished By			Date/Time	Received By			Date/Time
		9-12-12	1010	VICTOR HEWANDER		9-12-12	10 10
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

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Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: ERDF		DATA PACKAGE: K3987	
VALIDATOR: ELR	LAB: LLI		DATE: 11/20/12
		SDG: K3987	

ANALYSES PERFORMED

Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		

SAMPLES/MATRIX

B2LXB4 B2LX83 B2LX89 B2LX90

B2LXB3

Water Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

BY + ~~BS~~ - EB BY-TDS

~~[illegible] - TAS~~ 11/1[illegible]

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

NO MS - TDS + alkalinity - J all

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. HOLDING TIMES (all levels)

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

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

Comments:

Tox headspace — Tal

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

A division of Eberline Analytical Corporation

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 10/11/2012 16:32

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209077 - Default Prep GenChem										
Blank (L209077-BLK1)				Prepared & Analyzed: 09/12/2012 15:40						
Total Dissolved Solids	5.0 U	5.0	20.0	mg/L						
LCS (L209077-BS1)				Prepared & Analyzed: 09/12/2012 15:40						
Total Dissolved Solids	101	5.0	20.0	mg/L	100.00		101	80-120		
LCS (L209077-BS2)				Prepared & Analyzed: 09/12/2012 15:40						
Total Dissolved Solids	103	5.0	20.0	mg/L	100.00		103	80-120		
Duplicate (L209077-DUP2)		Source: 1209032-01		Prepared & Analyzed: 09/12/2012 15:40						
Total Dissolved Solids	7.0 B	5.0	20.0	mg/L		12.0			52.6*	20
Batch L209097 - Default Prep GenChem										
Blank (L209097-BLK1)				Prepared: 09/14/2012 11:00 Analyzed: 09/14/2012 13:15						
Total Alkalinity	0.2 U	0.2	0.5	mg/L						
LCS (L209097-BS1)				Prepared: 09/14/2012 11:00 Analyzed: 09/14/2012 13:15						
Total Alkalinity	103	0.2	0.5	mg/L	100.00		103	90-110		
LCS (L209097-BS2)				Prepared: 09/14/2012 11:00 Analyzed: 09/14/2012 13:15						
Total Alkalinity	98.1	0.2	0.5	mg/L	100.00		98.1	90-110		
Duplicate (L209097-DUP2)		Source: 1209032-03		Prepared: 09/14/2012 11:00 Analyzed: 09/14/2012 13:15						
Total Alkalinity	142	0.2	0.5	mg/L		143			0.784	20
Batch L209104 - Default Prep GenChem										
Blank (L209104-BLK1)				Prepared: 09/12/2012 09:23 Analyzed: 09/12/2012 10:08						
Fluoride	0.10 U	0.10	0.50	mg/L						
Chloride	0.10 U	0.10	0.50	mg/L						
Nitrite	0.10 U	0.10	0.50	mg/L						
Bromide	0.10 U	0.10	0.50	mg/L						
Nitrate	0.10 U	0.10	0.50	mg/L						
Orthophosphate	0.20 U	0.20	1.00	mg/L						
Sulfate	0.10 U	0.10	0.50	mg/L						

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	Reported: 10/11/2012 16:32

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209104 - Default Prep GenChem										
LCS (L209104-BS1)					Prepared: 09/12/2012 09:23 Analyzed: 09/12/2012 10:08					
Fluoride	5.16	0.10	0.50	mg/L	5.0000		103	90-110		
Chloride	4.96	0.10	0.50	mg/L	5.0000		99.2	90-110		
Nitrite	4.95	0.10	0.50	mg/L	5.0000		99.0	90-110		
Bromide	5.09	0.10	0.50	mg/L	5.0000		102	90-110		
Nitrate	5.13	0.10	0.50	mg/L	5.0000		103	90-110		
Orthophosphate	4.92	0.20	1.00	mg/L	5.0000		98.4	90-110		
Sulfate	5.10	0.10	0.50	mg/L	5.0000		102	90-110		
Duplicate (L209104-DUP2)		Source: 1209032-01			Prepared: 09/12/2012 09:23 Analyzed: 09/12/2012 17:58					
Fluoride	0.10 U	0.10	0.50	mg/L		0.10 U				20
Chloride	0.10 U	0.10	0.50	mg/L		0.10 U				20
Nitrite	0.10 U	0.10	0.50	mg/L		0.10 U				20
Bromide	0.10 U	0.10	0.50	mg/L		0.10 U				20
Nitrate	0.10 U	0.10	0.50	mg/L		0.10 U				20
Orthophosphate	0.20 U	0.20	1.00	mg/L		0.20 U				20
Sulfate	0.10 U	0.10	0.50	mg/L		0.10 U				20
Matrix Spike (L209104-MS4)		Source: 1209032-01			Prepared: 09/12/2012 09:23 Analyzed: 09/12/2012 17:58					
Fluoride	5.12	0.10	0.50	mg/L	5.0000	0.10 U	102	80-120		
Chloride	4.72	0.10	0.50	mg/L	5.0000	0.10 U	94.4	80-120		
Nitrite	4.92	0.10	0.50	mg/L	5.0000	0.10 U	98.4	80-120		
Bromide	4.94	0.10	0.50	mg/L	5.0000	0.10 U	98.8	80-120		
Nitrate	4.92	0.10	0.50	mg/L	5.0000	0.10 U	98.4	80-120		
Orthophosphate	4.95	0.20	1.00	mg/L	5.0000	0.20 U	99.0	80-120		
Sulfate	4.94	0.10	0.50	mg/L	5.0000	0.10 U	98.8	80-120		
Batch L209174 - Default Prep GenChem										
Blank (L209174-BLK1)					Prepared: 09/21/2012 10:00 Analyzed: 09/21/2012 10:38					
Nitrate/Nitrite as N	0.010 U	0.010	0.050	mg/L						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-008 Project Number: K3987 Project Manager: Joan Kessner	**Reported:** 10/11/2012 16:32

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209174 - Default Prep GenChem										
LCS (L209174-BS1)					Prepared: 09/21/2012 10:00 Analyzed: 09/21/2012 10:37					
Nitrate/Nitrite as N	0.512	0.010	0.050	mg/L	0.51302		100	90-110		
Duplicate (L209174-DUP2)					Source: 1209032-01	Prepared: 09/21/2012 10:00 Analyzed: 09/21/2012 11:53				
Nitrate/Nitrite as N	0.010 U	0.010	0.050	mg/L		0.010 U				20
Matrix Spike (L209174-MS2)					Source: 1209032-01	Prepared: 09/21/2012 10:00 Analyzed: 09/21/2012 11:54				
Nitrate/Nitrite as N	0.523	0.010	0.050	mg/L	0.50000	0.010 U	105	90-110		
Batch L210065 - Default Prep GenChem										
Blank (L210065-BLK1)					Prepared: 10/03/2012 06:20 Analyzed: 10/03/2012 19:30					
Total Organic Halides	20.0 U	20.0	100	ug/L						
LCS (L210065-BS1)					Prepared: 10/03/2012 06:20 Analyzed: 10/03/2012 19:30					
Total Organic Halides	49.7 B	20.0	100	ug/L	50.000		99	80-120		
Duplicate (L210065-DUP2)					Source: 1209032-01	Prepared: 10/03/2012 06:20 Analyzed: 10/03/2012 19:30				
Total Organic Halides	20.0 U	20.0	100	ug/L		20.0 U				20
Matrix Spike (L210065-MS2)					Source: 1209032-10	Prepared: 10/03/2012 06:20 Analyzed: 10/03/2012 19:30				
Total Organic Halides	54.5 B	20.0	100	ug/L	50.000	20.0 U	109	75-125		