SAF-RC-148
300 Area D4 Waste Sites –
Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:

Kathy Wendt H4-21

COMMENTS:

SDG KP0123 SAF-RC-148

Sample Location/Waste Site: 316-3

Date: 5 November 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 300 Area D4 Waste Sites – Soil Full Protocol – Waste Site 316-3
Subject: Polyaromatic Hydrocarbons - Data Package No. KP0123-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. KP0123 prepared by Lionville Laboratories 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	Analyte
J1PX95	8/16/12	Soil	C	See note 1
J1PX96	8/16/12	Soil	C	See note 1
J1PX97	8/16/12	Soil	C	See note 1
J1PX98	8/16/12	Soil	C	See note 1
J1PX99	8/20/12	Soil	C	See note 1
J1PXC0	8/20/12	Soil	C	See note 1
J1PXC1	8/20/12	Soil	C	See note 1
J1PXC2	8/20/12	Soil	C	See note 1

1 – Polyaromatic hydrocarbons by 8310..

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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 Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

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

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

All holding times were acceptable.

- **Method Blanks**

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

Due to method blank contamination, the naphthalene results in samples J1PX95, J1PX96, J1PX97, J1PX98, J1PXC0, J1PXC1 and J1PXC2 were qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

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

are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All laboratory results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. KP0123 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 deficiency was noted:

- Due to method blank contamination, the naphthalene results in samples J1PX95, J1PX96, J1PX97, J1PX98, J1PXC0, J1PXC1 and J1PXC2 were qualified as undetected and flagged "U".

REFERENCES

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

DOE/RL-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators 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 same quantitation limit corrected for sample dilution and moisture content by the laboratory.

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: KP0123	**REVIEWER: ELR**	**Project: 316-3**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Naphthalene	U	J1PX95, J1PX96 J1PX97, J1PX98 J1PXC0, J1PXC1 J1PXC2	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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/28/2012 21:20

J1PX95
1208077-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**6.36**	U	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthylene	**16.3**		3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthene	3.43	U	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluorene	**1.72**	J	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Phenanthrene	**1.37**	J	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Anthracene	3.43	U	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluoranthene	**2.58**	J	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Indeno[1,2,3-cd]pyrene	**5.71**		3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Pyrene	**1.03**	J	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benz[a]anthracene	**0.859**	J	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Chrysene	**0.980**	J	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[b] fluoranthene	3.43	U	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[k] fluoranthene	3.43	U	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[a] pyrene	**1.44**	J	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Dibenz[a,h]anthracene	3.43	U	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[g,h,i] perylene	3.43	U	3.43	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Surrogate: Triphenylene	*97 %*		*68-129*			*L208237*	*08/24/2012*	*08/27/2012*	*8310*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/28/2012 21:20

J1PX96
1208077-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**9.00**	U	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthylene	**8.86**		3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthene	3.52	U	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluorene	**1.89**	J	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Phenanthrene	**1.06**	J	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Anthracene	3.52	U	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluoranthene	**2.29**	J	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Indeno[1,2,3-cd]pyrene	**8.24**		3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Pyrene	**0.935**	J	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benz[a]anthracene	**5.96**		3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Chrysene	3.52	U	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[b] fluoranthene	**3.53**		3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[k] fluoranthene	3.52	U	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[a] pyrene	**1.41**	J	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Dibenz[a,h]anthracene	3.52	U	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[g,h,i] perylene	3.52	U	3.52	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Surrogate: Triphenylene	*93 %*		*68-129*			*L208237*	*08/24/2012*	*08/27/2012*	*8310*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/28/2012 21:20

J1PX97
1208077-03 (Soil)

Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Naphthalene	**1.55**	J U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthylene	**2.93**	J	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluorene	**1.21**	J	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Phenanthrene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Anthracene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluoranthene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Indeno[1,2,3-cd]pyrene	**3.00**	J	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Pyrene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benz[a]anthracene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Chrysene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[b] fluoranthene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[k] fluoranthene	**7.26**		3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[a] pyrene	**6.12**		3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Dibenz[a,h]anthracene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[g,h,i] perylene	3.45	U	3.45	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Surrogate: Triphenylene	*89 %*		*68-129*			*L208237*	*08/24/2012*	*08/27/2012*	*8310*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/28/2012 21:20

J1PX98

1208077-04 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**11.9**	U	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthylene	**23.4**		3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthene	**2.52**	J	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluorene	**2.77**	J	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Phenanthrene	**5.35**		3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Anthracene	3.96	U	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluoranthene	**4.56**		3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Indeno[1,2,3-cd]pyrene	**3.88**	J	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Pyrene	**2.18**	J	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benz[a]anthracene	**11.7**		3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Chrysene	3.96	U	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[b] fluoranthene	3.96	U	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[k] fluoranthene	3.96	U	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[a] pyrene	**1.84**	J	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Dibenz[a,h]anthracene	3.96	U	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[g,h,i] perylene	3.96	U	3.96	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Surrogate: Triphenylene	*99 %*		*68-129*			*L208237*	*08/24/2012*	*08/27/2012*	*8310*

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/28/2012 21:20

J1PX99
1208077-05 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**225**	D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Acenaphthylene	**3240**	D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Acenaphthene	**210**	D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Fluorene	**124**	D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Phenanthrene	**277**	D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Anthracene	**24.7**	D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Fluoranthene	**545**	D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Indeno[1,2,3-cd]pyrene	19.9	U	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Pyrene	**38.9**	D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Benz[a]anthracene	**21.3**	D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Chrysene	**14.6**	J, D	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Benzo[b] fluoranthene	19.9	U	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Benzo[k] fluoranthene	19.9	U	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Benzo[a] pyrene	19.9	U	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Dibenz[a,h]anthracene	19.9	U	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Benzo[g,h,i] perylene	19.9	U	19.9	ug/kg dry	5	L208237	08/24/2012	08/28/2012	8310
Surrogate: Triphenylene	*94 %*		*68-129*			*L208237*	*08/24/2012*	*08/28/2012*	*8310*

11/4/12

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/28/2012 21:20

J1PXC0
1208077-06 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**0.866**	J	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthylene	**9.70**		3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluorene	**1.39**	J	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Phenanthrene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Anthracene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluoranthene	**1.16**	J	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Indeno[1,2,3-cd]pyrene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Pyrene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benz[a]anthracene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Chrysene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[b] fluoranthene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[k] fluoranthene	**6.67**		3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[a] pyrene	**10.6**		3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Dibenz[a,h]anthracene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[g,h,i] perylene	3.46	U	3.46	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Surrogate: Triphenylene	*91 %*		*68-129*			*L208237*	*08/24/2012*	*08/27/2012*	*8310*

11/4/12

000000129

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/28/2012 21:20

J1PXC1
1208077-07 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**3.30**	J U	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthylene	**2.75**	J	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthene	3.66	U	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluorene	3.66	U	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Phenanthrene	**1.47**	J	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Anthracene	3.66	U	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluoranthene	**3.85**		3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Indeno[1,2,3-cd]pyrene	**1.10**	J	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Pyrene	**1.19**	J	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benz[a]anthracene	**1.28**	J	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Chrysene	3.66	U	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[b] fluoranthene	3.66	U	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[k] fluoranthene	3.66	U	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[a] pyrene	**1.58**	J	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Dibenz[a,h]anthracene	3.66	U	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[g,h,i] perylene	3.66	U	3.66	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Surrogate: Triphenylene	*87 %*		*68-129*			*L208237*	*08/24/2012*	*08/27/2012*	*8310*

11/14/12

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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/28/2012 21:20

J1PXC2
1208077-08 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**7.41**	U	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthylene	**21.9**		3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Acenaphthene	**2.65**	J	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluorene	**1.85**	J	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Phenanthrene	**2.96**	J	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Anthracene	3.70	U	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Fluoranthene	**5.37**		3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Indeno[1,2,3-cd]pyrene	**1.98**	J	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Pyrene	3.70	U	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benz[a]anthracene	**0.945**	J	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Chrysene	3.70	U	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[b] fluoranthene	3.70	U	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[k] fluoranthene	3.70	U	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[a] pyrene	3.70	U	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Dibenz[a,h]anthracene	3.70	U	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Benzo[g,h,i] perylene	3.70	U	3.70	ug/kg dry	1	L208237	08/24/2012	08/27/2012	8310
Surrogate: Triphenylene	*93 %*		*68-129*			*L208237*	*08/24/2012*	*08/27/2012*	*8310*

11/4/12

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-148 KP0123
LVL #: 1208077

W.O. #: 60049-001-001-0001-00
Date Received: 08-23-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

Eight (8) soil samples were collected on 08-16,20-2012.

The samples and associated QC samples were extracted 08-24-2012 and analyzed 08-27,28-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8310.

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. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. Sample J1PX99 required a 5-fold instrument dilution due to high concentrations of target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. The samples were reported on a dry weight basis.

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. 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
LvL Laboratory Manager

8/30/12
Date

1 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~

Collector: Weber, HC	Company Contact: Joan Kessner — Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B — Data Turnaround: 7 ~~21~~ Days
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No.: RC-148	
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03 — COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No.: A110483	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive ∠ DOT Limits A# 8-22-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
~~J1PX93~~	~~SOIL~~												
~~J1PX94~~	~~SOIL~~												
J1PX95	SOIL	8/16/12	0936	✓	✓	✓	✓	✓	✓	✓	✓	✓	34265
J1PX96	SOIL	8/16/12	1034	✓	✓	✓	✓	✓	✓	✓	✓	✓	~~242~~ 34266
J1PX97	SOIL	8/16/12	1221	✓	✓	✓	✓	✓	✓	✓	✓	✓	34267

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Heather Weber/[signature] — Date/Time: 8-16-12 1415	Received By/Stored In: DAVID BECKER [signature] — Date/Time: 8/16/12 1415		
Relinquished By/Removed From: DAVID BECKER [signature] — Date/Time: 8/16/12 1755	Received By/Stored In: 1060 #3B — Date/Time: 8/16/12 1755		
Relinquished By/Removed From: 1060 #3B — Date/Time: 8-20-12 0710	Received By/Stored In: 1060#3 A. Freier [signature] — Date/Time: 0710 8-20-12		
Relinquished By/Removed From: WCH A. Freier [signature] — Date/Time: 1060#3 8-22-12 1258	Received By/Stored In: Fed Ex — Date/Time:		
Relinquished By/Removed From: [signature] — Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HERNANDEZ — Date/Time: 8/23/12 0930		
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time:		

SPECIAL INSTRUCTIONS
VOAs Frozen Upon Collection

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

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, ~~uropium-155, Niobium-94~~, Radium-226, Radium-228, , Zinc-65) 8/16/12

* freeze upon receipt. A# 8-20-12

Matrix *: S=Soil, SE=Sediment, SO=Solid, Sl=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, Y=Other

KP0123

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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2 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~1 of 12~~

Collector: Weber, HC	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH
Price Code: ~~81~~ 9B	Data Turnaround: 7 ~~21~~ Days		
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits		SAF No.: RC-148
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03	COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No.: A110483		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive ∠ DOT Limits
AJ 8-22-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	sG	sG	Gs*	sG	sG	sG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
J1PX98	SOIL	8/16/12	1337	✓	✓	✓	✓	✓	✓	✓	✓	✓	34268
J1PX99	SOIL												
J1PXC0	SOIL												
J1PXC1	SOIL	AJ 8-20-12											
J1PXC2	SOIL												

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Heather Weber/	Date/Time: 8/16/12 1415	Received By/Stored In: DAVID BECKER	Date/Time: 8/16/12 1415
Relinquished By/Removed From: DAVID BECKER	Date/Time: 8/16/12 1755	Received By/Stored In: 1060/38	Date/Time: 8/16/12 1755
Relinquished By/Removed From: 1060#38	Date/Time: 8-20-12 0710	Received By/Stored In: 1060#3 A. Freier	Date/Time: 8-20-12 0710
Relinquished By/Removed From: WCH A. Freier 1060#3	Date/Time: 8-22-12 1258	Received By/Stored In: FedEx	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HERNANDEZ	Date/Time: 8/23/12 0930
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS
VOAs Frozen Upon Collection

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

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cesium-134, Cesium-137, Europium-155, Niobium-94, Radium-226, Radium-228, Zinc-65] 8/16/12

*freeze upon receipt.
AJ 8-20-12

KP0123

Matrix *
S=Soil
SD=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid

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

REVIEWED BY Moskea DATE 8/22/12

WCH-EE-011

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1 OF 1

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~1 of 12~~
Collector: ~~Weber, HC~~ STOWE, Q (KDB 8/20/12)	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: 7 ~~21~~ Days (KDB 8/20/12)
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No.: RC-148 (KDB 8/20/12)	
Ice Chest No.: RCC -07-012	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: ~~EDERLINE SERVICES~~ LIONVILLE (KDB 8/20/12)	Offsite Property No.: A 110483	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS (KDB 8/20/12)
Potential Radioactive < DOT Limits A# 8-22-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	~~5~~ 6 (KDB)	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	~~40mL~~ 8/20/12	250mL	120mL	120mL	~~500mL~~ 120mL

SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions. TCLP * METALS

Sample No.	Matrix *	Sample Date	Sample Time											RCF
~~J1PX98~~ (KDB)	8/20/12													
J1PX99	SOIL	8/20/12	1239	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34273
J1PXC0	SOIL	8/20/12	1323	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34274
J1PXC1	SOIL	8/20/12	1400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34275
J1PXC2	SOIL	8/20/12	1511	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34276

23

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From: Quincy Stowe		8/20/12 1545	Received By/Stored In: DAVID BECKER	8/20/12 1545
Relinquished By/Removed From: DAVID BECKER		8/20/12 1730	Received By/Stored In: 1060, 3B	8/20/12 1730
Relinquished By/Removed From: 1060#3B		8-21-12 0740	Received By/Stored In: 1060#3 A. Freier	0740 8-21-12
Relinquished By/Removed From: A. Freier (WCH)		8-22-12 1258	Received By/Stored In: FedEx	
Relinquished By/Removed From: FedEx		8/23/12 0930	Received By/Stored In: VICTOR HERNANDEZ	8-23-12 0930
Relinquished By/Removed From		Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS * freeze upon rec. pt. A# 8-21-12
VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc. Zirconium1: Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab. ~~Americium-125~~, Cerium-144, Cesium-134, Cesium-137, ~~Iodine-125, Iodine-131, Radium-226, Radium-228, Zinc-65~~ 8/20/12

TTCLP METALS - LEACH & HOLD UNTIL FURTHER DIRECTION IS PROVIDED (KDB 8/20/12)

KP0123

REVIEWED BY [signature] DATE 8/22/12

Matrix *: S=Soil; SB=Sediment; SO=Solid; Sl=Sludge; W = Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; Wi=Wipe; L=Liquid; V=Vegetation; X=Other

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

WCH-EE-011

0000000006

Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 316-3			DATA PACKAGE: KP0123		
VALIDATOR: ELR		LAB: LLI		DATE: 11/3/12	
			SDG: KP0123		
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	8310
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
J1PX95	J1PX96	J1PX97	J1PX98	J1PX99	
J1PXC0	J1PXC1	J1PXC2			
					soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

Comments:

GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: naphthalene - UJ - (all but 99)

no FB

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. HOLDING TIMES (all levels)

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

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

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries aceptable? ..... Yes No N/A

Check materials traceable? ..... Yes No N/A

Check materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments: _____

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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/28/2012 21:20

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208237 - SW 3540C										
Blank (L208237-BLK1)				Prepared: 08/24/2012 Analyzed: 08/27/2012						
Naphthalene	2.78	J	3.33	ug/kg wet						
Acenaphthylene	3.33	U	3.33	ug/kg wet						
Acenaphthene	3.33	U	3.33	ug/kg wet						
Fluorene	3.33	U	3.33	ug/kg wet						
Phenanthrene	3.33	U	3.33	ug/kg wet						
Anthracene	3.33	U	3.33	ug/kg wet						
Fluoranthene	3.33	U	3.33	ug/kg wet						
Indeno[1,2,3-cd]pyrene	3.33	U	3.33	ug/kg wet						
Pyrene	3.33	U	3.33	ug/kg wet						
Benz[a]anthracene	3.33	U	3.33	ug/kg wet						
Chrysene	3.33	U	3.33	ug/kg wet						
Benzo[b] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[k] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[a] pyrene	3.33	U	3.33	ug/kg wet						
Dibenz[a,h]anthracene	3.33	U	3.33	ug/kg wet						
Benzo[g,h,i] perylene	3.33	U	3.33	ug/kg wet						
Surrogate: Triphenylene	*151*			*ug/kg wet*	*166.67*		*90*	*68-129*		
LCS (L208237-BS1)				Prepared: 08/24/2012 Analyzed: 08/27/2012						
Naphthalene	131		3.33	ug/kg wet	166.67		79	0-127		
Acenaphthylene	132		3.33	ug/kg wet	166.67		79	50-140		
Acenaphthene	135		3.33	ug/kg wet	166.67		81	17-139		
Fluorene	150		3.33	ug/kg wet	166.67		90	28-145		
Phenanthrene	158		3.33	ug/kg wet	166.67		95	30-152		
Anthracene	162		3.33	ug/kg wet	166.67		97	19-171		
Fluoranthene	162		3.33	ug/kg wet	166.67		97	34-159		
Indeno[1,2,3-cd]pyrene	166		3.33	ug/kg wet	166.67		99	31-156		
Pyrene	160		3.33	ug/kg wet	166.67		96	33-152		
Benz[a]anthracene	169		3.33	ug/kg wet	166.67		101	32-157		
Chrysene	162		3.33	ug/kg wet	166.67		97	31-159		
Benzo[b] fluoranthene	170		3.33	ug/kg wet	166.67		102	33-164		
Benzo[k] fluoranthene	169		3.33	ug/kg wet	166.67		101	28-161		
Benzo[a] pyrene	173		3.33	ug/kg wet	166.67		104	29-149		
Dibenz[a,h]anthracene	172		3.33	ug/kg wet	166.67		103	27-153		
Benzo[g,h,i] perylene	171		3.33	ug/kg wet	166.67		102	32-157		
Surrogate: Triphenylene	*167*			*ug/kg wet*	*166.67*		*100*	*68-129*		

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/28/2012 21:20

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208237 - SW 3540C									
Matrix Spike (L208237-MS1)		**Source: 1208077-01**	Prepared: 08/24/2012 Analyzed: 08/27/2012						
Naphthalene	113	3.47	ug/kg dry	173.63	6.36	62	0-127		
Acenaphthylene	139	3.47	ug/kg dry	173.63	16.3	70	50-140		
Acenaphthene	109	3.47	ug/kg dry	173.63	3.43 U	63	17-139		
Fluorene	126	3.47	ug/kg dry	173.63	1.72	72	28-145		
Phenanthrene	133	3.47	ug/kg dry	173.63	1.37	76	30-152		
Anthracene	133	3.47	ug/kg dry	173.63	3.43 U	77	19-171		
Fluoranthene	137	3.47	ug/kg dry	173.63	2.58	77	34-159		
Indeno[1,2,3-cd]pyrene	141	3.47	ug/kg dry	173.63	5.71	78	31-156		
Pyrene	141	3.47	ug/kg dry	173.63	1.03	81	33-152		
Benz[a]anthracene	169	3.47	ug/kg dry	173.63	0.859	97	32-157		
Chrysene	145	3.47	ug/kg dry	173.63	0.980	83	31-159		
Benzo[b] fluoranthene	179	3.47	ug/kg dry	173.63	3.43 U	103	33-164		
Benzo[k] fluoranthene	153	3.47	ug/kg dry	173.63	3.43 U	88	28-161		
Benzo[a] pyrene	156	3.47	ug/kg dry	173.63	1.44	89	29-149		
Dibenz[a,h]anthracene	152	3.47	ug/kg dry	173.63	3.43 U	88	27-153		
Benzo[g,h,i] perylene	158	3.47	ug/kg dry	173.63	3.43 U	91	32-157		
Surrogate: Triphenylene	*150*		*ug/kg dry*	*173.63*		*86*	*68-129*		
Matrix Spike Dup (L208237-MSD1)		**Source: 1208077-01**	Prepared: 08/24/2012 Analyzed: 08/27/2012						
Naphthalene	128	3.39	ug/kg dry	169.90	6.36	72	0-127	15	40
Acenaphthylene	165	3.39	ug/kg dry	169.90	16.3	87	50-140	22	40
Acenaphthene	124	3.39	ug/kg dry	169.90	3.43 U	73	17-139	15	40
Fluorene	141	3.39	ug/kg dry	169.90	1.72	82	28-145	13	40
Phenanthrene	150	3.39	ug/kg dry	169.90	1.37	87	30-152	14	40
Anthracene	151	3.39	ug/kg dry	169.90	3.43 U	89	19-171	14	40
Fluoranthene	151	3.39	ug/kg dry	169.90	2.58	87	34-159	12	40
Indeno[1,2,3-cd]pyrene	151	3.39	ug/kg dry	169.90	5.71	86	31-156	9	40
Pyrene	149	3.39	ug/kg dry	169.90	1.03	87	33-152	8	40
Benz[a]anthracene	166	3.39	ug/kg dry	169.90	0.859	97	32-157	0.3	40
Chrysene	150	3.39	ug/kg dry	169.90	0.980	88	31-159	6	40
Benzo[b] fluoranthene	178	3.39	ug/kg dry	169.90	3.43 U	104	33-164	1	40
Benzo[k] fluoranthene	163	3.39	ug/kg dry	169.90	3.43 U	96	28-161	9	40
Benzo[a] pyrene	166	3.39	ug/kg dry	169.90	1.44	97	29-149	8	40
Dibenz[a,h]anthracene	163	3.39	ug/kg dry	169.90	3.43 U	96	27-153	9	40
Benzo[g,h,i] perylene	171	3.39	ug/kg dry	169.90	3.43 U	101	32-157	10	40
Surrogate: Triphenylene	*160*		*ug/kg dry*	*169.90*		*94*	*68-129*		

Date: 5 November 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 300 Area D4 Waste Sites – Soil Full Protocol – Waste Site 316-3
Subject: Semivolatile Organics - Data Package No. KP0123-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. KP0123 prepared by Lionville Laboratories 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	Analyte
J1PX95	8/16/12	Soil	C	See note 1
J1PX96	8/16/12	Soil	C	See note 1
J1PX97	8/16/12	Soil	C	See note 1
J1PX98	8/16/12	Soil	C	See note 1
J1PX99	8/20/12	Soil	C	See note 1
J1PXC0	8/20/12	Soil	C	See note 1
J1PXC1	8/20/12	Soil	C	See note 1
J1PXC2	8/20/12	Soil	C	See note 1

1 - Semivolatile organics by 8270C.

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 Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

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

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

All holding times were acceptable.

Method Blanks

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

All method blank results were acceptable.

Field (equipment) Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to an LCS recovery outside QC limits, all 2,4-dinitrophenol (25%), 4,6-dinitro-2-methylphenol (41%), 4-chloroanaline (49%), pentachlorophenol (43%) results were qualified as estimates and flagged "J".

Due to matrix spike recoveries outside QC limits, all 1,2,4-trichlorobenzene (46%), 1,3-dichlorobenzene (48%), 1,4-dichlorobenzene (49%), 2,4-dimethylphenol (49%), 4-chloroanaline (49%), hexachlorobutadiene (48%), hexachlorocyclopentadiene (41%),

hexachloroethane (47%), nitrobenzene (49%) and pentachlorophenol (24%) results were qualified as estimates and flagged "J".

Due to matrix spike duplicate recoveries outside QC limits, all 2,4-dimethylphenol (47%), 4-chloroanaline (45%) and pentachlorophenol (41%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

Due to a surrogate recovery outside QC limits, all 2,4-dichlorophenol, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, pentachlorophenol, bis(2-chloroethyl)ether, bis(2-chloroisopropyl)ether, bis(2-chloroethoxy)methane, 4-chlorophenyl phenyl ether and 4-bromophenyl phenyl ether results in sample J1PX96 were qualified as estimates and flagged "J".

Due to a surrogate recovery outside QC limits, all 2-chorophenol, 2,4-dichlorophenol and 4-chloro-3-methyl phenol results in sample J1PX99 were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of

specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to an RPD outside QC limits, all pentachlorophenol (53%) results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. KP0123 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 an LCS recovery outside QC limits, all 2,4-dinitrophenol (25%), 4,6-dinitro-2-methylphenol (41%), 4-chloroanaline (49%), pentachlorophenol (43%) results were qualified as estimates and flagged "J".

- Due to matrix spike recoveries outside QC limits, all 1,2,4-trichlorobenzene (46%), 1,3-dichlorobenzene (48%), 1,4-dichlorobenzene (49%), 2,4-dimethylphenol (49%), 4-chloroanaline (49%), hexachlorobutadiene (48%), hexachlorocyclopentadiene (41%), hexachloroethane (47%), nitrobenzene (49%) and pentachlorophenol (24%) results were qualified as estimates and flagged "J".

- Due to matrix spike duplicate recoveries outside QC limits, all 2,4-dimethylphenol (47%), 4-chloroanaline (45%) and pentachlorophenol (41%) results were qualified as estimates and flagged "J".

- Due to a surrogate recovery outside QC limits, all 2,4-dichlorophenol, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, pentachlorophenol, bis(2-chloroethyl)ether, bis(2-chloroisopropyl)ether, bis(2-chloroethoxy)methane, 4-chlorophenyl phenyl ether and 4-bromophenyl phenyl ether results in sample J1PX96 were qualified as estimates and flagged "J".

- Due to a surrogate recovery outside QC limits, all 2-chorophenol, 2,4-dichlorophenol and 4-chloro-3-methyl phenol results in sample J1PX99 were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits, all pentachlorophenol (53%) 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.

Fifty-six analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

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

DOE/RL-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators 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 same quantitation limit corrected for sample dilution and moisture content by the laboratory.

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

SEMIVOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: KP0123	**REVIEWER: ELR**	**Project: 316-3**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
2,4-dinitrophenol 4,6-dinitro-2-methylphenol 4-chloroanaline pentachlorophenol	J	All	LCS recovery
1,2,4-trichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene 2,4-dimethylphenol 4-chloroanaline hexachlorobutadiene hexachlorocyclopentadiene hexachloroethane nitrobenzene pentachlorophenol	J	All	MS recovery
2,4-dimethylphenol 4-chloroanaline pentachlorophenol	J	All	MSD recovery
2,4-dichlorophenol 2,4,6-trichlorophenol 2,4,5-trichlorophenol pentachlorophenol bis(2-chloroethyl)ether bis(2-chloroisopropyl)ether bis(2-chloroethoxy)methane 4-chlorophenyl phenyl ether 4-bromophenyl phenyl ether	J	J1PX96	Surrogate recovery
2-chorophenol 2,4-dichlorophenol 4-chloro-3-methyl phenol	J	J1PX99	Surrogate recovery
pentachlorophenol	J	All	RPD

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

Appendix 3

Annotated Laboratory Reports

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

J1PX95
1208077-01 (Soil)

11/4/12

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,2,4-Trichlorobenzene	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
1,2-Dichlorobenzene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
1,3-Dichlorobenzene	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
1,4-Dichlorobenzene	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2,4,5-Trichlorophenol	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2,4,6-Trichlorophenol	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2,4-Dichlorophenol	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2,4-Dimethylphenol	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2,4-Dinitrophenol	1720	U J	1720	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2,4-Dinitrotoluene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2,6-Dinitrotoluene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2-Chloronaphthalene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2-Chlorophenol	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2-Methylnaphthalene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2-Methylphenol	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2-Nitroaniline	1720	U	1720	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
2-Nitrophenol	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
3,3'-Dichlorobenzidine	688	U	688	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
3-Nitroaniline	1720	U	1720	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
4,6-Dinitro-2-methylphenol	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
4-Bromophenyl Phenyl Ether	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
4-Chloro-3-methylphenol	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
4-Chloroaniline	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
4-Chlorophenyl Phenyl Ether	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
3- and/or 4-Methylphenol	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
4-Nitroaniline	1720	U	1720	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
4-Nitrophenol	1720	U	1720	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Acenaphthene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Acenaphthylene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Anthracene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Benz[a]anthracene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Benzo[a] pyrene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Benzo[b] fluoranthene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Benzo[g,h,i] perylene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Benzo[k] fluoranthene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Bis(2-chloroethoxy) methane	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C

000000056

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

J1PX95
1208077-01 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Bis(2-chloroisopropyl) ether	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Bis(2-ethylhexyl) phthalate	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Butyl Benzyl Phthalate	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Carbazole	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Chrysene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Dibenz[a,h]anthracene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Dibenzofuran	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Diethyl Phthalate	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Dimethyl Phthalate	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Di-n-butyl Phthalate	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Di-n-octyl Phthalate	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Fluoranthene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Fluorene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Hexachlorobenzene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Hexachlorobutadiene	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Hexachlorocyclopentadiene	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Hexachloroethane	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Indeno[1,2,3-cd]pyrene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Isophorone	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Naphthalene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Nitrobenzene	344	U J	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
N-Nitrosodi-n-propylamine	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
N-Nitrosodiphenylamine	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Pentachlorophenol	1720	U J	1720	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Phenanthrene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Phenol	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Pyrene	344	U	344	ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
TIC:Unknown 1	**694**	J		ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
TIC:Polychlorinated Biphenyl 2	**248**	J		ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
TIC:Polychlorinated Biphenyl 1	**274**	J		ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
TIC:Aldol Condensate 2	**16000**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
TIC:Aldol Condensate 1	**367**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/28/2012	8270C
Surrogate: 2-Fluorophenol	*55 %*		*25-121*			*L208238*	*08/24/2012*	*08/28/2012*	*8270C*
Surrogate: Phenol-d5	*58 %*		*24-113*			*L208238*	*08/24/2012*	*08/28/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*58 %*		*23-120*			*L208238*	*08/24/2012*	*08/28/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

J1PX95
1208077-01 (Soil)

11/4/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory					
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*60 %*	*30-115*			*L208238*	*08/24/2012*	*08/28/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*45 %*	*19-122*			*L208238*	*08/24/2012*	*08/28/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*75 %*	*18-137*			*L208238*	*08/24/2012*	*08/28/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

J1PX96
1208077-02 (Soil)

V 11/4/12

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,2,4-Trichlorobenzene	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
1,2-Dichlorobenzene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
1,3-Dichlorobenzene	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
1,4-Dichlorobenzene	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4,5-Trichlorophenol	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4,6-Trichlorophenol	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4-Dichlorophenol	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4-Dimethylphenol	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4-Dinitrophenol	1780	U J	1780	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4-Dinitrotoluene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,6-Dinitrotoluene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Chloronaphthalene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Chlorophenol	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Methylnaphthalene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Methylphenol	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Nitroaniline	1780	U	1780	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Nitrophenol	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
3,3'-Dichlorobenzidine	713	U	713	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
3-Nitroaniline	1780	U	1780	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4,6-Dinitro-2-methylphenol	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Bromophenyl Phenyl Ether	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Chloro-3-methylphenol	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Chloroaniline	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Chlorophenyl Phenyl Ether	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
3- and/or 4-Methylphenol	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Nitroaniline	1780	U	1780	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Nitrophenol	1780	U	1780	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Acenaphthene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Acenaphthylene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Anthracene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benz[a]anthracene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benzo[a] pyrene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benzo[b] fluoranthene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benzo[g,h,i] perylene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benzo[k] fluoranthene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Bis(2-chloroethoxy) methane	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

J1PX96
1208077-02 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Bis(2-chloroisopropyl) ether	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Bis(2-ethylhexyl) phthalate	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Butyl Benzyl Phthalate	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Carbazole	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Chrysene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Dibenz[a,h]anthracene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Dibenzofuran	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Diethyl Phthalate	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Dimethyl Phthalate	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Di-n-butyl Phthalate	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Di-n-octyl Phthalate	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Fluoranthene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Fluorene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Hexachlorobenzene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Hexachlorobutadiene	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Hexachlorocyclopentadiene	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Hexachloroethane	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Indeno[1,2,3-cd]pyrene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Isophorone	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Naphthalene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Nitrobenzene	357	U J	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
N-Nitrosodi-n-propylamine	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
N-Nitrosodiphenylamine	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Pentachlorophenol	1780	U J	1780	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Phenanthrene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Phenol	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Pyrene	357	U	357	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Unknown 1	**245**	J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Aldol Condensate 4	**331**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Aldol Condensate 3	**360**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Aldol Condensate 2	**29600**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Aldol Condensate 1	**1210**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Surrogate: 2-Fluorophenol	*54 %*		*25-121*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*
Surrogate: Phenol-d5	*56 %*		*24-113*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*56 %*		*23-120*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

J1PX96
1208077-02 (Soil)

11/4/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*55 %*	*30-115*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*17 % **	*19-122*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*66 %*	*18-137*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

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J1PX97
1208077-03 (Soil)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,2,4-Trichlorobenzene	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
1,2-Dichlorobenzene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
1,3-Dichlorobenzene	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
1,4-Dichlorobenzene	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4,5-Trichlorophenol	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4,6-Trichlorophenol	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4-Dichlorophenol	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4-Dimethylphenol	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4-Dinitrophenol	1670	U J	1670	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,4-Dinitrotoluene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2,6-Dinitrotoluene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Chloronaphthalene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Chlorophenol	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Methylnaphthalene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Methylphenol	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Nitroaniline	1670	U	1670	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
2-Nitrophenol	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
3,3'-Dichlorobenzidine	667	U	667	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
3-Nitroaniline	1670	U	1670	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4,6-Dinitro-2-methylphenol	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Bromophenyl Phenyl Ether	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Chloro-3-methylphenol	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Chloroaniline	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Chlorophenyl Phenyl Ether	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
3- and/or 4-Methylphenol	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Nitroaniline	1670	U	1670	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
4-Nitrophenol	1670	U	1670	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Acenaphthene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Acenaphthylene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Anthracene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benz[a]anthracene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benzo[a] pyrene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benzo[b] fluoranthene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benzo[g,h,i] perylene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Benzo[k] fluoranthene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Bis(2-chloroethoxy) methane	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

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J1PX97
1208077-03 (Soil)

Lionville Laboratory

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Bis(2-chloroisopropyl) ether	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Bis(2-ethylhexyl) phthalate	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Butyl Benzyl Phthalate	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Carbazole	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Chrysene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Dibenz[a,h]anthracene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Dibenzofuran	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Diethyl Phthalate	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Dimethyl Phthalate	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Di-n-butyl Phthalate	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Di-n-octyl Phthalate	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Fluoranthene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Fluorene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Hexachlorobenzene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Hexachlorobutadiene	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Hexachlorocyclopentadiene	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Hexachloroethane	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Indeno[1,2,3-cd]pyrene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Isophorone	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Naphthalene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Nitrobenzene	334	U J	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
N-Nitrosodi-n-propylamine	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
N-Nitrosodiphenylamine	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Pentachlorophenol	1670	U J	1670	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Phenanthrene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Phenol	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Pyrene	334	U	334	ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Unknown 1	**286**	B, J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Aldol Condensate 4	**439**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Aldol Condensate 3	**155**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Aldol Condensate 1	**1060**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
TIC:Aldol Condensate 2	**25600**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/29/2012	8270C
Surrogate: 2-Fluorophenol	*54 %*		*25-121*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*
Surrogate: Phenol-d5	*54 %*		*24-113*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*58 %*		*23-120*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

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J1PX97
1208077-03 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*58 %*	*30-115*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*33 %*	*19-122*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*73 %*	*18-137*			*L208238*	*08/24/2012*	*08/29/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

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J1PX98
1208077-04 (Soil)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,2,4-Trichlorobenzene	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,2-Dichlorobenzene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,3-Dichlorobenzene	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,4-Dichlorobenzene	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,5-Trichlorophenol	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,6-Trichlorophenol	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dichlorophenol	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dimethylphenol	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrophenol	1960	U J	1960	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrotoluene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,6-Dinitrotoluene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chloronaphthalene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chlorophenol	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylnaphthalene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylphenol	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitroaniline	1960	U	1960	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitrophenol	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3,3'-Dichlorobenzidine	783	U	783	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3-Nitroaniline	1960	U	1960	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4,6-Dinitro-2-methylphenol	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Bromophenyl Phenyl Ether	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloro-3-methylphenol	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloroaniline	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chlorophenyl Phenyl Ether	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3- and/or 4-Methylphenol	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitroaniline	1960	U	1960	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitrophenol	1960	U	1960	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthylene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Anthracene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benz[a]anthracene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[a] pyrene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[b] fluoranthene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[g,h,i] perylene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[k] fluoranthene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroethoxy) methane	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

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J1PX98
1208077-04 (Soil)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Bis(2-chloroethyl) ether	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroisopropyl) ether	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-ethylhexyl) phthalate	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Butyl Benzyl Phthalate	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Carbazole	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Chrysene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenz[a,h]anthracene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenzofuran	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Diethyl Phthalate	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dimethyl Phthalate	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-butyl Phthalate	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-octyl Phthalate	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluoranthene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluorene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobenzene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobutadiene	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorocyclopentadiene	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachloroethane	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Indeno[1,2,3-cd]pyrene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Isophorone	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Naphthalene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Nitrobenzene	392	U J	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodi-n-propylamine	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodiphenylamine	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pentachlorophenol	1960	U J	1960	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenanthrene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenol	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pyrene	392	U	392	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Unknown 1	**557**	J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Tributyl phosphate	**243**	N, X, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Alkane 1	**231**	J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 2	**215**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 1	**12200**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Surrogate: 2-Fluorophenol	*52 %*		*25-121*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Phenol-d5	*55 %*		*24-113*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*59 %*		*23-120*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

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J1PX98
1208077-04 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*62 %*	*30-115*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*64 %*	*19-122*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*67 %*	*18-137*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

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J1PX99
1208077-05 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
1,2,4-Trichlorobenzene	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,2-Dichlorobenzene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,3-Dichlorobenzene	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,4-Dichlorobenzene	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,5-Trichlorophenol	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,6-Trichlorophenol	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dichlorophenol	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dimethylphenol	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrophenol	1990	U J	1990	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrotoluene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,6-Dinitrotoluene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chloronaphthalene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chlorophenol	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylnaphthalene	**320**	J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylphenol	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitroaniline	1990	U	1990	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitrophenol	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3,3'-Dichlorobenzidine	797	U	797	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3-Nitroaniline	1990	U	1990	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4,6-Dinitro-2-methylphenol	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Bromophenyl Phenyl Ether	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloro-3-methylphenol	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloroaniline	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chlorophenyl Phenyl Ether	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3- and/or 4-Methylphenol	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitroaniline	1990	U	1990	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitrophenol	1990	U	1990	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthylene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Anthracene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benz[a]anthracene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[a] pyrene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[b] fluoranthene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[g,h,i] perylene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[k] fluoranthene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroethoxy) methane	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

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J1PX99
1208077-05 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroisopropyl) ether	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-ethylhexyl) phthalate	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Butyl Benzyl Phthalate	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Carbazole	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Chrysene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenz[a,h]anthracene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenzofuran	**70.1**	J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Diethyl Phthalate	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dimethyl Phthalate	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-butyl Phthalate	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-octyl Phthalate	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluoranthene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluorene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobenzene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobutadiene	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorocyclopentadiene	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachloroethane	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Indeno[1,2,3-cd]pyrene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Isophorone	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Naphthalene	**222**	J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Nitrobenzene	398	U J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodi-n-propylamine	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodiphenylamine	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pentachlorophenol	1990	U J	1990	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenanthrene	**153**	J	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenol	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pyrene	398	U	398	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:PAH 1	**1340**	J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Unknown 2	**1150**	J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Unknown 1	**2560**	J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:PAH 2	**1390**	J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 1	**15300**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Surrogate: 2-Fluorophenol	*17 % **		*25-121*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Phenol-d5	*33 %*		*24-113*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*53 %*		*23-120*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

11/4/12

J1PX99
1208077-05 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*55 %*	*30-115*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*24 %*	*19-122*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*55 %*	*18-137*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

V 11/4/12

J1PXC0
1208077-06 (Soil)

Lionville Laboratory

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Semivolatile Organic Compounds by SW846 8270C									
1,2,4-Trichlorobenzene	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,2-Dichlorobenzene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,3-Dichlorobenzene	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,4-Dichlorobenzene	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,5-Trichlorophenol	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,6-Trichlorophenol	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dichlorophenol	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dimethylphenol	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrophenol	1720	U J	1720	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrotoluene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,6-Dinitrotoluene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chloronaphthalene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chlorophenol	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylnaphthalene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylphenol	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitroaniline	1720	U	1720	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitrophenol	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3,3'-Dichlorobenzidine	687	U	687	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3-Nitroaniline	1720	U	1720	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4,6-Dinitro-2-methylphenol	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Bromophenyl Phenyl Ether	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloro-3-methylphenol	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloroaniline	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chlorophenyl Phenyl Ether	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3- and/or 4-Methylphenol	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitroaniline	1720	U	1720	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitrophenol	1720	U	1720	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthylene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Anthracene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benz[a]anthracene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[a] pyrene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[b] fluoranthene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[g,h,i] perylene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[k] fluoranthene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroethoxy) methane	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

11/4/12

J1PXC0
1208077-06 (Soil)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Bis(2-chloroethyl) ether	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroisopropyl) ether	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-ethylhexyl) phthalate	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Butyl Benzyl Phthalate	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Carbazole	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Chrysene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenz[a,h]anthracene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenzofuran	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Diethyl Phthalate	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dimethyl Phthalate	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-butyl Phthalate	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-octyl Phthalate	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluoranthene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluorene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobenzene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobutadiene	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorocyclopentadiene	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachloroethane	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Indeno[1,2,3-cd]pyrene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Isophorone	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Naphthalene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Nitrobenzene	343	U J	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodi-n-propylamine	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodiphenylamine	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pentachlorophenol	1720	U J	1720	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenanthrene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenol	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pyrene	343	U	343	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Unknown 1	**153**	J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Unknown 2	**160**	J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 3	**201**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 2	**18800**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 1	**738**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Surrogate: 2-Fluorophenol	*54 %*		*25-121*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Phenol-d5	*61 %*		*24-113*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*63 %*		*23-120*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

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J1PXC0
1208077-06 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*66 %*	*30-115*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*52 %*	*19-122*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*70 %*	*18-137*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

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J1PXC1
1208077-07 (Soil)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,2,4-Trichlorobenzene	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,2-Dichlorobenzene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,3-Dichlorobenzene	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,4-Dichlorobenzene	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,5-Trichlorophenol	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,6-Trichlorophenol	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dichlorophenol	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dimethylphenol	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrophenol	1820	U J	1820	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrotoluene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,6-Dinitrotoluene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chloronaphthalene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chlorophenol	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylnaphthalene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylphenol	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitroaniline	1820	U	1820	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitrophenol	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3,3'-Dichlorobenzidine	726	U	726	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3-Nitroaniline	1820	U	1820	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4,6-Dinitro-2-methylphenol	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Bromophenyl Phenyl Ether	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloro-3-methylphenol	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloroaniline	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chlorophenyl Phenyl Ether	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3- and/or 4-Methylphenol	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitroaniline	1820	U	1820	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitrophenol	1820	U	1820	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthylene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Anthracene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benz[a]anthracene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[a] pyrene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[b] fluoranthene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[g,h,i] perylene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[k] fluoranthene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroethoxy) methane	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

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J1PXC1
1208077-07 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroisopropyl) ether	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-ethylhexyl) phthalate	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Butyl Benzyl Phthalate	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Carbazole	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Chrysene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenz[a,h]anthracene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenzofuran	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Diethyl Phthalate	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dimethyl Phthalate	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-butyl Phthalate	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-octyl Phthalate	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluoranthene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluorene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobenzene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobutadiene	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorocyclopentadiene	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachloroethane	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Indeno[1,2,3-cd]pyrene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Isophorone	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Naphthalene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Nitrobenzene	363	U J	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodi-n-propylamine	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodiphenylamine	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pentachlorophenol	1820	U J	1820	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenanthrene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenol	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pyrene	363	U	363	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Unknown 2	**109**	**J**		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Tributyl phosphate	**153**	**N, X, J**		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Unknown 1	**1400**	**J**		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 1	**448**	**A, B, J**		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 2	**17800**	**A, B, J**		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Surrogate: 2-Fluorophenol	*54 %*		*25-121*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Phenol-d5	*57 %*		*24-113*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*62 %*		*23-120*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

11/08/12

J1PXC1
1208077-07 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*66 %*	*30-115*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*59 %*	*19-122*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*71 %*	*18-137*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

000000076

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

11/4/12

J1PXC2
1208077-08 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
1,2,4-Trichlorobenzene	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,2-Dichlorobenzene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,3-Dichlorobenzene	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
1,4-Dichlorobenzene	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,5-Trichlorophenol	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4,6-Trichlorophenol	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dichlorophenol	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dimethylphenol	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrophenol	1800	U J	1800	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,4-Dinitrotoluene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2,6-Dinitrotoluene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chloronaphthalene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Chlorophenol	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylnaphthalene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Methylphenol	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitroaniline	1800	U	1800	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
2-Nitrophenol	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3,3'-Dichlorobenzidine	721	U	721	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3-Nitroaniline	1800	U	1800	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4,6-Dinitro-2-methylphenol	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Bromophenyl Phenyl Ether	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloro-3-methylphenol	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chloroaniline	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Chlorophenyl Phenyl Ether	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
3- and/or 4-Methylphenol	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitroaniline	1800	U	1800	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
4-Nitrophenol	1800	U	1800	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Acenaphthylene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Anthracene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benz[a]anthracene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[a] pyrene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[b] fluoranthene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[g,h,i] perylene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Benzo[k] fluoranthene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroethoxy) methane	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C

000000077

LIONVILLE LABORATORY
A division of Liberty 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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

V 11/4/12

J1PXC2

1208077-08 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-chloroisopropyl) ether	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Bis(2-ethylhexyl) phthalate	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Butyl Benzyl Phthalate	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Carbazole	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Chrysene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenz[a,h]anthracene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dibenzofuran	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Diethyl Phthalate	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Dimethyl Phthalate	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-butyl Phthalate	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Di-n-octyl Phthalate	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluoranthene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Fluorene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobenzene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorobutadiene	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachlorocyclopentadiene	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Hexachloroethane	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Indeno[1,2,3-cd]pyrene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Isophorone	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Naphthalene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Nitrobenzene	361	U J	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodi-n-propylamine	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
N-Nitrosodiphenylamine	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pentachlorophenol	1800	U J	1800	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenanthrene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Phenol	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Pyrene	361	U	361	ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Trichloro-1-propene	**290**	J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Unknown 1	**155**	B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 3	**276**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 2	**15900**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
TIC:Aldol Condensate 1	**611**	A, B, J		ug/kg dry	1	L208238	08/24/2012	08/31/2012	8270C
Surrogate: 2-Fluorophenol	*58 %*		*25-121*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Phenol-d5	*69 %*		*24-113*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*69 %*		*23-120*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

000000078

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

V 11/4/12

J1PXC2
1208077-08 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*71 %*	*30-115*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*63 %*	*19-122*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*74 %*	*18-137*			*L208238*	*08/24/2012*	*08/31/2012*	*8270C*

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-148 KP0123
LVL #: 1208077

W.O. #: 60049-001-001-0001-00
Date Received: 08-23-2012

SEMIVOLATILE

Eight (8) soil samples were collected on 08-16,20-2012.

The samples and associated QC samples were extracted 08-24-2012 and analyzed 08-28,29,31-2012 according to Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8270C for TCL Semivolatile 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 extracted and analyzed within holding time.

3. Non-target compounds were detected in these samples.

4. Two (2) of seventy-two (72) obtainable surrogate recoveries were outside acceptance criteria. The surrogate recovery criteria were not met for samples J1PX96 and J1PX99. A copy of the Sample Discrepancy Report (SDR#12MS155) has been enclosed.

   The loss of the surrogate 2,4,6-Tribromophenol in the sample J1PX96 appears to be due to a chemical reaction rather than to a problem with the extraction process. Peaks on the chromatogram indicate this reaction. The conversion compound has been reported as a non-target compound in the sample at a retention time of 19.901 minutes. The loss of this surrogate has been associated with the use of soxhlet extractions.

5. The method blank was below the reporting limit for all target compounds.

6. All blank spike recoveries were within acceptance criteria.

7. One (1) of one hundred and twenty-eight (128) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12MS155) has been enclosed.

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.

8. The samples were reported on a dry weight basis.

9. All initial calibrations associated with this data set were within acceptance criteria. Per method 8000B/8270C, the attached Table 1 shows the target compounds where the RSD exceeded 15%, and the mean RSD was used for evaluation of the initial calibration. Results associated with these compounds are considered to have greater uncertainty. Refer to the Analysis Batch Sequence Summary Forms to associate the calibration with client samples.

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

11. Internal standard area and retention time criteria were not met for sample L208238-BLK1. An associated blank spike analyses fulfilled its reanalysis requirement.

12. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

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

Iain Daniels
LvL Laboratory Manager

9/5/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12MS155

Initiator: Shawn Saylor
Date: 8-31-12
Client: Weltanford

Batch: 1208077
Samples: L208238-MS1, J1PX99
Method: SW846/MCAWW/CLP/

Parameter: 8270C
Matrix: Soil
Prep Batch: L208238

1. Reason for SDR

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

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

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

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

(1) low recovery of pentachlorophenol in L208238-MS1 but L208238-MSD1 and L208238-BS1 are ok

(2) 2-Fluorophenol surrogate below QC criteria in J1PX99 BCG 9/4/12

2. Known or Probable Causes(s) (1) Acidic subject to erratic chromatographic behavior (2) possible matrix effect, other 2 acid surrogates appear low but within criteria. All base surrogate within criteria. Targets found in sample at levels below the reporting limit

3. Discussion and Proposed Action
__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:
narrate

[signature] 9/5/12

4. Project Manager Instructions...signature/date: [signature] 9/5/12
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: [signature] 9/4/12
__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

Other Explanation:

When Final Action has been recorded, forward original to QA for diposition.

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

000000046

1 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~

Collector: Weber, HC	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: 7 ~~21~~ Days
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No.: RC-148	
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No.: A110483	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive L DOT Limits A# 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO3/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
J1PX93	SOIL												
J1PX94	SOIL												
J1PX95	SOIL	8/16/12	0936	✓	✓	✓	✓	✓	✓	✓	✓	✓	34265
J1PX96	SOIL	8/16/12	1034	✓	✓	✓	✓	✓	✓	✓	✓	✓	~~242~~ 34266
J1PX97	SOIL	8/16/12	1221	✓	✓	✓	✓	✓	✓	✓	✓	✓	34267

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: Heather Weber / Heather Weber; Date/Time: 8-16-12 1415	Received By/Stored In: DAVID BECKER / David Becker; Date/Time: 8/16/12 1415	
Relinquished By/Removed From: DAVID BECKER / David Becker; Date/Time: 8/16/12 1755	Received By/Stored In: 1060 #3B; Date/Time: 8/16/12 1755	
Relinquished By/Removed From: 1060 #3B; Date/Time: 8-20-12 0710	Received By/Stored In: 1060#3 A. Freier / A. Freier; Date/Time: 0710 8-20-12	
Relinquished By/Removed From: WCH A. Freier / A. Freier; Date/Time: 1060#3 8-22-12 1258	Received By/Stored In: Fed Ex; Date/Time:	
Relinquished By/Removed From: [signature]; Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HERNANDEZ; Date/Time: 8/23/12 0930	
Relinquished By/Removed From:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium}; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, ~~Europium-155, Niobium-94~~, Radium-226, Radium-228, ; Zinc-65 8/16/12

* freeze upon receipt. A# 8-20-12

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

KP0123

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

REVIEWED BY MWShen DATE 8/22/12

WCH-EE-011

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2 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~1 of 12~~ 8/16/12

Collector: Weber, HC	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: 7 ~~21~~ Days 8/16/12
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No.: RC-148 8/16/12	
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE 8/16/12	Offsite Property No.: A110483	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive ∠ DOT Limits AJ 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
J1PX98	SOIL	8/16/12	1337	✓	✓	✓	✓	✓	✓	✓	✓	✓	34268
J1PX99	SOIL												
J1PXC0	SOIL												
J1PXC1	SOIL												
J1PXC2	SOIL												

AJ 8-20-12

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber / [signature]	8/16/12 1415	DAVID BECKER [signature]	8/16/12 1415
DAVID BECKER [signature]	8/16/12 1755	1060/3B	8/16/12 1755
1060#3B	8-20-12 0710	1060#3 A. Freier A. Freier	8-20-12 0710
WCH A. Freier A. Freier 1060#3	8-22-12 1258	FedEx	
[signature]	8/23/12 0930	VICTOR HERNANDEZ	8/23/12 0930

SPECIAL INSTRUCTIONS

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium}; Mercury - 7471 - (CV)

241, Antimony-125, Cesium-134, Cesium-137, ~~Europium-155, Niobium-94~~, Radium-226, Radium-228, , Zinc-65} 8/16/12

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

*freeze upon receipt. AJ 8-20-12

Matrix *

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

KP0123

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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000000005

1 OF 1

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-148-052

Page ~~2 of 12~~ 8/20/12

Collector: ~~Weber, HC~~ STOWE, Q 8/20/12

Company Contact: Joan Kessner

Telephone No.: 509-375-4688

Project Coordinator: KESSNER, JH

Price Code: ~~01~~ 9B

Data Turnaround: 7 ~~21~~ Days 8/20/12

Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol

Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits

SAF No.: RC-148 8/20/12

Ice Chest No.: RCC -07-012

Field Logbook No.: EL-1663-03

COA: R316032000

Method of Shipment: Hand Deliver/Government Vehicle/FedEx

Shipped To: ~~EDERLINE SERVICES~~ LIONVILLE 8/20/12

Offsite Property No.: A 110483

Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive < DOT Limits A4 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	~~4~~ 6	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL 8/21/12	250mL	120mL	120mL	~~600mL~~ 120mL

SAMPLE ANALYSIS

	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	~~See item (2) in Special Instructions~~ TCLP* METALS

Sample No.	Matrix *	Sample Date	Sample Time											
~~J1PX98~~	~~8/20/12~~													
J1PX99	SOIL	8/20/12	1239	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34273
J1PXC0	SOIL	8/20/12	1323	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34274
J1PXC1	SOIL	8/20/12	1400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34275
J1PXC2	SOIL	8/20/12	1511	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34276

RCF

41

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	1545 8/20/12	DAVID BECKER	8/20/12 1545
DAVID BECKER	8/20/12 1730	1060, 3B	8/20/12 1730
1060#3B 8-21-12	0740	A. Freier	1060#3 0740 8-21-12
A. Freier	WCH 1060#3 8-22-12 1258	FedEx	
FedEx	8/23/12 0930	VICTOR HERNANDEZ	8-23-12 0930

Sign/Print Names

SPECIAL INSTRUCTIONS * freeze upon rec. pt. A4 8-21-12

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium]; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab. ~~Antimony-125, Cerium-144, Cesium-134, Cesium-137, Europium-155, Manganese-54, Radium-226, Radium-228~~ 8/20/12

TTCLP METALS - LEACH & HOLD UNTIL FURTHER DIRECTION IS PROVIDED 8/20/12

KP0123

Matrix *: S=Soil; SD=Sediment; SO=Solid; Sl=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; W=Wipe; L=Liquid; V=Vegetation; X=Other

REVIEWED BY [signature] DATE 8/22/12

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

WCH-EE-011

000000006

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 316-3			DATA PACKAGE: KP0123		
VALIDATOR: ELR		LAB: LLI		DATE: 11/8/12	
			SDG: KP0123		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J1PX95	J1PX96	J1PX97	J1PX98	J1PX99	
J1PXC0	J1PXC1	J1PXC2			
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

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

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

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

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

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

MS/MSD standards? (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: surr - 99 - 3 out - J surr 96 - 9 - J
LCS - 111 out - J all MS - ~~111~~ ~~111~~ out - J all
MSD - 111 - out - J all

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: pentachlorophenol - 53% - J only

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: SG

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208238 - SW 3540C										
Blank (L208238-BLK1)				Prepared: 08/24/2012 Analyzed: 08/28/2012						
1,2,4-Trichlorobenzene	330	U	330	ug/kg wet						
1,2-Dichlorobenzene	330	U	330	ug/kg wet						
1,3-Dichlorobenzene	330	U	330	ug/kg wet						
1,4-Dichlorobenzene	330	U	330	ug/kg wet						
2,4,5-Trichlorophenol	330	U	330	ug/kg wet						
2,4,6-Trichlorophenol	330	U	330	ug/kg wet						
2,4-Dichlorophenol	330	U	330	ug/kg wet						
2,4-Dimethylphenol	330	U	330	ug/kg wet						
2,4-Dinitrophenol	1650	U	1650	ug/kg wet						
2,4-Dinitrotoluene	330	U	330	ug/kg wet						
2,6-Dinitrotoluene	330	U	330	ug/kg wet						
2-Chloronaphthalene	330	U	330	ug/kg wet						
2-Chlorophenol	330	U	330	ug/kg wet						
2-Methylnaphthalene	330	U	330	ug/kg wet						
2-Methylphenol	330	U	330	ug/kg wet						
2-Nitroaniline	1650	U	1650	ug/kg wet						
2-Nitrophenol	330	U	330	ug/kg wet						
3,3'-Dichlorobenzidine	660	U	660	ug/kg wet						
3-Nitroaniline	1650	U	1650	ug/kg wet						
4,6-Dinitro-2-methylphenol	330	U	330	ug/kg wet						
4-Bromophenyl Phenyl Ether	330	U	330	ug/kg wet						
4-Chloro-3-methylphenol	330	U	330	ug/kg wet						
4-Chloroaniline	330	U	330	ug/kg wet						
4-Chlorophenyl Phenyl Ether	330	U	330	ug/kg wet						
3- and/or 4-Methylphenol	330	U	330	ug/kg wet						
4-Nitroaniline	1650	U	1650	ug/kg wet						
4-Nitrophenol	1650	U	1650	ug/kg wet						
Acenaphthene	330	U	330	ug/kg wet						
Acenaphthylene	330	U	330	ug/kg wet						
Anthracene	330	U	330	ug/kg wet						
Benz[a]anthracene	330	U	330	ug/kg wet						
Benzo[a] pyrene	330	U	330	ug/kg wet						
Benzo[b] fluoranthene	330	U	330	ug/kg wet						
Benzo[g,h,i] perylene	330	U	330	ug/kg wet						
Benzo[k] fluoranthene	330	U	330	ug/kg wet						
Bis(2-chloroethoxy) methane	330	U	330	ug/kg wet						

000000080

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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208238 - SW 3540C										
Blank (L208238-BLK1)				Prepared: 08/24/2012 Analyzed: 08/28/2012						
Bis(2-chloroethyl) ether	330	U	330	ug/kg wet						
Bis(2-chloroisopropyl) ether	330	U	330	ug/kg wet						
Bis(2-ethylhexyl) phthalate	330	U	330	ug/kg wet						
Butyl Benzyl Phthalate	330	U	330	ug/kg wet						
Carbazole	330	U	330	ug/kg wet						
Chrysene	330	U	330	ug/kg wet						
Dibenz[a,h]anthracene	330	U	330	ug/kg wet						
Dibenzofuran	330	U	330	ug/kg wet						
Diethyl Phthalate	330	U	330	ug/kg wet						
Dimethyl Phthalate	330	U	330	ug/kg wet						
Di-n-butyl Phthalate	330	U	330	ug/kg wet						
Di-n-octyl Phthalate	330	U	330	ug/kg wet						
Fluoranthene	330	U	330	ug/kg wet						
Fluorene	330	U	330	ug/kg wet						
Hexachlorobenzene	330	U	330	ug/kg wet						
Hexachlorobutadiene	330	U	330	ug/kg wet						
Hexachlorocyclopentadiene	330	U	330	ug/kg wet						
Hexachloroethane	330	U	330	ug/kg wet						
Indeno[1,2,3-cd]pyrene	330	U	330	ug/kg wet						
Isophorone	330	U	330	ug/kg wet						
Naphthalene	330	U	330	ug/kg wet						
Nitrobenzene	330	U	330	ug/kg wet						
N-Nitrosodi-n-propylamine	330	U	330	ug/kg wet						
N-Nitrosodiphenylamine	330	U	330	ug/kg wet						
Pentachlorophenol	1650	U	1650	ug/kg wet						
Phenanthrene	330	U	330	ug/kg wet						
Phenol	330	U	330	ug/kg wet						
Pyrene	330	U	330	ug/kg wet						
Unknown 1 TICS	283	J		ug/kg wet						
Aldol Condensate 2	28900	A, J		ug/kg wet						
Aldol Condensate 4	384	A, J		ug/kg wet						
Aldol Condensate 3	460	A, J		ug/kg wet						
Aldol Condensate 1	1490	A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1590*			*ug/kg wet*	*2500.0*		*64*	*25-121*		
Surrogate: Phenol-d5	*1520*			*ug/kg wet*	*2500.0*		*61*	*24-113*		
Surrogate: Nitrobenzene-d5	*1070*			*ug/kg wet*	*1666.7*		*64*	*23-120*		

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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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208238 - SW 3540C									
Blank (L208238-BLK1)			Prepared: 08/24/2012 Analyzed: 08/28/2012						
Surrogate: 2-Fluorobiphenyl	*1100*		*ug/kg wet*	*1666.7*		*66*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1300*		*ug/kg wet*	*2500.0*		*52*	*19-122*		
Surrogate: p-Terphenyl-d14	*1650*		*ug/kg wet*	*1666.7*		*99*	*18-137*		
LCS (L208238-BS1)			Prepared: 08/24/2012 Analyzed: 08/28/2012						
1,2,4-Trichlorobenzene	992		ug/kg wet	2000.0		50	45-110		
1,2-Dichlorobenzene	1190		ug/kg wet	2000.0		60	45-105		
1,3-Dichlorobenzene	1160		ug/kg wet	2000.0		58	40-100		
1,4-Dichlorobenzene	1160		ug/kg wet	2000.0		58	35-105		
2,4,5-Trichlorophenol	1330		ug/kg wet	2000.0		67	30-140		
2,4,6-Trichlorophenol	1190		ug/kg wet	2000.0		59	20-110		
2,4-Dichlorophenol	1070		ug/kg wet	2000.0		54	40-110		
2,4-Dimethylphenol	1020		ug/kg wet	2000.0		51	30-105		
2,4-Dinitrophenol	500		ug/kg wet	2000.0		25	25-130		
2,4-Dinitrotoluene	1420		ug/kg wet	2000.0		71	50-115		
2,6-Dinitrotoluene	1380		ug/kg wet	2000.0		69	40-120		
2-Chloronaphthalene	1250		ug/kg wet	2000.0		63	45-115		
2-Chlorophenol	1200		ug/kg wet	2000.0		60	45-105		
2-Methylnaphthalene	1030		ug/kg wet	2000.0		51	45-110		
2-Methylphenol	1210		ug/kg wet	2000.0		61	40-120		
2-Nitroaniline	1460		ug/kg wet	2000.0		73	45-120		
2-Nitrophenol	1040		ug/kg wet	2000.0		52	40-110		
3,3'-Dichlorobenzidine	1490		ug/kg wet	2000.0		75	15-130		
3-Nitroaniline	1350		ug/kg wet	2000.0		67	40-130		
4,6-Dinitro-2-methylphenol	829		ug/kg wet	2000.0		41	20-140		
4-Bromophenyl Phenyl Ether	1340		ug/kg wet	2000.0		67	45-115		
4-Chloro-3-methylphenol	1160		ug/kg wet	2000.0		58	35-115		
4-Chloroaniline	977		ug/kg wet	2000.0		49	10-100		
4-Chlorophenyl Phenyl Ether	1310		ug/kg wet	2000.0		65	45-110		
3- and/or 4-Methylphenol	1230		ug/kg wet	2000.0		61	40-120		
4-Nitroaniline	1520		ug/kg wet	2000.0		76	40-130		
4-Nitrophenol	1520		ug/kg wet	2000.0		76	15-140		
Acenaphthene	1290		ug/kg wet	2000.0		65	45-110		
Acenaphthylene	1380		ug/kg wet	2000.0		69	45-115		
Anthracene	1410		ug/kg wet	2000.0		70	45-130		
Benz[a]anthracene	1490		ug/kg wet	2000.0		74	45-130		
Benzo[a] pyrene	1430		ug/kg wet	2000.0		71	45-130		

000000082

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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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208238 - SW 3540C									
LCS (L208238-BS1)			Prepared: 08/24/2012 Analyzed: 08/28/2012						
Benzo[b] fluoranthene	1480		ug/kg wet	2000.0		74	40-130		
Benzo[g,h,i] perylene	1480		ug/kg wet	2000.0		74	45-125		
Benzo[k] fluoranthene	1410		ug/kg wet	2000.0		70	45-125		
Bis(2-chloroethoxy) methane	1020		ug/kg wet	2000.0		51	45-110		
Bis(2-chloroethyl) ether	1190		ug/kg wet	2000.0		60	40-110		
Bis(2-chloroisopropyl) ether	1190		ug/kg wet	2000.0		59	30-115		
Bis(2-ethylhexyl) phthalate	1610		ug/kg wet	2000.0		81	40-145		
Butyl Benzyl Phthalate	1520		ug/kg wet	2000.0		76	50-125		
Carbazole	1500		ug/kg wet	2000.0		75	40-140		
Chrysene	1530		ug/kg wet	2000.0		77	45-130		
Dibenz[a,h]anthracene	1460		ug/kg wet	2000.0		73	45-125		
Dibenzofuran	1370		ug/kg wet	2000.0		68	45-120		
Diethyl Phthalate	1360		ug/kg wet	2000.0		68	50-125		
Dimethyl Phthalate	1300		ug/kg wet	2000.0		65	45-130		
Di-n-butyl Phthalate	1360		ug/kg wet	2000.0		68	50-130		
Di-n-octyl Phthalate	1590		ug/kg wet	2000.0		80	40-150		
Fluoranthene	1380		ug/kg wet	2000.0		69	45-130		
Fluorene	1350		ug/kg wet	2000.0		67	45-120		
Hexachlorobenzene	1400		ug/kg wet	2000.0		70	45-130		
Hexachlorobutadiene	1110		ug/kg wet	2000.0		56	45-105		
Hexachlorocyclopentadiene	1100		ug/kg wet	2000.0		55	10-100		
Hexachloroethane	1170		ug/kg wet	2000.0		58	35-110		
Indeno[1,2,3-cd]pyrene	1480		ug/kg wet	2000.0		74	45-130		
Isophorone	1020		ug/kg wet	2000.0		51	40-110		
Naphthalene	1160		ug/kg wet	2000.0		58	40-110		
Nitrobenzene	1050		ug/kg wet	2000.0		52	40-105		
N-Nitrosodi-n-propylamine	1230		ug/kg wet	2000.0		61	30-130		
N-Nitrosodiphenylamine	1330		ug/kg wet	2000.0		67	50-120		
Pentachlorophenol	865		ug/kg wet	2000.0		43	25-120		
Phenanthrene	1440		ug/kg wet	2000.0		72	50-120		
Phenol	1220		ug/kg wet	2000.0		61	40-115		
Pyrene	1400		ug/kg wet	2000.0		70	45-125		
Surrogate: 2-Fluorophenol	*1640*		*ug/kg wet*	*2500.0*		*65*	*25-121*		
Surrogate: Phenol-d5	*1660*		*ug/kg wet*	*2500.0*		*67*	*24-113*		
Surrogate: Nitrobenzene-d5	*991*		*ug/kg wet*	*1666.7*		*59*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1190*		*ug/kg wet*	*1666.7*		*71*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1530*		*ug/kg wet*	*2500.0*		*61*	*19-122*		

264 Welsh Pool Road
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 09/04/2012 08:56

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208238 - SW 3540C									
LCS (L208238-BS1)			Prepared: 08/24/2012 Analyzed: 08/28/2012						
Surrogate: p-Terphenyl-d14	*1150*		*ug/kg wet*	*1666.7*		*69*	*18-137*		
Matrix Spike (L208238-MS1)		**Source: 1208077-01**	Prepared: 08/24/2012 Analyzed: 08/28/2012						
1,2,4-Trichlorobenzene	958		ug/kg dry	2079.4	344 U	46	45-110		
1,2-Dichlorobenzene	1080		ug/kg dry	2079.4	344 U	52	45-105		
1,3-Dichlorobenzene	989		ug/kg dry	2079.4	344 U	48	40-100		
1,4-Dichlorobenzene	1020		ug/kg dry	2079.4	344 U	49	35-105		
2,4,5-Trichlorophenol	1120		ug/kg dry	2079.4	344 U	54	30-140		
2,4,6-Trichlorophenol	1120		ug/kg dry	2079.4	344 U	54	20-110		
2,4-Dichlorophenol	1110		ug/kg dry	2079.4	344 U	53	40-110		
2,4-Dimethylphenol	1010		ug/kg dry	2079.4	344 U	49	30-105		
2,4-Dinitrophenol	1650		ug/kg dry	2079.4	1720 U	80	25-130		
2,4-Dinitrotoluene	1570		ug/kg dry	2079.4	344 U	75	50-115		
2,6-Dinitrotoluene	1480		ug/kg dry	2079.4	344 U	71	40-120		
2-Chloronaphthalene	1260		ug/kg dry	2079.4	344 U	61	45-115		
2-Chlorophenol	1250		ug/kg dry	2079.4	344 U	60	45-105		
2-Methylnaphthalene	1070		ug/kg dry	2079.4	344 U	51	45-110		
2-Methylphenol	1320		ug/kg dry	2079.4	344 U	63	40-120		
2-Nitroaniline	1540		ug/kg dry	2079.4	1720 U	74	45-120		
2-Nitrophenol	1040		ug/kg dry	2079.4	344 U	50	40-110		
3,3'-Dichlorobenzidine	1170		ug/kg dry	2079.4	688 U	56	15-130		
3-Nitroaniline	1440		ug/kg dry	2079.4	1720 U	69	40-130		
4,6-Dinitro-2-methylphenol	1530		ug/kg dry	2079.4	344 U	73	20-140		
4-Bromophenyl Phenyl Ether	1280		ug/kg dry	2079.4	344 U	62	45-115		
4-Chloro-3-methylphenol	1100		ug/kg dry	2079.4	344 U	53	35-115		
4-Chloroaniline	1020		ug/kg dry	2079.4	344 U	49	10-100		
4-Chlorophenyl Phenyl Ether	1330		ug/kg dry	2079.4	344 U	64	45-110		
3- and/or 4-Methylphenol	1350		ug/kg dry	2079.4	344 U	65	40-120		
4-Nitroaniline	1580		ug/kg dry	2079.4	1720 U	76	40-130		
4-Nitrophenol	1170		ug/kg dry	2079.4	1720 U	56	15-140		
Acenaphthene	1310		ug/kg dry	2079.4	344 U	63	45-110		
Acenaphthylene	1400		ug/kg dry	2079.4	344 U	67	45-115		
Anthracene	1390		ug/kg dry	2079.4	344 U	67	45-130		
Benz[a]anthracene	1490		ug/kg dry	2079.4	344 U	72	45-130		
Benzo[a] pyrene	1460		ug/kg dry	2079.4	344 U	70	45-130		
Benzo[b] fluoranthene	1400		ug/kg dry	2079.4	344 U	67	40-130		
Benzo[g,h,i] perylene	1360		ug/kg dry	2079.4	344 U	65	45-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208238 - SW 3540C									
Matrix Spike (L208238-MS1)		**Source: 1208077-01**	Prepared: 08/24/2012 Analyzed: 08/28/2012						
Benzo[k] fluoranthene	1480		ug/kg dry	2079.4	344 U	71	45-125		
Bis(2-chloroethoxy) methane	1080		ug/kg dry	2079.4	344 U	52	45-110		
Bis(2-chloroethyl) ether	1200		ug/kg dry	2079.4	344 U	57	40-110		
Bis(2-chloroisopropyl) ether	1200		ug/kg dry	2079.4	344 U	58	30-115		
Bis(2-ethylhexyl) phthalate	1690		ug/kg dry	2079.4	344 U	81	40-145		
Butyl Benzyl Phthalate	1650		ug/kg dry	2079.4	344 U	79	50-125		
Carbazole	1440		ug/kg dry	2079.4	344 U	69	40-140		
Chrysene	1530		ug/kg dry	2079.4	344 U	74	45-130		
Dibenz[a,h]anthracene	1350		ug/kg dry	2079.4	344 U	65	45-125		
Dibenzofuran	1410		ug/kg dry	2079.4	344 U	68	45-120		
Diethyl Phthalate	1460		ug/kg dry	2079.4	344 U	70	50-125		
Dimethyl Phthalate	1370		ug/kg dry	2079.4	344 U	66	45-130		
Di-n-butyl Phthalate	1380		ug/kg dry	2079.4	344 U	66	50-130		
Di-n-octyl Phthalate	1710		ug/kg dry	2079.4	344 U	82	40-150		
Fluoranthene	1380		ug/kg dry	2079.4	344 U	66	45-130		
Fluorene	1420		ug/kg dry	2079.4	344 U	68	45-120		
Hexachlorobenzene	1300		ug/kg dry	2079.4	344 U	62	45-130		
Hexachlorobutadiene	994		ug/kg dry	2079.4	344 U	48	45-105		
Hexachlorocyclopentadiene	852		ug/kg dry	2079.4	344 U	41	10-100		
Hexachloroethane	976		ug/kg dry	2079.4	344 U	47	35-110		
Indeno[1,2,3-cd]pyrene	1380		ug/kg dry	2079.4	344 U	66	45-130		
Isophorone	1080		ug/kg dry	2079.4	344 U	52	40-110		
Naphthalene	1140		ug/kg dry	2079.4	344 U	55	40-110		
Nitrobenzene	1030		ug/kg dry	2079.4	344 U	49	40-105		
N-Nitrosodi-n-propylamine	1290		ug/kg dry	2079.4	344 U	62	30-130		
N-Nitrosodiphenylamine	1280		ug/kg dry	2079.4	344 U	62	50-120		
Pentachlorophenol	502		ug/kg dry	2079.4	1720 U	24*	25-120		
Phenanthrene	1410		ug/kg dry	2079.4	344 U	68	50-120		
Phenol	1280		ug/kg dry	2079.4	344 U	62	40-115		
Pyrene	1600		ug/kg dry	2079.4	344 U	77	45-125		
Surrogate: 2-Fluorophenol	*1600*		*ug/kg dry*	*2599.2*		*62*	*25-121*		
Surrogate: Phenol-d5	*1770*		*ug/kg dry*	*2599.2*		*68*	*24-113*		
Surrogate: Nitrobenzene-d5	*975*		*ug/kg dry*	*1732.8*		*56*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1150*		*ug/kg dry*	*1732.8*		*67*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1160*		*ug/kg dry*	*2599.2*		*45*	*19-122*		
Surrogate: p-Terphenyl-d14	*1250*		*ug/kg dry*	*1732.8*		*72*	*18-137*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 09/04/2012 08:56

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208238 - SW 3540C									
Matrix Spike Dup (L208238-MSD1)		**Source: 1208077-01**	Prepared: 08/24/2012 Analyzed: 08/28/2012						
1,2,4-Trichlorobenzene	1040		ug/kg dry	2054.9	344 U	50	45-110	9	40
1,2-Dichlorobenzene	1240		ug/kg dry	2054.9	344 U	60	45-105	15	40
1,3-Dichlorobenzene	1160		ug/kg dry	2054.9	344 U	56	40-100	17	40
1,4-Dichlorobenzene	1180		ug/kg dry	2054.9	344 U	58	35-105	16	40
2,4,5-Trichlorophenol	1320		ug/kg dry	2054.9	344 U	64	30-140	18	40
2,4,6-Trichlorophenol	1300		ug/kg dry	2054.9	344 U	63	20-110	17	40
2,4-Dichlorophenol	1170		ug/kg dry	2054.9	344 U	57	40-110	7	40
2,4-Dimethylphenol	975		ug/kg dry	2054.9	344 U	47	30-105	3	40
2,4-Dinitrophenol	1520		ug/kg dry	2054.9	1720 U	74	25-130	7	40
2,4-Dinitrotoluene	1690		ug/kg dry	2054.9	344 U	82	50-115	9	40
2,6-Dinitrotoluene	1620		ug/kg dry	2054.9	344 U	79	40-120	10	40
2-Chloronaphthalene	1380		ug/kg dry	2054.9	344 U	67	45-115	11	40
2-Chlorophenol	1330		ug/kg dry	2054.9	344 U	65	45-105	7	40
2-Methylnaphthalene	1110		ug/kg dry	2054.9	344 U	54	45-110	5	40
2-Methylphenol	1390		ug/kg dry	2054.9	344 U	68	40-120	7	40
2-Nitroaniline	1690		ug/kg dry	2054.9	1720 U	82	45-120	10	40
2-Nitrophenol	1120		ug/kg dry	2054.9	344 U	55	40-110	9	40
3,3'-Dichlorobenzidine	1230		ug/kg dry	2054.9	688 U	60	15-130	7	40
3-Nitroaniline	1480		ug/kg dry	2054.9	1720 U	72	40-130	4	40
4,6-Dinitro-2-methylphenol	1550		ug/kg dry	2054.9	344 U	75	20-140	3	40
4-Bromophenyl Phenyl Ether	1390		ug/kg dry	2054.9	344 U	68	45-115	9	40
4-Chloro-3-methylphenol	1220		ug/kg dry	2054.9	344 U	59	35-115	12	40
4-Chloroaniline	930		ug/kg dry	2054.9	344 U	45	10-100	9	40
4-Chlorophenyl Phenyl Ether	1460		ug/kg dry	2054.9	344 U	71	45-110	10	40
3- and/or 4-Methylphenol	1440		ug/kg dry	2054.9	344 U	70	40-120	8	40
4-Nitroaniline	1660		ug/kg dry	2054.9	1720 U	81	40-130	7	40
4-Nitrophenol	1340		ug/kg dry	2054.9	1720 U	65	15-140	15	40
Acenaphthene	1420		ug/kg dry	2054.9	344 U	69	45-110	9	40
Acenaphthylene	1530		ug/kg dry	2054.9	344 U	74	45-115	10	40
Anthracene	1520		ug/kg dry	2054.9	344 U	74	45-130	11	40
Benz[a]anthracene	1620		ug/kg dry	2054.9	344 U	79	45-130	10	40
Benzo[a] pyrene	1570		ug/kg dry	2054.9	344 U	76	45-130	9	40
Benzo[b] fluoranthene	1480		ug/kg dry	2054.9	344 U	72	40-130	7	40
Benzo[g,h,i] perylene	1460		ug/kg dry	2054.9	344 U	71	45-125	9	40
Benzo[k] fluoranthene	1600		ug/kg dry	2054.9	344 U	78	45-125	9	40
Bis(2-chloroethoxy) methane	1160		ug/kg dry	2054.9	344 U	56	45-110	8	40

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Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208238 - SW 3540C									
Matrix Spike Dup (L208238-MSD1)	**Source: 1208077-01**		Prepared: 08/24/2012 Analyzed: 08/28/2012						
Bis(2-chloroethyl) ether	1330		ug/kg dry	2054.9	344 U	65	40-110	12	40
Bis(2-chloroisopropyl) ether	1360		ug/kg dry	2054.9	344 U	66	30-115	13	40
Bis(2-ethylhexyl) phthalate	1870		ug/kg dry	2054.9	344 U	91	40-145	12	40
Butyl Benzyl Phthalate	1760		ug/kg dry	2054.9	344 U	86	50-125	8	40
Carbazole	1580		ug/kg dry	2054.9	344 U	77	40-140	10	40
Chrysene	1700		ug/kg dry	2054.9	344 U	83	45-130	12	40
Dibenz[a,h]anthracene	1470		ug/kg dry	2054.9	344 U	72	45-125	10	40
Dibenzofuran	1530		ug/kg dry	2054.9	344 U	74	45-120	9	40
Diethyl Phthalate	1590		ug/kg dry	2054.9	344 U	77	50-125	10	40
Dimethyl Phthalate	1500		ug/kg dry	2054.9	344 U	73	45-130	10	40
Di-n-butyl Phthalate	1540		ug/kg dry	2054.9	344 U	75	50-130	12	40
Di-n-octyl Phthalate	1870		ug/kg dry	2054.9	344 U	91	40-150	10	40
Fluoranthene	1520		ug/kg dry	2054.9	344 U	74	45-130	11	40
Fluorene	1520		ug/kg dry	2054.9	344 U	74	45-120	8	40
Hexachlorobenzene	1380		ug/kg dry	2054.9	344 U	67	45-130	7	40
Hexachlorobutadiene	1120		ug/kg dry	2054.9	344 U	54	45-105	13	40
Hexachlorocyclopentadiene	1110		ug/kg dry	2054.9	344 U	54	10-100	28	40
Hexachloroethane	1180		ug/kg dry	2054.9	344 U	57	35-110	20	40
Indeno[1,2,3-cd]pyrene	1500		ug/kg dry	2054.9	344 U	73	45-130	9	40
Isophorone	1160		ug/kg dry	2054.9	344 U	56	40-110	8	40
Naphthalene	1210		ug/kg dry	2054.9	344 U	59	40-110	8	40
Nitrobenzene	1120		ug/kg dry	2054.9	344 U	55	40-105	10	40
N-Nitrosodi-n-propylamine	1420		ug/kg dry	2054.9	344 U	69	30-130	10	40
N-Nitrosodiphenylamine	1380		ug/kg dry	2054.9	344 U	67	50-120	9	40
Pentachlorophenol	853		ug/kg dry	2054.9	1720 U	41	25-120	53*	40
Phenanthrene	1530		ug/kg dry	2054.9	344 U	75	50-120	10	40
Phenol	1370		ug/kg dry	2054.9	344 U	67	40-115	8	40
Pyrene	1610		ug/kg dry	2054.9	344 U	78	45-125	1	40
Surrogate: 2-Fluorophenol	*1680*		*ug/kg dry*	*2568.6*		*65*	*25-121*		
Surrogate: Phenol-d5	*1820*		*ug/kg dry*	*2568.6*		*71*	*24-113*		
Surrogate: Nitrobenzene-d5	*1020*		*ug/kg dry*	*1712.4*		*60*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1220*		*ug/kg dry*	*1712.4*		*71*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1410*		*ug/kg dry*	*2568.6*		*55*	*19-122*		
Surrogate: p-Terphenyl-d14	*1270*		*ug/kg dry*	*1712.4*		*74*	*18-137*		

Date: 5 November 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 300 Area D4 Waste Sites – Soil Full Protocol – Waste Site 316-3
Subject: Wet Chemistry - Data Package No. KP0123-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. KP0123 prepared by Lionville Laboratories 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	Analyte
J1PX95	8/16/12	Soil	C	See note 1
J1PX96	8/16/12	Soil	C	See note 1
J1PX97	8/16/12	Soil	C	See note 1
J1PX98	8/16/12	Soil	C	See note 1
J1PX99	8/20/12	Soil	C	See note 1
J1PXC0	8/20/12	Soil	C	See note 1
J1PXC1	8/20/12	Soil	C	See note 1
J1PXC2	8/20/12	Soil	C	See note 1

1 – IC anions by 300.0, cyanide (9014), sulfide (9034) and nitrate/nitrite by 353.2, pH by9045.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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 PARAMETERS

Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for nitrate/nitrite, chloride, fluoride, bromide, sulfate; 14 days for cyanide; and 7 days for sulfide; 48 hours for nitrate, nitrite and orthophosphate.

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 holding time being exceeded by greater than twice the limit, all detected pH, nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrite and orthophosphate results were qualified as rejected and flagged "UR".

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

All other holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is

required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

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

- **Completeness**

Data package KP0123 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 85%.

MAJOR DEFICIENCIES

The following major deficiency was noted:

- Due to the holding time being exceeded by greater than twice the limit, all undetected nitrate, nitrite and orthophosphate results were qualified as rejected and flagged "UR".

Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

The following minor deficiencies were noted;

- Due to the holding time being exceeded by greater than twice the limit, all detected pH, nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J".

- Due to the holding time being exceeded by less then twice the limit, all sulfide 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.*

DOE/RL-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

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

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: KP0123	**REVIEWER: ELR**	**Project: 316-3**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate Sulfide pH	J	All	Hold time
Nitrite	UR	All	Hold time
Orthophosphate	J	J1PX95, J1PX96 J1PX97	Hold time
Orthophosphate	UR	J1PX98, J1PX99 J1PXC0, J1PXC1 J1PXC2	Hold time

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

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 16:44

11/4/12

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PX95 (1208077-01) Soil									
%Solids	95.7		0.1	% by Weight	1	L208230	08/24/2012 14:50	08/24/2012 14:50	SM2540G
Bromide	1.0 U	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Chloride	1.4 B	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Fluoride	1.0 U	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate	1.6 B J	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrite	1.0 U R	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Orthophosphate	4.6 B J	2.1	10.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Sulfate	4.5 B	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate/Nitrite as N	0.16 B	0.10	0.51	mg/kg dry	1	L208210	08/28/2012 13:00	08/29/2012 10:12	EPA 353.2
Cyanide	0.52 U	0.52	1.04	mg/kg dry	1	L208247	08/27/2012 11:20	08/28/2012 14:35	SW846 9014
Sulfide	41.8 U J	41.8	104	mg/kg dry	1	L208287	08/28/2012 22:00	08/28/2012 23:50	SW846 9034
pH	8.90 J	0.10	0.10	pH Units	1	L208279	08/30/2012 10:11	08/30/2012 10:11	SW846 9045
%Moisture	4.30		0.10	% by Weight	1	L208231	08/24/2012 14:50	08/24/2012 14:50	D2216
J1PX96 (1208077-02) Soil									
%Solids	92.7		0.1	% by Weight	1	L208230	08/24/2012 14:50	08/24/2012 14:50	SM2540G
Bromide	1.1 U	1.1	5.4	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Chloride	2.0 B	1.1	5.4	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Fluoride	5.7	1.1	5.4	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate	4.1 B J	1.1	5.4	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrite	1.1 U R	1.1	5.4	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Orthophosphate	4.1 B J	2.1	10.7	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Sulfate	5.2 B	1.1	5.4	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate/Nitrite as N	0.69	0.11	0.54	mg/kg dry	1	L208210	08/28/2012 13:00	08/29/2012 10:15	EPA 353.2
Cyanide	0.54 U	0.54	1.08	mg/kg dry	1	L208247	08/27/2012 11:20	08/28/2012 14:35	SW846 9014
Sulfide	43.1 U J	43.1	108	mg/kg dry	1	L208287	08/28/2012 22:00	08/28/2012 23:50	SW846 9034
pH	8.61 J	0.10	0.10	pH Units	1	L208279	08/30/2012 10:11	08/30/2012 10:11	SW846 9045
%Moisture	7.26		0.10	% by Weight	1	L208231	08/24/2012 14:50	08/24/2012 14:50	D2216

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 16:44

11/4/12

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PX97 (1208077-03) Soil									
%Solids	95.7		0.1	% by Weight	1	L208230	08/24/2012 14:50	08/24/2012 14:50	SM2540G
Bromide	1.0 U	1.0	5.2	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Chloride	1.7 B	1.0	5.2	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Fluoride	3.4 B	1.0	5.2	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate	7.7 J	1.0	5.2	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrite	1.0 U R	1.0	5.2	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Orthophosphate	3.0 B J	2.1	10.4	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Sulfate	5.7	1.0	5.2	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate/Nitrite as N	1.60	0.10	0.52	mg/kg dry	1	L208210	08/28/2012 13:00	08/29/2012 10:16	EPA 353.2
Cyanide	0.52 U	0.52	1.03	mg/kg dry	1	L208247	08/27/2012 11:20	08/28/2012 14:35	SW846 9014
Sulfide	41.8 U J	41.8	104	mg/kg dry	1	L208287	08/28/2012 22:00	08/28/2012 23:50	SW846 9034
pH	9.20 J	0.10	0.10	pH Units	1	L208279	08/30/2012 10:11	08/30/2012 10:11	SW846 9045
%Moisture	4.29		0.10	% by Weight	1	L208231	08/24/2012 14:50	08/24/2012 14:50	D2216
J1PX98 (1208077-04) Soil									
%Solids	84.1		0.1	% by Weight	1	L208230	08/24/2012 14:50	08/24/2012 14:50	SM2540G
Bromide	1.1 U	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Chloride	4.5 B	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Fluoride	7.7	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate	13.3 J	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrite	1.1 U R	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Orthophosphate	2.1 U R	2.1	10.7	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Sulfate	12.9	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate/Nitrite as N	2.94	0.11	0.53	mg/kg dry	1	L208210	08/28/2012 13:00	08/29/2012 10:17	EPA 353.2
Cyanide	0.59 U	0.59	1.19	mg/kg dry	1	L208247	08/27/2012 11:20	08/28/2012 14:35	SW846 9014
Sulfide	47.6 U J	47.6	119	mg/kg dry	1	L208293	08/30/2012 18:50	08/31/2012 01:20	SW846 9034
pH	8.65 J	0.10	0.10	pH Units	1	L208279	08/30/2012 10:11	08/30/2012 10:11	SW846 9045
%Moisture	15.9		0.10	% by Weight	1	L208231	08/24/2012 14:50	08/24/2012 14:50	D2216

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 16:44

11/4/12

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PX99 (1208077-05) Soil										
%Solids	**81.8**			0.1	% by Weight	1	L208230	08/24/2012 14:50	08/24/2012 14:50	SM2540G
Bromide	1.2	U	1.2	6.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Chloride	**1.7**	B	1.2	6.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Fluoride	**2.2**	B	1.2	6.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate	**211**	D J	2.4	12.2	mg/kg dry	2	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrite	1.2	U R	1.2	6.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Orthophosphate	2.4	U R	2.4	12.2	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Sulfate	**90.0**		1.2	6.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate/Nitrite as N	**45.2**	D	1.22	6.09	mg/kg dry	10	L208210	08/28/2012 13:00	08/29/2012 10:41	EPA 353.2
Cyanide	0.61	U	0.61	1.22	mg/kg dry	1	L208247	08/27/2012 11:20	08/28/2012 14:35	SW846 9014
Sulfide	48.9	U J	48.9	122	mg/kg dry	1	L208293	08/30/2012 18:50	08/31/2012 01:20	SW846 9034
pH	**8.49**	J	0.10	0.10	pH Units	1	L208279	08/30/2012 10:11	08/30/2012 10:11	SW846 9045
%Moisture	**18.2**			0.10	% by Weight	1	L208231	08/24/2012 14:50	08/24/2012 14:50	D2216
J1PXC0 (1208077-06) Soil										
%Solids	**95.2**			0.1	% by Weight	1	L208230	08/24/2012 14:50	08/24/2012 14:50	SM2540G
Bromide	1.0	U	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Chloride	**3.8**	B	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Fluoride	**2.6**	B	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate	**25.5**	J	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrite	1.0	U R	1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Orthophosphate	2.0	U R	2.0	10.2	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Sulfate	**26.3**		1.0	5.1	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate/Nitrite as N	**5.61**		0.10	0.51	mg/kg dry	1	L208210	08/28/2012 13:00	08/29/2012 10:19	EPA 353.2
Cyanide	0.52	U	0.52	1.05	mg/kg dry	1	L208247	08/27/2012 11:20	08/28/2012 14:35	SW846 9014
Sulfide	42.0	U J	42.0	105	mg/kg dry	1	L208293	08/30/2012 18:50	08/31/2012 01:20	SW846 9034
pH	**8.75**	J	0.10	0.10	pH Units	1	L208279	08/30/2012 10:11	08/30/2012 10:11	SW846 9045
%Moisture	**4.82**			0.10	% by Weight	1	L208231	08/24/2012 14:50	08/24/2012 14:50	D2216

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 16:44

11/4/12

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PXC1 (1208077-07) Soil									
%Solids	**88.9**		0.1	% by Weight	1	L208230	08/24/2012 14:50	08/24/2012 14:50	SM2540G
Bromide	1.1 U	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Chloride	**3.0** B	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Fluoride	**5.0** B	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate	**65.9** J	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrite	1.1 U R	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Orthophosphate	2.1 U R	2.1	10.7	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Sulfate	**76.6**	1.1	5.3	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate/Nitrite as N	**16.1** D	0.22	1.11	mg/kg dry	2	L208289	08/31/2012 08:30	08/31/2012 10:24	EPA 353.2
Cyanide	0.56 U	0.56	1.12	mg/kg dry	1	L208247	08/27/2012 11:20	08/28/2012 14:35	SW846 9014
Sulfide	45.0 U J	45.0	112	mg/kg dry	1	L208293	08/30/2012 20:30	08/31/2012 01:20	SW846 9034
pH	**8.27** J	0.10	0.10	pH Units	1	L208279	08/30/2012 10:11	08/30/2012 10:11	SW846 9045
%Moisture	**11.1**		0.10	% by Weight	1	L208231	08/24/2012 14:50	08/24/2012 14:50	D2216
J1PXC2 (1208077-08) Soil									
%Solids	**89.6**		0.1	% by Weight	1	L208230	08/24/2012 14:50	08/24/2012 14:50	SM2540G
Bromide	1.1 U	1.1	5.5	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Chloride	**1.6** B	1.1	5.5	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Fluoride	**5.9**	1.1	5.5	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate	**52.0** J	1.1	5.5	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrite	1.1 U R	1.1	5.5	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Orthophosphate	2.2 U R	2.2	10.9	mg/kg dry	1	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Sulfate	**156** D	2.2	10.9	mg/kg dry	2	L208274	08/28/2012 13:00	08/29/2012 12:38	EPA 300.0 (1993)
Nitrate/Nitrite as N	**11.5** D	0.22	1.09	mg/kg dry	2	L208210	08/28/2012 13:00	08/29/2012 10:42	EPA 353.2
Cyanide	0.55 U	0.55	1.10	mg/kg dry	1	L208247	08/27/2012 11:20	08/28/2012 14:35	SW846 9014
Sulfide	44.6 U J	44.6	112	mg/kg dry	1	L208293	08/30/2012 20:30	08/31/2012 01:20	SW846 9034
pH	**8.43** J	0.10	0.10	pH Units	1	L208279	08/30/2012 10:11	08/30/2012 10:11	SW846 9045
%Moisture	**10.4**		0.10	% by Weight	1	L208231	08/24/2012 14:50	08/24/2012 14:50	D2216

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-148 KP0123
LVL#: 1208077

Date Received: 08-23-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 8 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the data summary report. Results for soil or solid pH are measured in water at 25°C unless otherwise specified.

   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 with the exceptions of Nitrate, Nitrite and Orthophosphate that were received past hold and Sulfide that were analyzed past hold.

4. The results presented in this report are derived from samples that met LvL's sample acceptance policy with the exceptions noted on the Sample Receipt Checklist.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits with the exception of L208247-BS2 for Cyanide that was below the 80-120% control limits at 76.7%; however, L208247-BS1 was at 85.9%. The associated matrix spike sample was within the acceptance criteria.

7. The matrix spike recoveries were within the 75-125% control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit with the exception of Chloride at 33.7% and Orthophosphate at 45.8% for which the replicate results were below the limits of quantitation.

9. Results for soil samples are reported on a dry weight basis.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

9/4/12
Date

njp\i08-077

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 12 pages.

1 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~

Collector: Weber, HC	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: 7 ~~21~~ Days
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No.: RC-148	
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No.: A110483	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive ∠ DOT Limits A# 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	Semi-item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
J1PX93	SOIL												
J1PX94	SOIL												
J1PX95	SOIL	8/16/12	0936	✓	✓	✓	✓	✓	✓	✓	✓	✓	34265
J1PX96	SOIL	8/16/12	1034	✓	✓	✓	✓	✓	✓	✓	✓	✓	~~242~~ 34266
J1PX97	SOIL	8/16/12	1221	✓	✓	✓	✓	✓	✓	✓	✓	✓	34267

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Heather Weber / Heather Weber	Date/Time: 8-16-12 1415	Received By/Stored In: DAVID BECKER / David Becker	Date/Time: 8/16/12 1415
Relinquished By/Removed From: DAVID BECKER / David Becker	Date/Time: 8/16/12 1755	Received By/Stored In: 1060 #3B	Date/Time: 8/16/12 1755
Relinquished By/Removed From: 1060 #3B	Date/Time: 8-20-12 0710	Received By/Stored In: 1060#3 A. Freier / A. Freier	Date/Time: 0710 8-20-12
Relinquished By/Removed From: WCH A. Freier / A. Freier	Date/Time: 1060#3 8-22-12 1258	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HERNANDEZ	Date/Time: 8/23/12 0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium]; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-1[illegible], Cerium-144, Cesium-134, Cesium-137, Europium-155, Niobium-94, Radium-226, Radium-228, [illegible], Zinc-65 8/16/12

* freeze upon receipt. A# 8-20-12

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

KP0123

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

REVIEWED BY MWShen DATE 8/22/12

WCH-EE-011

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2 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~

Collector Weber, HC	Company Contact Joan Kessner Telephone No. 509-375-4688	Project Coordinator KESSNER, JH	Price Code ~~8L~~ 9B Data Turnaround 7 ~~21~~ Days
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No. RC-148	
Ice Chest No. RCC-07-012	Field Logbook No. EL-1663-03 COA R316032000	Method of Shipment Hand Deliver/Government Vehicle/FedEx	
Shipped To ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No. A110483	Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive ∠ DOT Limits
AJ 8-22-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
J1PX98	SOIL	8/16/12	1337	✓	✓	✓	✓	✓	✓	✓	✓	✓	34268
J1PX99	SOIL												
J1PXC0	SOIL												
J1PXC1	SOIL												
J1PXC2	SOIL												

AJ 8-20-12

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Heather Weber / [signature]	Date/Time: 8/16/12 1415	Received By/Stored In: DAVID BECKER [signature]	Date/Time: 8/16/12 1415
Relinquished By/Removed From: DAVID BECKER [signature]	Date/Time: 8/16/12 1755	Received By/Stored In: 1060/3B	Date/Time: 8/16/12 1755
Relinquished By/Removed From: 1060#3B	Date/Time: 8-20-12 0710	Received By/Stored In: 1060#3 A. Freier [signature]	Date/Time: 8-20-12 0710
Relinquished By/Removed From: WCH A. Freier [signature] 1060#3	Date/Time: 8-22-12 1258	Received By/Stored In: FedEx	Date/Time:
Relinquished By/Removed From: [signature]	Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HEANANDEZ [signature]	Date/Time: 8/23/12 0930
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS
VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium}; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cesium-134, Cesium-137, ...iropium-155, Niobium-94, Radium-226, Radium-228, ..., Zinc-65) 8/16/12

*freeze upon receipt.
AJ 8-20-12

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

KP0123

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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1 OF 1

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~

Collector ~~Weber, HC~~ STOWE, Q 8/20/12	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 316-3 Waste Site [307 Disposal Trenches] Test Pits		SAF No. RC-148
Ice Chest No. RCC-07-012	Field Logbook No. EL-1663-03	COA R316032000	Method of Shipment Hand Deliver/Government Vehicle FedEx
Shipped To ~~EBERLINE SERVICES~~ LIONVILLE 8/20/12	Offsite Property No. A110483		Bill of Lading/Air Bill No. See OSPC

Price Code ~~8L~~ 9B 8/20/12

Data Turnaround 7 ~~21~~ Days 8/20/12

POSSIBLE SAMPLE HAZARDS/REMARKS 8/20/12

Potential Radioactive < DOT Limits A4 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	~~5~~ 6	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL 8/20/12	250mL	120mL	120mL	~~500mL~~ 120mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions TCLP* METALS	RF
~~J1PX98~~	~~8/20/12~~													
J1PX99	SOIL	8/20/12	1239	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34273
J1PXC0	SOIL	8/20/12	1323	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34274
J1PXC1	SOIL	8/20/12	1400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34275
J1PXC2	SOIL	8/20/12	1511	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34276

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From Quincy Stowe Date/Time 1545 8/20/12	Received By/Stored In DAVID BECKER Date/Time 8/20/12 1545	
Relinquished By/Removed From DAVID BECKER Date/Time 8/20/12 1730	Received By/Stored In 1060, 3B Date/Time 8/20/12 1730	
Relinquished By/Removed From 1060#3B 8-21-12 Date/Time 0740	Received By/Stored In 1060#3 A. Freier A. Freier Date/Time 0740 8-21-12	
Relinquished By/Removed From WCH A. Freier A. Freier Date/Time 1060#3 8-22-12 1258	Received By/Stored In FedEx Date/Time	
Relinquished By/Removed From FedEx Date/Time 8/23/12 0930	Received By/Stored In VICTOR HERNANDEZ Date/Time 8-23-12 0930	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	

SPECIAL INSTRUCTIONS * freeze upon receipt. A4 8-21-12

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium]; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab. ~~Antimony-125, Cerium-144, Cesium-134, Cesium-137, Iron-55, Nitrogen-94, Radium-226, Radium-228, Zinc-65~~ 8/20/12

TTCLP METALS - LEACH & HOLD UNTIL FURTHER DIRECTION IS PROVIDED 8/20/12

KP0123

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

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	316-3		DATA PACKAGE:	KP0123	
VALIDATOR:	ELR	LAB:	LLI	DATE:	11/3/12
			SDG:	KP0123	

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	cyanide	
					sulfide

SAMPLES/MATRIX				
JIPX95	JIPX96	JIPX97	JIPX98	JIPX99
JIPXC0	JIPXC1	JIPXC2		
				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: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

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: nitrate, nitrite, ortho, pH – >2x J/UR
sulfide – <2x – J all

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/31/2012 16:44

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208210 - Default Prep GenChem										
Blank (L208210-BLK1)				Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 09:57						
Nitrate/Nitrite as N	0.10 U	0.10	0.50	mg/kg wet						
LCS (L208210-BS1)				Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 09:56						
Nitrate/Nitrite as N	4.77	0.10	0.50	mg/kg wet	5.0000		95.4	90-110		
Duplicate (L208210-DUP5)	**Source: 1208077-01**			Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 10:13						
Nitrate/Nitrite as N	0.10 U	0.10	0.51	mg/kg dry		0.16				20
Matrix Spike (L208210-MS5)	**Source: 1208077-01**			Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 10:35						
Nitrate/Nitrite as N	5.22	0.10	0.52	mg/kg dry	5.2071	0.16	97.2	75-125		
Batch L208230 - % Solids										
Duplicate (L208230-DUP2)	**Source: 1208077-01**			Prepared: 08/24/2012 14:50 Analyzed: 08/24/2012 14:50						
%Solids	95.7		0.1	% by Weight		95.7			0.04	20
Batch L208231 - Default Prep GenChem										
Duplicate (L208231-DUP1)	**Source: 1208077-01**			Prepared: 08/24/2012 14:50 Analyzed: 08/24/2012 14:50						
%Moisture	4.34		0.10	% by Weight		4.30			0.974	20
Batch L208247 - Default Prep GenChem										
Blank (L208247-BLK1)				Prepared: 08/27/2012 11:20 Analyzed: 08/28/2012 14:35						
Cyanide	0.50 U	0.50	0.99	mg/kg wet						

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 16:44

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208247 - Default Prep GenChem										
LCS (L208247-BS1)				Prepared: 08/27/2012 11:20 Analyzed: 08/28/2012 14:35						
Cyanide	1.71	0.50	1.00	mg/kg wet	1.9964		85.9	80-120		
LCS (L208247-BS2)				Prepared: 08/27/2012 11:20 Analyzed: 08/28/2012 14:35						
Cyanide	7.63	0.50	1.00	mg/kg wet	9.9522		76.7*	80-120		
Duplicate (L208247-DUP1)	Source: 1208077-01			Prepared: 08/27/2012 11:20 Analyzed: 08/28/2012 14:35						
Cyanide	0.52 U	0.52	1.04	mg/kg dry		0.52 U				20
Matrix Spike (L208247-MS1)	Source: 1208077-01			Prepared: 08/27/2012 11:20 Analyzed: 08/28/2012 14:35						
Cyanide	5.22	0.52	1.04	mg/kg dry	5.1933	0.52 U	101	75-125		
Batch L208274 - Default Prep GenChem										
Blank (L208274-BLK1)				Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 12:38						
Fluoride	1.0 U	1.0	5.0	mg/kg wet						
Chloride	1.0 U	1.0	5.0	mg/kg wet						
Bromide	1.0 U	1.0	5.0	mg/kg wet						
Orthophosphate	2.0 U	2.0	10.0	mg/kg wet						
Sulfate	1.0 U	1.0	5.0	mg/kg wet						
Nitrate	1.0 U	1.0	5.0	mg/kg wet						
Nitrite	1.0 U	1.0	5.0	mg/kg wet						
LCS (L208274-BS1)				Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 12:38						
Fluoride	49.1	1.0	5.0	mg/kg wet	50.000		98.2	80-120		
Chloride	46.7	1.0	5.0	mg/kg wet	50.000		93.4	80-120		
Bromide	47.5	1.0	5.0	mg/kg wet	50.000		95.0	80-120		
Orthophosphate	47.1	2.0	10.0	mg/kg wet	50.000		94.2	80-120		
Sulfate	49.3	1.0	5.0	mg/kg wet	50.000		98.6	80-120		
Nitrate	47.5	1.0	5.0	mg/kg wet	50.000		95.0	80-120		
Nitrite	47.5	1.0	5.0	mg/kg wet	50.000		95.0	80-120		

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 16:44

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208274 - Default Prep GenChem										
Duplicate (L208274-DUP2)	**Source: 1208077-01**			Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 12:38						
Fluoride	1.0 U	1.0	5.1	mg/kg dry		1.0 U				20
Chloride	1.0 B	1.0	5.1	mg/kg dry		1.4			33.7*	20
Bromide	1.0 U	1.0	5.1	mg/kg dry		1.0 U			-	20
Orthophosphate	7.4 B	2.0	10.2	mg/kg dry		4.6			45.8*	20
Sulfate	4.9 B	1.0	5.1	mg/kg dry		4.5			8.34	20
Nitrate	1.0 U	1.0	5.1	mg/kg dry		1.6				20
Nitrite	1.0 U	1.0	5.1	mg/kg dry		1.0 U				20
Matrix Spike (L208274-MS2)	**Source: 1208077-01**			Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 12:38						
Fluoride	52.1	1.0	5.2	mg/kg dry	52.071	1.0 U	100	75-125		
Chloride	49.4	1.0	5.2	mg/kg dry	52.071	1.4	92.0	75-125		
Bromide	50.0	1.0	5.2	mg/kg dry	52.071	1.0 U	96.0	75-125		
Orthophosphate	57.3	2.1	10.4	mg/kg dry	52.071	4.6	101	75-125		
Sulfate	54.7	1.0	5.2	mg/kg dry	52.071	4.5	96.3	75-125		
Nitrate	50.6	1.0	5.2	mg/kg dry	52.071	1.6	94.1	75-125		
Nitrite	50.0	1.0	5.2	mg/kg dry	52.071	1.0 U	96.0	75-125		
Batch L208279 - Default Prep GenChem										
Duplicate (L208279-DUP1)	**Source: 1208077-01**			Prepared: 08/30/2012 10:11 Analyzed: 08/30/2012 10:11						
pH	8.86	0.10	0.10	pH Units		8.90			0.450	20
Reference (L208279-SRM1)				Prepared: 08/30/2012 10:11 Analyzed: 08/30/2012 10:11						
pH	10.0	0.10	0.10	pH Units	10.000		100	99-101		
Batch L208287 - SW 9030B										
Blank (L208287-BLK1)				Prepared: 08/28/2012 22:00 Analyzed: 08/28/2012 23:50						
Sulfide	40.0 U	40.0	100	mg/kg wet						

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.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/31/2012 16:44

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208287 - SW 9030B										
LCS (L208287-BS1)				Prepared: 08/28/2012 22:00 Analyzed: 08/28/2012 23:50						
Sulfide	224	40.0	100	mg/kg wet	230.10		97.4	80-120		
LCS (L208287-BS2)				Prepared: 08/28/2012 22:00 Analyzed: 08/28/2012 23:50						
Sulfide	222	40.0	100	mg/kg wet	232.35		95.7	80-120		
Batch L208289 - Default Prep GenChem										
Blank (L208289-BLK1)				Prepared: 08/31/2012 08:30 Analyzed: 08/31/2012 10:23						
Nitrate/Nitrite as N	0.10 U	0.10	0.50	mg/kg wet						
LCS (L208289-BS1)				Prepared: 08/31/2012 08:30 Analyzed: 08/31/2012 10:21						
Nitrate/Nitrite as N	5.20	0.10	0.50	mg/kg wet	5.0000		104	90-110		
Duplicate (L208289-DUP1)	Source: 1208077-07			Prepared: 08/31/2012 08:30 Analyzed: 08/31/2012 10:25						
Nitrate/Nitrite as N	17.0 D	0.22	1.12	mg/kg dry		16.1			5.41	20
Matrix Spike (L208289-MS1)	Source: 1208077-07			Prepared: 08/31/2012 08:30 Analyzed: 08/31/2012 10:26						
Nitrate/Nitrite as N	42.1 D	0.55	2.77	mg/kg dry	27.729	16.1	93.8	75-125		
Batch L208293 - SW 9030B										
Blank (L208293-BLK1)				Prepared: 08/30/2012 22:30 Analyzed: 08/31/2012 01:20						
Sulfide	40.0 U	40.0	100	mg/kg wet						
LCS (L208293-BS1)				Prepared: 08/30/2012 22:10 Analyzed: 08/31/2012 01:20						
Sulfide	261	40.0	100	mg/kg wet	320.23		81.4	80-120		

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.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/31/2012 16:44

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208293 - SW 9030B										
LCS (L208293-BS2)				Prepared: 08/30/2012 22:10 Analyzed: 08/31/2012 01:20						
Sulfide	239	40.0	100	mg/kg wet	294.05		81.4	80-120		
Duplicate (L208293-DUP2)		Source: 1208077-08		Prepared: 08/30/2012 22:10 Analyzed: 08/31/2012 01:20						
Sulfide	44.6 U	44.6	112	mg/kg dry		44.6 U				20
Matrix Spike (L208293-MS2)		Source: 1208077-08		Prepared: 08/30/2012 23:45 Analyzed: 08/31/2012 01:20						
Sulfide	284	44.6	112	mg/kg dry	318.74	44.6 U	89.2	75-125		

Date: 5 November 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 300 Area D4 Waste Sites – Soil Full Protocol – Waste Site 316-3
Subject: Diesel Range Organics - Data Package No. KP0123-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. KP0123 prepared by Lionville Laboratories 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	Analyte
J1PX95	8/16/12	Soil	C	See note 1
J1PX96	8/16/12	Soil	C	See note 1
J1PX97	8/16/12	Soil	C	See note 1
J1PX98	8/16/12	Soil	C	See note 1
J1PX99	8/20/12	Soil	C	See note 1
J1PXC0	8/20/12	Soil	C	See note 1
J1PXC1	8/20/12	Soil	C	See note 1
J1PXC2	8/20/12	Soil	C	See note 1

1 – NWTPH-Dx.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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 Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

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

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

All holding times were acceptable.

Method Blanks

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

All method blank results were acceptable (although the motor oil result exceeded the RQL).

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to a matrix spike recovery outside QC limits (152%), the diesel range organic results in samples J1PX99 and J1PXC0 were qualified as estimates and flagged "J".

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all motor oil results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

Due to an RPD outside QC limits (72%), all diesel range organic results were qualified as estimates and flagged "J".

Due to the lack of a matrix spike and matrix spike duplicate analysis, all motor oil results were qualified as estimates and flagged "J".

All other laboratory results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. KP0123 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 a matrix spike recovery outside QC limits (152%), the diesel range organic results in samples J1PX99 and J1PXC0 were qualified as estimates and flagged "J".
- Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all motor oil results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (72%), all diesel range organic 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*, March 2008.

DOE/RL-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators 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 same quantitation limit corrected for sample dilution and moisture content by the laboratory.

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

DIESEL RANGE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: KP0123	**REVIEWER: ELR**	**Project: 316-3**	**PAGE 1 OF 1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Diesel range organics	J	J1PX99, J1PXC0	MS recovery
Diesel range organics	J	All	RPD
Motor oil	J	All	No MS, MSD or LCS 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

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/30/2012 12:35

11/4/12

Extractable Petroleum Hydrocarbons by SW846 8015
Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PX95 (1208077-01) Soil								
Surrogate: p-Terphenyl	*114 %*	*39-129*			*L208226*	*08/23/2012*	*08/28/2012*	*8015M*
Diesel Range Organics	3310 U J	3310	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
Motor Oil	18700 J	9930	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
J1PX96 (1208077-02) Soil								
Surrogate: p-Terphenyl	*114 %*	*39-129*			*L208226*	*08/23/2012*	*08/28/2012*	*8015M*
Diesel Range Organics	3510 U J	3510	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
Motor Oil	25200 J	10500	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
J1PX97 (1208077-03) Soil								
Surrogate: p-Terphenyl	*72 %*	*39-129*			*L208226*	*08/23/2012*	*08/28/2012*	*8015M*
Diesel Range Organics	3470 U J	3470	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
Motor Oil	3870 J J	10400	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
J1PX98 (1208077-04) Soil								
Surrogate: p-Terphenyl	*75 %*	*39-129*			*L208226*	*08/23/2012*	*08/28/2012*	*8015M*
Diesel Range Organics	3880 U J	3880	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
Motor Oil	41700 J	11600	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
J1PX99 (1208077-05) Soil								
Surrogate: p-Terphenyl	*70 %*	*39-129*			*L208226*	*08/23/2012*	*08/28/2012*	*8015M*
Diesel Range Organics	87900 J	4070	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
Motor Oil	178000 J	12200	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
J1PXC0 (1208077-06) Soil								
Surrogate: p-Terphenyl	*88 %*	*39-129*			*L208226*	*08/23/2012*	*08/28/2012*	*8015M*
Diesel Range Organics	1230 J J	3410	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
Motor Oil	10200 U J	10200	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M

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

WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/30/2012 12:35

Extractable Petroleum Hydrocarbons by SW846 8015
Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PXC1 (1208077-07) Soil								
Surrogate: p-Terphenyl	*71 %*	*39-129*			*L208226*	*08/23/2012*	*08/28/2012*	*8015M*
Diesel Range Organics	3720 U J	3720	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
Motor Oil	14500 J	11100	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
J1PXC2 (1208077-08) Soil								
Surrogate: p-Terphenyl	*79 %*	*39-129*			*L208226*	*08/23/2012*	*08/28/2012*	*8015M*
Diesel Range Organics	3630 U J	3630	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M
Motor Oil	13700 J	10900	ug/kg dry	1	L208226	08/23/2012	08/28/2012	8015M

11/4/12

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-148 KP0123
LVL #: 1208077

W.O. #: 60049-001-001-0001-00
Date Received: 08-23-2012

DIESEL RANGE ORGANICS

Eight (8) soil samples were collected on 08-16,20-2012.

The samples and associated QC samples were extracted 08-23-2012 and analyzed 08-28-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8015B for Diesel Range Organics.

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. All required holding times for extraction and analysis have been met.
3. One (1) of twelve (12) surrogate recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC142) has been enclosed.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. One (1) of two (2) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC142) has been enclosed.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. The samples were reported on a dry weight basis.

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.

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

Iain Daniels
LvL Laboratory Manager

8/30/12
Date

000000110

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC142

Initiator: Catherine Carey
Date: 08/28/12
Client: WC Hanford

Batch: 1208077
Samples: MS1
Method: SW846/MCAWW/CLP/

Parameter: DEO
Matrix: SOIL
Prep Batch: L2082246

1. Reason for SDR

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

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

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

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

Surrogate (144%) and Spike (138%) recoveries are high in MS1

MSD1 + BS okay

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

Narrate
JD

4. Project Manager Instructions...signature/date: 8/30/12
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 8/30/12 Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA for diposition.

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

000000113

1 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~1 of 12~~

Collector: Weber, HC	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: 7 ~~21~~ Days
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No.: RC-148	8/16/12
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE 8/16/12	Offsite Property No.: A110483	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive < DOT Limits AJ 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Ga*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
~~J1PX93~~	~~SOIL~~												
~~J1PX94~~ 8/16/12	~~SOIL~~												
J1PX95	SOIL	8/16/12	0936	✓	✓	✓	✓	✓	✓	✓	✓	✓	34265
J1PX96	SOIL	8/16/12	1034	✓	✓	✓	✓	✓	✓	✓	✓	✓	~~242~~ 34266
J1PX97	SOIL	8/16/12	1221	✓	✓	✓	✓	✓	✓	✓	✓	✓	34267

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: Heather Weber / [signature] Date/Time: 8-16-12 1415	Received By/Stored In: DAVID BECKER [signature] Date/Time: 8/16/12 1415	
Relinquished By/Removed From: DAVID BECKER [signature] Date/Time: 8/16/12 1755	Received By/Stored In: 1060 #3B Date/Time: 8/16/12 1755	
Relinquished By/Removed From: 1060 #3B Date/Time: 8-20-12 0710	Received By/Stored In: 1060#3 A. Freier A. Freier Date/Time: 8-20-12 0710	
Relinquished By/Removed From: WCH A. Freier A. Freier Date/Time: 8-22-12 1258	Received By/Stored In: Fed Ex Date/Time:	
Relinquished By/Removed From: [signature] Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HERNANDEZ Date/Time: 8/23/12 0930	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:	

SPECIAL INSTRUCTIONS

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium}; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, uropium-155, Niobium-94, Radium-226, Radium-228, , Zinc-65) 8/16/12

* freeze upon receipt. AJ 8-20-12

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

KP0123

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

000000004

17

2 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~1 of 12~~ 8/16/12

Collector: Weber, HC	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits		SAF No.: RC-148 8/16/12
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03	COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE 8/16/12	Offsite Property No.: A110483		Bill of Lading/Air Bill No.: See OSPC

Price Code: ~~8L~~ 9B

Data Turnaround: 7 ~~21~~ Days 8/16/12

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive ∠ DOT Limits AJ 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
J1PX98	SOIL	8/16/12	1337	✓	✓	✓	✓	✓	✓	✓	✓	✓	34268
~~J1PX99~~	~~SOIL~~												
~~J1PXC0~~	~~SOIL~~												
~~J1PXC1~~	~~SOIL~~												
~~J1PXC2~~	~~SOIL~~												

AJ 8-20-12

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Heather Weber/ [signature]	Date/Time: 8/16/12 1415	Received By/Stored In: DAVID BECKER [signature]	Date/Time: 8/16/12 1415
Relinquished By/Removed From: DAVID BECKER [signature]	Date/Time: 8/16/12 1755	Received By/Stored In: 1060/3B	Date/Time: 8/16/12 1755
Relinquished By/Removed From: 1060#3B	Date/Time: 8-20-12 0710	Received By/Stored In: 1060#3 A. Freier [signature]	Date/Time: 8-20-12 0710
Relinquished By/Removed From: WCH A. Freier [signature] 1060#3	Date/Time: 8-22-12 1258	Received By/Stored In: FedEx	Date/Time:
Relinquished By/Removed From: [signature]	Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HERNANDEZ [signature]	Date/Time: 8/23/12 0930
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium}; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cesium-134, Cesium-137, ~~Europium-155, Niobium-94, Radium-226, Radium-228,~~ Zinc-65} 8/16/12

*freeze upon receipt. AJ 8-20-12

Matrix *: S=Soil, SE=Sediment, SO=Solid, SI=Sludge, W = Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation

KP0123

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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0000000005

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-148-052 | Page ~~2 of 12~~

Collector: ~~Weber, HC~~ STOWE, Q 8/20/12	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH
Price Code: ~~8L~~ 9B	Data Turnaround: 7 ~~21~~ Days 8/20/12		
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits		SAF No.: RC-148 8/20/12
Ice Chest No.: RCC -07-012	Field Logbook No.: EL-1663-03	COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE 8/20/12	Offsite Property No.: A 110483		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive < DOT Limits A4 8-22-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	~~5~~ 6	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	~~40mL~~ 8/20/12	250mL	120mL	120mL	~~500mL~~ 120mL

SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions. TCLP * METALS	
Sample No. / Matrix * / Sample Date / Sample Time											REF
~~J1PX98~~ 8/20/12											
J1PX99 / SOIL / 8/20/12 / 1239	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34273
J1PXC0 / SOIL / 8/20/12 / 1323	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34274
J1PXC1 / SOIL / 8/20/12 / 1400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34275
J1PXC2 / SOIL / 8/20/12 / 1511	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34276

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	8/20/12 1545	DAVID BECKER	8/20/12 1545
DAVID BECKER	8/20/12 1730	1060, 3B	8/20/12 1730
1060#3B 8-21-12	0740	A. Freier A. Freier 8-21-12	0740
A. Freier A. Freier 8-22-12	1060#3 1258	FedEx	
Felix	8/23/12 0930	VICTOR HERNANDEZ	8-23-12 0930

SPECIAL INSTRUCTIONS * freeze upon rec. pt. A4 8-21-12

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium): Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab. Americium-125, Cerium-144, Cesium-134, Cesium-137, ~~Europium-155, Nickel-59, Radium-226, Radium-228, Zinc-65~~ 8/20/12

TTCLP METALS - LEACH & HOLD UNTIL FURTHER DIRECTION IS PROVIDED 8/20/12

KP0123

REVIEWED BY Mustkas DATE 8/22/12

Matrix *: S=Soil; SS=Subsoil; SO=Solid; SL=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

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

WCH-EE-011

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000000006

Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 316-3			DATA PACKAGE: KP0123		
VALIDATOR: FLR		LAB: LLI		DATE: 11/3/12	
			SDG: KP0123		

ANALYSES PERFORMED					
8015	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	WTPH-D	

SAMPLES/MATRIX:				
J1PX95	J1PX9C	J1PX97	J1PX98	J1PX99
J1PXC0	J1PXC1	J1PXC2		
				Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

Comments:

GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: MO over RQL

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

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

Comments: MS - 153% - J all DRO detects

no MS/MSD/LCS - J all

no PAS

GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: RPD – 7230 – J all DRO

No MO MS/MSD – J all

6. HOLDING TIMES (all levels)

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

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

Comments:

GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

Comments: I am

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries aceptable? ..... Yes No N/A

Check materials traceable? ..... Yes No N/A

Check materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:

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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/30/2012 12:35

Extractable Petroleum Hydrocarbons by SW846 8015 - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208226 - SW 3540C									
Blank (L208226-BLK1)			Prepared: 08/23/2012 Analyzed: 08/28/2012						
Diesel Range Organics	3330 U	3330	ug/kg wet						
Motor Oil	10000 U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*8550*		*ug/kg wet*	*6666.7*		*128*	*39-129*		
LCS (L208226-BS1)			Prepared: 08/23/2012 Analyzed: 08/28/2012						
Diesel Range Organics	62500	3330	ug/kg wet	66667		94	42-133		
Surrogate: p-Terphenyl	*7100*		*ug/kg wet*	*6666.7*		*106*	*39-129*		
Matrix Spike (L208226-MS1)		**Source: 1208077-01**	Prepared: 08/23/2012 Analyzed: 08/28/2012						
Diesel Range Organics	102000	3370	ug/kg dry	67326	3310 U	152*	42-133		
Surrogate: p-Terphenyl	*9720*		*ug/kg dry*	*6732.6*		*144**	*39-129*		
Matrix Spike Dup (L208226-MSD1)		**Source: 1208077-01**	Prepared: 08/23/2012 Analyzed: 08/28/2012						
Diesel Range Organics	49300	3460	ug/kg dry	69244	3310 U	71	42-133	72*	40
Surrogate: p-Terphenyl	*4860*		*ug/kg dry*	*6924.4*		*70*	*39-129*		

Date: 5 November 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 300 Area D4 Waste Sites – Soil Full Protocol – Waste Site 316-3
Subject: Inorganics - Data Package No. KP0123-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. KP0123 prepared by Lionville Laboratories 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	Analyte
J1PX95	8/16/12	Soil	C	See note 1
J1PX96	8/16/12	Soil	C	See note 1
J1PX97	8/16/12	Soil	C	See note 1
J1PX98	8/16/12	Soil	C	See note 1
J1PX99	8/20/12	Soil	C	See note 1
J1PXC0	8/20/12	Soil	C	See note 1
J1PXC1	8/20/12	Soil	C	See note 1
J1PXC2	8/20/12	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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 PARAMETERS

Holding Times

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits, all antimony (42%) results were qualified as estimates and flagged "J".

Due to LCS recoveries outside QC limits, all aluminum (153%), antimony (47.2%) and silicon (269%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. KP0123 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 a matrix spike recovery outside QC limits, all antimony (42%) results were qualified as estimates and flagged "J".
- Due to LCS recoveries outside QC limits, all aluminum (153%), antimony (47.2%) and silicon (269%) 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*, March 2008.

DOE/RL-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

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 DATA QUALIFICATION SUMMARY*

SDG: KP0123	**REVIEWER: ELR**	**Project: 316-3**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	J	All	Matrix spike recovery
Aluminum Antimony Silicon	J	All	LCS recovery

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

Appendix 3

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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/30/2012 13:06

J1PX95
1208077-01 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	7760	J	4.66	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Antimony	0.560	U J	0.560	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Arsenic	2.75		0.933	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Barium	81.7		0.466	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Beryllium	0.262		0.187	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Boron	1.54	B	1.87	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cadmium	0.147	B	0.187	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Calcium	5510		93.3	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Chromium	28.3		0.187	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cobalt	5.43		1.87	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Copper	206		0.933	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Iron	17800		18.7	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lead	8.01		0.466	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lithium	7.17		2.33	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Magnesium	4030		70.0	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Manganese	270		4.66	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Molybdenum	0.488	B	1.87	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Nickel	20.1		3.73	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Potassium	1120		373	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Selenium	0.280	U	0.280	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silicon	953	J	1.87	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silver	4.19		0.187	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Sodium	219		46.6	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Uranium	16.1	B	18.7	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Vanadium	46.5		2.33	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zinc	45.0		9.33	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zirconium	57.1		2.33	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Mercury	0.384		0.0294	mg/kg dry	1	L208227	08/23/2012	08/24/2012	7471A

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/30/2012 13:06

J1PX96
1208077-02 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	7710	J	5.18	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Antimony	0.622	U J	0.622	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Arsenic	2.60		1.04	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Barium	71.4		0.518	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Beryllium	0.254		0.207	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Boron	1.70	B	2.07	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cadmium	0.129	B	0.207	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Calcium	6080		104	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Chromium	30.7		0.207	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cobalt	5.60		2.07	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Copper	225		1.04	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Iron	18500		20.7	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lead	10.4		0.518	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lithium	6.91		2.59	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Magnesium	4060		77.8	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Manganese	282		5.18	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Molybdenum	0.567	B	2.07	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Nickel	26.3		4.15	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Potassium	1040		415	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Selenium	0.311	U	0.311	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silicon	737	J	2.07	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silver	3.71		0.207	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Sodium	216		51.8	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Uranium	34.2		20.7	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Vanadium	49.7		2.59	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zinc	49.0		10.4	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zirconium	51.2		2.59	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Mercury	0.400		0.0270	mg/kg dry	1	L208227	08/23/2012	08/24/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/30/2012 13:06

J1PX97
1208077-03 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Aluminum	**6070**	J	5.02	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Antimony	0.603	U J	0.603	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Arsenic	**2.48**		1.00	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Barium	**60.1**		0.502	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Beryllium	**0.219**		0.201	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Boron	**1.04**	B	2.01	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cadmium	**0.0732**	B	0.201	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Calcium	**4680**		100	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Chromium	**13.6**		0.201	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cobalt	**4.92**		2.01	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Copper	**56.8**		1.00	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Iron	**16800**		20.1	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lead	**3.96**		0.502	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lithium	**6.40**		2.51	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Magnesium	**3770**		75.3	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Manganese	**237**		5.02	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Molybdenum	**0.373**	B	2.01	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Nickel	**12.6**		4.02	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Potassium	**932**		402	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Selenium	0.301	U	0.301	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silicon	**593**	J	2.01	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silver	**0.770**		0.201	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Sodium	**201**		50.2	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Uranium	**11.2**	B	20.1	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Vanadium	**48.0**		2.51	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zinc	**37.9**		10.0	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zirconium	**27.6**		2.51	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Mercury	**0.117**		0.0254	mg/kg dry	1	L208227	08/23/2012	08/24/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/30/2012 13:06

J1PX98
1208077-04 (Soil)

11/4/12

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**11100**	J	5.83	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Antimony	0.699	U J	0.699	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Arsenic	**3.58**		1.17	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Barium	**101**		0.583	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Beryllium	**0.304**		0.233	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Boron	**2.03**	B	2.33	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cadmium	**0.250**		0.233	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Calcium	**8420**		117	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Chromium	**83.3**		0.233	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cobalt	**7.19**		2.33	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Copper	**775**		1.17	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Iron	**21100**		23.3	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lead	**17.6**		0.583	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lithium	**6.98**		2.91	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Magnesium	**5110**		87.4	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Manganese	**573**		5.83	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Molybdenum	**0.875**	B	2.33	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Nickel	**74.6**		4.66	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Potassium	**920**		466	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Selenium	0.350	U	0.350	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silicon	**363**	J	2.33	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silver	**10.9**		0.233	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Sodium	**361**		58.3	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Uranium	**155**		23.3	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Vanadium	**60.3**		2.91	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zinc	**59.4**		11.7	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zirconium	**110**		2.91	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Mercury	**1.32**		0.0324	mg/kg dry	1	L208227	08/23/2012	08/24/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/30/2012 13:06

J1PX99
1208077-05 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	13200	J	5.46	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Antimony	0.655	U J	0.655	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Arsenic	1.99		1.09	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Barium	786		0.546	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Beryllium	1.03		0.218	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Boron	197		2.18	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cadmium	0.252		0.218	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Calcium	42200		109	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Chromium	11.1		0.218	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cobalt	2.26		2.18	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Copper	21.4		1.09	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Iron	16600		21.8	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lead	14.9		0.546	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lithium	12.9		2.73	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Magnesium	10500		81.8	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Manganese	80.2		5.46	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Molybdenum	0.928	B	2.18	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Nickel	7.33		4.36	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Potassium	660		436	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Selenium	0.960		0.327	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silicon	552	J	2.18	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silver	0.218	U	0.218	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Sodium	1770		54.6	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Uranium	21.8	U	21.8	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Vanadium	26.2		2.73	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zinc	40.7		10.9	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zirconium	28.7		2.73	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Mercury	0.420		0.0355	mg/kg dry	1	L208227	08/23/2012	08/24/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/30/2012 13:06

J1PXC0
1208077-06 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	7530	J	4.69	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Antimony	0.563	U J	0.563	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Arsenic	1.95		0.938	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Barium	64.0		0.469	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Beryllium	0.250		0.188	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Boron	15.2		1.88	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cadmium	0.0911	B	0.188	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Calcium	5010		93.8	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Chromium	13.3		0.188	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cobalt	7.11		1.88	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Copper	45.3		0.938	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Iron	20000		18.8	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lead	3.84		0.469	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lithium	5.78		2.35	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Magnesium	4640		70.4	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Manganese	279		4.69	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Molybdenum	0.399	B	1.88	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Nickel	10.3		3.75	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Potassium	653		375	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Selenium	0.281	U	0.281	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silicon	472	J	1.88	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silver	2.80		0.188	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Sodium	401		46.9	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Uranium	13.2	B	18.8	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Vanadium	63.8		2.35	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zinc	49.6		9.38	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zirconium	25.9		2.35	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Mercury	0.380		0.0242	mg/kg dry	1	L208227	08/23/2012	08/24/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/30/2012 13:06

J1PXC1
1208077-07 (Soil)

11/4/12

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**13600**	J	4.93	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Antimony	0.592	U J	0.592	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Arsenic	**3.28**		0.987	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Barium	**114**		0.493	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Beryllium	**0.289**		0.197	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Boron	**34.4**		1.97	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cadmium	**0.175**	B	0.197	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Calcium	**9960**		98.7	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Chromium	**40.8**		0.197	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cobalt	**6.25**		1.97	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Copper	**116**		0.987	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Iron	**21400**		19.7	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lead	**9.33**		0.493	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lithium	**7.77**		2.47	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Magnesium	**4510**		74.0	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Manganese	**270**		4.93	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Molybdenum	**0.452**	B	1.97	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Nickel	**14.4**		3.95	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Potassium	**1000**		395	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Selenium	0.296	U	0.296	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silicon	**253**	J	1.97	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silver	**13.9**		0.197	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Sodium	**448**		49.3	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Uranium	**101**		19.7	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Vanadium	**65.9**		2.47	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zinc	**60.5**		9.87	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zirconium	**39.2**		2.47	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Mercury	**2.65**		0.131	mg/kg dry	4	L208227	08/23/2012	08/24/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/30/2012 13:06

J1PXC2

11/4/12

1208077-08 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	10000	J	5.36	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Antimony	0.644	U J	0.644	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Arsenic	3.00		1.07	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Barium	119		0.536	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Beryllium	0.300		0.215	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Boron	12.4		2.15	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cadmium	0.150	B	0.215	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Calcium	9940		107	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Chromium	27.0		0.215	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Cobalt	6.45		2.15	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Copper	149		1.07	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Iron	20100		21.5	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lead	6.70		0.536	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Lithium	6.97		2.68	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Magnesium	4390		80.5	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Manganese	261		5.36	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Molybdenum	0.463	B	2.15	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Nickel	14.8		4.29	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Potassium	919		429	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Selenium	0.322	U	0.322	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silicon	518	J	2.15	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Silver	7.87		0.215	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Sodium	468		53.6	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Uranium	64.1		21.5	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Vanadium	51.6		2.68	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zinc	47.9		10.7	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Zirconium	38.8		2.68	mg/kg dry	1	L208258	08/28/2012	08/29/2012	6010B
Mercury	1.11		0.0279	mg/kg dry	1	L208227	08/23/2012	08/24/2012	7471A

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-148
LVL#: 1208077
SDG/SAF#: KP0123/RC-148

W.O.#: 60049-001-001-0001-00
Date Received: 08-23-12

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.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analyses of 8 soil samples.

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

   Sample J1PXC1 was analyzed and reported with a 4-fold dilution for Mercury due to high concentration of Mercury in the sample.

   The TCLP metals were cancelled as per the client's request.

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 (80-120% for Mercury).

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, or samples were greater than 20X MB value}.

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

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer with the exception of Silicon at 269.0% (range 0 – 219.3%). The sample results for Silicon were reported and may be slightly biased high.

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.

There is no Uranium or Zirconium result for reference sample L208258-SRM1 due to the standard reference material does not contain Uranium and Zirconium. The matrix spike recovery for Uranium was within the 75-125% control limit and the soil samples were reported for Uranium. The matrix spike recovery for Zirconium was below the 75-125% control limit, however the soil samples were reported for Zirconium as per the project manager.

10. The matrix spike (MS) recoveries for 6 analytes were outside the 75-125% control limits.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1PX95	Aluminum	22,000	80.5
	Antimony	100	83.4
	Iron	42,000	69.2
	Lead	100	74.6
	Silicon	2,100	90.4
	Zirconium	500	81.4

12. 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 Molybdenum was less than ten times the MDL.

13. 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.

14. 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.

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

9/18/12
Date

Iain Daniels
Laboratory Manager
Lionville Laboratory

alm/08-077s

1 OF 2

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-148-052

Page ~~2 of 12~~ KOB 8/16/12

Collector: Weber, HC	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits		SAF No.: RC-148 KOB 8/16/12
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03	COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE KOB 8/16/12	Offsite Property No.: A110483		Bill of Lading/Air Bill No.: See OSPC

Price Code: ~~8L~~ 9B

Data Turnaround: 7 ~~21~~ Days KOB 8/16/12

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive L DOT Limits AJ 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
~~J1PX93~~ KOB 8/16/12	~~SOIL~~												
~~J1PX94~~	~~SOIL~~												
J1PX95	SOIL	8/16/12	0936	✓	✓	✓	✓	✓	✓	✓	✓	✓	34265
J1PX96	SOIL	8/16/12	1034	✓	✓	✓	✓	✓	✓	✓	✓	✓	~~242~~ 34266
J1PX97	SOIL	8/16/12	1221	✓	✓	✓	✓	✓	✓	✓	✓	✓	34267

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber / [signature]	8-16-12 1415	DAVID BECKER [signature]	8/16/12 1415
DAVID BECKER [signature]	8/16/12 1755	1060 #3B	8/16/12 1755
1060 #3B	8-20-12 0710	A. Freier [signature]	1060#3 8-20-12 0710
WCH A. Freier [signature]	1060#3 8-22-12 1258	Fed Ex	
[signature]	8/23/12 0930	VICTOR HERNANDEZ	8/23/12 0930

SPECIAL INSTRUCTIONS

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium}; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, ~~Europium-155, Niobium-94~~, Radium-226, Radium-228, ; Zinc-65) KOB 8/16/12

* freeze upon receipt. AJ 8-20-12

Matrix *: S=Soil, SS=Sediment, SO=Solid, Sl=Sludge, W = Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, Y=Other

KP0123

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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2 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~1 of 12~~ 8/16/12
Collector: Weber, HC	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: 7 ~~21~~ Days 8/16/12
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No.: RC-148 8/16/12	
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE 8/16/12	Offsite Property No.: A110483	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive ∠ DOT Limits AJ 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
J1PX98	SOIL	8/16/12	1337	✓	✓	✓	✓	✓	✓	✓	✓	✓	34268
J1PX99	SOIL												
J1PXC0	SOIL												
J1PXC1	SOIL												
J1PXC2	SOIL												

AJ 8-20-12

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber/[signature]	8/16/12 1415	DAVID BECKER [signature]	8/16/12 1415
DAVID BECKER [signature]	8/16/12 1755	1060/3B	8/16/12 1755
1060#3B	8-20-12 0710	1060#3 A. Freier A. Freier	8-20-12 0710
WCH A. Freier A. Freier 1060#3	8-22-12 1258	FedEx	
[signature]	8/23/12 0930	VICTOR HERNANDEZ	8/23/12 0930

SPECIAL INSTRUCTIONS

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium]; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cesium-134, Cesium-137, ~~Europium-155, Niobium-94~~, Radium-226, Radium-228, Zinc-65] 8/16/12

*freeze upon receipt. AJ 8-20-12

Matrix *

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

KP0123

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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1 OF 1

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-148-052

Page ~~2 of 12~~

Collector ~~Weber, HC~~ STOWE, Q 8/20/12	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 316-3 Waste Site [307 Disposal Trenches] Test Pits		SAF No. RC-148
Ice Chest No. RCC-07-012	Field Logbook No. EL-1663-03	COA R316032000	Method of Shipment Hand Deliver/Government Vehicle/FedEx
Shipped To ~~EDERLINE SERVICES~~ LIONVILLE 8/20/12	Offsite Property No. A110483		Bill of Lading/Air Bill No. See OSPC

Price Code ~~8L~~ 9B 8/20/12

Data Turnaround 7 ~~21~~ Days 8/20/12

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive < DOT Limits A4 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	~~5~~ 6	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL 8/20/12	250mL	120mL	120mL	~~500mL~~ 120mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions TCLP * METALS

Sample No.	Matrix *	Sample Date	Sample Time											RF
~~J1PX98~~	8/20/12													
J1PX99	SOIL	8/20/12	1239	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34273
J1PXC0	SOIL	8/20/12	1323	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34274
J1PXC1	SOIL	8/20/12	1400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34275
J1PXC2	SOIL	8/20/12	1511	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34276

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	1545 8/20/12	David Becker	8/20/12 1545
David Becker	8/20/12 1730	1060, 3B	8/20/12 1730
1060#3B	8-21-12 0740	1060#3 A. Freier	0740 8-21-12
A. Freier	8-22-12 1258	Fed Ex	
FedEx	8/23/12 0930	Victor Hernandez	8-23-12 0930

SPECIAL INSTRUCTIONS * freeze upon receipt. A4 8-21-12

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium]; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab. ~~Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-155, Nitrium-94, Radium-226, Radium-228, Zinc-65~~ 8/20/12

TTCLP METALS - LEACH & HOLD UNTIL FURTHER DIRECTION IS PROVIDED 8/20/12

KP0123

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

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 316-3		DATA PACKAGE: KP0123	
VALIDATOR: ELR	LAB: LLI	DATE: 11/3/12	
		SDG: KP0123	

ANALYSES PERFORMED

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

SAMPLES/MATRIX

J1PX95	J1PX96	J1PX97	J1PX98	J1PX99
J1PXC0	J1PXC1	J1PXC2		
				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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: MS - antimony (427%) - J all
LCS - aluminum (PS3%) antimony (47.27%) silicon (2692) - J all

no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

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

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

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

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

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

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

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

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

MSA performed as required? ..... Yes No N/A

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: _____

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/30/2012 13:06

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 L208227 - SW 7471A Prep										
Blank (L208227-BLK1)				Prepared: 08/23/2012 Analyzed: 08/24/2012						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L208227-DUP5)		Source: 1208077-01		Prepared: 08/23/2012 Analyzed: 08/24/2012						
Mercury	0.366		0.0269	mg/kg dry		0.384			4.79	20
Matrix Spike (L208227-MS5)		Source: 1208077-01		Prepared: 08/23/2012 Analyzed: 08/24/2012						
Mercury	0.554		0.0269	mg/kg dry	0.14927	0.384	114	75-125		20
Reference (L208227-SRM1)				Prepared: 08/23/2012 Analyzed: 08/24/2012						
Mercury	1.28		0.0281	mg/kg wet	1.2900		99.4	62.6-138		
Batch L208258 - SW 3050B										
Blank (L208258-BLK1)				Prepared: 08/28/2012 Analyzed: 08/29/2012						
Aluminum	4.81	U	4.81	mg/kg wet						
Antimony	0.577	U	0.577	mg/kg wet						
Arsenic	0.962	U	0.962	mg/kg wet						
Barium	0.481	U	0.481	mg/kg wet						
Beryllium	0.192	U	0.192	mg/kg wet						
Boron	1.92	U	1.92	mg/kg wet						
Cadmium	0.192	U	0.192	mg/kg wet						
Calcium	10.5	B	96.2	mg/kg wet						
Chromium	0.192	U	0.192	mg/kg wet						
Cobalt	1.92	U	1.92	mg/kg wet						
Copper	0.962	U	0.962	mg/kg wet						
Iron	19.2	U	19.2	mg/kg wet						
Lead	0.481	U	0.481	mg/kg wet						
Lithium	2.40	U	2.40	mg/kg wet						
Magnesium	72.1	U	72.1	mg/kg wet						
Manganese	4.81	U	4.81	mg/kg wet						
Molybdenum	1.92	U	1.92	mg/kg wet						
Nickel	3.85	U	3.85	mg/kg wet						
Potassium	385	U	385	mg/kg wet						
Selenium	0.288	U	0.288	mg/kg wet						
Silicon	1.92	U	1.92	mg/kg wet						
Silver	0.192	U	0.192	mg/kg wet						
Sodium	48.1	U	48.1	mg/kg wet						
Uranium	19.2	U	19.2	mg/kg wet						
Vanadium	2.40	U	2.40	mg/kg wet						

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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/30/2012 13:06

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 L208258 - SW 3050B										
Blank (L208258-BLK1)				Prepared: 08/28/2012 Analyzed: 08/29/2012						
Zinc	9.62	U	9.62	mg/kg wet						
Zirconium	2.40	U	2.40	mg/kg wet						
Duplicate (L208258-DUP1)			Source: 1208077-01	Prepared: 08/28/2012 Analyzed: 08/29/2012						
Aluminum	7980		4.66	mg/kg dry		7760			2.84	20
Antimony	0.560	U	0.560	mg/kg dry		0.560 U				20
Arsenic	2.84		0.933	mg/kg dry		2.75			3.37	20
Barium	74.6		0.466	mg/kg dry		81.7			9.04	20
Beryllium	0.263		0.187	mg/kg dry		0.262			0.462	20
Boron	1.57	B	1.87	mg/kg dry		1.54			2.22	20
Cadmium	0.133	B	0.187	mg/kg dry		0.147			10.2	20
Calcium	5610		93.3	mg/kg dry		5510			1.83	20
Chromium	31.0		0.187	mg/kg dry		28.3			9.28	20
Cobalt	5.34		1.87	mg/kg dry		5.43			1.59	20
Copper	202		0.933	mg/kg dry		206			2.15	20
Iron	18300		18.7	mg/kg dry		17800			2.48	20
Lead	7.95		0.466	mg/kg dry		8.01			0.666	20
Lithium	7.21		2.33	mg/kg dry		7.17			0.662	20
Magnesium	4370		70.0	mg/kg dry		4030			7.99	20
Manganese	267		4.66	mg/kg dry		270			0.972	20
Molybdenum	0.355	B	1.87	mg/kg dry		0.488			31.7*	20
Nickel	21.0		3.73	mg/kg dry		20.1			4.36	20
Potassium	1110		373	mg/kg dry		1120			1.09	20
Selenium	0.280	U	0.280	mg/kg dry		0.280 U				20
Silicon	792		1.87	mg/kg dry		953			18.6	20
Silver	4.13		0.187	mg/kg dry		4.19			1.43	20
Sodium	243		46.6	mg/kg dry		219			10.3	20
Uranium	16.2	B	18.7	mg/kg dry		16.1			0.982	20
Vanadium	48.8		2.33	mg/kg dry		46.5			4.88	20
Zinc	45.7		9.33	mg/kg dry		45.0			1.56	20
Zirconium	57.1		2.33	mg/kg dry		57.1			0.0327	20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/30/2012 13:06

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 L208258 - SW 3050B									
Matrix Spike (L208258-MS1)		**Source: 1208077-01**	Prepared: 08/28/2012 Analyzed: 08/29/2012						
Aluminum	9400	4.84	mg/kg dry	193.50	7760	846*	75-125		
Antimony	20.3	0.580	mg/kg dry	48.375	0.560 U	42.0*	75-125		
Arsenic	165	0.967	mg/kg dry	193.50	2.75	84.0	75-125		
Barium	246	0.484	mg/kg dry	193.50	81.7	84.8	75-125		
Beryllium	4.27	0.193	mg/kg dry	4.8375	0.262	82.8	75-125		
Boron	77.4	1.93	mg/kg dry	96.749	1.54	78.4	75-125		
Cadmium	4.17	0.193	mg/kg dry	4.8375	0.147	83.2	75-125		
Calcium	8170	96.7	mg/kg dry	2418.7	5510	110	75-125		
Chromium	45.3	0.193	mg/kg dry	19.350	28.3	87.9	75-125		
Cobalt	45.3	1.93	mg/kg dry	48.375	5.43	82.5	75-125		
Copper	226	0.967	mg/kg dry	24.187	206	84.0	75-125		
Iron	18500	19.3	mg/kg dry	96.749	17800	682*	75-125		
Lead	44.2	0.484	mg/kg dry	48.375	8.01	74.8*	75-125		
Lithium	91.1	2.42	mg/kg dry	96.749	7.17	86.8	75-125		
Magnesium	6180	72.6	mg/kg dry	2418.7	4030	88.9	75-125		
Manganese	326	4.84	mg/kg dry	48.375	270	115	75-125		
Molybdenum	79.0	1.93	mg/kg dry	96.749	0.488	81.2	75-125		
Nickel	60.4	3.87	mg/kg dry	48.375	20.1	83.3	75-125		
Potassium	3240	387	mg/kg dry	2418.7	1120	87.7	75-125		
Selenium	156	0.290	mg/kg dry	193.50	0.280 U	80.6	75-125		
Silicon	1080	1.93	mg/kg dry	96.749	953	128*	75-125		
Silver	8.63	0.193	mg/kg dry	4.8375	4.19	91.6	75-125		
Sodium	2430	48.4	mg/kg dry	2418.7	219	91.6	75-125		
Uranium	393	19.3	mg/kg dry	483.75	16.1	77.9	75-125		
Vanadium	97.1	2.42	mg/kg dry	48.375	46.5	105	75-125		
Zinc	90.0	9.67	mg/kg dry	48.375	45.0	93.0	75-125		
Zirconium	405	2.42	mg/kg dry	483.75	57.1	72.0*	75-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/30/2012 13:06

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 L208258 - SW 3050B									
Reference (L208258-SRM1)			Prepared: 08/28/2012 Analyzed: 08/29/2012						
Aluminum	10200	14.2	mg/kg wet	6670.0		153	0-200.89		
Antimony	25.0	1.70	mg/kg wet	53.000		47.2	0-235.8		
Arsenic	113	2.83	mg/kg wet	114.00		99.5	82.8-117.54		
Barium	302	1.42	mg/kg wet	307.00		98.5	79.8-120.2		
Beryllium	104	0.566	mg/kg wet	108.00		96.0	82.8-117.6		
Boron	80.6	5.66	mg/kg wet	85.100		94.7	67.5-132.8		
Cadmium	224	0.566	mg/kg wet	225.00		99.3	83.6-116.4		
Calcium	3240	283	mg/kg wet	3360.0		96.4	83.3-116.9		
Chromium	82.1	0.566	mg/kg wet	77.200		106	73.3-126.4		
Cobalt	163	5.66	mg/kg wet	166.00		98.0	80.7-118.7		
Copper	262	2.83	mg/kg wet	271.00		96.5	80.8-119.2		
Iron	8430	56.6	mg/kg wet	8420.0		100	78.6-121.1		
Lead	185	1.42	mg/kg wet	190.00		97.4	81.6-118.4		
Lithium	119	7.08	mg/kg wet	114.00		105	50.9-148.2		
Magnesium	8080	212	mg/kg wet	8570.0		94.3	83.2-116.7		
Manganese	887	14.2	mg/kg wet	965.00		91.9	69.3-130.5		
Molybdenum	228	5.66	mg/kg wet	235.00		96.8	76.2-123.8		
Nickel	222	11.3	mg/kg wet	221.00		101	79.6-120.8		
Potassium	13900	1130	mg/kg wet	14400		96.8	81.9-118.1		
Selenium	187	0.849	mg/kg wet	187.00		100	75.9-124.6		
Silicon	2170	5.66	mg/kg wet	807.00		269*	0-219.3		
Silver	81.1	0.566	mg/kg wet	83.500		97.1	82.7-117.1		
Sodium	9280	142	mg/kg wet	9730.0		95.3	82.5-117.2		
Vanadium	105	7.08	mg/kg wet	98.700		107	75.9-123.6		
Zinc	201	28.3	mg/kg wet	199.00		101	78.4-121.6		

Date: 5 November 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 300 Area D4 Waste Sites – Soil Full Protocol – Waste Site 316-3
Subject: PCBs - Data Package No. KP0123-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. KP0123 prepared by Lionville Laboratories 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	Analyte
J1PX95	8/16/12	Soil	C	See note 1
J1PX96	8/16/12	Soil	C	See note 1
J1PX97	8/16/12	Soil	C	See note 1
J1PX98	8/16/12	Soil	C	See note 1
J1PX99	8/20/12	Soil	C	See note 1
J1PXC0	8/20/12	Soil	C	See note 1
J1PXC1	8/20/12	Soil	C	See note 1
J1PXC2	8/20/12	Soil	C	See note 1

1 - PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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 Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Holding times are not applicable to PCB analytes.

Method Blanks

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to a matrix spike recovery outside QC limits (513%), the aroclor-1260 result in samples J1PX95, J1PX96, J1PX97, J1PX98, J1PXC0, J1PXC1 and J1PXC2 were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been

established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate Samples

All field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. KP0123 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 a matrix spike recovery outside QC limits (513%), the aroclor-1260 result in samples J1PX95, J1PX96, J1PX97, J1PX98, J1PXC0, J1PXC1 and J1PXC2 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*, March 2008.

DOE/RL-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators 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 same quantitation limit corrected for sample dilution and moisture content by the laboratory.

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: KP0123	**REVIEWER: ELR**	**Project: 316-3**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aroclor-1260	J	J1PX95, J1PX96 J1PX97, J1PX98 J1PXC0, J1PXC1 J1PXC2	MS recovery

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

Appendix 3

Annotated Laboratory Reports

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/29/2012 19:05

J1PX95
1208077-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	136	U	136	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1221	136	U	136	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1232	136	U	136	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1242	136	U	136	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1248	136	U	136	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1254	**618**	D	136	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1260	**1970**	D J	136	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1262	136	U	136	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1268	136	U	136	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Surrogate: Decachlorobiphenyl	*58 %*		*43-144*			*L208243*	*08/26/2012*	*08/28/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*70 %*		*52-141*			*L208243*	*08/26/2012*	*08/28/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/29/2012 19:05

J1PX96

1208077-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	55.6	U	55.6	ug/kg dry	4	L208243	08/26/2012	08/29/2012	8082
Aroclor 1221	55.6	U	55.6	ug/kg dry	4	L208243	08/26/2012	08/29/2012	8082
Aroclor 1232	55.6	U	55.6	ug/kg dry	4	L208243	08/26/2012	08/29/2012	8082
Aroclor 1242	55.6	U	55.6	ug/kg dry	4	L208243	08/26/2012	08/29/2012	8082
Aroclor 1248	**200**	D	55.6	ug/kg dry	4	L208243	08/26/2012	08/29/2012	8082
Aroclor 1254	**233**	D	55.6	ug/kg dry	4	L208243	08/26/2012	08/29/2012	8082
Aroclor 1260	**67.2**	D J	55.6	ug/kg dry	4	L208243	08/26/2012	08/29/2012	8082
Aroclor 1262	55.6	U	55.6	ug/kg dry	4	L208243	08/26/2012	08/29/2012	8082
Aroclor 1268	55.6	U	55.6	ug/kg dry	4	L208243	08/26/2012	08/29/2012	8082
Surrogate: Decachlorobiphenyl	*91 %*		*43-144*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*94 %*		*52-141*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*

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LIONVILLE LABORATORY
A division of Electron Analytical Corporation

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/29/2012 19:05

J1PX97
1208077-03 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.6	U	13.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1221	13.6	U	13.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1232	13.6	U	13.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1242	13.6	U	13.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1248	**41.8**		13.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1254	**62.1**		13.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1260	**74.0**	J	13.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1262	13.6	U	13.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1268	13.6	U	13.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Surrogate: Decachlorobiphenyl	*82 %*		*43-144*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*89 %*		*52-141*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/29/2012 19:05

J1PX98

1208077-04 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	152	U	152	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1221	152	U	152	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1232	152	U	152	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1242	152	U	152	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1248	**930**	D	152	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1254	**711**	D	152	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1260	**138**	J, D J	152	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1262	152	U	152	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Aroclor 1268	152	U	152	ug/kg dry	10	L208243	08/26/2012	08/28/2012	8082
Surrogate: Decachlorobiphenyl	*78 %*		*43-144*			*L208243*	*08/26/2012*	*08/28/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*78 %*		*52-141*			*L208243*	*08/26/2012*	*08/28/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/29/2012 19:05

J1PX99
1208077-05 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	79.1	U	79.1	ug/kg dry	5	L208243	08/26/2012	08/29/2012	8082
Aroclor 1221	79.1	U	79.1	ug/kg dry	5	L208243	08/26/2012	08/29/2012	8082
Aroclor 1232	79.1	U	79.1	ug/kg dry	5	L208243	08/26/2012	08/29/2012	8082
Aroclor 1242	79.1	U	79.1	ug/kg dry	5	L208243	08/26/2012	08/29/2012	8082
Aroclor 1248	79.1	U	79.1	ug/kg dry	5	L208243	08/26/2012	08/29/2012	8082
Aroclor 1254	79.1	U	79.1	ug/kg dry	5	L208243	08/26/2012	08/29/2012	8082
Aroclor 1260	79.1	U	79.1	ug/kg dry	5	L208243	08/26/2012	08/29/2012	8082
Aroclor 1262	79.1	U	79.1	ug/kg dry	5	L208243	08/26/2012	08/29/2012	8082
Aroclor 1268	79.1	U	79.1	ug/kg dry	5	L208243	08/26/2012	08/29/2012	8082
Surrogate: Decachlorobiphenyl	*86 %*		*43-144*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*83 %*		*52-141*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*

11/4/12

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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/29/2012 19:05

J1PXC0

1208077-06 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.9	U	13.9	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1221	13.9	U	13.9	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1232	13.9	U	13.9	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1242	13.9	U	13.9	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1248	**9.31**	J	13.9	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1254	**13.7**	J	13.9	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1260	**3.89**	J J	13.9	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1262	13.9	U	13.9	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1268	13.9	U	13.9	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Surrogate: Decachlorobiphenyl	*68 %*		*43-144*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*78 %*		*52-141*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*

✓ 11/4/12

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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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/29/2012 19:05

J1PXC1
1208077-07 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	14.6	U	14.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1221	14.6	U	14.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1232	14.6	U	14.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1242	14.6	U	14.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1248	**17.3**		14.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1254	**71.0**		14.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1260	**30.0**	J	14.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1262	14.6	U	14.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1268	14.6	U	14.6	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Surrogate: Decachlorobiphenyl	*91 %*		*43-144*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*94 %*		*52-141*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*

11/4/12

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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/29/2012 19:05

J1PXC2

1208077-08 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	14.4	U	14.4	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1221	14.4	U	14.4	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1232	14.4	U	14.4	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1242	14.4	U	14.4	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1248	**30.5**		14.4	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1254	**59.3**		14.4	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1260	**16.5**	J	14.4	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1262	14.4	U	14.4	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Aroclor 1268	14.4	U	14.4	ug/kg dry	1	L208243	08/26/2012	08/29/2012	8082
Surrogate: Decachlorobiphenyl	*95 %*		*43-144*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*95 %*		*52-141*			*L208243*	*08/26/2012*	*08/29/2012*	*8082*

11/4/12

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-148 KP0123
LVL #: 1208077

W.O. #: 60049-001-001-0001-00
Received: 08-23-2012

PCBs

Eight (8) soil samples were collected on 08-16,20-2012.

The samples and associated QC samples were extracted 08-26-2012 and analyzed 08-28,29-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8082. All samples received Copper-Sulfur and Sulfuric Acid cleanups based on SW846 methods 3660A and 3665A.

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. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. Two (2) of four (4) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC144) has been enclosed.
7. Four (4) samples required instrument dilutions due to high concentrations of target analytes. Sample J1PX96 required a 4-fold dilution; sample J1PX99 required a 5-fold dilution; samples J1PX95, L208243-MS3/MSD3 and J1PX98 required a 10-fold dilution. Reporting limits have been adjusted to reflect the necessary dilutions.
8. The samples are reported on a dry weight basis.
9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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. 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 hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

8/30/12
Date

000000092

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC144

Initiator: Catherine Carey
Date: 08-29-12
Client: WC Hanford

Batch: 1208077
Samples: MS3 / MSD3
Method: SW846/MCAWW/CLP/

Parameter: PCB
Matrix: SOIL
Prep Batch: L208243

1. Reason for SDR

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

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

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

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

Aroclor 1260 spike recoveries outside QC limits in MS3 (513%) + MSD3 (429%)

2. Known or Probable Causes(s)

Interference from high indigenous level of 1260 in sample

3. Discussion and Proposed Action

Other Description:

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

Narrate
JD.

4. Project Manager Instructions...signature/date: 8/30/12
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: JEB 8/30/12

Other Explanation:

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

When Final Action has been recorded, forward original to QA for diposition.

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

000000093

1 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~1 of 12~~

Collector: Weber, HC	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: 7 ~~21~~ Days
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No.: RC-148	
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No.: A110483	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive L DOT Limits AJ 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Ga*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	Semi-Vol (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
~~J1PX93~~	~~SOIL~~												
~~J1PX94~~	~~SOIL~~												
J1PX95	SOIL	8/16/12	0936	✓	✓	✓	✓	✓	✓	✓	✓	✓	34265
J1PX96	SOIL	8/16/12	1034	✓	✓	✓	✓	✓	✓	✓	✓	✓	~~242~~ 34266
J1PX97	SOIL	8/16/12	1221	✓	✓	✓	✓	✓	✓	✓	✓	✓	34267

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Heather Weber/Stefan	Date/Time: 8-16-12 1415	Received By/Stored In: DAVID BECKER	Date/Time: 8/16/12 1415
Relinquished By/Removed From: DAVID BECKER	Date/Time: 8/16/12 1755	Received By/Stored In: 1060 #3B	Date/Time: 8/16/12 1755
Relinquished By/Removed From: 1060 #3B	Date/Time: 8-20-12 0710	Received By/Stored In: 1060#3 A. Freier	Date/Time: 0710 8-20-12
Relinquished By/Removed From: WCH A. Freier	Date/Time: 1060#3 8-22-12 1258	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HERNANDEZ	Date/Time: 8/23/12 0930
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium}; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, ~~Europium-155, Niobium-94, Radium-226, Radium-228,~~ , Zinc-65) 8/16/12

* freeze upon receipt. AJ 8-20-12

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

KP0123

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

REVIEWED BY MWShen DATE 8/22/12

WCH-EE-011

22

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2 OF 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~1 of 12~~ 8/16/12

Collector: Weber, HC	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH
Price Code: ~~8L~~ 9B	Data Turnaround: 7 ~~21~~ Days 8/16/12		
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits		SAF No.: RC-148 8/16/12
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03	COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE 8/16/12	Offsite Property No.: A110483		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive ∠ DOT Limits AJ 8-22-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (1) in Special Instructions.
J1PX98	SOIL	8/16/12	1337	✓	✓	✓	✓	✓	✓	✓	✓	✓	34268
~~J1PX99~~	SOIL												
~~J1PXC0~~	SOIL												
~~J1PXC1~~	SOIL	AJ 8-20-12											
~~J1PXC2~~	SOIL												

23

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Heather Weber/	Date/Time: 8/16/12 1415	Received By/Stored In: DAVIS BECKER	Date/Time: 8/16/12 1415
Relinquished By/Removed From: DAVIS BECKER	Date/Time: 8/16/12 1755	Received By/Stored In: 1060/38	Date/Time: 8/16/12 1755
Relinquished By/Removed From: 1060#38	Date/Time: 8-20-12 0710	Received By/Stored In: 1060#3 A. Freier	Date/Time: 8-20-12 0710
Relinquished By/Removed From: WCH A. Freier 1060#3	Date/Time: 8-22-12 1258	Received By/Stored In: FedEx	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HANANDER	Date/Time: 8/23/12 0930
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS
VOAs Frozen Upon Collection

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

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cesium-134, Cesium-137, ~~Europium-155, Niobium-94, Radium-226, Radium-228,~~ Zinc-65) 8/16/12

*freeze upon receipt. AJ 8-20-12

Matrix *
S=Soil
SD=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid

KP0123

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

REVIEWED BY Moshen DATE 8/22/12

WCH-EE-011

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1 OF 1

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-148-052 | Page ~~2 of 12~~

Collector: ~~Weber, HC~~ STOWE, Q 8/20/12	Company Contact: Joan Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits		SAF No.: RC-148
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03	COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE 8/20/12	Offsite Property No.: A110483		Bill of Lading/Air Bill No.: See OSPC

Price Code: ~~8L~~ 9B 8/20/12

Data Turnaround: 7 ~~21~~ Days 8/20/12

POSSIBLE SAMPLE HAZARDS/REMARKS 8/20/12

Potential Radioactive < DOT Limits A# 8-22-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	~~5~~ 6	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL 8/20/12	250mL	120mL	120mL	~~500mL~~ 120mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions TCLP* METALS

Sample No.	Matrix *	Sample Date	Sample Time											RCF
~~J1PX98~~	8/20/12													
J1PX99	SOIL	8/20/12	1239	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34273
J1PXC0	SOIL	8/20/12	1323	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34274
J1PXC1	SOIL	8/20/12	1400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34275
J1PXC2	SOIL	8/20/12	1511	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34276

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: Quincy Stowe Date/Time: 8/20/12 1545	Received By/Stored In: DAVID BECKER Date/Time: 8/20/12 1545	
Relinquished By/Removed From: DAVID BECKER Date/Time: 8/20/12 1730	Received By/Stored In: 1060, 3B Date/Time: 8/20/12 1730	
Relinquished By/Removed From: 1060#3B Date/Time: 8-21-12 0740	Received By/Stored In: 1060#3 Date/Time: 0740 A. Freier A. Freier 8-21-12	
Relinquished By/Removed From: WCH Date/Time: 1060#3 A. Freier A. Freier 8-22-12 1258	Received By/Stored In: FedEx Date/Time:	
Relinquished By/Removed From: FedEx Date/Time: 8/23/12 0930	Received By/Stored In: VICTOR HERNANDEZ Date/Time: 8-23-12 0930	
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:	

SPECIAL INSTRUCTIONS * freeze upon receipt. A# 8-21-12

VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium]: Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab. ~~Antimony-125, Cerium-144, Cesium-134, Cesium-137, Iodine-125, Nickel-63, Radium-226, Radium-228, Zinc-65~~ 8/20/12

*TCLP METALS - LEACH & HOLD UNTIL FURTHER DIRECTION IS PROVIDED 8/20/12

KP0123

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

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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000000006

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 316-3			DATA PACKAGE: KP0123		
VALIDATOR: ECR		LAB: LLI		DATE: 11/3/12	
			SDG: KP0123		

ANALYSES PERFORMED

SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		

SAMPLES/MATRIX

J1PX95	J1PX96	J1PX97	J1PX98
J1PX99	J1PXC0	J1PXC1	J1PXC2
			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 acceptable? ..... Yes No N/A

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

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

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

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

Comments: no FB

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

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

Comments: MS/MSD - aroclor 1260 - J cell detect

no RAS

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

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

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

Comments: _____

PCB DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

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

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

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

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

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

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

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

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments: _____

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-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/29/2012 19:05

Polychlorinated Biphenyls by SW846 8082 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208243 - SW 3540C										
Blank (L208243-BLK2)				Prepared: 08/26/2012 Analyzed: 08/28/2012						
Aroclor 1016	13.3	U	13.3	ug/kg wet						
Aroclor 1221	13.3	U	13.3	ug/kg wet						
Aroclor 1232	13.3	U	13.3	ug/kg wet						
Aroclor 1242	13.3	U	13.3	ug/kg wet						
Aroclor 1248	13.3	U	13.3	ug/kg wet						
Aroclor 1254	13.3	U	13.3	ug/kg wet						
Aroclor 1260	13.3	U	13.3	ug/kg wet						
Aroclor 1262	13.3	U	13.3	ug/kg wet						
Aroclor 1268	13.3	U	13.3	ug/kg wet						
Surrogate: Decachlorobiphenyl	*24.5*			*ug/kg wet*	*33.333*		*74*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*26.8*			*ug/kg wet*	*33.337*		*80*	*52-141*		
LCS (L208243-BS2)				Prepared: 08/26/2012 Analyzed: 08/28/2012						
Aroclor 1016	118		13.3	ug/kg wet	166.67		71	50-138		
Aroclor 1260	128		13.3	ug/kg wet	166.67		77	50-148		
Surrogate: Decachlorobiphenyl	*28.3*			*ug/kg wet*	*33.333*		*85*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*31.1*			*ug/kg wet*	*33.337*		*93*	*52-141*		
Matrix Spike (L208243-MS3)		**Source: 1208077-01**		Prepared: 08/26/2012 Analyzed: 08/29/2012						
Aroclor 1016	183	D	136	ug/kg dry	170.40	136 U	107	50-138		
Aroclor 1260	2840	D	136	ug/kg dry	170.40	1970	513*	50-148		
Surrogate: Decachlorobiphenyl	*25.6*			*ug/kg dry*	*34.080*		*75*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*23.9*			*ug/kg dry*	*34.083*		*70*	*52-141*		
Matrix Spike Dup (L208243-MSD3)		**Source: 1208077-01**		Prepared: 08/26/2012 Analyzed: 08/29/2012						
Aroclor 1016	207	D	136	ug/kg dry	170.73	136 U	121	50-138	12	40
Aroclor 1260	2700	D	136	ug/kg dry	170.73	1970	429*	50-148	18	40
Surrogate: Decachlorobiphenyl	*26.9*			*ug/kg dry*	*34.147*		*79*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*26.2*			*ug/kg dry*	*34.150*		*77*	*52-141*		

Date: 5 November 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 300 Area D4 Waste Sites – Soil Full Protocol – Waste Site 316-3
Subject: Radiochemistry - Data Package No. KP0123-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. KP0123 prepared by Lionville Laboratories 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	Analyte
J1PX95	8/16/12	Soil	C	See note 1
J1PX96	8/16/12	Soil	C	See note 1
J1PX97	8/16/12	Soil	C	See note 1
J1PX98	8/16/12	Soil	C	See note 1
J1PX99	8/20/12	Soil	C	See note 1
J1PXC0	8/20/12	Soil	C	See note 1
J1PXC1	8/20/12	Soil	C	See note 1
J1PXC2	8/20/12	Soil	C	See note 1

1 – Alpha spectroscopy, tritium, carbon-14, nickel-63, technetium-99, gross alpha/beta and gamma spectroscopy.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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 Data Requested by Client

DATA QUALITY PARAMETERS

· Holding Times

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All laboratory blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

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

Due to the lack of an LCS analysis, all uranium-235 (aspec) and curium-242 results were qualified as estimates and flagged "J".

Due to the lack of a matrix spike analysis, all tritium and carbon-14 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses

performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects. All duplicate results were acceptable.

Field Duplicates

No field duplicates were submitted for analysis.

Detection Levels

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

Completeness

Data package No. KP0123 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 lack of an LCS analysis, all uranium-235 (aspec) and curium-242 results were qualified as estimates and flagged "J".
- Due to the lack of a matrix spike analysis, all tritium and carbon-14 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.

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

REFERENCES

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

DOE/RL-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

Appendix 1

Glossary of Data Reporting Qualifiers

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

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

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

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

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

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: KP0123	**REVIEWER: ELR**	**Project: 316-3**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Curium-242 Uranium-235 (aspec)	J	All	No LCS analysis
Tritium Carbon-14	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

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-001 J1PX95

DATA SHEET

SDG	7758	Client/Case no	Hanford SDG_KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-01	Client sample id	J1PX95
Dept sample id	7758-001	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/16/12 09:36 937 g
% solids	95.6	Custody/SAF No	RC-148-052 RC-148

K 11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.197	3.8	6.48	400	U J	H
Carbon 14	14762-75-5	-0.884	2.5	4.25	50.0	U J	C
Gross Alpha	12587-46-1	18.6	5.0	3.42	10.0		93A
Gross Beta	12587-47-2	30.9	4.8	5.30	15.0		93B
Nickel 63	13981-37-8	0.357	1.9	3.22	30.0	U	NI_L
Americium 241	14596-10-2	0.025	0.050	0.193	1.00	U	TP
Curium 242	15510-73-3	0	0.055	0.212	1.00	U J	TP
Curium 243/244	CM-243/244	-0.025	0.051	0.193	1.00	U	TP
Technetium 99	14133-76-7	0.166	0.13	0.271	15.0	U	TC
Uranium 233/234	U-233/234	11.4	1.1	0.207	1.00		U
Uranium 235	15117-96-1	0.747	0.23	0.143	1.00	J	U
Uranium 238	U-238	12.3	1.2	0.190	1.00		U
Plutonium 238	13981-16-3	0	0.083	0.318	1.00	U	PU
Plutonium 239/240	PU-239/240	1.16	0.42	0.318	1.00		PU
Plutonium 241	14119-32-5	0.525	7.2	12.0	15.0	U	PU_L
Potassium 40	13966-00-2	14.4	0.19	0.067			GAM
Cobalt 60	10198-40-0	U		0.007	0.050	U	GAM
Zinc 65	13982-39-3	U		0.016		U	GAM
Niobium 94	14681-63-1	U		0.006		U	GAM
Ruthenium 106	13967-48-1	U		0.063		U	GAM
Antimony 125	14234-35-6	U		0.019		U	GAM
Cesium 134	13967-70-9	U		0.011		U	GAM
Cesium 137	10045-97-3	0.026	0.005	0.007	0.100		GAM
Cerium 144	14762-78-8	U		0.056		U	GAM
Europium 152	14683-23-9	U		0.023	0.100	U	GAM
Europium 154	15585-10-1	U		0.025	0.100	U	GAM
Europium 155	14391-16-3	U		0.053	0.100	U	GAM
Radium 226	13982-63-3	0.405	0.017	0.016	0.100		GAM

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-001 J1PX95

DATA SHEET, cont

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-01	Client sample id	J1PX95
Dept sample id	7758-001	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/16/12 09:36 937 g
% solids	95.6	Custody/SAF No	RC-148-052 RC-148

✓ 11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Radium 228	15262-20-1	0.818	0.039	0.038	0.200		GAM
Thorium 228	14274-82-9	0.795	0.014	0.012			GAM
Thorium 232	TH-232	0.818	0.039	0.038			GAM
Uranium 235	15117-96-1	0.526	0.053	0.071	0.300		GAM
Uranium 238	U-238	10.6	1.0	1.06	10.0		GAM
Americium 241	14596-10-2	U		0.046	0.300	U	GAM

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-002 J1PX96

DATA SHEET

SDG	7758	Client/Case no	Hanford SDG_KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-02	Client sample id	J1PX96
Dept sample id	7758-002	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/16/12 10:34 721 g
% solids	93.0	Custody/SAF No	RC-148-052 RC-148

V 11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-1.25	3.9	6.87	400	U J	H
Carbon 14	14762-75-5	-1.48	2.9	5.03	50.0	U J	C
Gross Alpha	12587-46-1	20.5	5.1	2.97	10.0		93A
Gross Beta	12587-47-2	25.3	4.8	5.91	15.0		93B
Nickel 63	13981-37-8	0.884	1.9	3.26	30.0	U	NI_L
Americium 241	14596-10-2	-0.047	0.047	0.260	1.00	U	TP
Curium 242	15510-73-3	0.026	0.052	0.198	1.00	U J	TP
Curium 243/244	CM-243/244	-0.024	0.047	0.180	1.00	U	TP
Technetium 99	14133-76-7	0.145	0.12	0.288	15.0	U	TC
Uranium 233/234	U-233/234	12.0	1.2	0.227	1.00		U
Uranium 235	15117-96-1	0.820	0.27	0.146	1.00	J	U
Uranium 238	U-238	12.9	1.2	0.194	1.00		U
Plutonium 238	13981-16-3	-0.040	0.081	0.309	1.00	U	PU
Plutonium 239/240	PU-239/240	0.323	0.24	0.309	1.00		PU
Plutonium 241	14119-32-5	-2.40	9.5	16.0	15.0	U	PU_L
Potassium 40	13966-00-2	11.2	0.39	0.138			GAM
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Zinc 65	13982-39-3	U		0.045		U	GAM
Niobium 94	14681-63-1	U		0.017		U	GAM
Ruthenium 106	13967-48-1	U		0.165		U	GAM
Antimony 125	14234-35-6	U		0.050		U	GAM
Cesium 134	13967-70-9	U		0.028		U	GAM
Cesium 137	10045-97-3	U		0.022	0.100	U	GAM
Cerium 144	14762-78-8	U		0.126		U	GAM
Europium 152	14683-23-9	U		0.059	0.100	U	GAM
Europium 154	15585-10-1	U		0.058	0.100	U	GAM
Europium 155	14391-16-3	U		0.060	0.100	U	GAM
Radium 226	13982-63-3	0.359	0.048	0.046	0.100		GAM

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-002 J1PX96

DATA SHEET, cont

SDG	7758	Client/Case no	Hanford	SDG KP0123	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S208074-02	Client sample id	J1PX96		
Dept sample id	7758-002	Location/Matrix	316-3 WasteSiteTestPits	SOIL	
Received	08/23/12	Collected/Weight	08/16/12 10:34	721 g	
% solids	93.0	Custody/SAF No	RC-148-052	RC-148	

✓ 11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Radium 228	15262-20-1	0.760	0.085	0.084	0.200		GAM
Thorium 228	14274-82-9	0.626	0.035	0.028			GAM
Thorium 232	TH-232	0.760	0.085	0.084			GAM
Uranium 235	15117-96-1	0.882	0.14	0.170	0.300		GAM
Uranium 238	U-238	14.8	2.5	2.40	10.0		GAM
Americium 241	14596-10-2	U		0.047	0.300	U	GAM

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-003 J1PX97

DATA SHEET

SDG	7758	Client/Case no	Hanford SDG_KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-03	Client sample id	J1PX97
Dept sample id	7758-003	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/16/12 12:21 738 g
% solids	93.9	Custody/SAF No	RC-148-052 RC-148

V 11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-0.785	3.3	5.73	400	U J	H
Carbon 14	14762-75-5	-0.341	2.4	4.00	50.0	U J	C
Gross Alpha	12587-46-1	19.2	4.7	3.74	10.0		93A
Gross Beta	12587-47-2	25.8	4.4	4.86	15.0		93B
Nickel 63	13981-37-8	3.13	2.0	3.17	30.0	U	NI_L
Americium 241	14596-10-2	0	0.044	0.211	1.00	U	TP
Curium 242	15510-73-3	0.024	0.048	0.185	1.00	U J	TP
Curium 243/244	CM-243/244	0.022	0.044	0.169	1.00	U	TP
Technetium 99	14133-76-7	-0.011	0.19	0.310	15.0	U	TC
Uranium 233/234	U-233/234	7.75	0.88	0.238	1.00		U
Uranium 235	15117-96-1	0.660	0.24	0.153	1.00	J	U
Uranium 238	U-238	7.40	0.84	0.183	1.00		U
Plutonium 238	13981-16-3	0.023	0.093	0.224	1.00	U	PU
Plutonium 239/240	PU-239/240	0.093	0.093	0.178	1.00	U	PU
Plutonium 241	14119-32-5	-0.719	6.8	11.5	15.0	U	PU_L
Potassium 40	13966-00-2	12.5	0.41	0.212			GAM
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Zinc 65	13982-39-3	U		0.048		U	GAM
Niobium 94	14681-63-1	U		0.017		U	GAM
Ruthenium 106	13967-48-1	U		0.171		U	GAM
Antimony 125	14234-35-6	U		0.045		U	GAM
Cesium 134	13967-70-9	U		0.026		U	GAM
Cesium 137	10045-97-3	0.025	0.019	0.021	0.100		GAM
Cerium 144	14762-78-8	U		0.108		U	GAM
Europium 152	14683-23-9	U		0.055	0.100	U	GAM
Europium 154	15585-10-1	U		0.062	0.100	U	GAM
Europium 155	14391-16-3	U		0.063	0.100	U	GAM
Radium 226	13982-63-3	0.321	0.034	0.035	0.100		GAM

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-003 J1PX97

DATA SHEET, cont

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-03	Client sample id	J1PX97
Dept sample id	7758-003	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/16/12 12:21 738 g
% solids	93.9	Custody/SAF No	RC-148-052 RC-148

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ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Radium 228	15262-20-1	0.602	0.091	0.085	0.200		GAM
Thorium 228	14274-82-9	0.636	0.039	0.037			GAM
Thorium 232	TH-232	0.602	0.091	0.085			GAM
Uranium 235	15117-96-1	0.265	0.11	0.138	0.300		GAM
Uranium 238	U-238	6.36	2.6	2.64	10.0		GAM
Americium 241	14596-10-2	U		0.097	0.300	U.	GAM

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-004 J1PX98

DATA SHEET

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-04	Client sample id	J1PX98
Dept sample id	7758-004	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/16/12 13:37 796 g
% solids	91.1	Custody/SAF No	RC-148-052 RC-148

11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.966	3.7	6.35	400	U J	H
Carbon 14	14762-75-5	-2.64	2.7	4.64	50.0	U J	C
Gross Alpha	12587-46-1	61.3	9.0	3.41	10.0		93A
Gross Beta	12587-47-2	76.1	6.8	5.63	15.0		93B
Nickel 63	13981-37-8	-0.156	1.8	3.17	30.0	U	NI_L
Americium 241	14596-10-2	0.067	0.13	0.248	1.00	U	TP
Curium 242	15510-73-3	0.123	0.099	0.188	1.00	U J	TP
Curium 243/244	CM-243/244	0.045	0.045	0.172	1.00	U	TP
Technetium 99	14133-76-7	0.189	0.19	0.288	15.0	U	TC
Uranium 233/234	U-233/234	47.4	4.1	0.508	1.00		U
Uranium 235	15117-96-1	4.44	0.76	0.202	1.00	J	U
Uranium 238	U-238	46.3	4.0	0.484	1.00		U
Plutonium 238	13981-16-3	0.078	0.10	0.198	1.00	U	PU
Plutonium 239/240	PU-239/240	0.285	0.16	0.198	1.00		PU
Plutonium 241	14119-32-5	-0.997	7.3	12.3	15.0	U	PU_L
Potassium 40	13966-00-2	9.34	0.63	0.368			GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Zinc 65	13982-39-3	U		0.076		U	GAM
Niobium 94	14681-63-1	U		0.031		U	GAM
Ruthenium 106	13967-48-1	U		0.313		U	GAM
Antimony 125	14234-35-6	U		0.084		U	GAM
Cesium 134	13967-70-9	U		0.043		U	GAM
Cesium 137	10045-97-3	U		0.056	0.100	U	GAM
Cerium 144	14762-78-8	U		0.240		U	GAM
Europium 152	14683-23-9	U		0.101	0.100	U	GAM
Europium 154	15585-10-1	U		0.108	0.100	U	GAM
Europium 155	14391-16-3	U		0.143	0.100	U	GAM
Radium 226	13982-63-3	0.328	0.069	0.071	0.100		GAM

Lab id	EBRLNE
Protocol	RC-148
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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-004 J1PX98

DATA SHEET, cont

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-04	Client sample id	J1PX98
Dept sample id	7758-004	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/16/12 13:37 796 g
% solids	91.1	Custody/SAF No	RC-148-052 RC-148

11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Radium 228	15262-20-1	0.872	0.22	0.173	0.200		GAM
Thorium 228	14274-82-9	0.903	0.071	0.066			GAM
Thorium 232	TH-232	0.872	0.22	0.173			GAM
Uranium 235	15117-96-1	2.93	0.26	0.303	0.300		GAM
Uranium 238	U-238	52.1	5.1	4.62	10.0		GAM
Americium 241	14596-10-2	U		0.309	0.300	U	GAM

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-005 J1PX99

DATA SHEET

SDG	7758	Client/Case no	Hanford	SDG_KP0123	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S208074-05	Client sample id	J1PX99		
Dept sample id	7758-005	Location/Matrix	316-3 WasteSiteTestPits	SOIL	
Received	08/23/12	Collected/Weight	08/20/12 12:39	633 g	
% solids	83.1	Custody/SAF No	RC-148-052	RC-148	

✓ 11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-3.72	3.6	6.60	400	U J	H
Carbon 14	14762-75-5	0.090	2.8	4.78	50.0	U J	C
Gross Alpha	12587-46-1	11.3	4.0	3.12	10.0		93A
Gross Beta	12587-47-2	13.7	4.8	6.91	15.0		93B
Nickel 63	13981-37-8	-0.461	2.0	3.40	30.0	U	NI_L
Americium 241	14596-10-2	0.177	0.15	0.242	1.00	U	TP
Curium 242	15510-73-3	0.054	0.055	0.208	1.00	U J	TP
Curium 243/244	CM-243/244	0.025	0.10	0.194	1.00	U	TP
Technetium 99	14133-76-7	0.475	0.16	0.324	15.0		TC
Uranium 233/234	U-233/234	3.45	0.68	0.214	1.00		U
Uranium 235	15117-96-1	0.170	0.14	0.260	1.00	U J	U
Uranium 238	U-238	3.36	0.68	0.214	1.00		U
Plutonium 238	13981-16-3	-0.033	0.13	0.317	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.066	0.254	1.00	U	PU
Plutonium 241	14119-32-5	-1.40	7.4	12.4	15.0	U	PU_L
Potassium 40	13966-00-2	5.79	1.3	0.810			GAM
Cobalt 60	10198-40-0	U		0.082	0.050	U	GAM
Zinc 65	13982-39-3	U		0.168		U	GAM
Niobium 94	14681-63-1	U		0.074		U	GAM
Ruthenium 106	13967-48-1	U		0.751		U	GAM
Antimony 125	14234-35-6	U		0.237		U	GAM
Cesium 134	13967-70-9	U		0.173		U	GAM
Cesium 137	10045-97-3	U		0.103	0.100	U	GAM
Cerium 144	14762-78-8	U		0.559		U	GAM
Europium 152	14683-23-9	U		0.289	0.100	U	GAM
Europium 154	15585-10-1	U		0.293	0.100	U	GAM
Europium 155	14391-16-3	U		0.273	0.100	U	GAM
Radium 226	13982-63-3	0.916	0.22	0.221	0.100		GAM

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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-005 J1PX99

DATA SHEET, cont

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-05	Client sample id	J1PX99
Dept sample id	7758-005	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/20/12 12:39 633 g
% solids	83.1	Custody/SAF No	RC-148-052 RC-148

✓ 11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Radium 228	15262-20-1	1.08	0.32	0.311	0.200		GAM
Thorium 228	14274-82-9	0.798	0.13	0.129			GAM
Thorium 232	TH-232	1.08	0.32	0.311			GAM
Uranium 235	15117-96-1	U		0.626	0.300	U	GAM
Uranium 238	U-238	U		11.5	10.0	U	GAM
Americium 241	14596-10-2	U		0.289	0.300	U	GAM

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-006 J1PXC0

DATA SHEET

SDG	7758	Client/Case no	Hanford SDG_KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-06	Client sample id	J1PXC0
Dept sample id	7758-006	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/20/12 13:23 1270 g
% solids	96.1	Custody/SAF No	RC-148-052 RC-148

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ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-2.68	3.6	6.52	400	U J	H
Carbon 14	14762-75-5	-0.446	2.8	4.71	50.0	U J	C
Gross Alpha	12587-46-1	23.5	5.5	3.77	10.0		93A
Gross Beta	12587-47-2	42.8	5.8	6.45	15.0		93B
Nickel 63	13981-37-8	0.209	2.0	3.39	30.0	U	NI_L
Americium 241	14596-10-2	0.711	0.30	0.284	1.00		TP
Curium 242	15510-73-3	0.032	0.064	0.245	1.00	U J	TP
Curium 243/244	CM-243/244	0.059	0.060	0.227	1.00	U	TP
Technetium 99	14133-76-7	-0.009	0.13	0.277	15.0	U	TC
Uranium 233/234	U-233/234	16.0	1.8	0.274	1.00		U
Uranium 235	15117-96-1	0.869	0.31	0.229	1.00	J	U
Uranium 238	U-238	19.2	2.1	0.274	1.00		U
Plutonium 238	13981-16-3	0	0.12	0.328	1.00	U	PU
Plutonium 239/240	PU-239/240	2.76	0.61	0.227	1.00		PU
Plutonium 241	14119-32-5	-4.56	7.2	12.1	15.0	U	PU_L
Potassium 40	13966-00-2	11.0	0.63	0.206			GAM
Cobalt 60	10198-40-0	U		0.027	0.050	U	GAM
Zinc 65	13982-39-3	U		0.079		U	GAM
Niobium 94	14681-63-1	U		0.027		U	GAM
Ruthenium 106	13967-48-1	U		0.247		U	GAM
Antimony 125	14234-35-6	U		0.062		U	GAM
Cesium 134	13967-70-9	U		0.041		U	GAM
Cesium 137	10045-97-3	U		0.030	0.100	U	GAM
Cerium 144	14762-78-8	U		0.144		U	GAM
Europium 152	14683-23-9	U		0.073	0.100	U	GAM
Europium 154	15585-10-1	U		0.097	0.100	U	GAM
Europium 155	14391-16-3	U		0.098	0.100	U	GAM
Radium 226	13982-63-3	0.399	0.054	0.048	0.100		GAM

Lab id	EBRLNE
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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-006 J1PXC0

DATA SHEET, cont

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-06	Client sample id	J1PXC0
Dept sample id	7758-006	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/20/12 13:23 1270 g
% solids	96.1	Custody/SAF No	RC-148-052 RC-148

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ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Radium 228	15262-20-1	0.691	0.11	0.097	0.200		GAM
Thorium 228	14274-82-9	0.616	0.040	0.036			GAM
Thorium 232	TH-232	0.691	0.11	0.097			GAM
Uranium 235	15117-96-1	0.284	0.14	0.189	0.300		GAM
Uranium 238	U-238	9.22	3.8	3.96	10.0		GAM
Americium 241	14596-10-2	U		0.135	0.300	U	GAM

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-007 J1PXC1

DATA SHEET

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-07	Client sample id	J1PXC1
Dept sample id	7758-007	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/20/12 14:00 1000 g
% solids	92.8	Custody/SAF No	RC-148-052 RC-148

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ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-3.55	3.5	6.30	400	U J	H
Carbon 14	14762-75-5	-0.300	2.7	4.52	50.0	U J	C
Gross Alpha	12587-46-1	92.4	11	3.78	10.0		93A
Gross Beta	12587-47-2	120	8.3	5.76	15.0		93B
Nickel 63	13981-37-8	-0.596	1.9	3.22	30.0	U	NI_L
Americium 241	14596-10-2	0.124	0.15	0.238	1.00	U	TP
Curium 242	15510-73-3	0.054	0.054	0.205	1.00	U J	TP
Curium 243/244	CM-243/244	0.050	0.10	0.191	1.00	U	TP
Technetium 99	14133-76-7	0.082	0.12	0.266	15.0	U	TC
Uranium 233/234	U-233/234	78.6	6.2	0.597	1.00		U
Uranium 235	15117-96-1	7.25	0.99	0.189	1.00	J	U
Uranium 238	U-238	87.4	6.8	0.571	1.00		U
Plutonium 238	13981-16-3	-0.035	0.069	0.264	1.00	U	PU
Plutonium 239/240	PU-239/240	4.63	0.88	0.264	1.00		PU
Plutonium 241	14119-32-5	-1.86	7.1	11.9	15.0	U	PU_L
Potassium 40	13966-00-2	9.66	1.3	0.622			GAM
Cobalt 60	10198-40-0	U		0.079	0.050	U	GAM
Zinc 65	13982-39-3	U		0.156		U	GAM
Niobium 94	14681-63-1	U		0.060		U	GAM
Ruthenium 106	13967-48-1	U		0.593		U	GAM
Antimony 125	14234-35-6	U		0.182		U	GAM
Cesium 134	13967-70-9	U		0.101		U	GAM
Cesium 137	10045-97-3	U		0.056	0.100	U	GAM
Cerium 144	14762-78-8	U		0.464		U	GAM
Europium 152	14683-23-9	U		0.220	0.100	U	GAM
Europium 154	15585-10-1	U		0.256	0.100	U	GAM
Europium 155	14391-16-3	U		0.245	0.100	U	GAM
Radium 226	13982-63-3	0.340	0.13	0.141	0.100		GAM

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-007 J1PXC1

DATA SHEET, cont

SDG	7758	Client/Case no	Hanford	SDG KP0123	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S208074-07	Client sample id	J1PXC1		
Dept sample id	7758-007	Location/Matrix	316-3 WasteSiteTestPits	SOIL	
Received	08/23/12	Collected/Weight	08/20/12 14:00	1000 g	
% solids	92.8	Custody/SAF No	RC-148-052	RC-148	

11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Radium 228	15262-20-1	0.668	0.33	0.330	0.200		GAM
Thorium 228	14274-82-9	0.822	0.15	0.140			GAM
Thorium 232	TH-232	0.668	0.33	0.330			GAM
Uranium 235	15117-96-1	1.61	0.65	0.741	0.300		GAM
Uranium 238	U-238	34.0	10	10.1	10.0		GAM
Americium 241	14596-10-2	U		0.150	0.300	U	GAM

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
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EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-008 J1PXC2

DATA SHEET

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-08	Client sample id	J1PXC2
Dept sample id	7758-008	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/20/12 15:11 1021 g
% solids	91.6	Custody/SAF No	RC-148-052 RC-148

11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-2.95	3.6	6.46	400	U J	H
Carbon 14	14762-75-5	0.348	2.7	4.60	50.0	U J	C
Gross Alpha	12587-46-1	75.6	10	3.49	10.0		93A
Gross Beta	12587-47-2	71.1	7.0	6.32	15.0		93B
Nickel 63	13981-37-8	-0.667	1.8	3.18	30.0	U	NI_L
Americium 241	14596-10-2	0.182	0.22	0.348	1.00	U	TP
Curium 242	15510-73-3	0	0.078	0.300	1.00	U J	TP
Curium 243/244	CM-243/244	0.036	0.15	0.279	1.00	U	TP
Technetium 99	14133-76-7	0.016	0.15	0.277	15.0	U	TC
Uranium 233/234	U-233/234	44.6	3.8	0.441	1.00	J	U
Uranium 235	15117-96-1	3.43	0.66	0.195	1.00		U
Uranium 238	U-238	52.2	4.4	0.429	1.00		U
Plutonium 238	13981-16-3	0	0.16	0.379	1.00	U	PU
Plutonium 239/240	PU-239/240	2.97	0.74	0.303	1.00		PU
Plutonium 241	14119-32-5	0.568	7.8	13.0	15.0	U	PU_L
Potassium 40	13966-00-2	7.36	1.4	0.866			GAM
Cobalt 60	10198-40-0	U		0.086	0.050	U	GAM
Zinc 65	13982-39-3	U		0.234		U	GAM
Niobium 94	14681-63-1	U		0.095		U	GAM
Ruthenium 106	13967-48-1	U		0.881		U	GAM
Antimony 125	14234-35-6	U		0.242		U	GAM
Cesium 134	13967-70-9	U		0.116		U	GAM
Cesium 137	10045-97-3	U		0.116	0.100	U	GAM
Cerium 144	14762-78-8	U		0.555		U	GAM
Europium 152	14683-23-9	U		0.253	0.100	U	GAM
Europium 154	15585-10-1	U		0.301	0.100	U	GAM
Europium 155	14391-16-3	U		0.332	0.100	U	GAM
Radium 226	13982-63-3	0.459	0.26	0.236	0.100		GAM

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-008 J1PXC2

DATA SHEET, cont

SDG	7758	Client/Case no	Hanford SDG_KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-08	Client sample id	J1PXC2
Dept sample id	7758-008	Location/Matrix	316-3 WasteSiteTestPits SOIL
Received	08/23/12	Collected/Weight	08/20/12 15:11 1021 g
% solids	91.6	Custody/SAF No	RC-148-052 RC-148

✓ 11/4/12

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Radium 228	15262-20-1	0.670	0.39	0.394	0.200		GAM
Thorium 228	14274-82-9	0.660	0.18	0.177			GAM
Thorium 232	TH-232	0.670	0.39	0.394			GAM
Uranium 235	15117-96-1	1.28	0.58	0.692	0.300		GAM
Uranium 238	U-238	30.8	12	9.31	10.0		GAM
Americium 241	14596-10-2	U		0.658	0.300	U	GAM

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/10/12

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group KP0123 was composed of eight soil samples designated under SAF No. RC-148 with a Project Designation of: 300 Area D4 Waste Sites – Soil Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results, minus the Am/Cm results, were transmitted to WCH via e-mail on September 4, 2012, and the then again on September 10 with the Am/Cm results.

2.0 ANALYSIS NOTES

2.1 Gross Alpha/Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Tritium Analysis

No problems were encountered during the course of the analyses.

2.3 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.4 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analysis

No problems were encountered during the course of the analyses.

2.6 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.7 Isotopic Plutonium Analysis

The final plating solution from the alpha Pu chemistry was split prior to electroplating; half the solution was plated for alpha counting and the other half was used to prepare the beta Pu-241 planchet. As a consequence of splitting the plating solution, the apparent tracer yields are artificially low. The relative percent difference in the original and duplicate results was 33% and the DER was 0.8. No problems were encountered during the course of the analyses.

2.8 Plutonium-241 Analysis

The final plating solution from the alpha Pu chemistry was split prior to electroplating; half the solution was plated for alpha counting and the other half was used to prepare the beta Pu-241 planchet. As a consequence of splitting the plating solution, the apparent tracer yields are artificially low. No other problems were encountered during the course of the analyses.

2.9 Americium-241/Curium 242, 243/244 Analysis

The initial analyses were rejected due to a failed Cm-244 QC LCS recovery. The samples were reanalyzed with new QC samples and no problems were encountered, all QC results were within required control limits.

2.10 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

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

Joseph Verville **Client Services Manager**	9/10/12 **Date**

2 OF 4

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~6 of 12~~ 8/16/12

Collector: Weber, HC	Company Contact: Joan Kessner; Telephone No.: 509-375-4688 (7758)	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: 7 ~~21~~ Days 8/16/12
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits KP0123	SAF No.: RC-148 8/16/12	
Ice Chest No.: WCH-08-019	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: EBERLINE SERVICES ~~LIONVILLE~~ 8/16/12	Offsite Property No.: A110492	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS 8/16/12

Potential Radioactive L DOT Limits AJ 8-22-12

Special Handling and/or Storage.

~~Cool 1C~~ NONE AJ 8-20-12

Preservation	None	None	None	None	None	None					
Type of Container	P/G	G/P	G/P	G/P	G/P	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	60mL	60mL	60mL	60mL	60mL	60g					
SAMPLE ANALYSIS	Gross Alpha & Gross Beta	Isotopic Uranium Am-241 Cm-244	Isotopic Plutonium Pu-241	Technetium-99 Ni-63	~~Plutonium-241~~ AJ 8-20-12 C-14 H-3	ROTEX Shipping Screen					
Sample No.	Matrix *	Sample Date	Sample Time						RCF				
J1PX93	SOIL												
J1PX94	SOIL												
J1PX95	SOIL	8/16/12	0936	✓	✓	✓	✓	✓	34265				
J1PX96	SOIL	8/16/12	1034	✓	✓	✓	✓	✓	34266				
J1PX97	SOIL	8/16/12	1221	✓	✓	✓	✓	✓	34267				

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CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber/[signature]	8/16/12 1415	DAVID BECKER [signature]	8/16/12 1415
DAVID BECKER [signature]	8/16/12 1755	1060, 3B	8/16/12 1755
1060#3B	8-20-12 0710	A. Freier A. Freier	8-20-12 0710
WCH A. Freier A. Freier	1060#3 8-22-12 1352	Fed Ex	
Fed Ex		[signature]	08/23/12 0925

SPECIAL INSTRUCTIONS

~~VOAs Frozen Upon Collection~~ 8/16/12

Please run all listed analysis. AJ 8-20-12

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

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

REVIEWED BY [signature] DATE 8/22/12

KP0123

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

WCH-EE-011

2 of 2

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Washington Closure Hanford

RC-148-052

Page ~~2 of 12~~

Collector: ~~Weber, HC~~ STOWE, Q (KB 8/20/12)	Company Contact: Joan Kessner	Telephone No.: 509-375-4688 (7758)	Project Coordinator: KESSNER, JH
Price Code: ~~8L~~ 9B	Data Turnaround: 7 ~~21~~ Days (KB 8/20/12)		
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits KP0123	SAF No.: RC-148 (KB 8/20/12)	
Ice Chest No.: WCH-08-019	Field Logbook No.: EL-1663-03	COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx
Shipped To: EBERLINE SERVICES ~~LIONVILLE~~ (KB 8/20/12)	Offsite Property No.: A110492		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS (KB 8/20/12)

Potential Radioactive < DOT Limits AJ 8-22-12

Special Handling and/or Storage

~~Cool 4C~~ NONE AJ-8-21-12

Preservation	None	None	None	None	None	None	
Type of Container	P/G	G/P	G/P	G/P	G/P	G/P	
No. of Container(s)	1	1	1	1	1		
Volume	60mL	60mL	60mL	60mL	60mL		

SAMPLE ANALYSIS (KB 8/20/12)

Sample No.	Matrix *	Sample Date	Sample Time	Gross Alpha & Gross Beta	Isotopic Uranium: Am-241, Cm-244	Isotopic Plutonium: Pu-241	Technetium-99: Ni-63	~~Plutonium 241~~: C-14, H-3	RCF SEA Shipping Screen		RCF		
~~J1PX98~~	~~8/20/12~~												
J1PX99	SOIL	8/20/12	1239	✓	✓	✓	✓	✓			34273		
J1PXC0	SOIL	8/20/12	1323	✓	✓	✓	✓	✓			34274		
J1PXC1	SOIL	8/20/12	1400	✓	✓	✓	✓	✓			34275		
J1PXC2	SOIL	8/20/12	1511	✓	✓	✓	✓	✓			34276		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stone	8/20/12 1545	DAVID BECKER	8/20/12 1545
DAVID BECKER	8/20/12 1730	1060, 3B	8/20/12 1730
1060 #3B	8-21-12 0740	1060#3 A. Freier	8-21-12 0740
WCH A. Freier	8-22-12 1362	Fed Ex	
FED EX		[illegible]	08/22/12 0925

SPECIAL INSTRUCTIONS

~~VOAs Frozen Upon Collection~~ (KB 8/20/12)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

REVIEWED BY DWShea DATE 8/22/12

KP0123

Matrix *: S=Soil; SB=Sediment; SO=Solid; Sl=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; Wi=Wipe; Li=Liquid; Ve=Vegetation; X=Other

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

WCH-EE-011

1 OF 4

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~

Collector Weber, HC	Company Contact Joan Kessner Telephone No. 509-375-4688 (7758)	Project Coordinator KESSNER, JH	Price Code ~~8L~~ 9B Data Turnaround 7 ~~21~~ Days
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 316-3 Waste Site [307 Disposal Trenches] Test Pits KP0123	SAF No. RC-148	
Ice Chest No. WCH-~~11~~ 08-019	Field Logbook No. EL-1663-03 COA R316032000	Method of Shipment Hand Deliver/Government Vehicle/FedEx	
Shipped To EBERLINE SERVICES ~~LIONVILLE~~ AJ 8-22-12	Offsite Property No. A110492	Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive L DOT Limits AJ 8-22-12

Special Handling and/or Storage

~~Cool 4C~~ NONE AJ 8-20-12

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide 9010; Sulfides 8030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL)	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

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Sample No.	Matrix *	Sample Date	Sample Time									RCF	
J1PX93 AJ 8-20-12	SOIL												
J1PX94	~~SOIL~~												
J1PX95	SOIL	8/16/12	0936									34265	✓
J1PX96	SOIL	8/16/12	1034									34266	✓
J1PX97	SOIL	8/16/12	1221									34267	✓

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Heather Weber/[signature] Date/Time: 8-16-12 1415	Received By/Stored In: DAVID BECKER [signature] Date/Time: 8/16/12 1415		
Relinquished By/Removed From: DAVID BECKER [signature] Date/Time: 8/16/12 1755	Received By/Stored In: 1060 #3B Date/Time: 8/16/12 1755		
Relinquished By/Removed From: 1060#3B 8-20-12 0710 Date/Time:	Received By/Stored In: A. Freier A. Freier 8-20-12 0710 Date/Time:		
Relinquished By/Removed From: WCH A. Freier A. Freier Date/Time: 1060#3 8-22-12 1362	Received By/Stored In: Fed Ex Date/Time:		
Relinquished By/Removed From: FEDEX Date/Time:	Received By/Stored In: [signature] Date/Time: 08/23/12 0925		
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:		

SPECIAL INSTRUCTIONS

~~VOAs Frozen~~ Upon Collection

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

minum, Antimony, Arsenic, Barium, Beryllium, Boron, per, Iron, Lead, Lithium, Magnesium, Manganese, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium]; Mercury - 7471 - (CV)/

(2) Gamma Spec (Client List) [Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228, Ruthenium-106, Uranium-235, Uranium-238, Zinc-65]

Matrix *

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

KP0123

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

REVIEWED BY DWS [signature] DATE 8/22/12

WCH-EE-011

4 OF 4

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~

Collector Weber, HC	Company Contact Joan Kessner Telephone No. 509-375-4688 (7758)	Project Coordinator KESSNER, JH	Price Code ~~8L~~ 9B Data Turnaround 7 ~~21~~ Days
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 316-3 Waste Site [307 Disposal Trenches] Test Pits KP0123	SAF No. RC-148	
Ice Chest No. WCH-08-019	Field Logbook No. EL-1663-03 COA R316032000	Method of Shipment Hand Deliver/Government Vehicle/FedEx	
Shipped To EBERLINE SERVICES ~~LIONVILLE~~	Offsite Property No. A110492	Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS 8/16/12

Potential Radioactive LDOT Limits AJ 8-22-12

Special Handling and/or Storage

~~Cool 4C~~ NONE AJ 8-22-12

Preservation	None	None	None	None	None	None					
Type of Container	P/G	G/P	G/P	G/P	G/P	G/P					
No. of Container(s)	1	1	1	1	1						
Volume	60mL	60mL	60mL	60mL	60mL	60g					
SAMPLE ANALYSIS	Gross Alpha & Gross Beta	Isotopic Uranium Am-241 Cm-244	Isotopic Plutonium Pu-241	Technetium-99 Ni-63	~~Plutonium-241~~ AJ 8-20-12 C-14 H-3	RCF GEA Shipping Screen					

32

Sample No.	Matrix *	Sample Date	Sample Time						RCF				
J1PX98	SOIL	8/16/12	1337	✓	✓	✓	✓	✓	34268				
~~J1PX99~~	SOIL												
J1PXC0	SOIL												
J1PXC1	SOIL												
J1PXC2	SOIL												

8/16/12

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Heather Weber/[signature]	Date/Time: 8/16/12 1415	Received By/Stored In: DAVID BECKER [signature]	Date/Time: 8/16/12 1415
Relinquished By/Removed From: DAVID BECKER [signature]	Date/Time: 8/16/12 1755	Received By/Stored In: 1060, 3B	Date/Time: 8/16/12 1755
Relinquished By/Removed From: 1060 #3B	Date/Time: 8-20-12 0710	Received By/Stored In: A. Freier A. Freier	Date/Time: 8-20-12 0710
Relinquished By/Removed From: WCH A. Freier A. Freier	Date/Time: 1060 #3 8-22-12 1352	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In: [signature]	Date/Time: 08/27/12 0925
Relinquished By/Removed From	Date/Time:	Received By/Stored In	Date/Time:

SPECIAL INSTRUCTIONS

~~VOAs Frozen Upon Collection~~ 8/16/12

Please run all listed analysis. AJ 8-20-12

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

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

KP0123

REVIEWED BY [signature] DATE 8/22/12

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

WCH-EE-011

1 of 2

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~

Collector ~~Weber, HC~~ STOWE, Q 8/20/12	Company Contact Joan Kessner	Telephone No. 509-375-4688 (7758)	Project Coordinator KESSNER, JH
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 316-3 Waste Site [307 Disposal Trenches] Test Pits KP0123		SAF No. RC-148
Ice Chest No. WCH-08-019	Field Logbook No. EL-1663-03	COA R316032000	Method of Shipment Hand Deliver/Government Vehicle/FedEx
Shipped To EBERLINE SERVICES ~~LIONVILLE~~ 8/20/12	Offsite Property No. A110492		Bill of Lading/Air Bill No. See OSPC

Price Code ~~8L~~ 9B 8/20/12

Data Turnaround 7 ~~21~~ Days 8/20/12

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive < DOT Limits AJ 8-22-12

Special Handling and/or Storage

~~Cool 4C~~ NONE AJ 8-21-12

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL)	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

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Sample No.	Matrix *	Sample Date	Sample Time									RCF	
~~J1PX98~~	~~8/20/12~~												
J1PX99	SOIL	8/20/12	1239									34273	✓
J1PXC0	SOIL	8/20/12	1323									34274	✓
J1PXC1	SOIL	8/20/12	1400									34275	✓
J1PXC2	SOIL	8/20/12	1511									34276	✓

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From Quincy Stowe Date/Time 1545 8/20/12	Received By/Stored In DAVID BECKER Date/Time 8/20/12 1545	
Relinquished By/Removed From DAVID BECKER Date/Time 8/20/12 1730	Received By/Stored In 1060, 3B Date/Time 8/20/12 1730	
Relinquished By/Removed From 1060#3 8-21-12 0740 Date/Time	Received By/Stored In 1060#3 A. Freier A. Freier Date/Time 8-21-12 0740	
Relinquished By/Removed From WCH A. Freier A. Freier Date/Time 1060#3 8-22-12 1352	Received By/Stored In Fed Ex Date/Time	
Relinquished By/Removed From FED EX Date/Time	Received By/Stored In [signature] Date/Time 08/22/12 0925	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	

SPECIAL INSTRUCTIONS

~~VOAs Frozen~~ Upon Collection

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

~~Antimony~~, Arsenic, Barium, Beryllium, Boron, ~~per, Iron, Lead, Lithium, Magnesium~~, Manganese, Silicon, ~~Silver, Sodium, Uranium, Vanadium, Zinc~~

(2) Gamma Spec (Client List) [Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228, Ruthenium-106, Uranium-235, Uranium-238, Zinc-65]

KP0123

REVIEWED BY AWS hen DATE 8/22/12

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

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

WCH-EE-011

3 OF 4

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~3 of 12~~
Collector: Weber, HC	Company Contact: Joan Kessner; Telephone No.: 509-375-4688 (7758)	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: 7 ~~21~~ Days
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits KP0123	SAF No.: RC-148	
Ice Chest No.: WCH-08-019	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: EBERLINE SERVICES / ~~LIONVILLE~~	Offsite Property No.: A110492	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive DOT Limits AJ 8-22-12

Special Handling and/or Storage

~~Cool 4C~~ NONE AJ 8-22-12

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL)	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

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Sample No.	Matrix *	Sample Date	Sample Time										
J1PX98	SOIL	8/16/12	1337								RCF 34268		✓
J1PX99	SOIL												
J1PXC0	SOIL												
J1PXC1	SOIL												
J1PXC2	SOIL												

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber / [signature]	8/16/12 1415	DAVID BECKER [signature]	8/16/12 1415
DAVID BECKER [signature]	8/16/12 1755	1060/3B	8/16/12 1755
1060#3B	8-20-12 0710	A. Freier [signature]	8-20-12 0710
A Freier [signature]	8-22-12 1352	Fed Ex	
Fed Ex		[signature]	08/23/12 0925

SPECIAL INSTRUCTIONS

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

minum, Antimony, Arsenic, Barium, Beryllium, Boron, per, Iron, Lead, Lithium, Magnesium, Manganese, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium); Mercury - 7471 - (CV)

(2) Gamma Spec (Client List) {Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228, Ruthenium-106, Uranium-235, Uranium-238, Zinc-65}

Matrix *: S=Soil; SE=Sediment; SO=Solid; Sl=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; Wi=Wipe; L=Liquid; V=Vegetation

REVIEWED BY [signature] DATE 8/22/12

KP0123

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

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 316-3			DATA PACKAGE: KP0123		
VALIDATOR: ELR		LAB: EB		DATE: 11/3/12	
			SDG: KP0123		

ANALYSES PERFORMED

X Gross Alpha/Beta	☐ Strontium-90	X ☐ Technetium-99	X ☐ Alpha Spectroscopy	X Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	X Tritium	X C14	X Ni-63	

SAMPLES/MATRIX

J1PX95 J1PX96 J1PX97 J1PX98 J1PX99
J1PXC0 J1PXC1 J1PXC2

Soil

1. Completeness ..... ☐ N/A

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

Comments: _____

2. Initial Calibration (Levels D, E) ..... X ☐ N/A

Instruments/detectors calibrated? ..... Yes No N/A

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

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

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

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

Comments: _____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

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

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

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

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

Comments: _____

_____

_____

_____

_____

4. Background Counts (Levels D, E) ..... ☒ N/A

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

Analytes detected in method blank? ..... Yes No N/A

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

Comments: no U-235 (espec) – J all
no Curium 242 – J all

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

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

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

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

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

Comments: _____

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

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

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

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

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

Comments: _____

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

Matrix spike analyzed? ..... Yes No N/A

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

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

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

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

Comments: no 3H or C-14 MS – J all

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

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

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

Comments: _____

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

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

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

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

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

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

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

Comments: no field QC

12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments: _____

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

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

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

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

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

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

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

Comments: 11 ~~ten~~

Appendix 6

Additional Documentation Requested by Client

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-010

Method Blank

METHOD BLANK

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-10	Client sample id	Method Blank
Dept sample id	7758-010	Material/Matrix	SOIL
		SAF No	RC-148

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.416	4.0	6.84	400	U	H
Carbon 14	14762-75-5	-1.05	3.0	5.07	50.0	U	C
Gross Alpha	12587-46-1	-0.869	1.5	4.12	10.0	U	93A
Gross Beta	12587-47-2	-1.25	3.0	5.38	15.0	U	93B
Nickel 63	13981-37-8	-0.330	1.7	2.97	30.0	U	NI_L
Technetium 99	14133-76-7	-0.052	0.12	0.283	15.0	U	TC
Uranium 233/234	U-233/234	0	0.049	0.189	1.00	U	U
Uranium 235	15117-96-1	0.030	0.060	0.229	1.00	U	U
Uranium 238	U-238	0	0.049	0.189	1.00	U	U
Plutonium 238	13981-16-3	0	0.11	0.422	1.00	U	PU
Plutonium 239/240	PU-239/240	0.165	0.22	0.422	1.00	U	PU
Plutonium 241	14119-32-5	-3.92	7.6	12.8	15.0	U	PU_L
Potassium 40	13966-00-2	U		0.300		U	GAM
Cobalt 60	10198-40-0	U		0.024	0.050	U	GAM
Zinc 65	13982-39-3	U		0.042		U	GAM
Niobium 94	14681-63-1	U		0.020		U	GAM
Ruthenium 106	13967-48-1	U		0.186		U	GAM
Antimony 125	14234-35-6	U		0.047		U	GAM
Cesium 134	13967-70-9	U		0.028		U	GAM
Cesium 137	10045-97-3	U		0.021	0.100	U	GAM
Cerium 144	14762-78-8	U		0.085		U	GAM
Europium 152	14683-23-9	U		0.053	0.100	U	GAM
Europium 154	15585-10-1	U		0.068	0.100	U	GAM
Europium 155	14391-16-3	U		0.054	0.100	U	GAM
Radium 226	13982-63-3	U		0.043	0.100	U	GAM
Radium 228	15262-20-1	U		0.086	0.200	U	GAM
Thorium 228	14274-82-9	U		0.031		U	GAM
Thorium 232	TH-232	U		0.086		U	GAM
Uranium 235	15117-96-1	U		0.109	0.300	U	GAM

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-010 Method Blank

BLANK, cont.

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-10	Client sample id	Method Blank
Dept sample id	7758-010	Material/Matrix	SOIL
		SAF No	RC-148

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 238	U-238	U		2.54	10.0	U	GAM
Americium 241	14596-10-2	U		0.068	0.300	U	GAM

QC-BLANK #82411

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-013

Method Blank

METHOD BLANK

SDG	7758	Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S208074-13	Client sample id	Method Blank
Dept sample id	7758-013	Material/Matrix	SOIL
		SAF No	RC-148

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	0	0.082	0.315	1.00	U	TP
Curium 242	15510-73-3	0	0.082	0.315	1.00	U	TP
Curium 243/244	CM-243/244	0.041	0.16	0.315	1.00	U	TP

QC-BLANK #82498

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-009

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7758
Contact Joseph Verville

Client/Case no Hanford SDG KP0123
Contract No. S00W235A01

Lab sample id S208074-09
Dept sample id 7758-009

Client sample id Lab Control Sample
Material/Matrix SOIL
SAF No RC-148

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	637	17	6.97	400		H	647	26	98	84-116	80-120
Carbon 14	2070	42	10.3	50.0		C	2130	85	97	84-116	80-120
Gross Alpha	103	12	4.10	10.0		93A	101	4.0	102	63-137	80-120
Gross Beta	73.7	6.9	5.73	15.0		93B	84.3	3.4	87	70-130	80-120
Nickel 63	232	6.1	2.99	30.0		NI_L	258	10	90	83-117	80-120
Technetium 99	115	1.7	0.284	15.0		TC	109	4.4	106	78-122	80-120
Uranium 233/234	11.9	1.4	0.252	1.00		U	10.7	0.43	111	76-124	80-120
Uranium 238	12.0	1.4	0.218	1.00		U	10.7	0.43	112	75-125	80-120
Plutonium 238	10.4	1.3	0.253	1.00		PU	11.3	0.45	92	79-121	80-120
Plutonium 239/240	13.8	1.6	0.253	1.00		PU	13.2	0.53	104	77-123	80-120
Plutonium 241	237	12	13.4	15.0		PU_L	298	12	80	83-117	80-120
Cobalt 60	2.30	0.073	0.037	0.050		GAM	2.48	0.099	93	88-112	80-120
Cesium 137	2.78	0.065	0.044	0.100		GAM	2.91	0.12	96	88-112	80-120

QC-LCS #82410

Lab id EBRLNE
Protocol RC-148
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-012 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7758 Client/Case no Hanford SDG KP0123
Contact Joseph Verville Contract No. S00W235A01

Lab sample id S208074-12 Client sample id Lab Control Sample
Dept sample id 7758-012 Material/Matrix SOIL
SAF No RC-148

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Americium 241	11.4	1.4	0.276	1.00		TP	12.1	0.48	94	78-122	80-120
Curium 243/244	9.22	1.2	0.220	1.00		TP	10.4	0.42	89	79-121	80-120

QC-LCS #82497

Lab id EBRLNE
Protocol RC-148
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-011 J1PX95

DUPLICATE

SDG	7758			Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville			Contract	No. S00W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S208074-11	Lab sample id	S208074-01	Client sample id	J1PX95
Dept sample id	7758-011	Dept sample id	7758-001	Location/Matrix	316-3 WasteSiteTestPits SOIL
		Received	08/23/12	Collected/Weight	08/16/12 09:36 937 g
% solids	95.6	% solids	95.6	Custody/SAF No	RC-148-052 RC-148

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Tritium	0.200	3.8	6.57	400	U	H	0.197	3.8	6.48	U	-		0
Carbon 14	-0.787	2.6	4.38	50.0	U	C	-0.884	2.5	4.25	U	-		0.1
Gross Alpha	23.2	5.6	3.10	10.0		93A	18.6	5.0	3.42		22	70	0.9
Gross Beta	37.0	5.4	5.93	15.0		93B	30.9	4.8	5.30		18	54	1.0
Nickel 63	-1.13	1.9	3.27	30.0	U	NI_L	0.357	1.9	3.22	U	-		1.1
Technetium 99	0.064	0.13	0.291	15.0	U	TC	0.166	0.13	0.271	U	-		1.1
Uranium 233/234	12.8	1.5	0.283	1.00		U	11.4	1.1	0.207		12	29	1.2
Uranium 235	0.753	0.28	0.213	1.00		U	0.747	0.23	0.143		1	74	0
Uranium 238	12.2	1.4	0.255	1.00		U	12.3	1.2	0.190		1	28	0.1
Plutonium 238	-0.050	0.099	0.380	1.00	U	PU	0	0.083	0.318	U	-		0.8
Plutonium 239/240	1.34	0.51	0.380	1.00		PU	1.16	0.42	0.318		14	81	0.5
Plutonium 241	-6.03	7.4	12.7	15.0	U	PU_L	0.525	7.2	12.0	U	-		1.3
Potassium 40	14.7	0.67	0.291			GAM	14.4	0.19	0.067		2	17	0.4
Cobalt 60	U		0.027	0.050	U	GAM	U		0.007	U	-		1.4
Zinc 65	U		0.073		U	GAM	U		0.016	U	-		1.5
Niobium 94	U		0.024		U	GAM	U		0.006	U	-		1.5
Ruthenium 106	U		0.246		U	GAM	U		0.063	U	-		1.4
Antimony 125	U		0.064		U	GAM	U		0.019	U	-		1.3
Cesium 134	U		0.040		U	GAM	U		0.011	U	-		1.4
Cesium 137	0.066	0.029	0.033	0.100		GAM	0.026	0.005	0.007		87	97	2.7
Cerium 144	U		0.182		U	GAM	U		0.056	U	-		1.3
Europium 152	U		0.075	0.100	U	GAM	U		0.023	U	-		1.3
Europium 154	U		0.092	0.100	U	GAM	U		0.025	U	-		1.4
Europium 155	U		0.115	0.100	U	GAM	U		0.053	U	-		1.0
Radium 226	0.445	0.056	0.051	0.100		GAM	0.405	0.017	0.016		9	25	1.1
Radium 228	0.772	0.12	0.114	0.200		GAM	0.818	0.039	0.038		6	28	0.6
Thorium 228	0.836	0.044	0.038			GAM	0.795	0.014	0.012		5	17	0.9
Thorium 232	0.772	0.12	0.114			GAM	0.818	0.039	0.038		6	28	0.6

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-011 J1PX95

DUPLICATE, cont.

SDG	7758			Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville			Contract	No. S00W235A01
DUPLICATE		ORIGINAL			
Lab sample id	S208074-11	Lab sample id	S208074-01	Client sample id	J1PX95
Dept sample id	7758-011	Dept sample id	7758-001	Location/Matrix	316-3 WasteSiteTestPits SOIL
		Received	08/23/12	Collected/Weight	08/16/12 09:36 937 g
% solids	95.6	% solids	95.6	Custody/SAF No	RC-148-052 RC-148

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Uranium 235	0.505	0.19	0.244	0.300		GAM	0.526	0.053	0.071		4	59	0.2
Uranium 238	11.9	3.4	3.46	10.0		GAM	10.6	1.0	1.06		12	50	0.7
Americium 241	U		0.224	0.300	U	GAM	U		0.046	U	-		1.6

QC-DUP#1 82412

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	09/10/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP KP0123

7758-014 J1PX95

DUPLICATE

SDG	7758			Client/Case no	Hanford SDG KP0123
Contact	Joseph Verville			Contract	No. S00W235A01
DUPLICATE		ORIGINAL			
Lab sample id	S208074-14	Lab sample id	S208074-01	Client sample id	J1PX95
Dept sample id	7758-014	Dept sample id	7758-001	Location/Matrix	316-3 WasteSiteTestPits SOIL
		Received	08/23/12	Collected/Weight	08/16/12 09:36 937 g
% solids	95.6	% solids	95.6	Custody/SAF No	RC-148-052 RC-148

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Americium 241	0.073	0.097	0.232	1.00	U	TP	0.025	0.050	0.193	U	-		0.9
Curium 242	0	0.053	0.204	1.00	U	TP	0	0.055	0.212	U	-		0
Curium 243/244	-0.024	0.049	0.186	1.00	U	TP	-0.025	0.051	0.193	U	-		0

QC-DUP#1 82499

300 Area D4 Waste Sites-Soil Full Protocol

Lab id EBRLNR
Protocol RC-148
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 09/10/12

Date: 5 November 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 300 Area D4 Waste Sites – Soil Full Protocol – Waste Site 316-3
Subject: Volatile Organics - Data Package No. KP0123-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. KP0123 prepared by Lionville Laboratories 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	Analyte
J1PX95	8/16/12	Soil	C	See note 1
J1PX96	8/16/12	Soil	C	See note 1
J1PX97	8/16/12	Soil	C	See note 1
J1PX98	8/16/12	Soil	C	See note 1
J1PX99	8/20/12	Soil	C	See note 1
J1PXC0	8/20/12	Soil	C	See note 1
J1PXC1	8/20/12	Soil	C	See note 1
J1PXC2	8/20/12	Soil	C	See note 1

1 – Volatiles by 8260.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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

Analytical holding times were 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 14 days of the date of sample collection.

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

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

All holding times were acceptable.

Method Blanks

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike (27%) and matrix spike duplicate (12%) recoveries outside QC limits, all methylene chloride results (except J1PXC2) were qualified as estimates and flagged "J".

Due to matrix spike (174%) and matrix spike duplicate (167%) recoveries outside QC limits, all detected tetrachloroethane results (except J1PXC2) were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

Due to a surrogate recovery outside QC limits, the methylene chloride result in sample J1PX99 was qualified as an estimate and flagged "J".

All other surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

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

Due to an RPD outside QC limits (80%), all methylene chloride results (except J1PXC2) were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. Eighty-nine analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

Completeness

Data package No. KP0123 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 deficiency was noted:

- Due to matrix spike (27%) and matrix spike duplicate (12%) recoveries outside QC limits, all methylene chloride results (except J1PXC2) were qualified as estimates and flagged "J".
- Due to matrix spike (174%) and matrix spike duplicate (167%) recoveries outside QC limits, all detected tetrachloroethane results (except J1PXC2) were qualified as estimates and flagged "J".
- Due to a surrogate recovery outside QC limits, the methylene chloride result in sample J1PX99 was qualified as an estimate and flagged "J".
- Due to an RPD outside QC limits (80%), all methylene chloride results (except J1PXC2) 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.

Eighty-nine analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

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

DOE/RL-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators 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 same quantitation limit corrected for sample dilution and moisture content by the laboratory.

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

VOLATILE ORGANICS DATA QUALIFICATION SUMMARY*

SDG: KP0123	**REVIEWER: ELR**	**Project: 316-3**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	J	All (except J1PXC2)	MS & MSD recovery
Tetrachloroethane	J	J1PX96, J1PX97 J1PX98	MS & MSD recovery
Methylene chloride	J	All (except J1PXC2)	RPD
Methylene Chloride	J	J1PX99	Surrogate recovery

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

Appendix 3

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PX95
1208077-01 (Soil)

11/14/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2,2-Tetrachloroethane	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2-Trichloroethane	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethane	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethane	6.45	U	6.45	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethene (total)	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloropropane	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Butanone	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Hexanone	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
4-Methyl-2-pentanone	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Acetone	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Benzene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromodichloromethane	6.45	U	6.45	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromoform	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromomethane	10.7	U	10.7	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Disulfide	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Tetrachloride	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chlorobenzene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroethane	10.7	U	10.7	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroform	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloromethane	10.7	U	10.7	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,2-Dichloroethene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,3-Dichloropropene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Dibromochloromethane	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Ethylbenzene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Methylene Chloride	6.45	U J	6.45	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Styrene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Tetrachloroethene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,2-Dichloroethene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Toluene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,3-Dichloropropene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Trichloroethene	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Vinyl chloride	10.7	U	10.7	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Xylenes, total	5.37	U	5.37	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*87 %*		*60-130*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

000000016

264 Welsh Pool Road
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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/31/2012 14:49

J1PX95

1208077-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*107 %*	*72-117*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*111 %*	*72-144*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

LVL
LIONVILLE LABORATORY
A division of Pineline Analytical Corporation

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PX96
1208077-02 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2,2-Tetrachloroethane	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2-Trichloroethane	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethane	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethane	8.01	U	8.01	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethene (total)	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloropropane	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Butanone	16.0	U	16.0	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Hexanone	16.0	U	16.0	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
4-Methyl-2-pentanone	16.0	U	16.0	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Acetone	16.0	U	16.0	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Benzene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromodichloromethane	8.01	U	8.01	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromoform	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromomethane	13.3	U	13.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Disulfide	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Tetrachloride	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chlorobenzene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroethane	13.3	U	13.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroform	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloromethane	13.3	U	13.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,2-Dichloroethene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,3-Dichloropropene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Dibromochloromethane	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Ethylbenzene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Methylene Chloride	**3.27**	J J	8.01	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Styrene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Tetrachloroethene	**2.37**	J J	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,2-Dichloroethene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Toluene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,3-Dichloropropene	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Trichloroethene	**6.96**	7 11/14	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Vinyl chloride	13.3	U	13.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Xylenes, total	6.67	U	6.67	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*84 %*		*60-130*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

000000018

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/31/2012 14:49

J1PX96
1208077-02 (Soil)

11/4/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*111 %*	*72-117*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*109 %*	*72-144*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PX97
1208077-03 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2,2-Tetrachloroethane	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2-Trichloroethane	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethane	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethane	7.68	U	7.68	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethene (total)	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloropropane	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Butanone	15.4	U	15.4	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Hexanone	15.4	U	15.4	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
4-Methyl-2-pentanone	15.4	U	15.4	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Acetone	15.4	U	15.4	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Benzene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromodichloromethane	7.68	U	7.68	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromoform	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromomethane	12.8	U	12.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Disulfide	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Tetrachloride	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chlorobenzene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroethane	12.8	U	12.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroform	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloromethane	12.8	U	12.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,2-Dichloroethene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,3-Dichloropropene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Dibromochloromethane	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Ethylbenzene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Methylene Chloride	7.68	U J	7.68	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Styrene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Tetrachloroethene	**1.45**	J J	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,2-Dichloroethene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Toluene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,3-Dichloropropene	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Trichloroethene	**4.56**	J	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Vinyl chloride	12.8	U	12.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Xylenes, total	6.40	U	6.40	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*84 %*		*60-130*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

000000020

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/31/2012 14:49

J1PX97
1208077-03 (Soil)

11/4/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*108 %*	*72-117*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*107 %*	*72-144*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

000000021

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PX98
1208077-04 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2,2-Tetrachloroethane	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2-Trichloroethane	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethane	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethane	9.88	U	9.88	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethene (total)	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloropropane	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Butanone	19.8	U	19.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Hexanone	19.8	U	19.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
4-Methyl-2-pentanone	19.8	U	19.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Acetone	19.8	U	19.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Benzene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromodichloromethane	9.88	U	9.88	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromoform	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromomethane	16.5	U	16.5	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Disulfide	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Tetrachloride	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chlorobenzene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroethane	16.5	U	16.5	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroform	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloromethane	16.5	U	16.5	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,2-Dichloroethene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,3-Dichloropropene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Dibromochloromethane	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Ethylbenzene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Methylene Chloride	**5.14**	J J	9.88	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Styrene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Tetrachloroethene	**1.68**	J J	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,2-Dichloroethene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Toluene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,3-Dichloropropene	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Trichloroethene	**5.95**	J	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Vinyl chloride	16.5	U	16.5	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Xylenes, total	8.23	U	8.23	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*84 %*		*60-130*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

000000022

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PX98
1208077-04 (Soil)

V 11/4/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*103 %*	*72-117*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*104 %*	*72-144*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PX99
1208077-05 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2,2-Tetrachloroethane	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2-Trichloroethane	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethane	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethane	15.5	U	15.5	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethene (total)	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloropropane	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Butanone	30.9	U	30.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Hexanone	30.9	U	30.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
4-Methyl-2-pentanone	30.9	U	30.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Acetone	30.9	U	30.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Benzene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromodichloromethane	15.5	U	15.5	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromoform	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromomethane	25.8	U	25.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Disulfide	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Tetrachloride	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chlorobenzene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroethane	25.8	U	25.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroform	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloromethane	25.8	U	25.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,2-Dichloroethene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,3-Dichloropropene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Dibromochloromethane	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Ethylbenzene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Methylene Chloride	**105**	J	15.5	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Styrene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Tetrachloroethene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,2-Dichloroethene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Toluene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,3-Dichloropropene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Trichloroethene	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Vinyl chloride	25.8	U	25.8	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Xylenes, total	12.9	U	12.9	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
TIC:Unknown 1	**28.2**	J		ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PX99
1208077-05 (Soil)

V 10/4/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B								
Surrogate: 1,2-Dichloroethane-d4	*155 % **	*60-130*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*
Surrogate: Toluene-d8	*126 % **	*72-117*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*138 %*	*72-144*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/31/2012 14:49

J1PXC0
1208077-06 (Soil)

V 11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2,2-Tetrachloroethane	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2-Trichloroethane	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethane	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethane	6.20	U	6.20	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethene (total)	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloropropane	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Butanone	12.4	U	12.4	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Hexanone	12.4	U	12.4	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
4-Methyl-2-pentanone	12.4	U	12.4	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Acetone	12.4	U	12.4	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Benzene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromodichloromethane	6.20	U	6.20	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromoform	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromomethane	10.3	U	10.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Disulfide	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Tetrachloride	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chlorobenzene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroethane	10.3	U	10.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroform	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloromethane	10.3	U	10.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,2-Dichloroethene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,3-Dichloropropene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Dibromochloromethane	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Ethylbenzene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Methylene Chloride	**4.35**	J J	6.20	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Styrene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Tetrachloroethene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,2-Dichloroethene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Toluene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,3-Dichloropropene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Trichloroethene	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Vinyl chloride	10.3	U	10.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Xylenes, total	5.17	U	5.17	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*103 %*		*60-130*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	**Reported:** 08/31/2012 14:49

J1PXC0
1208077-06 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*99 %*	*72-117*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*100 %*	*72-144*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PXC1
1208077-07 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2,2-Tetrachloroethane	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1,2-Trichloroethane	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethane	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,1-Dichloroethene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethane	8.59	U	8.59	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloroethene (total)	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
1,2-Dichloropropane	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Butanone	17.2	U	17.2	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
2-Hexanone	17.2	U	17.2	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
4-Methyl-2-pentanone	17.2	U	17.2	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Acetone	17.2	U	17.2	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Benzene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromodichloromethane	8.59	U	8.59	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromoform	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Bromomethane	14.3	U	14.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Disulfide	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Carbon Tetrachloride	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chlorobenzene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroethane	14.3	U	14.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloroform	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Chloromethane	14.3	U	14.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,2-Dichloroethene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
cis-1,3-Dichloropropene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Dibromochloromethane	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Ethylbenzene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Methylene Chloride	**6.15**	J J	8.59	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Styrene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Tetrachloroethene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,2-Dichloroethene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Toluene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
trans-1,3-Dichloropropene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Trichloroethene	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Vinyl chloride	14.3	U	14.3	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
Xylenes, total	7.15	U	7.15	ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B
TIC:Unknown 1	**13.8**	J		ug/kg dry	1	L208245	08/25/2012	08/25/2012	8260B

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

WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: KP0123	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/31/2012 14:49

J1PXC1
1208077-07 (Soil)

11/4/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: 1,2-Dichloroethane-d4	*97 %*	*60-130*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*
Surrogate: Toluene-d8	*103 %*	*72-117*			*L208245*	*08/25/2012*	*08/25/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*104 %*	*72-144*			*L208245*	*08/25/2012*	*08/25/2012*	*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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PXC2
1208077-08 (Soil)

11/4/12

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
1,1,2,2-Tetrachloroethane	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
1,1,2-Trichloroethane	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
1,1-Dichloroethane	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
1,1-Dichloroethene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
1,2-Dichloroethane	5.22	U	5.22	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
1,2-Dichloroethene (total)	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
1,2-Dichloropropane	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
2-Butanone	10.4	U	10.4	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
2-Hexanone	10.4	U	10.4	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
4-Methyl-2-pentanone	10.4	U	10.4	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Acetone	10.4	U	10.4	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Benzene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Bromodichloromethane	5.22	U	5.22	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Bromoform	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Bromomethane	8.70	U	8.70	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Carbon Disulfide	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Carbon Tetrachloride	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Chlorobenzene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Chloroethane	8.70	U	8.70	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Chloroform	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Chloromethane	8.70	U	8.70	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
cis-1,2-Dichloroethene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
cis-1,3-Dichloropropene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Dibromochloromethane	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Ethylbenzene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Methylene Chloride	**6.04**		5.22	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Styrene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Tetrachloroethene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
trans-1,2-Dichloroethene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Toluene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
trans-1,3-Dichloropropene	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Trichloroethene	**0.986**	J	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Vinyl chloride	8.70	U	8.70	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Xylenes, total	4.35	U	4.35	ug/kg dry	1	L208250	08/27/2012	08/27/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*109 %*		*60-130*			*L208250*	*08/27/2012*	*08/27/2012*	*8260B*

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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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

J1PXC2
1208077-08 (Soil)

11/4/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*105 %*	*72-117*			*L208250*	*08/27/2012*	*08/27/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*113 %*	*72-144*			*L208250*	*08/27/2012*	*08/27/2012*	*8260B*

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-148 KP0123
LVL #: 1208077

W.O. #: 60049-001-001-0001-00
Date Received: 08-23-2012

GC/MS VOLATILE

Eight (8) soil samples were collected on 08-16,20-2012.

The samples and associated QC samples were prepared and analyzed 08-25,27-2012 according to criteria set forth in Lionville Laboratory SOPs. The preparation procedure was based on SW846 Method 5035A and the analysis procedure was based on SW846 Method 8260B for Client Specified 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 hold time.

3. Non-target compounds were detected in these samples.

4. Four (4) of forty-eight (48) surrogate recoveries were outside QC acceptance criteria. Surrogate recovery criteria were not met for sample J1PX99 on 08-25-2012. An associated matrix spike and matrix spike duplicate analyses fulfilled its reanalysis requirement, with similar results.

5. Thirty-one of one hundred and forty (140) matrix spike recoveries were outside QC acceptance criteria. The out of range recoveries in samples L208245-MS1/MSD1 are possibly due to sample matrix; however, internal areas were also biased low. This may have contributed to the high recoveries. A second MS/MSD were analyzed and all were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. The method blanks were below the reporting limit for all target analytes.

8. Samples are reported on a dry weight basis.

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.

9. 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 ad indicates the target compounds where the RSD exceeded 15%; results for the indicated target compounds are considered to have greater uncertainty.

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

11. All internal standard area and retention time criteria were outside QC criteria for sample J1PX99 on 08-25-2012. An associated matrix spike and matrix spike duplicate analyses fulfilled its reanalysis requirement, with similar results.

12. 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").

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

Iain Daniels
LvL Laboratory Manager

8/29/12
Date

000000011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~ 1 OF 2
Collector: Weber, HC	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: ~~8L~~ 9B; Data Turnaround: ~~21~~ 7 Days
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No.: RC-148	
Ice Chest No.: RCC-07-012	Field Logbook No.: EL-1663-03; COA: R316032000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No.: A110483	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive L DOT Limits AJ 8-22-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	sG	sG	Gs*	sG	sG	sG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	500ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
J1PX93	SOIL												
J1PX94	SOIL												
J1PX95	SOIL	8/16/12	0936	✓	✓	✓	✓	✓	✓	✓	✓	✓	34265
J1PX96	SOIL	8/16/12	1034	✓	✓	✓	✓	✓	✓	✓	✓	✓	34266
J1PX97	SOIL	8/16/12	1221	✓	✓	✓	✓	✓	✓	✓	✓	✓	34267

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber/ Heather Weber	8/16/12 1415	DAVID BECKER / David Becker	8/16/12 1415
DAVID BECKER / David Becker	8/16/12 1755	1060 3B	8/16/12 1755
1060 #3B	8-20-12 0710	1060#3 / A. Freier / A. Freier	0710 8-20-12
A. Freier / A. Freier (WCH)	8-22-12 1258 (1060#3)	Fed Ex	
Fed Ex	8/23/12 0930	VICTOR HERNANDEZ	8/23/12 0930

SPECIAL INSTRUCTIONS
VOAs Frozen Upon Collection

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

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, Cesium-134, Cesium-137, Europium-155, Niobium-94, Radium-226, Radium-228, Zinc-65 8/16/12

* freeze upon receipt.
AJ 8-20-12

Matrix *: S=Soil; SB=Sediment; SO=Solid; Sl=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; Wi=Wipe; L=Liquid; Vo=Vegetation; V=Other

KP0123

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

REVIEWED BY MJS DATE 8/22/12

WCH-EE-011

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Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-148-052

Collector Weber, HC	**Company Contact** Joan Kessner	**Telephone No.** 509-375-4688
Project Coordinator KESSNER, JH	**Price Code** ~~81~~ 9B	**Data Turnaround** 7 ~~21~~ Days 8/16/12
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	**Sampling Location** 316-3 Waste Site [307 Disposal Trenches] Test Pits	**SAF No.** RC-148 8/16/12
Ice Chest No. RCC-07-012	**Field Logbook No.** EL-1663-03	**COA** R316032000
Method of Shipment Hand Deliver/Government Vehicle/FedEx		
Shipped To ~~EDERLINE SERVICES~~ LIONVILLE 8/16/12	**Offsite Property No.** A110483	**Bill of Lading/Air Bill No.** See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive ∠ DOT Limits AJ 8-22-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	sG	sG	Gs*	sG	sG	sG	G/P
No. of Container(s)	1	1	1	1	1	5	1	1	1	
Volume	60mL	60mL	60mL	60mL	120mL	40mL	250mL	120mL	120mL	

SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (1) in Special Instructions.
Sample No. / Matrix * / Sample Date / Sample Time										
J1PX98 / SOIL / 8/16/12 / 1337	✓	✓	✓	✓	✓	✓	✓	✓	✓	34268
J1PX99 / SOIL										
J1PXC0 / SOIL										
J1PXC1 / SOIL										
J1PXC2 / SOIL										

AJ 8-20-12

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CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Heather Weber	8/16/12 1415	DAVID BECKER	8/16/12 1415
DAVID BECKER	8/16/12 1755	1060/38	8/16/12 1755
1060#38	8-20-12 0710	A. Freier 1060#3	8-20-12 0710
A. Freier 1060#3 (WCH)	8-22-12 1258	FedEx	
FedEx	8/23/12 0930	VICTOR HERNANDEZ	8/23/12 0930

SPECIAL INSTRUCTIONS
VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium]; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

241, Antimony-125, ~~Cobalt-60~~, Cesium-134, Cesium-137, Europium-155, Niobium-94, Radium-226, Radium-228, Zinc-65] 8/16/12

*freeze upon receipt. AJ 8-20-12

Matrix *
S=Soil, SD=Sediment, SO=Solid, Sl=Sludge, W = Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, Wi=Wipe, L=Liquid

KP0123

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

REVIEWED BY Mushen 8/22/12

WCH-EE-011

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1 OF 1

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-052	Page ~~2 of 12~~

Collector ~~Weber, HC~~ STOWE, Q 8/20/12	Company Contact Joan Kessner / Telephone No. 509-375-4688	Project Coordinator KESSNER, JH	Price Code ~~8L~~ 9B / Data Turnaround 7 ~~21~~ Days 8/20/12
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 316-3 Waste Site [307 Disposal Trenches] Test Pits	SAF No. RC-148 8/20/12	8/20/12
Ice Chest No. RCC -07-012	Field Logbook No. EL-1663-03 / COA R316032000	Method of Shipment Hand Deliver/Government Vehicle/FedEx	
Shipped To ~~EBERLINE SERVICES~~ LIONVILLE 8/20/12	Offsite Property No. A 110483	Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive < DOT Limits A4 8-22-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Freeze	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	G/P	G/P	G/P	aG	aG	Gs*	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	~~5~~ 6	1	1	1	1
Volume	60mL	60mL	60mL	60mL	120mL	~~40mL~~ 8/20/12	250mL	120mL	120mL	~~500ml~~ 120mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D +	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions TCLP * METALS	RCF
~~J1PX98~~	~~8/20/12~~													
J1PX99	SOIL	8/20/12	1239	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34273
J1PXC0	SOIL	8/20/12	1323	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34274
J1PXC1	SOIL	8/20/12	1400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34275
J1PXC2	SOIL	8/20/12	1511	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	34276

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	1545 8/20/12	DAVID BECKER	8/20/12 1545
DAVID BECKER	8/20/12 1730	1060, 3B	8/20/12 1730
1060#3B	8-21-12 0740	1060#3 A. Freier	0740 8-21-12
A. Freier	WCH 8-22-12 1258	FedEx	
FedEx	8/23/12 0930	VICTOR HERNANDEZ	8-23-12 0930

SPECIAL INSTRUCTIONS * freeze upon receipt. A4 8-21-12
VOAs Frozen Upon Collection

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc, Zirconium}; Mercury - 7471 - (CV)

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab. ~~M. Antimony-125, Cerium-144, Cesium-134, Cesium-137, Iodium-133, Niobium-94, Radium-226, Radium-228, Zinc-65~~ 8/20/12

TTCLP METALS - LEACH & HOLD UNTIL FURTHER DIRECTION IS PROVIDED 8/20/12

KP0123

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

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

REVIEWED BY [signature] DATE 8/22/12

WCH-EE-011

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Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 316-3			DATA PACKAGE: KP0123		
VALIDATOR: ECR		LAB: LLI		DATE: 11/3/12	
			SDG: KP0123		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J1PX95	J1PX96	J1PX97	J1PX98	J1PX99	
J1PXC0	J1PXC1	J1PXC2			
					soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

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

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

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

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

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

MS/MSD standards? (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: Surr - methylene chloride - 99
MS - tetrachloroethane (179%) MSD - J all
MS - Methylene chloride (277%) - J all MSD - MC - J all } except 250

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: RPD - MC - J all (except C2)

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: 89 ~

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-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

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 L208245 - SW 5035A										
Blank (L208245-BLK1)				Prepared & Analyzed: 08/25/2012						
1,1,1-Trichloroethane	5.00	U	5.00	ug/kg wet						
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/kg wet						
1,1,2-Trichloroethane	5.00	U	5.00	ug/kg wet						
1,1-Dichloroethane	5.00	U	5.00	ug/kg wet						
1,1-Dichloroethene	5.00	U	5.00	ug/kg wet						
1,2-Dichloroethane	6.00	U	6.00	ug/kg wet						
1,2-Dichloroethene (total)	5.00	U	5.00	ug/kg wet						
1,2-Dichloropropane	5.00	U	5.00	ug/kg wet						
2-Butanone	12.0	U	12.0	ug/kg wet						
2-Hexanone	12.0	U	12.0	ug/kg wet						
4-Methyl-2-pentanone	12.0	U	12.0	ug/kg wet						
Acetone	12.0	U	12.0	ug/kg wet						
Benzene	5.00	U	5.00	ug/kg wet						
Bromodichloromethane	6.00	U	6.00	ug/kg wet						
Bromoform	5.00	U	5.00	ug/kg wet						
Bromomethane	10.0	U	10.0	ug/kg wet						
Carbon Disulfide	5.00	U	5.00	ug/kg wet						
Carbon Tetrachloride	5.00	U	5.00	ug/kg wet						
Chlorobenzene	5.00	U	5.00	ug/kg wet						
Chloroethane	10.0	U	10.0	ug/kg wet						
Chloroform	5.00	U	5.00	ug/kg wet						
Chloromethane	10.0	U	10.0	ug/kg wet						
cis-1,2-Dichloroethene	5.00	U	5.00	ug/kg wet						
cis-1,3-Dichloropropene	5.00	U	5.00	ug/kg wet						
Dibromochloromethane	5.00	U	5.00	ug/kg wet						
Ethylbenzene	5.00	U	5.00	ug/kg wet						
Methylene Chloride	6.00	U	6.00	ug/kg wet						
Styrene	5.00	U	5.00	ug/kg wet						
Tetrachloroethene	5.00	U	5.00	ug/kg wet						
trans-1,2-Dichloroethene	5.00	U	5.00	ug/kg wet						
Toluene	5.00	U	5.00	ug/kg wet						
trans-1,3-Dichloropropene	5.00	U	5.00	ug/kg wet						
Trichloroethene	5.00	U	5.00	ug/kg wet						
Vinyl chloride	10.0	U	10.0	ug/kg wet						
Xylenes, total	5.00	U	5.00	ug/kg wet						
Surrogate: 1,2-Dichloroethane-d4	*41.4*			*ug/kg wet*	*50.000*		*83*	*60-130*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

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 L208245 - SW 5035A									
Blank (L208245-BLK1)			Prepared & Analyzed: 08/25/2012						
Surrogate: Toluene-d8	*53.3*		*ug/kg wet*	*50.000*		*107*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*53.4*		*ug/kg wet*	*50.000*		*107*	*72-144*		
LCS (L208245-BS1)			Prepared & Analyzed: 08/25/2012						
1,1,1-Trichloroethane	49.5	5.00	ug/kg wet	50.000		99	65-130		
1,1,2,2-Tetrachloroethane	31.7	5.00	ug/kg wet	50.000		63	50-130		
1,1,2-Trichloroethane	39.0	5.00	ug/kg wet	50.000		78	60-125		
1,1-Dichloroethane	44.8	5.00	ug/kg wet	50.000		90	70-130		
1,1-Dichloroethene	47.9	5.00	ug/kg wet	50.000		96	60-130		
1,2-Dichloroethane	41.2	6.00	ug/kg wet	50.000		82	60-130		
1,2-Dichloroethene (total)	95.1	5.00	ug/kg wet	100.00		95	75-125		
1,2-Dichloropropane	43.7	5.00	ug/kg wet	50.000		87	70-130		
2-Butanone	44.3	12.0	ug/kg wet	50.000		89	20-200		
2-Hexanone	42.5	12.0	ug/kg wet	50.000		85	20-200		
4-Methyl-2-pentanone	34.8	12.0	ug/kg wet	50.000		70	40-150		
Acetone	57.1	12.0	ug/kg wet	50.000		114	15-240		
Benzene	46.4	5.00	ug/kg wet	50.000		93	75-125		
Bromodichloromethane	42.8	6.00	ug/kg wet	50.000		86	65-135		
Bromoform	37.1	5.00	ug/kg wet	50.000		74	60-130		
Bromomethane	48.2	10.0	ug/kg wet	50.000		96	40-150		
Carbon Disulfide	43.2	5.00	ug/kg wet	50.000		86	55-140		
Carbon Tetrachloride	51.6	5.00	ug/kg wet	50.000		103	60-135		
Chlorobenzene	47.9	5.00	ug/kg wet	50.000		96	70-125		
Chloroethane	48.7	10.0	ug/kg wet	50.000		97	50-150		
Chloroform	47.5	5.00	ug/kg wet	50.000		95	70-130		
Chloromethane	44.6	10.0	ug/kg wet	50.000		89	40-130		
cis-1,2-Dichloroethene	49.2	5.00	ug/kg wet	50.000		98	70-125		
cis-1,3-Dichloropropene	39.5	5.00	ug/kg wet	50.000		79	70-125		
Dibromochloromethane	38.3	5.00	ug/kg wet	50.000		77	65-125		
Ethylbenzene	52.0	5.00	ug/kg wet	50.000		104	70-125		
Methylene Chloride	37.2	6.00	ug/kg wet	50.000		74	45-140		
Styrene	46.6	5.00	ug/kg wet	50.000		93	70-125		
Tetrachloroethene	53.3	5.00	ug/kg wet	50.000		107	60-130		
trans-1,2-Dichloroethene	45.9	5.00	ug/kg wet	50.000		92	65-130		
Toluene	49.9	5.00	ug/kg wet	50.000		100	70-125		
trans-1,3-Dichloropropene	35.5	5.00	ug/kg wet	50.000		71	65-125		
Trichloroethene	53.1	5.00	ug/kg wet	50.000		106	70-130		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

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 L208245 - SW 5035A									
LCS (L208245-BS1)			Prepared & Analyzed: 08/25/2012						
Vinyl chloride	48.0	10.0	ug/kg wet	50.000		96	50-150		
Xylenes, total	155	5.00	ug/kg wet	150.00		104	70-125		
Surrogate: 1,2-Dichloroethane-d4	*40.1*		*ug/kg wet*	*50.000*		*80*	*60-130*		
Surrogate: Toluene-d8	*53.0*		*ug/kg wet*	*50.000*		*106*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*53.8*		*ug/kg wet*	*50.000*		*108*	*72-144*		
Matrix Spike (L208245-MS1)		**Source: 1208077-05**	Prepared & Analyzed: 08/25/2012						
1,1,1-Trichloroethane	181	11.9	ug/kg dry	119.35	12.9 U	152*	65-130		
1,1,2,2-Tetrachloroethane	243	11.9	ug/kg dry	119.35	12.9 U	204*	50-130		
1,1,2-Trichloroethane	183	11.9	ug/kg dry	119.35	12.9 U	153*	60-125		
1,1-Dichloroethane	159	11.9	ug/kg dry	119.35	12.9 U	134*	70-130		
1,1-Dichloroethene	149	11.9	ug/kg dry	119.35	12.9 U	125	60-130		
1,2-Dichloroethane	152	14.3	ug/kg dry	119.35	15.5 U	127	60-130		
1,2-Dichloroethene (total)	276	11.9	ug/kg dry	238.70	12.9 U	116	75-125		
1,2-Dichloropropane	148	11.9	ug/kg dry	119.35	12.9 U	124	70-130		
2-Butanone	141	28.6	ug/kg dry	119.35	30.9 U	118	20-200		
2-Hexanone	180	28.6	ug/kg dry	119.35	30.9 U	151	20-200		
4-Methyl-2-pentanone	148	28.6	ug/kg dry	119.35	30.9 U	124	40-150		
Acetone	177	28.6	ug/kg dry	119.35	30.9 U	149	15-240		
Benzene	126	11.9	ug/kg dry	119.35	12.9 U	105	75-125		
Bromodichloromethane	158	14.3	ug/kg dry	119.35	15.5 U	133	65-135		
Bromoform	167	11.9	ug/kg dry	119.35	12.9 U	140*	60-130		
Bromomethane	156	23.9	ug/kg dry	119.35	25.8 U	131	40-150		
Carbon Disulfide	125	11.9	ug/kg dry	119.35	12.9 U	105	55-140		
Carbon Tetrachloride	177	11.9	ug/kg dry	119.35	12.9 U	148*	60-135		
Chlorobenzene	109	11.9	ug/kg dry	119.35	12.9 U	91	70-125		
Chloroethane	160	23.9	ug/kg dry	119.35	25.8 U	134	50-150		
Chloroform	167	11.9	ug/kg dry	119.35	12.9 U	140*	70-130		
Chloromethane	134	23.9	ug/kg dry	119.35	25.8 U	112	40-130		
cis-1,2-Dichloroethene	137	11.9	ug/kg dry	119.35	12.9 U	115	70-125		
cis-1,3-Dichloropropene	156	11.9	ug/kg dry	119.35	12.9 U	131*	70-125		
Dibromochloromethane	178	11.9	ug/kg dry	119.35	12.9 U	149*	65-125		
Ethylbenzene	175	11.9	ug/kg dry	119.35	12.9 U	147*	70-125		
Methylene Chloride	137	14.3	ug/kg dry	119.35	105	27*	45-140		
Styrene	74.9	11.9	ug/kg dry	119.35	12.9 U	63*	70-125		
Tetrachloroethene	208	11.9	ug/kg dry	119.35	12.9 U	174*	60-130		
trans-1,2-Dichloroethene	139	11.9	ug/kg dry	119.35	12.9 U	116	65-130		

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

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 L208245 - SW 5035A									
Matrix Spike (L208245-MS1)		**Source: 1208077-05**		Prepared & Analyzed: 08/25/2012					
Toluene	157	11.9	ug/kg dry	119.35	12.9 U	132*	70-125		
trans-1,3-Dichloropropene	128	11.9	ug/kg dry	119.35	12.9 U	107	65-125		
Trichloroethene	157	11.9	ug/kg dry	119.35	12.9 U	132*	70-130		
Vinyl chloride	135	23.9	ug/kg dry	119.35	25.8 U	113	50-150		
Xylenes, total	466	11.9	ug/kg dry	358.04	12.9 U	130*	70-125		
Surrogate: 1,2-Dichloroethane-d4	*155*		*ug/kg dry*	*119.35*		*130*	*60-130*		
Surrogate: Toluene-d8	*166*		*ug/kg dry*	*119.35*		*139**	*72-117*		
Surrogate: 4-Bromofluorobenzene	*157*		*ug/kg dry*	*119.35*		*131*	*72-144*		
Matrix Spike Dup (L208245-MSD1)		**Source: 1208077-05**		Prepared & Analyzed: 08/25/2012					
1,1,1-Trichloroethane	143	9.92	ug/kg dry	99.198	12.9 U	144*	65-130	5	20
1,1,2,2-Tetrachloroethane	200	9.92	ug/kg dry	99.198	12.9 U	202*	50-130	1	20
1,1,2-Trichloroethane	152	9.92	ug/kg dry	99.198	12.9 U	154*	60-125	0.2	20
1,1-Dichloroethane	134	9.92	ug/kg dry	99.198	12.9 U	135*	70-130	1	20
1,1-Dichloroethene	120	9.92	ug/kg dry	99.198	12.9 U	121	60-130	3	20
1,2-Dichloroethane	127	11.9	ug/kg dry	99.198	15.5 U	128	60-130	0.4	20
1,2-Dichloroethene (total)	236	9.92	ug/kg dry	198.40	12.9 U	119	75-125	3	20
1,2-Dichloropropane	124	9.92	ug/kg dry	99.198	12.9 U	125	70-130	0.5	20
2-Butanone	103	23.8	ug/kg dry	99.198	30.9 U	104	20-200	13	20
2-Hexanone	147	23.8	ug/kg dry	99.198	30.9 U	149	20-200	2	20
4-Methyl-2-pentanone	126	23.8	ug/kg dry	99.198	30.9 U	127	40-150	3	20
Acetone	144	23.8	ug/kg dry	99.198	30.9 U	146	15-240	2	20
Benzene	104	9.92	ug/kg dry	99.198	12.9 U	105	75-125	0.7	20
Bromodichloromethane	131	11.9	ug/kg dry	99.198	15.5 U	132	65-135	0.5	20
Bromoform	137	9.92	ug/kg dry	99.198	12.9 U	138*	60-130	1	20
Bromomethane	129	19.8	ug/kg dry	99.198	25.8 U	130	40-150	0.8	20
Carbon Disulfide	106	9.92	ug/kg dry	99.198	12.9 U	107	55-140	2	20
Carbon Tetrachloride	146	9.92	ug/kg dry	99.198	12.9 U	147*	60-135	0.7	20
Chlorobenzene	90.6	9.92	ug/kg dry	99.198	12.9 U	91	70-125	0.08	20
Chloroethane	137	19.8	ug/kg dry	99.198	25.8 U	138	50-150	3	20
Chloroform	141	9.92	ug/kg dry	99.198	12.9 U	143*	70-130	2	20
Chloromethane	107	19.8	ug/kg dry	99.198	25.8 U	108	40-130	4	20
cis-1,2-Dichloroethene	119	9.92	ug/kg dry	99.198	12.9 U	120	70-125	4	20
cis-1,3-Dichloropropene	133	9.92	ug/kg dry	99.198	12.9 U	134*	70-125	2	20
Dibromochloromethane	160	9.92	ug/kg dry	99.198	12.9 U	161*	65-125	8	20
Ethylbenzene	143	9.92	ug/kg dry	99.198	12.9 U	144*	70-125	2	20
Methylene Chloride	116	11.9	ug/kg dry	99.198	105	12*	45-140	80*	20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

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 L208245 - SW 5035A										
Matrix Spike Dup (L208245-MSD1)			**Source: 1208077-05**	Prepared & Analyzed: 08/25/2012						
Styrene	65.1		9.92	ug/kg dry	99.198	12.9 U	66*	70-125	4	20
Tetrachloroethene	166		9.92	ug/kg dry	99.198	12.9 U	167*	60-130	4	20
trans-1,2-Dichloroethene	117		9.92	ug/kg dry	99.198	12.9 U	118	65-130	2	20
Toluene	134		9.92	ug/kg dry	99.198	12.9 U	135*	70-125	2	20
trans-1,3-Dichloropropene	120		9.92	ug/kg dry	99.198	12.9 U	121	65-125	12	20
Trichloroethene	124		9.92	ug/kg dry	99.198	12.9 U	125	70-130	5	20
Vinyl chloride	118		19.8	ug/kg dry	99.198	25.8 U	119	50-150	5	20
Xylenes, total	398		9.92	ug/kg dry	297.59	12.9 U	134*	70-125	3	20
Surrogate: 1,2-Dichloroethane-d4	*127*			*ug/kg dry*	*99.198*		*128*	*60-130*		
Surrogate: Toluene-d8	*141*			*ug/kg dry*	*99.198*		*142**	*72-117*		
Surrogate: 4-Bromofluorobenzene	*126*			*ug/kg dry*	*99.198*		*127*	*72-144*		
Batch L208250 - SW 5035A										
Blank (L208250-BLK1)				Prepared & Analyzed: 08/27/2012						
1,1,1-Trichloroethane	5.00	U	5.00	ug/kg wet						
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/kg wet						
1,1,2-Trichloroethane	5.00	U	5.00	ug/kg wet						
1,1-Dichloroethane	5.00	U	5.00	ug/kg wet						
1,1-Dichloroethene	5.00	U	5.00	ug/kg wet						
1,2-Dichloroethane	6.00	U	6.00	ug/kg wet						
1,2-Dichloroethene (total)	5.00	U	5.00	ug/kg wet						
1,2-Dichloropropane	5.00	U	5.00	ug/kg wet						
2-Butanone	12.0	U	12.0	ug/kg wet						
2-Hexanone	12.0	U	12.0	ug/kg wet						
4-Methyl-2-pentanone	12.0	U	12.0	ug/kg wet						
Acetone	12.0	U	12.0	ug/kg wet						
Benzene	5.00	U	5.00	ug/kg wet						
Bromodichloromethane	6.00	U	6.00	ug/kg wet						
Bromoform	5.00	U	5.00	ug/kg wet						
Bromomethane	10.0	U	10.0	ug/kg wet						
Carbon Disulfide	5.00	U	5.00	ug/kg wet						
Carbon Tetrachloride	5.00	U	5.00	ug/kg wet						
Chlorobenzene	5.00	U	5.00	ug/kg wet						
Chloroethane	10.0	U	10.0	ug/kg wet						
Chloroform	5.00	U	5.00	ug/kg wet						
Chloromethane	10.0	U	10.0	ug/kg wet						
cis-1,2-Dichloroethene	5.00	U	5.00	ug/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: KP0123 Project Manager: Joan Kessner	Reported: 08/31/2012 14:49

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 L208250 - SW 5035A										
Blank (L208250-BLK1)				Prepared & Analyzed: 08/27/2012						
cis-1,3-Dichloropropene	5.00	U	5.00	ug/kg wet						
Dibromochloromethane	5.00	U	5.00	ug/kg wet						
Ethylbenzene	5.00	U	5.00	ug/kg wet						
Methylene Chloride	6.00	U	6.00	ug/kg wet						
Styrene	5.00	U	5.00	ug/kg wet						
Tetrachloroethene	5.00	U	5.00	ug/kg wet						
trans-1,2-Dichloroethene	5.00	U	5.00	ug/kg wet						
Toluene	5.00	U	5.00	ug/kg wet						
trans-1,3-Dichloropropene	5.00	U	5.00	ug/kg wet						
Trichloroethene	5.00	U	5.00	ug/kg wet						
Vinyl chloride	10.0	U	10.0	ug/kg wet						
Xylenes, total	5.00	U	5.00	ug/kg wet						
Surrogate: 1,2-Dichloroethane-d4	*48.8*			*ug/kg wet*	*50.000*		*98*	*60-130*		
Surrogate: Toluene-d8	*52.0*			*ug/kg wet*	*50.000*		*104*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*54.0*			*ug/kg wet*	*50.000*		*108*	*72-144*		
LCS (L208250-BS1)				Prepared & Analyzed: 08/27/2012						
1,1,1-Trichloroethane	47.7		5.00	ug/kg wet	50.000		95	65-130		
1,1,2,2-Tetrachloroethane	41.7		5.00	ug/kg wet	50.000		83	50-130		
1,1,2-Trichloroethane	48.9		5.00	ug/kg wet	50.000		98	60-125		
1,1-Dichloroethane	44.4		5.00	ug/kg wet	50.000		89	70-130		
1,1-Dichloroethene	43.3		5.00	ug/kg wet	50.000		87	60-130		
1,2-Dichloroethane	46.7		6.00	ug/kg wet	50.000		93	60-130		
1,2-Dichloroethene (total)	93.0		5.00	ug/kg wet	100.00		93	75-125		
1,2-Dichloropropane	46.2		5.00	ug/kg wet	50.000		92	70-130		
2-Butanone	49.1		12.0	ug/kg wet	50.000		98	20-200		
2-Hexanone	53.3		12.0	ug/kg wet	50.000		107	20-200		
4-Methyl-2-pentanone	46.2		12.0	ug/kg wet	50.000		92	40-150		
Acetone	62.0		12.0	ug/kg wet	50.000		124	15-240		
Benzene	45.9		5.00	ug/kg wet	50.000		92	75-125		
Bromodichloromethane	47.3		6.00	ug/kg wet	50.000		95	65-135		
Bromoform	50.0		5.00	ug/kg wet	50.000		100	60-130		
Bromomethane	50.7		10.0	ug/kg wet	50.000		101	40-150		
Carbon Disulfide	41.2		5.00	ug/kg wet	50.000		82	55-140		
Carbon Tetrachloride	48.7		5.00	ug/kg wet	50.000		97	60-135		
Chlorobenzene	48.2		5.00	ug/kg wet	50.000		96	70-125		
Chloroethane	46.8		10.0	ug/kg wet	50.000		94	50-150		

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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 L208250 - SW 5035A									
LCS (L208250-BS1)			Prepared & Analyzed: 08/27/2012						
Chloroform	49.9	5.00	ug/kg wet	50.000		100	70-130		
Chloromethane	42.4	10.0	ug/kg wet	50.000		85	40-130		
cis-1,2-Dichloroethene	48.3	5.00	ug/kg wet	50.000		97	70-125		
cis-1,3-Dichloropropene	48.4	5.00	ug/kg wet	50.000		97	70-125		
Dibromochloromethane	46.8	5.00	ug/kg wet	50.000		94	65-125		
Ethylbenzene	50.6	5.00	ug/kg wet	50.000		101	70-125		
Methylene Chloride	39.5	6.00	ug/kg wet	50.000		79	45-140		
Styrene	48.9	5.00	ug/kg wet	50.000		98	70-125		
Tetrachloroethene	52.6	5.00	ug/kg wet	50.000		105	60-130		
trans-1,2-Dichloroethene	44.7	5.00	ug/kg wet	50.000		89	65-130		
Toluene	48.8	5.00	ug/kg wet	50.000		98	70-125		
trans-1,3-Dichloropropene	52.6	5.00	ug/kg wet	50.000		105	65-125		
Trichloroethene	49.0	5.00	ug/kg wet	50.000		98	70-130		
Vinyl chloride	44.5	10.0	ug/kg wet	50.000		89	50-150		
Xylenes, total	153	5.00	ug/kg wet	150.00		102	70-125		
Surrogate: 1,2-Dichloroethane-d4	*48.7*		*ug/kg wet*	*50.000*		*97*	*60-130*		
Surrogate: Toluene-d8	*52.3*		*ug/kg wet*	*50.000*		*105*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*52.4*		*ug/kg wet*	*50.000*		*105*	*72-144*		
Matrix Spike (L208250-MS1)		Source: 1208077-08	Prepared & Analyzed: 08/27/2012						
1,1,1-Trichloroethane	59.1	5.68	ug/kg dry	56.815	4.35 U	104	65-130		
1,1,2,2-Tetrachloroethane	51.3	5.68	ug/kg dry	56.815	4.35 U	90	50-130		
1,1,2-Trichloroethane	52.7	5.68	ug/kg dry	56.815	4.35 U	93	60-125		
1,1-Dichloroethane	54.0	5.68	ug/kg dry	56.815	4.35 U	95	70-130		
1,1-Dichloroethene	50.8	5.68	ug/kg dry	56.815	4.35 U	89	60-130		
1,2-Dichloroethane	59.3	6.82	ug/kg dry	56.815	5.22 U	104	60-130		
1,2-Dichloroethene (total)	105	5.68	ug/kg dry	113.63	4.35 U	92	75-125		
1,2-Dichloropropane	51.4	5.68	ug/kg dry	56.815	4.35 U	91	70-130		
2-Butanone	58.7	13.6	ug/kg dry	56.815	10.4 U	103	20-200		
2-Hexanone	61.4	13.6	ug/kg dry	56.815	10.4 U	108	20-200		
4-Methyl-2-pentanone	54.0	13.6	ug/kg dry	56.815	10.4 U	95	40-150		
Acetone	80.0	13.6	ug/kg dry	56.815	10.4 U	141	15-240		
Benzene	51.7	5.68	ug/kg dry	56.815	4.35 U	91	75-125		
Bromodichloromethane	57.5	6.82	ug/kg dry	56.815	5.22 U	101	65-135		
Bromoform	55.4	5.68	ug/kg dry	56.815	4.35 U	97	60-130		
Bromomethane	58.6	11.4	ug/kg dry	56.815	8.70 U	103	40-150		
Carbon Disulfide	45.7	5.68	ug/kg dry	56.815	4.35 U	80	55-140		

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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 L208250 - SW 5035A									
Matrix Spike (L208250-MS1)		**Source: 1208077-08**		Prepared & Analyzed: 08/27/2012					
Carbon Tetrachloride	59.4	5.68	ug/kg dry	56.815	4.35 U	105	60-135		
Chlorobenzene	51.8	5.68	ug/kg dry	56.815	4.35 U	91	70-125		
Chloroethane	52.1	11.4	ug/kg dry	56.815	8.70 U	92	50-150		
Chloroform	57.3	5.68	ug/kg dry	56.815	4.35 U	101	70-130		
Chloromethane	39.7	11.4	ug/kg dry	56.815	8.70 U	70	40-130		
cis-1,2-Dichloroethene	54.9	5.68	ug/kg dry	56.815	4.35 U	97	70-125		
cis-1,3-Dichloropropene	56.0	5.68	ug/kg dry	56.815	4.35 U	99	70-125		
Dibromochloromethane	54.6	5.68	ug/kg dry	56.815	4.35 U	96	65-125		
Ethylbenzene	55.0	5.68	ug/kg dry	56.815	4.35 U	97	70-125		
Methylene Chloride	51.0	6.82	ug/kg dry	56.815	6.04	79	45-140		
Styrene	52.2	5.68	ug/kg dry	56.815	4.35 U	92	70-125		
Tetrachloroethene	58.6	5.68	ug/kg dry	56.815	4.35 U	103	60-130		
trans-1,2-Dichloroethene	50.2	5.68	ug/kg dry	56.815	4.35 U	88	65-130		
Toluene	54.0	5.68	ug/kg dry	56.815	4.35 U	95	70-125		
trans-1,3-Dichloropropene	60.7	5.68	ug/kg dry	56.815	4.35 U	107	65-125		
Trichloroethene	57.4	5.68	ug/kg dry	56.815	0.986	99	70-130		
Vinyl chloride	45.4	11.4	ug/kg dry	56.815	8.70 U	80	50-150		
Xylenes, total	166	5.68	ug/kg dry	170.44	4.35 U	97	70-125		
Surrogate: 1,2-Dichloroethane-d4	*62.1*		*ug/kg dry*	*56.815*		*109*	*60-130*		
Surrogate: Toluene-d8	*59.0*		*ug/kg dry*	*56.815*		*104*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*62.1*		*ug/kg dry*	*56.815*		*109*	*72-144*		
Matrix Spike Dup (L208250-MSD1)		**Source: 1208077-08**		Prepared & Analyzed: 08/27/2012					
1,1,1-Trichloroethane	40.8	3.91	ug/kg dry	39.125	4.35 U	104	65-130	0.3	20
1,1,2,2-Tetrachloroethane	36.3	3.91	ug/kg dry	39.125	4.35 U	93	50-130	3	20
1,1,2-Trichloroethane	39.4	3.91	ug/kg dry	39.125	4.35 U	101	60-125	8	20
1,1-Dichloroethane	36.7	3.91	ug/kg dry	39.125	4.35 U	94	70-130	1	20
1,1-Dichloroethene	36.7	3.91	ug/kg dry	39.125	4.35 U	94	60-130	5	20
1,2-Dichloroethane	41.5	4.69	ug/kg dry	39.125	5.22 U	106	60-130	2	20
1,2-Dichloroethene (total)	76.3	3.91	ug/kg dry	78.250	4.35 U	97	75-125	5	20
1,2-Dichloropropane	37.8	3.91	ug/kg dry	39.125	4.35 U	97	70-130	6	20
2-Butanone	48.2	9.39	ug/kg dry	39.125	10.4 U	123	20-200	18	20
2-Hexanone	47.0	9.39	ug/kg dry	39.125	10.4 U	120	20-200	11	20
4-Methyl-2-pentanone	40.3	9.39	ug/kg dry	39.125	10.4 U	103	40-150	8	20
Acetone	62.5	9.39	ug/kg dry	39.125	10.4 U	160	15-240	13	20
Benzene	37.5	3.91	ug/kg dry	39.125	4.35 U	96	75-125	5	20
Bromodichloromethane	39.5	4.69	ug/kg dry	39.125	5.22 U	101	65-135	0.3	20

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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 L208250 - SW 5035A									
Matrix Spike Dup (L208250-MSD1)		**Source: 1208077-08**	Prepared & Analyzed: 08/27/2012						
Bromoform	42.9	3.91	ug/kg dry	39.125	4.35 U	110	60-130	12	20
Bromomethane	41.8	7.82	ug/kg dry	39.125	8.70 U	107	40-150	3	20
Carbon Disulfide	32.2	3.91	ug/kg dry	39.125	4.35 U	82	55-140	2	20
Carbon Tetrachloride	42.6	3.91	ug/kg dry	39.125	4.35 U	109	60-135	4	20
Chlorobenzene	38.7	3.91	ug/kg dry	39.125	4.35 U	99	70-125	8	20
Chloroethane	37.5	7.82	ug/kg dry	39.125	8.70 U	96	50-150	4	20
Chloroform	41.3	3.91	ug/kg dry	39.125	4.35 U	105	70-130	4	20
Chloromethane	28.5	7.82	ug/kg dry	39.125	8.70 U	73	40-130	4	20
cis-1,2-Dichloroethene	38.5	3.91	ug/kg dry	39.125	4.35 U	98	70-125	2	20
cis-1,3-Dichloropropene	39.2	3.91	ug/kg dry	39.125	4.35 U	100	70-125	2	20
Dibromochloromethane	39.7	3.91	ug/kg dry	39.125	4.35 U	101	65-125	5	20
Ethylbenzene	40.9	3.91	ug/kg dry	39.125	4.35 U	105	70-125	8	20
Methylene Chloride	36.1	4.69	ug/kg dry	39.125	6.04	77	45-140	3	20
Styrene	38.4	3.91	ug/kg dry	39.125	4.35 U	98	70-125	6	20
Tetrachloroethene	42.5	3.91	ug/kg dry	39.125	4.35 U	109	60-130	5	20
trans-1,2-Dichloroethene	37.8	3.91	ug/kg dry	39.125	4.35 U	97	65-130	9	20
Toluene	38.8	3.91	ug/kg dry	39.125	4.35 U	99	70-125	4	20
trans-1,3-Dichloropropene	43.8	3.91	ug/kg dry	39.125	4.35 U	112	65-125	5	20
Trichloroethene	40.0	3.91	ug/kg dry	39.125	0.986	100	70-130	0.5	20
Vinyl chloride	33.1	7.82	ug/kg dry	39.125	8.70 U	85	50-150	6	20
Xylenes, total	121	3.91	ug/kg dry	117.37	4.35 U	103	70-125	6	20
Surrogate: 1,2-Dichloroethane-d4	*43.9*		*ug/kg dry*	*39.125*		*112*	*60-130*		
Surrogate: Toluene-d8	*41.1*		*ug/kg dry*	*39.125*		*105*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*42.8*		*ug/kg dry*	*39.125*		*109*	*72-144*		