

0096349

SAF-RC-107
100-H Remaining Sites Burial Grounds –
Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt H4-21

COMMENTS:

SDG K2047

SAF-RC-107

Waste Site: 118-H-1:1



Date: 7 April 2011
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol – Waste Subsite
 118-H-1:1
 Subject: Diesel Range Organics - Data Package No. K2047-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2047 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J19Y39	5/11/10	Soil	C	See note 1
J19Y40	5/11/10	Soil	C	See note 1
J19Y41	5/11/10	Soil	C	See note 1
J19Y42	5/11/10	Soil	C	See note 1
J19Y43	5/11/10	Soil	C	See note 1
J19Y44	5/11/10	Soil	C	See note 1
J19Y45	5/11/10	Soil	C	See note 1
J19Y46	5/11/10	Soil	C	See note 1
J19Y47	5/11/10	Soil	C	See note 1
J19Y48	5/11/10	Soil	C	See note 1
J19Y49	5/11/10	Soil	C	See note 1
J19Y50	5/11/10	Soil	C	See note 1
J19Y51	5/11/10	Soil	C	See note 1
J19Y52	5/11/10	Soil	C	See note 1
J19Y53	5/11/10	Soil	C	See note 1
J19Y54	5/11/10	Soil	C	See note 1
J19Y55	5/11/10	Soil	C	See note 1
J19Y56	5/12/10	Soil	C	See note 1

1 – Diesel range organics by 8015B.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, Rev. 0, December 2001). 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

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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".

Due to the holding time being exceeded by less than twice the limit, the diesel range organic and motor oil result in sample J19Y42 were qualified as estimates and flagged "J".

All other 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 blank was submitted for analysis.

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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 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 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.

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 duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J19Y39/J19Y51) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

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. Ten motor oil results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

Completeness

Data package No. K2047 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 the holding time being exceeded by less than twice the limit, the diesel range organic and motor oil result in sample J19Y42 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".

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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.

Ten motor oil results 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

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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).

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Appendix 2
Summary of Data Qualification

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DIESEL RANGE ORGANICS DATA QUALIFICATION SUMMARY*

SDG: K2047	REVIEWER: ELR	Project: 118-H-1:1	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	J19Y42	Hold time
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

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

WC-Hanford, Inc.
 2620 Ferni Avenue
 Richland WA, 99354

Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 06/05/2010 06:18

K 4/12/11

Extractable Petroleum Hydrocarbons by SW846 8015
Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J19Y39 (1005049-01) Soil								
Surrogate: <i>p</i> -Terphenyl	91 %	39-129			L005243	05/21/2010	05/27/2010	8015M
Diesel Range Organics	3480 U	3480	ug/kg dry	1	L005243	05/21/2010	05/27/2010	8015M
Motor Oil	13800 J	10500	ug/kg dry	1	L005243	05/21/2010	05/27/2010	8015M
J19Y40 (1005049-02) Soil								
Surrogate: <i>p</i> -Terphenyl	85 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3370 U	3370	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	10100 U J	10100	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y41 (1005049-03) Soil								
Surrogate: <i>p</i> -Terphenyl	99 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3440 U	3440	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	10300 U J	10300	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y42 (1005049-04) Soil								
Surrogate: <i>p</i> -Terphenyl	90 %	39-129			L006002	06/01/2010	06/04/2010	8015M
Diesel Range Organics	3340 U J	3340	ug/kg dry	1	L006002	06/01/2010	06/04/2010	8015M
Motor Oil	4750 J J	10000	ug/kg dry	1	L006002	06/01/2010	06/04/2010	8015M
J19Y43 (1005049-05) Soil								
Surrogate: <i>p</i> -Terphenyl	96 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3370 U	3370	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	10100 U J	10100	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y44 (1005049-06) Soil								
Surrogate: <i>p</i> -Terphenyl	87 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3380 U	3380	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	10100 U J	10100	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M

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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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 06/05/2010 06:18

Extractable Petroleum Hydrocarbons by SW846 8015
Lionville Laboratory

4/5/10

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J19Y45 (1005049-07) Soil								
Surrogate: p-Terphenyl	84 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3410 U	3410	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	10200 U J	10200	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y46 (1005049-08) Soil								
Surrogate: p-Terphenyl	93 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3380 U	3380	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	4310 J J	10100	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y47 (1005049-09) Soil								
Surrogate: p-Terphenyl	85 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3440 U	3440	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	13300 J J	10300	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y48 (1005049-10) Soil								
Surrogate: p-Terphenyl	94 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3350 U	3350	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	10100 U J	10100	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y49 (1005049-11) Soil								
Surrogate: p-Terphenyl	92 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3380 U	3380	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	5770 J J	10200	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y50 (1005049-12) Soil								
Surrogate: p-Terphenyl	83 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3360 U	3360	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	5320 J J	10100	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M

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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-107 Project Number: K2047 Project Manager: Joan Kessler	Reported: 06/05/2010 06:18
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Extractable Petroleum Hydrocarbons by SW846 8015
Lionville Laboratory

4/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J19Y51 (1005049-13) Soil								
Surrogate: <i>p</i> -Terphenyl	86 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3450 U	3450	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	11500 J	10400	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y52 (1005049-14) Soil								
Surrogate: <i>p</i> -Terphenyl	86 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3370 U	3370	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	10100 U J	10100	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y53 (1005049-15) Soil								
Surrogate: <i>p</i> -Terphenyl	87 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3410 U	3410	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	10200 U J	10200	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y54 (1005049-16) Soil								
Surrogate: <i>p</i> -Terphenyl	83 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3390 U	3390	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	10200 U J	10200	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y55 (1005049-17) Soil								
Surrogate: <i>p</i> -Terphenyl	87 %	39-129			L005243	05/21/2010	05/28/2010	8015M
Diesel Range Organics	3390 U	3390	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
Motor Oil	3880 J J	10200	ug/kg dry	1	L005243	05/21/2010	05/28/2010	8015M
J19Y56 (1005049-18) Soil								
Surrogate: <i>p</i> -Terphenyl	82 %	39-129			L005243	05/21/2010	05/29/2010	8015M
Diesel Range Organics	3350 U	3350	ug/kg dry	1	L005243	05/21/2010	05/29/2010	8015M
Motor Oil	10000 U J	10000	ug/kg dry	1	L005243	05/21/2010	05/29/2010	8015M

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000014



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

Case Narrative

Client: WC-HANFORD RC-107 K2047
LVL #: 1005049

W.O. #: 60049-001-001-0001-00
Date Received: 05-14-2010

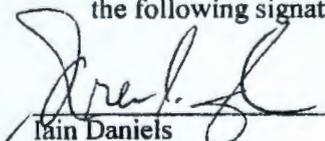
DIESEL RANGE ORGANICS

Eighteen (18) soil samples were collected on 05-11,12-2010.

The samples and associated QC samples were extracted 05-21-2010, (sample J19Y42 was re-extracted 06-01-2010) and analyzed 05-27,28,29-2010 and 06-04-2010 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. The samples were originally extracted within their required holding time. Due to the loss of sample J19Y42, this sample was re-extracted outside of hold time. The re-extracted results have been reported.
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. 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.
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

6/8/10
Date

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Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-107-019		Page 1 of 2			
Collector 5-11-10 Clark, S			Company Contact Don Woolery			Telephone No. 509-431-0448			Project Coordinator KESSNER, JH		Price Code BL		Data Turnaround 21 Days	
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol			Sampling Location 118-H-1 Exc-A Verification			SAF No. RC-107								
Ice Chest No. ERC-02-009			Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex							
Shipped To EBERLINE SERVICES / LIONVILLE			Offsite Property No. A100205/206			Bill of Lading/Air Bill No. SEE OSRC								
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation < DOT Limits				Preservation	Name	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Name	Name	Name		
Special Handling and/or Storage Cool 4 Deg C				Type of Container	aG	aG	aG	aG	aG	P	P	P		
No. of Container(s)				1	1	1	0	1	1	0	0	0		
Volume				125ml.	125ml.	250mL	250mL	125mL	1000ml	1000ml	1000ml.			
SAMPLE ANALYSIS				See item (1) in Special Instructions.	NO2/NO3 - 353.2	TPH-Diesel Range - WTP1 - D+	PCBs - B082	PAHs - R310	See item (2) in Special Instructions	Isotopic Strontium	Carbon-14 Low Level, Tritium - 113	Ni-63, Etal Sr-90		
				000016										
Sample No.	Matrix *	Sample Date	Sample Time											
J19Y39	SOIL	5-11-10	0825	X	X	X	X	X						
J19Y40	SOIL	5-11-10	1215	X	X	X	X	X						
J19Y41	SOIL	5-11-10	0915	X	X	X	X	X						
J19Y42	SOIL	5-11-10	1230	X	X	X	X	X						
J19Y43	SOIL	5-11-10	1245	X	X	X	X	X						
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS						Matrix *		
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time	Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) (2) Gamma Spec - Client List {Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable}						Matrix * Soil SF - Sediment SC - Solid SL - Sludge W - Water U - Uril A - Air ES - Emission Source DL - Drums / Liquid F - Fossil W/W - Waste F - Fungal V - Vegetation X - Other		
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time									
LABORATORY SECTION	Received By		Title									Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By									Date/Time		



Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-107-019		Page 2 of 3							
Collector Clark, S			Common Contact Don Woolery			Telephone No. 509-431-0448			Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 21 Days					
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol			Sampling Location 118-H-1 Exc-A Verification			SAF No. RC-107												
Ice Chest No. ERC-02-009			Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex											
Shipped To EBERLINE SERVICES / LIONVILLE			Offsite Property No. A100205/806			Bill of Lading/Air Bill No. SEE OSPC												
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation Special Handling and/or Storage Cool 4 Deg C			Preservation		None		Cool 4C		Cool 4C		Cool 4C		None		None		None	
◀ DOT Limits			Type of Container		aG		aG		aG		aG		P		P		P	
000017			No. of Container(s)		1		1		1		0		1		1		0	
			Volume		125mL		125mL		250mL		250mL		125mL		1000mL		1000mL	
SAMPLE ANALYSIS			See item (1) in Special Instructions.		NO2/NO3 - 353.2		TPH-Diesel Range - WTPH-D+		PCBs - 8082		PAHs - 8310		See item (2) in Special Instructions		Isotopic Platinum		Carbon-14 Low Level; Tritium - 113 M-63, Bhl Sr-90	
Sample No.		Matrix *	Sample Date		Sample Time													
J19Y44		SOIL	5-11-10		0945		X	X	X	X	X							
J19Y45		SOIL	5-11-10		0930		X	X	X	X	X							
J19Y46		SOIL	5-11-10		1000		X	X	X	X	X							
J19Y47		SOIL	5-11-10		1030		X	X	X	X	X							
J19Y48		SOIL	5-11-10		1345		X	X	X	X	X							
CHAIN OF POSSESSION			Sign/Print Names						SPECIAL INSTRUCTIONS						Matrix *			
Relinquished By/Removed From S. Van Den Hende Date/Time 5-11-10 1435			Received By/Stored In S. Van Den Hende Date/Time 5-11-10 1435			Run all Rad analysis from 1000ml container.						(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)		S=Soil SE=Soil/Env SL=Soil/Le SL=Sludge W=Water O=Oil A=Air DS=Drum Spills DL=Drum Leaks T=Trash WH=Wipe L=Liquid V=Vegetation N=Other				
Relinquished By/Removed From S. Van Den Hende Date/Time 5-11-10 1800			Received By/Stored In J. E. Beal Date/Time 5-11-10															
Relinquished By/Removed From J. E. Beal Date/Time 5-13-10 1230			Received By/Stored In FED EX Date/Time															
Relinquished By/Removed From Fed Ex Date/Time 5-14-10 1010			Received By/Stored In VICTOR HERNANDEZ Date/Time 5-14-10 1010															
Relinquished By/Removed From			Received By/Stored In															
LABORATORY SECTION			Received By						Title						Date/Time			
FINAL SAMPLE DISPOSITION			Disposal Method						Disposed By						Date/Time			



33333333

Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-107-019		Page 1 of 1			
Collector R-Driven 5-11-10 Clark, S.			Company Contact Don Woolery			Telephone No. 509-431-0448			Project Coordinator KESSNER, JH		Price Code BL		Data Turnaround 21 Days	
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol			Sampling Location 118-H-1 Exc-A Verification			SAF No. RC-107								
Ice Chest No. EAC-02-009			Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex							
Shipped To EBERLINE SERVICES / LIONVILLE			Offsite Property No. A100205/206			Bill of Lading/Air Bill No. SEE OSPC								
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation < DOT Limits Special Handling and/or Storage Cool 4 Deg C 000018				Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	
				Type of Container		aG	aG	aG	aG	aG	P	P	P	
				No. of Container(s)		1	1	1	0	1	1	0	0	
				Volume		125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL	
SAMPLE ANALYSIS				See item (1) in Special Instructions.	NO2/NO3 - 353.2	TPH - Diesel Range - WTPH - D +	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotope Plutonium	Carbon-14 Low Level; Tritium - 113 Ni-63, Total Sr-90			
Sample No.	Matrix *	Sample Date	Sample Time											
J19Y49	SOIL	5-11-10	1315	X	X	X	X	X						
J19Y50	SOIL	5-11-10	1400	X	X	X	X	X						
J19Y51	SOIL	5-11-10	0825	X	X	X	X	X						
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium 152, Europium-154, Europium-155, Silver-108 metastable)				Se=Soil SE=Soil+water Sl=Sludge W=Water U=U Au=Air DS=Drum Solids D=Drum Contents T=Trash W=Wipe L=Liquid V=Vegetation N=Other		
S. Van Den Hende		5-11-10		S. Van Den Hende		5-11-10 1435								
S. Van Den Hende		5-11-10		J. E. Baul		5-11-10 1800								
J. E. Baul		5-13-10		FED EX										
F. O. P.		5-14-10 1010		VICTOR HERNANDEZ		5-14-10 1010								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION	Received By			Title			Date/Time							
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By			Date/Time							

Washington Closure Hanford				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 2			
Collector: <i>DH 5/14/10 Clark</i>				Company Contact: Don Woolery		Telephone No.: 509-431-0448		Project Coordinator: KESSNER, JH		Price Code: <i>BL</i>		Data Turnaround: 21 Days		
Project Designation: 100-H Remaining Sites Burial Grounds - Soil Full Protocol				Sampling Location: 11R-H-1 Exc-B Verification			SAF No.: RC-107							
Ice Chest No.: <i>ERC-02-009</i>				Field Logbook No.: EL 1627-4		COA: R118H12000		Method of Shipment: Fed Ex						
Shipped To: EBERLINE SERVICES (LIONVILLE)				Offsite Property No.: <i>A100205/206</i>			Bill of Lading/Air Bill No.: <i>SEE OSPC</i>							
POSSIBLE SAMPLE HAZARD/REMARKS														
Possible Radiation: <i><DOT Limits</i>														
Special Handling and/or Storage: <i>Cool 4 Deg C</i>														
<i>000019</i> SAMPLE ANALYSIS				Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	
				Type of Container		aG	aG	aG	aG	aG	P	P	P	
				No. of Container(s)		1	1	1	0	1	1			
				Volume		125mL	125mL	250mL	250mL	125mL	1000mL			
				See item (1) in Special Instructions	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D +	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotope: Plutonium	Carbon-14 Low Level, Tritium - H1 Ni-63, Total Sr-90			
Sample No.	Matrix *	Sample Date	Sample Time											
J19Y52	SOIL	5-11-10	1315	X	X	X	X	X						
J19Y53	SOIL	5-11-10	1345	X	X	X	X	X						
J19Y54	SOIL	5-11-10	1350	X	X	X	X	X						
J19Y55	SOIL	5-11-10	1355	X	X	X	X	X						
J19Y56 <i>5-5-11-10</i>	SOIL													
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Chise-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV) (2) Gamma Spec - Client List [Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable]				Matrix * B-241 SE-241 SE-241 SE-241 W - Water C-14 AC-14 DS - Dism. Sev. 14 DS - Dism. Sev. 14 F-150m WTA Wqe F-150m V - Vegetation A - Other		
<i>Stephen A. Clark / Steve Clark</i>		<i>5-11-10 1435</i>		<i>S. Van Den Hende</i>		<i>5-11-10 1435</i>								
<i>S. Van Den Hende</i>		<i>5-11-10 1800</i>		<i>J. E. Bawl</i>		<i>5-11-10 1800</i>								
<i>J. E. Bawl</i>		<i>5-13-10 1230</i>		<i>FED EX</i>										
<i>Fed Ex</i>		<i>5-14-10 1010</i>		<i>VICTOR HERNANDEZ</i>		<i>5-14-10 1010</i>								
LABORATORY SECTION		Received By		Title										
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By										



Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 1		
Collector R. Brown Clark, S		Company Contact Don Woolery		Telephone No. 509-431-0448		Project Coordinator KESSNER, JI		Price Code 8L		Data Turnaround 21 Days	
Project Designation 100-II Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 118-H-1 Exc-B Verification		SAF No. RC-107							
Ice Chest No. ERC-02-009		Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex					
Shipped To EBERLINE SERVICES (LIONVILLE)		Offsite Property No. A100205/206		Bill of Lading/Air Bill No. SEE OSPA							
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation < DOT Limits		Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None
Special Handling and/or Storage Cool 4 Deg C		Type of Container		aG	aG	aG	aG	aG	P	P	P
000020		No. of Container(s)		1	1	1	0	1	1	0	0
		Volume		125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS		See item (1) in Special Instructions		NO2/NO3 - 353.2	TPH-Diesel Range - WPHI: D+	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotopic Plutonium	Carbon-14 Low Level, Tritium - 113	
Sample No.	Matrix *	Sample Date	Sample Time								
J19Y52	SOIL										
J19Y53	SOIL										
J19Y54	SOIL										
J19Y55	SOIL										
J19Y56	SOIL	5-12-10	0900	✓	✓	✓	✓	✓			
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
LABORATORY SECTION		Received By		Title		Date/Time		REVIEWED BY JRD DATE 5/14/10			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Appendix 5
Data Validation Supporting Documentation

000021

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	118-14-1:1		DATA PACKAGE: K2047		
VALIDATOR:	ELR	LAB:	LLI	DATE: 4/3/11	
			SDG:	K2047	
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
J19439	J19440	J19441	J19442	J19443	J19444
J19445	J19446	J19447	J19448	J19449	J19450
J19451	J19452	J19453	J19454	J19455	J19456
					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: 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

no water oil LCS, MS, MSD - J cell

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: _____
42 < 2x - fall

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: 10 over

9. SAMPLE CLEANUP (Levels D and E)

Fluoridil ® (or other aborbant) cleanup performed? Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable? Yes No N/A
Check materials traceable? Yes No N/A
Check materials Expired? Yes No N/A
Analytical batch QC given similar cleanup? Yes No N/A
Transcription/Calculation Errors? Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000026.



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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 06/05/2010 06:18
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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 L005243 - SW 3540C

Blank (L005243-BLK1)				Prepared: 05/21/2010 Analyzed: 05/27/2010					
Diesel Range Organics	3330 U	3330	ug/kg wet						
Motor Oil	10000 U	10000	ug/kg wet						
Surrogate: p-Terphenyl	5460		ug/kg wet	6666.7		82	39-129		
LCS (L005243-BS1)				Prepared: 05/21/2010 Analyzed: 05/27/2010					
Diesel Range Organics	63800	3330	ug/kg wet	66667		96	34-104		
Surrogate: p-Terphenyl	6340		ug/kg wet	6666.7		95	39-129		
Matrix Spike (L005243-MS1)		Source: 1005049-01		Prepared: 05/21/2010 Analyzed: 05/28/2010					
Diesel Range Organics	64300	3480	ug/kg dry	69695	3480 U	92	34-104		
Surrogate: p-Terphenyl	6210		ug/kg dry	6969.5		89	39-129		
Matrix Spike Dup (L005243-MSD1)		Source: 1005049-01		Prepared: 05/21/2010 Analyzed: 05/28/2010					
Diesel Range Organics	67800	3480	ug/kg dry	69695	3480 U	97	34-104	5	40
Surrogate: p-Terphenyl	6400		ug/kg dry	6969.5		92	39-129		

Batch L006002 - SW 3540C

Blank (L006002-BLK1)				Prepared: 06/01/2010 Analyzed: 06/04/2010					
Diesel Range Organics	3330 U	3330	ug/kg wet						
Motor Oil	10000 U	10000	ug/kg wet						
Surrogate: p-Terphenyl	5850		ug/kg wet	6666.7		88	39-129		
LCS (L006002-BS1)				Prepared: 06/01/2010 Analyzed: 06/04/2010					
Diesel Range Organics	62900	3330	ug/kg wet	66667		94	34-104		
Surrogate: p-Terphenyl	6190		ug/kg wet	6666.7		93	39-129		

000027

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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 06/05/2010 06:18

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 L006002 - SW 3540C									
Matrix Spike (L006002-MS1)		Source: 1005049-04		Prepared: 06/01/2010 Analyzed: 06/04/2010					
Diesel Range Organics	60400	3220	ug/kg dry	64473	3340 U	94	34-104		
Surrogate: <i>p</i> -Terphenyl	5990		ug/kg dry	6447.3		93	39-129		
Matrix Spike Dup (L006002-MSD1)		Source: 1005049-04		Prepared: 06/01/2010 Analyzed: 06/04/2010					
Diesel Range Organics	66100	3330	ug/kg dry	66605	3340 U	99	34-104	6	40
Surrogate: <i>p</i> -Terphenyl	6460		ug/kg dry	6660.5		97	39-129		

000028

Date: 7 April 2011
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol – 118-H-1:1
 Subject: Polyaromatic Hydrocarbons - Data Package No. K2047-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2047 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J19Y39	5/11/10	Soil	C	See note 1
J19Y40	5/11/10	Soil	C	See note 1
J19Y41	5/11/10	Soil	C	See note 1
J19Y42	5/11/10	Soil	C	See note 1
J19Y43	5/11/10	Soil	C	See note 1
J19Y44	5/11/10	Soil	C	See note 1
J19Y45	5/11/10	Soil	C	See note 1
J19Y46	5/11/10	Soil	C	See note 1
J19Y47	5/11/10	Soil	C	See note 1
J19Y48	5/11/10	Soil	C	See note 1
J19Y49	5/11/10	Soil	C	See note 1
J19Y50	5/11/10	Soil	C	See note 1
J19Y51	5/11/10	Soil	C	See note 1
J19Y52	5/11/10	Soil	C	See note 1
J19Y53	5/11/10	Soil	C	See note 1
J19Y54	5/11/10	Soil	C	See note 1
J19Y55	5/11/10	Soil	C	See note 1
J19Y56	5/12/10	Soil	C	See note 1

1 – Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, Rev. 0, December 2001). 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

000001

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.

All accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-35%. 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

One set of field duplicates (J19Y39/J19Y51) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field

000003

duplicate results were acceptable.

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. No RQLs were specified..

Completeness

Data package No. K2047 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

DOE/RL-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1
Glossary of Data Reporting Qualifiers

000005

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).

000006

Appendix 2

Summary of Data Qualification

000007

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: K2047	REVIEWER: ELR	Project: 118-H-1:1	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

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

000008

Appendix 3
Annotated Laboratory Reports

000009



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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y39
1005049-01 (Soil)

4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.45 U	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.45 U	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	2.51 J	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.45 U	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	1.85 J	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.45 U	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	2.57 J	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	11.2	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	3.70	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	3.45 U	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	3.45 U	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b] fluoranthene	1.02 J	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k] fluoranthene	0.968 J	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a] pyrene	1.80 J	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.45 U	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i] perylene	1.97 J	3.45	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	106 %	68-129			L005256	05/22/2010	05/27/2010	8310

000010

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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 14:28

J19Y40
 1005049-02 (Soil)

Handwritten: ✓
 4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	3.27 J	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	0.946 J	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b]fluoranthene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k]fluoranthene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a]pyrene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i]perylene	3.32 U	3.32	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	104 %	68-129			L005256	05/22/2010	05/27/2010	8310

000011

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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 14:28

J19Y41
 1005049-03 (Soil)

4/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	1.37 J	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	1.29 J	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b]fluoranthene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k]fluoranthene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a]pyrene	1.13 J	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i]perylene	1.08 J	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	104 %	68-129			L005256	05/22/2010	05/27/2010	8310

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y42
1005049-04 (Soil)

Handwritten signature/initials

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	2.18 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	4.86	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	2.09 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	1.71 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	1.21 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b] fluoranthene	1.83 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k] fluoranthene	0.938 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a] pyrene	1.94 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i] perylene	1.19 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	104 %	68-129			L005256	05/22/2010	05/27/2010	8310



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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA. 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y43
1005049-05 (Soil)

Handwritten: 4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	0.985 J	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	3.48	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	1.20 J	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b] fluoranthene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k] fluoranthene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a] pyrene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i] perylene	3.28 U	3.28	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	98 %	68-129			L005256	05/22/2010	05/27/2010	8310

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y44
1005049-06 (Soil)

✓
4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	1.51 J	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	13.9	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.03 J	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	44.9	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	10.2	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	53.4	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	14.4	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	15.7	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b]fluoranthene	17.8	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k]fluoranthene	8.35	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a]pyrene	19.8	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.41	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i]perylene	12.1	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	105 %	68-129			L005256	05/22/2010	05/27/2010	8310

000015



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 Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y45
1005049-07 (Soil)

Handwritten initials/signature
 4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.34 J	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	1.01 J	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	4.47	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b]fluoranthene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k]fluoranthene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a]pyrene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i]perylene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	102 %	68-129			L005256	05/22/2010	05/27/2010	8310

000016



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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y46
1005049-08 (Soil)

W
4/5/10

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	1.85 J	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b] fluoranthene	0.890 J	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k] fluoranthene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a] pyrene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i] perylene	3.36 U	3.36	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	105 %	68-129			L005256	05/22/2010	05/27/2010	8310

000017

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 Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA. 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y47
1005049-09 (Soil)

4/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	5.32	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Accnaphthylene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Accnaphthene	3.43 U	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	6.18	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	47.2	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	10.6	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	143	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	29.4	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	146	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	40.1	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	55.2	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b] fluoranthene	50.8	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k] fluoranthene	23.4	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a] pyrene	54.7	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	8.03	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i] perylene	28.7	3.43	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	114 %	68-129			L005256	05/22/2010	05/27/2010	8310

000018

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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 14:28

J19Y48
 1005049-10 (Soil)

Handwritten: ✓
 4/15/11

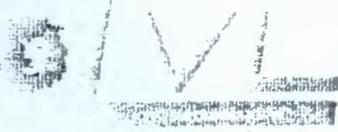
Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	1.19 J	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b] fluoranthene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k] fluoranthene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a] pyrene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i] perylene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	107 %	68-129			L005256	05/22/2010	05/27/2010	8310

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WC-Hanford, Inc.
 2620 Fermi Avenue
 Richland WA, 99354

Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 14:28

J19Y49
 1005049-11 (Soil)

4/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	7.48	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	1.35 J	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	20.9	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	3.37 U	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	22.0	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	8.58	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	7.87	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b] fluoranthene	14.2	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k] fluoranthene	5.33	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a] pyrene	12.3	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	1.82 J	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i] perylene	6.31	3.37	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	110 %	68-129			L005256	05/22/2010	05/27/2010	8310

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 2620 Fermi Avenue
 Richland WA, 99354

Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 14:28

J19Y50
 1005049-12 (Soil)

4/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	2.51 J	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	3.01 J	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	0.836 J	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	7.52	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	6.60	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	7.57	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	3.41	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	4.50	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b]fluoranthene	5.89	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k]fluoranthene	1.76 J	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a]pyrene	3.86	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.34 U	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i]perylene	2.71 J	3.34	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	103 %	68-129			L005256	05/22/2010	05/27/2010	8310

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y51
 1005049-13 (Soil)

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 4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.40 U	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.40 U	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.40 U	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.40 U	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	3.40	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.40 U	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	3.40 U	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	17.0	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	5.93	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	1.38 J	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	3.40 U	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b] fluoranthene	4.35	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k] fluoranthene	1.41 J	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a] pyrene	3.32 J	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.40 U	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i] perylene	3.35 J	3.40	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	104 %	68-129			L005256	05/22/2010	05/27/2010	8310

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WC-Hanford, Inc.
 2620 Fermi Avenue
 Richland WA, 99354

Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 14:28

J19Y52
 1005049-14 (Soil)

✓
 4/5/10

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	1.32 J	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	4.47	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	3.01 J	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	3.44	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a]anthracene	1.74 J	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	1.27 J	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b] fluoranthene	1.27 J	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k] fluoranthene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a] pyrene	1.06 J	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i] perylene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	101 %	68-129			L005256	05/22/2010	05/27/2010	8310

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y53
 1005049-15 (Soil)

Handwritten: 4/15/14

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthylene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Acenaphthene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluorene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Phenanthrene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Anthracene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Fluoranthene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Indeno[1,2,3-cd]pyrene	2.76 J	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Pyrene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benz[a]anthracene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Chrysene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[b]fluoranthene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[k]fluoranthene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[a]pyrene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Dibenz[a,h]anthracene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Benzo[g,h,i]perylene	3.31 U	3.31	ug/kg dry	1	L005256	05/22/2010	05/27/2010	8310
Surrogate: Triphenylene	103 %	68-129			L005256	05/22/2010	05/27/2010	8310

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
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J19Y54
1005049-16 (Soil)

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4/13/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Acenaphthylene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Acenaphthene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Fluorene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Phenanthrene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Anthracene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Fluoranthene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Indeno[1,2,3-cd]pyrene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Pyrene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benz[a]anthracene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Chrysene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[b] fluoranthene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[k] fluoranthene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[a] pyrene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Dibenz[a,h]anthracene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[g,h,i] perylene	3.18 U	3.18	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Surrogate: Triphenylene	101 %	68-129			L005256	05/22/2010	05/28/2010	8310

000025



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WC-Hanford, Inc.
2620 Fermi Avenue
Richland WA. 99354

Project: RC-107
Project Number: K2047
Project Manager: Joan Kessner

Reported:
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J19Y55
1005049-17 (Soil)

✓
4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.38 U	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Acenaphthylene	3.38 U	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Acenaphthene	1.84 J	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Fluorene	3.38 U	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Phenanthrene	0.845 J	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Anthracene	3.38 U	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Fluoranthene	2.20 J	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Indeno[1,2,3-cd]pyrene	1.81 J	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Pyrene	1.22 J	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[a]anthracene	3.38 U	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Chrysene	1.50 J	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[b]fluoranthene	3.38 U	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[k]fluoranthene	3.38 U	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[a]pyrene	0.862 J	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Dibenz[a,h]anthracene	3.38 U	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[g,h,i]perylene	3.38 U	3.38	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Surrogate: Triphenylene	105 %	68-129			L005256	05/22/2010	05/28/2010	8310

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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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 14:28
---	---	-------------------------------

J19Y56
1005049-18 (Soil)

4/15/10

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
---------	----------------------	-----------------	-------	----------	-------	----------	----------	--------

Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Acenaphthylene	11.8	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Acenaphthene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Fluorene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Phenanthrene	3.43	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Anthracene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Fluoranthene	3.60	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Indeno[1,2,3-cd]pyrene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Pyrene	3.08 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[a]anthracene	2.01 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Chrysene	5.68	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[b] fluoranthene	7.50	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[k] fluoranthene	1.04 J	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[a] pyrene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Dibenz[a,h]anthracene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Benzo[g,h,i] perylene	3.35 U	3.35	ug/kg dry	1	L005256	05/22/2010	05/28/2010	8310
Surrogate: Triphenylene	106 %	68-129			L005256	05/22/2010	05/28/2010	8310

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000028



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

Case Narrative

Client: WC-HANFORD RC-107 K2047
LVL #: 1005049

W.O. #: 60049-001-001-0001-00
Date Received: 05-14-2010

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

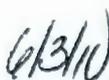
Eighteen (18) soil samples were collected on 05-11,12-2010.

The samples and associated QC samples were extracted 05-22-2010 and analyzed 05-27,28-2010 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. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
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. The samples were reported on a dry weight basis.
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. 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


Date

000029

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-019		Page 1 of 3			
Collector Clark, S		Company Contact Don Woolery		Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code BL		Data Turnaround 21 Days		
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 118-H-1 Exc-A Verification		SAF No. RC-107								
Ice Chest No. ERC-02-009		Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex						
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. A100205/206		Bill of Lading/Air Bill No. SEE OSRC								
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation <DOT Limits				Preservation		Type of Container		No. of Container(s)		Volume		
				None		aG		1		125mL		
				Cool 4C		aG		1		125mL		
				Cool 4C		aG		1		250mL		
				Cool 4C		aG		0		250mL		
				None		P		1		1000mL		
				None		P		0		1000mL		
				None		P		0		1000mL		
Special Handling and/or Storage Cool 4 Deg C				See item (1) in Special Instructions		NO2/NO3 - 353.2		TPH - Diesel Range - WTPH-D +		PCBs - 8082		
000030				See item (2) in Special Instructions		PAHs - 8310		Stochastic Plutonium		Carbon-14 Low Level; Tritium 10; Ni-63, Total Sr-90		
Sample No.		Matrix *	Sample Date	Sample Time								
J19Y39		SOIL	5-11-10	0825	X	X	X	X	X			
J19Y40		SOIL	5-11-10	1215	X	X	X	X	X			
J19Y41		SOIL	5-11-10	0915	X	X	X	X	X			
J19Y42		SOIL	5-11-10	1230	X	X	X	X	X			
J19Y43		SOIL	5-11-10	1245	X	X	X	X	X			
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *				
Relinquished By/Removed From Clark, S		Date/Time 5-11-10		Received By/Stored In S. Van Den Herde		Date/Time 5-11-10		Run all Rad analysis from 1000ml container				Soil
Relinquished By/Removed From S. Van Den Herde		Date/Time 5-11-10		Received By/Stored In J.E. Beaul		Date/Time 5-11-10		(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Strontium, Vanadium, Zinc); Mercury - 7471 - (CV)				SE=Sludg
Relinquished By/Removed From J.E. Beaul		Date/Time 5-13-10		Received By/Stored In FED EX		Date/Time		(2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)				SO=Soil
Relinquished By/Removed From Fed Ex		Date/Time 5-14-10		Received By/Stored In Victor Hernandez		Date/Time 5-14-10						Sl=Sludge
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						W=Water
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						O=Oil
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						A=Air
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						D=Drum Content
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						L=Liner
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						W=Wipe
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						L=Label
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						V=Vapor
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						X=Other
LABORATORY SECTION		Received By		Title		Date/Time		REVIEWED BY JRD DATE 5/13/10				
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time						

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-107-019		Page 2 of 3	
Collector R. Brown Clark, S		Company Contact Don Woolery		Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code 8L	
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 118-11-1 Exc-A Verification		SAF No. RC-107				Data Turnaround 21 Days	
Ice Chest No. ERC-02-009		Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex			
Shipped To EDERLINE SERVICES / LIONVILLE		Offsite Property No. A100205/206		Bill of Lading/Air Bill No. SEE OSPE					

POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation Special Handling and/or Storage Cool 4 Deg C 0000031	Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None
	Type of Container	aG	aG	aG	aG	aG	P	P	P
	No. of Container(s)	1	1	1	0	1	1	0	0
	Volume	125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS		See item (1) in Special Instructions	NO2/NO3 - 351.2	TPH - Diesel Range - WTPH - D +	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotopic Plutonium	Carbon-14 Low Level, Tritium - H3 Ni-63, Bq/L Sr-90
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Sample No.	Matrix *	Sample Date	Sample Time								
J19Y44	SOIL	5-11-10	0945	X	X	X	X	X			
J19Y45	SOIL	5-11-10	0930	X	X	X	X	X			
J19Y46	SOIL	5-11-10	1000	X	X	X	X	X			
J19Y47	SOIL	5-11-10	1030	X	X	X	X	X			
J19Y48	SOIL	5-11-10	1345	X	X	X	X	X			

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	Run all Rad analysis from 1000ml container		Soil	
Stephen A. Clark / Steve Beck	5-11-10 1435	S. Van Den Hende	5-11-10 1435	(1) ICP Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV)		Soil Sediment	
S. Van Den Hende	5-11-10 1800	J. E. Beal	5-11-10	(2) Gamma Spec - Client List [Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable]		Soil Slurry	
J. E. Beal	5-13-10 1230	FED EX				Water	
Fed Ex	5-14-10 1010	VICTOR HERNANDEZ	5-14-10 1010			Oil	
						As Air	
						In/From Soil	
						In/From Liquid	
						F-Tissue	
						Wt-Wt	
						L-Tissue	
						Vegetation	
						As In	



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

Collector: *R. Threven Clark, S.* Company Contact: *Don Woolery* Telephone No.: *509-431-0448* Project Coordinator: *KESSNER, JH* Price Code: *8L* Data Turnaround: **21 Days**

Project Designation: *100-II Remaining Sites Burial Grounds - Soil Full Protocol* Sampling Location: *118-H-1 Exc-A Verification* SAF No.: *RC-107*

Ice Chest No.: *ERC-02-009* Field Logbook No.: *EL 1627-4* COA: *R118112000* Method of Shipment: *Fed Ex*

Shipped To: *EMERLINE SERVICES / LIONVILLE* Offsite Property No.: *A100205/206* Bill of Lading/Air Bill No.: *SEE QSPC*

POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation: <i>< DOT Limits</i> Special Handling and/or Storage: Cool 4 Deg C	Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Note	None	None
	Type of Container	aG	aG	aG	aG	aG	P	P	P
	No. of Container(s)	1	1	1	0	1	1	0	0
	Volume	125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL

0000032	SAMPLE ANALYSIS				See item (1) in Special Instructions	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D +	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotopic Plutonium	Carbon-14 Low Level, Tritium - 113 Ni-63 Total Sr-90
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Sample No.	Matrix *	Sample Date	Sample Time									
J19Y49	SOIL	5-11-10	1315	X	X	X	X	X				
J19Y50	SOIL	5-11-10	1400	X	X	X	X	X				
J19Y51	SOIL	5-11-10	0825	X	X	X	X	X				

CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV) (2) Gamma Spec - Client List [Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable]	Se=Se Sr=Strontium S=Solids W=Water Ur=Urine As=Air HS=Drum Solids ML=Drum Liquids T=Time W=Wipe L=Liquid V=Vegetation K=Other			
<i>S. Van Den Herde</i>	<i>5-11-10 1435</i>	<i>S. Van Den Herde</i>	<i>5-11-10 1435</i>	<i>S. Van Den Herde</i>	<i>5-11-10 1800</i>	<i>J. E. Beal</i>	<i>5-11-10</i>					
<i>J. E. Beal</i>	<i>5-13-10 1230</i>	<i>FED EX</i>		<i>J. E. Beal</i>	<i>5-14-10 1010</i>	<i>VICTOR HERNANDEZ</i>	<i>5-14-10 1010</i>					
<i>FED EX</i>												



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

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 2		
Collector: <i>5/14/10 Clark</i>		Company Contact: Don Woolery			Telephone No.: 509-431-0448		Project Coordinator: KESSNER, JH		Price Code: 8L		
Project Designation: 100-H Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location: 118-H-1 Exc-B Verification			SAF No.: RC-107				Data Turnaround: 21 Days		
Ice Chest No.: <i>ERC-02-009</i>		Field Logbook No.: EL 1627-4		COA: R11RH12000		Method of Shipment: Fed Ex					
Shipped To: EBERLINE SERVICES <i>LIONVILLE</i>		Offsite Property No.: <i>A100205/206</i>			Bill of Lading/Air Bill No.: <i>SEE OSCC</i>						
POSSIBLE SAMPLE HAZARDS/REMARKS <i>Possible Radiation <DOT Limits</i>		Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Special Handling and/or Storage <i>Cool 4 Deg C</i>		Type of Container		uG	uG	uG	uG	uG	P	P	
0000033		No. of Container(s)		1	1	1	0	1	1	0	
		Volume		125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	
SAMPLE ANALYSIS		See item (1) in Special Instructions		NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotope: Plutonium	Carbon-14 Low Level, Tritium - H3 Ni-63, Total Sr-90	
Sample No.	Matrix *	Sample Date	Sample Time								
J19Y52	SOIL	5-11-10	1315	X	X	X	X	X			
J19Y53	SOIL	5-11-10	1345	X	X	X	X	X			
J19Y54	SOIL	5-11-10	1350	X	X	X	X	X			
J19Y55	SOIL	5-11-10	1355	X	X	X	X	X			
J19Y56	SOIL	5-11-10									
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From: <i>Stephen A. Clark</i>		Date/Time: <i>5-11-10 1435</i>		Received By/Stored In: <i>S. Van Den Herde</i>		Date/Time: <i>5-11-10 1435</i>		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)			
Relinquished By/Removed From: <i>S. Van Den Herde</i>		Date/Time: <i>5-11-10 1800</i>		Received By/Stored In: <i>J. E. Beaul</i>		Date/Time: <i>5-11-10</i>					
Relinquished By/Removed From: <i>J. E. Beaul</i>		Date/Time: <i>5-13-10 1230</i>		Received By/Stored In: <i>FED EX</i>		Date/Time: <i></i>					
Relinquished By/Removed From: <i>Paul Eo</i>		Date/Time: <i>5-14-10 1010</i>		Received By/Stored In: <i>VICTOR HERNANDEZ</i>		Date/Time: <i>5-14-10 1010</i>					
Relinquished By/Removed From:		Date/Time:		Received By/Stored In:		Date/Time:					
Relinquished By/Removed From:		Date/Time:		Received By/Stored In:		Date/Time:					
LABORATORY SECTION		Received By:		Title:		Matrix * Soil Slush Sludge Water Gas Ash (See address for details, Dioxin, Spill, etc.) Waste Leachate Vegetation Other					
FINAL SAMPLE DISPOSITION		Disposal Method:		Disposed By:						Date/Time:	



Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 3																																																																										
Collector H. Dreyfus Clark, S		Company Contact Don Woolery		Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 21 Days																																																																									
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 118-H-1 Exc-B Verification			SAF No. RC-107																																																																														
Ice Chest No. ERC-02-009		Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex																																																																													
Shipped To EBERLINE SERVICES/LIONVILLE		Offsite Property No. A100205/206			Bill of Lading/Air Bill No. SEE OSFC																																																																														
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation < DOT Limits																																																																																			
Special Handling and/or Storage Cool 4 Deg C																																																																																			
SAMPLE ANALYSIS		Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None																																																																									
		Type of Container	aG	aG	aG	aG	aG	P	P	P																																																																									
		No. of Container(s)	1	1	1	0	1	1	0	0																																																																									
		Volume	125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL																																																																									
		See item (1) in Special Instructions.	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D +	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotope Plutonium	Carbon-14 Low Level, Tritium - H3																																																																										
<table border="1"> <thead> <tr> <th>Sample No.</th> <th>Matrix *</th> <th>Sample Date</th> <th>Sample Time</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>J18Y52</td> <td>SOIL</td> <td></td> </tr> <tr> <td>J18Y53</td> <td>SOIL</td> <td></td> </tr> <tr> <td>J18Y54</td> <td>SOIL</td> <td></td> </tr> <tr> <td>J19Y55</td> <td>SOIL</td> <td></td> </tr> <tr> <td>J19Y56</td> <td>SOIL</td> <td>5-12-10</td> <td>0900</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>												Sample No.	Matrix *	Sample Date	Sample Time									J18Y52	SOIL											J18Y53	SOIL											J18Y54	SOIL											J19Y55	SOIL											J19Y56	SOIL	5-12-10	0900	✓	✓	✓	✓	✓			
Sample No.	Matrix *	Sample Date	Sample Time																																																																																
J18Y52	SOIL																																																																																		
J18Y53	SOIL																																																																																		
J18Y54	SOIL																																																																																		
J19Y55	SOIL																																																																																		
J19Y56	SOIL	5-12-10	0900	✓	✓	✓	✓	✓																																																																											
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *																																																																							
Relinquished By/Removed From		Date/Time 1930		Received By/Stored In		Date/Time 1330		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)				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																																																																							
Relinquished By/Removed From		Date/Time 1530		Received By/Stored In		Date/Time 1530																																																																													
Relinquished By/Removed From		Date/Time 1230		Received By/Stored In		Date/Time																																																																													
Relinquished By/Removed From		Date/Time 1010		Received By/Stored In		Date/Time 1010																																																																													
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																																																																													
LABORATORY SECTION		Received By		Title				Date/Time																																																																											
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time																																																																											

Appendix 5

Data Validation Supporting Documentation

000035

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	118-17-1:1		DATA PACKAGE: K2047		
VALIDATOR:	ELR	LAB:	LLI	DATE:	4/3/11
			SDG:	K2047	
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	<u>8310</u>
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
J19439	J19440	J19441	J19442	J19443	J19444
J19445	J19446	J19447	J19448	J19449	J19450
J19451	J19452	J19453	J19454	J19455	J19456
					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: 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: _____

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)

Fluoridil ® (or other absorbant) cleanup performed?..... Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable?..... Yes No N/A
Check materials traceable? Yes No N/A
Check materials Expired?..... Yes No N/A
Analytical batch QC given similar cleanup? Yes No N/A
Transcription/Calculation Errors? Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000040

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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 14:28

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 L005256 - SW 3540C									
Blank (L005256-BLK1)			Prepared: 05/22/2010 Analyzed: 05/27/2010						
Naphthalene	3.33 U	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	163		ug/kg wet	166.61		98	68-129		
LCS (L005256-BS1)			Prepared: 05/22/2010 Analyzed: 05/27/2010						
Naphthalene	181	3.31	ug/kg wet	165.89		109	0-127		
Acenaphthylene	171	3.31	ug/kg wet	165.89		103	50-140		
Acenaphthene	184	3.31	ug/kg wet	165.89		111	17-139		
Fluorene	174	3.31	ug/kg wet	165.89		105	28-145		
Phenanthrene	183	3.31	ug/kg wet	165.89		110	30-152		
Anthracene	191	3.31	ug/kg wet	165.89		115	19-171		
Fluoranthene	191	3.31	ug/kg wet	165.89		115	34-159		
Indeno[1,2,3-cd]pyrene	190	3.31	ug/kg wet	165.89		115	31-156		
Pyrene	166	3.31	ug/kg wet	165.89		100	33-152		
Benz[a]anthracene	147	3.31	ug/kg wet	165.89		89	32-157		
Chrysene	175	3.31	ug/kg wet	165.89		105	31-159		
Benzo[b]fluoranthene	179	3.31	ug/kg wet	165.89		108	33-164		
Benzo[k]fluoranthene	178	3.31	ug/kg wet	165.89		107	28-161		
Benzo[a]pyrene	179	3.31	ug/kg wet	165.89		108	29-149		
Dibenz[a,h]anthracene	172	3.31	ug/kg wet	165.89		104	27-153		
Benzo[g,h,i]perylene	181	3.31	ug/kg wet	165.89		109	32-157		
Surrogate: Triphenylene	171		ug/kg wet	165.89		103	68-129		

000041

WC-Hanford, Inc.
 2620 Fermi Avenue
 Richland WA. 99354

Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 14:28

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
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Batch L005256 - SW 3540C

Matrix Spike (L005256-MS1)	Source: 1005049-01	Prepared: 05/22/2010	Analyzed: 05/27/2010
Naphthalene	172	3.46	ug/kg dry 173.03 3.45 U 100 0-127
Acenaphthylene	168	3.46	ug/kg dry 173.03 3.45 U 97 50-140
Acenaphthene	163	3.46	ug/kg dry 173.03 2.51 93 17-139
Fluorene	168	3.46	ug/kg dry 173.03 3.45 U 97 28-145
Phenanthrene	184	3.46	ug/kg dry 173.03 1.85 105 30-152
Anthracene	186	3.46	ug/kg dry 173.03 3.45 U 107 19-171
Fluoranthene	186	3.46	ug/kg dry 173.03 2.57 106 34-159
Indeno[1,2,3-cd]pyrene	206	3.46	ug/kg dry 173.03 11.2 112 31-156
Pyrene	190	3.46	ug/kg dry 173.03 3.70 107 33-152
Benz[a]anthracene	159	3.46	ug/kg dry 173.03 3.45 U 92 32-157
Chrysene	184	3.46	ug/kg dry 173.03 3.45 U 107 31-159
Benzo[b]fluoranthene	182	3.46	ug/kg dry 173.03 1.02 104 33-164
Benzo[k]fluoranthene	182	3.46	ug/kg dry 173.03 0.968 105 28-161
Benzo[a]pyrene	190	3.46	ug/kg dry 173.03 1.80 109 29-149
Dibenz[a,h]anthracene	172	3.46	ug/kg dry 173.03 3.45 U 100 27-153
Benzo[g,h,i]perylene	186	3.46	ug/kg dry 173.03 1.97 106 32-157
Surrogate: Triphenylene	186		ug/kg dry 173.03 107 68-129

Matrix Spike Dup (L005256-MSD1)	Source: 1005049-01	Prepared: 05/22/2010	Analyzed: 05/27/2010
Naphthalene	161	3.46	ug/kg dry 173.25 3.45 U 93 0-127 7 40
Acenaphthylene	160	3.46	ug/kg dry 173.25 3.45 U 92 50-140 5 40
Acenaphthene	156	3.46	ug/kg dry 173.25 2.51 88 17-139 5 40
Fluorene	156	3.46	ug/kg dry 173.25 3.45 U 90 28-145 7 40
Phenanthrene	177	3.46	ug/kg dry 173.25 1.85 101 30-152 4 40
Anthracene	179	3.46	ug/kg dry 173.25 3.45 U 104 19-171 4 40
Fluoranthene	183	3.46	ug/kg dry 173.25 2.57 104 34-159 2 40
Indeno[1,2,3-cd]pyrene	206	3.46	ug/kg dry 173.25 11.2 113 31-156 0.3 40
Pyrene	180	3.46	ug/kg dry 173.25 3.70 102 33-152 5 40
Benz[a]anthracene	156	3.46	ug/kg dry 173.25 3.45 U 90 32-157 2 40
Chrysene	178	3.46	ug/kg dry 173.25 3.45 U 103 31-159 3 40
Benzo[b]fluoranthene	179	3.46	ug/kg dry 173.25 1.02 103 33-164 1 40
Benzo[k]fluoranthene	181	3.46	ug/kg dry 173.25 0.968 104 28-161 0.4 40
Benzo[a]pyrene	188	3.46	ug/kg dry 173.25 1.80 108 29-149 1 40
Dibenz[a,h]anthracene	170	3.46	ug/kg dry 173.25 3.45 U 98 27-153 1 40
Benzo[g,h,i]perylene	185	3.46	ug/kg dry 173.25 1.97 106 32-157 0.6 40
Surrogate: Triphenylene	178		ug/kg dry 173.25 103 68-129

000042

Date: 7 April 2011
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol – Waste Subsite
 118-H-1:1
 Subject: PCB - Data Package No. K2047-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2047 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J19Y39	5/11/10	Soil	C	See note 1
J19Y40	5/11/10	Soil	C	See note 1
J19Y41	5/11/10	Soil	C	See note 1
J19Y42	5/11/10	Soil	C	See note 1
J19Y43	5/11/10	Soil	C	See note 1
J19Y44	5/11/10	Soil	C	See note 1
J19Y45	5/11/10	Soil	C	See note 1
J19Y46	5/11/10	Soil	C	See note 1
J19Y47	5/11/10	Soil	C	See note 1
J19Y48	5/11/10	Soil	C	See note 1
J19Y49	5/11/10	Soil	C	See note 1
J19Y50	5/11/10	Soil	C	See note 1
J19Y51	5/11/10	Soil	C	See note 1
J19Y52	5/11/10	Soil	C	See note 1
J19Y53	5/11/10	Soil	C	See note 1
J19Y54	5/11/10	Soil	C	See note 1
J19Y55	5/11/10	Soil	C	See note 1
J19Y56	5/12/10	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 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, Rev. 0, December 2001). 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

000001

DATA QUALITY OBJECTIVES

Holding Times

Holding times are not applicable for PCB analysis.

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.

All accuracy results were acceptable.

000002

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 PCB results in sample J19Y52 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 +/-35%. 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

One set of field duplicates (J19Y39/J19Y51) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

000003

Analytical Detection Levels

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

Completeness

Data package No. K2047 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 a surrogate recovery outside QC limits, all PCB results in sample J19Y52 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

000004

Appendix 1
Glossary of Data Reporting Qualifiers

000005

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).

000006

Appendix 2
Summary of Data Qualification

000007

PCB DATA QUALIFICATION SUMMARY*

SDG: K2047	REVIEWER: ELR	Project: 118-H-1:1	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	J19Y52	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.

000008

Appendix 3
Annotated Laboratory Reports

000009

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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 13:28

J19Y39
 1005049-01 (Soil)

✓ 4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	95 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	113 %	52-141			L005257	05/23/2010	05/27/2010	8082

000010

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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y40
1005049-02 (Soil)

M
4/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	12.7 U	12.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	12.7 U	12.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	12.7 U	12.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	12.7 U	12.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	12.7 U	12.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	12.7 U	12.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	12.7 U	12.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	85 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	105 %	52-141			L005257	05/23/2010	05/27/2010	8082

000011



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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y41
1005049-03 (Soil)

V
4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.7 U	13.7	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	89 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	110 %	52-141			L005257	05/23/2010	05/27/2010	8082

000012



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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y42
1005049-04 (Soil)

Handwritten: 4/15/14

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	101 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	110 %	52-141			L005257	05/23/2010	05/27/2010	8082

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 Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y43
1005049-05 (Soil)

✓
4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	93 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	111 %	52-141			L005257	05/23/2010	05/27/2010	8082

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 Richland WA, 99354

Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 13:28

J19Y44
 1005049-06 (Soil)

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 4/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	99 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	113 %	52-141			L005257	05/23/2010	05/27/2010	8082

000015



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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA. 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y45
1005049-07 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	102 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	111 %	52-141			L005257	05/23/2010	05/27/2010	8082



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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y46
1005049-08 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.2 U	13.2	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	94 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	109 %	52-141			L005257	05/23/2010	05/27/2010	8082

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y47
1005049-09 (Soil)

4/5/11 W

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	71 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	92 %	52-141			L005257	05/23/2010	05/27/2010	8082

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 Project Number: K2047
 Project Manager: Joan Kessner

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J19Y48
 1005049-10 (Soil)

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 4/15/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	68 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	87 %	52-141			L005257	05/23/2010	05/27/2010	8082

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA. 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y49
 1005049-11 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	68 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	87 %	52-141			L005257	05/23/2010	05/27/2010	8082

000020



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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y50
1005049-12 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	68 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	85 %	52-141			L005257	05/23/2010	05/27/2010	8082

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WC-Hanford, Inc.
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Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

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J19Y51
 1005049-13 (Soil)

*W
 4/15/10*

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	- Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.4 U	13.4	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	74 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	93 %	52-141			L005257	05/23/2010	05/27/2010	8082

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Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

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J19Y52
 1005049-14 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	76 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	39 % *	52-141			L005257	05/23/2010	05/27/2010	8082

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y53
1005049-15 (Soil)

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4/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	79 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	96 %	52-141			L005257	05/23/2010	05/27/2010	8082

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 Project Number: K2047
 Project Manager: Joan Kessner

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 05/28/2010 13:28

J19Y54
 1005049-16 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1221	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1232	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1242	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1248	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1254	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Aroclor 1260	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/27/2010	8082
Surrogate: Decachlorobiphenyl	76 %	43-144			L005257	05/23/2010	05/27/2010	8082
Surrogate: Tetrachloro-meta-xylene	92 %	52-141			L005257	05/23/2010	05/27/2010	8082

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 Project Number: K2047
 Project Manager: Joan Kessner

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 05/28/2010 13:28

J19Y55
 1005049-17 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1221	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1232	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1242	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1248	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1254	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1260	13.5 U	13.5	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Surrogate: Decachlorobiphenyl	73 %	43-144			L005257	05/23/2010	05/28/2010	8082
Surrogate: Tetrachloro-meta-xylene	90 %	52-141			L005257	05/23/2010	05/28/2010	8082

000026



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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/28/2010 13:28
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J19Y56
1005049-18 (Soil)

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4/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1221	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1232	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1242	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1248	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1254	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Aroclor 1260	13.3 U	13.3	ug/kg dry	1	L005257	05/23/2010	05/28/2010	8082
Surrogate: Decachlorobiphenyl	73 %	43-144			L005257	05/23/2010	05/28/2010	8082
Surrogate: Tetrachloro-meta-xylene	91 %	52-141			L005257	05/23/2010	05/28/2010	8082

000027

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000028



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

Case Narrative

Client: WC-HANFORD RC-107 K2047
LVL #: 1005049

W.O. #: 60049-001-001-0001-00
Received: 05-14-2010

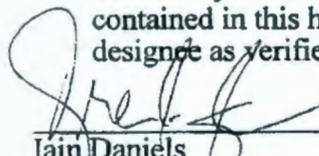
PCBs

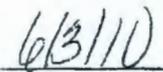
Eighteen (18) soil samples were collected on 05-11,12-2010.

The samples and associated QC samples were extracted 05-23-2010 and analyzed 05-27,28-2010 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. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. One (1) of forty-four (44) surrogate recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 10GC190) 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. All matrix spike recoveries were within acceptance criteria.
7. The samples are reported on a dry weight basis.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.


Iain Daniels
LvL Laboratory Manager


Date

Washington Closure Hanford				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-107-019		Page 2 of 3		
Collector R. Brown Clark, S				Company Contact Don Woolery		Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 21 Days		
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol				Sampling Location 118-H-1 Exc-A Verification				SAF No. RC-107						
Ice Chest No. ERC-02-009				Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex						
Shipped To EBERLINE SERVICES / LIONVILLE				Offsite Property No. A100205/206				Bill of Lading/Air Bill No. SEE OSPC						
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation < DOT limits Special Handling and/or Storage Cool 4 Deg C 000032				Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	
				Type of Container		aG	aG	aG	aG	aG	P	P	P	
				No. of Container(s)		1	1	1	0	1	1	0	0	
				Volume		125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL	
SAMPLE ANALYSIS				Sev. mem (1) in Special Instructions	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D+	PCBs - 8082	PAHs - 8310	See Item (2) in Special Instructions	Isotopic Plutonium	Carbon-14 Low Level, Tritium - 113 N: 63, Total Sr-90			
Sample No.	Matrix *	Sample Date	Sample Time											
J19Y44	SOIL	5-11-10	0945	X	X	X	X	X						
J19Y45	SOIL	5-11-10	0930	X	X	X	X	X						
J19Y46	SOIL	5-11-10	1000	X	X	X	X	X						
J19Y47	SOIL	5-11-10	1030	X	X	X	X	X						
J19Y48	SOIL	5-11-10	1345	X	X	X	X	X						
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS					Matrix * S=Soil SE=Soil in water SL=Soil SLW=Soil in water W=Water O=Oil A=Air DS=From Solid DL=From Liquid T=Triste W=W/air L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION		Received By		Title		Date/Time								
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time								



Washington Closure Hanford				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-019		Page 3 of 3				
Collector 5-11-10 R-Dreven Clark, S.				Company Contact Don Woolery			Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 21 Days		
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol				Sampling Location 118-H-1 Exc-A Verification			SAF No. RC-107								
Ice Chest No. ERC-02-009				Field Logbook No. EL 1627-4		COA RI18H12000		Method of Shipment Fed Ex							
Shipped To BERLINE SERVICES / LIONVILLE				Offsite Property No. A100205/206			Bill of Lading/Air Bill No. SEE OSPC								
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation Special Handling and/or Storage Cool 4 Deg C DOT Limits 0000033				Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
				Type of Container		aG	aG	aG	aG	aG	P	P	P		
				No. of Container(s)		1	1	1	0	1	1	0	0		
				Volume		125ml.	125ml.	250ml.	250ml.	125ml.	1000ml.	1000ml.	1000ml.		
SAMPLE ANALYSIS				See item (1) in Special Instructions	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotopic Phosphorus	Carbon-14 Low Level: Tritium - 113 Ni-63 Td-63-70				
Sample No.	Matrix *	Sample Date	Sample Time												
J19Y49	SOIL	5-11-10	1315	X	X	X	X	X							
J19Y50	SOIL	5-11-10	1400	X	X	X	X	X							
J19Y51	SOIL	5-11-10	0825	X	X	X	X	X							
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)				Se=Soil SE=Soil St=Soil Sl=Soil W=Water G=Gas A=Air DS=Down Stream DL=Down Leg T=Truck W=Water L=Liquid V=Vegetation K=Other			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
LABORATORY SECTION		Received By		Title						Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time							



Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 2		
Collector: <i>R. Brewer 5/11/10 Clark</i>		Company Contact: <i>Don Woolery</i>		Telephone No.: <i>509-431-0448</i>		Protect Coordinator: <i>KESSNER, JH</i>		Price Code: <i>EL</i>		Data Turnaround: <i>21 Days</i>	
Project Designation: <i>100-II Remaining Sites Burial Grounds - Soil Full Protocol</i>		Sampling Location: <i>118-H-1 Exc-B Verification</i>		SAF No.: <i>RC-107</i>							
Ice Chest No.: <i>ERC-02-009</i>		Field Logbook No.: <i>EL 1627-4</i>		COA: <i>R118H12000</i>		Method of Shipment: <i>Fed Ex</i>					
Shipped To: <i>EBERLINE SERVICES (LIONVILLE)</i>		Offsite Property No.: <i>A100205/206</i>		Bill of Lading/Air Bill No.: <i>SEE OSC</i>							
POSSIBLE SAMPLE HAZARDS/REMARKS: <i>Possible Radiation <DOT Limits</i>		Special Handling and/or Storage: <i>Cool 4 Deg C</i>		Cool 4C		Cool 4C		Cool 4C		Cool 4C	
000034		Preservation		None	Cool 4C	Cool 4C	Cool 4C	None	None	None	
		Type of Container		aG	aG	aG	aG	P	P	P	
		No. of Container(s)		1	1	1	0	1	1	0	
		Volume		125ml.	125ml.	250ml.	250ml.	125ml.	1000ml.	1000ml.	
SAMPLE ANALYSIS		Section (1) in Special Instructions:		NO2/NO3-353.2	TPH-Diesel Range - W/PH-D+	PCBs - 8082	PAHs - 8310	Section (2) in Special Instructions:	Isotope: Plutonium	Carbon-14 Low Level Transuranic - H1 Ni-63, Total Sr-90	
		Sample No		Matrix *	Sample Date	Sample Time					
J19Y52		SOIL		5-11-10		1315		X	X	X	X
J19Y53		SOIL		5-11-10		1345		X	X	X	X
J19Y54		SOIL		5-11-10		1350		X	X	X	X
J19Y55		SOIL		5-11-10		1355		X	X	X	X
J19Y56		SOIL		5-11-10							
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From: <i>R. Brewer</i>		Date/Time: <i>5-11-10 1435</i>		Received By/Stored In: <i>S. Van Den Hende</i>		Date/Time: <i>5-11-10 1435</i>		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc). Mercury - 7471 - (CV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)			
Relinquished By/Removed From: <i>S. Van Den Hende</i>		Date/Time: <i>5-11-10 1800</i>		Received By/Stored In: <i>J. E. Beaul</i>		Date/Time: <i>5-11-10 1800</i>					
Relinquished By/Removed From: <i>J. E. Beaul</i>		Date/Time: <i>5-13-10 1230</i>		Received By/Stored In: <i>FED EX</i>		Date/Time: <i>5-13-10</i>					
Relinquished By/Removed From: <i>Fed Ex</i>		Date/Time: <i>5-14-10 1010</i>		Received By/Stored In: <i>VICTOR HERNANDEZ</i>		Date/Time: <i>5-14-10 1010</i>					
Relinquished By/Removed From:		Date/Time:		Received By/Stored In:		Date/Time:					
Relinquished By/Removed From:		Date/Time:		Received By/Stored In:		Date/Time:					
LABORATORY SECTION		Received By:		Title:							
FINAL SAMPLE DISPOSITION		Disposal Method:		Disposed By:		Date/Time:					



Collector: *R. Drown* / *Clark, S* Company Contact: *Don Woolery* Telephone No.: *509-431-0448* Project Coordinator: *KESSNER, JH* Price Code: *8L* Data Turnaround: *21 Days*

Project Designation: *100-H Remaining Sites Burial Grounds - Soil Full Protocol* Sampling Location: *118-H-1 Exc-B Verification* SAF No.: *RC-107*

Ice Chest No.: *ERC-02-009* Field Logbook No.: *EL 1627-4* COA: *R1181112000* Method of Shipment: *Fed Ex*

Shipped To: *EBERLINE SERVICES LIONVILLE* Offsite Property No.: *A100205/206* Bill of Lading/Air Bill No.: *SEE ASPC*

POSSIBLE SAMPLE HAZARDS/REMARKS <i>Possible Radiation < LOT Limits</i> <i>Special Handling and/or Storage Cool 4 Deg C</i>	Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None
	Type of Container	aG	aG	aG	aG	aG	P	P	P
	No. of Container(s)	1	1	1	0	1	1	0	0
	Volume	125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS	See item (1) in Special Instructions	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D	PCBs - BHR2	PAHs - 8310	See item (2) in Special Instructions	Isotope Plutonium	Carbon-14 Low Level Trisran - 113
	<i>000035</i>							

Sample No.	Matrix *	Sample Date	Sample Time							
J10Y52	SOIL									
J10Y53	SOIL									
J10Y54	SOIL									
J19Y55	SOIL									
J19Y56	SOIL	5-12-10	0900	✓	✓	✓	✓	✓		

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	Run all Rad analysis from 1000ml container.		
<i>Stephen Hernandez</i>	<i>5-12-10 1330</i>	<i>Don Heideberg</i>	<i>5-12-10 1330</i>	(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	(2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)		
<i>Don Heideberg</i>	<i>5-12-10 1530</i>	<i>J.E. Barnd</i>	<i>5-12-10 1530</i>			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			
<i>J.E. Barnd</i>	<i>5-13-10 1230</i>	<i>FED EX</i>				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			
<i>Fred Ep</i>	<i>5-14-10 1010</i>	<i>VICTOR HERRANDEZ</i>	<i>5-14-10 1010</i>			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			



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

Appendix 5

Data Validation Supporting Documentation

000036

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	118-H-1:1		DATA PACKAGE: K2047		
VALIDATOR:	FLR	LAB:	LLI	DATE: 4/3/11	
			SDG:	K2047	
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J19439	J19440	J19441	J19442	J19443	J19444
J19445	J19446	J19447	J19448	J19449	J19450
J19451	J19452	J19453	J19454	J19455	J19456
					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 FH

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: 52 - surr low - J all

no PAS

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)

- Fluorocil ® (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

000041

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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/28/2010 13:28

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 L005257 - SW 3540C									
Blank (L005257-BLK1)				Prepared: 05/23/2010 Analyzed: 05/27/2010					
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						
Surrogate: Decachlorobiphenyl	28.0		ug/kg wet	33.300		84	43-144		
Surrogate: Tetrachloro-meta-xylene	34.9		ug/kg wet	33.303		105	52-141		
LCS (L005257-BS1)				Prepared: 05/23/2010 Analyzed: 05/27/2010					
Aroclor 1016	146	13.2	ug/kg wet	166.00		88	50-138		
Aroclor 1260	159	13.2	ug/kg wet	166.00		96	50-148		
Surrogate: Decachlorobiphenyl	31.0		ug/kg wet	33.201		93	43-144		
Surrogate: Tetrachloro-meta-xylene	36.4		ug/kg wet	33.204		110	52-141		
Matrix Spike (L005257-MS1)				Source: 1005049-12		Prepared: 05/23/2010 Analyzed: 05/27/2010			
Aroclor 1016	112	13.4	ug/kg dry	168.21	13.3 U	66	50-138		
Aroclor 1260	122	13.4	ug/kg dry	168.21	13.3 U	72	50-148		
Surrogate: Decachlorobiphenyl	23.9		ug/kg dry	33.642		71	43-144		
Surrogate: Tetrachloro-meta-xylene	29.4		ug/kg dry	33.645		87	52-141		
Matrix Spike Dup (L005257-MSD1)				Source: 1005049-12		Prepared: 05/23/2010 Analyzed: 05/27/2010			
Aroclor 1016	110	13.0	ug/kg dry	163.26	13.3 U	67	50-138	1	40
Aroclor 1260	119	13.0	ug/kg dry	163.26	13.3 U	73	50-148	0.4	40
Surrogate: Decachlorobiphenyl	23.2		ug/kg dry	32.651		71	43-144		
Surrogate: Tetrachloro-meta-xylene	28.4		ug/kg dry	32.655		87	52-141		

000042

Date: 7 April 2011
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-H Remaining Sites Burial Grounds– Soil Full Protocol – Waste Site 118-H-1:1
 Subject: Wet Chemistry - Data Package No. K2047-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2047 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J19Y39	5/11/10	Soil	C	See note 1
J19Y40	5/11/10	Soil	C	See note 1
J19Y41	5/11/10	Soil	C	See note 1
J19Y42	5/11/10	Soil	C	See note 1
J19Y43	5/11/10	Soil	C	See note 1
J19Y44	5/11/10	Soil	C	See note 1
J19Y45	5/11/10	Soil	C	See note 1
J19Y46	5/11/10	Soil	C	See note 1
J19Y47	5/11/10	Soil	C	See note 1
J19Y48	5/11/10	Soil	C	See note 1
J19Y49	5/11/10	Soil	C	See note 1
J19Y50	5/11/10	Soil	C	See note 1
J19Y51	5/11/10	Soil	C	See note 1
J19Y52	5/11/10	Soil	C	See note 1
J19Y53	5/11/10	Soil	C	See note 1
J19Y54	5/11/10	Soil	C	See note 1
J19Y55	5/11/10	Soil	C	See note 1
J19Y56	5/12/10	Soil	C	See note 1

1 – Nitrate/nitrite by 353.2.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, December 2001). 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

000001

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.

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 Blanks

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

All method blank results were acceptable.

Field (Equipment) Blank

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 65% to 135%. 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 64% 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 135% and a sample result less than the IDL, no qualification is required.

000002

Due to the lack of a matrix spike analysis, all nitrate/nitrate 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 35%, 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

One set of field duplicates (J19Y39/J19Y51) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

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 K2047 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.

000003

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to the lack of a matrix spike analysis, all nitrate/nitrate 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

000004

Appendix 1
Glossary of Data Reporting Qualifiers

000005

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

000007

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K2047	REVIEWER: ELR	Project: 118-H-1:1	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate/nitrite	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.

000008

Appendix 3
Annotated Laboratory Reports

000009



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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/27/2010 15:46

Wet Chemistry
 Lionville Laboratory

✓
 4/6/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J19Y39 (1005049-01) Soil								
%Solids	93.7	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	1.83 J	0.20	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y40 (1005049-02) Soil								
%Solids	98.8	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.26 J	0.20	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y41 (1005049-03) Soil								
%Solids	96.8	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.64 J	0.20	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y42 (1005049-04) Soil								
%Solids	99.3	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.28 J	0.19	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y43 (1005049-05) Soil								
%Solids	98.8	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.31 J	0.19	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y44 (1005049-06) Soil								
%Solids	98.5	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.47 J	0.21	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y45 (1005049-07) Soil								
%Solids	97.8	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.49 J	0.20	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2

000010



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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/27/2010 15:46

Wet Chemistry
 Lionville Laboratory

Handwritten initials: V 4/6/10

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J19Y46 (1005049-08) Soil								
%Solids	98.6	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	1.31 J	0.21	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y47 (1005049-09) Soil								
%Solids	96.8	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	11.0 D J	0.96	mg/kg dry	5	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y48 (1005049-10) Soil								
%Solids	99.4	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.20 J	0.19	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y49 (1005049-11) Soil								
%Solids	98.5	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.72 J	0.21	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y50 (1005049-12) Soil								
%Solids	99.1	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.60 J	0.20	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y51 (1005049-13) Soil								
%Solids	96.5	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	2.06 J	0.21	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y52 (1005049-14) Soil								
%Solids	98.8	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.34 J	0.21	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2

000011



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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/27/2010 15:46
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**Wet Chemistry
 Lionville Laboratory**

Handwritten: 4/6/11

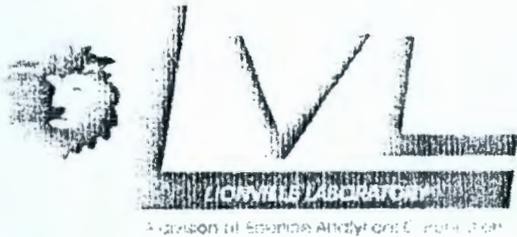
Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J19Y53 (1005049-15) Soil								
%Solids	97.9	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.21 U J	0.21	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y54 (1005049-16) Soil								
%Solids	98.4	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.34 J	0.21	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y55 (1005049-17) Soil								
%Solids	98.3	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	0.44 J	0.21	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2
J19Y56 (1005049-18) Soil								
%Solids	99.5	0.1	% by Weight	1	L005165	05/15/2010	05/15/2010	EPA 160.6
Nitrate/Nitrite as N	3.57 J	0.19	mg/kg dry	1	L005232	05/20/2010	05/20/2010	EPA 353.2

000012

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013



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

Case Narrative

Client: WC-HANFORD RC-107 K2047

LVL#: 1005049

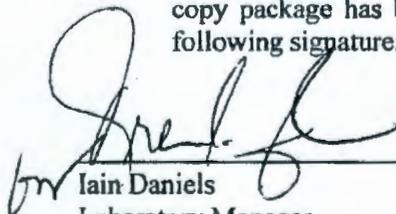
Date Received: 05-14-10

INORGANIC NARRATIVE

1. This narrative covers the analyses of 18 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the data summary report.

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

3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
5. The method blanks for Nitrate Nitrite were within the method criteria.
6. The Laboratory Control Samples (LCS) for Nitrate Nitrite were within the laboratory control limits with the exception of L005232-BS2 and L005298-BS3 that were below the control limits of 90-110% at 89.8%.
7. The matrix spike recovery for Nitrate Nitrite was within the 75-125% control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
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
njpl05-049

5/27/10
Date

Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-107-019		Page 1 of 3			
Collector 5-11-10 Received Clark, S			Company Contact Don Woolery			Telephone No. 509-431-0448			Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 21 Days	
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol			Sampling Location 118-H-1 Exc-A Verification			SAF No. RC-107								
Ice Chest No. ERC-02-009			Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex							
Shipped To EBERLINE SERVICES / LIONVILLE			Offsite Property No. A100205/206			Bill of Lading/Air Bill No. SEE OSPC								
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation < DOT Limits			Preservation			Type of Container			No. of Container(s)			Volume		
			None			aG			1			125ml.		
			Cool 4C			aG			1			125ml.		
			Cool 4C			aG			0			250ml.		
			Cool 4C			aG			1			250ml.		
			None			P			1			1000ml.		
			None			P			0			1000ml.		
			None			P			0			1000ml.		
Special Handling and/or Storage Cool 4 Deg C			Sec Item (1) in Special Instructions			NO2/NO3 - 353.2			TPH-Diesel Range - WTPH D +			PCBs - 8082		
000015			Sec Item (2) in Special Instructions			PAHs - 8310			Sec Item (3) in Special Instructions			isotope: Plutonium		
SAMPLE ANALYSIS			Curium-14 Low Level, Tritium-113			Ni-63, Total Sr-90								
Sample No.		Matrix *	Sample Date		Sample Time									
J19Y39		SOIL	5-11-10		0825		X	X	X	X	X			
J19Y40		SOIL	5-11-10		1215		X	X	X	X	X			
J19Y41		SOIL	5-11-10		0915		X	X	X	X	X			
J19Y42		SOIL	5-11-10		1230		X	X	X	X	X			
J19Y43		SOIL	5-11-10		1245		X	X	X	X	X			
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS						Matrix *		
Relinquished By/Removed From 5-11-10 1435			Received By/Stored In S. Van Den Herde			Run all Rad analysis from 1000ml container.						Soil		
Date/Time 5-11-10			Date/Time 5-11-10			(1) ICP Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV)						Soil Solids		
Date/Time 5-11-10			Date/Time 1800			(2) Gamma Spec - Client List [Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable]						Soil Sludge		
Date/Time 5-11-10			Date/Time 5-11-10									W - Water		
Date/Time 5-13-10			Date/Time									G - Oil		
Date/Time 5-14-10 1010			Date/Time									As-Air		
Date/Time			Date/Time									D - Other Solids		
Date/Time			Date/Time									D - Other Liquids		
Date/Time			Date/Time									E - Soap		
Date/Time			Date/Time									O - Waste		
Date/Time			Date/Time									L - Liquid		
Date/Time			Date/Time									A - Volatile		
Date/Time			Date/Time									N - Other		
LABORATORY SECTION		Received By		Title		REVIEWED BY JRD DATE 5/13/10						Date/Time		
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By								Date/Time		

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-107-019	Page 1 of 1
Collector R-Driven 5-11-10 Clark, S.	Company Contact Don Woolery	Telephone No. 509-431-0448	Project Coordinator KESSNER, JH		Price Code 8L	Data Turnaround 21 Days	
Project Designation 100-11 Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 118-H-1 Exc-A Verification		SAF No. RC-107				
Ice Chest No. ERC-02-009	Field Logbook No. EL 1627-4	COA R118H12000	Method of Shipment Fed Ex				
Shipped To EMERLINE SERVICES / LIONVILLE	Offsite Property No. A100205/206		Bill of Lading/Air Bill No. SEE OSPC				

Possible Radiation Possible Contamination Special Handling and/or Storage Cool 4 Deg C	Possible Sample Hazards/Remarks DOT Limits	Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None
		Type of Container	aG	aG	aG	aG	aG	P	P	P
		No. of Container(s)	1	1	1	0	1	1	0	0
		Volume	125ml.	125ml.	250ml.	250ml.	125ml.	1000ml.	1000ml.	1000ml.

0000017	SAMPLE ANALYSIS		See item (1) in Special Instructions	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH D	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotopic Mercurium	Carbon-14 Low Level, Tritium - 113 Ni-63, Total Sr-90
---------	-----------------	--	--------------------------------------	-----------------	---------------------------	-------------	-------------	--------------------------------------	--------------------	---

Sample No.	Matrix *	Sample Date	Sample Time							
J19Y49	SOIL	5-11-10	1315	X	X	X	X	X		
J19Y50	SOIL	5-11-10	1400	X	X	X	X	X		
J19Y51	SOIL	5-11-10	0825	X	X	X	X	X		

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From S. Van Den Heude Date/Time 5-11-10 1435	Received By/Stored In S. Van Den Heude Date/Time 5-11-10 1435	Run all Rad analysis from 1000ml container.				(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)			
Relinquished By/Removed From S. Van Den Heude Date/Time 5-11-10 1800	Received By/Stored In J. E. Beaulieu Date/Time 5-11-10 1800								
Relinquished By/Removed From J. E. Beaulieu Date/Time 5-13-10 1230	Received By/Stored In FED EX Date/Time								
Relinquished By/Removed From F. O. Fe Date/Time 5-14-10 1010	Received By/Stored In Victor Hernandez Date/Time 5-14-10 1010								
Relinquished By/Removed From	Received By/Stored In								
Relinquished By/Removed From	Received By/Stored In								



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

Washington Closure Hanford				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 2								
Collector: <i>Clark</i> 5/11/10				Company Contact: Don Woolery			Telephone No.: 509-431-0448			Project Coordinator: KESSNER, JH		Price Code: <i>8L</i>		Data Turnaround: 21 Days					
Project Designation: 100-H Remaining Sites Burial Grounds - Soil Full Protocol				Sampling Location: 118-H-1 Exc-B Verification			SAF No.: RC-107												
Ice Chest No.: <i>ERC-02-009</i>				Field Logbook No.: EL 1627-4		COA: R118H12000		Method of Shipment: Fed Ex											
Shipped To: EMERLINE SERVICES (LIONVILLE)				Offsite Property No.: <i>A100205/206</i>			Bill of Lading/Air Bill No.: <i>SEE OSPC</i>												
POSSIBLE SAMPLE HAZARD/REMARKS <i>Possible Radiation <DOT Limits</i> Special Handling and/or Storage <i>Cool 4 Deg C</i>				Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None						
				Type of Container		aG	aG	aG	aG	aG	P	P	P						
				No. of Container(s)		1	1	1	0	1	1	1	1	0					
				Volume		125ml.	125ml.	250ml.	250ml.	125ml.	1000ml.	1000ml.	1000ml.						
SAMPLE ANALYSIS				See item (1) in Special Instructions.		NO2/NO1 - 353.2	TPH-Diesel Range - WTPH-D4	PCBs - 8082	PAHs - 810	See item (2) in Special Instructions.	Isotopic Platinum	Carbon-14 Low Level Tritium - 211 N-63, Total Sr-90							
Sample No.		Matrix *		Sample Date		Sample Time													
J19Y52		SOIL		5-11-10		1315		X	X	X	X	X							
J19Y53		SOIL		5-11-10		1345		X	X	X	X	X							
J19Y54		SOIL		5-11-10		1350		X	X	X	X	X							
J19Y55		SOIL		5-11-10		1355		X	X	X	X	X							
J19Y56 5-11-10		SOIL																	
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix * See List 81 - Sediment 82 - Soil 83 - Sludge 84 - Water 85 - Oil 86 - Air 87 - Drums/Solids 88 - Drums/liquids 89 - Slurry 90 - Waste 91 - Liquid 92 - Vapor 93 - Other							
Relinquished By/Removed From: <i>Clark</i> 5-11-10 1435		Received By/Stored In: <i>S. Van Den Hendre</i> 5-11-10 1435		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc], Mercury - 7471 - (CV) (2) Gamma Spec - Client List [Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable]															
Relinquished By/Removed From: <i>S. Van Den Hendre</i> 5-11-10 1800		Received By/Stored In: <i>J. E. Baul</i> 5-11-10																	
Relinquished By/Removed From: <i>J. E. Baul</i> 5-13-10 1230		Received By/Stored In: <i>FED EX</i>																	
Relinquished By/Removed From: <i>Victor Hernandez</i> 5-14-10 1010		Received By/Stored In: <i>Victor Hernandez</i> 5-14-10 1010																	
Relinquished By/Removed From:		Received By/Stored In:																	
Relinquished By/Removed From:		Received By/Stored In:																	
LABORATORY SECTION		Received By:		Title:															
FINAL SAMPLE DISPOSITION		Disposal Method:		Disposed By:															

000018



Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 2		
Collector R. Brown <i>Clark, S</i>		Company Contact Don Woolery		Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 21 Days	
Project Designation 100-II Remaining Sites-Burial Grounds - Soil Full Protocol		Sampling Location 118-II-1 Exc-B Verification			SAF No. RC-107						
Ice Chest No. <i>ERC-02-009</i>		Field Logbook No. EL 1627-4		COA R118II12000		Method of Shipment Fed Ex					
Shipped To FIBERLINE SERVICES <i>(LIONVILLE)</i>		Offsite Property No. <i>A100205/206</i>			Bill of Lading/Air Bill No. <i>SEE OSPA</i>						
POSSIBLE SAMPLE HAZARDS/REMARKS <i>Possible Radiation < 100 Limits</i>		Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None
Special Handling and/or Storage <i>Cool 4 Deg C</i>		Type of Container		aG	aG	aG	aG	aG	P	P	P
000019		No. of Container(s)		1	1	1	0	1	1	0	0
		Volume		125ml.	125ml.	250ml.	250ml.	125ml.	1000ml.	1000ml.	1000ml.
SAMPLE ANALYSIS		See item (1) in Special Instructions		NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotope Plutonium	Carbon-14 Low Level, Tritium - D3	
Sample No.	Matrix *	Sample Date	Sample Time								
J10Y52	SOIL										
J10Y53	SOIL										
J10Y54	SOIL										
J19Y55	SOIL										
J19Y56	SOIL	5-12-10	0900	✓	✓	✓	✓	✓			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From <i>Don Heidelberg</i>		Date/Time 5-12-10 1530		Received By/Stored In <i>Don Heidelberg</i>		Date/Time 5-12-10 1330		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV) (2) Gamma Spec - Client List [Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium 152, Europium-154, Europium-155, Silver-108 metastable]			
Relinquished By/Removed From <i>Don Heidelberg</i>		Date/Time 5-12-10 1530		Received By/Stored In <i>J.E. Beards</i>		Date/Time 5-12-10 1530					
Relinquished By/Removed From <i>J.E. Beards</i>		Date/Time 5-13-10 1230		Received By/Stored In <i>FED EX</i>		Date/Time					
Relinquished By/Removed From <i>Feal Ep</i>		Date/Time 5-14-10 1010		Received By/Stored In <i>VICTOR HERNANDEZ</i>		Date/Time 5-14-10 1010					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix *			
LABORATORY SECTION		Received By		Title				Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time			



Appendix 5

Data Validation Supporting Documentation

000020

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	108-H-1:1		DATA PACKAGE: K2047		
VALIDATOR:	ELR	LAB:	H LI	DATE: 4/2/11	
			SDG: K2047		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO₃/NO₂
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J19439 J19440 J19441 J19442 J19443 J19444					
J19445 J19446 J19447 J19448 J19449 J19450					
J19451 J19452 J19453 J19454 J19455 J19456					
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
 Spike standards NIST traceable? (Levels D, E)..... Yes No N/A
 Spike standards expired? (Levels D, E)..... Yes No N/A
 LCS/BSS samples analyzed? Yes No N/A
 LCS/BSS results acceptable?..... Yes No N/A
 Standards traceable? (Levels D, E)..... Yes No N/A
 Standards expired? (Levels D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E)..... Yes No N/A
 Performance audit sample(s) analyzed? Yes No N/A
 Performance audit sample results acceptable?..... Yes No N/A
 Comments: no PAT

no MS - J all

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

6. HOLDING TIMES (all levels)

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000025



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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/27/2010 15:46

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L005165 - % Solids									
Duplicate (L005165-DUP3)		Source: 1005049-01		Prepared & Analyzed: 05/15/2010					
%Solids	95.7	0.1	% by Weight		95.7			0	20
Batch L005232 - Default Prep GenChem									
Blank (L005232-BLK1)		Prepared & Analyzed: 05/20/2010							
Nitrate/Nitrite as N	0.19 U	0.19	mg/kg wet						
LCS (L005232-BS1)		Prepared & Analyzed: 05/20/2010							
Nitrate/Nitrite as N	5.30	0.20	mg/kg wet	4.9068	108		90-110		
LCS (L005232-BS2)		Prepared & Analyzed: 05/20/2010							
Nitrate/Nitrite as N	4.50	0.20	mg/kg wet	5.0117	89.8*		90-110		
Duplicate (L005232-DUP2)		Source: 1005049-01		Prepared & Analyzed: 05/20/2010					
Nitrate/Nitrite as N	1.97	0.21	mg/kg dry		1.83			7.11	20
Batch L005298 - Default Prep GenChem									
Blank (L005298-BLK1)		Prepared & Analyzed: 05/26/2010							
Nitrate/Nitrite as N	0.21 U	0.21	mg/kg wet						
Blank (L005298-BLK2)		Prepared & Analyzed: 05/26/2010							
Nitrate/Nitrite as N	0.21 U	0.21	mg/kg wet						
Blank (L005298-BLK3)		Prepared & Analyzed: 05/26/2010							
Nitrate/Nitrite as N	0.21 U	0.21	mg/kg wet						

000026



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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/27/2010 15:46

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L005298 - Default Prep GenChem									
LCS (L005298-BS1)									
Nitrate/Nitrite as N	4.90	0.20	mg/kg wet	5.0100		97.8	90-110		
				Prepared & Analyzed: 05/26/2010					
LCS (L005298-BS2)									
Nitrate/Nitrite as N	4.73	0.20	mg/kg wet	5.0100		94.4	90-110		
				Prepared & Analyzed: 05/26/2010					
LCS (L005298-BS3)									
Nitrate/Nitrite as N	4.50	0.20	mg/kg wet	5.0100		89.8*	90-110		
				Prepared & Analyzed: 05/26/2010					
LCS Dup (L005298-BSD1)									
Nitrate/Nitrite as N	4.75	0.19	mg/kg wet	4.8717		97.4	90-110	3.21	20
				Prepared & Analyzed: 05/26/2010					
LCS Dup (L005298-BSD2)									
Nitrate/Nitrite as N	4.59	0.19	mg/kg wet	4.8717		94.2	90-110	3.01	20
				Prepared & Analyzed: 05/26/2010					
LCS Dup (L005298-BSD3)									
Nitrate/Nitrite as N	4.41	0.19	mg/kg wet	4.8717		90.6	90-110	1.91	20
				Prepared & Analyzed: 05/26/2010					
Matrix Spike (L005298-MS4)									
Nitrate/Nitrite as N	6.31	0.21	mg/kg dry	5.1583	1.83	86.9	75-125		
				Source: 1005049-01RE1 Prepared & Analyzed: 05/26/2010					

000027

Date: 7 April 2011
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol – Waste Subsite 118-H-1:1
 Subject: Radiochemistry - Data Package No. K2047-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2047 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J19Y39	5/11/10	Soil	C	See note 1
J19Y40	5/11/10	Soil	C	See note 1
J19Y41	5/11/10	Soil	C	See note 1
J19Y42	5/11/10	Soil	C	See note 1
J19Y43	5/11/10	Soil	C	See note 1
J19Y44	5/11/10	Soil	C	See note 1
J19Y45	5/11/10	Soil	C	See note 1
J19Y46	5/11/10	Soil	C	See note 1
J19Y47	5/11/10	Soil	C	See note 1
J19Y48	5/11/10	Soil	C	See note 1
J19Y49	5/11/10	Soil	C	See note 1
J19Y50	5/11/10	Soil	C	See note 1
J19Y51	5/11/10	Soil	C	See note 1
J19Y52	5/11/10	Soil	C	See note 1
J19Y53	5/11/10	Soil	C	See note 1
J19Y54	5/11/10	Soil	C	See note 1
J19Y55	5/11/10	Soil	C	See note 1
J19Y56	5/12/10	Soil	C	See note 1

1 – Gamma spectroscopy, alpha spectroscopy, total strontium, nickel-63, carbon-14 & tritium.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, Rev. 0, December 2001). 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

000001

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 blank results were acceptable.

Field (Equipment) Blank

No equipment blank was 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 65-135%. 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 a matrix spike analysis, all carbon-14 and tritium results were qualified estimates and flagged "J".

All other accuracy results were acceptable.

000002

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 35%, 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

One set of field duplicates (J19Y39/J19Y51) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Detection Levels

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

Completeness

Data package No. K2047 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 a matrix spike analysis, all carbon-14 and tritium results were qualified estimates and flagged "J".

000003

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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

000005

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.

000006

Appendix 2
Summary of Data Qualification

000007

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K2047	REVIEWER: ELR	Project: 118-H-1:1	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Carbon-14 Tritium	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.

000008

Appendix 3
Annotated Laboratory Reports

000009

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-001

J19Y39

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-01</u>	Client sample id <u>J19Y39</u>	
Dept sample id <u>7671-001</u>	Location/Matrix <u>118-H-1 Exc-A Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 08:25</u>	<u>1045 g</u>
% solids <u>96.3</u>	Custody/SAF No <u>RC-107-019</u>	<u>RC-107</u>

✓ 4/6/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	1.19	1.8	2.96	400	U <u>J</u>	H
Carbon 14	14762-75-5	3.66	0.54	0.813	1.00	U <u>J</u>	C
Nickel 63	13981-37-8	-0.421	1.4	2.40	30.0	U	NI_L
Total Strontium	SR-RAD	0.072	0.12	0.229	1.00	U	SR
Plutonium 238	13981-16-3	0.054	0.054	0.205	1.00	U	PU
Plutonium 239/240	PU-239/240	0.188	0.16	0.205	1.00	U	PU
Potassium 40	13966-00-2	14.7	0.69	0.262			GAM
Cobalt 60	10198-40-0	U		0.032	0.050	U	GAM
Cesium 137	10045-97-3	0.128	0.034	0.037	0.100		GAM
Radium 226	13982-63-3	0.704	0.062	0.053	0.100		GAM
Radium 228	15262-20-1	0.934	0.14	0.128	0.200		GAM
Europium 152	14683-23-9	U		0.074	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.103</u>	0.100	U	GAM
Europium 155	14391-16-3	U		0.083	0.100	U	GAM
Thorium 228	14274-82-9	0.844	0.040	0.033			GAM
Thorium 232	TH-232	0.934	0.14	0.128			GAM
Uranium 235	15117-96-1	U		0.158		U	GAM
Uranium 238	U-238	U		3.91		U	GAM
Americium 241	14596-10-2	U		0.103		U	GAM
Silver 108m	14391-65-2	U		0.022		U	GAM
Barium 133	13981-41-4	U		0.027		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 06/07/10

000010

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-002

J19Y40

DATA SHEET

SDG 7671 Client/Case no Hanford SDG K2047
 Contact N. Joseph Verville Contract No. S00W235A00

Lab sample id S005061-02 Client sample id J19Y40
 Dept sample id 7671-002 Location/Matrix 118-H-1 Exc-A Verificat SOLID
 Received 05/17/10 Collected/Weight 05/11/10 12:15 1344 g
 % solids 98.7 Custody/SAF No RC-107-019 RC-107

V 4/6/10

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.050	1.7	2.99	400	U ^J	H
Carbon 14	14762-75-5	1.47	0.49	0.778	1.00	J	C
Nickel 63	13981-37-8	0	1.4	2.41	30.0	U	NI_L
Total Strontium	SR-RAD	0.065	0.12	0.235	1.00	U	SR
Plutonium 238	13981-16-3	0	0.050	0.189	1.00	U	PU
Plutonium 239/240	PU-239/240	0.025	0.050	0.189	1.00	U	PU
Potassium 40	13966-00-2	14.9	0.58	0.262			GAM
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	U		0.024	0.100	U	GAM
Radium 226	13982-63-3	0.467	0.053	0.048	0.100		GAM
Radium 228	15262-20-1	0.535	0.11	0.106	0.200		GAM
Europium 152	14683-23-9	U		0.061	0.100	U	GAM
Europium 154	15585-10-1	U		0.085	0.100	U	GAM
Europium 155	14391-16-3	U		0.079	0.100	U	GAM
Thorium 228	14274-82-9	0.528	0.033	0.031			GAM
Thorium 232	TH-232	0.535	0.11	0.106			GAM
Uranium 235	15117-96-1	U		0.147		U	GAM
Uranium 238	U-238	U		2.87		U	GAM
Americium 241	14596-10-2	U		0.142		U	GAM
Silver 108m	14391-65-2	U		0.015		U	GAM
Barium 133	13981-41-4	U		0.026		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

DATA SHEETS

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SUMMARY DATA SECTION

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000011

Lab id EBRLNE
 Protocol Hanford1
 Version Ver 1.0
 Form DVD-DS
 Version 3.06
 Report date 06/07/10

EBERLINE ANALYTICAL/RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-003

J19Y41

DATA SHEET

<u>SDG 7671</u>	<u>Client/Case no Hanford</u>	<u>SDG K2047</u>
<u>Contact N. Joseph Verville</u>	<u>Contract No. S00W235A00</u>	
<u>Lab sample id S005061-03</u>	<u>Client sample id J19Y41</u>	
<u>Dept sample id 7671-003</u>	<u>Location/Matrix 118-H-1 Exc-A Verificat SOLID</u>	
<u>Received 05/17/10</u>	<u>Collected/Weight 05/11/10 09:15 1334 g</u>	
<u>% solids 97.5</u>	<u>Custody/SAF No RC-107-019 RC-107</u>	

✓ 4/6/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.815	1.8	3.04	400	U J	H
Carbon 14	14762-75-5	1.31	0.50	0.800	1.00	J	C
Nickel 63	13981-37-8	1.03	1.6	2.68	30.0	U	NI_L
Total Strontium	SR-RAD	-0.022	0.13	0.262	1.00	U	SR
Plutonium 238	13981-16-3	-0.025	0.049	0.189	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.049	0.188	1.00	U	PU
Potassium 40	13966-00-2	15.3	0.92	0.284			GAM
Cobalt 60	10198-40-0	U		0.034	0.050	U	GAM
Cesium 137	10045-97-3	0.072	0.036	0.039	0.100		GAM
Radium 226	13982-63-3	0.492	0.064	0.058	0.100		GAM
Radium 228	15262-20-1	0.627	0.13	0.139	0.200		GAM
Europium 152	14683-23-9	U		0.083	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.119</u>	0.100	U	GAM
Europium 155	14391-16-3	U		0.084	0.100	U	GAM
Thorium 228	14274-82-9	0.696	0.043	0.039			GAM
Thorium 232	TH-232	0.627	0.13	0.139			GAM
Uranium 235	15117-96-1	U		0.175		U	GAM
Uranium 238	U-238	U		4.00		U	GAM
Americium 241	14596-10-2	U		0.048		U	GAM
Silver 108m	14391-65-2	U		0.024		U	GAM
Barium 133	13981-41-4	U		0.035		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

000012

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-004

J19Y42

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-04</u>	Client sample id <u>J19Y42</u>	
Dept sample id <u>7671-004</u>	Location/Matrix <u>118-H-1 Exc-A Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 12:30</u>	<u>1515 g</u>
% solids <u>99.1</u>	Custody/SAF No <u>RC-107-019</u>	<u>RC-107</u>

Handwritten: ✓ 4/1/10

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	1.70	1.8	2.98	400	U J	H
Carbon 14	14762-75-5	1.52	0.50	0.794	1.00	J	C
Nickel 63	13981-37-8	0.338	1.6	2.65	30.0	U	NI_L
Total Strontium	SR-RAD	0.070	0.12	0.221	1.00	U	SR
Plutonium 238	13981-16-3	0.030	0.12	0.286	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.060	0.229	1.00	U	PU
Potassium 40	13966-00-2	14.0	0.78	0.332			GAM
Cobalt 60	10198-40-0	U		0.045	0.050	U	GAM
Cesium 137	10045-97-3	U		0.062	0.100	U	GAM
Radium 226	13982-63-3	0.427	0.073	0.076	0.100		GAM
Radium 228	15262-20-1	0.681	0.16	0.156	0.200		GAM
Europium 152	14683-23-9	U		0.096	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.128</u>	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.102</u>	0.100	U	GAM
Thorium 228	14274-82-9	0.551	0.043	0.045			GAM
Thorium 232	TH-232	0.681	0.16	0.156			GAM
Uranium 235	15117-96-1	U		0.211		U	GAM
Uranium 238	U-238	U		4.42		U	GAM
Americium 241	14596-10-2	U		0.305		U	GAM
Silver 108m	14391-65-2	U		0.026		U	GAM
Barium 133	13981-41-4	U		0.041		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000013

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-005

J19Y43

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-05</u>	Client sample id <u>J19Y43</u>	
Dept sample id <u>7671-005</u>	Location/Matrix <u>118-H-1 Exc-A Verificat SOLID</u>	
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 12:45 1526 g</u>	
% solids <u>98.7</u>	Custody/SAF No <u>RC-107-019 RC-107</u>	

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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	1.94	1.8	2.90	400	U ^J	H
Carbon 14	14762-75-5	1.02	0.47	0.766	1.00	U ^J	C
Nickel 63	13981-37-8	1.58	1.6	2.54	30.0	U	NI_L
Total Strontium	SR-RAD	0.055	0.088	0.151	1.00	U	SR
Plutonium 238	13981-16-3	0	0.11	0.271	1.00	U	PU
Plutonium 239/240	PU-239/240	0.028	0.057	0.216	1.00	U	PU
Potassium 40	13966-00-2	14.1	0.64	0.211			GAM
Cobalt 60	10198-40-0	0.098	0.035	0.033	0.050		GAM
Cesium 137	10045-97-3	0.104	0.030	0.032	0.100		GAM
Radium 226	13982-63-3	0.424	0.056	0.057	0.100		GAM
Radium 228	15262-20-1	0.606	0.11	0.115	0.200		GAM
Europium 152	14683-23-9	0.184	0.046	0.062	0.100		GAM
Europium 154	15585-10-1	U		0.100	0.100	U	GAM
Europium 155	14391-16-3	U		0.073	0.100	U	GAM
Thorium 228	14274-82-9	0.548	0.032	0.030			GAM
Thorium 232	TH-232	0.606	0.11	0.115			GAM
Uranium 235	15117-96-1	U		0.142		U	GAM
Uranium 238	U-238	U		3.44		U	GAM
Americium 241	14596-10-2	U		0.086		U	GAM
Silver 108m	14391-65-2	U		0.019		U	GAM
Barium 133	13981-41-4	U		0.025		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000014

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-006

J19Y44

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-06</u>	Client sample id <u>J19Y44</u>	
Dept sample id <u>7671-006</u>	Location/Matrix <u>118-H-1 Exc-A Verificat SOLID</u>	
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 09:45 1463 g</u>	
% solids <u>98.6</u>	Custody/SAF No <u>RC-107-019 RC-107</u>	

✓ 4/6/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	3.40	1.8	2.86	400	J	H
Carbon 14	14762-75-5	1.65	0.51	0.816	1.00	J	C
Nickel 63	13981-37-8	1.16	1.6	2.70	30.0	U	NI_L
Total Strontium	SR-RAD	1.03	0.21	0.236	1.00		SR
Plutonium 238	13981-16-3	0	0.071	0.270	1.00	U	PU
Plutonium 239/240	PU-239/240	0.282	0.21	0.270	1.00		PU
Potassium 40	13966-00-2	16.6	0.56	0.253			GAM
Cobalt 60	10198-40-0	0.044	0.023	0.026	0.050		GAM
Cesium 137	10045-97-3	0.162	0.030	0.030	0.100		GAM
Radium 226	13982-63-3	0.467	0.047	0.041	0.100		GAM
Radium 228	15262-20-1	0.611	0.10	0.099	0.200		GAM
Europium 152	14683-23-9	0.212	0.054	0.065	0.100		GAM
Europium 154	15585-10-1	U		0.081	0.100	U	GAM
Europium 155	14391-16-3	U		0.079	0.100	U	GAM
Thorium 228	14274-82-9	0.630	0.035	0.034			GAM
Thorium 232	TH-232	0.611	0.10	0.099			GAM
Uranium 235	15117-96-1	U		0.145		U	GAM
Uranium 238	U-238	U		2.94		U	GAM
Americium 241	14596-10-2	U		0.138		U	GAM
Silver 108m	14391-65-2	U		0.017		U	GAM
Barium 133	13981-41-4	U		0.025		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

000015

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-007

J19Y45

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-07</u>	Client sample id <u>J19Y45</u>	
Dept sample id <u>7671-007</u>	Location/Matrix <u>118-H-1 Exc-A Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 09:30</u>	<u>1478 g</u>
% solids <u>98.3</u>	Custody/SAF No <u>RC-107-019</u>	<u>RC-107</u>

W 4/6/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.821	1.7	2.88	400	U J	H
Carbon 14	14762-75-5	1.47	0.50	0.796	1.00	J	C
Nickel 63	13981-37-8	0.276	1.4	2.47	30.0	U	NI_L
Total Strontium	SR-RAD	0.008	0.13	0.262	1.00	U	SR
Plutonium 238	13981-16-3	0.152	0.18	0.291	1.00	U	PU
Plutonium 239/240	PU-239/240	2.83	0.65	0.233	1.00		PU
Potassium 40	13966-00-2	14.6	0.78	0.240			GAM
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	U		0.029	0.100	U	GAM
Radium 226	13982-63-3	0.465	0.056	0.051	0.100		GAM
Radium 228	15262-20-1	0.714	0.12	0.103	0.200		GAM
Europium 152	14683-23-9	U		0.068	0.100	U	GAM
Europium 154	15585-10-1	U		0.097	0.100	U	GAM
Europium 155	14391-16-3	U		0.071	0.100	U	GAM
Thorium 228	14274-82-9	0.758	0.053	0.052			GAM
Thorium 232	TH-232	0.714	0.12	0.103			GAM
Uranium 235	15117-96-1	U		0.142		U	GAM
Uranium 238	U-238	U		3.01		U	GAM
Americium 241	14596-10-2	U		0.039		U	GAM
Silver 108m	14391-65-2	U		0.019		U	GAM
Barium 133	13981-41-4	U		0.028		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000016

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-008

J19Y46

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-08</u>	Client sample id <u>J19Y46</u>	
Dept sample id <u>7671-008</u>	Location/Matrix <u>118-H-1 Exc-A Verificat SOLID</u>	
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 10:00 1447 g</u>	
% solids <u>98.6</u>	Custody/SAF No <u>RC-107-019 RC-107</u>	

Handwritten: 4/14/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	2.45	1.8	2.93	400	U <u>J</u>	H
Carbon 14	14762-75-5	1.45	0.48	0.762	1.00	U <u>J</u>	C
Nickel 63	13981-37-8	1.64	1.6	2.63	30.0	U	NI_L
Total Strontium	SR-RAD	0.345	0.15	0.222	1.00		SR
Plutonium 238	13981-16-3	0.036	0.14	0.275	1.00	U	PU
Plutonium 239/240	PU-239/240	0.036	0.14	0.275	1.00	U	PU
Potassium 40	13966-00-2	14.7	0.53	0.203			GAM
Cobalt 60	10198-40-0	0.192	0.027	0.023	0.050		GAM
Cesium 137	10045-97-3	0.339	0.034	0.030	0.100		GAM
Radium 226	13982-63-3	0.460	0.047	0.045	0.100		GAM
Radium 228	15262-20-1	0.666	0.091	0.094	0.200		GAM
Europium 152	14683-23-9	0.259	0.050	0.063	0.100		GAM
Europium 154	15585-10-1	U		0.076	0.100	U	GAM
Europium 155	14391-16-3	U		0.086	0.100	U	GAM
Thorium 228	14274-82-9	0.626	0.037	0.037			GAM
Thorium 232	TH-232	0.666	0.091	0.094			GAM
Uranium 235	15117-96-1	U		0.156		U	GAM
Uranium 238	U-238	U		2.72		U	GAM
Americium 241	14596-10-2	U		0.100		U	GAM
Silver 108m	14391-65-2	U		0.018		U	GAM
Barium 133	13981-41-4	U		0.027		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000017

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K2047

7671-009

J19Y47

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-09</u>	Client sample id <u>J19Y47</u>	
Dept sample id <u>7671-009</u>	Location/Matrix <u>118-H-1 Exc-A Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 10:30</u>	<u>1228 g</u>
% solids <u>96.8</u>	Custody/SAF No <u>RC-107-019</u>	<u>RC-107</u>

u 4/6/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	1.18	1.8	2.94	400	U ^J	H
Carbon 14	14762-75-5	0.977	0.49	0.788	1.00	^J	C
Nickel 63	13981-37-8	0.874	1.6	2.74	30.0	U	NI_L
Total Strontium	SR-RAD	-0.030	0.12	0.258	1.00	U	SR
Plutonium 238	13981-16-3	0	0.15	0.407	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.074	0.282	1.00	U	PU
Potassium 40	13966-00-2	15.0	0.59	0.284			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	0.020	0.020	0.026	0.100	U	GAM
Radium 226	13982-63-3	0.699	0.055	0.046	0.100		GAM
Radium 228	15262-20-1	0.904	0.11	0.103	0.200		GAM
Europium 152	14683-23-9	U		0.073	0.100	U	GAM
Europium 154	15585-10-1	U		0.084	0.100	U	GAM
Europium 155	14391-16-3	U		0.097	0.100	U	GAM
Thorium 228	14274-82-9	0.964	0.042	0.038			GAM
Thorium 232	TH-232	0.904	0.11	0.103			GAM
Uranium 235	15117-96-1	U		0.196		U	GAM
Uranium 238	U-238	U		3.10		U	GAM
Americium 241	14596-10-2	U		0.187		U	GAM
Silver 108m	14391-65-2	U		0.019		U	GAM
Barium 133	13981-41-4	U		0.031		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000018

Lab id <u>EBRINE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-010

J19Y48

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-10</u>	Client sample id <u>J19Y48</u>	
Dept sample id <u>7671-010</u>	Location/Matrix <u>118-H-1 Exc-A Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 13:45</u>	<u>1624 g</u>
% solids <u>99.1</u>	Custody/SAF No <u>RC-107-019</u>	<u>RC-107</u>

w 4/6/10

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	1.81	1.8	3.01	400	U ^J	H
Carbon 14	14762-75-5	1.09	0.48	0.778	1.00	U ^J	C
Nickel 63	13981-37-8	0.710	1.6	2.62	30.0	U	NI_L
Total Strontium	SR-RAD	-0.025	0.12	0.248	1.00	U	SR
Plutonium 238	13981-16-3	0.170	0.20	0.325	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.068	0.260	1.00	U	PU
Potassium 40	13966-00-2	14.5	0.77	0.275			GAM
Cobalt 60	10198-40-0	U		0.029	0.050	U	GAM
Cesium 137	10045-97-3	U		0.026	0.100	U	GAM
Radium 226	13982-63-3	0.425	0.056	0.051	0.100		GAM
Radium 228	15262-20-1	0.572	0.11	0.117	0.200		GAM
Europium 152	14683-23-9	U		0.068	0.100	U	GAM
Europium 154	15585-10-1	U		0.093	0.100	U	GAM
Europium 155	14391-16-3	U		0.070	0.100	U	GAM
Thorium 228	14274-82-9	0.606	0.038	0.036			GAM
Thorium 232	TH-232	0.572	0.11	0.117			GAM
Uranium 235	15117-96-1	U		0.142		U	GAM
Uranium 238	U-238	U		3.31		U	GAM
Americium 241	14596-10-2	U		0.040		U	GAM
Silver 108m	14391-65-2	U		0.017		U	GAM
Barium 133	13981-41-4	U		0.025		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

000019

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-011

J19Y49

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-11</u>	Client sample id <u>J19Y49</u>	
Dept sample id <u>7671-011</u>	Location/Matrix <u>118-H-1 Exc-A Verificat SOLID</u>	
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 13:15 1531 g</u>	
% solids <u>98.3</u>	Custody/SAF No <u>RC-107-019 RC-107</u>	

w 4/4/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	1.82	1.8	2.94	400	U <u>J</u>	H
Carbon 14	14762-75-5	1.18	0.49	0.791	1.00	<u>J</u>	C
Nickel 63	13981-37-8	0.532	1.6	2.78	30.0	U	NI_L
Total Strontium	SR-RAD	-0.057	0.11	0.244	1.00	U	SR
Plutonium 238	13981-16-3	0.074	0.22	0.408	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.074	0.282	1.00	U	PU
Potassium 40	13966-00-2	12.2	0.56	0.234			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	U		0.030	0.100	U	GAM
Radium 226	13982-63-3	0.494	0.054	0.051	0.100		GAM
Radium 228	15262-20-1	0.815	0.12	0.111	0.200		GAM
Europium 152	14683-23-9	U		0.064	0.100	U	GAM
Europium 154	15585-10-1	U		0.086	0.100	U	GAM
Europium 155	14391-16-3	U		0.070	0.100	U	GAM
Thorium 228	14274-82-9	0.669	0.032	0.028			GAM
Thorium 232	TH-232	0.815	0.12	0.111			GAM
Uranium 235	15117-96-1	U		0.129		U	GAM
Uranium 238	U-238	U		3.08		U	GAM
Americium 241	14596-10-2	U		0.080		U	GAM
Silver 108m	14391-65-2	U		0.016		U	GAM
Barium 133	13981-41-4	U		0.022		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000020

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K2047

7671-012

J19Y50

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-12</u>	Client sample id <u>J19Y50</u>	
Dept sample id <u>7671-012</u>	Location/Matrix <u>118-H-1 Exc-A Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 14:00</u>	<u>1600 g</u>
% solids <u>98.9</u>	Custody/SAF No <u>RC-107-019</u>	<u>RC-107</u>

u 4/6/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	1.12	1.8	3.04	400	U <i>J</i>	H
Carbon 14	14762-75-5	1.29	0.49	0.789	1.00	<i>J</i>	C
Nickel 63	13981-37-8	0.507	1.6	2.65	30.0	U	NI_L
Total Strontium	SR-RAD	1.47	0.22	0.210	1.00		SR
Plutonium 238	13981-16-3	0	0.13	0.320	1.00	U	PU
Plutonium 239/240	PU-239/240	0.033	0.067	0.256	1.00	U	PU
Potassium 40	13966-00-2	14.1	0.74	0.263			GAM
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	U		0.030	0.100	U	GAM
Radium 226	13982-63-3	0.503	0.049	0.040	0.100		GAM
Radium 228	15262-20-1	0.628	0.11	0.109	0.200		GAM
Europium 152	14683-23-9	U		0.068	0.100	U	GAM
Europium 154	15585-10-1	U		0.086	0.100	U	GAM
Europium 155	14391-16-3	U		0.065	0.100	U	GAM
Thorium 228	14274-82-9	0.681	0.038	0.037			GAM
Thorium 232	TH-232	0.628	0.11	0.109			GAM
Uranium 235	15117-96-1	U		0.165		U	GAM
Uranium 238	U-238	U		3.05		U	GAM
Americium 241	14596-10-2	U		0.041		U	GAM
Silver 108m	14391-65-2	U		0.020		U	GAM
Barium 133	13981-41-4	U		0.029		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

Lab id <u>EBRLINE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-013

J19Y51

DATA SHEET

<u>SDG 7671</u>	<u>Client/Case no Hanford</u>	<u>SDG K2047</u>
<u>Contact N. Joseph Verville</u>	<u>Contract No. S00W235A00</u>	
<u>Lab sample id S005061-13</u>	<u>Client sample id J19Y51</u>	
<u>Dept sample id 7671-013</u>	<u>Location/Matrix 118-H-1 Exc-A Verificat</u>	<u>SOLID</u>
<u>Received 05/17/10</u>	<u>Collected/Weight 05/11/10 08:25</u>	<u>1062 g</u>
<u>% solids 96.3</u>	<u>Custody/SAF No RC-107-019</u>	<u>RC-107</u>

4/9/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	1.11	1.8	3.01	400	U <i>J</i>	H
Carbon 14	14762-75-5	1.04	0.50	0.809	1.00	<i>J</i>	C
Nickel 63	13981-37-8	0.853	1.5	2.55	30.0	U	NI_L
Total Strontium	SR-RAD	0.024	0.13	0.256	1.00	U	SR
Plutonium 238	13981-16-3	-0.033	0.13	0.362	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.065	0.250	1.00	U	PU
Potassium 40	13966-00-2	15.0	0.61	0.326			GAM
Cobalt 60	10198-40-0	U		0.027	0.050	U	GAM
Cesium 137	10045-97-3	0.135	0.020	0.021	0.100		GAM
Radium 226	13982-63-3	0.656	0.055	0.050	0.100		GAM
Radium 228	15262-20-1	1.08	0.12	0.108	0.200		GAM
Europium 152	14683-23-9	U		0.058	0.100	U	GAM
Europium 154	15585-10-1	U		0.091	0.100	U	GAM
Europium 155	14391-16-3	U		0.089	0.100	U	GAM
Thorium 228	14274-82-9	0.886	0.037	0.031			GAM
Thorium 232	TH-232	1.08	0.12	0.108			GAM
Uranium 235	15117-96-1	U		0.147		U	GAM
Uranium 238	U-238	U		2.96		U	GAM
Americium 241	14596-10-2	U		0.045		U	GAM
Silver 108m	14391-65-2	U		0.017		U	GAM
Barium 133	13981-41-4	U		0.026		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000022

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-014

J19Y52

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-14</u>	Client sample id <u>J19Y52</u>	
Dept sample id <u>7671-014</u>	Location/Matrix <u>118-H-1 Exc-B Verificat SOLID</u>	
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 13:15 1147 g</u>	
% solids <u>98.5</u>	Custody/SAF No <u>RC-107-020 RC-107</u>	

n 4/6/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	2.12	1.8	2.94	400	U J	H
Carbon 14	14762-75-5	1.11	0.47	0.763	1.00	J	C
Nickel 63	13981-37-8	0.037	1.4	2.33	30.0	U	NI_L
Total Strontium	SR-RAD	0.101	0.13	0.243	1.00	U	SR
Plutonium 238	13981-16-3	0.059	0.12	0.284	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.059	0.227	1.00	U	PU
Potassium 40	13966-00-2	16.8	0.67	0.197			GAM
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	0.098	0.028	0.030	0.100		GAM
Radium 226	13982-63-3	0.412	0.055	0.054	0.100		GAM
Radium 228	15262-20-1	0.627	0.12	0.110	0.200		GAM
Europium 152	14683-23-9	U		0.079	0.100	U	GAM
Europium 154	15585-10-1	U		0.093	0.100	U	GAM
Europium 155	14391-16-3	U		0.090	0.100	U	GAM
Thorium 228	14274-82-9	0.631	0.042	0.041			GAM
Thorium 232	TH-232	0.627	0.12	0.110			GAM
Uranium 235	15117-96-1	U		0.190		U	GAM
Uranium 238	U-238	U		3.21		U	GAM
Americium 241	14596-10-2	U		0.121		U	GAM
Silver 108m	14391-65-2	U		0.020		U	GAM
Barium 133	13981-41-4	U		0.028		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000023

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL/RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-015

J19Y53

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-15</u>	Client sample id <u>J19Y53</u>	
Dept sample id <u>7671-015</u>	Location/Matrix <u>118-H-1 Exc-B Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 13:45</u>	<u>1326 g</u>
% solids <u>98.1</u>	Custody/SAF No <u>RC-107-020</u>	<u>RC-107</u>

n 4/9/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.149	1.7	2.97	400	U ^J	H
Carbon 14	14762-75-5	0.816	0.51	0.822	1.00	U ^J	C
Nickel 63	13981-37-8	0.640	1.5	2.51	30.0	U	NI_L
Total Strontium	SR-RAD	2.33	0.28	0.232	1.00		SR
Plutonium 238	13981-16-3	-0.032	0.13	0.354	1.00	U	PU
Plutonium 239/240	PU-239/240	0.064	0.13	0.245	1.00	U	PU
Potassium 40	13966-00-2	17.3	0.64	0.256			GAM
Cobalt 60	10198-40-0	U		0.027	0.050	U	GAM
Cesium 137	10045-97-3	0.033	0.023	0.031	0.100		GAM
Radium 226	13982-63-3	0.428	0.053	0.051	0.100		GAM
Radium 228	15262-20-1	0.743	0.11	0.096	0.200		GAM
Europium 152	14683-23-9	0.259	0.048	0.063	0.100		GAM
Europium 154	15585-10-1	U		0.089	0.100	U	GAM
Europium 155	14391-16-3	U		0.089	0.100	U	GAM
Thorium 228	14274-82-9	0.609	0.038	0.037			GAM
Thorium 232	TH-232	0.743	0.11	0.096			GAM
Uranium 235	15117-96-1	U		0.173		U	GAM
Uranium 238	U-238	U		3.15		U	GAM
Americium 241	14596-10-2	U		0.110		U	GAM
Silver 108m	14391-65-2	U		0.020		U	GAM
Barium 133	13981-41-4	U		0.032		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000024

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-016

J19Y54

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-16</u>	Client sample id <u>J19Y54</u>	
Dept sample id <u>7671-016</u>	Location/Matrix <u>118-H-1 Exc-B Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 13:50</u>	<u>1512 g</u>
% solids <u>98.3</u>	Custody/SAF No <u>RC-107-020</u>	<u>RC-107</u>

✓ 4/6/10

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.725	1.7	2.89	400	U J	H
Carbon 14	14762-75-5	1.40	0.48	0.773	1.00	J	C
Nickel 63	13981-37-8	0.968	1.7	2.76	30.0	U	NI_L
Total Strontium	SR-RAD	0.108	0.13	0.244	1.00	U	SR
Plutonium 238	13981-16-3	-0.064	0.064	0.305	1.00	U	PU
Plutonium 239/240	PU-239/240	-0.032	0.064	0.244	1.00	U	PU
Potassium 40	13966-00-2	14.4	0.92	0.451			GAM
Cobalt 60	10198-40-0	0.085	0.050	0.049	0.050		GAM
Cesium 137	10045-97-3	0.068	0.040	0.048	0.100		GAM
Radium 226	13982-63-3	0.454	0.084	0.088	0.100		GAM
Radium 228	15262-20-1	0.678	0.17	0.166	0.200		GAM
Europium 152	14683-23-9	U		<u>0.117</u>	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.159</u>	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.122</u>	0.100	U	GAM
Thorium 228	14274-82-9	0.615	0.051	0.052			GAM
Thorium 232	TH-232	0.678	0.17	0.166			GAM
Uranium 235	15117-96-1	U		0.234		U	GAM
Uranium 238	U-238	U		5.89		U	GAM
Americium 241	14596-10-2	U		0.344		U	GAM
Silver 108m	14391-65-2	U		0.029		U	GAM
Barium 133	13981-41-4	U		0.043		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000025

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-017

J19Y55

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-17</u>	Client sample id <u>J19Y55</u>	
Dept sample id <u>7671-017</u>	Location/Matrix <u>118-H-1 Exc-B Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 13:55</u>	<u>1254 g</u>
% solids <u>98.6</u>	Custody/SAF No <u>RC-107-020</u>	<u>RC-107</u>

W 4/11

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	1.00	1.7	2.86	400	U J	H
Carbon 14	14762-75-5	0.998	0.47	0.755	1.00	J	C
Nickel 63	13981-37-8	0.261	1.6	2.72	30.0	U	NI_L
Total Strontium	SR-RAD	-0.064	0.11	0.239	1.00	U	SR
Plutonium 238	13981-16-3	-0.079	0.079	0.378	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.079	0.302	1.00	U	PU
Potassium 40	13966-00-2	14.2	0.59	0.240			GAM
Cobalt 60	10198-40-0	U		0.028	0.050	U	GAM
Cesium 137	10045-97-3	0.055	0.023	0.027	0.100		GAM
Radium 226	13982-63-3	0.475	0.052	0.050	0.100		GAM
Radium 228	15262-20-1	0.705	0.098	0.098	0.200		GAM
Europium 152	14683-23-9	U		0.052	0.100	U	GAM
Europium 154	15585-10-1	U		0.084	0.100	U	GAM
Europium 155	14391-16-3	U		0.074	0.100	U	GAM
Thorium 228	14274-82-9	0.681	0.033	0.029			GAM
Thorium 232	TH-232	0.705	0.098	0.098			GAM
Uranium 235	15117-96-1	U		0.138		U	GAM
Uranium 238	U-238	U		3.04		U	GAM
Americium 241	14596-10-2	U		0.041		U	GAM
Silver 108m	14391-65-2	U		0.016		U	GAM
Barium 133	13981-41-4	U		0.025		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000026

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-018

J19Y56

DATA SHEET

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-18</u>	Client sample id <u>J19Y56</u>	
Dept sample id <u>7671-018</u>	Location/Matrix <u>118-H-1 Exc-B Verificat</u>	<u>SOLID</u>
Received <u>05/17/10</u>	Collected/Weight <u>05/12/10 09:00</u>	<u>1521 g</u>
% solids <u>99.2</u>	Custody/SAF No <u>RC-107-020</u>	<u>RC-107</u>

w 4/6/14

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.669	1.7	2.86	400	UJ	H
Carbon 14	14762-75-5	1.31	0.48	0.773	1.00	J	C
Nickel 63	13981-37-8	-0.365	1.5	2.54	30.0	U	NI_L
Total Strontium	SR-RAD	0.027	0.11	0.229	1.00	U	SR
Plutonium 238	13981-16-3	0	0.081	0.309	1.00	U	PU
Plutonium 239/240	PU-239/240	0.040	0.081	0.309	1.00	U	PU
Potassium 40	13966-00-2	13.7	0.53	0.259			GAM
Cobalt 60	10198-40-0	0.071	0.025	0.024	0.050		GAM
Cesium 137	10045-97-3	0.135	0.025	0.027	0.100		GAM
Radium 226	13982-63-3	0.507	0.052	0.047	0.100		GAM
Radium 228	15262-20-1	0.844	0.10	0.087	0.200		GAM
Europium 152	14683-23-9	0.137	0.044	0.059	0.100		GAM
Europium 154	15585-10-1	U		0.073	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.181</u>	0.100	U	GAM
Thorium 228	14274-82-9	0.728	0.035	0.031			GAM
Thorium 232	TH-232	0.844	0.10	0.087			GAM
Uranium 235	15117-96-1	U		0.153		U	GAM
Uranium 238	U-238	U		2.83		U	GAM
Americium 241	14596-10-2	U		0.152		U	GAM
Silver 108m	14391-65-2	U		0.017		U	GAM
Barium 133	13981-41-4	U		0.027		U	GAM

100-H Remaining Sites Burial Grounds - Soil Full Protocol

000027

Lab id <u>EBRLINE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000028

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K2047 was composed of eighteen solid (soil) sample designated under SAF No. RC-107 with a Project Designation of: 100-H Remaining Sites Burial Grounds – Soil Full Protocol

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on June 7, 2010.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis, low-level

The RPD in the original and duplicate results was 63%, greater than the QSAS control limit of 25%; the DER was 4.1. No other problems were encountered during the course of the analyses.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.5 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

2.6 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."



N. Joseph Verville
Client Services Manager

5/7/10

Date

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-019	Page 1 of 1		
Collector Clark, S	Company Contact Don Woolery	Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code 8L	Data Turnaround 21 Days			
Project Designation 110-H Remaining Sites Burial Grounds - Soil Full Protocol	Sample Location 118-H-1 Exc-A Verification	K2047 (7671)		SAF No. RC-107						
Ice Chest No. AFS-04-121	Field Logbook No. EL 1627-4	COA R118H12000		Method of Shipment Fed Ex						
Shipped To EBERLINE SERVICES/LIONVILLE	Offsite Property No. A100162			Bill of Lading/Air Bill No. SEE OSA						
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation <DOT Limits			Preservation	Note	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Note	
Special Handling and/or Storage None			Type of Container	aG	aG	aG	aG	aG	P	
No. of Container(s)			1	1	1	1	1	1	0	
Volume			125ml.	125ml.	250ml.	250ml.	125ml.	1000ml.	1000ml.	
SAMPLE ANALYSIS			See item (1) in Special Instructions.	NO2/NO3 35%	TPH-Diesel Range - WTPH D+	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotopic Phosphorus	Carbon 14 Low Level, Tritium - 114 Ni-63, Total Sr-90
000030										
Sample No.	Matrix *	Sample Date	Sample Time							
J19Y39	SOIL	5-11-10	0825					X	X	X
J19Y40	SOIL	5-11-10	1215					X	X	X
J19Y41	SOIL	5-11-10	0915					X	X	X
J19Y42	SOIL	5-11-10	1230					X	X	X
J19Y43	SOIL	5-11-10	1245					X	X	X
CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From S. Van Den Heide	Date/Time 5-11-10	Received By/Stored In S. Van Den Heide	Date/Time 5-11-10	Run all Rad analysis from 1000ml container. (1) K/P Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (UV) (2) Gamma Spec - Client List [Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable]				Matrix * 35-50 50-60 60-70 70-80 80-90 90-100 100-110 110-120 120-130 130-140 140-150 150-160 160-170 170-180 180-190 190-200 200-210 210-220 220-230 230-240 240-250 250-260 260-270 270-280 280-290 290-300 300-310 310-320 320-330 330-340 340-350 350-360 360-370 370-380 380-390 390-400 400-410 410-420 420-430 430-440 440-450 450-460 460-470 470-480 480-490 490-500 500-510 510-520 520-530 530-540 540-550 550-560 560-570 570-580 580-590 590-600 600-610 610-620 620-630 630-640 640-650 650-660 660-670 670-680 680-690 690-700 700-710 710-720 720-730 730-740 740-750 750-760 760-770 770-780 780-790 790-800 800-810 810-820 820-830 830-840 840-850 850-860 860-870 870-880 880-890 890-900 900-910 910-920 920-930 930-940 940-950 950-960 960-970 970-980 980-990 990-1000		
Relinquished By/Removed From S. Van Den Heide	Date/Time 5-11-10	Received By/Stored In J.E. Beal	Date/Time 5-11-10							
Relinquished By/Removed From J.E. Beal	Date/Time 5-13-10	Received By/Stored In FED EX	Date/Time							
Relinquished By/Removed From FED EX	Date/Time	Received By/Stored In M. NATAW	Date/Time 05/14/10 0930							
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time							
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time							
LABORATORY SECTION	Received By	Title						Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By						Date/Time		



Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST							RC-107-019		Page 2 of 3	
Collector 5-11-10 Clark, S		Company Contact Don Woolery		Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 21 Days		
Project Designation 100-H Remaining Sites Bunal Grounds - Soil Full Protocol		Sampling Location 118-H-1 Exc-A Verification		K2047 (7671)		SAF No. RC-107						
Ice Chest No. AFS-84-121		Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex						
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. A100162				Bill of Lading/Air Bill No.		SEE CSR				
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation < DOT Limits				Preservation		None		None		None		
Special Handling and/or Storage Cool + Dry - JEB 5-11-10 None				Type of Container		aG		aG		aG		
000031				No. of Container(s)		1		1		1		
				Volume		125ml.		125ml.		250ml.		250ml.
SAMPLE ANALYSIS				See item (1) w/ Special Instructions		NO2/AO3 35%		-TPH-Diesel Range - WTPH D+		PCBs - 8082		
								PAHs - 8310		See item (2) w/ Special Instructions		
								Isotopic Phosphorus		Carbon 14 Low Level; Tritium H3 4-63 6ml Sr-90		
Sample No.		Matrix *	Sample Date	Sample Time								
J19Y44		SOIL	5-11-10	0945					X	X	X	
J19Y45		SOIL	5-11-10	0930					X	X	X	
J19Y46		SOIL	5-11-10	1000					X	X	X	
J19Y47		SOIL	5-11-10	1030					X	X	X	
J19Y48		SOIL	5-11-10	1345					X	X	Y	
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *				
Relinquished By/Removed From		Date/Time		Sign/Print Names		Date/Time		Run all Rad analysis from 1000ml container.				(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV1) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)
S. Van Den Hende		5-11-10 1435		S. Van Den Hende		5-11-10 1435						
S. Van Den Hende		5-11-10 1800		J. E. Beal		5-11-10						
J. E. Beal		5-13-10		FED EX								
FED EX				J. F. WATAWANA		05/14/10 0920						
LABORATORY SECTION		Received By		Title		Date/Time						
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time						

REVIEWED BY
JED
DATE
5/13/10

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 2						
Collector <i>Clark</i>		Company Contact Don Woolery		Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code <i>8L</i>		Data Turnaround 21 Days					
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 118-H-1 Exc-B Verification		<i>K2047 (7671)</i>		SAF No. RC-107									
Ice Chest No. <i>AFS-04-121</i>		Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex									
Shipped To <u>EBERLINE SERVICES</u> / LIONVILLE		Offsite Property No. <i>A100162</i>				Bill of Lading/Air Bill No. <i>SEE OSMC</i>									
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation <i>< DOT Limits</i> Special Handling and/or Storage <i>Can't + Deg-C JEB 5-11-10</i> <i>NOTE</i> 0000033				Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None			
				Type of Container	uG	aG	aG	aG	aG	P	P	P			
				No. of Container(s)	1	1	1	1	1	1	0	0	0		
				Volume	125ml.	125ml.	250ml.	250ml.	125ml.	1000ml.	1000ml.	1000ml.			
SAMPLE ANALYSIS				See item (1) in Special Instructions	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D+	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotopic Plutonium	Carbon-14 Low Level, Tritium - H3, Ni-63, Total Sr-90				
				Sample No.	Matrix *	Sample Date	Sample Time								
<i>J19Y52</i>	SOIL	<i>5-11-10</i>	<i>1315</i>						X	X	X				
<i>J19Y53</i>	SOIL	<i>5-11-10</i>	<i>1345</i>						X	X	X				
<i>J19Y54</i>	SOIL	<i>5-11-10</i>	<i>1350</i>						X	X	X				
<i>J19Y55</i>	SOIL	<i>5-11-10</i>	<i>1355</i>						X	X	X				
<i>J19Y56</i>	SOIL	<i>5-11-10</i>													
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix * S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dust Solids DL=Distilled Liquids TL=Toxic WLV=Volatile L=Liquid V=Vegetative X=Other			
Relinquished By/Removed From <i>Clark</i>		Date/Time <i>1435</i>		Received By/Stored In <i>S. VanDenHende</i>		Date/Time <i>5-11-10</i>		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV) (2) Gamma Spec - Client List [Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable]							
Relinquished By/Removed From <i>S. VanDenHende</i>		Date/Time <i>5-11-10</i>		Received By/Stored In <i>J. E. Bern</i>		Date/Time <i>1800</i>									
Relinquished By/Removed From <i>J. E. Bern</i>		Date/Time <i>1100</i>		Received By/Stored In <i>FED EX</i>		Date/Time									
Relinquished By/Removed From <i>FED EX</i>		Date/Time		Received By/Stored In <i>F. WATAWA</i>		Date/Time <i>05/17/10 0915</i>									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
LABORATORY SECTION	Received By			Title			Date/Time								
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By			Date/Time								



Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 2			
Collector: <i>R. Breveny 5/12/10 Clark, S.</i>		Company Contact: Don Woolery		Telephone No.: 509-431-0448		Project Coordinator: KESSNER, JH		Price Code: 8L		Data Turnaround: 21 Days		
Project Designation: 100-H Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location: 118-H-1 Exc-B Verification		K2047 (7071)		SAF No.: RC-107						
Ice Chest No.: AFS-04-121		Field Logbook No.: EL 1627-4		COA: R118H12000		Method of Shipment: Fed Ex						
Shipped To: <u>EBERLINE SERVICES / LIONVILLE</u>		Offsite Property No.: A100162				Bill of Ladine/Air Bill No.: SEE ASPC						
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation < DOT Limits				Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None
Special Handling and/or Storage Cool 4 Deg C - JEB 5-12-10 NOTE				Type of Container	aG	aG	aG	aG	aG	P	P	P
				No. of Container(s)	1	1	1	0	1	1	0	0
				Volume	125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS				See item (1) in Special Instructions.	NO2/NO3 - 353.2	TPH - Diesel Range - WTPH	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotopic Plutonium	Carbon-14 Low Level Tritium - H3 Ni-63 Total Sr-90	US 5/15/10
				000034								
Sample No.	Matrix *	Sample Date	Sample Time									
J19Y52	SOIL											
J19Y53	SOIL											
J19Y54	SOIL											
J19Y55	SOIL											
J19Y56	SOIL	5-12-10	0900									
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From		Date/Time 1930		Received By/Stored In		Date/Time 1330		Run all Rad analysis from 1000ml container.				S=Soil
<i>John Clark / Steve Clark</i>				<i>Don Heibelberg</i>		5-12-10		(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)				SE=Sediment
Relinquished By/Removed From		Date/Time 1530		Received By/Stored In		Date/Time 1530		(2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)				SO=Solid
<i>Don Heibelberg</i>		5-12-10		<i>J. E. Bernhart</i>		5-12-10						SL=Sediment
Relinquished By/Removed From		Date/Time 1100		Received By/Stored In		Date/Time						W=Water
<i>J. E. Bernhart</i>		5-12-10		FED EX								O=Oil
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						A=Air
FED EX				<i>RE WATMAN</i>		05/17/10 0915						DS=Dross Solids
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						DL=Dross Liquid
												T=Tissue
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						Wl=Wipe
												L=Liquid
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						V=Vegetation
												X=Other
LABORATORY SECTION	Received By			Title			Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By			Date/Time					



Appendix 5

Data Validation Supporting Documentation

000035

**APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	118-H-111		DATA PACKAGE:	K2047	
VALIDATOR:	ELR	LAB:	EB	DATE:	4/2/11
		SDG:	K2047		
ANALYSES PERFORMED					
<input type="checkbox"/> Gross Alpha/Beta	<input type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input checked="" type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input checked="" type="checkbox"/> Tritium	Xc-14	Xn-63	
SAMPLES/MATRIX					
J19439 J19440 J19441 J19442 J19443					
J19444 J19445 J19446 J19447 J19448					
J19449 J19450 J19451 J19452 J19453					
J19454 J19455 J19456					
Sol. 1					

1. Completeness N/A

Technical verification forms present? Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) N/A

Instruments/detectors calibrated? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E)

N/A

Calibration checked within required frequency?Yes No N/A

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

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

Calibration check standards expired?Yes No N/A

Calculation check acceptable?Yes No N/A

Comments: _____

4. Background Counts (Levels D, E)

N/A

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

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

Calculation check acceptable?Yes No N/A

Comments: _____

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

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

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

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

Field blank results acceptable? Yes No N/A

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

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

Comments: no FB

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

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

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

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

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

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

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

Comments: _____

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

Chemical carrier added? Yes No N/A

Chemical recovery acceptable?..... Yes No N/A

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

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

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

Comments: _____

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

Tracer added? Yes No N/A

Tracer recovery acceptable? Yes No N/A

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

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

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

Comments: _____

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

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

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

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

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

Comments: NO 36 for E-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 FS or PAS

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A

Comments: _____

13. Results and Detection Limits (All Levels)..... N/A
Results reported for all required sample analyses?..... Yes No N/A
Results supported in raw data?(Levels D, E)..... Yes No N/A
Results Acceptable? (Levels D, E) Yes No N/A
Transcription/Calculation errors? (Levels D, E)..... Yes No N/A
MDA's meet required detection limits? Yes No N/A
Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000042 .

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K2047

7671-020

Method Blank

METHOD BLANK

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S005061-20</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7671-020</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-107</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.559	1.7	3.04	400	U	H
Carbon 14	14762-75-5	0.110	0.48	0.799	1.00	U	C
Nickel 63	13981-37-8	0.038	1.4	2.40	30.0	U	NI_L
Total Strontium	SR-RAD	-0.009	0.12	0.240	1.00	U	SR
Plutonium 238	13981-16-3	-0.045	0.090	0.343	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.090	0.343	1.00	U	PU
Potassium 40	13966-00-2	U		0.653		U	GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	U		0.023	0.100	U	GAM
Radium 226	13982-63-3	U		0.106	0.100	U	GAM
Radium 228	15262-20-1	U		0.091	0.200	U	GAM
Europium 152	14683-23-9	U		0.059	0.100	U	GAM
Europium 154	15585-10-1	U		0.053	0.100	U	GAM
Europium 155	14391-16-3	U		0.054	0.100	U	GAM
Thorium 228	14274-82-9	U		0.037		U	GAM
Thorium 232	TH-232	U		0.091		U	GAM
Uranium 235	15117-96-1	U		0.132		U	GAM
Uranium 238	U-238	U		2.64		U	GAM
Americium 241	14596-10-2	U		0.031		U	GAM
Silver 108m	14391-65-2	U		0.017		U	GAM
Barium 133	13981-41-4	U		0.026		U	GAM

QC-BLANK #73344

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

000043

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2047

7671-019

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7671</u> Contact <u>N. Joseph Verville</u> Lab sample id <u>S005061-19</u> Dept sample id <u>7671-019</u>	Client/Case no <u>Hanford</u> SDG <u>K2047</u> Contract No. <u>S00W235A00</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>RC-107</u>
---	--

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	346	8.5	3.21	400		H	367	15	94	84-116	80-120
Carbon 14	1040	21	<u>4.67</u>	1.00		C	1060	42	98	84-116	80-120
Nickel 63	192	5.5	2.34	30.0		NI_L	218	8.7	88	84-116	80-120
Total Strontium	9.17	0.53	0.226	1.00		SR	8.89	0.36	103	81-119	80-120
Plutonium 238	10.5	1.5	0.253	1.00		PU	11.5	0.46	91	77-123	80-120
Plutonium 239/240	12.6	1.7	0.253	1.00		PU	13.2	0.53	95	77-123	80-120
Cobalt 60	0.362	0.031	0.016	0.050		GAM	0.384	0.015	94	83-117	80-120
Cesium 137	0.406	0.030	0.021	0.100		GAM	0.386	0.015	105	83-117	80-120

QC-LCS #73343

000044

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>06/07/10</u>

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2047

7671-021

J19Y39

DUPLICATE

SDG <u>7671</u>	Client/Case no <u>Hanford</u>	SDG <u>K2047</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>S005061-21</u>	Lab sample id <u>S005061-01</u>	Client sample id <u>J19Y39</u>
Dept sample id <u>7671-021</u>	Dept sample id <u>7671-001</u>	Location/Matrix <u>118-H-1 Exc-A Verificat SOLID</u>
	Received <u>05/17/10</u>	Collected/Weight <u>05/11/10 08:25 1045 g</u>
% solids <u>96.3</u>	% solids <u>96.3</u>	Custody/SAF No <u>RC-107-019 RC-107</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	DER σ
Tritium	1.38	1.8	2.95	400	U	H	1.19	1.8	2.96	U	-		0.1
Carbon 14	1.91	0.50	0.787	1.00		C	3.66	0.54	0.813		63	45	4.1
Nickel 63	-0.584	1.5	2.62	30.0	U	NI_L	-0.421	1.4	2.40	U	-		0.2
Total Strontium	0.039	0.13	0.253	1.00	U	SR	0.072	0.12	0.229	U	-		0.4
Plutonium 238	0.036	0.15	0.277	1.00	U	PU	0.054	0.054	0.205	U	-		0.2
Plutonium 239/240	0.181	0.15	0.277	1.00	U	PU	0.188	0.16	0.205	U	-		0.1
Potassium 40	15.0	0.61	0.313			GAM	14.7	0.69	0.262		2	18	0.3
Cobalt 60	U		0.026	0.050	U	GAM	U		0.032	U	-		0.3
Cesium 137	0.133	0.029	0.031	0.100		GAM	0.128	0.034	0.037		4	53	0.2
Radium 226	0.657	0.053	0.049	0.100		GAM	0.704	0.062	0.053		7	23	0.9
Radium 228	1.11	0.12	0.114	0.200		GAM	0.934	0.14	0.128		17	31	1.7
Europium 152	U		0.058	0.100	U	GAM	U		0.074	U	-		0.3
Europium 154	U		0.095	0.100	U	GAM	U		0.103	U	-		0.1
Europium 155	U		0.102	0.100	U	GAM	U		0.083	U	-		0.3
Thorium 228	0.891	0.037	0.031			GAM	0.844	0.040	0.033		5	18	0.9
Thorium 232	1.11	0.12	0.114			GAM	0.934	0.14	0.128		17	31	1.7
Uranium 235	U		0.148		U	GAM	U		0.158	U	-		0.1
Uranium 238	U		3.07		U	GAM	U		3.91	U	-		0.3
Americium 241	U		0.045		U	GAM	U		0.103	U	-		1.0
Silver 108m	U		0.018		U	GAM	U		0.022	U	-		0.3
Barium 133	U		0.027		U	GAM	U		0.027	U	-		0

QC-DUP#1 73345

100-H Remaining Sites Burial Grounds - Soil Full Protocol

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 06/07/10

000045

Date: 7 April 2011
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol – 118-H-1:1
 Subject: Inorganic - Data Package No. K2047-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2047 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J19Y39	5/11/10	Soil	C	See note 1
J19Y40	5/11/10	Soil	C	See note 1
J19Y41	5/11/10	Soil	C	See note 1
J19Y42	5/11/10	Soil	C	See note 1
J19Y43	5/11/10	Soil	C	See note 1
J19Y44	5/11/10	Soil	C	See note 1
J19Y45	5/11/10	Soil	C	See note 1
J19Y46	5/11/10	Soil	C	See note 1
J19Y47	5/11/10	Soil	C	See note 1
J19Y48	5/11/10	Soil	C	See note 1
J19Y49	5/11/10	Soil	C	See note 1
J19Y50	5/11/10	Soil	C	See note 1
J19Y51	5/11/10	Soil	C	See note 1
J19Y52	5/11/10	Soil	C	See note 1
J19Y53	5/11/10	Soil	C	See note 1
J19Y54	5/11/10	Soil	C	See note 1
J19Y55	5/11/10	Soil	C	See note 1
J19Y56	5/12/10	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Burial Grounds Remedial Action Sampling and Analysis Plan (DOE/RL-2001-35, Rev. 0, December 2001). 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 "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

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

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

000002

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

Due to matrix spike recoveries outside QC limits (46%), all antimony 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 35%, 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 Duplicates

One set of field duplicates (J19Y39/J19Y51) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

Completeness

Data package No. K2047 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

000003

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to matrix spike recoveries outside QC limits, all antimony (46%) 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-2001-35, Rev. 0, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1
Glossary of Data Reporting Qualifiers

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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).

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Appendix 2
Summary of Data Qualification

000007

METALS DATA QUALIFICATION SUMMARY*

SDG: K2407	REVIEWER: ELR	Project: 118-H-1:1	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	J	All	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

000009



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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y39
 1005049-01 (Soil)

n 4/6/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	7740		16.6	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.830	U J	0.830	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	5.64		0.830	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	65.0		0.415	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.224		0.166	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	1.53	B	1.66	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.0496	B	0.207	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	3950		16.6	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	12.4		0.830	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	6.48		2.49	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	11.8		1.66	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	19200		16.6	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	12.1		0.830	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	4090		4.15	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	294		0.830	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.220	B	0.830	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	10.9		2.07	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	1420		83:0	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.249	U	0.249	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	674		4.98	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.830	U	0.830	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	173		41.5	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	48.0		0.830	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	37.7		2.49	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0241	U	0.0241	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/20/2010 07:16

J19Y40
 1005049-02 (Soil)

n 4/6/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	4620		13.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.666	U J	0.666	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	1.40		0.666	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	26.6		0.333	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.113	B	0.133	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	0.750	B	1.33	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.0378	B	0.166	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	4800		13.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	8.34		0.666	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	5.05		2.00	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	10.2		1.33	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	13400		13.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	1.52		0.666	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	3570		3.33	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	195		0.666	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.166	B	0.666	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	9.92		1.66	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	536		66.6	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.200	U	0.200	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	233		4.00	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.666	U	0.666	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	144		33.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	40.4		0.666	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	29.6		2.00	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0234	U	0.0234	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y41
1005049-03 (Soil)

Handwritten signature and date: 4/9/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	6860		18.8	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.939	U J	0.939	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	2.59		0.939	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	43.4		0.470	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.189		0.188	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	1.09	B	1.88	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.0573	B	0.235	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	6260		18.8	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	11.9		0.939	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	6.38		2.82	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	14.7		1.88	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	17600		18.8	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	3.17		0.939	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	4650		4.70	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	272		0.939	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.243	B	0.939	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	13.9		2.35	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	952		93.9	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.282	U	0.282	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	654		5.63	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.939	U	0.939	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	196		47.0	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	48.2		0.939	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	37.4		2.82	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0183	B	0.0266	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y42
1005049-04 (Soil)

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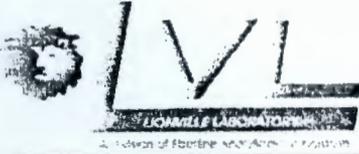
Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminium	5590		16.2	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.812	U J	0.812	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	1.60		0.812	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	36.6		0.406	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.132	B	0.162	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	0.732	B	1.62	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.203	U	0.203	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	4710		16.2	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	11.0		0.812	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	4.65		2.44	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	11.9		1.62	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	14700		16.2	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	1.75		0.812	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	3940		4.06	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	220		0.812	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.812	U	0.812	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	9.68		2.03	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	674		81.2	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.244	U	0.244	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	294		4.87	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.812	U	0.812	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	181		40.6	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	42.8		0.812	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	28.9		2.44	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0267	U	0.0267	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y43
1005049-05 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	6130		14.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.713	U J	0.713	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	1.79		0.713	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	47.5		0.356	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.165		0.143	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	1.44		1.43	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.0379	B	0.178	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	5300		14.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	10.2		0.713	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	5.13		2.14	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	12.9		1.43	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	16000		14.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	2.16		0.713	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	4050		3.56	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	234		0.713	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.150	B	0.713	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	9.34		1.78	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	843		71.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.214	U	0.214	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	407		4.28	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.713	U	0.713	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	196		35.6	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	44.3		0.713	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	31.4		2.14	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0240	U	0.0240	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y44
1005049-06 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	5140		16.1	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.805	U J	0.805	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	2.13		0.805	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	34.1		0.403	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.126	B	0.161	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	0.972	B	1.61	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.201	U	0.201	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	4140		16.1	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	9.25		0.805	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	4.49		2.42	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	10.3		1.61	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	12900		16.1	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	3.91		0.805	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	3520		4.03	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	204		0.805	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.253	B	0.805	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	8.47		2.01	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	734		80.5	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.242	U	0.242	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	364		4.83	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.805	U	0.805	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	149		40.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	35.1		0.805	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	28.4		2.42	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0228	U	0.0228	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y45
1005049-07 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	6190		13.6	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.682	U J	0.682	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	2.24		0.682	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	41.6		0.341	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.165		0.136	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	0.971	B	1.36	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.0364	B	0.170	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	4960		13.6	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	9.35		0.682	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	5.30		2.04	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	12.0		1.36	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	15700		13.6	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	2.57		0.682	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	3970		3.41	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	246		0.682	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.180	B	0.682	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	8.91		1.70	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	365		68.2	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.204	U	0.204	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	438		4.09	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.682	U	0.682	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	194		34.1	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	40.7		0.682	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	32.4		2.04	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0249	U	0.0249	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc.
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 Richland WA, 99354

Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
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J19Y46
1005049-08 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	5280		14.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.714	U J	0.714	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	1.77		0.714	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	45.4		0.357	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.146		0.143	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	1.07	B	1.43	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.0364	B	0.179	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	3750		14.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	7.75		0.714	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	4.30		2.14	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	9.26		1.43	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	12700		14.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	2.57		0.714	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	3160		3.57	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	203		0.714	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.714	U	0.714	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	7.54		1.79	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	759		71.4	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.214	U	0.214	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	407		4.28	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.714	U	0.714	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	151		35.7	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	32.9		0.714	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	26.6		2.14	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0294	U	0.0294	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

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J19Y47
 1005049-09 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	8920		16.9	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.847	U J	0.847	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	7.17		0.847	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	79.1		0.423	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.271		0.169	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	2.46		1.69	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.0580	B	0.212	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	4200		16.9	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	12.8		0.847	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	6.89		2.54	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	13.0		1.69	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	20100		16.9	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	17.3		0.847	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	4310		4.23	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	315		0.847	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.847	U	0.847	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	11.7		2.12	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	1700		84.7	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.254	U	0.254	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	704		5.08	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.847	U	0.847	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	199		42.3	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	47.7		0.847	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	42.1		2.54	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0291	U	0.0291	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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J19Y48
1005049-10 (Soil)

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Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	5170		14.2	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.709	U J	0.709	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	2.03		0.709	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	32.3		0.354	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.146		0.142	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	0.674	B	1.42	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.177	U	0.177	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	5810		14.2	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	10.1		0.709	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	4.48		2.13	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	11.0		1.42	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	13700		14.2	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	2.49		0.709	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	3680		3.54	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	214		0.709	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.709	U	0.709	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	8.85		1.77	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	608		70.9	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.213	U	0.213	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	285		4.25	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.709	U	0.709	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	139		35.4	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	36.7		0.709	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	28.1		2.13	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0245	U	0.0245	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/20/2010 07:16

J19Y49
 1005049-11 (Soil)

W 4/6/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	7790		17.5	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Antimony	0.875	U J	0.875	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Arsenic	2.90		0.875	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Barium	66.5		0.438	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Beryllium	0.234		0.175	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Boron	2.36		1.75	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cadmium	0.0445	B	0.219	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Calcium	7290		17.5	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Chromium	11.5		0.875	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Cobalt	6.10		2.63	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Copper	14.7		1.75	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Iron	19200		17.5	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Lead	4.37		0.875	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Magnesium	4040		4.38	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Manganese	286		0.875	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Molybdenum	0.875	U	0.875	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Nickel	10.2		2.19	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Potassium	1280		87.5	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Selenium	0.263	U	0.263	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silicon	658		5.25	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Silver	0.875	U	0.875	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Sodium	186		43.8	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Vanadium	46.9		0.875	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Zinc	36.4		2.63	mg/kg dry	1	L005158	05/17/2010	05/18/2010	6010B
Mercury	0.0286	U	0.0286	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y50
 1005049-12 (Soil)

Handwritten: W 4/6/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	5630		13.8	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Antimony	0.691	U J	0.691	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Arsenic	2.78		0.691	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Barium	40.3		0.346	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Beryllium	0.144		0.138	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Boron	0.983	B	1.38	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cadmium	0.0448	B	0.173	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Calcium	5440		13.8	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Chromium	8.61		0.691	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cobalt	5.28		2.07	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Copper	13.3		1.38	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Iron	14600		13.8	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Lead	5.96		0.691	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Magnesium	3480		3.46	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Manganese	222		0.691	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Molybdenum	0.691	U	0.691	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Nickel	8.61		1.73	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Potassium	801		69.1	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Selenium	0.207	U	0.207	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silicon	420		4.15	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silver	0.691	U	0.691	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Sodium	178		34.6	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Vanadium	38.9		0.691	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Zinc	31.5		2.07	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Mercury	0.0303	U	0.0303	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y51
 1005049-13 (Soil)

Handwritten: 4/6/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	7900		18.2	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Antimony	0.909	U J	0.909	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Arsenic	6.22		0.909	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Barium	65.7		0.455	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Beryllium	0.235		0.182	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Boron	1.73	B	1.82	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cadmium	0.0505	B	0.227	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Calcium	4050		18.2	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Chromium	12.9		0.909	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cobalt	6.67		2.73	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Copper	12.4		1.82	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Iron	19500		18.2	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Lead	11.8		0.909	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Magnesium	4010		4.55	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Manganese	294		0.909	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Molybdenum	0.909	U	0.909	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Nickel	11.5		2.27	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Potassium	1390		90.9	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Selenium	0.273	U	0.273	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silicon	757		5.45	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silver	0.909	U	0.909	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Sodium	190		45.5	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Vanadium	48.8		0.909	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Zinc	39.0		2.73	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Mercury	0.0283	U	0.0283	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y52
 1005049-14 (Soil)

W 4/4/11

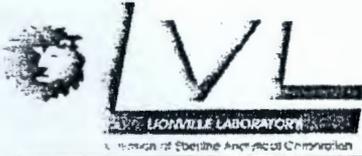
Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	5230		14.9	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Antimony	0.257	B J	0.744	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Arsenic	1.46		0.744	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Barium	31.0		0.372	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Beryllium	0.128	B	0.149	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Boron	0.631	B	1.49	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cadmium	0.0403	B	0.186	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Calcium	5540		14.9	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Chromium	8.54		0.744	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cobalt	4.30		2.23	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Copper	10.4		1.49	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Iron	13000		14.9	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Lead	1.98		0.744	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Magnesium	3730		3.72	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Manganese	214		0.744	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Molybdenum	0.744	U	0.744	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Nickel	9.91		1.86	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Potassium	694		74.4	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Selenium	0.223	U	0.223	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silicon	338		4.46	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silver	0.744	U	0.744	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Sodium	147		37.2	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Vanadium	35.9		0.744	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Zinc	27.9		2.23	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Mercury	0.0294	U	0.0294	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y53
1005049-15 (Soil)

W 4/16/10

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	5000		15.5	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Antimony	0.774	U J	0.774	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Arsenic	1.35		0.774	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Barium	34.0		0.387	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Beryllium	0.134	B	0.155	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Boron	0.777	B	1.55	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cadmium	0.193	U	0.193	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Calcium	5420		15.5	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Chromium	10.0		0.774	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cobalt	4.58		2.32	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Copper	10.0		1.55	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Iron	13000		15.5	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Lead	1.77		0.774	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Magnesium	3930		3.87	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Manganese	214		0.774	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Molybdenum	0.774	U	0.774	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Nickel	15.0		1.93	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Potassium	643		77.4	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Selenium	0.232	U	0.232	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silicon	391		4.64	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silver	0.774	U	0.774	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Sodium	149		38.7	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Vanadium	37.1		0.774	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Zinc	29.1		2.32	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Mercury	0.0230	U	0.0230	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc.
 2620 Fermi Avenue
 Richland WA, 99354

Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/20/2010 07:16

J19Y54
 1005049-16 (Soil)

Handwritten signature and date: 4/9/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	5600		14.3	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Antimony	0.716	U J	0.716	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Arsenic	1.97		0.716	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Barium	39.0		0.358	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Beryllium	0.152		0.143	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Boron	0.720	B	1.43	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cadmium	0.0415	B	0.179	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Calcium	5710		14.3	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Chromium	9.30		0.716	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cobalt	4.67		2.15	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Copper	13.1		1.43	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Iron	14500		14.3	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Lead	1.94		0.716	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Magnesium	3720		3.58	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Manganese	226		0.716	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Molybdenum	0.179	B	0.716	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Nickel	9.19		1.79	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Potassium	719		71.6	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Selenium	0.215	U	0.215	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silicon	304		4.30	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silver	0.716	U	0.716	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Sodium	191		35.8	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Vanadium	39.6		0.716	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Zinc	29.4		2.15	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Mercury	0.0277	U	0.0277	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y55
1005049-17 (Soil)

n 4/10/10

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	6360		16.4	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Antimony	0.821	U J	0.821	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Arsenic	3.84		0.821	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Barium	40.9		0.410	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Beryllium	0.171		0.164	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Boron	1.02	B	1.64	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cadmium	0.205	U	0.205	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Calcium	5700		16.4	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Chromium	11.1		0.821	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cobalt	5.39		2.46	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Copper	13.4		1.64	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Iron	16600		16.4	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Lead	4.69		0.821	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Magnesium	4120		4.10	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Manganese	242		0.821	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Molybdenum	0.821	U	0.821	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Nickel	10.2		2.05	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Potassium	933		82.1	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Selenium	0.246	U	0.246	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silicon	465		4.92	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silver	0.821	U	0.821	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Sodium	182		41.0	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Vanadium	42.5		0.821	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Zinc	32.2		2.46	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Mercury	0.0286	U	0.0286	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

000026



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-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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J19Y56
 1005049-18 (Soil)

V 4/4/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

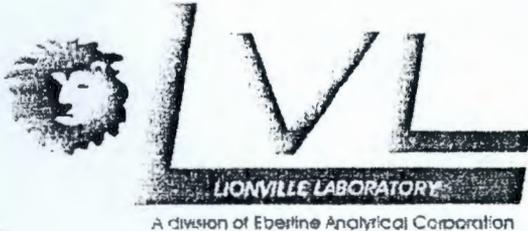
Aluminum	7670		15.9	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Antimony	0.797	U J	0.797	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Arsenic	3.16		0.797	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Barium	66.5		0.399	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Beryllium	0.223		0.159	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Boron	2.09		1.59	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cadmium	0.0524	B	0.199	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Calcium	6690		15.9	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Chromium	14.5		0.797	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Cobalt	6.42		2.39	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Copper	16.1		1.59	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Iron	19400		15.9	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Lead	3.47		0.797	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Magnesium	4550		3.99	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Manganese	284		0.797	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Molybdenum	0.182	B	0.797	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Nickel	12.7		1.99	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Potassium	1110		79.7	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Selenium	0.239	U	0.239	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silicon	594		4.78	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Silver	0.797	U	0.797	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Sodium	232		39.9	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Vanadium	52.9		0.797	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Zinc	38.2		2.39	mg/kg dry	1	L005158	05/17/2010	05/19/2010	6010B
Mercury	0.0266	U	0.0266	mg/kg dry	1	L005172	05/17/2010	05/19/2010	7471A

000027

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000028



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

Case Narrative

Client: WC-HANFORD RC-107
LVL#: 1005049
SDG/SAF#: K2047/RC-107

W.O.#: 60049-001-001-0001-00
Date Received: 05-14-10

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.

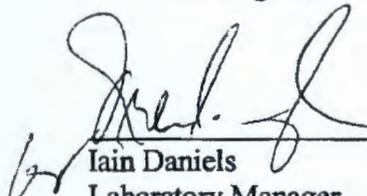
All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

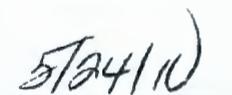
1. This narrative covers the analyses of 18 soil samples.
2. The samples were prepared and analyzed in accordance with methods listed on the data report forms.
3. All analyses were performed within the required holding times.
4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvLI's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).
7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation (3-10X the LOD), or samples 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.
10. The matrix spike (MS) recoveries for 5 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 serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes.

000029

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
J19Y39	Antimony	100	116.4
	Aluminum	22,000	89.3
	Iron	42,000	56.6
	Silicon	3,100	127.5
	Mercury	1.0	107.0

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limit criteria. The $\pm 20\%$ 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.


 Iain Daniels
 Laboratory Manager
 Lionville Laboratory


 Date

alm/05-049

000030

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-019		Page 1 of 3			
Collector R-Dreven 5-11-10 Clark, S.		Company Contact Don Woolery			Telephone No. 509-431-0448		Project Coordinator KRESSNER, JH		Price Code 8L		Data Turnaround 21 Days	
Project Designation 100-H Remaining Sites Burial Grounds - Soil Fall Protocol		Sampling Location 118-H-1 Exc-A Verification			SAF No. RC-107							
Ice Chest No. ERC-02-009		Field Logbook No. EL 1627-4		COA R118H12000		Method of Shipment Fed Ex						
Shipped To EMERLINE SERVICES / LIONVILLE		Offsite Property No. A100205/206			Bill of Lading/Air Bill No. SEE OSPC							
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation Special Handling and/or Storage Cool 4 Deg C DOT Limits		Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	
		Type of Container		aG	aG	aG	aG	aG	P	P	P	
		No. of Container(s)		1	1	1	0	1	1	0	0	
		Volume		125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL	
0000033		SAMPLE ANALYSIS		See item (1) in Special Instructions.	NO2/NO3 - 35.2	TPH-Diesel Range - WTPH-D +	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions	Isotopic Potassium	Carbon-14 Low Level, Tritium-113 Ni-63, Total Sr-90	
Sample No.	Matrix *	Sample Date	Sample Time									
J19Y49	SOIL	5-11-10	1315	X	X	X	X	X				
J19Y50	SOIL	5-11-10	1400	X	X	X	X	X				
J19Y51	SOIL	5-11-10	0825	X	X	X	X	X				
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From S. Van Den Heide Date/Time 5-11-10 1800		Received By/Stored In S. Van Den Heide Date/Time 5-11-10 1435		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) (2) Gamma Spec - Client List {Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium 152, Europium-154, Europium-155, Silver-108 metastable}				REVIEWED BY JRH DATE 5/13/10	Matrix * Se-75 SF-Neutron Si-28/Si-29 Na-23/Sr-87 W-Water D-Deut Ar-Ar DSD-Born Seals EM-Born Logpad In-From W-Water Co-Logpad C-Vegetation V-Crater			
Relinquished By/Removed From S. Van Den Heide Date/Time 5-11-10 1800		Received By/Stored In J. E. Beaulieu Date/Time 5-11-10 1800										
Relinquished By/Removed From J. E. Beaulieu Date/Time 5-13-10 1230		Received By/Stored In FED EX Date/Time										
Relinquished By/Removed From F. O. P. Date/Time 5-14-10 1010		Received By/Stored In VICTOR HERNANDEZ Date/Time 5-14-10 1010										
Relinquished By/Removed From		Received By/Stored In										
Relinquished By/Removed From		Received By/Stored In										
LABORATORY SECTION	Received By	Title						Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By						Date/Time				

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020	Page 1 of 2		
Collector: <i>5/11/10 Clark</i>		Company Contact: <i>Don Woolery</i>		Telephone No.: <i>509-431-0448</i>		Project Coordinator: <i>KESSNER, JH</i>		Price Code: <i>BL</i>	Data Turnaround: <i>21 Days</i>	
Project Designation: <i>100-II Remaining Sites Burial Grounds - Soil Full Protocol</i>		Sampling Location: <i>11R-II-1 Exc-B Verification</i>			SAF No.: <i>RC-107</i>					
Ice Chest No.: <i>ERC-02-009</i>		Field Logbook No.: <i>EL 1627-4</i>		COA: <i>R118H12000</i>		Method of Shipment: <i>Fed Ex</i>				
Shipped To: <i>EMERLINE SERVICES / LIONVILLE</i>		Offsite Property No.: <i>A100205/206</i>			Bill of Lading/Air Bill No.: <i>SEE OSPC</i>					
POSSIBLE SAMPLE HAZARDS/REMARKS: <i>Possible Radiation <DOT Limits</i>		Preservation		None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	
Special Handling and/or Storage: <i>Cool 4 Deg C</i>		Type of Container		aG	aG	aG	aG	aG	P	
000034		No. of Container(s)		1	1	1	0	1	1	
		Volume		125ml.	125ml.	250ml.	250ml.	125ml.	1000ml.	1000ml.
SAMPLE ANALYSIS		See item (1) in Special Instructions.		NO2/NO3 - 353.2	TPH-Diesel Range - WTPH 13	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.	Isotopic Potassium	Carbon 14 Low Level Tritium - 111 N1, 63, Total Sr-90
Sample No.	Matrix *	Sample Date	Sample Time							
J19Y52	SOIL	5-11-10	1315	X	X	X	X	X		
J19Y53	SOIL	5-11-10	1345	X	X	X	X	X		
J19Y54	SOIL	5-11-10	1350	X	X	X	X	X		
J19Y55	SOIL	5-11-10	1355	X	X	X	X	X		
J19Y56	SOIL	5-11-10								
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From: <i>S. Van Den Hende</i>		Date/Time: <i>1435 5-11-10</i>	Received By/Stored In: <i>S. Van Den Hende</i>		Date/Time: <i>1435 5-11-10</i>	Run all Rad analysis from 1000ml container (1) ICP Metals - 6010TR (Close-out List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc], Mercury - 7471 - (CV) (2) Gamma Spec - Client List [Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable]				Soil Sediment Sludge Water Gas Ice Dry Other Unknown Vegetation Asbestos
Relinquished By/Removed From: <i>S. Van Den Hende</i>		Date/Time: <i>1800 5-11-10</i>	Received By/Stored In: <i>J. E. Bawl</i>		Date/Time: <i>1800 5-11-10</i>					
Relinquished By/Removed From: <i>J. E. Bawl</i>		Date/Time: <i>1230 5-13-10</i>	Received By/Stored In: <i>FED EX</i>		Date/Time: <i></i>					
Relinquished By/Removed From: <i>Victor Hernandez</i>		Date/Time: <i>1010 5-14-10</i>	Received By/Stored In: <i>Victor Hernandez</i>		Date/Time: <i>1010 5-14-10</i>					
Relinquished By/Removed From: <i></i>		Date/Time: <i></i>	Received By/Stored In: <i></i>		Date/Time: <i></i>					
Relinquished By/Removed From: <i></i>		Date/Time: <i></i>	Received By/Stored In: <i></i>		Date/Time: <i></i>	REVIEWED BY <i>JLD</i> DATE <i>5/12/10</i>				
Relinquished By/Removed From: <i></i>		Date/Time: <i></i>	Received By/Stored In: <i></i>		Date/Time: <i></i>					
LABORATORY SECTION	Received By: <i></i>		Title: <i></i>							
FINAL SAMPLE DISPOSITION	Disposal Method: <i></i>		Disposed By: <i></i>							Date/Time: <i></i>

RECEIVED

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-107-020		Page 1 of 3																																						
Collector <i>Clark, S</i>		Company Contact Don Woolery		Telephone No. 509-431-0448		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 21 Days																																					
Project Designation 100-H Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 118-11-1 Exc-B Verification			SAF No. RC-107																																										
Ice Chest No. ERC-02-009		Field Logbook No. EL 1627-4		COA R1181112000		Method of Shipment Fed Ex																																									
Shipped To EBERLINE SERVICES LIONVILLE		Offsite Property No. A100205/206			Bill of Lading/Air Bill No. SEE OSFC																																										
POSSIBLE SAMPLE HAZARDS/REMARKS Possible Radiation < DOT Limits		<table border="1"> <thead> <tr> <th>Preservation</th> <th>None</th> <th>Cool 4C</th> <th>Cool 4C</th> <th>Cool 4C</th> <th>Cool 4C</th> <th>None</th> <th>None</th> <th>None</th> </tr> </thead> <tbody> <tr> <td>Type of Container</td> <td>aG</td> <td>aG</td> <td>aG</td> <td>aG</td> <td>aG</td> <td>P</td> <td>P</td> <td>P</td> </tr> <tr> <td>No. of Container(s)</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>Volume</td> <td>125mL</td> <td>125mL</td> <td>250mL</td> <td>250mL</td> <td>125mL</td> <td>1000mL</td> <td>1000mL</td> <td>1000mL</td> </tr> </tbody> </table>										Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	Type of Container	aG	aG	aG	aG	aG	P	P	P	No. of Container(s)	1	1	1	0	1	1	0	0	Volume	125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL
Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None																																							
Type of Container	aG	aG	aG	aG	aG	P	P	P																																							
No. of Container(s)	1	1	1	0	1	1	0	0																																							
Volume	125mL	125mL	250mL	250mL	125mL	1000mL	1000mL	1000mL																																							
Special Handling and/or Storage Cool 4 Deg C		<table border="1"> <thead> <tr> <th>Sec item (1) in Special Instructions</th> <th>NO2/NO3 - 353.2</th> <th>TPH-Diesel Range - WTPH-D</th> <th>PCBs - RW2</th> <th>PALis - B310</th> <th>Sec item (2) in Special Instructions</th> <th>Isotope Plutonium</th> <th>Carbon-14 Low Level Tritium - 103</th> </tr> </thead> <tbody> <tr> <td>SAMPLE ANALYSIS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										Sec item (1) in Special Instructions	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D	PCBs - RW2	PALis - B310	Sec item (2) in Special Instructions	Isotope Plutonium	Carbon-14 Low Level Tritium - 103	SAMPLE ANALYSIS																											
Sec item (1) in Special Instructions	NO2/NO3 - 353.2	TPH-Diesel Range - WTPH-D	PCBs - RW2	PALis - B310	Sec item (2) in Special Instructions	Isotope Plutonium	Carbon-14 Low Level Tritium - 103																																								
SAMPLE ANALYSIS																																															
000035																																															
Sample No.		Matrix *		Sample Date		Sample Time																																									
J19Y52		SOIL																																													
J19Y53		SOIL																																													
J19Y54		SOIL																																													
J19Y55		SOIL																																													
J19Y56		SOIL		5-12-10		0900		<input checked="" type="checkbox"/>																																							
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS																																							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Run all Rad analysis from 1000ml container. (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (TV) (2) Gamma Spec - Client List (Americium-241, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Silver-108 metastable)																																							
<i>Hyndman</i>		5-12-10 1330		<i>Don Woolery</i>		5-12-10 1330																																									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																																									
<i>Don Heideberg</i>		5-12-10 1530		<i>J.E. Beard</i>		5-12-10 1530																																									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																																									
<i>J.E. Beard</i>		5-13-10 1230		<i>FED EX</i>																																											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix * S - Soil SL - Sediment SD - Solid SI - Sludge W - Water G - Gas A - Air TS - Tissue Solids TB - Tissue Support T - Tissue WT - Wipe L - Liquid V - Vegetation X - Other																																							
<i>Fed Ex</i>		5-14-10 1010		<i>VICTOR HERANDERZ</i>		5-14-10 1010																																									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																																									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																																									
LABORATORY SECTION		Received By		Title				Date/Time																																							
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time																																							



Appendix 5
Data Validation Supporting Documentation

000036

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	118-H-1:1		DATA PACKAGE: K2047		
VALIDATOR:	ELR	LAB:	LLI	DATE: 4/2/11	
			SDG:	K2047	
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J19439	J19440	J19441	J19442	J19443	J19444
J19445	J19446	J19447	J19448	J19449	J19450
J19451	J19452	J19453	J19454	J19455	J19456
					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 - quartz (4690) - I 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

000042



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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/20/2010 07:16

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
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Batch L005158 - SW 3050B

Blank (L005158-BLK1)

Prepared: 05/17/2010 Analyzed: 05/18/2010

Aluminum	16.4	U	16.4	mg/kg wet					
Antimony	0.820	U	0.820	mg/kg wet					
Arsenic	0.820	U	0.820	mg/kg wet					
Barium	0.410	U	0.410	mg/kg wet					
Beryllium	0.164	U	0.164	mg/kg wet					
Boron	1.64	U	1.64	mg/kg wet					
Cadmium	0.205	U	0.205	mg/kg wet					
Calcium	5.23	B	16.4	mg/kg wet					
Chromium	0.820	U	0.820	mg/kg wet					
Cobalt	2.46	U	2.46	mg/kg wet					
Copper	1.64	U	1.64	mg/kg wet					
Iron	16.4	U	16.4	mg/kg wet					
Lead	0.820	U	0.820	mg/kg wet					
Magnesium	4.10	U	4.10	mg/kg wet					
Manganese	0.820	U	0.820	mg/kg wet					
Molybdenum	0.820	U	0.820	mg/kg wet					
Nickel	2.05	U	2.05	mg/kg wet					
Potassium	82.0	U	82.0	mg/kg wet					
Selenium	0.246	U	0.246	mg/kg wet					
Silicon	4.92	U	4.92	mg/kg wet					
Silver	0.820	U	0.820	mg/kg wet					
Sodium	41.0	U	41.0	mg/kg wet					
Vanadium	0.820	U	0.820	mg/kg wet					
Zinc	2.46	U	2.46	mg/kg wet					

Duplicate (L005158-DUP1)

Source: 1005049-01

Prepared: 05/17/2010 Analyzed: 05/18/2010

Aluminum	7570		14.5	mg/kg dry	7740			2	20
Antimony	0.726	U	0.726	mg/kg dry	0.830	U			20
Arsenic	5.70		0.726	mg/kg dry	5.64			1	20
Barium	65.6		0.363	mg/kg dry	65.0			1	20
Beryllium	0.215		0.145	mg/kg dry	0.224			4	20
Boron	1.43	B	1.45	mg/kg dry	1.53			7	20
Cadmium	0.0553	B	0.181	mg/kg dry	0.0496			11	20
Calcium	4210		14.5	mg/kg dry	3950			6	20
Chromium	11.4		0.726	mg/kg dry	12.4			9	20
Cobalt	6.76		2.18	mg/kg dry	6.48			4	20
Copper	12.4		1.45	mg/kg dry	11.8			5	20

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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-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/20/2010 07:16

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 L005158 - SW 3050B									
Duplicate (L005158-DUP1)		Source: 1005049-01		Prepared: 05/17/2010 Analyzed: 05/18/2010					
Iron	19800	14.5	mg/kg dry		19200			3	20
Lead	10.9	0.726	mg/kg dry		12.1			11	20
Magnesium	4160	3.63	mg/kg dry		4090			2	20
Manganese	299	0.726	mg/kg dry		294			2	20
Molybdenum	0.160 B	0.726	mg/kg dry		0.220			32*	20
Nickel	10.6	1.81	mg/kg dry		10.9			3	20
Potassium	1310	72.6	mg/kg dry		1420			8	20
Selenium	0.218 U	0.218	mg/kg dry		0.249 U				20
Silicon	697	4.36	mg/kg dry		674			3	20
Silver	0.726 U	0.726	mg/kg dry		0.830 U				20
Sodium	207	36.3	mg/kg dry		173			18	20
Vanadium	48.6	0.726	mg/kg dry		48.0			1	20
Zinc	38.6	2.18	mg/kg dry		37.7			2	20
Matrix Spike (L005158-MS1)		Source: 1005049-01		Prepared: 05/17/2010 Analyzed: 05/18/2010					
Aluminum	8290	17.7	mg/kg dry	177.19	7740	315*	75-125		
Antimony	20.3	0.886	mg/kg dry	44.297	0.830 U	46*	75-125		
Arsenic	157	0.886	mg/kg dry	177.19	5.64	85	75-125		
Barium	212	0.443	mg/kg dry	177.19	65.0	83	75-125		
Beryllium	3.79	0.177	mg/kg dry	4.4297	0.224	80	75-125		
Boron	72.5	1.77	mg/kg dry	88.595	1.53	80	75-125		
Cadmium	3.72	0.221	mg/kg dry	4.4297	0.0496	83	75-125		
Calcium	5830	17.7	mg/kg dry	2214.9	3950	85	75-125		
Chromium	26.7	0.886	mg/kg dry	17.719	12.4	81	75-125		
Cobalt	42.4	2.66	mg/kg dry	44.297	6.48	81	75-125		
Copper	29.9	1.77	mg/kg dry	22.149	11.8	82	75-125		
Iron	19000	17.7	mg/kg dry	88.595	19200	-233*	75-125		
Lead	47.3	0.886	mg/kg dry	44.297	12.1	79	75-125		
Magnesium	5830	4.43	mg/kg dry	2214.9	4090	79	75-125		
Manganese	334	0.886	mg/kg dry	44.297	294	91	75-125		
Molybdenum	74.7	0.886	mg/kg dry	88.595	0.220	84	75-125		
Nickel	46.8	2.21	mg/kg dry	44.297	10.9	81	75-125		
Potassium	3170	88.6	mg/kg dry	2214.9	1420	79	75-125		
Selenium	147	0.266	mg/kg dry	177.19	0.249 U	83	75-125		
Silicon	849	5.32	mg/kg dry	88.595	674	198*	75-125		
Silver	3.76	0.886	mg/kg dry	4.4297	0.830 U	85	75-125		
Sodium	2070	44.3	mg/kg dry	2214.9	173	86	75-125		

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264 Welsh Pool Road
 Exton, PA 19341
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WC-Hanford, Inc.
 2620 Fermi Avenue
 Richland WA, 99354

Project: RC-107
 Project Number: K2047
 Project Manager: Joan Kessner

Reported:
 05/20/2010 07:16

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 L005158 - SW 3050B									
Matrix Spike (L005158-MS1)		Source: 1005049-01		Prepared: 05/17/2010 Analyzed: 05/18/2010					
Vanadium	83.8	0.886	mg/kg dry	44.297	48.0	81	75-125		
Zinc	73.9	2.66	mg/kg dry	44.297	37.7	82	75-125		
Reference (L005158-SRM1)		Prepared: 05/17/2010 Analyzed: 05/18/2010							
Aluminum	6920	50.8	mg/kg wet	6766.6		102	0-225.5		
Antimony	60.2	2.54	mg/kg wet	56.630		106	0-225.6		
Arsenic	116	2.54	mg/kg wet	113.85		102	85-115		
Barium	289	1.27	mg/kg wet	298.35		97	75.7-124.3		
Beryllium	101	0.508	mg/kg wet	108.32		94	85.2-114.8		
Boron	81.7	5.08	mg/kg wet	86.580		94	68.5-131.6		
Cadmium	224	0.636	mg/kg wet	224.09		100	84.9-115.1		
Calcium	3180	50.8	mg/kg wet	3305.9		96	82.8-117.2		
Chromium	80.5	2.54	mg/kg wet	77.590		104	76.8-123.2		
Cobalt	162	7.63	mg/kg wet	163.19		99	79.4-120.6		
Copper	262	5.08	mg/kg wet	265.65		98	82.4-117.6		
Iron	8110	50.8	mg/kg wet	8202.8		99	78.9-121.1		
Lead	187	2.54	mg/kg wet	187.62		100	81.5-118.5		
Magnesium	8110	12.7	mg/kg wet	8352.3		97	84.2-115.8		
Manganese	846	2.54	mg/kg wet	951.35		89	69-131		
Molybdenum	242	2.54	mg/kg wet	234.78		103	80.1-119.9		
Nickel	224	6.36	mg/kg wet	220.85		101	81.4-118.6		
Potassium	14100	254	mg/kg wet	14177		100	85.7-114.3		
Selenium	189	0.763	mg/kg wet	187.99		100	78.8-121.2		
Silicon	790	15.3	mg/kg wet	939.78		84	0-272.3		
Silver	80.7	2.54	mg/kg wet	83.960		96	81.9-118.1		
Sodium	9280	127	mg/kg wet	9587.1		97	83.5-116.4		
Vanadium	103	2.54	mg/kg wet	97.430		106	75.8-124.2		
Zinc	200	7.63	mg/kg wet	196.52		102	78.9-121.1		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-107 Project Number: K2047 Project Manager: Joan Kessner	Reported: 05/20/2010 07:16
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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 L005172 - SW 7471A Prep									
Blank (L005172-BLK1)				Prepared: 05/17/2010 Analyzed: 05/19/2010					
Mercury	0.0243 U	0.0243	mg/kg wet						
Duplicate (L005172-DUP3)				Source: 1005049-01 Prepared: 05/17/2010 Analyzed: 05/19/2010					
Mercury	0.0285 U	0.0285	mg/kg dry		0.0241 U				20
Matrix Spike (L005172-MS3)				Source: 1005049-01 Prepared: 05/17/2010 Analyzed: 05/19/2010					
Mercury	0.188	0.0269	mg/kg dry	0.14935	0.0241 U 126*		75-125		
Reference (L005172-SRM1)				Prepared: 05/17/2010 Analyzed: 05/19/2010					
Mercury	1.50	0.0500	mg/kg wet	1.2600		119	65.9-133.3		

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