0070218

SAF-RC-025
100-BC Remaining Pipelines and Sewers - Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 DE 7/10/06
INITIAL/DATE

COMMENTS:

SDG K0284 SAF-RC-025

Waste Site: 100-B-14:2

RECEIVED
JUL 13 2006
EDMC

Date: 28 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines & Sewers – Soil Full Protocol - Waste Subsite 100-B-14:2
Subject: Semivolatiles - Data Package No. K0284-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0284 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11K85	4/3/06	Soil	C	See note 1
J11K86	4/3/06	Soil	C	See note 1
J11K87	4/3/06	Soil	C	See note 1
J11K88	4/3/06	Soil	C	See note 1
J11K89	4/3/06	Soil	C	See note 1
J11K90	4/3/06	Soil	C	See note 1
J11K91	4/3/06	Soil	C	See note 1
J11K92	4/3/06	Soil	C	See note 1
J11K93	4/3/06	Soil	C	See note 1
J11K94	4/3/06	Soil	C	See note 1
J11K95	4/3/06	Soil	C	See note 1
J11K96	4/3/06	Soil	C	See note 1
J11KD1	4/3/06	Soil	C	See note 1
J11KD2	4/3/06	Soil	C	See note 1

1– Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times 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 met.

- **Method Blanks**

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

Due to method blank contamination, all detected di-n-butylphthalate and bis(2-ethylhexyl)phthalate results were qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

Field Blanks

One equipment blank (J11K96) was submitted for analysis. Diethylphthalate was detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **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 +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike

concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to an RPD outside QC limits (68%), all 2,4-dinitrophenol results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J11K86/J11K95) 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. One hundred-twelve analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0284 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, all detected di-n-butylphthalate and bis(2-ethylhexyl)phthalate results were qualified as undetected, raised to the RQL and flagged "U".

- Due to an RPD outside QC limits (68%), all 2,4-dinitrophenol 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

One hundred-twelve analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

SEMIVOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: K0284	REVIEWER: TLI	Project: 100-B-14:2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate Di-n-butylphthalate	U at RQL	All detects	Blank contamination
2,4-Dinitrophenol	J	All	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																	
Laboratory: LLI	SDG: K0284																
Sample Number		J11K85		J11K86		J11K87		J11K88		J11K89		J11K90		J11K91		J11K92		J11K93	
Remarks				Main															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06	
Extraction Date		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06	
Analysis Date		4/17/06		4/17/06		4/17/06		4/17/06		4/17/06		4/17/06		4/18/06		4/18/06		4/18/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
bis(2-Chloroethyl)ether	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2-Chlorophenol	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
1,3-Dichlorobenzene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
1,4-Dichlorobenzene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
1,2-Dichlorobenzene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2-Methylphenol	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2,2'-oxybis(1-chloropropane)	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
3 and/or 4-Methylphenol	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
N-Nitroso-di-n-propylamine	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Hexachloroethane	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Nitrobenzene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Isophorone	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2-Nitrophenol	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2,4-Dimethylphenol	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
bis(2-Chloroethoxy)methane	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2,4-Dichlorophenol	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
1,2,4-Trichlorobenzene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Naphthalene	660	370	U	360	U	350	U	360	U	350	U	350	U	24		350	U	350	U
4-Chloroaniline	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Hexachlorobutadiene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
4-Chloro-3-methylphenol	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2-Methylnaphthalene	660	370	U	360	U	350	U	360	U	350	U	350	U	34		350	U	350	U
Hexachlorocyclopentadiene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2,4,6-Trichlorophenol	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2,4,5-Trichlorophenol*	660	920	U	890	U	890	U	890	U	880	U	880	U	890	U	880	U	880	U
2-Chloronaphthalene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2-Nitroaniline*	660	920	U	890	U	890	U	890	U	880	U	880	U	890	U	880	U	880	U
Dimethylphthalate	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Acenaphthylene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2,6-Dinitrotoluene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000011

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0284																		
Sample Number		J11K85		J11K86		J11K87		J11K88		J11K89		J11K90		J11K91		J11K92		J11K93	
Remarks				Main															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06	
Extraction Date		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06	
Analysis Date		4/16/06		4/17/06		4/17/06		4/17/06		4/17/06		4/17/06		4/18/06		4/18/06		4/18/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	920	U	890	U	890	U	890	U	880	U	880	U	890	U	880	U	880	U
Acenaphthene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2,4-Dinitrophenol*	660	920	UJ	890	UJ	890	UJ	890	UJ	880	UJ	880	UJ	890	UJ	880	UJ	880	UJ
4-Nitrophenol*	660	920	U	890	U	890	U	890	U	880	U	880	U	890	U	880	U	880	U
Dibenzofuran	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
2,4-Dinitrotoluene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Diethylphthalate	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
4-Chlorophenyl-phenyl ether	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Fluorene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
4-Nitroaniline*	660	920	U	890	U	890	U	890	U	880	U	880	U	890	U	880	U	880	U
4,6-Dinitro-2-methylphenol*	660	920	U	890	U	890	U	890	U	880	U	880	U	890	U	880	U	880	U
N-Nitrosodiphenylamine	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
4-Bromophenyl-phenyl ether	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Hexachlorobenzene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Pentachlorophenol*	660	920	U	890	U	890	U	890	U	880	U	880	U	890	U	880	U	880	U
Phenanthrene	660	370	U	360	U	350	U	360	U	350	U	350	U	24		350	U	350	U
Anthracene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Carbazole	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Di-n-butylphthalate	660	660	U	660	U	660	U	360	U	660	U	660	U	660	U	660	U	660	U
Fluoranthene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Pyrene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Butylbenzylphthalate	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
3,3'-Dichlorobenzidine	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Benzo(a)anthracene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Chrysene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U	660	U	660	U	660	U	660	U	660	U
Di-n-octylphthalate	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Benzo(b)fluoranthene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Benzo(k)fluoranthene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Benzo(a)pyrene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Indeno(1,2,3-cd)pyrene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Dibenz(a,h)anthracene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U
Benzo(g,h,i)perylene	660	370	U	360	U	350	U	360	U	350	U	350	U	360	U	350	U	350	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000012

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD

Laboratory: LLI SDG: K0284

Sample Number		J11K94		J11K95		J11K96		J11KD1		J11KD2									
Remarks				Duplicate		E. Blank													
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06									
Extraction Date		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06									
Analysis Date		4/18/06		4/18/06		4/19/06		4/16/06		4/17/06									
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	370	U	360	U	330	U	350	U	350	U								
bis(2-Chloroethyl)ether	660	370	U	360	U	330	U	350	U	350	U								
2-Chlorophenol	660	370	U	360	U	330	U	350	U	350	U								
1,3-Dichlorobenzene	660	370	U	360	U	330	U	350	U	350	U								
1,4-Dichlorobenzene	660	370	U	360	U	330	U	350	U	350	U								
1,2-Dichlorobenzene	660	370	U	360	U	330	U	350	U	350	U								
2-Methylphenol	660	370	U	360	U	330	U	350	U	350	U								
2,2'-oxybis(1-chloropropane)	660	370	U	360	U	330	U	350	U	350	U								
3 and/or 4-Methylphenol	660	370	U	360	U	330	U	350	U	350	U								
N-Nitroso-di-n-propylamine	660	370	U	360	U	330	U	350	U	350	U								
Hexachloroethane	660	370	U	360	U	330	U	350	U	350	U								
Nitrobenzene	660	370	U	360	U	330	U	350	U	350	U								
Isophorone	660	370	U	360	U	330	U	350	U	350	U								
2-Nitrophenol	660	370	U	360	U	330	U	350	U	350	U								
2,4-Dimethylphenol	660	370	U	360	U	330	U	350	U	350	U								
bis(2-Chloroethoxy)methane	660	370	U	360	U	330	U	350	U	350	U								
2,4-Dichlorophenol	660	370	U	360	U	330	U	350	U	350	U								
1,2,4-Trichlorobenzene	660	370	U	360	U	330	U	350	U	350	U								
Naphthalene	660	370	U	360	U	330	U	350	U	350	U								
4-Chloroaniline	660	370	U	360	U	330	U	350	U	350	U								
Hexachlorobutadiene	660	370	U	360	U	330	U	350	U	350	U								
4-Chloro-3-methylphenol	660	370	U	360	U	330	U	350	U	350	U								
2-Methylnaphthalene	660	370	U	360	U	330	U	350	U	350	U								
Hexachlorocyclopentadiene	660	370	U	360	U	330	U	350	U	350	U								
2,4,6-Trichlorophenol	660	370	U	360	U	330	U	350	U	350	U								
2,4,5-Trichlorophenol*	660	930	U	890	U	830	U	870	U	880	U								
2-Chloronaphthalene	660	370	U	360	U	330	U	350	U	350	U								
2-Nitroaniline*	660	930	U	890	U	830	U	870	U	880	U								
Dimethylphthalate	660	370	U	360	U	330	U	350	U	350	U								
Acenaphthylene	660	370	U	360	U	330	U	350	U	350	U								
2,6-Dinitrotoluene	660	370	U	360	U	330	U	350	U	350	U								

000013

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0284																		
Sample Number		J11K94		J11K95		J11K96		J11KD1		J11KD2									
Remarks				Duplicate		E. Blank													
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06									
Extraction Date		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06									
Analysis Date		4/18/06		4/18/06		4/19/06		4/16/06		4/17/06									
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	930	U	890	U	830	U	870	U	880	U								
Acenaphthene	660	370	U	360	U	330	U	350	U	350	U								
2,4-Dinitrophenol*	660	930	UJ	890	UJ	830	UJ	870	UJ	880	UJ								
4-Nitrophenol*	660	930	U	890	U	830	U	870	U	880	U								
Dibenzofuran	660	370	U	360	U	330	U	350	U	350	U								
2,4-Dinitrotoluene	660	370	U	360	U	330	U	350	U	350	U								
Diethylphthalate	660	370	U	360	U	91		350	U	350	U								
4-Chlorophenyl-phenyl ether	660	370	U	360	U	330	U	350	U	350	U								
Fluorene	660	370	U	360	U	330	U	350	U	350	U								
4-Nitroaniline*	660	930	U	890	U	830	U	870	U	880	U								
4,6-Dinitro-2-methylphenol*	660	930	U	890	U	830	U	870	U	880	U								
N-Nitrosodiphenylamine	660	370	U	360	U	330	U	350	U	350	U								
4-Bromophenyl-phenyl ether	660	370	U	360	U	330	U	350	U	350	U								
Hexachlorobenzene	660	370	U	360	U	330	U	350	U	350	U								
Pentachlorophenol*	660	930	U	890	U	830	U	870	U	880	U								
Phenanthrene	660	370	U	360	U	330	U	350	U	350	U								
Anthracene	660	370	U	360	U	330	U	350	U	350	U								
Carbazole	660	370	U	360	U	330	U	350	U	350	U								
Di-n-butylphthalate	660	660	U	660	U	660	U	660	U	350	U								
Fluoranthene	660	370	U	360	U	330	U	350	U	350	U								
Pyrene	660	370	U	360	U	330	U	350	U	350	U								
Butylbenzylphthalate	660	370	U	360	U	330	U	350	U	350	U								
3,3'-Dichlorobenzidine	660	370	U	360	U	330	U	350	U	350	U								
Benzo(a)anthracene	660	370	U	360	U	330	U	350	U	350	U								
Chrysene	660	22		360	U	330	U	350	U	350	U								
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U	660	U								
Di-n-octylphthalate	660	370	U	360	U	330	U	350	U	350	U								
Benzo(b)fluoranthene	660	23		360	U	330	U	350	U	350	U								
Benzo(k)fluoranthene	660	22		360	U	330	U	350	U	350	U								
Benzo(a)pyrene	660	21		360	U	330	U	350	U	350	U								
Indeno(1,2,3-cd)pyrene	660	370	U	360	U	330	U	350	U	350	U								
Dibenz(a,h)anthracene	660	370	U	360	U	330	U	350	U	350	U								
Benzo(g,h,i)perylene	660	370	U	360	U	330	U	350	U	350	U								

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000014

Semivolatiles by GC/MS, HSL List

Report Date: 04/24/06 11:08

RFW Batch Number: 0604L689 Client: TNUHANFORD RC-025 K0284 Work Order: 11343606001 Page: 1a

000000007

	Cust ID:	J11KD1	J11KD1	J11KD1	J11KD2	J11K85	J11K86
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	77 %	67 %	67 %	63 %	97 %	44 %
	2-Fluorobiphenyl	83 %	105 %	76 %	64 %	98 %	49 %
	Terphenyl-d14	85 %	104 %	78 %	75 %	132 %	79 %
	Phenol-d5	72 %	95 %	74 %	62 %	94 %	45 %
	2-Fluorophenol	73 %	86 %	65 %	58 %	85 %	38 %
	2,4,6-Tribromophenol	76 %	100 %	75 %	61 %	120 %	64 %
		fl	fl	fl	fl	fl	fl
Phenol		350 U	108 %	87 %	350 U	370 U	360 U
bis(2-Chloroethyl)ether		350 U	107 %	85 %	350 U	370 U	360 U
2-Chlorophenol		350 U	107 %	84 %	350 U	370 U	360 U
1,3-Dichlorobenzene		350 U	98 %	81 %	350 U	370 U	360 U
1,4-Dichlorobenzene		350 U	95 %	79 %	350 U	370 U	360 U
1,2-Dichlorobenzene		350 U	103 %	85 %	350 U	370 U	360 U
2-Methylphenol		350 U	109 %	86 %	350 U	370 U	360 U
2,2'-oxybis(1-Chloropropane)		350 U	104 %	86 %	350 U	370 U	360 U
4-Methylphenol		350 U	105 %	89 %	350 U	370 U	360 U
N-Nitroso-di-n-propylamine		350 U	116 %	93 %	350 U	370 U	360 U
Hexachloroethane		350 U	97 %	78 %	350 U	370 U	360 U
Nitrobenzene		350 U	73 %	76 %	350 U	370 U	360 U
Isophorone		350 U	82 %	87 %	350 U	370 U	360 U
2-Nitrophenol		350 U	76 %	80 %	350 U	370 U	360 U
2,4-Dimethylphenol		350 U	62 %	71 %	350 U	370 U	360 U
bis(2-Chloroethoxy)methane		350 U	76 %	81 %	350 U	370 U	360 U
2,4-Dichlorophenol		350 U	75 %	80 %	350 U	370 U	360 U
1,2,4-Trichlorobenzene		350 U	72 %	78 %	350 U	370 U	360 U
Naphthalene		350 U	71 %	78 %	350 U	370 U	360 U
4-Chloroaniline		350 U	78 %	80 %	350 U	370 U	360 U
Hexachlorobutadiene		350 U	81 %	86 %	350 U	370 U	360 U
4-Chloro-3-methylphenol		350 U	75 %	80 %	350 U	370 U	360 U
2-Methylnaphthalene		350 U	76 %	84 %	350 U	370 U	360 U
Hexachlorocyclopentadiene		350 U	101 * %	76 %	350 U	370 U	360 U
2,4,6-Trichlorophenol		350 U	110 %	88 %	350 U	370 U	360 U
2,4,5-Trichlorophenol		870 U	105 %	85 %	880 U	920 U	890 U

*= Outside of EPA CLP QC limits.

000015

JL 6/24/06

Cust ID:	J11KD1	J11KD1	J11KD1	J11KD2	J11K85	J11K86
RFW#:	001	001 MS	001 MSD	002	003	004
2-Chloronaphthalene	350 U	106 %	88 %	350 U	370 U	360 U
2-Nitroaniline	870 U	112 %	89 %	880 U	920 U	890 U
Dimethylphthalate	350 U	108 %	92 %	350 U	370 U	360 U
Acenaphthylene	350 U	105 %	88 %	350 U	370 U	360 U
2,6-Dinitrotoluene	350 U	108 %	88 %	350 U	370 U	360 U
3-Nitroaniline	870 U	119 %	101 %	880 U	920 U	890 U
Acenaphthene	350 U	105 %	88 %	350 U	370 U	360 U
2,4-Dinitrophenol	870 U J	23 %	47 %	880 U J	920 U J	890 U J
4-Nitrophenol	870 U	115 %	101 %	880 U	920 U	890 U
Dibenzofuran	350 U	107 %	92 %	350 U	370 U	360 U
2,4-Dinitrotoluene	350 U	114 %	99 %	350 U	370 U	360 U
Diethylphthalate	350 U	109 %	93 %	350 U	370 U	360 U
4-Chlorophenyl-phenylether	350 U	101 %	90 %	350 U	370 U	360 U
Fluorene	350 U	103 %	86 %	350 U	370 U	360 U
4-Nitroaniline	870 U	93 %	102 %	880 U	920 U	890 U
4,6-Dinitro-2-methylphenol	870 U	101 %	86 %	880 U	920 U	890 U
N-Nitrosodiphenylamine (1)	350 U	93 %	74 %	350 U	370 U	360 U
4-Bromophenyl-phenylether	350 U	97 %	79 %	350 U	370 U	360 U
Hexachlorobenzene	350 U	107 %	94 %	350 U	370 U	360 U
Pentachlorophenol	870 U	108 %	86 %	880 U	920 U	890 U
Phenanthrene	350 U	107 %	89 %	350 U	370 U	360 U
Anthracene	350 U	113 %	91 %	350 U	370 U	360 U
Carbazole	350 U	99 %	86 %	350 U	370 U	360 U
Di-n-butylphthalate	660 ~~21~~ JB U 6/24/00	111 %	90 %	350 U	660 ~~62~~ JB U 6/24/00	660 ~~23~~ JB U 6/24/00
Fluoranthene	350 U	106 %	89 %	350 U	370 U	360 U
Pyrene	350 U	108 %	89 %	350 U	370 U	360 U
Butylbenzylphthalate	350 U	118 %	96 %	350 U	370 U	360 U
3,3'-Dichlorobenzidine	350 U	92 %	91 %	350 U	370 U	360 U
Benzo(a)anthracene	350 U	106 %	84 %	350 U	370 U	360 U
Chrysene	350 U	108 %	84 %	350 U	370 U	360 U
bis(2-Ethylhexyl)phthalate	660 ~~25~~ JB U 6/24/00	116 %	91 %	660 ~~29~~ JB U 6/24/00	660 ~~60~~ JB U 6/24/00	660 ~~36~~ JB U 6/24/00
Di-n-octyl phthalate	350 U	112 %	89 %	350 U	370 U	360 U
Benzo(b)fluoranthene	350 U	110 %	82 %	350 U	370 U	360 U
Benzo(k)fluoranthene	350 U	97 %	78 %	350 U	370 U	360 U
Benzo(a)pyrene	350 U	101 %	79 %	350 U	370 U	360 U
Indeno(1,2,3-cd)pyrene	350 U	107 %	80 %	350 U	370 U	360 U
Dibenz(a,h)anthracene	350 U	105 %	75 %	350 U	370 U	360 U
Benzo(g,h,i)perylene	350 U	103 %	75 %	350 U	370 U	360 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

JK 6/24/00

000016

000000008

	Cust ID:	J11K87	J11K88	J11K89	J11K90	J11K91	J11K92
Sample Information	RFW#:	005	006	007	008	009	010
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	82 %	62 %	68 %	59 %	53 %	61 %
	2-Fluorobiphenyl	83 %	61 %	70 %	63 %	60 %	63 %
	Terphenyl-d14	112 %	93 %	112 %	82 %	72 %	85 %
	Phenol-d5	79 %	61 %	67 %	57 %	53 %	62 %
	2-Fluorophenol	73 %	57 %	61 %	54 %	47 %	62 %
	2,4,6-Tribromophenol	96 %	77 %	96 %	71 %	55 %	65 %
		fl	fl	fl	fl	fl	fl
Phenol		350 U	360 U	350 U	350 U	360 U	350 U
bis(2-Chloroethyl)ether		350 U	360 U	350 U	350 U	360 U	350 U
2-Chlorophenol		350 U	360 U	350 U	350 U	360 U	350 U
1,3-Dichlorobenzene		350 U	360 U	350 U	350 U	360 U	350 U
1,4-Dichlorobenzene		350 U	360 U	350 U	350 U	360 U	350 U
1,2-Dichlorobenzene		350 U	360 U	350 U	350 U	360 U	350 U
2-Methylphenol		350 U	360 U	350 U	350 U	360 U	350 U
2,2'-oxybis(1-Chloropropane)		350 U	360 U	350 U	350 U	360 U	350 U
4-Methylphenol		350 U	360 U	350 U	350 U	360 U	350 U
N-Nitroso-di-n-propylamine		350 U	360 U	350 U	350 U	360 U	350 U
Hexachloroethane		350 U	360 U	350 U	350 U	360 U	350 U
Nitrobenzene		350 U	360 U	350 U	350 U	360 U	350 U
Isophorone		350 U	360 U	350 U	350 U	360 U	350 U
2-Nitrophenol		350 U	360 U	350 U	350 U	360 U	350 U
2,4-Dimethylphenol		350 U	360 U	350 U	350 U	360 U	350 U
bis(2-Chloroethoxy)methane		350 U	360 U	350 U	350 U	360 U	350 U
2,4-Dichlorophenol		350 U	360 U	350 U	350 U	360 U	350 U
1,2,4-Trichlorobenzene		350 U	360 U	350 U	350 U	360 U	350 U
Naphthalene		350 U	360 U	350 U	350 U	24 J	350 U
4-Chloroaniline		350 U	360 U	350 U	350 U	360 U	350 U
Hexachlorobutadiene		350 U	360 U	350 U	350 U	360 U	350 U
4-Chloro-3-methylphenol		350 U	360 U	350 U	350 U	360 U	350 U
2-Methylnaphthalene		350 U	360 U	350 U	350 U	34 J	350 U
Hexachlorocyclopentadiene		350 U	360 U	350 U	350 U	360 U	350 U
2,4,6-Trichlorophenol		350 U	360 U	350 U	350 U	360 U	350 U
2,4,5-Trichlorophenol		890 U	890 U	880 U	880 U	890 U	880 U

*= Outside of EPA CLP QC limits.

L/24/06

000017

000000009

Cust ID:	J11K87		J11K88		J11K89		J11K90		J11K91		J11K92	
RFW#:	005		006		007		008		009		010	
2-Chloronaphthalene	350	U	360	U	350	U	350	U	360	U	350	U
2-Nitroaniline	890	U	890	U	880	U	880	U	890	U	880	U
Dimethylphthalate	350	U	360	U	350	U	350	U	360	U	350	U
Acenaphthylene	350	U	360	U	350	U	350	U	360	U	350	U
2,6-Dinitrotoluene	350	U	360	U	350	U	350	U	360	U	350	U
3-Nitroaniline	890	U	890	U	880	U	880	U	890	U	880	U
Acenaphthene	350	U	360	U	350	U	350	U	360	U	350	U
2,4-Dinitrophenol	890	U J	890	U J	880	U J	880	U J	890	U J	880	U J
4-Nitrophenol	890	U	890	U	880	U	880	U	890	U	880	U
Dibenzofuran	350	U	360	U	350	U	350	U	360	U	350	U
2,4-Dinitrotoluene	350	U	360	U	350	U	350	U	360	U	350	U
Diethylphthalate	350	U	360	U	350	U	350	U	360	U	350	U
4-Chlorophenyl-phenylether	350	U	360	U	350	U	350	U	360	U	350	U
Fluorene	350	U	360	U	350	U	350	U	360	U	350	U
4-Nitroaniline	890	U	890	U	880	U	880	U	890	U	880	U
4,6-Dinitro-2-methylphenol	890	U	890	U	880	U	880	U	890	U	880	U
N-Nitrosodiphenylamine (1)	350	U	360	U	350	U	350	U	360	U	350	U
4-Bromophenyl-phenylether	350	U	360	U	350	U	350	U	360	U	350	U
Hexachlorobenzene	350	U	360	U	350	U	350	U	360	U	350	U
Pentachlorophenol	890	U	890	U	880	U	880	U	890	U	880	U
Phenanthrene	350	U	360	U	350	U	350	U	24	J	350	U
Anthracene	350	U	360	U	350	U	350	U	360	U	350	U
Carbazole	350	U	360	U	350	U	350	U	360	U	350	U
Di-n-butylphthalate	660 ~~24~~ JB U		360	U	660 ~~30~~ JB U		660 ~~41~~ JB U		660 ~~39~~ JB U		660 ~~35~~ JB U	
Fluoranthene	350	U	360	U	350	U	350	U	360	U	350	U
Pyrene	350	U	360	U	350	U	350	U	360	U	350	U
Butylbenzylphthalate	350	U	360	U	350	U	350	U	360	U	350	U
3,3'-Dichlorobenzidine	350	U	360	U	350	U	350	U	360	U	350	U
Benzo(a)anthracene	350	U	360	U	350	U	350	U	360	U	350	U
Chrysene	350	U	360	U	350	U	350	U	360	U	350	U
bis(2-Ethylhexyl)phthalate	660 ~~27~~ JB U		660 ~~29~~ JB U		660 ~~30~~ JB U		660 ~~220~~ JB U		660 ~~36~~ JB U		660 ~~48~~ JB U	
Di-n-octyl phthalate	350	U	360	U	350	U	350	U	360	U	350	U
Benzo(b)fluoranthene	350	U	360	U	350	U	350	U	360	U	350	U
Benzo(k)fluoranthene	350	U	360	U	350	U	350	U	360	U	350	U
Benzo(a)pyrene	350	U	360	U	350	U	350	U	360	U	350	U
Indeno(1,2,3-cd)pyrene	350	U	360	U	350	U	350	U	360	U	350	U
Dibenz(a,h)anthracene	350	U	360	U	350	U	350	U	360	U	350	U
Benzo(g,h,i)perylene	350	U	360	U	350	U	350	U	360	U	350	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

6/24/06

000018

000000010

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0604L689 Client: TNUHANFORD RC-025 K0284 Work Order: 11343606001 Report Date: 04/24/06 11:08

000000011

	Cust ID:	J11K93	J11K94	J11K95	J11K96	SBLKVZ	SBLKVZ BS
Sample Information	RFW#:	011	012	013	014	06LE0275-MB1	06LE0275-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	63 %	70 %	55 %	66 %	73 %	64 %
	2-Fluorobiphenyl	64 %	73 %	63 %	69 %	75 %	85 %
	Terphenyl-d14	91 %	87 %	85 %	93 %	93 %	96 %
	Phenol-d5	62 %	68 %	58 %	71 %	76 %	86 %
	2-Fluorophenol	56 %	60 %	55 %	73 %	66 %	77 %
	2,4,6-Tribromophenol	68 %	69 %	66 %	88 %	65 %	95 %
		fl	fl	fl	fl	fl	fl
Phenol		350 U	370 U	360 U	330 U	330 U	92 %
bis(2-Chloroethyl)ether		350 U	370 U	360 U	330 U	330 U	88 %
2-Chlorophenol		350 U	370 U	360 U	330 U	330 U	86 %
1,3-Dichlorobenzene		350 U	370 U	360 U	330 U	330 U	80 %
1,4-Dichlorobenzene		350 U	370 U	360 U	330 U	330 U	79 %
1,2-Dichlorobenzene		350 U	370 U	360 U	330 U	330 U	82 %
2-Methylphenol		350 U	370 U	360 U	330 U	330 U	89 %
2,2'-oxybis(1-Chloropropane)		350 U	370 U	360 U	330 U	330 U	85 %
4-Methylphenol		350 U	370 U	360 U	330 U	330 U	89 %
N-Nitroso-di-n-propylamine		350 U	370 U	360 U	330 U	330 U	94 %
Hexachloroethane		350 U	370 U	360 U	330 U	330 U	81 %
Nitrobenzene		350 U	370 U	360 U	330 U	330 U	64 %
Isophorone		350 U	370 U	360 U	330 U	330 U	72 %
2-Nitrophenol		350 U	370 U	360 U	330 U	330 U	65 %
2,4-Dimethylphenol		350 U	370 U	360 U	330 U	330 U	52 %
bis(2-Chloroethoxy)methane		350 U	370 U	360 U	330 U	330 U	67 %
2,4-Dichlorophenol		350 U	370 U	360 U	330 U	330 U	66 %
1,2,4-Trichlorobenzene		350 U	370 U	360 U	330 U	330 U	62 %
Naphthalene		350 U	370 U	360 U	330 U	330 U	61 %
4-Chloroaniline		350 U	370 U	360 U	330 U	330 U	75 %
Hexachlorobutadiene		350 U	370 U	360 U	330 U	330 U	68 %
4-Chloro-3-methylphenol		350 U	370 U	360 U	330 U	330 U	72 %
2-Methylnaphthalene		350 U	370 U	360 U	330 U	330 U	67 %
Hexachlorocyclopentadiene		350 U	370 U	360 U	330 U	330 U	67 %
2,4,6-Trichlorophenol		350 U	370 U	360 U	330 U	330 U	90 %
2,4,5-Trichlorophenol		880 U	930 U	890 U	830 U	830 U	87 %

*= Outside of EPA CLP QC limits.

000019

L/24/06

Cust ID:	J11K93		J11K94		J11K95		J11K96		SBLKVZ		SBLKVZ BS	
RFW#:	011		012		013		014		06LE0275-MB1		06LE0275-MB1	
2-Chloronaphthalene	350	U	370	U	360	U	330	U	330	U	84	%
2-Nitroaniline	880	U	930	U	890	U	830	U	830	U	97	%
Dimethylphthalate	350	U	370	U	360	U	330	U	330	U	89	%
Acenaphthylene	350	U	370	U	360	U	330	U	330	U	86	%
2,6-Dinitrotoluene	350	U	370	U	360	U	330	U	330	U	91	%
3-Nitroaniline	880	U	930	U	890	U	830	U	830	U	103	%
Acenaphthene	350	U	370	U	360	U	330	U	330	U	85	%
2,4-Dinitrophenol	880	U J	930	U J	890	U J	830	U J	830	U	30	%
4-Nitrophenol	880	U	930	U	890	U	830	U	830	U	101	%
Dibenzofuran	350	U	370	U	360	U	330	U	330	U	87	%
2,4-Dinitrotoluene	350	U	370	U	360	U	330	U	330	U	94	%
Diethylphthalate	350	U	370	U	360	U	91	J	330	U	89	%
4-Chlorophenyl-phenylether	350	U	370	U	360	U	330	U	330	U	82	%
Fluorene	350	U	370	U	360	U	330	U	330	U	84	%
4-Nitroaniline	880	U	930	U	890	U	830	U	830	U	86	%
4,6-Dinitro-2-methylphenol	880	U	930	U	890	U	830	U	830	U	85	%
N-Nitrosodiphenylamine (1)	350	U	370	U	360	U	330	U	330	U	76	%
4-Bromophenyl-phenylether	350	U	370	U	360	U	330	U	330	U	82	%
Hexachlorobenzene	350	U	370	U	360	U	330	U	330	U	92	%
Pentachlorophenol	880	U	930	U	890	U	830	U	830	U	104	%
Phenanthrene	350	U	370	U	360	U	330	U	330	U	91	%
Anthracene	350	U	370	U	360	U	330	U	330	U	93	%
Carbazole	350	U	370	U	360	U	330	U	330	U	81	%
Di-n-butylphthalate	660 ~~26~~ JB	U	660 ~~41~~ JB	U	660 ~~25~~ JB	U	660 ~~200~~ JB	U	32	J	90	%
Fluoranthene	350	U	370	U	360	U	330	U	330	U	94	%
Pyrene	350	U	370	U	360	U	330	U	330	U	89	%
Butylbenzylphthalate	350	U	370	U	360	U	330	U	330	U	94	%
3,3'-Dichlorobenzidine	350	U	370	U	360	U	330	U	330	U	92	%
Benzo(a)anthracene	350	U	370	U	360	U	330	U	330	U	92	%
Chrysene	350	U	22	J	360	U	330	U	330	U	89	%
bis(2-Ethylhexyl)phthalate	660 ~~35~~ JB	U	660 ~~69~~ JB	U	660 ~~49~~ JB	U	660 ~~46~~ JB	U	40	J	90	%
Di-n-octyl phthalate	350	U	370	U	360	U	330	U	330	U	95	%
Benzo(b)fluoranthene	350	U	23	J	360	U	330	U	330	U	92	%
Benzo(k)fluoranthene	350	U	22	J	360	U	330	U	330	U	90	%
Benzo(a)pyrene	350	U	21	J	360	U	330	U	330	U	90	%
Indeno(1,2,3-cd)pyrene	350	U	370	U	360	U	330	U	330	U	96	%
Dibenz(a,h)anthracene	350	U	370	U	360	U	330	U	330	U	94	%
Benzo(g,h,i)perylene	350	U	370	U	360	U	330	U	330	U	93	%

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

6/24/06

000000012

000020

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-025
LVL #: 0604L689
SDG/SAF # K0284/RC-025

W.O. #: 11343-606-001-9999-00
Date Received: 04-05-2006

SEMIVOLATILE

Fourteen (14) soil samples were collected on 04-03-2006.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 04-12-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 04-16,17,18,19-2006.

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

1. Samples were extracted and analyzed within required holding time.

2. Non-target compounds were detected in the samples.

3. All surrogate recoveries were within acceptance criteria.

4. One (1) of two hundred twenty-eight (128) matrix spike recoveries was outside acceptance criteria.

5. All blank spike recoveries were within acceptance criteria.

6. The method blank contained the common laboratory contaminants Bis (2-Ethylhexyl) phthalate and Di-n-butylphthalate at levels less than the CRQL.

7. Internal standard area and retention time criteria were met.

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 3 4 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LvLI
LIONVILLE LABORATORY INC.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/25/04
Date

som\gorup\data\bna\tnu-hanford\0604-689.doc

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-005	Page 1 of 1

Collector: C. Martinez/K Singleton/D. Bowers	Company Contact: C. Martinez — Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-B-14:2 (1607-B7) BCL	SAF No.: RC-025	Air Quality ☐ 21 days
Ice Chest No.: SML-531	Field Logbook No.: EL-1585-5 — COA: R108142000	Method of Shipment: fed ex	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060349	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000024

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~+25g~~ 500 mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chlorin. Herbicides - EPA8151~~					

Sample No.	Matrix *	Sample Date	Sample Time										
J11KD1	SOIL	04/03/06	14:30	✓	✓	✓	✓	—	✓				
J11KD2	SOIL	04/03/06	14:33	✓	✓	✓	✓	—	✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 # 2C 4-4-06	1030	[illegible] 4-4-06	1030
[illegible] WCH 4-4-06	1500	FED EX	
Fed Ex 4-5-06	0930	[illegible]	4-5-06 / 0930

SPECIAL INSTRUCTIONS

~~(2) addition to item # 2. Run gross alpha and gross beta off available material.~~ 04/03/06

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

(2) ~~Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ 04/03/06

Personnel not available to Relinquish samples from 3728 Ref #2C on 4/4/06

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 1 of 3

Collector: C. Martinez/K Singleton/D. Bowers	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: 21 days	Air Quality ☐	
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-B-14:2 (1607-B7) Area 2	SAF No.: RC-025	
Ice Chest No.: ERC-02-506	Field Logbook No.: EL-1585-5	COA: R10B142000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060348	Bill of Lading/Air Bill No.: SEE OSPC	

000000031

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C				
Type of Container	G/P	G/P	aG	aG	G/P	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL				

04/03/06

SAMPLE ANALYSIS

	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chloro-Herbicides - EPA8151~~				
						04/03/06				

Sample No.	Matrix *	Sample Date	Sample Time										
J11K85	SOIL	04/03/06	1445	✓	✓	✓	✓	—	✓				
J11K86	SOIL	04/03/06	1455	✓	✓	✓	✓	—	✓				
J11K87	SOIL	04/03/06	1505	✓	✓	✓	✓	—	✓				
J11K88	SOIL	04/03/06	1515	✓	✓	✓	✓	—	✓				
J11K89	SOIL	04/03/06	1520	✓	✓	✓	✓	—	✓				

000025

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 #2C	4-4-06 1030	TR Edmundson	4-4-06 1030
TR Edmundson	4-4-06 1500	FED EX	
FED EX	4-5-06 0930	[illegible]	4-5-06 0930

SPECIAL INSTRUCTIONS 04/03/06

~~(2) addition to item # 2. Run gross alpha and gross beta off available material.~~

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

~~(2) Gamma Spectroscopy (TGL List) (Cesium 137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~

04/03/06

Personnel not available to relinquish samples from 3728 Ref # 26 on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 2 of 3

Collector C. Martinez/K Singleton/D. Bowers	Company Contact C. Martinez	Telephone No. 509-539-2816	Project Coordinator KESSNER, JH
Price Code	Data Turnaround		
Air Quality ☐	21 days		
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location 100-B-14:2 (1607-B7) Area 2		SAF No. RC-025
Ice Chest No. ERC-02-506	Field Logbook No. EL-1585-5	COA R10B142000	Method of Shipment fed ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060348		Bill of Lading/Air Bill No. SEE OSPC

000000032

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000026

SAMPLE ANALYSIS												
Preservation				None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C			
Type of Container				G/P	G/P	aG	aG	G/P	aG			
No. of Container(s)				1	1	1	1	1	1			
Volume				250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL			
				See Item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See Item (2) in Special Instructions.	Pesticides - 8081; ~~Chlorinated Herbicides - SPA8151~~			
Sample No.	Matrix *	Sample Date	Sample Time									
J11K90	SOIL	04/03/06	1535	✓	✓	✓	✓	—	✓			
J11K91	SOIL	04/03/06	1540	✓	✓	✓	✓	—	✓			
J11K92	SOIL	04/03/06	1545	✓	✓	✓	✓	—	✓			
J11K93	SOIL	04/03/06	1550	✓	✓	✓	✓	—	✓			
J11K94	SOIL	04/03/06	1555	✓	✓	✓	✓	—	✓			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 #2C	4-4-06 1030	T.J. Edmundson / JR Edmundson	4-4-06 1030
T.J. Edmundson / JR Edmundson	4-4-06 1500	WCH / FED EX	
FED EX	4-5-06 0930	[illegible]	4-5-06 0930

SPECIAL INSTRUCTIONS

~~(3) addition to item # 2. Run gross alpha and gross beta off available material.~~ 04/03/06

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

~~(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~

04/03/06

Personnel not available to Relinquish samples from 3728 Ref # 2C on 4/4/06

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 1 of 2

Collector C. Martinez/K Singleton/D. Bowers	Company Contact C. Martinez	Telephone No. 509-539-2816	Project Coordinator KESSNER, JH
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location 100-B-14:2 (1607-B7) Area 2		SAF No. RC-025
Ice Chest No. ERC-02-506	Field Logbook No. EL-1585-5	COA R10B142000	Method of Shipment fed ex
Shipped To EBERLINE SERVICES/ LIONVILLE	Offsite Property No. A060348		Bill of Lading/Air Bill No. SEE OSPC

Price Code: Air Quality ☐

Data Turnaround: 21 days

000000033

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

1200027

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions	Pesticides - 8081; ~~Chloro Herbicides - EPA515.1~~					
Sample No.	Matrix *	Sample Date	Sample Time								
J11K95	SOIL	04/03/06	1500	✓	✓	✓	✓	—	✓		
J11K96	SOIL	04/03/06	1450	✓	—	—	✓	—	—		

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez/C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 #2C	4-4-06 1030	T.R. Edmundson T.R. Edmundson	4-4-06 1030
T.R. Edmundson T.R. Edmundson	4-4-06 1500	FED EX	
[illegible]	4-5-06 0930	W. Smith	4-5-06/0930

SPECIAL INSTRUCTIONS 04/03/06

~~(2) addition to item # 2. Run gross alpha and gross beta off available material.~~

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

~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~ 04/03/06

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-B-14:2			DATA PACKAGE: K0284		
VALIDATOR: TLI		LAB: LLI		DATE: 6/12/06	
			SDG: K0284		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J11K85	J11K86	J11K87	J11K88	J11K89	J11K90
J11K91	J11K92	J11K93	J11K94	J11K95	J11K96
J11K01	J11K02				
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: MB - di-n-butylphthalate + bis(2-ethylhexyl)phthalate in mb - U at RQL - all detects

FB - diethyl phthalate

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

MS/MSD RPD values acceptable? ..... Yes No N/A

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

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

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

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

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

Comments: 2,4-dinitrophenol – 68% RPD – J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

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

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

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

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

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

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

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

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

Comments: 112 over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A

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

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

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

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

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

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

Comments:

Date: 28 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines & Sewers – Soil Full Protocol - Waste Subsite 100-B-14:2
Subject: Inorganics - Data Package No. K0284-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0284 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11K85	4/3/06	Soil	C	See note 1
J11K86	4/3/06	Soil	C	See note 1
J11K87	4/3/06	Soil	C	See note 1
J11K88	4/3/06	Soil	C	See note 1
J11K89	4/3/06	Soil	C	See note 1
J11K90	4/3/06	Soil	C	See note 1
J11K91	4/3/06	Soil	C	See note 1
J11K92	4/3/06	Soil	C	See note 1
J11K93	4/3/06	Soil	C	See note 1
J11K94	4/3/06	Soil	C	See note 1
J11K95	4/3/06	Soil	C	See note 1
J11K96	4/3/06	Soil	C	See note 1
J11KD1	4/3/06	Soil	C	See note 1
J11KD2	4/3/06	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY 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.

Due to method blank contamination, the boron results in samples J11K86, J11K88, J11K89, J11K90, J11K92, J11K95 and J11K96 were qualified as estimates and flagged "UJ".

Due to method blank contamination, all detected tin results (J11K85, J11K93 and J11KD1) were qualified as estimates and flagged "UJ".

Due to method blank contamination, the aluminum and lithium results in sample J11K96 were qualified as estimates and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J11K96) was submitted for analysis. Barium, calcium, chromium, iron, magnesium, manganese, molybdenum, sodium, phosphorous, lead, silicon, strontium, titanium, vanadium, zinc and zirconium were detected in the equipment blank.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

Due to an LCS recovery outside QC limits (59%), all silicon results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (46.3%), all antimony results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (55.3%), all phosphorous results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (137%), all calcium results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample

and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits (75%), all uranium results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J11K86/J11K95) 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. K0284 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the boron results in samples J11K86, J11K88, J11K89, J11K90, J11K92, J11K95 and J11K96 were qualified as estimates and flagged "UJ".

- Due to method blank contamination, all detected tin results (J11K85, J11K93 and J11KD1) were qualified as estimates and flagged "UJ".

- Due to method blank contamination, the aluminum and lithium results in sample J11K96 were qualified as estimates and flagged "UJ".

- Due to an LCS recovery outside QC limits (59%), all silicon results were qualified as estimates and flagged "J".

- Due to a matrix spike recovery outside QC limits (46.3%), all antimony results were qualified as estimates and flagged "J".

- Due to a matrix spike recovery outside QC limits (55.3%), all phosphorous results were qualified as estimates and flagged "J".

- Due to a matrix spike recovery outside QC limits (137%), all calcium results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (75%), all uranium 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

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: K0284	REVIEWER: TLI	Project: 100-B-14:2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Boron	UJ	J11K86, J11K88 J11K89, J11K90 J11K92, J11K95 J11K96	Blank contamination
Tin	UJ	J11K85, J11K93 J11KD1	Blank contamination
Aluminum Lithium	UJ	J11K96	Blank contamination
Silicon	J	All	LCS recovery
Antimony Phosphorous Calcium	J	All	MS recovery
Uranium	J	All	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0284																		
Sample Number		J11K85		J11K86		J11K87		J11K88		J11K89		J11K90		J11K91		J11K92		J11K93	
Remarks				Main															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Aluminum		6040		5210		5840		5450		5470		4160		6390		5020		5700	
Arsenic	10	2.9		1.8		3.2		2.9		3.0		2.7		3.4		3.5		3.3	
Boron		1.4	UJ	1.1	UJ	1.6		1.1	UJ	0.47	UJ	0.54	UJ	5.0		0.83	UJ	2.7	
Barium	2	61.3		62.4		72.7		63.2		55.8		49.6		409		63.6		131	
Beryllium		0.36		0.25		0.38		0.30		0.35		0.33		0.41		0.42		0.37	
Calcium		4880	J	4080	J	8070	J	6710	J	6000	J	6290	J	7950	J	8840	J	8290	J
Cadmium	0.2	0.17		0.12		0.11		0.11		0.15		0.12		0.14		0.09		0.07	U
Cobalt		8.7		7.1		8.3		7.8		8.0		8.0		6.5		8.2		8.8	
Chromium	1	8.5		7.7		8.6		6.5		7.6		5.9		10.1		6.1		7.9	
Copper		17.7		12.9		17.1		16.3		17.2		18.2		15.9		18.3		17.4	
Iron		22700		17000		20500		17900		19600		19100		13300		22000		21200	
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.02	U	0.02		0.05		0.03		0.01	U	0.03	
Potassium		1310		1210		1130		1060		1070		863		1080		1030		1070	
Lithium		7.1		5.1		7.0		6.6		6.3		4.6		8.6		5.9		6.3	
Magnesium		4480		3330		4640		4310		4120		3740		3820		4610		4210	
Manganese		380		334		355		315		317		293		279		348		352	
Molybdenum		0.54		0.38		0.50		0.29		0.44		1.1		0.60		0.50		0.58	
Sodium		139		118		153		154		208		142		182		156		160	
Nickel		11.1		9.3		11.6		9.9		10.2		9.9		12.1		10.6		11.2	
Phosohorous		954	J	987	J	1030	J	975	J	984	J	1150	J	780	J	1200	J	1080	J
Lead	5	6.1		4.2		5.5		4.7		4.6		4.4		5.6		5.5		5.7	
Antimony		0.44	UJ	0.44	UJ	0.44	UJ	0.44	UJ	0.44	UJ	0.43	UJ	0.43	UJ	0.43	UJ	0.44	UJ
Selenium	1	0.47	U	0.47	U	0.47	U	0.47	U	0.47	U	0.46	U	0.46	U	0.45	U	0.47	U
Silicon		468	J	502	J	418	J	514	J	510	J	417	J	600	J	405	J	541	J
Tin		1.2	UJ	1.1	U	1.1	U	1.1	U	1.1	U	1.0	U	1.1	U	1.0	U	1.1	UJ
Strontium		23.8		21.5		36.1		30.3		23.4		24.1		118		28.0		64.2	
Titanium		1860		1170		1520		1340		1580		1580		727		1820		1590	
Thallium		0.70	U	0.69	U	0.70	U	0.70	U	0.70	U	0.69	U	0.69	U	0.68	U	0.69	U
Uranium		0.89	UJ	0.87	UJ	0.88	UJ	0.88	UJ	0.88	UJ	0.86	UJ	0.87	UJ	0.85	UJ	0.87	UJ
Vanadium		53.6		38.8		47.1		37.8		49.2		43.8		28.1		51.4		49.8	
Zinc	1	46.1		36.9		44.6		39.5		42.8		39.1		38.5		44.9		44.5	
Zirconium		24.8		19.2		21.0		18.6		20.8		20.9		10.2		22.7		21.9	

000011

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

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0284																		
Sample Number		J11K94		J11K95		J11K96		J11KD1		J11KD2									
Remarks				Duplicate		E. Blank													
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06									
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.07	U	0.07	U	0.06	U	0.07	U	0.07	U								
Aluminum		6210		4950		50.7	UJ	5330		6040									
Arsenic	10	3.8		2.3		0.56	U	2.7		2.9									
Boron		1.6		0.64	UJ	0.61	UJ	3.6		3.5									
Barium	2	95.6		64.3		1.4		141		86.6									
Beryllium		0.32		0.29		0.02	U	0.34		0.31									
Calcium		9770	J	3600	J	22.9	J	7610	J	5450	J								
Cadmium	0.2	0.09		0.07		0.06	U	0.21		0.20									
Cobalt		7.5		7.3		0.13	U	9.2		8.4									
Chromium	1	10.4		7.5		0.20		7.6		8.9									
Copper		17.4		12.6		0.11	U	17.6		16.3									
Iron		18700		17300		283		19400		20300									
Mercury	0.2	0.02	U	0.01	U	0.02	U	0.08		0.02	U								
Potassium		1170		1220		71.4	U	1040		1150									
Lithium		7.9		4.6		0.09	UJ	6.3		6.7									
Magnesium		4590		3300		7.3		3920		4160									
Manganese		318		345		4.1		322		351									
Molybdenum		0.53		0.47		0.29		0.51		0.51									
Sodium		163		109		7.6		160		146									
Nickel		12.5		9.7		0.22	U	11.1		11.0									
Phosohorous		989	J	887	J	5.4	J	1090	J	923	J								
Lead	5	6.5		4.4		0.34		6.0		5.7									
Antimony		0.45	UJ	0.43	UJ	0.41	UJ	0.44	UJ	0.44	UJ								
Selenium	1	0.48	U	0.46	U	0.44	U	0.46	U	0.47	U								
Silicon		560	J	452	J	38.9	J	517	J	524	J								
Tin		1.1	U	1.1	U	0.99	U	1.3	UJ	1.1	U								
Strontium		42.8		20.0		0.30		57.1		30.8									
Titanium		1190		1260		2.0		1250		1490									
Thallium		0.72	U	0.69	U	0.65	U	0.69	U	0.70	U								
Uranium		0.91	UJ	0.87	UJ	0.81	UJ	2.2	J	1.2	J								
Vanadium		40.7		40.6		0.12		39.8		47.2									
Zinc	1	48.0		37.3		1.4		40.6		43.6									
Zirconium		14.7		19.7		3.0		19.6		20.4									

000012

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J11K85	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	6040	MG/KG	2.4	1.0
		Arsenic, Total	2.9	MG/KG	0.61	1.0
		Boron, Total	1.4 J	MG/KG	0.24	1.0
		Barium, Total	61.3	MG/KG	0.02	1.0
		Beryllium, Total	0.36	MG/KG	0.02	1.0
		Calcium, Total	4880 J	MG/KG	2.2	1.0
		Cadmium, Total	0.17	MG/KG	0.07	1.0
		Cobalt, Total	8.7	MG/KG	0.14	1.0
		Chromium, Total	8.5	MG/KG	0.13	1.0
		Copper, Total	17.7	MG/KG	0.12	1.0
		Iron, Total	22700	MG/KG	3.5	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1310	MG/KG	77.6	1.0
		Lithium, Total	7.1	MG/KG	0.03	1.0
		Magnesium, Total	4480	MG/KG	3.9	1.0
		Manganese, Total	380	MG/KG	0.03	1.0
		Molybdenum, Total	0.54	MG/KG	0.29	1.0
		Sodium, Total	139	MG/KG	2.5	1.0
		Nickel, Total	11.1	MG/KG	0.24	1.0
		Phosphorus, Total	954 J	MG/KG	0.91	1.0
		Lead, Total	6.1	MG/KG	0.31	1.0
		Antimony, Total	0.44 u J	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	468 J	MG/KG	2.3	1.0
		Tin, Total	1.2 J	MG/KG	1.1	1.0
		Strontium, Total	23.8	MG/KG	0.01	1.0
		Titanium, Total	1860	MG/KG	0.03	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	0.89 u J	MG/KG	0.89	1.0
		Vanadium, Total	53.6	MG/KG	0.09	1.0
		Zinc, Total	46.1	MG/KG	0.16	1.0
		Zirconium, Total	24.8	MG/KG	1.1	1.0

4/24/06

000012A

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J11K86	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5210	MG/KG	2.3	1.0
		Arsenic, Total	1.8	MG/KG	0.60	1.0
		Boron, Total	1.1 UJ	MG/KG	0.24	1.0
		Barium, Total	62.4	MG/KG	0.02	1.0
		Beryllium, Total	0.25	MG/KG	0.02	1.0
		Calcium, Total	4080 J	MG/KG	2.2	1.0
		Cadmium, Total	0.12 J	MG/KG	0.07	1.0
		Cobalt, Total	7.1 UL	MG/KG	0.14	1.0
		Chromium, Total	7.7	MG/KG	0.13	1.0
		Copper, Total	12.9	MG/KG	0.12	1.0
		Iron, Total	17000	MG/KG	3.5	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1210	MG/KG	76.4	1.0
		Lithium, Total	5.1	MG/KG	0.03	1.0
		Magnesium, Total	3330	MG/KG	3.9	1.0
		Manganese, Total	334	MG/KG	0.03	1.0
		Molybdenum, Total	0.38	MG/KG	0.29	1.0
		Sodium, Total	118	MG/KG	2.5	1.0
		Nickel, Total	9.3	MG/KG	0.24	1.0
		Phosphorus, Total	987 J	MG/KG	0.89	1.0
		Lead, Total	4.2	MG/KG	0.31	1.0
		Antimony, Total	0.44 u J	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	502 J	MG/KG	2.2	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	21.5	MG/KG	0.01	1.0
		Titanium, Total	1170	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	0.87 u J	MG/KG	0.87	1.0
		Vanadium, Total	38.8	MG/KG	0.09	1.0
		Zinc, Total	36.9	MG/KG	0.16	1.0
		Zirconium, Total	19.2	MG/KG	1.1	1.0

K
6/24/06

000012B

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J11K87	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5840	MG/KG	2.4	1.0
		Arsenic, Total	3.2	MG/KG	0.61	1.0
		Boron, Total	1.6	MG/KG	0.24	1.0
		Barium, Total	72.7	MG/KG	0.02	1.0
		Beryllium, Total	0.38	MG/KG	0.02	1.0
		Calcium, Total	8070 J	MG/KG	2.2	1.0
		Cadmium, Total	0.11	MG/KG	0.07	1.0
		Cobalt, Total	8.3	MG/KG	0.14	1.0
		Chromium, Total	8.6	MG/KG	0.13	1.0
		Copper, Total	17.1	MG/KG	0.12	1.0
		Iron, Total	20500	MG/KG	3.5	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1130 J	MG/KG	77.3	1.0
		Lithium, Total	7.0	MG/KG	0.03	1.0
		Magnesium, Total	4640	MG/KG	3.9	1.0
		Manganese, Total	355	MG/KG	0.03	1.0
		Molybdenum, Total	0.50	MG/KG	0.29	1.0
		Sodium, Total	153	MG/KG	2.5	1.0
		Nickel, Total	11.6	MG/KG	0.24	1.0
		Phosphorus, Total	1030	MG/KG	0.90	1.0
		Lead, Total	5.5	MG/KG	0.31	1.0
		Antimony, Total	0.44 uJ	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	418 J	MG/KG	2.3	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	36.1	MG/KG	0.01	1.0
		Titanium, Total	1520	MG/KG	0.03	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	0.88 uJ	MG/KG	0.88	1.0
		Vanadium, Total	47.1	MG/KG	0.09	1.0
		Zinc, Total	44.6	MG/KG	0.16	1.0
		Zirconium, Total	21.0	MG/KG	1.1	1.0

6/24/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J11K88	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5450	MG/KG	2.4	1.0
		Arsenic, Total	2.9	MG/KG	0.61	1.0
		Boron, Total	1.1 UJ	MG/KG	0.24	1.0
		Barium, Total	63.2	MG/KG	0.02	1.0
		Beryllium, Total	0.30	MG/KG	0.02	1.0
		Calcium, Total	6710 J	MG/KG	2.2	1.0
		Cadmium, Total	0.11	MG/KG	0.07	1.0
		Cobalt, Total	7.8	MG/KG	0.14	1.0
		Chromium, Total	6.5	MG/KG	0.13	1.0
		Copper, Total	16.3	MG/KG	0.12	1.0
		Iron, Total	17900	MG/KG	3.5	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1060	MG/KG	77.5	1.0
		Lithium, Total	6.6	MG/KG	0.03	1.0
		Magnesium, Total	4310	MG/KG	3.9	1.0
		Manganese, Total	215	MG/KG	0.03	1.0
		Molybdenum, Total	0.29	MG/KG	0.29	1.0
		Sodium, Total	154	MG/KG	2.5	1.0
		Nickel, Total	9.9	MG/KG	0.24	1.0
		Phosphorus, Total	975 J	MG/KG	0.90	1.0
		Lead, Total	4.7	MG/KG	0.31	1.0
		Antimony, Total	0.44 uJ	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	514 J	MG/KG	2.3	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	30.3	MG/KG	0.01	1.0
		Titanium, Total	1340	MG/KG	0.03	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	0.88 uJ	MG/KG	0.88	1.0
		Vanadium, Total	37.8	MG/KG	0.09	1.0
		Zinc, Total	39.5	MG/KG	0.16	1.0
		Zirconium, Total	18.6	MG/KG	1.1	1.0

6/24/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J11K89	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5470	MG/KG	2.4	1.0
		Arsenic, Total	3.0	MG/KG	0.61	1.0
		Boron, Total	0.47 UJ	MG/KG	0.24	1.0
		Barium, Total	55.8	MG/KG	0.02	1.0
		Beryllium, Total	0.35	MG/KG	0.02	1.0
		Calcium, Total	6000 J	MG/KG	2.2	1.0
		Cadmium, Total	0.15	MG/KG	0.07	1.0
		Cobalt, Total	8.0	MG/KG	0.14	1.0
		Chromium, Total	7.6	MG/KG	0.13	1.0
		Copper, Total	17.2	MG/KG	0.12	1.0
		Iron, Total	19600	MG/KG	3.5	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Potassium, Total	1070	MG/KG	76.9	1.0
		Lithium, Total	6.3	MG/KG	0.03	1.0
		Magnesium, Total	4120	MG/KG	3.9	1.0
		Manganese, Total	317	MG/KG	0.03	1.0
		Molybdenum, Total	0.44	MG/KG	0.29	1.0
		Sodium, Total	208	MG/KG	2.5	1.0
		Nickel, Total	10.2	MG/KG	0.24	1.0
		Phosphorus, Total	984 J	MG/KG	0.90	1.0
		Lead, Total	4.6	MG/KG	0.31	1.0
		Antimony, Total	0.44 uJ	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	510 J	MG/KG	2.3	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	23.4	MG/KG	0.01	1.0
		Titanium, Total	1580	MG/KG	0.03	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	0.88 uJ	MG/KG	0.88	1.0
		Vanadium, Total	49.2	MG/KG	0.09	1.0
		Zinc, Total	42.8	MG/KG	0.16	1.0
		Zirconium, Total	20.8	MG/KG	1.1	1.0

6/24/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	J11K90	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4160	MG/KG	2.3	1.0
		Arsenic, Total	2.7	MG/KG	0.60	1.0
		Boron, Total	0.54 uJ	MG/KG	0.24	1.0
		Barium, Total	49.6	MG/KG	0.02	1.0
		Beryllium, Total	0.33	MG/KG	0.02	1.0
		Calcium, Total	6290 J	MG/KG	2.1	1.0
		Cadmium, Total	0.12	MG/KG	0.07	1.0
		Cobalt, Total	8.0	MG/KG	0.14	1.0
		Chromium, Total	5.9	MG/KG	0.13	1.0
		Copper, Total	18.2	MG/KG	0.12	1.0
		Iron, Total	19100	MG/KG	3.4	1.0
		Mercury, Total	0.05	MG/KG	0.02	1.0
		Potassium, Total	863	MG/KG	75.6	1.0
		Lithium, Total	4.6	MG/KG	0.03	1.0
		Magnesium, Total	3740	MG/KG	3.8	1.0
		Manganese, Total	293	MG/KG	0.03	1.0
		Molybdenum, Total	1.1	MG/KG	0.28	1.0
		Sodium, Total	142	MG/KG	2.5	1.0
		Nickel, Total	9.9	MG/KG	0.24	1.0
		Phosphorus, Total	1150 J	MG/KG	0.88	1.0
		Lead, Total	4.4	MG/KG	0.30	1.0
		Antimony, Total	0.43 uJ	MG/KG	0.43	1.0
		Selenium, Total	0.46 u	MG/KG	0.46	1.0
		Silicon, Total	417 J	MG/KG	2.2	1.0
		Tin, Total	1.0 u	MG/KG	1.0	1.0
		Strontium, Total	24.1	MG/KG	0.01	1.0
		Titanium, Total	1580	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	0.86 uJ	MG/KG	0.86	1.0
		Vanadium, Total	43.8	MG/KG	0.09	1.0
		Zinc, Total	39.1	MG/KG	0.16	1.0
		Zirconium, Total	20.9	MG/KG	1.0	1.0

6/24/06

000012F

000000029

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J11K91	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	6390	MG/KG	2.3	1.0
		Arsenic, Total	3.4	MG/KG	0.60	1.0
		Boron, Total	5.0	MG/KG	0.24	1.0
		Barium, Total	409	MG/KG	0.02	1.0
		Beryllium, Total	0.41	MG/KG	0.02	1.0
		Calcium, Total	7950 J	MG/KG	2.2	1.0
		Cadmium, Total	0.14	MG/KG	0.07	1.0
		Cobalt, Total	6.5	MG/KG	0.14	1.0
		Chromium, Total	10.1	MG/KG	0.13	1.0
		Copper, Total	15.9	MG/KG	0.12	1.0
		Iron, Total	13300	MG/KG	3.4	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Potassium, Total	1080	MG/KG	76.1	1.0
		Lithium, Total	8.6	MG/KG	0.03	1.0
		Magnesium, Total	3820	MG/KG	3.9	1.0
		Manganese, Total	279	MG/KG	0.03	1.0
		Molybdenum, Total	0.60	MG/KG	0.29	1.0
		Sodium, Total	182	MG/KG	2.5	1.0
		Nickel, Total	12.1	MG/KG	0.24	1.0
		Phosphorus, Total	780 J	MG/KG	0.89	1.0
		Lead, Total	5.6	MG/KG	0.31	1.0
		Antimony, Total	0.43 u J	MG/KG	0.43	1.0
		Selenium, Total	0.46 u	MG/KG	0.46	1.0
		Silicon, Total	600 J	MG/KG	2.2	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	118	MG/KG	0.01	1.0
		Titanium, Total	727	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	0.87 u J	MG/KG	0.87	1.0
		Vanadium, Total	28.1	MG/KG	0.09	1.0
		Zinc, Total	38.5	MG/KG	0.16	1.0
		Zirconium, Total	10.2	MG/KG	1.0	1.0

6/24/06

000012G

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-010	J11K92	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5020	MG/KG	2.3	1.0
		Arsenic, Total	3.5	MG/KG	0.59	1.0
		Boron, Total	0.83 UJ	MG/KG	0.23	1.0
		Barium, Total	63.6	MG/KG	0.02	1.0
		Beryllium, Total	0.42	MG/KG	0.02	1.0
		Calcium, Total	8840 J	MG/KG	2.1	1.0
		Cadmium, Total	0.09	MG/KG	0.07	1.0
		Cobalt, Total	8.2	MG/KG	0.14	1.0
		Chromium, Total	6.1	MG/KG	0.13	1.0
		Copper, Total	18.3	MG/KG	0.12	1.0
		Iron, Total	22000	MG/KG	3.4	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1030	MG/KG	74.5	1.0
		Lithium, Total	5.9	MG/KG	0.03	1.0
		Magnesium, Total	4610	MG/KG	3.8	1.0
		Manganese, Total	348	MG/KG	0.03	1.0
		Molybdenum, Total	0.50	MG/KG	0.28	1.0
		Sodium, Total	156	MG/KG	2.4	1.0
		Nickel, Total	10.6	MG/KG	0.23	1.0
		Phosphorus, Total	1200 J	MG/KG	0.87	1.0
		Lead, Total	5.5	MG/KG	0.30	1.0
		Antimony, Total	0.43 uJ	MG/KG	0.43	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	405 J	MG/KG	2.2	1.0
		Tin, Total	1.0 u	MG/KG	1.0	1.0
		Strontium, Total	28.0	MG/KG	0.01	1.0
		Titanium, Total	1820	MG/KG	0.03	1.0
		Thallium, Total	0.68 u	MG/KG	0.68	1.0
		Uranium, Total	0.85 uJ	MG/KG	0.85	1.0
		Vanadium, Total	51.4	MG/KG	0.09	1.0
		Zinc, Total	44.9	MG/KG	0.15	1.0
		Zirconium, Total	22.7	MG/KG	1.0	1.0

6/24/06

000012H

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

WORK ORDER: 11243-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J11K93	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5700	MG/KG	2.3	1.0
		Arsenic, Total	3.3	MG/KG	0.60	1.0
		Boron, Total	2.7	MG/KG	0.24	1.0
		Barium, Total	131	MG/KG	0.02	1.0
		Beryllium, Total	0.37	MG/KG	0.02	1.0
		Calcium, Total	8290 J	MG/KG	2.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	8.8	MG/KG	0.14	1.0
		Chromium, Total	7.9	MG/KG	0.13	1.0
		Copper, Total	17.4	MG/KG	0.12	1.0
		Iron, Total	21200	MG/KG	3.5	1.0
		Mercury, Total	0.03	MG/KG	0.01	1.0
		Potassium, Total	1070	MG/KG	76.3	1.0
		Lithium, Total	6.3	MG/KG	0.03	1.0
		Magnesium, Total	4210	MG/KG	3.9	1.0
		Manganese, Total	352	MG/KG	0.03	1.0
		Molybdenum, Total	0.58	MG/KG	0.29	1.0
		Sodium, Total	160	MG/KG	2.5	1.0
		Nickel, Total	11.2	MG/KG	0.24	1.0
		Phosphorus, Total	1080 J	MG/KG	0.89	1.0
		Lead, Total	5.7	MG/KG	0.31	1.0
		Antimony, Total	0.44 u J	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	541 J	MG/KG	2.2	1.0
		Tin, Total	1.1 UJ	MG/KG	1.1	1.0
		Strontium, Total	64.2	MG/KG	0.01	1.0
		Titanium, Total	1590	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	0.87 u J	MG/KG	0.87	1.0
		Vanadium, Total	49.8	MG/KG	0.09	1.0
		Zinc, Total	44.5	MG/KG	0.16	1.0
		Zirconium, Total	21.9	MG/KG	1.0	1.0

4/24/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-012	J11K94	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	6210	MG/KG	2.4	1.0
		Arsenic, Total	3.8	MG/KG	0.63	1.0
		Boron, Total	1.6	MG/KG	0.25	1.0
		Barium, Total	95.6	MG/KG	0.02	1.0
		Beryllium, Total	0.32	MG/KG	0.02	1.0
		Calcium, Total	9770 J	MG/KG	2.3	1.0
		Cadmium, Total	0.09	MG/KG	0.07	1.0
		Cobalt, Total	7.5	MG/KG	0.14	1.0
		Chromium, Total	10.4	MG/KG	0.12	1.0
		Copper, Total	17.4	MG/KG	0.12	1.0
		Iron, Total	18700	MG/KG	3.6	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1170	MG/KG	79.5	1.0
		Lithium, Total	7.9	MG/KG	0.03	1.0
		Magnesium, Total	4590	MG/KG	4.0	1.0
		Manganese, Total	318	MG/KG	0.03	1.0
		Molybdenum, Total	0.53	MG/KG	0.30	1.0
		Sodium, Total	163	MG/KG	2.6	1.0
		Nickel, Total	12.5	MG/KG	0.25	1.0
		Phosphorus, Total	989 J	MG/KG	0.93	1.0
		Lead, Total	6.5	MG/KG	0.32	1.0
		Antimony, Total	0.45 uJ	MG/KG	0.45	1.0
		Selenium, Total	0.48 u	MG/KG	0.48	1.0
		Silicon, Total	560 J	MG/KG	2.3	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	42.8	MG/KG	0.01	1.0
		Titanium, Total	1190	MG/KG	0.03	1.0
		Thallium, Total	0.72 u	MG/KG	0.72	1.0
		Uranium, Total	0.91 uJ	MG/KG	0.91	1.0
		Vanadium, Total	40.7	MG/KG	0.09	1.0
		Zinc, Total	48.0	MG/KG	0.16	1.0
		Zirconium, Total	14.7	MG/KG	1.1	1.0

6/24/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-013	J11K95	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4950	MG/KG	2.3	1.0
		Arsenic, Total	2.3	MG/KG	0.60	1.0
		Boron, Total	0.64 UJ	MG/KG	0.24	1.0
		Barium, Total	64.3	MG/KG	0.02	1.0
		Beryllium, Total	0.29	MG/KG	0.02	1.0
		Calcium, Total	3600 J	MG/KG	2.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	7.3	MG/KG	0.14	1.0
		Chromium, Total	7.5	MG/KG	0.13	1.0
		Copper, Total	12.6	MG/KG	0.12	1.0
		Iron, Total	17300	MG/KG	3.4	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1220	MG/KG	76.1	1.0
		Lithium, Total	4.6	MG/KG	0.03	1.0
		Magnesium, Total	3300	MG/KG	3.9	1.0
		Manganese, Total	345	MG/KG	0.03	1.0
		Molybdenum, Total	0.47	MG/KG	0.29	1.0
		Sodium, Total	109	MG/KG	2.5	1.0
		Nickel, Total	9.7	MG/KG	0.24	1.0
		Phosphorus, Total	887 J	MG/KG	0.89	1.0
		Lead, Total	4.4	MG/KG	0.31	1.0
		Antimony, Total	0.43 u J	MG/KG	0.43	1.0
		Selenium, Total	0.46 u	MG/KG	0.46	1.0
		Silicon, Total	452 J	MG/KG	2.2	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	20.0	MG/KG	0.01	1.0
		Titanium, Total	1260	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	0.87 u J	MG/KG	0.87	1.0
		Vanadium, Total	40.6	MG/KG	0.09	1.0
		Zinc, Total	37.3	MG/KG	0.16	1.0
		Zirconium, Total	19.7	MG/KG	1.0	1.0

6/24/06

000012 K

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-014	J11K96	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Aluminum, Total	50.7 UJ	MG/KG	2.2	1.0
		Arsenic, Total	0.56 u	MG/KG	0.56	1.0
		Boron, Total	0.61 UJ	MG/KG	0.22	1.0
		Barium, Total	1.4	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	22.9 J	MG/KG	2.0	1.0
		Cadmium, Total	0.06 u	MG/KG	0.06	1.0
		Cobalt, Total	0.13 u	MG/KG	0.13	1.0
		Chromium, Total	0.20	MG/KG	0.12	1.0
		Copper, Total	0.11 u	MG/KG	0.11	1.0
		Iron, Total	283	MG/KG	3.2	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	71.4 u	MG/KG	71.4	1.0
		Lithium, Total	0.09 UJ	MG/KG	0.03	1.0
		Magnesium, Total	7.3	MG/KG	3.6	1.0
		Manganese, Total	4.1	MG/KG	0.03	1.0
		Molybdenum, Total	0.29	MG/KG	0.27	1.0
		Sodium, Total	7.6	MG/KG	2.3	1.0
		Nickel, Total	0.22 u	MG/KG	0.22	1.0
		Phosphorus, Total	5.4 J	MG/KG	0.83	1.0
		Lead, Total	0.34	MG/KG	0.29	1.0
		Antimony, Total	0.41 uJ	MG/KG	0.41	1.0
		Selenium, Total	0.44 u	MG/KG	0.44	1.0
		Silicon, Total	38.9 J	MG/KG	2.1	1.0
		Tin, Total	0.99 u	MG/KG	0.99	1.0
		Strontium, Total	0.30	MG/KG	0.009	1.0
		Titanium, Total	2.0	MG/KG	0.03	1.0
		Thallium, Total	0.65 u	MG/KG	0.65	1.0
		Uranium, Total	0.81 uJ	MG/KG	0.81	1.0
		Vanadium, Total	0.12	MG/KG	0.08	1.0
		Zinc, Total	1.4	MG/KG	0.15	1.0
		Zirconium, Total	3.0	MG/KG	0.98	1.0

6/24/06

000012L

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TWUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11KD1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5330	MG/KG	2.3	1.0
		Arsenic, Total	2.7	MG/KG	0.60	1.0
		Boron, Total	3.6	MG/KG	0.24	1.0
		Barium, Total	141	MG/KG	0.02	1.0
		Beryllium, Total	0.34	MG/KG	0.02	1.0
		Calcium, Total	7610 J	MG/KG	2.2	1.0
		Cadmium, Total	0.21	MG/KG	0.07	1.0
		Cobalt, Total	9.2	MG/KG	0.14	1.0
		Chromium, Total	7.6	MG/KG	0.13	1.0
		Copper, Total	17.6	MG/KG	0.12	1.0
		Iron, Total	19400	MG/KG	3.5	1.0
		Mercury, Total	0.08	MG/KG	0.01	1.0
		Potassium, Total	1040	MG/KG	76.3	1.0
		Lithium, Total	6.3	MG/KG	0.03	1.0
		Magnesium, Total	3920	MG/KG	3.9	1.0
		Manganese, Total	322	MG/KG	0.03	1.0
		Molybdenum, Total	0.51	MG/KG	0.29	1.0
		Sodium, Total	160	MG/KG	2.5	1.0
		Nickel, Total	11.1	MG/KG	0.24	1.0
		Phosphorus, Total	1090 J	MG/KG	0.89	1.0
		Lead, Total	6.0	MG/KG	0.31	1.0
		Antimony, Total	0.44 u J	MG/KG	0.44	1.0
		Selenium, Total	0.46 u	MG/KG	0.46	1.0
		Silicon, Total	517 J	MG/KG	2.2	1.0
		Tin, Total	1.3 UJ	MG/KG	1.1	1.0
		Strontium, Total	57.1	MG/KG	0.01	1.0
		Titanium, Total	1250	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	2.2 J	MG/KG	0.87	1.0
		Vanadium, Total	39.8	MG/KG	0.09	1.0
		Zinc, Total	40.6	MG/KG	0.16	1.0
		Zirconium, Total	19.6	MG/KG	1.0	1.0

6/24/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J11KD2	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	6040	MG/KG	2.4	1.0
		Arsenic, Total	2.9	MG/KG	0.61	1.0
		Boron, Total	3.5	MG/KG	0.24	1.0
		Barium, Total	86.6	MG/KG	0.02	1.0
		Beryllium, Total	0.31	MG/KG	0.02	1.0
		Calcium, Total	5450 J	MG/KG	2.2	1.0
		Cadmium, Total	0.20	MG/KG	0.07	1.0
		Cobalt, Total	8.4	MG/KG	0.14	1.0
		Chromium, Total	8.9	MG/KG	0.13	1.0
		Copper, Total	16.3	MG/KG	0.12	1.0
		Iron, Total	20300	MG/KG	3.5	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1150	MG/KG	76.9	1.0
		Lithium, Total	6.7	MG/KG	0.03	1.0
		Magnesium, Total	4160	MG/KG	3.9	1.0
		Manganese, Total	351	MG/KG	0.03	1.0
		Molybdenum, Total	0.51	MG/KG	0.29	1.0
		Sodium, Total	146	MG/KG	2.5	1.0
		Nickel, Total	11.0	MG/KG	0.24	1.0
		Phosphorus, Total	923 J	MG/KG	0.90	1.0
		Lead, Total	5.7	MG/KG	0.31	1.0
		Antimony, Total	0.44 u J	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	524 J	MG/KG	2.3	1.0
		Tin, Total	1.1 u	MG/KG	1.1	1.0
		Strontium, Total	30.8	MG/KG	0.01	1.0
		Titanium, Total	1490	MG/KG	0.03	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	1.2 J	MG/KG	0.88	1.0
		Vanadium, Total	47.2	MG/KG	0.09	1.0
		Zinc, Total	43.6	MG/KG	0.16	1.0
		Zirconium, Total	20.4	MG/KG	1.1	1.0

4/24/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-025
LVL#: 0604L689
SDG/SAF#: K0284/RC-025

W.O.#: 11343-606-001-9999-00
Date Received: 04-05-06

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) 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 14 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. All samples were reported from a different instrument for Aluminum, Beryllium, Calcium, Magnesium, Potassium, Sodium, Phosphorous, and Zirconium due to high concentrations and sample matrix.

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

4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of CCV3 in file TA0419B for various analytes. All impacted samples were rerun in file TA0420C.

5. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

6. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 59.0%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results mmy be biased low.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 46 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

9. The matrix spike (MS) recoveries for 8 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J11KD1	Aluminum	40,000	91.2
	Calcium	40,000	90.5
	Iron	40,000	82.5
	Manganese	2,000	103.2
	Phosphorous	4,000	87.5
	Antimony	100	97.1
	Silicon	2,100	97.9
	Titanium	2,100	87.7

11. The duplicate analyses for 8 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/1/06
Date

jjw/m04-689

LVLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-005	Page 1 of 1

Collector C. Martinez/K Singleton/D. Bowers	Company Contact C. Martinez	Telephone No. 509-539-2816	Project Coordinator KESSNER, JH
Price Code	Data Turnaround		
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location 100-B-14:2 (1607-B7) BCL		SAF No. RC-025
Air Quality ☐	21 days		
Ice Chest No. SML-531	Field Logbook No. EL-1585-5	COA R108142000	Method of Shipment fed ex
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060349		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 500 mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chloro-Herbicides-EPA8151~~					

000017

Sample No.	Matrix *	Sample Date	Sample Time										
J11KD1	SOIL	04/03/06	14:30	✓	✓	✓	✓	—	✓				
J11KD2	SOIL	04/03/06	14:33	✓	✓	✓	✓	—	✓				

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From C. Martinez / C. Martinez 04/03/06	1650	Received By/Stored In 3728 2C	1650 04/03/06
Relinquished By/Removed From 3728 # 2C 4-4-06	1030	Received By/Stored In TR Edmondson 4-4-06	1030
Relinquished By/Removed From TR Edmondson TR Edmondson 4-4-06	1500	Received By/Stored In FED EX	
Relinquished By/Removed From Fed Ex 4-5-06	10930	Received By/Stored In [illegible]	4-5-06/0930
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

~~(1) addition to item # 2. Run gross alpha and gross beta off available material.~~ 04/03/06

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

(2) ~~Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ 04/03/06

Personnel not available to Relinquish samples from 3728 Ref #2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 1 of 3

Collector: C. Martinez/K Singleton/D. Bowers	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: 21 days		
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-B-14:2 (1607-B7) Area 2	SAF No.: RC-025	Air Quality ☐
Ice Chest No.: ERC-02-506	Field Logbook No.: EL-1585-5	COA: R10B142000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060348	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chloro-Herbicides - EPA8151~~					

04/03/06

04/03/06

Sample No.	Matrix *	Sample Date	Sample Time										
J11K85	SOIL	04/03/06	1445	✓	✓	✓	✓	—	✓				
J11K86	SOIL	04/03/06	1455	✓	✓	✓	✓	—	✓				
J11K87	SOIL	04/03/06	1505	✓	✓	✓	✓	—	✓				
J11K88	SOIL	04/03/06	1515	✓	✓	✓	✓	—	✓				
J11K89	SOIL	04/03/06	1520	✓	✓	✓	✓	—	✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez C. Martinez	1650 04/03/06	3728 #2C	1650 04/03/06
3728 #2C	4-4-06 1030	TR Edmundson	4-4-06 1030
TR Edmundson	4-4-06 1500	FED EX	
FED EX	4-5-06 1030		4-5-06 1030

SPECIAL INSTRUCTIONS

04/03/06

~~(2) addition to item #2 - Run gross alpha and gross beta off available materials~~

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

~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~

04/03/06

Personnel not available to relinquish samples from 3728 Ref # 21 on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 2 of 3

Collector C. Martinez/K Singleton/D. Bowers	Company Contact C. Martinez	Telephone No. 509-539-2816	Project Coordinator KESSNER, JH	Price Code	Data Turnaround
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location 100-B-14:2 (1607-B7) Area 2		SAF No. RC-025	Air Quality ☐	21 days
Ice Chest No. ERC-02-506	Field Logbook No. EL-1585-5	COA R10B142000	Method of Shipment fed ex		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060348		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chloro-Herbicides - EPA8151~~					

000019

Sample No.	Matrix *	Sample Date	Sample Time										
J11K90	SOIL	04/03/06	1535	✓	✓	✓	✓	—	✓				
J11K91	SOIL	04/03/06	1540	✓	✓	✓	✓	—	✓				
J11K92	SOIL	04/03/06	1545	✓	✓	✓	✓	—	✓				
J11K93	SOIL	04/03/06	1550	✓	✓	✓	✓	—	✓				
J11K94	SOIL	04/03/06	1555	✓	✓	✓	✓	—	✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	04/03/06 1650	3728 2C	04/03/06 1650
3728 #2C	4-4-06 1030	T.R. Edmundson TR Edmundson	4-4-06 1030
T.R. Edmundson WCH TR Edmundson	4-4-06 1500	FED EX	
FED EX	4-5-06 0930	[illegible]	4-5-06 0930

SPECIAL INSTRUCTIONS

~~(2) addition to item # 2. Run gross alpha and gross beta off available material.~~ 04/03/06

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

~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~

04/03/06

Personnel not available to Relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 2 of 2

Collector C. Martinez/K Singleton/D. Bowers	Company Contact C. Martinez	Telephone No. 509-539-2816	Project Coordinator KESSNER, JH	Price Code	Data Turnaround
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location 100-B-14:2 (1607-B7) Area 2		SAF No. RC-025	Air Quality ☐	21 days
Ice Chest No. ERC-02-506	Field Logbook No. EL-1585-5	COA R10B142000	Method of Shipment fed ex		
Shipped To EBERLINE SERVICES/ LIONVILLE	Offsite Property No. A060348		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	30mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions	Pesticides - 8081; ~~Chloro-Herbicides - EPA8151~~					
Sample No.	Matrix *	Sample Date	Sample Time								
J11K95	SOIL	04/03/06	1500	✓	✓	✓	✓	—	✓		
J11K96	SOIL	04/03/06	1450	✓	—	—	✓	—	—		

000020

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1650	Received By/Stored In	Date/Time 1650
C. Martinez/C. Martinez	04/03/06	3728 2C	04/03/06
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728 2C 4-4-06	1030	R Edmundson 4-4-06	1030
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R Edmundson 4-4-06	1500	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	4-5-06 0930	[illegible]	4-5-06/0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS 04/03/06

~~(2) addition to item # 2. Run gross alpha and gross beta off available material.~~

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

~~(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ 04/03/06

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 100-KR-1 & 2		DATA PACKAGE: K0284	
VALIDATOR: TLI	LAB: LLI		DATE: 6/12/06
		SDG: K0284	

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

SAMPLES/MATRIX				
J11K85	J11K86	J11K87	J11K88	J11K89
J11K90	J11K91	J11K92	J11K93	J11K94
J11K95	J11KD1	J11KD2		

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: Boron - 86, 88, 89, 90, 92, 96 no FB like
tin - 85, 93, D1
al + lithium - 96

FB - 16 in 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: Calcium 13770 - MS - J all detects (all) no DAB
phosphorous - 5590 - MS - J all
Antimony - 4690 - MS - J all

Silicon - 5990 - LCS - J all

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: Uranium 75% RPD – Jall

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

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0227-MB1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	30.6	MG/KG	2.4	1.0
		Arsenic, Total	0.61 u	MG/KG	0.61	1.0
		Boron, Total	0.25	MG/KG	0.24	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	2.2 u	MG/KG	2.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.14 u	MG/KG	0.14	1.0
		Chromium, Total	0.13 u	MG/KG	0.13	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	4.2	MG/KG	3.5	1.0
		Potassium, Total	77.1 u	MG/KG	77.1	1.0
		Lithium, Total	0.06	MG/KG	0.03	1.0
		Magnesium, Total	3.9 u	MG/KG	3.9	1.0
		Manganese, Total	0.03 u	MG/KG	0.03	1.0
		Molybdenum, Total	0.29 u	MG/KG	0.29	1.0
		Sodium, Total	2.5 u	MG/KG	2.5	1.0
		Nickel, Total	0.24 u	MG/KG	0.24	1.0
		Phosphorus, Total	0.90 u	MG/KG	0.90	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.44 u	MG/KG	0.44	1.0
		Selenium, Total	0.47 u	MG/KG	0.47	1.0
		Silicon, Total	2.3 u	MG/KG	2.3	1.0
		Tin, Total	1.1	MG/KG	1.1	1.0
		Strontium, Total	0.01 u	MG/KG	0.01	1.0
		Titanium, Total	0.03 u	MG/KG	0.03	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	0.88 u	MG/KG	0.88	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.16 u	MG/KG	0.16	1.0
		Zirconium, Total	1.1 u	MG/KG	1.1	1.0
BLANK1	06C0071-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J11KD1	Silver, Total	4.4	0.07u	4.9	89.8	1.0
		Aluminum, Total	7320	5330	198	1010 *	1.0
		Arsenic, Total	181	2.7	198	90.0	1.0
		Boron, Total	96.1	3.6	98.9	93.5	1.0
		Barium, Total	371	141	198	115.9	1.0
		Beryllium, Total	4.9	0.34	4.9	93.1	1.0
		Calcium, Total	11000	7610	2470	137.4	1.0
		Cadmium, Total	4.8	0.21	4.9	93.7	1.0
		Cobalt, Total	55.7	9.2	49.5	93.9	1.0
		Chromium, Total	29.0	7.6	19.8	108.1	1.0
		Copper, Total	41.7	17.6	24.7	97.6	1.0
		Iron, Total	20100	19400	98.9	639.0*	1.0
		Mercury, Total	0.25	0.08	0.14	117.6	1.0
		Potassium, Total	3190	1040	2470	87.0	1.0
		Lithium, Total	113	6.3	98.9	107.8	1.0
		Magnesium, Total	6510	3920	2470	104.9	1.0
		Manganese, Total	388	322	49.5	132.3*	1.0
		Molybdenum, Total	93.6	0.51	98.9	94.1	1.0
		Sodium, Total	2400	160	2470	90.5	1.0
		Nickel, Total	58.7	11.1	49.5	96.2	1.0
		Phosphorus, Total	1360	1090	494	55.3	1.0
		Lead, Total	53.6	6.0	49.5	96.2	1.0
		Antimony, Total	22.9	0.44u	49.5	46.3	1.0
		Selenium, Total	165	0.46u	198	83.6	1.0
		Silicon, Total	815	517	98.9	300.7*	1.0
		Tin, Total	94.0	1.3	98.9	93.7	1.0
		Strontium, Total	162	57.1	98.9	106.5	1.0
		Titanium, Total	1530	1250	98.9	278.7*	1.0
		Thallium, Total	181	0.69u	198	91.4	1.0
		Uranium, Total	227	2.2	247 ~~494~~	~~45.5~~ 90.9	1.0
		Vanadium, Total	90.9	39.8	49.5	103.2	1.0
		Zinc, Total	88.3	40.6	49.5	96.4	1.0
		Zirconium, Total	436	19.6	494	84.3	1.0

correct entries
AW 4/23/06

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J11KD1	Silver, Total	0.07u	0.07u	NC	1.0
		Aluminum, Total	5230	4970	7.0	1.0
		Arsenic, Total	2.7	2.5	7.7	1.0
		Boron, Total	3.6	3.3	8.7	1.0
		Barium, Total	141	126	11.8	1.0
		Beryllium, Total	0.34	0.28	17.8	1.0
		Calcium, Total	7610	6830	10.8	1.0
		Cadmium, Total	0.21	0.17	22.3	1.0
		Cobalt, Total	9.2	7.8	16.5	1.0
		Chromium, Total	7.6	7.6	0.00	1.0
		Copper, Total	17.6	16.0	9.5	1.0
		Iron, Total	19400	16400	17.0	1.0
		Mercury, Total	0.08	0.16	65.0	1.0
		Potassium, Total	1040	995	4.4	1.0
		Lithium, Total	6.3	5.9	6.6	1.0
		Magnesium, Total	3920	3510	10.9	1.0
		Manganese, Total	322	302	6.7	1.0
		Molybdenum, Total	0.51	0.47	8.7	1.0
		Sodium, Total	160	161	0.50	1.0
		Nickel, Total	11.1	10.2	8.5	1.0
		Phosphorus, Total	1090	865	23.0	1.0
		Lead, Total	6.0	6.2	3.3	1.0
		Antimony, Total	0.44u	0.44u	NC	1.0
		Selenium, Total	0.46u	0.46u	NC	1.0
		Silicon, Total	517	408	23.8	1.0
		Tin, Total	1.3	1.1 u	~~NC~~ 200	1.0
		Strontium, Total	57.1	50.4	12.5	1.0
		Titanium, Total	1250	983	24.1	1.0
		Thallium, Total	0.69u	0.69u	NC	1.0
		Uranium, Total	2.2	1.0	75.0	1.0
		Vanadium, Total	39.8	32.4	20.5	1.0
		Zinc, Total	40.6	35.2	14.2	1.0
		Zirconium, Total	19.6	16.5	17.2	1.0

corrected entry
PW 4/28/06

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/26/06

CLIENT: TNUHANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0227-LC1	Silver, LCS	48.0	50.0	MG/KG	96.0
		Aluminum, LCS	457	500	MG/KG	91.3
		Arsenic, LCS	894	1000	MG/KG	89.4
		Boron, LCS	458	500	MG/KG	91.6
		Barium, LCS	482	500	MG/KG	96.4
		Beryllium, LCS	23.7	25.0	MG/KG	94.8
		Calcium, LCS	2220	2500	MG/KG	89.0
		Cadmium, LCS	23.8	25.0	MG/KG	95.2
		Cobalt, LCS	245	250	MG/KG	98.0
		Chromium, LCS	49.7	50.0	MG/KG	99.4
		Copper, LCS	122	125	MG/KG	97.9
		Iron, LCS	497	500	MG/KG	99.4
		Potassium, LCS	2250	2500	MG/KG	90.0
		Lithium, LCS	501	500	MG/KG	100.1
		Magnesium, LCS	2210	2500	MG/KG	88.4
		Manganese, LCS	75.4	75.0	MG/KG	100.5
		Molybdenum, LCS	495	500	MG/KG	99.0
		Sodium, LCS	2240	2500	MG/KG	89.5
		Nickel, LCS	195	200	MG/KG	97.3
		Phosphorus, LCS	454	500	MG/KG	90.7
		Lead, LCS	237	250	MG/KG	95.0
		Antimony, LCS	281	300	MG/KG	93.6
		Selenium, LCS	847	1000	MG/KG	84.7
		Silicon, LCS	295	500	MG/KG	59.0
		Tin, LCS	490	500	MG/KG	98.0
		Strontium, LCS	486	500	MG/KG	97.2
		Titanium, LCS	490	500	MG/KG	98.1
		Thallium, LCS	941	1000	MG/KG	94.1
		Uranium, LCS	242	250 ~~500~~ *	MG/KG	* ~~48.3~~ 96.7
		Vanadium, LCS	247	250	MG/KG	98.6
		Zinc, LCS	93.7	100	MG/KG	93.7
		Zirconium, LCS	458	500	MG/KG	91.7
LCS1	06C0071-LC1	Mercury, LCS	6.1	6.2	MG/KG	99.0

* correct entry
MW 4/28/06

Date: 28 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines & Sewers – Soil Full Protocol - Waste Subsite 100-B-14:2
Subject: Wet Chemistry - Data Package No. K0284-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0284 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11K85	4/3/06	Soil	C	See note 1
J11K86	4/3/06	Soil	C	See note 1
J11K87	4/3/06	Soil	C	See note 1
J11K88	4/3/06	Soil	C	See note 1
J11K89	4/3/06	Soil	C	See note 1
J11K90	4/3/06	Soil	C	See note 1
J11K91	4/3/06	Soil	C	See note 1
J11K92	4/3/06	Soil	C	See note 1
J11K93	4/3/06	Soil	C	See note 1
J11K94	4/3/06	Soil	C	See note 1
J11K95	4/3/06	Soil	C	See note 1
J11KD1	4/3/06	Soil	C	See note 1
J11KD2	4/3/06	Soil	C	See note 1

1– Chromium VI by 7196A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY 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 30 days for chromium VI. 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 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less

than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J11K85/J11K96) were submitted for analysis. Field duplicates are analyzed 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 K0284 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

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0284	REVIEWER: TLI	Project: 100-B-14:2	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0284																		
Sample Number		J11K85		J11K86		J11K87		J11K88		J11K89		J11K90		J11K91		J11K92		J11K93	
Remarks				Main															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.25		0.22		0.21	U	0.26		0.21	U	0.22		0.28		0.24		0.25	
Sample Number		J11K94		J11K95		J11KD1		J11KD2											
Remarks				Duplicate															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06											
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q										
Chromium VI	0.5	0.27		0.34		0.21	U	0.28											

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/10/06

CLIENT: TNU-HANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11KD1	% Solids	95.4	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-002	J11KD2	% Solids	94.6	%	0.01	1.0
		Chromium VI	0.28	MG/KG	0.21	1.0
-003	J11K85	% Solids	91.1	%	0.01	1.0
		Chromium VI	0.25	MG/KG	0.22	1.0
-004	J11K86	% Solids	93.4	%	0.01	1.0
		Chromium VI	0.22	MG/KG	0.21	1.0
-005	J11K87	% Solids	94.1	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-006	J11K88	% Solids	93.9	%	0.01	1.0
		Chromium VI	0.26	MG/KG	0.21	1.0
-007	J11K89	% Solids	94.5	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-008	J11K90	% Solids	94.5	%	0.01	1.0
		Chromium VI	0.22	MG/KG	0.21	1.0
-009	J11K91	% Solids	93.8	%	0.01	1.0
		Chromium VI	0.28	MG/KG	0.21	1.0
-010	J11K92	% Solids	95.0	%	0.01	1.0
		Chromium VI	0.24	MG/KG	0.21	1.0

4/24/06

07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/10/06

CLIENT: TNU-HANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J11K93	% Solids	94.4	%	0.01	1.0
		Chromium VI	0.25	MG/KG	0.21	1.0
-012	J11K94	% Solids	89.8	%	0.01	1.0
		Chromium VI	0.27	MG/KG	0.22	1.0
-013	J11K95	% Solids	93.8	%	0.01	1.0
		Chromium VI	0.34	MG/KG	0.21	1.0
-014	J11K96	% Solids	100	%	0.01	1.0

6/24/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-025 K0284
LVL#: 0604L689

W.O.#: 11343-606-001-9999-00
Date Received: 04-05-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 14 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

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

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

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blank for Chromium VI was within the method criteria.

6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.

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

8. The replicate analyses for Chromium VI and Percent Solids were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid 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 Incorporated

4/26/06
Date

njp\i04-689

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 18 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-005	Page 1 of 1

Collector: C. Martinez/K Singleton/D. Bowers	Company Contact: C. Martinez — Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH	Price Code / Data Turnaround: Air Quality ☐ 21 days
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-B-14:2 (1607-B7) BCL	SAF No.: RC-025	
Ice Chest No.: SML-531	Field Logbook No.: EL-1585-5 — COA: R10B142000	Method of Shipment: fed ex	
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060349	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000015

Preservation			None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C				
Type of Container			G/P	G/P	aG	aG	G/P	aG				
No. of Container(s)			1	1	1	1	1	1				
Volume			250g	~~125g~~ 120 mL	120mL	120mL	500mL	250mL				
SAMPLE ANALYSIS			See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chlorinated Herbicides - EPA8151~~				
Sample No.	Matrix *	Sample Date	Sample Time									
J11KD1	SOIL	04/03/06	1430	✓	✓	✓	✓	—	✓			
J11KD2	SOIL	04/03/06	1433	✓	✓	✓	✓	—	✓			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 # 2C 4-4-06	1030	TR Edmondson / TR Edmondson	4-4-06 1030
TR Edmondson / TR Edmondson 4-4-06	1500	WCH / FED EX	
FED EX 4-5-06	0930	[illegible]	4-5-06 / 0930

SPECIAL INSTRUCTIONS

~~(2) addition to item # 2. Run gross alpha and gross beta off available material.~~ 04/03/06

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

(2) ~~Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ 04/03/06

Personnel not available to Relinquish samples from 3728 Ref #2C on 4/4/06

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 1 of 2

Collector C. Martinez/K Singleton/D. Bowers	Company Contact C. Martinez	Telephone No. 509-539-2816	Project Coordinator KESSNER, JH	Price Code	Data Turnaround 15
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location 100-B-14:2 (1607-B7) Area 2		SAF No. RC-025	Air Quality ☐	21 days
Ice Chest No. ERC-02-506	Field Logbook No. EL-1585-5	COA R10B142000	Method of Shipment fed ex		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060348		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C				
Type of Container	G/P	G/P	aG	aG	G/P	aG				
No. of Container(s)	1	1 04/03/06	1	1	1	1				
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions	Pesticides - 8081; ~~Chloro-Herbicides - EPA8151~~ 04/03/06				

Sample No.	Matrix *	Sample Date	Sample Time									
J11K85	SOIL	04/03/06	1445	✓	✓	✓	✓	—	✓			
J11K86	SOIL	04/03/06	1455	✓	✓	✓	✓	—	✓			
J11K87	SOIL	04/03/06	1505	✓	✓	✓	✓	—	✓			
J11K88	SOIL	04/03/06	1515	✓	✓	✓	✓	—	✓			
J11K89	SOIL	04/03/06	1520	✓	✓	✓	✓	—	✓			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
S. Martinez/ C. Martinez	04/03/06 1650	3728 2C	04/03/06 1650
3728 #2C	4-4-06 1030	JR Slaughter	4-4-06 1030
JR Slaughter	4-4-06 1500	FED EX	
FED EX	4-5-06 0930	[illegible]	4-5-06 0930

SPECIAL INSTRUCTIONS 04/03/06

~~(2) addition to item # 7 - Run gross alpha and gross beta off available material~~

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

~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~ 04/03/06

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 2 of 2

Collector: C. Martinez/K Singleton/D. Bowers	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: 21 days		
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-B-14:2 (1607-B7) Area 2		SAF No.: RC-025
Air Quality ☐			
Ice Chest No.: ERC-02-506	Field Logbook No.: EL-1585-5	COA: R10B142000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES/ LIONVILLE	Offsite Property No.: A060348		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000017

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chloro-Herbicides - SW8151~~					

Sample No.	Matrix *	Sample Date	Sample Time										
J11K90	SOIL	04/03/06	1535	✓	✓	✓	✓	—	✓				
J11K91	SOIL	04/03/06	1540	✓	✓	✓	✓	—	✓				
J11K92	SOIL	04/03/06	1545	✓	✓	✓	✓	—	✓				
J11K93	SOIL	04/03/06	1550	✓	✓	✓	✓	—	✓				
J11K94	SOIL	04/03/06	1555	✓	✓	✓	✓	—	✓				

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: C. Martinez / C. Martinez	Date/Time: 04/03/06 1650	Received By/Stored In: 3728 2C	Date/Time: 04/03/06 1650
Relinquished By/Removed From: 3728 #2C	Date/Time: 4-4-06 1030	Received By/Stored In: T.S. Edwardson / JR Thomson	Date/Time: 4-4-06 1030
Relinquished By/Removed From: WCH T.S. Edwardson / JR Thomson	Date/Time: 4-4-06 1500	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 4-5-06 / 0930	Received By/Stored In: [illegible]	Date/Time: 4-5-06 / 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:

SPECIAL INSTRUCTIONS

~~(2) addition to item # 2. Run gross alpha and gross beta off available material.~~ 04/03/06

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

~~(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ 04/03/06

Personnel not available to Relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 1 of 1

Collector C. Martinez/K Singleton/D. Bowers	Company Contact C. Martinez	Telephone No. 509-539-2816	Project Coordinator KESSNER, JH
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location 100-B-14:2 (1607-B7) Area 2		SAF No. RC-025
Ice Chest No. ERC-02-506	Field Logbook No. EL-1585-5	COA R10B142000	Method of Shipment fed ex
Shipped To EBERLINE SERVICES/ LIONVILLE	Offsite Property No. A060348		Bill of Lading/Air Bill No. SEE OSPC

Price Code

Data Turnaround

Air Quality ☐ 21 days

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000018

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions	Pesticides - 8081; ~~Chloro-Herbicides - EPA8151~~					
Sample No.	Matrix *	Sample Date	Sample Time								
J11K95	SOIL	04/03/06	1500	✓	✓	✓	✓	—	✓		
J11K96	SOIL	04/03/06	1450	✓	—	—	✓	—	—		

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From C. Martinez/C. Martinez	1650 04/03/06	Received By/Stored In 3728 2C	1650 04/03/06
Relinquished By/Removed From 3728 #2C 4-4-06	1030	Received By/Stored In J.R. Slemmons 4-4-06	1030
Relinquished By/Removed From J.R. Slemmons 4-4-06	1500	Received By/Stored In FED EX	
Relinquished By/Removed From [illegible] 4-5-06	0930	Received By/Stored In [illegible] 4-5-06	0930
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS 04/03/06

~~(2) addition to item # 2. Run gross alpha and gross beta off available material.~~

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

~~(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~

04/03/06

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 100-B-14:2			DATA PACKAGE: K0284		
VALIDATOR: TLI		LAB: LCI		DATE: 6/12/06	
			SDG: K0284		

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

SAMPLES/MATRIX					
J11KD1	J11KD2	J11K85	J11K86	J11K87	J11K88
J11K89	J11K90	J11K91	J11K92	J11K93	J11K94
J11K95					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PS

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?..... Yes No N/A

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/10/06

CLIENT: TNU-HANFORD RC-025 X0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LVI021-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/10/06

CLIENT: TNU-HANFORD RC-025 K0284 LVL LOT #: 0604L689
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J11KD1	Soluble Chromium VI	4.1	0.21U	4.2	93.8	1.0
		Insoluble Chromium VI	1300	0.21U	1240	104.5	100
BLANK10	06LVI021-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.9	1.0
		Insoluble Chromium VI	1040	0.20u	985	105.7	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/10/06

CLIENT: TNU-HANFORD RC-025 K0284 LVL LOT #: 0604L689

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J11KD1	Chromium VI	0.21u	0.21u	NC	1.0
-007REP	J11K89	% Solids	94.5	94.8	0.29	1.0

Date: 28 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines & Sewers – Soil Full Protocol - Waste Subsite 100-B-14:2
Subject: PCB/Pesticide - Data Package No. K0284-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0284 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11K85	4/3/06	Soil	C	See note 1
J11K86	4/3/06	Soil	C	See note 1
J11K87	4/3/06	Soil	C	See note 1
J11K88	4/3/06	Soil	C	See note 1
J11K89	4/3/06	Soil	C	See note 1
J11K90	4/3/06	Soil	C	See note 1
J11K91	4/3/06	Soil	C	See note 1
J11K92	4/3/06	Soil	C	See note 1
J11K93	4/3/06	Soil	C	See note 1
J11K94	4/3/06	Soil	C	See note 1
J11K95	4/3/06	Soil	C	See note 1
J11K96	4/3/06	Soil	C	See note 1
J11KD1	4/3/06	Soil	C	See note 1
J11KD2	4/3/06	Soil	C	See note 1

1– PCBs by 8082 & pesticides by 8081.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil 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 by less 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 detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%, If spike recoveries are

outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to LCS recoveries outside QC limits, all pesticide results (except toxaphene) were qualified as estimates and flagged "J".

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

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

Due to surrogate recoveries outside QC limits, the beta-BHC result in samples J11KD1 and J11K93 were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 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 toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate

One set of field duplicates (J11K86/J11K95) 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 toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data Package No. K0284 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 LCS recoveries outside QC limits, all pesticide results (except toxaphene) were qualified as estimates and flagged "J".
- Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

- Due to surrogate recoveries outside QC limits, the beta-BHC result in samples J11KD1 and J11K93 were qualified as estimates and flagged "J".

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

All toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein 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 quantitation limit is an estimate.

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

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

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

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

Appendix 2

Summary of Data Qualification

PESTICIDE/PCB DATA QUALIFICATION SUMMARY*

SDG: K0284	REVIEWER: TLI	Project: 100-B-14:2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS/MSD/LCS analysis
All pesticide analytes except toxahene	J	All	LCS recovery
Beta-BHC	J	J11KD1, K11K93	Surrogate recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB/PESTICIDE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD

Laboratory: LLI | SDG: K0284

Sample Number		J11K85		J11K86		J11K87		J11K88		J11K89		J11K90		J11K91		J11K92		J11K93	
Remarks				Main															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06	
Extraction Date		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06	
Analysis Date		4/19/06		4/19/06		4/19/06		4/19/06		4/19/06		4/19/06		4/19/06		4/19/06		4/19/06	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	15	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1221	100	15	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1232	100	15	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1242	100	15	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1248	100	15	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1254	100	15	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1260	100	15	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U

Sample Number		J11K85		J11K86		J11K87		J11K88		J11K89		J11K90		J11K91		J11K92		J11K93	
Remarks				Main															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06	
Extraction Date		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06		4/12/06	
Analysis Date		4/18/06		4/18/06		4/18/06		4/18/06		4/18/06		4/18/06		4/18/06		4/18/06		4/18/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Gamma-BHC (Lindane)	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Beta-BHC	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	0.60	J
Heptachlor	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Delta-BHC	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Aldrin	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Heptachlor Epoxide	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
gamma-Chlordane	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Endosulfan I	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
alpha-Chlordane	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
4,4'-DDE	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Dieldrin	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Endrin	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
4,4'-DDD	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Endosulfan II	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
4,4'-DDT	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Endrin Aldehyde	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Endosulfan sulfate	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	0.53	J	1.4	UJ	1.4	UJ
Methoxyclor	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Endrin Ketone	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ
Toxaphene	5	15	UJ	14	UJ	14	UJ	14	UJ	14	UJ	14	UJ	14	UJ	14	UJ	14	UJ

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

000011

PCB/PESTICIDE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD

Laboratory: LLI SDG: K0284

Sample Number		J11K94		J11K95		J11KD1		J11KD2											
Remarks				Duplicate															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06											
Extraction Date		4/12/06		4/12/06		4/12/06		4/12/06											
Analysis Date		4/19/06		4/19/06		4/19/06		4/19/06											
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q										
Aroclor-1016	100	15	U	15	U	14	U	14	U										
Aroclor-1221	100	15	U	15	U	14	U	14	U										
Aroclor-1232	100	15	U	15	U	14	U	14	U										
Aroclor-1242	100	15	U	15	U	14	U	14	U										
Aroclor-1248	100	15	U	15	U	14	U	14	U										
Aroclor-1254	100	15	U	15	U	14	U	14	U										
Aroclor-1260	100	15	U	15	U	14	U	14	U										

Sample Number		J11K94		J11K95		J11KD1		J11KD2											
Remarks				Duplicate															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06											
Extraction Date		4/12/06		4/12/06		4/12/06		4/12/06											
Analysis Date		4/18/06		4/18/06		4/18/06		4/18/06											
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q						
Alpha-BHC	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Gamma-BHC (Lindane)	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Beta-BHC	5	1.5	UJ	1.4	UJ	4.3	J	1.4	UJ										
Heptachlor	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Delta-BHC	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Aldrin	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Heptachlor Epoxide	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
gamma-Chlordane	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Endosulfan I	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
alpha-Chlordane	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
4,4'-DDE	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Dieldrin	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Endrin	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
4,4'-DDD	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Endosulfan II	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
4,4'-DDT	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Endrin Aldehyde	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Endosulfan sulfate	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Methoxyclor	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Endrin Ketone	5	1.5	UJ	1.4	UJ	1.4	UJ	1.4	UJ										
Toxaphene	5	15	UJ	14	UJ	14	UJ	14	UJ										

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

	Cust ID:	J11KD1	J11KD1	J11KD1	J11KD2	J11K85	J11K86
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	110 %	105 %	106 %	110 %	113 %	114 %
	Decachlorobiphenyl	108 %	108 %	106 %	109 %	112 %	115 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U	110 %	117 %	14 U	15 U	14 U
Aroclor-1221		14 U	14 U	14 U	14 U	15 U	14 U
Aroclor-1232		14 U	14 U	14 U	14 U	15 U	14 U
Aroclor-1242		14 U	14 U	14 U	14 U	15 U	14 U
Aroclor-1248		14 U	14 U	14 U	14 U	15 U	14 U
Aroclor-1254		14 U	14 U	14 U	14 U	15 U	14 U
Aroclor-1260		14 U	103 %	108 %	14 U	15 U	14 U

	Cust ID:	J11K87	J11K88	J11K89	J11K90	J11K91	J11K92
Sample Information	RFW#:	005	006	007	008	009	010
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	111 %	103 %	111 %	110 %	97 %	103 %
	Decachlorobiphenyl	106 %	103 %	108 %	108 %	99 %	106 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1221		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1232		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1242		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1248		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1254		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1260		14 U	14 U	14 U	14 U	14 U	14 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

4/27/06 4/27/06 4/27/06

000013

	Cust ID:	J11K93	J11K94	J11K95	PBLKFJ	PBLKFJ BS
Sample Information	RFW#:	011	012	013	06LE0277-MB1	06LE0277-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	103 %	99 %	108 %	96 %	94 %
	Decachlorobiphenyl	106 %	101 %	107 %	95 %	100 %
		fl	fl	fl	fl	fl fl
Aroclor-1016		14 U	15 U	14 U	13 U	100 %
Aroclor-1221		14 U	15 U	14 U	13 U	13 U
Aroclor-1232		14 U	15 U	14 U	13 U	13 U
Aroclor-1242		14 U	15 U	14 U	13 U	13 U
Aroclor-1248		14 U	15 U	14 U	13 U	13 U
Aroclor-1254		14 U	15 U	14 U	13 U	13 U
Aroclor-1260		14 U	15 U	14 U	13 U	100 %

000014

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

JK 6/27/06

Pesticide/PCBs by GC, CLP List

Report Date: 04/26/06 11:59

RFW Batch Number: 0604L689 Client: TNUHANFORD RC-025 K0284 Work Order: 11343606001 Page: 1

	Cust ID:	J11KD1	J11KD1	J11KD1	J11KD2	J11K85	J11K86
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	4.00	4.00	4.00	4.00	4.00	4.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	111 %	123 * %	124 * %	120 * %	129 * %	122 * %
	Decachlorobiphenyl	128 * %	128 * %	124 * %	128 * %	132 * %	132 * %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.4 U J	102 %	109 %	1.4 U J	1.5 U J	1.4 U J
gamma-BHC (Lindane)		1.4 U	108 %	114 %	1.4 U	1.5 U	1.4 U
Beta-BHC		4.3 ~~J~~ U	102 %	112 %	1.4 U	1.5 U	1.4 U
Heptachlor		1.4 U	104 %	110 %	1.4 U	1.5 U	1.4 U
Delta-BHC		1.4 U	90 %	96 %	1.4 U	1.5 U	1.4 U
Aldrin		1.4 U	98 %	103 %	1.4 U	1.5 U	1.4 U
Heptachlor epoxide		1.4 U	104 %	108 %	1.4 U	1.5 U	1.4 U
gamma-Chlordane		1.4 U	102 %	105 %	1.4 U	1.5 U	1.4 U
Endosulfan I		1.4 U	101 %	105 %	1.4 U	1.5 U	1.4 U
alpha-Chlordane		1.4 U	105 %	107 %	1.4 U	1.5 U	1.4 U
4,4'-DDE		1.4 U	98 %	105 %	1.4 U	1.5 U	1.4 U
Dieldrin		1.4 U	98 %	104 %	1.4 U	1.5 U	1.4 U
Endrin		1.4 U	104 %	111 %	1.4 U	1.5 U	1.4 U
4,4'-DDD		1.4 U	103 %	117 %	1.4 U	1.5 U	1.4 U
Endosulfan II		1.4 U	102 %	107 %	1.4 U	1.5 U	1.4 U
4,4'-DDT		1.4 U	93 %	108 %	1.4 U	1.5 U	1.4 U
Endrin aldehyde		1.4 U	104 %	107 %	1.4 U	1.5 U	1.4 U
Endosulfan sulfate		1.4 U	102 %	108 %	1.4 U	1.5 U	1.4 U
Methoxychlor		1.4 U	110 %	127 %	1.4 U	1.5 U	1.4 U
Endrin ketone		1.4 U	110 %	114 %	1.4 U	1.5 U	1.4 U
Toxaphene		14 U	14 U	14 U	14 U	15 U	14 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

000015

4/27/06

4/26/06

Pesticide/PCBs by GC, CLP List

Report Date: 04/26/06 11:59

RFW Batch Number: 0604L689 Client: TNUHANFORD RC-025 K0284 Work Order: 11343606001 Page: 2

	Cust ID:	J11K87	J11K88	J11K89	J11K90	J11K91	J11K92
Sample Information	RFW#:	005	006	007	008	009	010
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	4.00	4.00	4.00	4.00	4.00	4.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	122 * %	112 %	111 %	114 %	107 %	115 %
	Decachlorobiphenyl	124 * %	121 %	126 * %	124 * %	116 %	126 * %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.4 U J	1.4 U J	1.4 U J	1.4 U J	1.4 U J	1.4 U J
gamma-BHC (Lindane)		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Beta-BHC		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Heptachlor		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Delta-BHC		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Aldrin		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Heptachlor epoxide		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
gamma-Chlordane		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Endosulfan I		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
alpha-Chlordane		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
4,4'-DDE		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Dieldrin		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Endrin		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
4,4'-DDD		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Endosulfan II		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
4,4'-DDT		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Endrin aldehyde		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Endosulfan sulfate		1.4 U	1.4 U	1.4 U	1.4 U	0.53 ~~J~~	1.4 U
Methoxychlor		1.4 U	1.4 U	1.4 U	1.4 U	1.4 4/27 U	1.4 U
Endrin ketone		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Toxaphene		14 U	14 U	14 U	14 U	14 U	14 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

K 4/27/06

4/26/6

000016

Pesticide/PCBs by GC, CLP List

Report Date: 04/26/06 11:59

RFW Batch Number: 0604L689 Client: TNUHANFORD RC-025 K0284 Work Order: 11343606001 Page: 3

	Cust ID:	J11K93	J11K94	J11K95	PBLKFJ	PBLKFJ BS
Sample Information	RFW#:	011	012	013	06LE0277-MB1	06LE0277-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	4.00	4.00	4.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	114 %	109 %	125 * %	90 %	17 * %
	Decachlorobiphenyl	124 * %	123 * %	129 * %	95 %	20 * %
Alpha-BHC		1.4 U J	1.5 U J	1.4 U J	0.33 U	13 * %
gamma-BHC (Lindane)		1.4 U	1.5 U	1.4 U	0.33 U	14 * %
Beta-BHC		0.60 ~~J~~	1.5 U	1.4 U	0.33 U	17 * %
Heptachlor		1.4 U	1.5 U	1.4 U	0.33 U	14 * %
Delta-BHC		1.4 U	1.5 U	1.4 U	0.33 U	11 * %
Aldrin		1.4 U	1.5 U	1.4 U	0.33 U	13 * %
Heptachlor epoxide		1.4 U	1.5 U	1.4 U	0.33 U	15 * %
gamma-Chlordane		1.4 U	1.5 U	1.4 U	0.33 U	15 * %
Endosulfan I		1.4 U	1.5 U	1.4 U	0.33 U	14 * %
alpha-Chlordane		1.4 U	1.5 U	1.4 U	0.33 U	15 * %
4,4'-DDE		1.4 U	1.5 U	1.4 U	0.33 U	13 * %
Dieldrin		1.4 U	1.5 U	1.4 U	0.33 U	14 * %
Endrin		1.4 U	1.5 U	1.4 U	0.33 U	13 * %
4,4'-DDD		1.4 U	1.5 U	1.4 U	0.33 U	13 * %
Endosulfan II		1.4 U	1.5 U	1.4 U	0.33 U	15 * %
4,4'-DDT		1.4 U	1.5 U	1.4 U	0.33 U	11 * %
Endrin aldehyde		1.4 U	1.5 U	1.4 U	0.33 U	15 * %
Endosulfan sulfate		1.4 U	1.5 U	1.4 U	0.33 U	14 * %
Methoxychlor		1.4 U	1.5 U	1.4 U	0.33 U	13 * %
Endrin ketone		1.4 U	1.5 U	1.4 U	0.33 U	16 * %
Toxaphene		14 U	15 U	14 U	3.3 U	3.3 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

000017

K 4/27/06

4/26/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LvLI
LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-025
LVL #: 0604L698
SDG/SAF # K0286/RC-025

W.O. #: 11343-606-001-9999-00
Date Received: 04-06-2006

PCB

Fifteen (15) soil samples were collected on 04-04-2006.

The samples and their associated QC samples were extracted on 04-13-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 04-19-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

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

1. Samples were extracted and analyzed within required holding time.

2. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.

3. The method blank was below the reporting limits for all target compounds.

4. Twenty-one (21) of thirty-eight (38) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. The blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. The results for soil samples were reported on a dry-weight basis.

8. The initial calibrations associated with this data set were within acceptance criteria.

9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 4 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

LvLI
LIONVILLE LABORATORY INC.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/2/6
Date

scan\v:\group\data\pest\tmu hanford\0604-698.pcbx

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Discrepancy Report (SDR)

SDR #: 0747-157

Initiator: KBW
Date: 6/26/06
Client: TM

Batch: 06042698
Samples:
Method: SW846/MCAWW/CLP/

Parameter: DPCB
Matrix: SOIL
Prep Batch: 06LR0281

1. Reason for SDR

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

b. General Discrepancy

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

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

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

Surrogate recoveries high for most samples.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

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

Other Description:

Note - Surrogate outside acceptance criteria by 10-20%; marginal impact on reported data.

7/16

4. Project Manager Instructions...signature/date: _____

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: _____

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

Other Explanation:

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

000000004

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-025
LVL #: 0604L689
SDG/SAF # K0284/RC-025

W.O. #: 11343-606-001-9999-00
Date Received: 04-05-2006

CHLORINATED PESTICIDES

Thirteen (13) soil samples were collected on 04-03-2006.

The samples and their associated QC samples were extracted on 04-12-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 04-17, 18, 19-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A.

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

1. Samples were extracted and analyzed within required holding time.

2. The samples and their associated QC samples received a Copper-Sulfur cleanup according to Lionville Laboratory SOPs based on SW846 method 3660A.

3. The method blank was below the reporting limits for all target compounds.

4. Twenty-two (22) of thirty-four (34) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. All blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

6. All matrix spike recoveries were within acceptance criteria.

7. All samples required a 4-fold dilution due to the nature of the sample matrix. The reporting limits were adjusted to reflect the necessary dilution.

8. The results for soil samples were reported on a dry weight basis.

9. The initial calibrations associated with this data set were within acceptance criteria.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 5 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LvLI
LIONVILLE LABORATORY INC.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/27/06
Date

som\r:\group\data\pest\tmu hanford\0604-689.pst

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06GC135

Initiator: John Lach
Date: 4/26/06
Client: TNV

Batch: 0604L684.
Samples: 15, 1T, 2, 3, 4, 5, 13
Method: SW846/MCAWW/CLP/

Parameter: Pres
Matrix: Soil
Prep Batch: 06LE0277

1. Reason for SDR

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

b. General Discrepancy

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

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

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

① surrogates elevated.
② Blank spike decreased ~ 20%

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

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

Other Description:
Narr.
① No hits found in samples
② matrix QC in control

4. Project Manager Instructions...signature/date: 4/26/06

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 4/26/06

Other Explanation:

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

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-005	Page 1 of 1

Collector: C. Martinez/K Singleton/D. Bowers	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-B-14:2 (1607-B7) BCL		SAF No.: RC-025
Ice Chest No.: SML-531	Field Logbook No.: EL-1585-5	COA: R10B142000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060349		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: Air Quality ☐

Data Turnaround: 21 days

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000025

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C				
Type of Container	G/P	G/P	aG	aG	G/P	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	~~125g~~ 120 mL	120mL	120mL	500mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081, ~~Chlorinated Herbicides - EPA8151~~				

Sample No.	Matrix *	Sample Date	Sample Time										
J11KD1	SOIL	04/03/06	1430	✓	✓	✓	✓	—	✓				
J11KD2	SOIL	04/03/06	1433	✓	✓	✓	✓	—	✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	04/03/06 1650	3728 2C	04/03/06 1650
3728 # 2C	4-4-06 1030	TR Edmundson	4-4-06 1030
TR Edmundson / TR Edmundson	4-4-06 1500	FED EX	
Fed Ex	4-5-06 1030	[illegible]	4-5-06 1030

SPECIAL INSTRUCTIONS

~~(1) addition to item # 2. Run gross alpha and gross beta off available material.~~ 04/03/06

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

(2) ~~Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]~~ 04/03/06

Personnel not available to Relinquish samples from 3728 Ref #2C on 4/4/06

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-025-003

Collector C. Martinez/K Singleton/D. Bowers	**Company Contact** C. Martinez	**Telephone No.** 509-539-2816	**Project Coordinator** KESSNER, JH
Price Code	**Data Turnaround** 21 days		
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	**Sampling Location** 100-B-14:2 (1607-B7) Area 2		**SAF No.** RC-025
Air Quality ☐			
Ice Chest No. ERC-02-506	**Field Logbook No.** EL-1585-5	**COA** R10B142000	**Method of Shipment** fed ex
Shipped To EBERLINE SERVICES (LIONVILLE)	**Offsite Property No.** A060348		**Bill of Lading/Air Bill No.** SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1 04/03/06	1	1	1	1					
Volume	250g	~~125g~~ 250mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chlorinated Herbicides - EPA8151~~ 04/03/06					

020000

Sample No.	Matrix *	Sample Date	Sample Time										
J11K85	SOIL	04/03/06	1445	✓	✓	✓	✓	—	✓				
J11K86	SOIL	04/03/06	1455	✓	✓	✓	✓	—	✓				
J11K87	SOIL	04/03/06	1505	✓	✓	✓	✓	—	✓				
J11K88	SOIL	04/03/06	1515	✓	✓	✓	✓	—	✓				
J11K89	SOIL	04/03/06	1520	✓	✓	✓	✓	—	✓				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez/C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 #2C	4-4-06 1030	JR Edmondson	4-4-06 1030
JR Edmondson	4-4-06 1500	FED EX	
	4-5-06 0930		4-5-06 0930

SPECIAL INSTRUCTIONS 04/03/06

~~(2) addition to item # 2 - Run gross alpha and gross beta off available material.~~

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

~~(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ 04/03/06

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-025-003

Collector C. Martinez/K Singleton/D. Bowers	**Company Contact** C. Martinez	**Telephone No.** 509-539-2816	**Project Coordinator** KESSNER, JH
Price Code	**Data Turnaround**		
Air Quality ☐	21 days		
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	**Sampling Location** 100-B-14:2 (1607-B7) Area 2		**SAF No.** RC-025
Ice Chest No. ERC-02-506	**Field Logbook No.** EL-1585-5	**COA** R10B142000	**Method of Shipment** fed ex
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060348		**Bill of Lading/Air Bill No.** SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chloro-Herbicides - 8041A~~					

1200027

Sample No.	Matrix *	Sample Date	Sample Time										
J11K90	SOIL	04/03/06	1535	✓	✓	✓	✓	—	✓				
J11K91	SOIL	04/03/06	1540	✓	✓	✓	✓	—	✓				
J11K92	SOIL	04/03/06	1545	✓	✓	✓	✓	—	✓				
J11K93	SOIL	04/03/06	1550	✓	✓	✓	✓	—	✓				
J11K94	SOIL	04/03/06	1555	✓	✓	✓	✓	—	✓				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 #2C 4-4-06	1030	JR Edmundson JR Edmundson 4.4.06	1030
JR Edmundson JR Edmundson 4-4-06	WCH 1500	FED EX	
Fed Ex	4-5-06 / 0930	[illegible]	4-5-06 / 0930
Reliuquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

~~(2) addition to item # 2.~~ Run gross alpha and gross beta off available material. 04/03/06

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

~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~

04/03/06

Personnel not available to Relinquish samples from 3728. Ref # 2C on 4/4/06

Matrix *

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

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

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-025-003

Collector: C. Martinez/K Singleton/D. Bowers	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Price Code	Data Turnaround: Air Quality ☐ 21 days		
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-B-14:2 (1607-B7) Area 2		SAF No.: RC-025
Ice Chest No.: ERC-02-506	Field Logbook No.: EL-1585-5	COA: R10B142000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES/ LIONVILLE	Offsite Property No.: A060348		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000028

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions	Pesticides - 8081; ~~Chlorinated Herbicides - SW8151~~					

Sample No.	Matrix *	Sample Date	Sample Time										
J11K95	SOIL	04/03/06	1500	✓	✓	✓	✓	—	✓				
J11K96	SOIL	04/03/06	1450	✓	—	—	✓	—	—				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez/C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 #2C	4-4-06 1030	T.E. Edmundson	4-4-06 1030
T.E. Edmundson	4-4-06 1500	FED EX	
[illegible]	4-5-06 0930	W. Smith	4-5-06/0930

SPECIAL INSTRUCTIONS 04/03/06

~~(2) addition to item # 2 - Run gross alpha and gross beta off available material.~~

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

~~(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~

04/03/06

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-B-14:2			DATA PACKAGE: K0284		
VALIDATOR: TLI		LAB: LLI		DATE: 6/12/06	
			SDG: K0284		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J11K85	J11K86	J11K87	J11K88	J11K89	
J11K90	J11K91	J11K92	J11K93	J11K94	
J11K95	J11KD1	J11KD2			
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

Comments: _____

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

Surrogates analyzed? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: Surrogate Pest Recov-able - D1, 93 - J no PAS

Pest - all but toxaphene - LCS - J

toxaphene - no MS, MSD or LCS

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:

no toxaphene ms/msd – J all

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: ~~[illegible]~~ 6/12h

toxaphen over

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

GPC cleanup performed? ..... Yes No N/A

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

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

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

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

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

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

Comments:

Date: 28 June 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines & Sewers – Soil Full Protocol - Waste Subsite 100-B-14:2
Subject: Radiochemistry - Data Package No. K0284-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0284 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	Date
J11K85	4/3/06	Soil	C	See note 1
J11K86	4/3/06	Soil	C	See note 1
J11K87	4/3/06	Soil	C	See note 1
J11K88	4/3/06	Soil	C	See note 1
J11K89	4/3/06	Soil	C	See note 1
J11K90	4/3/06	Soil	C	See note 1
J11K91	4/3/06	Soil	C	See note 1
J11K92	4/3/06	Soil	C	See note 1
J11K93	4/3/06	Soil	C	See note 1
J11K94	4/3/06	Soil	C	See note 1
J11K95	4/3/06	Soil	C	See note 1
J11KD1	4/3/06	Soil	C	See note 1
J11KD2	4/3/06	Soil	C	See note 1

1 – Gamma spectroscopy, gross alpha and gross beta.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

- **Laboratory Duplicates**

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

Due to an RPD outside QC limits (56%), all radium-226 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J11K86/J11K95) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPD for thorium-232 was outside QC limits (39%). Under the WCH statement of work, no qualification is required. All other 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. Sixty-five analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0284 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an RPD outside QC limits (56%), all radium-226 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.

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

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

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

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

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

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0284	REVIEWER: TLI	Project: 100-B-14:2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Radium-226	J	All	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: EB																			
Case	SDG: K0284																		
Sample Number		J11K85		J11K86		J11K87		J11K88		J11K89		J11K90		J11K91		J11K92		J11K93	
Remarks				Main															
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06		4/3/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross alpha		-0.656	U	1.74	U	11.2		3.31	U	5.62	U	10.8		2.50	U	1.21	U	7.38	
Gross beta		15.5		13.4		17.1		12.2		14.1		16.9		28.8		17.3		14.1	
Potassium-40		6.66		10.2		9.24		10.5		9.36		6.12		6.94		8.39		8.73	
Cobalt 60	0.05	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Cesium 137	0.05	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Radium-226		0.328	J	0.470	J	0.350	J	0.399	J	0.345	J	0.185	J	0.443	J	0.354	J	0.508	J
Radium-228		0.663		0.576		0.766		0.493		0.463		0.497		0.565		0.522		0.721	
Europium 152	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Europium 154	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Europium 155	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Thorium-228		0.423		0.595		0.533		0.489		0.642		0.355		0.506		0.556		0.751	
Thorium-232		0.663		0.576		0.766		0.493		0.463		0.497		0.565		0.522		0.721	
Uranium-235(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Americium-241(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

000010

* - RQL exceeded

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

Project: WASHINGTON CLOSURE HANFORD																				
Laboratory: EB																				
Case	**SDG: K0284**																			
Sample Number		J11K94		J11K95		J11KD1		J11KD2												
Remarks				Duplicate																
Sample Date		4/3/06		4/3/06		4/3/06		4/3/06												
Radiochemistry	**RQL**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**							
Gross alpha		-2.10	U	8.98		0.744	U	2.52	U											
Gross beta		19.4		17.6		16.4		17.9												
Potassium-40		9.27		9.92		6.54		9.54												
Cobalt 60	**0.05**	U	U*	U	U*	U	U*	U	U*											
Cesium 137	**0.05**	U	U*	U	U*	U	U*	U	U*											
Radium-226		0.361	J	0.439	J	0.386	J	0.400	J											
Radium-228		0.832		0.860		0.616		0.669												
Europium 152	**0.1**	U	U*	U	U*	U	U*	U	U*											
Europium 154	**0.1**	U	U*	U	U*	U	U*	U	U*											
Europium 155	**0.1**	U	U*	U	U*	U	U*	U	U*											
Thorium-228		0.415		0.597		0.438		0.536												
Thorium-232		0.832		0.860		0.616		0.669												
Uranium-235(gea)		U	U	U	U	U	U	U	U											
Uranium-238(gea)		U	U	U	U	U	U	U	U											
Americium-241(gea)		U	U	U	U	U	U	U	U											

000011

* - RQL exceeded

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-01 J11K85

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-01	Client sample id	J11K85
Dept sample id	7410-001	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
Received	04/05/06	Collected/Weight	04/03/06 14:45 795 g
% solids	92.8	Custody/SAF No	RC-025-003 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.656	4.8	9.8	10	U	93A
Gross Beta	12587-47-2	15.5	4.5	6.2	15		93B
Potassium 40	13966-00-2	6.66	3.0	0.95			GAM
Cobalt 60	10198-40-0	U		0.080	0.050	U	GAM
Cesium 137	10045-97-3	U		0.072	0.10	U	GAM
Radium 226	13982-63-3	0.328	0.14	0.13	0.10	J	GAM
Radium 228	15262-20-1	0.663	0.32	0.29	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.25	0.10	U	GAM
Europium 155	14391-16-3	U		0.19	0.10	U	GAM
Thorium 228	14274-82-9	0.423	0.087	0.079			GAM
Thorium 232	TH-232	0.663	0.32	0.29			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		8.3		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Antimony 125	14234-35-6	U		0.15		U	GAM
Cesium 134	13967-70-9	U		0.12		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-02 J11K86

DATA SHEET

SDG	7410	Client/Case no	Hanford	SDG K0284	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604018-02	Client sample id	J11K86		
Dept sample id	7410-002	Location/Matrix	100-B-14:2(1607-B7)Area2	SOLID	
Received	04/05/06	Collected/Weight	04/03/06 14:55	593 g	
% solids	93.8	Custody/SAF No	RC-025-003	RC-025	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.74	2.6	4.1	10	U	93A
Gross Beta	12587-47-2	13.4	3.1	4.0	15		93B
Potassium 40	13966-00-2	10.2	1.5	0.73			GAM
Cobalt 60	10198-40-0	U		0.089	0.050	U	GAM
Cesium 137	10045-97-3	U		0.085	0.10	U	GAM
Radium 226	13982-63-3	0.470	0.15	0.16	0.10	J	GAM
Radium 228	15262-20-1	0.576	0.34	0.38	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	0.595	0.091	0.094			GAM
Thorium 232	TH-232	0.576	0.34	0.38			GAM
Uranium 235	15117-96-1	U		0.30		U	GAM
Uranium 238	U-238	U		8.8		U	GAM
Americium 241	14596-10-2	U		0.32		U	GAM
Antimony 125	14234-35-6	U		0.19		U	GAM
Cesium 134	13967-70-9	U		0.11		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-03 J11K87

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-03	Client sample id	J11K87
Dept sample id	7410-003	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
Received	04/05/06	Collected/Weight	04/03/06 15:05 785 g
% solids	94.4	Custody/SAF No	RC-025-003 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	11.2	6.3	7.2	10		93A
Gross Beta	12587-47-2	17.1	6.6	10	15		93B
Potassium 40	13966-00-2	9.24	2.7	0.67			GAM
Cobalt 60	10198-40-0	U		0.085	0.050	U	GAM
Cesium 137	10045-97-3	U		0.068	0.10	U	GAM
Radium 226	13982-63-3	0.325	0.14	0.13	0.10	J	GAM
Radium 228	15262-20-1	0.766	0.41	0.36	0.20		GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.24	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	0.552	0.13	0.13			GAM
Thorium 232	TH-232	0.766	0.41	0.36			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		8.4		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Antimony 125	14234-35-6	U		0.15		U	GAM
Cesium 134	13967-70-9	U		0.091		U	GAM

100BC Remain.Piplns&Sewers-SoilFull1P

6/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-04 J11K88

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-04	Client sample id	J11K88
Dept sample id	7410-004	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
Received	04/05/06	Collected/Weight	04/03/06 15:15 761 g
% solids	94.2	Custody/SAF No	RC-025-003 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	3.31	3.7	5.3	10	U	93A
Gross Beta	12587-47-2	12.2	3.3	4.5	15		93B
Potassium 40	13966-00-2	10.5	1.5	0.74			GAM
Cobalt 60	10198-40-0	U		0.091	0.050	U	GAM
Cesium 137	10045-97-3	U		0.082	0.10	U	GAM
Radium 226	13982-63-3	0.399	0.16	0.15	0.10	J	GAM
Radium 228	15262-20-1	0.493	0.26	0.27	0.20		GAM
Europium 152	14683-23-9	U		0.20	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.19	0.10	U	GAM
Thorium 228	14274-82-9	0.489	0.076	0.081			GAM
Thorium 232	TH-232	0.493	0.26	0.27			GAM
Uranium 235	15117-96-1	U		0.27		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.20		U	GAM
Antimony 125	14234-35-6	U		0.19		U	GAM
Cesium 134	13967-70-9	U		0.098		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-05 J11K89

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-05	Client sample id	J11K89
Dept sample id	7410-005	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
Received	04/05/06	Collected/Weight	04/03/06 15:20 850 g
% solids	95.0	Custody/SAF No	RC-025-003 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	5.62	4.5	5.9	10	U	93A
Gross Beta	12587-47-2	14.1	4.0	5.6	15		93B
Potassium 40	13966-00-2	9.36	1.2	0.61			GAM
Cobalt 60	10198-40-0	U		0.065	0.050	U	GAM
Cesium 137	10045-97-3	U		0.066	0.10	U	GAM
Radium 226	13982-63-3	0.345	0.12	0.12	0.10	J	GAM
Radium 228	15262-20-1	0.463	0.22	0.22	0.20		GAM
Europium 152	14683-23-9	U		0.14	0.10	U	GAM
Europium 154	15585-10-1	U		0.22	0.10	U	GAM
Europium 155	14391-16-3	U		0.16	0.10	U	GAM
Thorium 228	14274-82-9	0.642	0.11	0.11			GAM
Thorium 232	TH-232	0.463	0.22	0.22			GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		7.8		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Antimony 125	14234-35-6	U		0.14		U	GAM
Cesium 134	13967-70-9	U		0.080		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-06 J11K90

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-06	Client sample id	J11K90
Dept sample id	7410-006	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
Received	04/05/06	Collected/Weight	04/03/06 15:35 990 g
% solids	95.1	Custody/SAF No	RC-025-003 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	10.8	5.4	5.7	10		93A
Gross Beta	12587-47-2	16.9	3.1	3.7	15		93B
Potassium 40	13966-00-2	6.12	1.6	0.72			GAM
Cobalt 60	10198-40-0	U		0.069	0.050	U	GAM
Cesium 137	10045-97-3	U		0.060	0.10	U	GAM
Radium 226	13982-63-3	0.185	0.12	0.13	0.10	J	GAM
Radium 228	15262-20-1	0.497	0.25	0.26	0.20		GAM
Europium 152	14683-23-9	U		0.13	0.10	U	GAM
Europium 154	15585-10-1	U		0.19	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	0.355	0.063	0.065			GAM
Thorium 232	TH-232	0.497	0.25	0.26			GAM
Uranium 235	15117-96-1	U		0.18		U	GAM
Uranium 238	U-238	U		7.1		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM
Antimony 125	14234-35-6	U		0.11		U	GAM
Cesium 134	13967-70-9	U		0.079		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

K 4/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-07 J11K91

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-07	Client sample id	J11K91
Dept sample id	7410-007	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
Received	04/05/06	Collected/Weight	04/03/06 15:40 563 g
% solids	94.3	Custody/SAF No	RC-025-003 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.50	3.6	5.4	10	U	93A
Gross Beta	12587-47-2	28.8	4.1	4.5	15		93B
Potassium 40	13966-00-2	6.94	2.0	0.95			GAM
Cobalt 60	10198-40-0	U		0.089	0.050	U	GAM
Cesium 137	10045-97-3	U		0.084	0.10	U	GAM
Radium 226	13982-63-3	0.443	0.13	0.13	0.10	J	GAM
Radium 228	15262-20-1	0.565	0.27	0.29	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.26	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	0.506	0.076	0.078			GAM
Thorium 232	TH-232	0.565	0.27	0.29			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		8.6		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Antimony 125	14234-35-6	U		0.14		U	GAM
Cesium 134	13967-70-9	U		0.097		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/20/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-08 J11K92

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-08	Client sample id	J11K92
Dept sample id	7410-008	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
Received	04/05/06	Collected/Weight	04/03/06 15:45 940 g
% solids	95.1	Custody/SAF No	RC-025-003 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.21	5.9	11	10	U	93A
Gross Beta	12587-47-2	17.3	3.9	5.1	15		93B
Potassium 40	13966-00-2	8.39	1.4	0.93			GAM
Cobalt 60	10198-40-0	U		0.069	0.050	U	GAM
Cesium 137	10045-97-3	U		0.071	0.10	U	GAM
Radium 226	13982-63-3	0.354	0.12	0.13	0.10	J	GAM
Radium 228	15262-20-1	0.522	0.25	0.25	0.20		GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.21	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	0.556	0.11	0.12			GAM
Thorium 232	TH-232	0.522	0.25	0.25			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		9.9		U	GAM
Americium 241	14596-10-2	U		0.18		U	GAM
Antimony 125	14234-35-6	U		0.16		U	GAM
Cesium 134	13967-70-9	U		0.089		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-09 J11K93

DATA SHEET

SDG	7410	Client/Case no	Hanford	SDG K0284	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604018-09	Client sample id	J11K93		
Dept sample id	7410-009	Location/Matrix	100-B-14:2(1607-B7)Area2	SOLID	
Received	04/05/06	Collected/Weight	04/03/06 15:50	765 g	
% solids	94.9	Custody/SAF No	RC-025-003	RC-025	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	7.38	5.0	6.7	10		93A
Gross Beta	12587-47-2	14.1	3.1	3.9	15		93B
Potassium 40	13966-00-2	8.73	1.5	0.84			GAM
Cobalt 60	10198-40-0	U		0.081	0.050	U	GAM
Cesium 137	10045-97-3	U		0.084	0.10	U	GAM
Radium 226	13982-63-3	0.508	0.17	0.19	0.10	J	GAM
Radium 228	15262-20-1	0.721	0.36	0.40	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	0.751	0.14	0.14			GAM
Thorium 232	TH-232	0.721	0.36	0.40			GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		10		U	GAM
Americium 241	14596-10-2	U		0.21		U	GAM
Antimony 125	14234-35-6	U		0.21		U	GAM
Cesium 134	13967-70-9	U		0.12		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

V
Cl 2/4/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-10 J11K94

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-10	Client sample id	J11K94
Dept sample id	7410-010	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
Received	04/05/06	Collected/Weight	04/03/06 15:55 855 g
% solids	90.5	Custody/SAF No	RC-025-003 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-2.10	6.7	11	10	U	93A
Gross Beta	12587-47-2	19.4	4.0	5.1	15		93B
Potassium 40	13966-00-2	9.27	3.2	0.90			GAM
Cobalt 60	10198-40-0	U		0.088	0.050	U	GAM
Cesium 137	10045-97-3	U		0.080	0.10	U	GAM
Radium 226	13982-63-3	0.361	0.16	0.15	0.10	J	GAM
Radium 228	15262-20-1	0.832	0.38	0.36	0.20		GAM
Europium 152	14683-23-9	U		0.20	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.22	0.10	U	GAM
Thorium 228	14274-82-9	0.415	0.097	0.10			GAM
Thorium 232	TH-232	0.832	0.38	0.36			GAM
Uranium 235	15117-96-1	U		0.29		U	GAM
Uranium 238	U-238	U		9.9		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM
Antimony 125	14234-35-6	U		0.18		U	GAM
Cesium 134	13967-70-9	U		0.10		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-11 J11K95

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-11	Client sample id	J11K95
Dept sample id	7410-011	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
Received	04/05/06	Collected/Weight	04/03/06 15:00 677 g
% solids	93.4	Custody/SAF No	RC-025-003 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	8.98	5.7	7.8	10		93A
Gross Beta	12587-47-2	17.6	3.6	4.6	15		93B
Potassium 40	13966-00-2	9.92	1.4	0.67			GAM
Cobalt 60	10198-40-0	U		0.069	0.050	U	GAM
Cesium 137	10045-97-3	U		0.070	0.10	U	GAM
Radium 226	13982-63-3	0.439	0.14	0.13	0.10	J	GAM
Radium 228	15262-20-1	0.860	0.30	0.25	0.20		GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.23	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.597	0.076	0.082			GAM
Thorium 232	TH-232	0.860	0.30	0.25			GAM
Uranium 235	15117-96-1	U		0.27		U	GAM
Uranium 238	U-238	U		8.6		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM
Antimony 125	14234-35-6	U		0.16		U	GAM
Cesium 134	13967-70-9	U		0.086		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-12 J11KD1

DATA SHEET

SDG	7410	Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604018-12	Client sample id	J11KD1
Dept sample id	7410-012	Location/Matrix	100-B-14:2(1607-B7) BCL SOLID
Received	04/05/06	Collected/Weight	04/03/06 14:30 817 g
% solids	95.1	Custody/SAF No	RC-025-005 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.744	5.2	9.5	10	U	93A
Gross Beta	12587-47-2	16.4	4.6	6.9	15		93B
Potassium 40	13966-00-2	6.54	1.7	0.59			GAM
Cobalt 60	10198-40-0	U		0.079	0.050	U	GAM
Cesium 137	10045-97-3	U		0.071	0.10	U	GAM
Radium 226	13982-63-3	0.386	0.12	0.11	0.10	J	GAM
Radium 228	15262-20-1	0.616	0.24	0.25	0.20		GAM
Europium 152	14683-23-9	U		0.15	0.10	U	GAM
Europium 154	15585-10-1	U		0.20	0.10	U	GAM
Europium 155	14391-16-3	U		0.16	0.10	U	GAM
Thorium 228	14274-82-9	0.438	0.095	0.11			GAM
Thorium 232	TH-232	0.616	0.24	0.25			GAM
Uranium 235	15117-96-1	U		0.20		U	GAM
Uranium 238	U-238	U		7.3		U	GAM
Americium 241	14596-10-2	U		0.21		U	GAM
Antimony 125	14234-35-6	U		0.14		U	GAM
Cesium 134	13967-70-9	U		0.081		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/24/04

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-13 J11KD2

DATA SHEET

SDG	7410	Client/Case no	Hanford	SDG K0284	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604018-13	Client sample id	J11KD2		
Dept sample id	7410-013	Location/Matrix	100-B-14:2(1607-B7) BCL	SOLID	
Received	04/05/06	Collected/Weight	04/03/06 14:33	759 g	
% solids	94.7	Custody/SAF No	RC-025-005	RC-025	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.52	4.8	7.9	10	U	93A
Gross Beta	12587-47-2	17.9	4.4	6.6	15		93B
Potassium 40	13966-00-2	9.54	2.7	0.66			GAM
Cobalt 60	10198-40-0	U		0.085	0.050	U	GAM
Cesium 137	10045-97-3	U		0.077	0.10	U	GAM
Radium 226	13982-63-3	0.400	0.15	0.14	0.10	J	GAM
Radium 228	15262-20-1	0.669	0.34	0.32	0.20		GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.21	0.10	U	GAM
Thorium 228	14274-82-9	0.536	0.12	0.12			GAM
Thorium 232	TH-232	0.669	0.34	0.32			GAM
Uranium 235	15117-96-1	U		0.27		U	GAM
Uranium 238	U-238	U		9.3		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM
Antimony 125	14234-35-6	U		0.16		U	GAM
Cesium 134	13967-70-9	U		0.098		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0284 was composed of thirteen solid (soil) samples designated under SAF No. RC-025 with a Project Designation of: 100-BC Remaining Pipelines and Sewers-Soil Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The updated results were transmitted to WCH via e-mail on May 18, 2006.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Mel Mannion — 5/23/6

Melissa C. Mannion
Senior Program Manager

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 1 of 3

Collector C. Martinez/K Singleton/D. Bowers	**Company Contact** C. Martinez **Telephone No.** 509-539-2816	**Project Coordinator** KESSNER, JH	**Price Code** / **Data Turnaround**
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	**Sampling Location** 100-B-14:2 (1607-B7) Area 2 K0284 (7410)	**SAF No.** RC-025	**Air Quality** ☐ 21 days
Ice Chest No. ERC-03-102	**Field Logbook No.** EL-1585-5 / **COA** R10B142000	**Method of Shipment** fed ex	
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060326	**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000027

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chlor. Herbicides - 8151~~					

Sample No.	Matrix *	Sample Date	Sample Time										
J11K85	SOIL	04/03/06	1445										
J11K86	SOIL	04/03/06	1455										
J11K87	SOIL	04/03/06	1505										
J11K88	SOIL	04/03/06	1515										
J11K89	SOIL	04/03/06	1520										

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez/C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 #2C	4-4-06 1200	J.P. Slamdon	4-4-06 1200
J.P. Slamdon	4-4-06 1500	FED EX	
FED EX			04/05/06 9:15

SPECIAL INSTRUCTIONS

(2) addition to item # 2. Run gross alpha and gross beta off available material.

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

(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Personnel not available to Relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 2 of 3

Collector C. Martinez/K Singleton/D. Bowers	**Company Contact** C. Martinez	**Telephone No.** 509-539-2816	**Project Coordinator** KESSNER, JH	**Price Code** / **Data Turnaround**
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	**Sampling Location** 100-B-14:2 (1607-B7) Area 2 K0284 (7410)		**SAF No.** RC-025	Air Quality ☐ 21 days
Ice Chest No. ERC-03-102	**Field Logbook No.** EL-1585-5	**COA** R10B142000	**Method of Shipment** fed ex	
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060326		**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

00002820

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081 ~~Chloro Herbicides - EPA8151~~					

Sample No.	Matrix *	Sample Date	Sample Time										
J11K90	SOIL	04/03/06	1535					✓					
J11K91	SOIL	04/03/06	1540					✓					
J11K92	SOIL	04/03/06	1545					✓					
J11K93	SOIL	04/03/06	1550					✓					
J11K94	SOIL	04/03/06	1555					✓					

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez/C. Martinez	04/03/06 1650	3728 2C	04/03/06 1650
3728 #2C	4-4-06 1200	~~K Edmondson~~ JR Edmondson	4-4-06 / 1200
~~K Edmondson~~ JR Edmondson	4-4-06 1500	FED EX	
FED EX		MFW	04/05/06 9:15

SPECIAL INSTRUCTIONS

(2) addition to item # 2. Run gross alpha and gross beta off available material.

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

(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Personnel not available to relinquish samples from 3728 Ref #2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-003	Page 3 of 3

Collector C. Martinez/K Singleton/D. Powers	**Company Contact** C. Martinez	**Telephone No.** 509-539-2816	**Project Coordinator** KESSNER, JH
Price Code	**Data Turnaround**		
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	**Sampling Location** 100-B-14:2 (1607-B7) Area 2 K0284(7710)	**SAF No.** RC-025	**Air Quality** ☐ 21 days
Ice Chest No. ERC-03-102	**Field Logbook No.** EL-1585-5	**COA** R10B142000	**Method of Shipment** fed ex
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060326		**Bill of Lading/Air Bill No.** SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000029

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	~~125g~~ 120mL	180mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; ~~Chloro-Herbicides - 8151A~~					
Sample No.	Matrix *	Sample Date	Sample Time								
J11K95	SOIL	04/03/06	1500					✓			
~~J11K96~~	~~SOIL~~	~~04/03/06~~	~~1430~~		RZS	4-4-06		✓			

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez/C. Martinez	1650 04/03/06	3728 2C	1650 04/03/06
3728 #2C 4-4-06	1200	R Edmundson / JR Edmundson	4-4-06 1200
R.E. Edmundson / JR Edmundson 4-4-06	1500	FED EX	
FED EX		[illegible]	04/05/06 9:15

SPECIAL INSTRUCTIONS

(2) addition to item # 2. Run gross alpha and gross beta off available material.

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

(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-005	Page 1 of 1

Collector C. Martinez/K Singleton/D. Bowers	**Company Contact** C. Martinez	**Telephone No.** 509-539-2816	**Project Coordinator** KESSNER, JH	**Price Code**	**Data Turnaround**
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	**Sampling Location** 100-B-14:2 (1607-B7) BCL K0284 (7410)		**SAF No.** RC-025	**Air Quality** ☐	21 days
Ice Chest No. ERC-03-102	**Field Logbook No.** EL-1585-5	**COA**	**Method of Shipment** fed ex		
Shipped To FEDERLINE SERVICES, LIONVILLE	**Offsite Property No.** A060326		**Bill of Lading/Air Bill No.** SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000030

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C					
Type of Container	G/P	G/P	aG	aG	G/P	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	125g	120mL	120mL	500mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	Pesticides - 8081; Chloro-Herbicides - EPA8151					
Sample No.	Matrix *	Sample Date	Sample Time								
J11KD1	SOIL	04/03/06	1430	—	—	—	—	—	—		
J11KD2	SOIL	04/03/06	1433	—	—	—	—	—	—		

04/03/06

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	04/03/06 1650	3728 2C	04/03/06 1650
3728 #2C	4-4-06 1200	T.R. Edmondson / T.R. Edmondson	4-4-06 / 1200
T.R. Edmondson / T.R. Edmondson	4-4-06 1500	FED EX	
FED EX		[illegible]	04/05/06 9:15

SPECIAL INSTRUCTIONS

(2) addition to item # 2. Run gross alpha and gross beta off available material.

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

(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Personnel not available to relinquish samples from 3728 Ref # 2C on 4/4/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-B-14:2		DATA PACKAGE:	R0284	
VALIDATOR:	RCI	LAB:	ES	DATE:	6/12/00
			SDG:	K0284	

ANALYSES PERFORMED				
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy
Total Uranium	Radium-22	Tritium		

SAMPLES/MATRIX					
J11K85	J11K86	J11K87	J11K88	J11K89	J11K90
J11K91	J11K92	J11K93	J11K94	J11K95	J11KD0
J11KD1					
					Soil

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: _____

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: Ra-226 50% - J all

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

th-232 - 37% RPD

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: 105 ave

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-15 Method Blank

METHOD BLANK

SDG	7410	Client/Case no	Hanford	SDG K0284	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604018-15	Client sample id	Method Blank		
Dept sample id	7410-015	Material/Matrix		SOLID	
		SAF No	RC-025		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	U		1.8		U	GAM
Cobalt 60	10198-40-0	U		0.098	0.050	U	GAM
Cesium 137	10045-97-3	U		0.070	0.10	U	GAM
Radium 226	13982-63-3	U		0.15	0.10	U	GAM
Radium 228	15262-20-1	U		0.36	0.20	U	GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.22	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	U		0.089		U	GAM
Thorium 232	TH-232	U		0.36		U	GAM
Uranium 235	15117-96-1	U		0.21		U	GAM
Uranium 238	U-238	U		8.2		U	GAM
Americium 241	14596-10-2	U		0.20		U	GAM
Antimony 125	14234-35-6	U		0.14		U	GAM
Cesium 134	13967-70-9	U		0.083		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

QC-BLANK #56678

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-18 Method Blank

METHOD BLANK

SDG	7410	Client/Case no	Hanford	SDG K0284
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R604018-18	Client sample id	Method Blank	
Dept sample id	7410-018	Material/Matrix		SOLID
		SAF No	RC-025	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.017	2.3	4.8	10	U	93A
Gross Beta	12587-47-2	0.788	3.8	6.4	15	U	93B

100BC Remain.Piplns&Sewers-SoilFullP

QC-BLANK 57031

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-14

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7410

Contact Melissa C. Mannion

Client/Case no Hanford SDG K0284

Contract No. 630

Lab sample id R604018-14

Dept sample id 7410-014

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-025

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
Cobalt 60	1.22	0.18	0.10	0.050		GAM	1.25	0.050	98	69-131	80-120
Cesium 137	1.37	0.16	0.12	0.10		GAM	1.29	0.052	106	69-131	80-120

100BC Remain.Piplns&Sewers-SoilFullP

QC-LCS #56677

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-17

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7410
Contact Melissa C. Mannion

Client/Case no Hanford SDG K0284
Contract No. 630

Lab sample id R604018-17
Dept sample id 7410-017

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No RC-025

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
Gross Alpha	84.1	12	4.8	10		93A	112	4.5	75	72-128	70-130
Gross Beta	117	8.1	5.6	15		93B	118	4.7	99	75-125	70-130

100BC Remain.Piplns&Sewers-SoilFullP

QC-LCS 57030

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-16 J11K93

DUPLICATE

SDG	7410			Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R604018-16	Lab sample id	R604018-09	Client sample id	J11K93
Dept sample id	7410-016	Dept sample id	7410-009	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
		Received	04/05/06	Collected/Weight	04/03/06 15:50 765 g
% solids	94.9	% solids	94.9	Custody/SAF No	RC-025-003 RC-025

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
Potassium 40	7.60	1.3	0.86			GAM	8.73	1.5	0.84		14	48	0.9
Cobalt 60	U		0.080	0.050	U	GAM	U		0.081	U	-		0
Cesium 137	U		0.080	0.10	U	GAM	U		0.084	U	-		0.1
Radium 226	0.285	0.14	0.16	0.10		GAM	0.508	0.17	0.19		56	90	1.9
Radium 228	0.769	0.33	0.28	0.20		GAM	0.721	0.36	0.40		6	103	0.2
Europium 152	U		0.17	0.10	U	GAM	U		0.18	U	-		0.1
Europium 154	U		0.21	0.10	U	GAM	U		0.27	U	-		0.3
Europium 155	U		0.19	0.10	U	GAM	U		0.20	U	-		0.1
Thorium 228	0.618	0.090	0.090			GAM	0.751	0.14	0.14		19	48	1.2
Thorium 232	0.769	0.33	0.28			GAM	0.721	0.36	0.40		6	103	0.2
Uranium 235	U		0.30		U	GAM	U		0.31	U	-		0
Uranium 238	U		8.6		U	GAM	U		10	U	-		0.2
Americium 241	U		0.32		U	GAM	U		0.21	U	-		0.6
Antimony 125	U		0.17		U	GAM	U		0.21	U	-		0.3
Cesium 134	U		0.096		U	GAM	U		0.12	U	-		0.3

100BC Remain.Piplns&Sewers-SoilFullP

QC-DUP#9 56679

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	05/18/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0284

R604018-19 J11K93

DUPLICATE

SDG	7410			Client/Case no	Hanford SDG K0284
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R604018-19	Lab sample id	R604018-09	Client sample id	J11K93
Dept sample id	7410-019	Dept sample id	7410-009	Location/Matrix	100-B-14:2(1607-B7)Area2 SOLID
		Received	04/05/06	Collected/Weight	04/03/06 15:50 765 g
% solids	94.9	% solids	94.9	Custody/SAF No	RC-025-003 RC-025

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
Gross Alpha	8.17	4.5	5.0	10		93A	7.38	5.0	6.7		10	136	0.2
Gross Beta	16.4	3.0	3.7	15		93B	14.1	3.1	3.9		15	53	0.9

100BC Remain.Piplns&Sewers-SoilFullP

QC-DUP#9 57032

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	05/18/06