0070326

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

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Jeanette Duncan (2) H9-02 De 7/13/06
INITIAL/DATE

COMMENTS:

SDG K0286 SAF-RC-025

Waste Site: 100-B-14:2

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. K0286-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0286 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	Matrix	Validation	Analysis
J11KB3	4/4/06	Soil	C	See note 1
J11KB4	4/4/06	Soil	C	See note 1
J11KB5	4/4/06	Soil	C	See note 1
J11KB6	4/4/06	Soil	C	See note 1
J11KB7	4/4/06	Soil	C	See note 1
J11KB8	4/4/06	Soil	C	See note 1
J11KB9	4/4/06	Soil	C	See note 1
J11KC0	4/4/06	Soil	C	See note 1
J11KC1	4/4/06	Soil	C	See note 1
J11KC2	4/4/06	Soil	C	See note 1
J11KC3	4/4/06	Soil	C	See note 1
J11KC4	4/4/06	Soil	C	See note 1
J11KD3	4/4/06	Soil	C	See note 1
J11KD4	4/4/06	Soil	C	See note 1
J11KD5	4/4/06	Soil	C	See note 1
J11KD6	4/4/06	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".

All method blank results were acceptable.

Field Blanks

One equipment blank (J11KC4) was submitted for analysis. Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were 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.

Due to a matrix spike (54%) recovery outside QC limits, the 1,2,4-trichlorobenzene result in all samples were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the

recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to RPDs outside QC limits, all phenol (31%), 1,2-dichlorobenzene (31%), 2-methylphenol (33%), 2,2'-oxybis(1-chloropropane) (32%), 4-methylphenol (32%), n-nitroso-di-n-propylamine (32%), 2-nitrophenol (36%), 2,4-dimethylphenol (32%), 2,4-dichlorophenol (31%), 2,4-dinitrophenol (52%), 4,6-dinitro-2-methylphenol (37%) and 2,4,6-trichlorophenol (31%) results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J11KB6/J11KC3) 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-twenty eight analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0286 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to a matrix spike (54%) recovery outside QC limits, the 1,2,4-trichlorobenzene result in all samples were qualified as estimates and flagged "J".

- Due to RPDs outside QC limits, all phenol (31%), 1,2-dichlorobenzene (31%), 2-methylphenol (33%), 2,2'-oxybis(1-chloropropane) (32%), 4-methylphenol (32%), n-nitroso-di-n-propylamine (32%), 2-nitrophenol (36%), 2,4-dimethylphenol (32%), 2,4-dichlorophenol (31%), 2,4-dinitrophenol (52%), 4,6-dinitro-2-methylphenol (37%) and 2,4,6-trichlorophenol (31%) results were qualified as estimates and flagged "J".

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

One hundred-twenty eight 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: [illegible]			
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
1,2,4-Trichlorobenzene	J	All	MS recovery
Phenol 1,2-Dichlorobenzene 2-Methylphenol 2,2'-Oxybis(1-chloropropane) 4-Methylphenol n-Nitroso-di-n-propylamine 2-Nitrophenol 2,4-Dimethylphenol 2,4-Dichlorophenol 2,4-Dinitrophenol 4,6-Dinitro-2-methylphenoL 2,4,6-Trichlorophenol	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: K0286

Sample Number		J11KB3		J11KB4		J11KB5		J11KB6		J11KB7		J11KB8		J11KB9		J11KC0		J11KC1	
Remarks								Main											
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
Extraction Date		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06	
Analysis Date		4/20/06		4/20/06		4/20/06		4/20/06		4/18/06		4/18/06		4/20/06		4/23/06		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	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
bis(2-Chloroethyl)ether	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
2-Chlorophenol	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
1,3-Dichlorobenzene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
1,4-Dichlorobenzene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
1,2-Dichlorobenzene	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
2-Methylphenol	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
2,2'-oxybis(1-chloropropane)	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
4-Methylphenol	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
N-Nitroso-di-n-propylamine	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
Hexachloroethane	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Nitrobenzene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Isophorone	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
2-Nitrophenol	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
2,4-Dimethylphenol	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
bis(2-Chloroethoxy)methane	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
2,4-Dichlorophenol	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
1,2,4-Trichlorobenzene	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
Naphthalene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
4-Chloroaniline	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Hexachlorobutadiene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
4-Chloro-3-methylphenol	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
2-Methylnaphthalene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Hexachlorocyclopentadiene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
2,4,6-Trichlorophenol	660	370	UJ	360	UJ	350	UJ	360	UJ	350	UJ	360	UJ	370	UJ	350	UJ	360	UJ
2,4,5-Trichlorophenol*	660	910	U	890	U	890	U	910	U	890	U	900	U	910	U	880	U	890	U
2-Chloronaphthalene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
2-Nitroaniline*	660	910	U	890	U	890	U	910	U	890	U	900	U	910	U	880	U	890	U
Dimethylphthalate	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Acenaphthylene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
2,6-Dinitrotoluene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	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

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD

Laboratory: LLI | SDG: K0286

Sample Number		J11KB3		J11KB4		J11KB5		J11KB6		J11KB7		J11KB8		J11KB9		J11KC0		J11KC1	
Remarks								Main											
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
Extraction Date		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06	
Analysis Date		4/20/06		4/20/06		4/20/06		4/20/06		4/18/06		4/18/06		4/20/06		4/23/06		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	910	U	890	U	890	U	910	U	890	U	900	U	910	U	880	U	890	U
Acenaphthene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
2,4-Dinitrophenol*	660	910	UJ	890	UJ	890	UJ	910	UJ	890	UJ	900	UJ	910	UJ	880	UJ	890	UJ
4-Nitrophenol*	660	910	U	890	U	890	U	910	U	890	U	900	U	910	U	880	U	890	U
Dibenzofuran	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
2,4-Dinitrotoluene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Diethylphthalate	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
4-Chlorophenyl-phenyl ether	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Fluorene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
4-Nitroaniline*	660	910	U	890	U	890	U	910	U	890	U	900	U	910	U	880	U	890	U
4,6-Dinitro-2-methylphenol*	660	910	UJ	890	UJ	890	UJ	910	UJ	890	UJ	900	UJ	910	UJ	880	UJ	890	UJ
N-Nitrosodiphenylamine	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
4-Bromophenyl-phenyl ether	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Hexachlorobenzene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Pentachlorophenol*	660	910	U	890	U	890	U	910	U	890	U	900	U	910	U	880	U	890	U
Phenanthrene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Anthracene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Carbazole	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Di-n-butylphthalate	660	370	U	360	U	21		360	U	350	U	360	U	370	U	350	U	360	U
Fluoranthene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Pyrene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	20		360	U
Butylbenzylphthalate	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
3,3'-Dichlorobenzidine	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Benzo(a)anthracene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Chrysene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
bis(2-Ethylhexyl)phthalate	660	370	U	36		33		19		350	U	360	U	370	U	22		360	U
Di-n-octylphthalate	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Benzo(b)fluoranthene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Benzo(k)fluoranthene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Benzo(a)pyrene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Indeno(1,2,3-cd)pyrene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Dibenz(a,h)anthracene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	U
Benzo(g,h,i)perylene	660	370	U	360	U	350	U	360	U	350	U	360	U	370	U	350	U	360	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

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0286																		
Sample Number		J11KC2		J11KC3		J11KC4		J11KD3		J11KD4		J11KD5		J11KD6					
Remarks				Duplicate															
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06					
Extraction Date		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06					
Analysis Date		4/20/06		4/23/06		4/18/06		4/20/06		4/23/06		4/18/06		4/23/06					
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
bis(2-Chloroethyl)ether	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
2-Chlorophenol	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
1,3-Dichlorobenzene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
1,4-Dichlorobenzene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
1,2-Dichlorobenzene	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
2-Methylphenol	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
2,2'-oxybis(1-chloropropane)	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
4-Methylphenol	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
N-Nitroso-di-n-propylamine	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
Hexachloroethane	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Nitrobenzene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Isophorone	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
2-Nitrophenol	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
2,4-Dimethylphenol	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
bis(2-Chloroethoxy)methane	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
2,4-Dichlorophenol	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
1,2,4-Trichlorobenzene	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
Naphthalene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
4-Chloroaniline	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Hexachlorobutadiene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
4-Chloro-3-methylphenol	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
2-Methylnaphthalene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Hexachlorocyclopentadiene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
2,4,6-Trichlorophenol	660	410	UJ	360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ				
2,4,5-Trichlorophenol*	660	1000	U	910	U	830	U	890	U	890	U	910	U	890	U				
2-Chloronaphthalene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
2-Nitroaniline*	660	1000	U	910	U	830	U	890	U	890	U	910	U	890	U				
Dimethylphthalate	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Acenaphthylene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
2,6-Dinitrotoluene	660	410	U	360	U	330	U	350	U	360	U	360	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: K0286

Sample Number		J11KC2		J11KC3		J11KC4		J11KD3		J11KD4		J11KD5		J11KD6					
Remarks				Duplicate															
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06					
Extraction Date		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06					
Analysis Date		4/20/06		4/23/06		4/18/06		4/20/06		4/23/06		4/18/06		4/23/06					
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	1000	U	910	U	830	U	890	U	890	U	910	U	890	U				
Acenaphthene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
2,4-Dinitrophenol*	660	1000	UJ	910	UJ	830	UJ	890	UJ	890	UJ	910	UJ	890	UJ				
4-Nitrophenol*	660	1000	U	910	U	830	U	890	U	890	U	910	U	890	U				
Dibenzofuran	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
2,4-Dinitrotoluene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Diethylphthalate	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
4-Chlorophenyl-phenyl ether	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Fluorene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
4-Nitroaniline*	660	1000	U	910	U	830	U	890	U	890	U	910	U	890	U				
4,6-Dinitro-2-methylphenol*	660	1000	UJ	910	UJ	830	UJ	890	UJ	890	UJ	910	UJ	890	UJ				
N-Nitrosodiphenylamine	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
4-Bromophenyl-phenyl ether	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Hexachlorobenzene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Pentachlorophenol*	660	1000	U	910	U	830	U	890	U	890	U	910	U	890	U				
Phenanthrene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Anthracene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Carbazole	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Di-n-butylphthalate	660	410	U	360	U	48		350	U	360	U	360	U	350	U				
Fluoranthene	660	410	U	360	U	330	U	19		360	U	360	U	350	U				
Pyrene	660	410	U	360	U	330	U	18		19		360	U	350	U				
Butylbenzylphthalate	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
3,3'-Dichlorobenzidine	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Benzo(a)anthracene	660	410	U	360	U	330	U	21		360	U	360	U	350	U				
Chrysene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
bis(2-Ethylhexyl)phthalate	660	410	U	24		19		25		27		360	U	27					
Di-n-octylphthalate	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Benzo(b)fluoranthene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Benzo(k)fluoranthene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Benzo(a)pyrene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Indeno(1,2,3-cd)pyrene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Dibenz(a,h)anthracene	660	410	U	360	U	330	U	350	U	360	U	360	U	350	U				
Benzo(g,h,i)perylene	660	410	U	360	U	330	U	350	U	360	U	360	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

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 04/25/06 12:14

RFW Batch Number: 0604L698 Client: TNUHANFORD RC-025 K0286 Work Order: 11343606001 Page: 1a

	Cust ID:	J11KB3		J11KB3		J11KB3		J11KB4		J11KB5		J11KB6	
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	63	%	59	%	77	%	75	%	72	%	58	%
	2-Fluorobiphenyl	62	%	58	%	77	%	79	%	84	%	60	%
	Terphenyl-d14	75	%	67	%	80	%	71	%	97	%	79	%
	Phenol-d5	72	%	65	%	87	%	72	%	71	%	66	%
	2-Fluorophenol	64	%	60	%	79	%	70	%	71	%	64	%
	2,4,6-Tribromophenol	60	%	61	%	80	%	65	%	76	%	82	%
			fl		fl		fl		fl		fl		fl
Phenol		370	U J	72	%	98	%	360	U J	350	U J	360	U J
bis(2-Chloroethyl)ether		370	U	77	%	98	%	360	U	350	U	360	U
2-Chlorophenol		370	U	71	%	95	%	360	U	350	U	360	U
1,3-Dichlorobenzene		370	U	58	%	78	%	360	U	350	U	360	U
1,4-Dichlorobenzene		370	U	58	%	77	%	360	U	350	U	360	U
1,2-Dichlorobenzene		370	U J	63	%	86	%	360	U J	350	U J	360	U J
2-Methylphenol		370	U J	73	%	102	%	360	U	350	U	360	U
2,2'-oxybis(1-Chloropropane)		370	U J	79	%	104	%	360	U	350	U	360	U
4-Methylphenol		370	U J	74	%	102	%	360	U	350	U	360	U
N-Nitroso-di-n-propylamine		370	U J	81	%	112	%	360	U	350	U	360	U
Hexachloroethane		370	U	60	%	80	%	360	U	350	U	360	U
Nitrobenzene		370	U	67	%	87	%	360	U	350	U	360	U
Isophorone		370	U	79	%	104	%	360	U	350	U	360	U
2-Nitrophenol		370	U J	63	%	91	%	360	U J	350	U J	360	U J
2,4-Dimethylphenol		370	U J	64	%	88	%	360	U J	350	U J	360	U J
bis(2-Chloroethoxy)methane		370	U	73	%	96	%	360	U	350	U	360	U
2,4-Dichlorophenol		370	U J	67	%	92	%	360	U J	350	U J	360	U J
1,2,4-Trichlorobenzene		370	U J	59 *	%	79	%	360	U J	350	U J	360	U J
Naphthalene		370	U	62	%	81	%	360	U	350	U	360	U
4-Chloroaniline		370	U	80	%	104	%	360	U	350	U	360	U
Hexachlorobutadiene		370	U	63	%	85	%	360	U	350	U	360	U
4-Chloro-3-methylphenol		370	U	74	%	100	%	360	U	350	U	360	U
2-Methylnaphthalene		370	U	70	%	90	%	360	U	350	U	360	U
Hexachlorocyclopentadiene		370	U	41	%	63	%	360	U	350	U	360	U
2,4,6-Trichlorophenol		370	U J	65	%	89	%	360	U J	350	U J	360	U J
2,4,5-Trichlorophenol		910	U	68	%	91	%	890	U	890	U	910	U

*= Outside of EPA CLP QC limits.

K 6/23/06

000000008

000015

RFW Batch Number: 0604L698 Client: TNUHANFORD RC-025 K0286 Work Order: 11343606001 Page: 1b

Cust ID:	J11KB3		J11KB3		J11KB3		J11KB4		J11KB5		J11KB6	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	370	U	64	%	86	%	360	U	350	U	360	U
2-Nitroaniline	910	U	80	%	107	%	890	U	890	U	910	U
Dimethylphthalate	370	U	73	%	94	%	360	U	350	U	360	U
Acenaphthylene	370	U	66	%	87	%	360	U	350	U	360	U
2,6-Dinitrotoluene	370	U	73	%	96	%	360	U	350	U	360	U
3-Nitroaniline	910	U	86	%	110	%	890	U	890	U	910	U
Acenaphthene	370	U	67	%	88	%	360	U	350	U	360	U
2,4-Dinitrophenol	910	U J	30	%	51	%	890	U J	890	U J	910	U J
4-Nitrophenol	910	U	72	%	94	%	890	U	890	U	910	U
Dibenzofuran	370	U	69	%	90	%	360	U	350	U	360	U
2,4-Dinitrotoluene	370	U	78	%	104	%	360	U	350	U	360	U
Diethylphthalate	370	U	75	%	96	%	360	U	350	U	360	U
4-Chlorophenyl-phenylether	370	U	68	%	89	%	360	U	350	U	360	U
Fluorene	370	U	67	%	86	%	360	U	350	U	360	U
4-Nitroaniline	910	U	73	%	91	%	890	U	890	U	910	U
4,6-Dinitro-2-methylphenol	910	U J	62	%	90	%	890	U J	890	U J	910	U J
N-Nitrosodiphenylamine (1)	370	U	60	%	79	%	360	U	350	U	360	U
4-Bromophenyl-phenylether	370	U	61	%	80	%	360	U	350	U	360	U
Hexachlorobenzene	370	U	69	%	92	%	360	U	350	U	360	U
Pentachlorophenol	910	U	66	%	82	%	890	U	890	U	910	U
Phenanthrene	370	U	70	%	89	%	360	U	350	U	360	U
Anthracene	370	U	71	%	92	%	360	U	350	U	360	U
Carbazole	370	U	72	%	93	%	360	U	350	U	360	U
Di-n-butylphthalate	370	U	75	%	95	%	360	U	21	J	360	U
Fluoranthene	370	U	71	%	90	%	360	U	350	U	360	U
Pyrene	370	U	70	%	89	%	360	U	350	U	360	U
Butylbenzylphthalate	370	U	80	%	102	%	360	U	350	U	360	U
3,3'-Dichlorobenzidine	370	U	94	%	117	%	360	U	350	U	360	U
Benzo(a)anthracene	370	U	71	%	91	%	360	U	350	U	360	U
Chrysene	370	U	69	%	88	%	360	U	350	U	360	U
bis(2-Ethylhexyl)phthalate	370	U	81	%	101	%	36	J	33	J	19	J
Di-n-octyl phthalate	370	U	80	%	100	%	360	U	350	U	360	U
Benzo(b)fluoranthene	370	U	70	%	88	%	360	U	350	U	360	U
Benzo(k)fluoranthene	370	U	68	%	85	%	360	U	350	U	360	U
Benzo(a)pyrene	370	U	67	%	85	%	360	U	350	U	360	U
Indeno(1,2,3-cd)pyrene	370	U	70	%	89	%	360	U	350	U	360	U
Dibenz(a,h)anthracene	370	U	71	%	87	%	360	U	350	U	360	U
Benzo(g,h,i)perylene	370	U	67	%	86	%	360	U	350	U	360	U

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

K 6/23/06

000016

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 04/25/06 12:14

RFW Batch Number: 0604L698 Client: TNUHANFORD RC-025 K0286 Work Order: 11343606001 Page: 2a

	Cust ID:	J11KB7	J11KB8	J11KB9	J11KC0	J11KC1	J11KC2
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	59 %	69 %	56 %	64 %	53 %	68 %
	2-Fluorobiphenyl	59 %	70 %	57 %	70 %	51 %	68 %
	Terphenyl-d14	80 %	88 %	76 %	111 %	71 %	88 %
	Phenol-d5	63 %	71 %	62 %	71 %	55 %	75 %
	2-Fluorophenol	64 %	76 %	61 %	59 %	58 %	78 %
	2,4,6-Tribromophenol	65 %	85 %	75 %	65 %	68 %	97 %
		fl	fl	fl	fl	fl	fl
Phenol		350 UJ	360 UJ	370 UJ	350 UJ	360 UJ	410 UJ
bis(2-Chloroethyl)ether		350 U	360 U	370 U	350 U	360 U	410 U
2-Chlorophenol		350 U	360 U	370 U	350 U	360 U	410 U
1,3-Dichlorobenzene		350 U	360 U	370 U	350 U	360 U	410 U
1,4-Dichlorobenzene		350 U	360 U	370 U	350 U	360 U	410 U
1,2-Dichlorobenzene		350 UJ	360 UJ	370 UJ	350 UJ	360 UJ	410 UJ
2-Methylphenol		350 U	360 U	370 U	350 U	360 U	410 U
2,2'-oxybis(1-Chloropropane)		350 U	360 U	370 U	350 U	360 U	410 U
4-Methylphenol		350 U	360 U	370 U	350 U	360 U	410 U
N-Nitroso-di-n-propylamine		350 U	360 U	370 U	350 U	360 U	410 U
Hexachloroethane		350 U	360 U	370 U	350 U	360 U	410 U
Nitrobenzene		350 U	360 U	370 U	350 U	360 U	410 U
Isophorone		350 U	360 U	370 U	350 U	360 U	410 U
2-Nitrophenol		350 UJ	360 UJ	370 UJ	350 UJ	360 UJ	410 UJ
2,4-Dimethylphenol		350 UJ	360 UJ	370 UJ	350 UJ	360 UJ	410 UJ
bis(2-Chloroethoxy)methane		350 U	360 U	370 U	350 U	360 U	410 U
2,4-Dichlorophenol		350 UJ	360 UJ	370 UJ	350 UJ	360 UJ	410 UJ
1,2,4-Trichlorobenzene		350 UJ	360 UJ	370 UJ	350 UJ	360 UJ	410 UJ
Naphthalene		350 U	360 U	370 U	350 U	360 U	410 U
4-Chloroaniline		350 U	360 U	370 U	350 U	360 U	410 U
Hexachlorobutadiene		350 U	360 U	370 U	350 U	360 U	410 U
4-Chloro-3-methylphenol		350 U	360 U	370 U	350 U	360 U	410 U
2-Methylnaphthalene		350 U	360 U	370 U	350 U	360 U	410 U
Hexachlorocyclopentadiene		350 U	360 U	370 U	350 U	360 U	410 U
2,4,6-Trichlorophenol		350 UJ	360 UJ	370 UJ	350 UJ	360 UJ	410 UJ
2,4,5-Trichlorophenol		890 U	900 U	910 U	880 U	890 U	1000 U

*= Outside of EPA CLP QC limits.

R 6/23/06

000012

000000010

Cust ID:	J11KB7		J11KB8		J11KB9		J11KC0		J11KC1		J11KC2	
RFW#:	005		006		007		008		009		010	
2-Chloronaphthalene	350	U	360	U	370	U	350	U	360	U	410	U
2-Nitroaniline	890	U	900	U	910	U	880	U	890	U	1000	U
Dimethylphthalate	350	U	360	U	370	U	350	U	360	U	410	U
Acenaphthylene	350	U	360	U	370	U	350	U	360	U	410	U
2,6-Dinitrotoluene	350	U	360	U	370	U	350	U	360	U	410	U
3-Nitroaniline	890	U	900	U	910	U	880	U	890	U	1000	U
Acenaphthene	350	U	360	U	370	U	350	U	360	U	410	U
2,4-Dinitrophenol	890	U J	900	U J	910	U J	880	U J	890	U J	1000	U J
4-Nitrophenol	890	U	900	U	910	U	880	U	890	U	1000	U
Dibenzofuran	350	U	360	U	370	U	350	U	360	U	410	U
2,4-Dinitrotoluene	350	U	360	U	370	U	350	U	360	U	410	U
Diethylphthalate	350	U	360	U	370	U	350	U	360	U	410	U
4-Chlorophenyl-phenylether	350	U	360	U	370	U	350	U	360	U	410	U
Fluorene	350	U	360	U	370	U	350	U	360	U	410	U
4-Nitroaniline	890	U	900	U	910	U	880	U	890	U	1000	U
4,6-Dinitro-2-methylphenol	890	U J	900	U J	910	U J	880	U J	890	U J	1000	U J
N-Nitrosodiphenylamine (1)	350	U	360	U	370	U	350	U	360	U	410	U
4-Bromophenyl-phenylether	350	U	360	U	370	U	350	U	360	U	410	U
Hexachlorobenzene	350	U	360	U	370	U	350	U	360	U	410	U
Pentachlorophenol	890	U	900	U	910	U	880	U	890	U	1000	U
Phenanthrene	350	U	360	U	370	U	350	U	360	U	410	U
Anthracene	350	U	360	U	370	U	350	U	360	U	410	U
Carbazole	350	U	360	U	370	U	350	U	360	U	410	U
Di-n-butylphthalate	350	U	360	U	370	U	350	U	360	U	410	U
Fluoranthene	350	U	360	U	370	U	350	U	360	U	410	U
Pyrene	350	U	360	U	370	U	20	J	360	U	410	U
Butylbenzylphthalate	350	U	360	U	370	U	350	U	360	U	410	U
3,3'-Dichlorobenzidine	350	U	360	U	370	U	350	U	360	U	410	U
Benzo(a)anthracene	350	U	360	U	370	U	350	U	360	U	410	U
Chrysene	350	U	360	U	370	U	350	U	360	U	410	U
bis(2-Ethylhexyl)phthalate	350	U	360	U	370	U	22	J	360	U	410	U
Di-n-octyl phthalate	350	U	360	U	370	U	350	U	360	U	410	U
Benzo(b)fluoranthene	350	U	360	U	370	U	350	U	360	U	410	U
Benzo(k)fluoranthene	350	U	360	U	370	U	350	U	360	U	410	U
Benzo(a)pyrene	350	U	360	U	370	U	350	U	360	U	410	U
Indeno(1,2,3-cd)pyrene	350	U	360	U	370	U	350	U	360	U	410	U
Dibenz(a,h)anthracene	350	U	360	U	370	U	350	U	360	U	410	U
Benzo(g,h,i)perylene	350	U	360	U	370	U	350	U	360	U	410	U

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

K 6/23/00

0000018 0000000011

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 04/25/06 12:14

RFW Batch Number: 0604L698 Client: TNUHANFORD RC-025 K0286 Work Order: 11343606001 Page: 3a

000000012

	Cust ID:	J11KC3		J11KC4		J11KD3		J11KD4		J11KD5		J11KD6	
Sample Information	RFW#:	011		012		013		014		015		016	
	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	%	59	%	54	%	76	%	52	%	68	%
	2-Fluorobiphenyl	67	%	59	%	63	%	77	%	50	%	68	%
	Terphenyl-d14	99	%	73	%	73	%	104	%	81	%	91	%
	Phenol-d5	66	%	61	%	53	%	78	%	55	%	71	%
	2-Fluorophenol	61	%	63	%	54	%	71	%	54	%	63	%
	2,4,6-Tribromophenol	60	%	60	%	61	%	68	%	71	%	62	%
		fl		fl		fl		fl		fl		fl	
Phenol		360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ
bis(2-Chloroethyl)ether		360	U	330	U	350	U	360	U	360	U	350	U
2-Chlorophenol		360	U	330	U	350	U	360	U	360	U	350	U
1,3-Dichlorobenzene		360	U	330	U	350	U	360	U	360	U	350	U
1,4-Dichlorobenzene		360	U	330	U	350	U	360	U	360	U	350	U
1,2-Dichlorobenzene		360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ
2-Methylphenol		360	U	330	U	350	U	360	U	360	U	350	U
2,2'-oxybis(1-Chloropropane)		360	U	330	U	350	U	360	U	360	U	350	U
4-Methylphenol		360	U	330	U	350	U	360	U	360	U	350	U
N-Nitroso-di-n-propylamine		360	U	330	U	350	U	360	U	360	U	350	U
Hexachloroethane		360	U	330	U	350	U	360	U	360	U	350	U
Nitrobenzene		360	U	330	U	350	U	360	U	360	U	350	U
Isophorone		360	U	330	U	350	U	360	U	360	U	350	U
2-Nitrophenol		360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ
2,4-Dimethylphenol		360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ
bis(2-Chloroethoxy)methane		360	U	330	U	350	U	360	U	360	U	350	U
2,4-Dichlorophenol		360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ
1,2,4-Trichlorobenzene		360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ
Naphthalene		360	U	330	U	350	U	360	U	360	U	350	U
4-Chloroaniline		360	U	330	U	350	U	360	U	360	U	350	U
Hexachlorobutadiene		360	U	330	U	350	U	360	U	360	U	350	U
4-Chloro-3-methylphenol		360	U	330	U	350	U	360	U	360	U	350	U
2-Methylnaphthalene		360	U	330	U	350	U	360	U	360	U	350	U
Hexachlorocyclopentadiene		360	U	330	U	350	U	360	U	360	U	350	U
2,4,6-Trichlorophenol		360	UJ	330	UJ	350	UJ	360	UJ	360	UJ	350	UJ
2,4,5-Trichlorophenol		910	U	830	U	890	U	890	U	910	U	890	U

*= Outside of EPA CLP QC limits.

4/23/06

000019

Cust ID:	J11KC3		J11KC4		J11KD3		J11KD4		J11KD5		J11KD6	
RFW#:	011		012		013		014		015		016	
2-Chloronaphthalene	360	U	330	U	350	U	360	U	360	U	350	U
2-Nitroaniline	910	U	830	U	890	U	890	U	910	U	890	U
Dimethylphthalate	360	U	330	U	350	U	360	U	360	U	350	U
Acenaphthylene	360	U	330	U	350	U	360	U	360	U	350	U
2,6-Dinitrotoluene	360	U	330	U	350	U	360	U	360	U	350	U
3-Nitroaniline	910	U	830	U	890	U	890	U	910	U	890	U
Acenaphthene	360	U	330	U	350	U	360	U	360	U	350	U
2,4-Dinitrophenol	910	U J	830	U J	890	U J	890	U J	910	U J	890	U J
4-Nitrophenol	910	U	830	U	890	U	890	U	910	U	890	U
Dibenzofuran	360	U	330	U	350	U	360	U	360	U	350	U
2,4-Dinitrotoluene	360	U	330	U	350	U	360	U	360	U	350	U
Diethylphthalate	360	U	330	U	350	U	360	U	360	U	350	U
4-Chlorophenyl-phenylether	360	U	330	U	350	U	360	U	360	U	350	U
Fluorene	360	U	330	U	350	U	360	U	360	U	350	U
4-Nitroaniline	910	U	830	U	890	U	890	U	910	U	890	U
4,6-Dinitro-2-methylphenol	910	U J	830	U J	890	U J	890	U J	910	U J	890	U J
N-Nitrosodiphenylamine (1)	360	U	330	U	350	U	360	U	360	U	350	U
4-Bromophenyl-phenylether	360	U	330	U	350	U	360	U	360	U	350	U
Hexachlorobenzene	360	U	330	U	350	U	360	U	360	U	350	U
Pentachlorophenol	910	U	830	U	890	U	890	U	910	U	890	U
Phenanthrene	360	U	330	U	350	U	360	U	360	U	350	U
Anthracene	360	U	330	U	350	U	360	U	360	U	350	U
Carbazole	360	U	330	U	350	U	360	U	360	U	350	U
Di-n-butylphthalate	360	U	48	J	350	U	360	U	360	U	350	U
Fluoranthene	360	U	330	U	19	J	360	U	360	U	350	U
Pyrene	360	U	330	U	18	J	19	J	360	U	350	U
Butylbenzylphthalate	360	U	330	U	350	U	360	U	360	U	350	U
3,3'-Dichlorobenzidine	360	U	330	U	350	U	360	U	360	U	350	U
Benzo(a)anthracene	360	U	330	U	350	U	360	U	360	U	350	U
Chrysene	360	U	330	U	21	J	360	U	360	U	350	U
bis(2-Ethylhexyl)phthalate	24	J	19	J	25	J	27	J	360	U	27	J
Di-n-octyl phthalate	360	U	330	U	350	U	360	U	360	U	350	U
Benzo(b)fluoranthene	360	U	330	U	350	U	360	U	360	U	350	U
Benzo(k)fluoranthene	360	U	330	U	350	U	360	U	360	U	350	U
Benzo(a)pyrene	360	U	330	U	350	U	360	U	360	U	350	U
Indeno(1,2,3-cd)pyrene	360	U	330	U	350	U	360	U	360	U	350	U
Dibenz(a,h)anthracene	360	U	330	U	350	U	360	U	360	U	350	U
Benzo(g,h,i)perylene	360	U	330	U	350	U	360	U	360	U	350	U

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

K 6/23/01

000020

000000013

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 04/25/06 12:14

RFW Batch Number: 0604L698 Client: TNUHANFORD RC-025 K0286 Work Order: 11343606001 Page: 4a

	Cust ID:	SBLKWC		SBLKWC BS	
Sample Information	RFW#:	06LE0283-MB1		06LE0283-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	1.00		1.00	
	Units:	ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	69	%	65	%
	2-Fluorobiphenyl	67	%	73	%
	Terphenyl-d14	93	%	82	%
	Phenol-d5	72	%	75	%
	2-Fluorophenol	74	%	70	%
	2,4,6-Tribromophenol	71	%	85	%
Phenol		330	U	85	%
bis(2-Chloroethyl)ether		330	U	76	%
2-Chlorophenol		330	U	81	%
1,3-Dichlorobenzene		330	U	71	%
1,4-Dichlorobenzene		330	U	69	%
1,2-Dichlorobenzene		330	U	76	%
2-Methylphenol		330	U	77	%
2,2'-oxybis(1-Chloropropane)		330	U	76	%
4-Methylphenol		330	U	82	%
N-Nitroso-di-n-propylamine		330	U	81	%
Hexachloroethane		330	U	67	%
Nitrobenzene		330	U	68	%
Isophorone		330	U	79	%
2-Nitrophenol		330	U	74	%
2,4-Dimethylphenol		330	U	58	%
bis(2-Chloroethoxy)methane		330	U	73	%
2,4-Dichlorophenol		330	U	77	%
1,2,4-Trichlorobenzene		330	U	70	%
Naphthalene		330	U	71	%
4-Chloroaniline		330	U	89	%
Hexachlorobutadiene		330	U	76	%
4-Chloro-3-methylphenol		330	U	79	%
2-Methylnaphthalene		330	U	75	%
Hexachlorocyclopentadiene		330	U	68	%
2,4,6-Trichlorophenol		330	U	87	%
2,4,5-Trichlorophenol		830	U	80	%

*= Outside of EPA CLP QC limits.

K 6/23/06

0000021

Cust ID:	SBLKWC		SBLKWC BS	
RFW#:	06LE0283-MB1		06LE0283-MB1	
2-Chloronaphthalene	330	U	80	%
2-Nitroaniline	830	U	81	%
Dimethylphthalate	330	U	83	%
Acenaphthylene	330	U	80	%
2,6-Dinitrotoluene	330	U	81	%
3-Nitroaniline	830	U	112	%
Acenaphthene	330	U	80	%
2,4-Dinitrophenol	830	U	30	%
4-Nitrophenol	830	U	105	%
Dibenzofuran	330	U	82	%
2,4-Dinitrotoluene	330	U	87	%
Diethylphthalate	330	U	84	%
4-Chlorophenyl-phenylether	330	U	83	%
Fluorene	330	U	78	%
4-Nitroaniline	830	U	97	%
4,6-Dinitro-2-methylphenol	830	U	74	%
N-Nitrosodiphenylamine (1)	330	U	69	%
4-Bromophenyl-phenylether	330	U	72	%
Hexachlorobenzene	330	U	87	%
Pentachlorophenol	830	U	113	%
Phenanthrene	330	U	84	%
Anthracene	330	U	85	%
Carbazole	330	U	86	%
Di-n-butylphthalate	330	U	87	%
Fluoranthene	330	U	88	%
Pyrene	330	U	88	%
Butylbenzylphthalate	330	U	93	%
3,3'-Dichlorobenzidine	330	U	125	%
Benzo(a)anthracene	330	U	85	%
Chrysene	330	U	82	%
bis(2-Ethylhexyl)phthalate	330	U	90	%
Di-n-octyl phthalate	330	U	91	%
Benzo(b)fluoranthene	330	U	88	%
Benzo(k)fluoranthene	330	U	82	%
Benzo(a)pyrene	330	U	82	%
Indeno(1,2,3-cd)pyrene	330	U	87	%
Dibenz(a,h)anthracene	330	U	86	%
Benzo(g,h,i)perylene	330	U	83	%

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

L 1/23/06

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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

SEMIVOLATILE

Sixteen (16) soil samples were collected on 04-04-2006.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 04-13-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 04-18,20,23-2006.

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 one hundred twenty-eight (128) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. All blank spike recoveries were within acceptance criteria.

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

7. The sample results were reported on a dry-weight basis.

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 9 pages.

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

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

5-5-06
Date

som\gonup\data\bna\tmi-hanford\0604-698.doc

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06MS139

Initiator: Robert Carden
Date: 4/25/06
Client: TNU Hanford RCORS

Batch: 06GL690
Samples: QL1MS
Method: SW846/MCAWW/CLP/

Parameter: 06254
Matrix: Soil
Prep Batch: 06GP283

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)

1,4-Trichlorobenzene spike recovery below QC limits in QL1MS59% (60-120%) Ok in MSD / LCS

2. Known or Probable Causes(s) Matrix/Interference problem all other spike/surrogates are good. Sporadic

3. Discussion and Proposed Action Other Description: Narrate

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

4. Project Manager Instructions...signature/date: [signature] 4/25/06

✓ 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: [signature] 5/5/06 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
1	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	2	X 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-025-004	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 (115-B) Area 5	SAF No.: RC-025	Air Quality ☐ 21 days
Ice Chest No.: GRP-03-009	Field Logbook No.: EL-1585-5 — COA: B10B14 2000	Method of Shipment: fed ex	
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060350	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	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	~~125g~~ 250mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Gamma Spec~~ Tritium - 3H	~~Nickel-63~~ Strontium-89,90 – Total Sr	Pesticides - 8081; ~~Chloro-Herbicides - 8151~~		

Sample No.	Matrix *	Sample Date	Sample Time									
J11KB3	SOIL	04/04/06	1015	✓	✓	✓	✓				✓	
J11KB4	SOIL	04/04/06	1020	✓	✓	✓	✓				✓	
J11KB5	SOIL	04/04/06	1045	✓	✓	✓	✓				✓	
J11KB6	SOIL	04/04/06	1050	✓	✓	✓	✓				✓	
J11KB7	SOIL	04/04/06	1230	✓	✓	✓	✓				✓	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Brian Singleton/Jody	4-4-06 1600	3728 Ref 2	4-4-06 1600
3728 #24	4-5-06 0930	R. Edmundson / Jo Shaw	4-5-06 0930
R. Edmundson / Jo Shaw	4-5-06 1500	FED EX	
FED EX	4/6/06 0910	J. Reckamp	4/6/06 0910

SPECIAL INSTRUCTIONS

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

(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}~~ 04/04/06

Personnel not available to relinquish samples from 3728 Ref # 2A on 4/5/06

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)

000000035

420000

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-004	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 (115-B) Area 5		SAF No.: RC-025
Ice Chest No.: ERC-03-105	Field Logbook No.: EL-1585-5	COA: R10B14 2000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060350		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	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	~~125g~~ 1 qm	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~ Tritium - H3	~~Nickel-63~~, Strontium-89,90 -- Total Sr	Pesticides - 8081, ~~Chlorp-Herbicides - 8151A~~		

04/04/06

04/04/06

000028

Sample No.	Matrix *	Sample Date	Sample Time									
J11KB8	SOIL	04/04/06	1235	✓	✓	✓	✓				✓	
J11KB9	SOIL	04/04/06	1240	✓	✓	✓	✓				✓	
J11KC0	SOIL	04/04/06	1245	✓	✓	✓	✓				✓	
J11KC1	SOIL	04/04/06	1345	✓	✓	✓	✓				✓	
J11KC2	SOIL	04/04/06	1355	✓	✓	✓	✓				✓	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	1600 4-4-06	372B RefZ	1600 4-4-06
372B RefZA	4-5-06 0930	[illegible]	4-5-06 0930
[illegible] WCH	4-5-06 1500	FED EX	
FED EX	4/6/06 0910	[illegible]	4/6/06 0910

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 372B Ref ~~#2A~~ on 4/5/06

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-025-004	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 (115-B) Area 5	SAF No.: RC-025	Air Quality ☐ 21 days
Ice Chest No.: ERC-99-063	Field Logbook No.: EL-1585-5 — COA: R10B14 2000	Method of Shipment: fed ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060350	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

620029

SAMPLE ANALYSIS

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C				
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG				
No. of Container(s)	1	1	1	1	1	1	1	1				
Volume	250g 04/04/06	~~125g~~ 120mL	120mL	120mL	500mL	120mL	120mL	250mL				
	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Gamma-44; Tritium-3H~~	~~Nickel-63;~~ Strontium-89,90 -- Total Sr	Pesticides - 8081; ~~Chlorinated Herbicides - 8151A~~ 04/04/06				

Sample No.	Matrix *	Sample Date	Sample Time									
J11KC3	SOIL	04/04/06	1055	✓	✓	✓	✓				✓	
J11KC4	SOIL	04/04/06	1040	✓	N/A	N/A	✓				N/A	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	4-4-06 1600	3278 Rm 2	4-4-06 1600
3728 #2A	4-5-06 0930	JR Glendenen	4-5-06 0930
WCH JR Glendenen	4-5-06 1500	FED EX	
FED EX	4/6/06 0910	V. Hernandez	4/6/06 0910

SPECIAL INSTRUCTIONS

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

(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]~~ 04/04/06

Personnel not available to Relinquish samples from 3728 Ref# 2A on 4/5/06

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-025-006	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 (115-B) BCL Area 5		SAF No.: RC-025
Air Quality ☐ 21 days			
Ice Chest No.: GRP-03-009	Field Logbook No.: EL-1585-5	COA: R10B142000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES/ LIONVILLE	Offsite Property No.: A060350		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000030

SAMPLE ANALYSIS

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	Cool 4C			
Type of Container	G/P	G/P	aG	aG	G/P	G/P	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	250g	~~125g~~ 2oz 04/04/06	120mL	120mL	500mL	120mL	250mL			
	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Cesium-14~~ Tritium - H3	Pesticides - 8081; ~~Chlorinated Herbicides - 8151A~~ 04/04/06			

Sample No.	Matrix *	Sample Date	Sample Time									
J11KD3	SOIL	04/04/06	0915	✓	✓	✓	✓			✓		
J11KD4	SOIL	04/04/06	0925	✓	✓	✓	✓			✓		
J11KD5	SOIL	04/04/06	0930	✓	✓	✓	✓			✓		
J11KD6	SOIL	04/04/06	0935	✓	✓	✓	✓			✓		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Kevin Singleton	Date/Time: 1600 4-4-06	Received By/Stored In: 3728 Ref 2A	Date/Time: 1600 4-4-06
Relinquished By/Removed From: 3728 Ref 2A	Date/Time: 4-5-06 0930	Received By/Stored In: LR Edmundson	Date/Time: 4-5-06 0930
Relinquished By/Removed From: WCH LR Edmundson	Date/Time: 4-5-06 1500	Received By/Stored In: FED EX	Date/Time
Relinquished By/Removed From: Fed Ex	Date/Time: 4/6/06 0910	Received By/Stored In:	Date/Time: 4/6/06 0910
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 04/04/06

~~(2) addition to item # 2 Run gross alpha and gross beta on 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}~~ 04/04/06

Personnel not available to relinquish samples from 3728 Ref # 2A on 4/5/06

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: K0228		
VALIDATOR: TLI		LAB: LLI		DATE: 6/12/02	
			SDG: K0228		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J11KB3	J11KB4	J11KB5	J11KB6	J11KB7	J11KB8
J11KB9	J11KC0	J11KC1	J11KC2	J11KC3	J11KC4
J11KD3	J11KD4	J11KD5	J11KD6		
					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: bis(2-ethylhexyl)phthalate + di-n-butylphthalate in the FB

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

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

Comments: 1,2,4-trichlorobenzene - US 57% - J all
no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

Phenol (31%) 1,2-dichlorobenzene (31%) 2-methylphenol (33%)
2,2'-oxybis(1-chloropropane) (32%) 4-methylphenol (32%)
n-nitroso-di-n-propylamine (32%) 2-nitrophenol (36%) 2,4 dimethylphenol (32%)
2,4-dichlorophenol (31%) 2,4-dinitrophenol (52%)
4,6-dinitro-2-methylphenol (37%) - J all 2,4,6-trichlorophenol - 31% - J

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: 1.28 ovr

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: Wet Chemistry - Data Package No. K0286-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0286 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	Matrix	Validation	Date
J11KB3	4/4/06	Soil	C	See note 1
J11KB4	4/4/06	Soil	C	See note 1
J11KB5	4/4/06	Soil	C	See note 1
J11KB6	4/4/06	Soil	C	See note 1
J11KB7	4/4/06	Soil	C	See note 1
J11KB8	4/4/06	Soil	C	See note 1
J11KB9	4/4/06	Soil	C	See note 1
J11KC0	4/4/06	Soil	C	See note 1
J11KC1	4/4/06	Soil	C	See note 1
J11KC2	4/4/06	Soil	C	See note 1
J11KC3	4/4/06	Soil	C	See note 1
J11KD3	4/4/06	Soil	C	See note 1
J11KD4	4/4/06	Soil	C	See note 1
J11KD5	4/4/06	Soil	C	See note 1
J11KD6	4/4/06	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 (J11KB6/J11KC3) 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 K0286 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: K0286	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: K0286																		
Sample Number		J11KB3		J11KB4		J11KB5		J11KB6		J11KB7		J11KB8		J11KB9		J11KC0		J11KC1	
Remarks								Main											
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
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	0.22	U	0.26		0.21	U	0.26		0.21	U	0.22	U	0.36		0.21	U	0.21	U
Sample Number		J11KC2		J11KC3		J11KD3		J11KD4		J11KD5		J11KD6							
Remarks				Duplicate															
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06							
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q						
Chromium VI	0.5	0.37		0.36		0.65		0.22		0.22	U	0.22							

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.

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/12/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11KB3	% Solids	91.3	%	0.01	1.0
		Chromium VI	0.22 u	MG/KG	0.22	1.0
-002	J11KB4	% Solids	93.6	%	0.01	1.0
		Chromium VI	0.26	MG/KG	0.21	1.0
-003	J11KB5	% Solids	94.1	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-004	J11KB6	% Solids	91.4	%	0.01	1.0
		Chromium VI	0.26	MG/KG	0.22	1.0
-005	J11KB7	% Solids	94.1	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-006	J11KB8	% Solids	92.4	%	0.01	1.0
		Chromium VI	0.22 u	MG/KG	0.22	1.0
-007	J11KB9	% Solids	91.2	%	0.01	1.0
		Chromium VI	0.36	MG/KG	0.22	1.0
-008	J11KC0	% Solids	94.9	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-009	J11KC1	% Solids	93.4	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-010	J11KC2	% Solids	81.5	%	0.01	1.0
		Chromium VI	0.37	MG/KG	0.24	1.0

4/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/12/06

CLIENT: TNUHANFORD RC-025 K0286
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0604L698

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J11KC3	% Solids	91.6	%	0.01	1.0
		Chromium VI	0.36	MG/KG	0.22	1.0
-012	J11KC4	% Solids	99.9	%	0.01	1.0
-013	J11KD3	% Solids	94.1	%	0.01	1.0
		Chromium VI	0.65	MG/KG	0.21	1.0
-014	J11KD4	% Solids	93.4	%	0.01	1.0
		Chromium VI	0.22	MG/KG	0.21	1.0
-015	J11KD5	% Solids	91.6	%	0.01	1.0
		Chromium VI	0.22 u	MG/KG	0.22	1.0
-016	J11KD6	% Solids	94.0	%	0.01	1.0
		Chromium VI	0.22	MG/KG	0.21	1.0

4/23/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

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

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

INORGANIC NARRATIVE

1. This narrative covers the analyses of 16 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 analysis for Percent Solids was within the 20% Relative Percent Difference (RPD) control limit however replicate analysis for Chromium VI was outside the control limit that may be attributed sample inhomogeneity.

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\i04-698

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-025-004	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 (115-B) Area 5		SAF No.: RC-025
Ice Chest No.: GRP-03-009	Field Logbook No.: EL-1585-5	COA: B10B14 2000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060350		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: | Data Turnaround: 21 days

Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Gamma Spec~~ Tritium - 3H	~~Nickel-63~~ Strontium-89,90 -- Total Sr	Pesticides - 8081; ~~Chloro Herbicides - 8PA815~~		

Sample No.	Matrix *	Sample Date	Sample Time										
J11KB3	SOIL	04/04/06	1015	✓	✓	✓	✓				✓		
J11KB4	SOIL	04/04/06	1020	✓	✓	✓	✓				✓		
J11KB5	SOIL	04/04/06	1045	✓	✓	✓	✓				✓		
J11KB6	SOIL	04/04/06	1050	✓	✓	✓	✓				✓		
J11KB7	SOIL	04/04/06	1230	✓	✓	✓	✓				✓		

000015

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Brian Singleton 3728	Date/Time: 4-4-06 1600	Received By/Stored In: 3728 Ref 2	Date/Time: 4-4-06 1600
Relinquished By/Removed From: 3728 #2A	Date/Time: 4-5-06 0930	Received By/Stored In: R. Edmondson / JR Blanchard	Date/Time: 4-5-06 0930
Relinquished By/Removed From: WCH R. Edmondson / JR Blanchard	Date/Time: 4-5-06 1500	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 4/6/06 0910	Received By/Stored In: [illegible]	Date/Time: 4/6/06 0910
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 # 3 - Run gross alpha and gross beta off available material.~~ 04/04/06

(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)

~~(3) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~ 04/04/06

Personnel not available to relinquish samples from 3728 Ref # 2A on 4/5/06

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-025-004	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	**Date Turnaround**		
Project Designation 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	**Sampling Location** 100-B-14:2 (115-B) Area 5		**SAF No.** RC-025
Air Quality ☐ 21 days			
Ice Chest No. ERC-03-105	**Field Logbook No.** EL-1585-5	**COA** B10B14 2000	**Method of Shipment** fed ex
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060350		**Bill of Lading/Air Bill No.** SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000016

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g 04/04/06	~~125g~~ 125 mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~ Tritium - H3 04/04/06	~~Nickel-63~~ Strontium-89,90 -- Total Sr	Pesticides - 8081, Chloro-Herbicides - 8151 04/04/06		

Sample No.	Matrix *	Sample Date	Sample Time									
J11KB8	SOIL	04/04/06	1235	✓	✓	✓	✓				✓	
J11KB9	SOIL	04/04/06	1240	✓	✓	✓	✓				✓	
J11KC0	SOIL	04/04/06	1245	✓	✓	✓	✓				✓	
J11KC1	SOIL	04/04/06	1345	✓	✓	✓	✓				✓	
J11KC2	SOIL	04/04/06	1355	✓	✓	✓	✓				✓	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	4-4-06 1600	3728 Ref 2	4-4-06 1600
3728 Ref 2A	4-5-06 0930	J.E. Edmundson	4-5-06 0930
J.E. Edmundson	4-5-06 1500	FED EX	
FED EX	4/6/06 0910		4/6/06 0910

Sign/Print Names

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 #2A on 4/5/06

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-025-004 | Page 3 of 3

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 (115-B) Area 5		**SAF No.** RC-025
Ice Chest No. ERC-99-063	**Field Logbook No.** EL-1585-5	**COA** R10B14 2000	**Method of Shipment** fed ex
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060350		**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

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g 04/04/06	~~125g~~ 120mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions	~~Gamma-14; Tritium-3H~~	~~Nickel-63~~, Strontium-89,90 -- Total Sr	Pesticides - 8081; ~~Chlorinated Herbicides - 8151~~ 04/04/06		

Sample No.	Matrix *	Sample Date	Sample Time										
J11KC3	SOIL	04/04/06	1055	✓	✓	✓	✓				✓		
J11KC4	SOIL	04/04/06	1040	✓	N/A	N/A	✓				N/A		

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	4-4-06 1600	3278 Ref 2	4-4-06 1600
3728 #2A	4-5-06 0930	J R Edmundson	4-5-06 0930
J.R. Edmundson WCH	4-5-06 1500	FED EX	
FED EX	4/6/06 0910	P Kennedy	4/6/06 0910

SPECIAL INSTRUCTIONS

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

(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}~~ 04/04/06

Personnel not available to Relinquish samples from 3728 Ref # 2A on 4/5/06

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-025-006 | 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: 21 days		
Project Designation: 100-BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-B-14:2 (115-B) BCL Area 5		SAF No.: RC-025
Air Quality ☐			
Ice Chest No.: GRP-03-009	Field Logbook No.: EL-1585-5	COA: R10B142000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES/ LIONVILLE	Offsite Property No.: A060350		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	None	Cool 4C			
Type of Container	G/P	G/P	aG	aG	G/P	G/P	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	250g	~~125g~~ 250 mL 04/04/06	120mL	120mL	500mL	120mL	250mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Gamma-14, Tritium - H3~~	Pesticides - 8081; ~~Chlorinated Herbicides 8151~~ 04/04/06			

010018

Sample No.	Matrix *	Sample Date	Sample Time									
J11KD3	SOIL	04/04/06	0915	✓	✓	✓	✓			✓		
J11KD4	SOIL	04/04/06	0925	✓	✓	✓	✓			✓		
J11KD5	SOIL	04/04/06	0930	✓	✓	✓	✓			✓		
J11KD6	SOIL	04/04/06	0935	✓	✓	✓	✓			✓		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	4-4-06 1600	3728 Ref 2A	4-4-06 1600
3728 #2A	4-5-06 0930	TR Edmundson	4-5-06 0930
TR Edmundson	4-5-06 1500	FED EX	
FED EX	4/6/06 0910		4/6/06 0910

SPECIAL INSTRUCTIONS

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

(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)~~ 04/04/06

Personnel not available to relinquish samples from 3728 Ref # 2A on 4/5/06

Matrix *: S=Soil; SE=Sediment; SO=Solid; SJ=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: 100-B-14:2			DATA PACKAGE: K0286		
VALIDATOR: TLI		LAB: LLI		DATE: 6/12/06	
			SDG: K0286		

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					
J11KB3	J11KB4	J11KB5	J11KB6	J11KB7	J11KB8
J11KB9	J11KC0	J11KC1	J11KC2	J11KC3	J11KD3
J11KD4	J11KD5	J11KD6			
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. HOLDING TIMES (all levels)

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

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

Comments:

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 04/12/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LVI023-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/12/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J11XB3	Soluble Chromium VI	4.2	0.22u	4.4	92.7	1.0
		Insoluble Chromium VI	1320	0.22u	1240	106.3	100
BLANK10	06LVI023-MB1	Soluble Chromium VI	4.0	0.20u	4.0	98.9	1.0
		Insoluble Chromium VI	1270	0.20u	1170	109.1	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/12/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J11KB3	Chromium VI	0.22u	0.26	~~NC~~ 60.3	1.0
-016REP	J11KD6	% Solids	94.0	93.7	0.34	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: Radiochemistry - Data Package No. K0286-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0286 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	Matrix	Validation	Date
J11KB3	4/4/06	Soil	C	See note 1
J11KB4	4/4/06	Soil	C	See note 1
J11KB5	4/4/06	Soil	C	See note 1
J11KB6	4/4/06	Soil	C	See note 1
J11KB7	4/4/06	Soil	C	See note 1
J11KB8	4/4/06	Soil	C	See note 1
J11KB9	4/4/06	Soil	C	See note 1
J11KC0	4/4/06	Soil	C	See note 1
J11KC1	4/4/06	Soil	C	See note 1
J11KC2	4/4/06	Soil	C	See note 1
J11KC3	4/4/06	Soil	C	See note 1
J11KD3	4/4/06	Soil	C	See note 1
J11KD4	4/4/06	Soil	C	See note 1
J11KD5	4/4/06	Soil	C	See note 1
J11KD6	4/4/06	Soil	C	See note 1

1 – Gamma spectroscopy, gross alpha, gross beta, tritium and total strontium.

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 (39%), all thorium-232 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J11KB6/J11KC3) 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 (55%). 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. Seventy-four analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0286 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to an RPD outside QC limits (39%), all thorium-232 results were qualified as estimates and flagged "J".

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

Seventy-four 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 BHI statement of work are as follows:

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

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

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

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

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

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0286	REVIEW: [illegible]	Test: 100-B-14-2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-232	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: K0286																		
Sample Number		J11KB3		J11KB4		J11KB5		J11KB6		J11KB7		J11KB8		J11KB9		J11KC0		J11KC1	
Remarks								Main											
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross alpha		4.82	U	1.86	U	4.35		6.75		4.34	U	9.17		5.90		0.948	U	0.581	U
Gross beta		22.3		13.8		8.32	U	19.1		10.2		15.3		17.6		15.1		18.4	
Tritium	10	-0.076	U	-0.130	U	-0.140	U	-0.028	U	-0.024	U	-0.085	U	0.110	U	0.094	U	-0.005	U
Total strontium	1	-0.051	U	-0.052	U	-0.135	U	-0.039	U	0.090	U	0.085	U	0.018	U	-0.033	U	-0.041	U
Potassium-40		8.39		8.83		6.75		10.3		7.29		7.68		8.45		11.0		6.16	
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*	0.077		U	U*
Radium-226		0.294		0.419		0.280		0.292		0.185		0.248		0.404		0.346		0.314	
Radium-228		0.489		0.551		0.302		0.479		0.404		0.546		0.648		0.574		0.464	
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		0.354		0.516		0.460		0.696		0.265		0.341		0.498		0.408		0.463	
Thorium-232		0.489	J	0.551	J	0.302	UJ	0.479	J	0.404	J	0.546	J	0.680	J	0.574	J	0.464	J
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: K0286												
Sample Number		J11KC2		J11KC3		J11KD3		J11KD4		J11KD5		J11KD6	
Remarks				Duplicate									
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross alpha		7.72		8.50		6.32	U	4.20		4.37	U	6.36	
Gross beta		14.6		19.8		15.6		11.9		20.1		19.8	
Tritium	10	0.239	U	0.151	U	-0.105	U	0.296	U	0.045	U	-0.114	U
Total strontium	1	0.114	U	-0.045	U	NA		NA		NA		NA	
Potassium-40		12.2		8.82		9.81		11.6		9.15		9.42	
Cobalt 60	0.05	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*
Radium-226		0.431		0.377		0.324		0.455		0.258		0.349	
Radium-228		0.909		0.835		0.546		U	U	0.575		0.501	
Europium 152	0.1	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*
Europium 155	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Thorium-228		0.742		0.589		0.490		0.450		0.566		0.509	
Thorium-232		0.909	J	0.835	J	0.546	J	U	UJ	0.575	J	0.501	J
Uranium-235(gea)		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
Americium-241(gea)		U	U	U	U	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 K0286

R604022-01 **J11KB3**

DATA SHEET

SDG	7413	Client/Case no	Hanford	SDG K0286	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604022-01	Client sample id	J11KB3		
Dept sample id	7413-001	Location/Matrix	100-B-14:2(115-B) Area 5	SOLID	
Received	04/06/06	Collected/Weight	04/04/06 10:15	1107 g	
% solids	93.7	Custody/SAF No	RC-025-004	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	4.82	3.9	5.4	10	U	93A
Gross Beta	12587-47-2	22.3	4.7	5.9	15		93B
Tritium	10028-17-8	-0.076	0.22	0.37	400	U	H
Total Strontium	SR-RAD	-0.051	0.15	0.32	1.0	U	SR
Potassium 40	13966-00-2	8.39	2.0	0.84			GAM
Cobalt 60	10198-40-0	U		0.093	0.050	U	GAM
Cesium 137	10045-97-3	U		0.077	0.10	U	GAM
Radium 226	13982-63-3	0.294	0.11	0.12	0.10		GAM
Radium 228	15262-20-1	0.489	0.33	0.34	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.21	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.354	0.074	0.080			GAM
Thorium 232	TH-232	0.489	0.33	0.34		J	GAM
Uranium 235	15117-96-1	U		0.23		U	GAM
Uranium 238	U-238	U		9.4		U	GAM
Americium 241	14596-10-2	U		0.24		U	GAM

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4/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-02 J11KB4

DATA SHEET

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-02	Client sample id	J11KB4
Dept sample id	7413-002	Location/Matrix	100-B-14:2(115-B) Area 5 SOLID
Received	04/06/06	Collected/Weight	04/04/06 10:20 1161 g
% solids	94.8	Custody/SAF No	RC-025-004 RC-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	1.86	2.8	4.4	10	U	93A
Gross Beta	12587-47-2	13.8	6.7	10	15		93B
Tritium	10028-17-8	-0.130	0.21	0.36	400	U	H
Total Strontium	SR-RAD	-0.052	0.14	0.31	1.0	U	SR
Potassium 40	13966-00-2	8.83	1.3	0.53			GAM
Cobalt 60	10198-40-0	U		0.068	0.050	U	GAM
Cesium 137	10045-97-3	U		0.067	0.10	U	GAM
Radium 226	13982-63-3	0.419	0.13	0.14	0.10		GAM
Radium 228	15262-20-1	0.551	0.28	0.32	0.20		GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.25	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.516	0.079	0.087			GAM
Thorium 232	TH-232	0.551	0.28	0.32		J	GAM
Uranium 235	15117-96-1	U		0.26		U	GAM
Uranium 238	U-238	U		10		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM

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Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
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Report date	05/11/06

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SAMPLE DELIVERY GROUP K0286

R604022-03 **J11KB5**

DATA SHEET

SDG	7413	Client/Case no	Hanford	SDG K0286	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604022-03	Client sample id	J11KB5		
Dept sample id	7413-003	Location/Matrix	100-B-14:2(115-B) Area 5	SOLID	
Received	04/06/06	Collected/Weight	04/04/06 10:45	1240 g	
% solids	95.1	Custody/SAF No	RC-025-004	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	4.35	3.3	4.3	10		93A
Gross Beta	12587-47-2	8.32	6.8	11	15	U	93B
Tritium	10028-17-8	-0.140	0.21	0.36	400	U	H
Total Strontium	SR-RAD	-0.135	0.16	0.37	1.0	U	SR
Potassium 40	13966-00-2	6.75	1.8	0.82			GAM
Cobalt 60	10198-40-0	U		0.090	0.050	U	GAM
Cesium 137	10045-97-3	U		0.071	0.10	U	GAM
Radium 226	13982-63-3	0.280	0.14	0.13	0.10		GAM
Radium 228	15262-20-1	0.302	0.27	0.31	0.20	U	GAM
Europium 152	14683-23-9	U		0.15	0.10	U	GAM
Europium 154	15585-10-1	U		0.22	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	0.460	0.093	0.099			GAM
Thorium 232	TH-232	0.302	0.27	0.31		U J	GAM
Uranium 235	15117-96-1	U		0.22		U	GAM
Uranium 238	U-238	U		8.2		U	GAM
Americium 241	14596-10-2	U		0.23		U	GAM

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Lab id	EBRLNE
Protocol	Hanford
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Form	DVD-DS
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SAMPLE DELIVERY GROUP K0286

R604022-04 J11KB6

DATA SHEET

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-04	Client sample id	J11KB6
Dept sample id	7413-004	Location/Matrix	100-B-14:2(115-B) Area 5 SOLID
Received	04/06/06	Collected/Weight	04/04/06 10:50 1020 g
% solids	93.4	Custody/SAF No	RC-025-004 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	6.75	4.0	4.7	10		93A
Gross Beta	12587-47-2	19.1	4.3	5.5	15		93B
Tritium	10028-17-8	-0.028	0.21	0.36	400	U	H
Total Strontium	SR-RAD	-0.039	0.13	0.28	1.0	U	SR
Potassium 40	13966-00-2	10.3	1.2	0.54			GAM
Cobalt 60	10198-40-0	U		0.065	0.050	U	GAM
Cesium 137	10045-97-3	U		0.071	0.10	U	GAM
Radium 226	13982-63-3	0.292	0.13	0.14	0.10		GAM
Radium 228	15262-20-1	0.479	0.29	0.32	0.20		GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.25	0.10	U	GAM
Europium 155	14391-16-3	U		0.16	0.10	U	GAM
Thorium 228	14274-82-9	0.696	0.11	0.12			GAM
Thorium 232	TH-232	0.479	0.29	0.32		J	GAM
Uranium 235	15117-96-1	U		0.26		U	GAM
Uranium 238	U-238	U		7.9		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM

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SAMPLE DELIVERY GROUP K0286

R604022-05 J11KB7

DATA SHEET

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-05	Client sample id	J11KB7
Dept sample id	7413-005	Location/Matrix	100-B-14:2(115-B) Area 5 SOLID
Received	04/06/06	Collected/Weight	04/04/06 12:30 1076 g
% solids	94.1	Custody/SAF No	RC-025-004 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	4.34	3.6	4.9	10	U	93A
Gross Beta	12587-47-2	10.2	4.3	6.5	15		93B
Tritium	10028-17-8	-0.024	0.21	0.37	400	U	H
Total Strontium	SR-RAD	0.090	0.15	0.29	1.0	U	SR
Potassium 40	13966-00-2	7.29	1.8	0.60			GAM
Cobalt 60	10198-40-0	U		0.082	0.050	U	GAM
Cesium 137	10045-97-3	U		0.062	0.10	U	GAM
Radium 226	13982-63-3	0.185	0.11	0.11	0.10		GAM
Radium 228	15262-20-1	0.404	0.25	0.25	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	0.265	0.066	0.070			GAM
Thorium 232	TH-232	0.404	0.25	0.25		J	GAM
Uranium 235	15117-96-1	U		0.21		U	GAM
Uranium 238	U-238	U		7.1		U	GAM
Americium 241	14596-10-2	U		0.22		U	GAM

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Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
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SAMPLE DELIVERY GROUP K0286

R604022-06 J11KB8

DATA SHEET

SDG	7413	Client/Case no	Hanford	SDG K0286	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604022-06	Client sample id	J11KB8		
Dept sample id	7413-006	Location/Matrix	100-B-14:2(115-B) Area 5	SOLID	
Received	04/06/06	Collected/Weight	04/04/06 12:35	1034 g	
% solids	93.3	Custody/SAF No	RC-025-004	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	9.17	4.1	3.9	10		93A
Gross Beta	12587-47-2	15.3	4.0	5.4	15		93B
Tritium	10028-17-8	-0.085	0.21	0.37	400	U	H
Total Strontium	SR-RAD	0.085	0.15	0.29	1.0	U	SR
Potassium 40	13966-00-2	7.68	1.7	0.62			GAM
Cobalt 60	10198-40-0	U		0.077	0.050	U	GAM
Cesium 137	10045-97-3	U		0.067	0.10	U	GAM
Radium 226	13982-63-3	0.248	0.14	0.14	0.10		GAM
Radium 228	15262-20-1	0.546	0.28	0.27	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		0.17	0.10	U	GAM
Thorium 228	14274-82-9	0.341	0.067	0.071			GAM
Thorium 232	TH-232	0.546	0.28	0.27		J	GAM
Uranium 235	15117-96-1	U		0.22		U	GAM
Uranium 238	U-238	U		7.8		U	GAM
Americium 241	14596-10-2	U		0.21		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

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Lab id	EBRLNE
Protocol	Hanford
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SAMPLE DELIVERY GROUP K0286

R604022-07 **J11KB9**

DATA SHEET

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-07	Client sample id	J11KB9
Dept sample id	7413-007	Location/Matrix	100-B-14:2(115-B) Area 5 SOLID
Received	04/06/06	Collected/Weight	04/04/06 12:40 1125 g
% solids	93.2	Custody/SAF No	RC-025-004 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	5.90	3.7	4.4	10		93A
Gross Beta	12587-47-2	17.6	4.3	5.6	15		93B
Tritium	10028-17-8	0.110	0.22	0.36	400	U	H
Total Strontium	SR-RAD	0.018	0.16	0.31	1.0	U	SR
Potassium 40	13966-00-2	8.45	1.3	0.76			GAM
Cobalt 60	10198-40-0	U		0.078	0.050	U	GAM
Cesium 137	10045-97-3	U		0.065	0.10	U	GAM
Radium 226	13982-63-3	0.404	0.11	0.10	0.10		GAM
Radium 228	15262-20-1	0.648	0.31	0.33	0.20		GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.19	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.498	0.081	0.089			GAM
Thorium 232	TH-232	0.648	0.31	0.33		J	GAM
Uranium 235	15117-96-1	U		0.29		U	GAM
Uranium 238	U-238	U		8.2		U	GAM
Americium 241	14596-10-2	U		0.37		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-08 J11KC0

DATA SHEET

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-08	Client sample id	J11KC0
Dept sample id	7413-008	Location/Matrix	100-B-14:2(115-B) Area 5 SOLID
Received	04/06/06	Collected/Weight	04/04/06 10:45 1162 g
% solids	94.7	Custody/SAF No	RC-025-004 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	0.948	3.8	5.9	10	U	93A
Gross Beta	12587-47-2	15.1	4.1	5.7	15		93B
Tritium	10028-17-8	0.094	0.21	0.35	400	U	H
Total Strontium	SR-RAD	-0.033	0.15	0.31	1.0	U	SR
Potassium 40	13966-00-2	11.0	2.5	0.69			GAM
Cobalt 60	10198-40-0	U		0.068	0.050	U	GAM
Cesium 137	10045-97-3	0.077	0.055	0.063	0.10		GAM
Radium 226	13982-63-3	0.346	0.14	0.13	0.10		GAM
Radium 228	15262-20-1	0.574	0.27	0.26	0.20		GAM
Europium 152	14683-23-9	U		0.15	0.10	U	GAM
Europium 154	15585-10-1	U		0.19	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.408	0.075	0.072			GAM
Thorium 232	TH-232	0.574	0.27	0.26		J	GAM
Uranium 235	15117-96-1	U		0.22		U	GAM
Uranium 238	U-238	U		6.7		U	GAM
Americium 241	14596-10-2	U		0.21		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-09 J11KC1

DATA SHEET

SDG	7413	Client/Case no	Hanford	SDG K0286	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604022-09	Client sample id	J11KC1		
Dept sample id	7413-009	Location/Matrix	100-B-14:2(115-B) Area 5	SOLID	
Received	04/06/06	Collected/Weight	04/04/06 13:45	1158 g	
% solids	94.8	Custody/SAF No	RC-025-004	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	0.581	2.6	4.9	10	U	93A
Gross Beta	12587-47-2	18.4	4.2	5.6	15		93B
Tritium	10028-17-8	-0.005	0.22	0.38	400	U	H
Total Strontium	SR-RAD	-0.041	0.13	0.26	1.0	U	SR
Potassium 40	13966-00-2	6.16	1.7	0.67			GAM
Cobalt 60	10198-40-0	U		0.083	0.050	U	GAM
Cesium 137	10045-97-3	U		0.059	0.10	U	GAM
Radium 226	13982-63-3	0.314	0.12	0.11	0.10		GAM
Radium 228	15262-20-1	0.464	0.20	0.20	0.20		GAM
Europium 152	14683-23-9	U		0.14	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	0.463	0.094	0.096			GAM
Thorium 232	TH-232	0.464	0.20	0.20		J	GAM
Uranium 235	15117-96-1	U		0.19		U	GAM
Uranium 238	U-238	U		7.8		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

ve 12/7/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-10 **J11KC2**

DATA SHEET

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-10	Client sample id	J11KC2
Dept sample id	7413-010	Location/Matrix	100-B-14:2(115-B) Area 5 SOLID
Received	04/06/06	Collected/Weight	04/04/06 13:55 892 g
% solids	85.1	Custody/SAF No	RC-025-004 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	7.72	4.4	5.8	10		93A
Gross Beta	12587-47-2	14.6	4.0	5.7	15		93B
Tritium	10028-17-8	0.239	0.24	0.40	400	U	H
Total Strontium	SR-RAD	0.114	0.18	0.33	1.0	U	SR
Potassium 40	13966-00-2	12.2	1.6	0.62			GAM
Cobalt 60	10198-40-0	U		0.094	0.050	U	GAM
Cesium 137	10045-97-3	U		0.098	0.10	U	GAM
Radium 226	13982-63-3	0.431	0.15	0.17	0.10		GAM
Radium 228	15262-20-1	0.909	0.33	0.33	0.20		GAM
Europium 152	14683-23-9	U		0.20	0.10	U	GAM
Europium 154	15585-10-1	U		0.31	0.10	U	GAM
Europium 155	14391-16-3	U		0.22	0.10	U	GAM
Thorium 228	14274-82-9	0.742	0.096	0.083			GAM
Thorium 232	TH-232	0.909	0.33	0.33		J	GAM
Uranium 235	15117-96-1	U		0.33		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.23		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

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Lab id	EBRLNE
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-11 J11KC3

DATA SHEET

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-11	Client sample id	J11KC3
Dept sample id	7413-011	Location/Matrix	100-B-14:2(115-B) Area 5 SOLID
Received	04/06/06	Collected/Weight	04/04/06 10:55 1088 g
% solids	93.0	Custody/SAF No	RC-025-004 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	8.50	4.6	5.8	10		93A
Gross Beta	12587-47-2	19.8	5.8	8.9	15		93B
Tritium	10028-17-8	0.151	0.16	0.27	400	U	H
Total Strontium	SR-RAD	-0.045	0.12	0.25	1.0	U	SR
Potassium 40	13966-00-2	8.82	1.6	1.1			GAM
Cobalt 60	10198-40-0	U		0.082	0.050	U	GAM
Cesium 137	10045-97-3	U		0.097	0.10	U	GAM
Radium 226	13982-63-3	0.377	0.17	0.19	0.10		GAM
Radium 228	15262-20-1	0.835	0.37	0.35	0.20		GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.26	0.10	U	GAM
Europium 155	14391-16-3	U		0.21	0.10	U	GAM
Thorium 228	14274-82-9	0.589	0.13	0.14			GAM
Thorium 232	TH-232	0.835	0.37	0.35		J	GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.22		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/23/06

Lab id	EBRLNE
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-12 **J11KD3**

DATA SHEET

SDG	7413	Client/Case no	Hanford	SDG K0286	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604022-12	Client sample id	J11KD3		
Dept sample id	7413-012	Location/Matrix	100-B-14:2(115-B)BCL Ar5	SOLID	
Received	04/06/06	Collected/Weight	04/04/06 09:15	974 g	
% solids	95.6	Custody/SAF No	RC-025-006	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	6.32	4.7	6.7	10	U	93A
Gross Beta	12587-47-2	15.6	5.6	8.6	15		93B
Tritium	10028-17-8	-0.105	0.17	0.25	400	U	H
Potassium 40	13966-00-2	9.81	1.3	0.096			GAM
Cobalt 60	10198-40-0	U		0.070	0.050	U	GAM
Cesium 137	10045-97-3	U		0.074	0.10	U	GAM
Radium 226	13982-63-3	0.324	0.11	0.12	0.10		GAM
Radium 228	15262-20-1	0.546	0.32	0.32	0.20		GAM
Europium 152	14683-23-9	U		0.19	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	0.490	0.074	0.080			GAM
Thorium 232	TH-232	0.546	0.32	0.32		J	GAM
Uranium 235	15117-96-1	U		0.27		U	GAM
Uranium 238	U-238	U		9.4		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/23/06

Lab id	EBRLNE
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-13 J11KD4

DATA SHEET

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-13	Client sample id	J11KD4
Dept sample id	7413-013	Location/Matrix	100-B-14:2(115-B)BCL Ar5 SOLID
Received	04/06/06	Collected/Weight	04/04/06 09:25 933 g
% solids	94.5	Custody/SAF No	RC-025-006 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	4.20	3.5	5.1	10	U	93A
Gross Beta	12587-47-2	11.9	3.8	5.4	15		93B
Tritium	10028-17-8	0.296	0.20	0.27	400		H
Potassium 40	13966-00-2	11.6	2.8	0.66			GAM
Cobalt 60	10198-40-0	U		0.092	0.050	U	GAM
Cesium 137	10045-97-3	U		0.17	0.10	U	GAM
Radium 226	13982-63-3	0.455	0.14	0.12	0.10		GAM
Radium 228	15262-20-1	U		0.64	0.20	U	GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.26	0.10	U	GAM
Europium 155	14391-16-3	U		0.24	0.10	U	GAM
Thorium 228	14274-82-9	0.450	0.092	0.097			GAM
Thorium 232	TH-232	U		0.64		U J	GAM
Uranium 235	15117-96-1	U		0.34		U	GAM
Uranium 238	U-238	U		9.0		U	GAM
Americium 241	14596-10-2	U		0.30		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-14 **J11KD5**

DATA SHEET

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-14	Client sample id	J11KD5
Dept sample id	7413-014	Location/Matrix	100-B-14:2(115-B)BCL Ar5 SOLID
Received	04/06/06	Collected/Weight	04/04/06 09:30 870 g
% solids	93.6	Custody/SAF No	RC-025-006 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	4.37	3.7	5.3	10	U	93A
Gross Beta	12587-47-2	20.1	4.6	5.9	15		93B
Tritium	10028-17-8	0.045	0.16	0.26	400	U	H
Potassium 40	13966-00-2	9.15	2.0	0.87			GAM
Cobalt 60	10198-40-0	U		0.082	0.050	U	GAM
Cesium 137	10045-97-3	U		0.079	0.10	U	GAM
Radium 226	13982-63-3	0.258	0.16	0.15	0.10		GAM
Radium 228	15262-20-1	0.575	0.31	0.33	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.23	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	0.566	0.11	0.12			GAM
Thorium 232	TH-232	0.575	0.31	0.33		J	GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		9.0		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

6/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-15 **J11KD6**

DATA SHEET

SDG	7413	Client/Case no	Hanford	SDG K0286	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R604022-15	Client sample id	J11KD6		
Dept sample id	7413-015	Location/Matrix	100-B-14:2(115-B)BCL Ar5	SOLID	
Received	04/06/06	Collected/Weight	04/04/06 09:35	1015 g	
% solids	94.4	Custody/SAF No	RC-025-006	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	6.36	3.8	4.5	10		93A
Gross Beta	12587-47-2	19.8	6.9	10	15		93B
Tritium	10028-17-8	-0.114	0.15	0.25	400	U	H
Potassium 40	13966-00-2	9.42	2.6	0.81			GAM
Cobalt 60	10198-40-0	U		0.081	0.050	U	GAM
Cesium 137	10045-97-3	U		0.066	0.10	U	GAM
Radium 226	13982-63-3	0.349	0.15	0.14	0.10		GAM
Radium 228	15262-20-1	0.501	0.31	0.31	0.20		GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.21	0.10	U	GAM
Europium 155	14391-16-3	U		0.19	0.10	U	GAM
Thorium 228	14274-82-9	0.509	0.12	0.12			GAM
Thorium 232	TH-232	0.501	0.31	0.31		J	GAM
Uranium 235	15117-96-1	U		0.28		U	GAM
Uranium 238	U-238	U		8.3		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

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6/23/06

Lab id	EBRLNE
Protocol	Hanford
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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0286 was composed of fifteen 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 results were transmitted to WCH via e-mail on May 11, 2006.

2.0 ANALYSIS NOTES

2.1 Gross Alpha/Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Tritium Analysis

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.4 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."

Melissa Mannion

Melissa C. Mannion
Senior Program Manager

5/17/6

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-004	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 (115-B) Area 5 K0286 (7413)	**SAF No.** RC-025	**Air Quality** ☐ 21 days
Ice Chest No. ERC-02-504	**Field Logbook No.** EL-1585-5 / **COA** RIDB14 2000	**Method of Shipment** fed ex	
Shipped To EBERLINE SERVICES LIONVILLE	**Offsite Property No.** A060327	**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~cool 4 degrees centigrade~~

none TRE 4-5-06

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	G aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~; Tritium - H3	~~Nickel-63~~; Strontium-89,90 -- Total Sr	Pesticides - 8081 ~~Chloro Herbicides - 8151~~		

620000029

Sample No.	Matrix *	Sample Date	Sample Time										
J11KB3	SOIL	04/04/06	1015					✓	✓	✓			
J11KB4	SOIL	04/04/06	1020					✓	✓	✓			
J11KB5	SOIL	04/04/06	1045					✓	✓	✓			
J11KB6	SOIL	04/04/06	1050					✓	✓	✓			
J11KB7	SOIL	04/04/06	1330					✓	✓	✓			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1600	Received By/Stored In	Date/Time 1600
Kevin Singleton	4-4-06	3728 Ref 2A	4-4-06
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728 #2A	4-5-06 1030	TR Edmundson	4-5-06 1030
Relinquished By/Removed From WCH	Date/Time	Received By/Stored In	Date/Time
TR Edmundson	4-5-06 1500	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED EX			04/06/06 9:30
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.

(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 # 2A on 4/5/06

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-025-004	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 (115-B) Area 5 K0286 (7413)	**SAF No.** RC-025	**Air Quality** ☐ 21 days
Ice Chest No. ERC-02-504	**Field Logbook No.** EL-1585-5 **COA** R10B14 2000	**Method of Shipment** fed ex	
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060327	**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~cool 4 degrees centigrade~~

None TRE 4-5-06

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~; Tritium - H3	~~Nickel-63~~; Strontium-89,90 -- Total Sr	Pesticides - 8081 ~~Chloro-Herbicides - EPA 8151~~		

Sample No.	Matrix *	Sample Date	Sample Time										
J11KB8	SOIL	04/04/06	1235					✓	✓	✓			
J11KB9	SOIL	04/04/06	1240					✓	✓	✓			
J11KC0	SOIL	04/04/06	1245					✓	✓	✓			
J11KC1	SOIL	04/04/06	1345					✓	✓	✓			
J11KC2	SOIL	04/04/06	1355					✓	✓	✓			

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	4-4-06 1600	3728 Rf 2A	4-4-06 1600
3728 #2A	4-5-06 1030	T.K. Edmundson / JE Edmundson	4-5-06 1030
T.K. Edmundson / JE Edmundson	4-5-06 1500	FED EX	
FED EX		[illegible]	04/06/06 930

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 # 2A on 5/4/06

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-025-004	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 (115-B) Area 5 K0286 (7413)	**SAF No.** RC-025	**Air Quality** ☐ 21 days
Ice Chest No. ERC 02-504	**Field Logbook No.** EL-1585-5 / **COA** R10B14 2000	**Method of Shipment** fed ex	
Shipped To EBERLINE SERVICES/ LIONVILLE	**Offsite Property No.** A060327	**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~cool 4 degrees centigrade~~

None TRE 4-5-06

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~; Tritium - H3	~~Nickel-63~~; Strontium-89,90 – Total Sr	Pesticides - 8081; ~~Chlorinated Herbicides~~ - ~~EPA 515.1~~		

000031

Sample No.	Matrix *	Sample Date	Sample Time										
J11KC3	SOIL	04/04/06	1055					✓	✓	✓			
J11KC4	SOIL	n/a	n/a					n/a	n/a	n/a			

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Kevin Singleton	4-4-06 1600	3728 Ref 2A	4-4-06 1600
Relinquished By/Removed From: 3728 #2A	4-5-06 1030	T.R. Edmundson	4-5-06 1030
Relinquished By/Removed From: WCH T.R. Edmundson	4-5-06 1500	FED EX	
Relinquished By/Removed From: FED EX		Received By/Stored In	04/06/06 9:30
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

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 # 2A on 4/5/06

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-025-006	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 (115-B) BCL Area 5 K0286 (7413)	**SAF No.** RC-025	**Air Quality** ☐ 21 days
Ice Chest No. ERC-02-504	**Field Logbook No.** EL-1585-5 **COA** R10B142000	**Method of Shipment** fed ex	
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060327	**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~cool 4 degrees centigrade~~ TRE 4-5-06

none

0000032

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	Cool 4C				
Type of Container	G/P	G/P	aG	aG	G/P	G/P	aG				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	250g	~~125g~~ 120mL	120mL	120mL	500mL	120mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~; Tritium - H3 04/04/06	Pesticides - 8081; ~~Chlor. Herbicides - 8151A~~				
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**								
J11KD3	SOIL	04/04/06	0915				✓	✓			
J11KD4	SOIL	04/04/06	0925				✓	✓			
J11KD5	SOIL	04/04/06	0930				✓	✓			
J11KD6	SOIL	04/04/06	0935				✓	✓			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Kevin Singleton	Date/Time 1600 4-4-06	Received By/Stored In: 3728 Ref 2A	Date/Time 1600 4-4-06
Relinquished By/Removed From: 3728 #2A	Date/Time 4-5-06 1030	Received By/Stored In:	Date/Time 4-5-06 1030
Relinquished By/Removed From: WCH	Date/Time 4-5-06 1500	Received By/Stored In: FED EX	Date/Time
Relinquished By/Removed From: FED EX	Date/Time	Received By/Stored In:	Date/Time 04/06/06 [illegible]
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.

~~(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) {Thorium, Uranium, Zinc, Zirconium}; Mercury - 7471A (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 # 2A on 4/5/06

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)

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

Test H Matrix SOLID
SDG 7413
Contact Melissa C. Mannion

METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG K0286

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7131-132 2σ prep error 10.0 % Reference Lab Notebook 7131 pg. 135																
11KB3	R604022-01			0.37	20.3			33		75			26	04/20/06	04/30	LSC-006
11KB4	R604022-02			0.36	20.4			33		75			26	04/20/06	04/30	LSC-006
11KB5	R604022-03			0.36	20.6			33		75			26	04/20/06	04/30	LSC-006
11KB6	R604022-04			0.36	20.8			33		75			26	04/20/06	04/30	LSC-006
11KB7	R604022-05			0.37	20.2			33		75			26	04/20/06	04/30	LSC-006
11KB8	R604022-06			0.37	20.1			32		75			21	04/20/06	04/25	LSC-006
11KB9	R604022-07			0.36	20.8			33		75			21	04/20/06	04/25	LSC-006
11KC0	R604022-08			0.35	20.7			33		75			21	04/20/06	04/25	LSC-006
11KC1	R604022-09			0.38	20.2			33		75			21	04/20/06	04/25	LSC-006
11KC2	R604022-10			0.40	20.1			31		75			21	04/20/06	04/25	LSC-006
11KC3	R604022-11			0.27	20.0			33		150			20	04/20/06	04/24	LSC-007
11KD3	R604022-12			0.25	20.6			34		150			20	04/20/06	04/24	LSC-007
11KD4	R604022-13			0.27	20.0			33		150			20	04/20/06	04/24	LSC-007
11KD5	R604022-14			0.26	20.5			32		150			20	04/20/06	04/24	LSC-007
11KD6	R604022-15			0.25	20.1			34		150			20	04/20/06	04/24	LSC-007
ethod Blank	R604022-17			17	0.300			34		150				04/20/06	04/24	LSC-007
ab Control Sample	R604022-16			17	0.300			35		150				04/20/06	04/24	LSC-007
uplicate (R604022-07)	R604022-18			0.27	20.1			33		150			20	04/20/06	04/24	LSC-007
pike (R604022-07)	R604022-19			0.44	20.6			33		51			20	04/20/06	04/24	LSC-007
ominal values and limits from method				400	0.300					25			180			

PROCEDURES	REFERENCE	TRITIUM_COX_LSC
	CP-251	Tritium/Carbon-14 Oxidation, rev 8

AVERAGES ± 2 SD FOR 19 SAMPLES
MDA 2.1 ± 11
YIELD 33 ± 2

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/11/06

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-B-1412		DATA PACKAGE:	K028C	
VALIDATOR:	TLR	LAB: EB		DATE: 6/12/06	
			SDG:	K028C	

ANALYSES PERFORMED					
Gross Alpha/Beta Total Uranium	Strontium-90 Radium-22	Technetium-99 Tritium	Alpha Spectroscopy	Gamma Spectroscopy	

SAMPLES/MATRIX					
J11KB3	J11KB4	J11KB5	J11KB6	J11KB7	J11KB8
J11KB9	J11KC0	J11KC1	J11KC2	J11KC3	J11KD3
J11KD4	J11KD5	J11KD6			
					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: thorium 232 - 397% - 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 G/rch

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

Comments: th 232 - 559% RPD no FS or PAS

12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments: B3 - B7 10 days ~~prep to analy~~ 7/5/01 - J

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: 74 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-17

Method Blank

METHOD BLANK

SDG	7413	Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R604022-17	Client sample id	Method Blank
Dept sample id	7413-017	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	-1.60	2.3	5.5	10	U	93A
Gross Beta	12587-47-2	2.82	3.4	5.5	15	U	93B
Tritium	10028-17-8	-5.12	10	17	400	U	H
Total Strontium	SR-RAD	0.003	0.14	0.30	1.0	U	SR
Potassium 40	13966-00-2	U		1.6		U	GAM
Cobalt 60	10198-40-0	U		0.074	0.050	U	GAM
Cesium 137	10045-97-3	U		0.064	0.10	U	GAM
Radium 226	13982-63-3	U		0.13	0.10	U	GAM
Radium 228	15262-20-1	U		0.31	0.20	U	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	U		0.083		U	GAM
Thorium 232	TH-232	U		0.31		U	GAM
Uranium 235	15117-96-1	U		0.21		U	GAM
Uranium 238	U-238	U		7.6		U	GAM
Americium 241	14596-10-2	U		0.20		U	GAM

100BC Remain.Piplns&Sewers-SoilFullP

QC-BLANK #56699

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-16

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7413

Contact Melissa C. Mannion

Client/Case no Hanford SDG K0286

Contract No. 630

Lab sample id R604022-16

Dept sample id 7413-016

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	110	14	4.9	10		93A	102	4.1	108	61-139	70-130
Gross Beta	116	9.9	11	15		93B	98.1	3.9	118	69-131	70-130
Tritium	709	22	17	400		H	737	29	96	84-116	80-120
Total Strontium	10.4	0.55	0.23	1.0		SR	9.81	0.39	106	81-119	80-120
Cobalt 60	2.12	0.24	0.15	0.050		GAM	2.42	0.097	88	75-125	80-120
Cesium 137	2.46	0.22	0.15	0.10		GAM	2.51	0.10	98	74-126	80-120

100BC Remain.Piplns&Sewers-SoilFullP

QC-LCS #56698

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-18 J11KB9

DUPLICATE

SDG	7413			Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R604022-18	Lab sample id	R604022-07	Client sample id	J11KB9
Dept sample id	7413-018	Dept sample id	7413-007	Location/Matrix	100-B-14:2(115-B) Area 5 SOLID
		Received	04/06/06	Collected/Weight	04/04/06 12:40 1125 g
% solids	93.2	% solids	93.2	Custody/SAF No	RC-025-004 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	5.75	3.6	4.6	10		93A	5.90	3.7	4.4		3	140	0.1
Gross Beta	9.89	4.3	6.4	15		93B	17.6	4.3	5.6		56	74	2.3
Tritium	-0.126	0.15	0.27	400	U	H	0.110	0.22	0.36	U	-		1.8
Total Strontium	0.034	0.13	0.25	1.0	U	SR	0.018	0.16	0.31	U	-		0.2
Potassium 40	8.12	1.2	0.83			GAM	8.45	1.3	0.76		4	45	0.3
Cobalt 60	U		0.077	0.050	U	GAM	U		0.078	U	-		0
Cesium 137	U		0.079	0.10	U	GAM	U		0.065	U	-		0.3
Radium 226	0.452	0.14	0.13	0.10		GAM	0.404	0.11	0.10		11	70	0.5
Radium 228	0.435	0.30	0.28	0.20		GAM	0.648	0.31	0.33		39	124	1.0
Europium 152	U		0.14	0.10	U	GAM	U		0.19	U	-		0.4
Europium 154	U		0.24	0.10	U	GAM	U		0.19	U	-		0.3
Europium 155	U		0.18	0.10	U	GAM	U		0.18	U	-		0
Thorium 228	0.489	0.079	0.089			GAM	0.498	0.081	0.089		2	47	0.1
Thorium 232	0.435	0.30	0.28			GAM	0.648	0.31	0.33		39	124	1.0
Uranium 235	U		0.28		U	GAM	U		0.29	U	-		0
Uranium 238	U		9.2		U	GAM	U		8.2	U	-		0.2
Americium 241	U		0.32		U	GAM	U		0.37	U	-		0.2

100BC Remain.Piplns&Sewers-SoilFullP

QC-DUP#7 56700

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	05/11/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0286

R604022-19

J11KB9

MATRIX SPIKE

SDG	7413			Client/Case no	Hanford SDG K0286
Contact	Melissa C. Mannion			Contract	No. 630
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R604022-19	Lab sample id	R604022-07	Client sample id	J11KB9
Dept sample id	7413-019	Dept sample id	7413-007	Location/Matrix	100-B-14:2(115-B) Area 5 SOLID
		Received	04/06/06	Collected/Weight	04/04/06 12:40 1125 g
% solids	93.2	% solids	93.2	Custody/SAF No	RC-025-004 RC-025

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	49.5	1.1	0.44	400	X	H	53.6	2.1	0.110	0.22	92	85-115	60-140

100BC Remain.Piplns&Sewers-SoilFullP

QC-MS#7 56701

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-MS
Version	3.06
Report date	05/11/06

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: Inorganics - Data Package No. K0286-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0286 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	Matrix	Validation	Date
J11KB3	4/4/06	Soil	C	See note 1
J11KB4	4/4/06	Soil	C	See note 1
J11KB5	4/4/06	Soil	C	See note 1
J11KB6	4/4/06	Soil	C	See note 1
J11KB7	4/4/06	Soil	C	See note 1
J11KB8	4/4/06	Soil	C	See note 1
J11KB9	4/4/06	Soil	C	See note 1
J11KC0	4/4/06	Soil	C	See note 1
J11KC1	4/4/06	Soil	C	See note 1
J11KC2	4/4/06	Soil	C	See note 1
J11KC3	4/4/06	Soil	C	See note 1
J11KC4	4/4/06	Soil	C	See note 1
J11KD3	4/4/06	Soil	C	See note 1
J11KD4	4/4/06	Soil	C	See note 1
J11KD5	4/4/06	Soil	C	See note 1
J11KD6	4/4/06	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, all detected uranium results were qualified as estimates and flagged "UJ".

Due to method blank contamination, lithium, sodium and phosphorous results in sample J11KC4 were qualified as estimates and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J11KC4) was submitted for analysis. Aluminum, boron, barium, calcium, iron, magnesium, manganese, silicon, strontium, titanium, vanadium and

zinc were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 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 (50.3%), all silicon results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (59.2%), all antimony results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (68.6%), 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.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J11KB6/J11KC3) 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. K0286 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 uranium results were qualified as estimates and flagged "UJ".
- Due to method blank contamination, lithium, sodium and phosphorous results in sample J11KC4 were qualified as estimates and flagged "UJ".
- Due to an LCS recovery outside QC limits (50.3%), all silicon results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits (59.2%), all antimony results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits (68.6%), all calcium 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: K0286	REVIEWER: TU	100-B-14.2	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Uranium	UJ	J11KB8, J11KB9 J11KC1, J11KC2 J11KC3, J11KD3 J11KD4, J11KD5 J111KD6	Blank contamination
Lithium Sodium Phosphorous	UJ	J11KC4	Blank contamination
Silicon	J	All	LCS recovery
Antimony Calcium	J	All	MS recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0286																		
Sample Number		J11KB3		J11KB4		J11KB5		J11KB6		J11KB7		J11KB8		J11KB9		J11KC0		J11KC1	
Remarks								Main											
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
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		4250		4720		4020		5390		4310		4560		4530		3420		5780	
Arsenic	10	2.6		2.4		2.9		2.7		2.3		2.3		2.0		1.7		2.8	
Boron		0.88		1.5		0.70		0.98		0.37		0.76		1.0		0.68		1.8	
Barium	2	44.2		51.2		43.6		56.2		46.8		56.2		60.1		48.1		67.2	
Beryllium		0.24		0.31		0.22		0.31		0.30		0.29		0.26		0.24		0.34	
Calcium		6860	J	5680	J	6840	J	5670	J	7710	J	4370	J	5910	J	4310	J	4820	J
Cadmium	0.2	0.09		0.15		0.14		0.14		0.12		0.13		0.13		0.09		0.15	
Cobalt		7.1		7.4		6.5		7.5		8.3		7.2		6.2		6.2		8.4	
Chromium	1	5.8		6.5		5.8		7.6		5.9		6.4		6.7		5.2		7.8	
Copper		14.8		16.3		16.0		16.4		17.5		15.0		15.4		14.8		18.4	
Iron		17300		18200		16500		18400		18800		15900		14500		13200		19800	
Mercury	0.2	0.02	U	0.04		0.02	U	0.02	U	0.02	U	0.02	U	0.03		0.02	U	0.02	
Potassium		951		925		685		1050		757		866		825		660		1150	
Lithium		5.6		8.4		5.2		6.4		5.7		5.5		5.4		3.9		5.9	
Magnesium		3680		3690		3650		4030		4100		3550		3360		2930		4090	
Manganese		289		306		259		315		312		308		302		232		362	
Molybdenum		0.49		0.53		0.41		0.43		0.50		0.49		0.49		0.40		0.53	
Sodium		119		135		98.4		111		105		89.8		110		101		129	
Nickel		8.7		9.8		8.7		10.0		10.6		9.7		8.6		8.3		11.7	
Phosohorous		939		887		874		829		1030		808		717		801		944	
Lead	5	5.1		4.8		6.5		5.8		3.9		5.7		5.0		3.2		5.6	
Antimony		0.44	UJ	0.43	UJ	0.43	UJ	0.43	UJ	0.43	UJ	0.43	UJ	0.43	UJ	0.42	UJ	0.42	UJ
Selenium	1	0.47	U	0.46	U	0.45	U	0.46	U	0.45	U	0.46	U	0.46	U	0.45	U	0.45	U
Silicon		522	J	441	J	416	J	478	J	466	J	587	J	491	J	387	J	483	J
Tin		1.1		1.4		1.2		1.4		1.5		1.2		1.3		1.2		1.3	
Strontium		21.6		21.6		24.2		24.3		25.7		19.8		25.6		20.2		27.5	
Titanium		1330		1560		1360		1450		1730		1270		1100		1010		1460	
Thallium		0.70	U	0.68	U	0.68	U	0.69	U	0.68	U	0.69	U	0.69	U	0.67	U	0.67	U
Uranium		0.88	U	0.85	U	0.85	U	0.87	U	0.85	U	1.1	UJ	1.3	UJ	0.84	U	1.6	UJ
Vanadium		40.8		46.9		41.1		46.2		49.1		39.1		35.2		31.2		43.7	
Zinc	1	38.8		38.5		35.5		40.2		38.4		35.5		34.4		29.2		39.4	
Zirconium		16.1		19.8		17.0		19.6		18.3		17.9		14.5		14.4		23.1	

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: K0286																		
Sample Number		J11KC2		J11KC3		J11KC4		J11KD3		J11KD4		J11KD5		J11KD6					
Remarks				Duplicate		E. Blank													
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06					
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.08	U	0.07	U	0.06	U	0.07	U	0.07	U	0.07	U	0.07	U				
Aluminum		7870		5380		40.8		3810		5170		4790		4090					
Arsenic	10	7.5		3.0		0.54	U	2.0		2.4		2.3		2.6					
Boron		2.6		0.82		0.80		0.59		0.95		0.97		3.3					
Barium	2	70.5		55.7		1.3		50.6		58.2		65.5		75.0					
Beryllium		0.42		0.35		0.02	U	0.24		0.32		0.32		0.26					
Calcium		32500	J	6580	J	18.1	J	4720	J	4830	J	4010	J	6970	J				
Cadmium	0.2	0.21		0.12		0.06	U	0.14		0.09		0.1		0.1					
Cobalt		8.6		7.8		0.12	U	6.8		7.0		7.4		6.6					
Chromium	1	10.9		7.4		0.12	U	5.4		8.7		6.3		12.7					
Copper		21.2		15.7		0.11	U	14.2		15.5		14.6		15.8					
Iron		21000		18200		359		15200		16700		15700		14000					
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.04		0.02	U	0.02	U	0.1					
Potassium		1290		1100		68.3	U	772		1050		1130		742					
Lithium		11.9		6.4		0.07	UJ	4.9		5.9		5.0		4.9					
Magnesium		6020		4170		6.7		3060		3630		3470		3120					
Manganese		388		333		5.4		276		306		324		264					
Molybdenum		0.56		0.52		0.26	U	0.45		0.50		0.39		0.46					
Sodium		218		108		6.9	UJ	101		103		91.6		154					
Nickel		14.1		10.0		0.21	U	8.0		9.7		9.0		8.1					
Phosohorous		802		886		3.3	UJ	889		801		859		896					
Lead	5	10.6		5.8		0.34		26.1		7.2		4.8		7.4					
Antimony		0.50	UJ	0.43	UJ	0.39	UJ	0.43	UJ	0.42	UJ	0.44	UJ	0.42	UJ				
Selenium	1	0.53	U	0.46	U	0.42	U	0.45	U	0.45	U	0.47	U	0.45	U				
Silicon		526	J	522	J	42.2	J	482	J	486	J	519	J	517	J				
Tin		1.2	U	1.3		0.95	U	1.1		1.1		1.3		1.3					
Strontium		59.2		23.7		0.22		23.9		21.6		20.0		33.1					
Titanium		1020		1460		1.9		1020		1250		1140		1090					
Thallium		0.79	U	0.69	U	0.62	U	0.68	U	0.68	U	0.70	U	0.66	U				
Uranium		3.1	UJ	2.2	UJ	0.78	U	1.9	UJ	1.8	UJ	1.8	UJ	2.2	UJ				
Vanadium		36.7		44.6		0.12		33.6		42.0		35.7		33.9					
Zinc	1	44.8		38.5		1.2		33.2		38.2		41.3		39.0					
Zirconium		11.2		19.8		0.94	U	14.6		17.4		19.4		14.5					

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 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11KB3	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4250	MG/KG	2.4	1.0
		Arsenic, Total	2.6	MG/KG	0.61	1.0
		Boron, Total	0.88	MG/KG	0.24	1.0
		Barium, Total	44.2	MG/KG	0.02	1.0
		Beryllium, Total	0.24	MG/KG	0.02	1.0
		Calcium, Total	6860 J	MG/KG	2.2	1.0
		Cadmium, Total	0.09	MG/KG	0.07	1.0
		Cobalt, Total	7.1	MG/KG	0.14	1.0
		Chromium, Total	5.8	MG/KG	0.13	1.0
		Copper, Total	14.8	MG/KG	0.12	1.0
		Iron, Total	17300	MG/KG	0.54	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	951	MG/KG	77.5	1.0
		Lithium, Total	5.6	MG/KG	0.03	1.0
		Magnesium, Total	3680	MG/KG	3.9	1.0
		Manganese, Total	289	MG/KG	0.03	1.0
		Molybdenum, Total	0.49	MG/KG	0.29	1.0
		Sodium, Total	119	MG/KG	2.5	1.0
		Nickel, Total	8.7	MG/KG	0.24	1.0
		Phosphorus, Total	939	MG/KG	0.90	1.0
		Lead, Total	5.1	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	522 J	MG/KG	2.3	1.0
		Tin, Total	1.1	MG/KG	1.1	1.0
		Strontium, Total	21.6	MG/KG	0.01	1.0
		Titanium, Total	1330	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	40.8	MG/KG	0.09	1.0
		Zinc, Total	38.8	MG/KG	0.16	1.0
		Zirconium, Total	16.1	MG/KG	1.1	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J11KB4	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4720	MG/KG	2.3	1.0
		Arsenic, Total	2.4	MG/KG	0.59	1.0
		Boron, Total	1.5	MG/KG	0.23	1.0
		Barium, Total	51.2	MG/KG	0.02	1.0
		Beryllium, Total	0.31	MG/KG	0.02	1.0
		Calcium, Total	5680 J	MG/KG	2.1	1.0
		Cadmium, Total	0.15	MG/KG	0.07	1.0
		Cobalt, Total	7.4	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	18200	MG/KG	0.52	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Potassium, Total	925	MG/KG	74.9	1.0
		Lithium, Total	8.4	MG/KG	0.03	1.0
		Magnesium, Total	3690	MG/KG	3.8	1.0
		Manganese, Total	306	MG/KG	0.03	1.0
		Molybdenum, Total	0.53	MG/KG	0.28	1.0
		Sodium, Total	135	MG/KG	2.4	1.0
		Nickel, Total	9.8	MG/KG	0.23	1.0
		Phosphorus, Total	887	MG/KG	0.87	1.0
		Lead, Total	4.8	MG/KG	0.30	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	441 J	MG/KG	2.2	1.0
		Tin, Total	1.4	MG/KG	1.0	1.0
		Strontium, Total	21.6	MG/KG	0.01	1.0
		Titanium, Total	1560	MG/KG	0.03	1.0
		Thallium, Total	0.68 u	MG/KG	0.68	1.0
		Uranium, Total	0.85 u	MG/KG	0.85	1.0
		Vanadium, Total	46.9	MG/KG	0.09	1.0
		Zinc, Total	38.5	MG/KG	0.16	1.0
		Zirconium, Total	19.8	MG/KG	1.0	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J11KB5	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4020	MG/KG	2.3	1.0
		Arsenic, Total	2.9	MG/KG	0.59	1.0
		Boron, Total	0.70	MG/KG	0.23	1.0
		Barium, Total	43.6	MG/KG	0.02	1.0
		Beryllium, Total	0.22	MG/KG	0.02	1.0
		Calcium, Total	6840 J	MG/KG	2.1	1.0
		Cadmium, Total	0.14	MG/KG	0.07	1.0
		Cobalt, Total	6.5	MG/KG	0.14	1.0
		Chromium, Total	5.8	MG/KG	0.13	1.0
		Copper, Total	16.0	MG/KG	0.12	1.0
		Iron, Total	16500	MG/KG	0.52	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	685	MG/KG	74.5	1.0
		Lithium, Total	5.2	MG/KG	0.03	1.0
		Magnesium, Total	3650	MG/KG	3.8	1.0
		Manganese, Total	259	MG/KG	0.03	1.0
		Molybdenum, Total	0.41	MG/KG	0.28	1.0
		Sodium, Total	98.4	MG/KG	2.4	1.0
		Nickel, Total	8.7	MG/KG	0.23	1.0
		Phosphorus, Total	874	MG/KG	0.87	1.0
		Lead, Total	6.5	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	416 J	MG/KG	2.2	1.0
		Tin, Total	1.2	MG/KG	1.0	1.0
		Strontium, Total	24.2	MG/KG	0.01	1.0
		Titanium, Total	1360	MG/KG	0.03	1.0
		Thallium, Total	0.68 u	MG/KG	0.68	1.0
		Uranium, Total	0.85 u	MG/KG	0.85	1.0
		Vanadium, Total	41.1	MG/KG	0.09	1.0
		Zinc, Total	35.5	MG/KG	0.15	1.0
		Zirconium, Total	17.0	MG/KG	1.0	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J11KB6	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5390	MG/KG	2.3	1.0
		Arsenic, Total	2.7	MG/KG	0.60	1.0
		Boron, Total	0.98	MG/KG	0.24	1.0
		Barium, Total	56.2	MG/KG	0.02	1.0
		Beryllium, Total	0.31	MG/KG	0.02	1.0
		Calcium, Total	5670 J	MG/KG	2.2	1.0
		Cadmium, Total	0.14	MG/KG	0.07	1.0
		Cobalt, Total	7.5	MG/KG	0.14	1.0
		Chromium, Total	7.6	MG/KG	0.13	1.0
		Copper, Total	16.4	MG/KG	0.12	1.0
		Iron, Total	18400	MG/KG	0.53	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1050	MG/KG	76.0	1.0
		Lithium, Total	6.4	MG/KG	0.03	1.0
		Magnesium, Total	4030	MG/KG	3.9	1.0
		Manganese, Total	315	MG/KG	0.03	1.0
		Molybdenum, Total	0.43	MG/KG	0.29	1.0
		Sodium, Total	111	MG/KG	2.5	1.0
		Nickel, Total	10.0	MG/KG	0.24	1.0
		Phosphorus, Total	829	MG/KG	0.89	1.0
		Lead, Total	5.8	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	478 J	MG/KG	2.2	1.0
		Tin, Total	1.4	MG/KG	1.1	1.0
		Strontium, Total	24.3	MG/KG	0.01	1.0
		Titanium, Total	1450	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	0.87 u	MG/KG	0.87	1.0
		Vanadium, Total	46.2	MG/KG	0.09	1.0
		Zinc, Total	40.2	MG/KG	0.16	1.0
		Zirconium, Total	19.6	MG/KG	1.0	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J11KB7	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4310	MG/KG	2.3	1.0
		Arsenic, Total	2.3	MG/KG	0.59	1.0
		Boron, Total	0.37	MG/KG	0.23	1.0
		Barium, Total	46.8	MG/KG	0.02	1.0
		Beryllium, Total	0.30	MG/KG	0.02	1.0
		Calcium, Total	7710 J	MG/KG	2.1	1.0
		Cadmium, Total	0.12	MG/KG	0.07	1.0
		Cobalt, Total	8.3	MG/KG	0.14	1.0
		Chromium, Total	5.9	MG/KG	0.13	1.0
		Copper, Total	17.5	MG/KG	0.12	1.0
		Iron, Total	18800	MG/KG	0.52	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	757	MG/KG	74.5	1.0
		Lithium, Total	5.7	MG/KG	0.03	1.0
		Magnesium, Total	4100	MG/KG	3.8	1.0
		Manganese, Total	312	MG/KG	0.03	1.0
		Molybdenum, Total	0.50	MG/KG	0.28	1.0
		Sodium, Total	105	MG/KG	2.4	1.0
		Nickel, Total	10.6	MG/KG	0.23	1.0
		Phosphorus, Total	1030	MG/KG	0.87	1.0
		Lead, Total	3.9	MG/KG	0.30	1.0
		Antimony, Total	0.43 u J	MG/KG	0.43	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	466 J	MG/KG	2.2	1.0
		Tin, Total	1.5	MG/KG	1.0	1.0
		Strontium, Total	25.7	MG/KG	0.01	1.0
		Titanium, Total	1730	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.68	1.0
		Uranium, Total	0.85 u	MG/KG	0.85	1.0
		Vanadium, Total	49.1	MG/KG	0.09	1.0
		Zinc, Total	38.4	MG/KG	0.15	1.0
		Zirconium, Total	18.3	MG/KG	1.0	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J11KB8	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4560	MG/KG	2.3	1.0
		Arsenic, Total	2.3	MG/KG	0.60	1.0
		Boron, Total	0.76	MG/KG	0.24	1.0
		Barium, Total	56.2	MG/KG	0.02	1.0
		Beryllium, Total	0.29	MG/KG	0.02	1.0
		Calcium, Total	4370 J	MG/KG	2.2	1.0
		Cadmium, Total	0.13	MG/KG	0.07	1.0
		Cobalt, Total	7.2	MG/KG	0.14	1.0
		Chromium, Total	6.4	MG/KG	0.13	1.0
		Copper, Total	15.0	MG/KG	0.12	1.0
		Iron, Total	15900	MG/KG	0.53	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	866	MG/KG	75.9	1.0
		Lithium, Total	5.5	MG/KG	0.03	1.0
		Magnesium, Total	3550	MG/KG	3.8	1.0
		Manganese, Total	308	MG/KG	0.03	1.0
		Molybdenum, Total	0.49	MG/KG	0.29	1.0
		Sodium, Total	89.8	MG/KG	2.5	1.0
		Nickel, Total	9.7	MG/KG	0.24	1.0
		Phosphorus, Total	808	MG/KG	0.89	1.0
		Lead, Total	5.7	MG/KG	0.31	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	587 J	MG/KG	2.2	1.0
		Tin, Total	1.2	MG/KG	1.1	1.0
		Strontium, Total	19.8	MG/KG	0.01	1.0
		Titanium, Total	1270	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	1.1 UJ	MG/KG	0.87	1.0
		Vanadium, Total	39.1	MG/KG	0.09	1.0
		Zinc, Total	35.5	MG/KG	0.16	1.0
		Zirconium, Total	17.9	MG/KG	1.0	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANPORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J11KB9	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4530	MG/KG	2.3	1.0
		Arsenic, Total	2.0	MG/KG	0.60	1.0
		Boron, Total	1.0	MG/KG	0.24	1.0
		Barium, Total	60.1	MG/KG	0.02	1.0
		Beryllium, Total	0.26	MG/KG	0.02	1.0
		Calcium, Total	5910 J	MG/KG	2.2	1.0
		Cadmium, Total	0.13	MG/KG	0.07	1.0
		Cobalt, Total	6.2	MG/KG	0.14	1.0
		Chromium, Total	6.7	MG/KG	0.13	1.0
		Copper, Total	15.4	MG/KG	0.12	1.0
		Iron, Total	14500	MG/KG	0.53	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Potassium, Total	825	MG/KG	76.2	1.0
		Lithium, Total	5.4	MG/KG	0.03	1.0
		Magnesium, Total	2360	MG/KG	3.9	1.0
		Manganese, Total	302	MG/KG	0.03	1.0
		Molybdenum, Total	0.49	MG/KG	0.29	1.0
		Sodium, Total	110	MG/KG	2.5	1.0
		Nickel, Total	8.6	MG/KG	0.24	1.0
		Phosphorus, Total	717	MG/KG	0.89	1.0
		Lead, Total	5.0	MG/KG	0.31	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	491 J	MG/KG	2.2	1.0
		Tin, Total	1.3	MG/KG	1.1	1.0
		Strontium, Total	25.6	MG/KG	0.01	1.0
		Titanium, Total	1100	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	1.3 UJ	MG/KG	0.87	1.0
		Vanadium, Total	35.2	MG/KG	0.09	1.0
		Zinc, Total	34.4	MG/KG	0.16	1.0
		Zirconium, Total	14.5	MG/KG	1.0	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	J11KC0	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	3420	MG/KG	2.3	1.0
		Arsenic, Total	1.7	MG/KG	0.58	1.0
		Boron, Total	0.68	MG/KG	0.23	1.0
		Barium, Total	48.1	MG/KG	0.02	1.0
		Beryllium, Total	0.24	MG/KG	0.02	1.0
		Calcium, Total	4310 J	MG/KG	2.1	1.0
		Cadmium, Total	0.09	MG/KG	0.07	1.0
		Cobalt, Total	6.2	MG/KG	0.13	1.0
		Chromium, Total	5.2	MG/KG	0.12	1.0
		Copper, Total	14.8	MG/KG	0.11	1.0
		Iron, Total	13200	MG/KG	0.52	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	660	MG/KG	73.9	1.0
		Lithium, Total	3.9	MG/KG	0.03	1.0
		Magnesium, Total	2930	MG/KG	3.7	1.0
		Manganese, Total	232	MG/KG	0.03	1.0
		Molybdenum, Total	0.40	MG/KG	0.28	1.0
		Sodium, Total	101	MG/KG	2.4	1.0
		Nickel, Total	8.3	MG/KG	0.23	1.0
		Phosphorus, Total	801	MG/KG	0.86	1.0
		Lead, Total	3.2	MG/KG	0.30	1.0
		Antimony, Total	0.42 u J	MG/KG	0.42	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	387 J	MG/KG	2.2	1.0
		Tin, Total	1.2	MG/KG	1.0	1.0
		Strontium, Total	20.2	MG/KG	0.01	1.0
		Titanium, Total	1010	MG/KG	0.03	1.0
		Thallium, Total	0.67 u	MG/KG	0.67	1.0
		Uranium, Total	0.84 u	MG/KG	0.84	1.0
		Vanadium, Total	31.2	MG/KG	0.09	1.0
		Zinc, Total	29.2	MG/KG	0.15	1.0
		Zirconium, Total	14.4	MG/KG	1.0	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J11KC1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5780	MG/KG	2.3	1.0
		Arsenic, Total	2.8	MG/KG	0.58	1.0
		Boron, Total	1.8	MG/KG	0.23	1.0
		Barium, Total	67.2	MG/KG	0.02	1.0
		Beryllium, Total	0.34	MG/KG	0.02	1.0
		Calcium, Total	4820 J	MG/KG	2.1	1.0
		Cadmium, Total	0.15	MG/KG	0.07	1.0
		Cobalt, Total	8.4	MG/KG	0.13	1.0
		Chromium, Total	7.8	MG/KG	0.12	1.0
		Copper, Total	18.4	MG/KG	0.11	1.0
		Iron, Total	19800	MG/KG	0.52	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Potassium, Total	1150	MG/KG	73.7	1.0
		Lithium, Total	5.9	MG/KG	0.03	1.0
		Magnesium, Total	4090	MG/KG	3.7	1.0
		Manganese, Total	362	MG/KG	0.03	1.0
		Molybdenum, Total	0.53	MG/KG	0.28	1.0
		Sodium, Total	129	MG/KG	2.4	1.0
		Nickel, Total	11.7	MG/KG	0.23	1.0
		Phosphorus, Total	944	MG/KG	0.86	1.0
		Lead, Total	5.6	MG/KG	0.30	1.0
		Antimony, Total	0.42 u J	MG/KG	0.42	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	483 J	MG/KG	2.2	1.0
		Tin, Total	1.3	MG/KG	1.0	1.0
		Strontium, Total	27.5	MG/KG	0.01	1.0
		Titanium, Total	1460	MG/KG	0.03	1.0
		Thallium, Total	0.67 u	MG/KG	0.67	1.0
		Uranium, Total	1.6 UJ	MG/KG	0.84	1.0
		Vanadium, Total	43.7	MG/KG	0.09	1.0
		Zinc, Total	39.4	MG/KG	0.15	1.0
		Zirconium, Total	23.1	MG/KG	1.0	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-010	J11KC2	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Aluminum, Total	7870	MG/KG	2.7	1.0
		Arsenic, Total	7.5	MG/KG	0.69	1.0
		Boron, Total	2.6	MG/KG	0.27	1.0
		Barium, Total	70.5	MG/KG	0.02	1.0
		Beryllium, Total	0.42	MG/KG	0.02	1.0
		Calcium, Total	32500 J	MG/KG	2.5	1.0
		Cadmium, Total	0.21	MG/KG	0.08	1.0
		Cobalt, Total	8.6	MG/KG	0.16	1.0
		Chromium, Total	10.9	MG/KG	0.15	1.0
		Copper, Total	21.2	MG/KG	0.14	1.0
		Iron, Total	21000	MG/KG	0.61	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1290	MG/KG	86.8	1.0
		Lithium, Total	11.9	MG/KG	0.03	1.0
		Magnesium, Total	6020	MG/KG	4.4	1.0
		Manganese, Total	388	MG/KG	0.03	1.0
		Molybdenum, Total	0.56	MG/KG	0.33	1.0
		Sodium, Total	218	MG/KG	2.8	1.0
		Nickel, Total	14.1	MG/KG	0.27	1.0
		Phosphorus, Total	802	MG/KG	1.0	1.0
		Lead, Total	10.6	MG/KG	0.35	1.0
		Antimony, Total	0.50 u J	MG/KG	0.50	1.0
		Selenium, Total	0.53 u	MG/KG	0.53	1.0
		Silicon, Total	526 J	MG/KG	2.6	1.0
		Tin, Total	1.2 u	MG/KG	1.2	1.0
		Strontium, Total	59.2	MG/KG	0.01	1.0
		Titanium, Total	1020	MG/KG	0.03	1.0
		Thallium, Total	0.79 u	MG/KG	0.79	1.0
		Uranium, Total	3.1 UJ	MG/KG	0.99	1.0
		Vanadium, Total	36.7	MG/KG	0.10	1.0
		Zinc, Total	44.8	MG/KG	0.18	1.0
		Zirconium, Total	11.2	MG/KG	1.2	1.0

6/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J11KC3	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5380	MG/KG	2.3	1.0
		Arsenic, Total	3.0	MG/KG	0.60	1.0
		Boron, Total	0.82	MG/KG	0.24	1.0
		Barium, Total	55.7	MG/KG	0.02	1.0
		Beryllium, Total	0.35	MG/KG	0.02	1.0
		Calcium, Total	6580 J	MG/KG	2.2	1.0
		Cadmium, Total	0.12	MG/KG	0.07	1.0
		Cobalt, Total	7.8	MG/KG	0.14	1.0
		Chromium, Total	7.4	MG/KG	0.13	1.0
		Copper, Total	15.7	MG/KG	0.12	1.0
		Iron, Total	18200	MG/KG	0.53	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1100	MG/KG	75.8	1.0
		Lithium, Total	6.4	MG/KG	0.03	1.0
		Magnesium, Total	4170	MG/KG	3.8	1.0
		Manganese, Total	333	MG/KG	0.03	1.0
		Molybdenum, Total	0.52	MG/KG	0.29	1.0
		Sodium, Total	108	MG/KG	2.5	1.0
		Nickel, Total	10.0	MG/KG	0.24	1.0
		Phosphorus, Total	886	MG/KG	0.88	1.0
		Lead, Total	5.8	MG/KG	0.30	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	522 J	MG/KG	2.2	1.0
		Tin, Total	1.3	MG/KG	1.1	1.0
		Strontium, Total	23.7	MG/KG	0.01	1.0
		Titanium, Total	1460	MG/KG	0.03	1.0
		Thallium, Total	0.69 u	MG/KG	0.69	1.0
		Uranium, Total	2.2 UJ	MG/KG	0.87	1.0
		Vanadium, Total	44.6	MG/KG	0.09	1.0
		Zinc, Total	28.5	MG/KG	0.16	1.0
		Zirconium, Total	19.8	MG/KG	1.0	1.0

6/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-012	J11KC4	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Aluminum, Total	40.8	MG/KG	2.1	1.0
		Arsenic, Total	0.54 u	MG/KG	0.54	1.0
		Boron, Total	0.80	MG/KG	0.21	1.0
		Barium, Total	1.3	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	18.1 J	MG/KG	1.9	1.0
		Cadmium, Total	0.06 u	MG/KG	0.06	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.12 u	MG/KG	0.12	1.0
		Copper, Total	0.11 u	MG/KG	0.11	1.0
		Iron, Total	359	MG/KG	0.48	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	68.3 u	MG/KG	68.3	1.0
		Lithium, Total	0.07 UJ	MG/KG	0.03	1.0
		Magnesium, Total	6.7	MG/KG	3.5	1.0
		Manganese, Total	5.4	MG/KG	0.03	1.0
		Molybdenum, Total	0.26 u	MG/KG	0.26	1.0
		Sodium, Total	6.9 UJ	MG/KG	2.2	1.0
		Nickel, Total	0.21 u	MG/KG	0.21	1.0
		Phosphorus, Total	3.3 UJ	MG/KG	0.80	1.0
		Lead, Total	0.34	MG/KG	0.27	1.0
		Antimony, Total	0.39 u J	MG/KG	0.39	1.0
		Selenium, Total	0.42 u	MG/KG	0.42	1.0
		Silicon, Total	42.2 J	MG/KG	2.0	1.0
		Tin, Total	0.95 u	MG/KG	0.95	1.0
		Strontium, Total	0.22	MG/KG	0.009	1.0
		Titanium, Total	1.9	MG/KG	0.03	1.0
		Thallium, Total	0.62 u	MG/KG	0.62	1.0
		Uranium, Total	0.78 u	MG/KG	0.78	1.0
		Vanadium, Total	0.12	MG/KG	0.08	1.0
		Zinc, Total	1.2	MG/KG	0.14	1.0
		Zirconium, Total	0.94 u	MG/KG	0.94	1.0

6/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-013	J11KD3	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	3810	MG/KG	2.3	1.0
		Arsenic, Total	2.0	MG/KG	0.59	1.0
		Boron, Total	0.59	MG/KG	0.23	1.0
		Barium, Total	50.6	MG/KG	0.02	1.0
		Beryllium, Total	0.24	MG/KG	0.02	1.0
		Calcium, Total	4720 J	MG/KG	2.1	1.0
		Cadmium, Total	0.14	MG/KG	0.07	1.0
		Cobalt, Total	6.8	MG/KG	0.14	1.0
		Chromium, Total	5.4	MG/KG	0.13	1.0
		Copper, Total	14.2	MG/KG	0.12	1.0
		Iron, Total	15200	MG/KG	0.52	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Potassium, Total	772	MG/KG	74.5	1.0
		Lithium, Total	4.9	MG/KG	0.03	1.0
		Magnesium, Total	2060	MG/KG	3.8	1.0
		Manganese, Total	276	MG/KG	0.03	1.0
		Molybdenum, Total	0.45	MG/KG	0.28	1.0
		Sodium, Total	101	MG/KG	2.4	1.0
		Nickel, Total	8.0	MG/KG	0.23	1.0
		Phosphorus, Total	889	MG/KG	0.87	1.0
		Lead, Total	26.1	MG/KG	0.30	1.0
		Antimony, Total	0.43 u J	MG/KG	0.43	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	482 J	MG/KG	2.2	1.0
		Tin, Total	1.1	MG/KG	1.0	1.0
		Strontium, Total	23.9	MG/KG	0.01	1.0
		Titanium, Total	1020	MG/KG	0.03	1.0
		Thallium, Total	0.68 u	MG/KG	0.68	1.0
		Uranium, Total	1.9 UJ	MG/KG	0.85	1.0
		Vanadium, Total	33.6	MG/KG	0.09	1.0
		Zinc, Total	33.2	MG/KG	0.15	1.0
		Zirconium, Total	14.6	MG/KG	1.0	1.0

6/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 06041698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-014	J11KD4	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	5170	MG/KG	2.3	1.0
		Arsenic, Total	2.4	MG/KG	0.59	1.0
		Boron, Total	0.95	MG/KG	0.23	1.0
		Barium, Total	58.2	MG/KG	0.02	1.0
		Beryllium, Total	0.32	MG/KG	0.02	1.0
		Calcium, Total	4830 J	MG/KG	2.1	1.0
		Cadmium, Total	0.09	MG/KG	0.07	1.0
		Cobalt, Total	7.0	MG/KG	0.14	1.0
		Chromium, Total	8.7	MG/KG	0.13	1.0
		Copper, Total	15.5	MG/KG	0.12	1.0
		Iron, Total	16700	MG/KG	0.52	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1050	MG/KG	74.4	1.0
		Lithium, Total	5.9	MG/KG	0.03	1.0
		Magnesium, Total	3630	MG/KG	3.8	1.0
		Manganese, Total	306	MG/KG	0.03	1.0
		Molybdenum, Total	0.50	MG/KG	0.28	1.0
		Sodium, Total	103	MG/KG	2.4	1.0
		Nickel, Total	9.7	MG/KG	0.23	1.0
		Phosphorus, Total	801	MG/KG	0.87	1.0
		Lead, Total	7.2	MG/KG	0.30	1.0
		Antimony, Total	0.42 u J	MG/KG	0.42	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	486 J	MG/KG	2.2	1.0
		Tin, Total	1.1	MG/KG	1.0	1.0
		Strontium, Total	21.6	MG/KG	0.01	1.0
		Titanium, Total	1250	MG/KG	0.03	1.0
		Thallium, Total	0.68 u	MG/KG	0.68	1.0
		Uranium, Total	1.8 UJ	MG/KG	0.85	1.0
		Vanadium, Total	42.0	MG/KG	0.09	1.0
		Zinc, Total	38.2	MG/KG	0.15	1.0
		Zirconium, Total	17.4	MG/KG	1.0	1.0

6/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-015	J11KD5	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4790	MG/KG	2.4	1.0
		Arsenic, Total	2.3	MG/KG	0.61	1.0
		Boron, Total	0.97	MG/KG	0.24	1.0
		Barium, Total	65.5	MG/KG	0.02	1.0
		Beryllium, Total	0.32	MG/KG	0.02	1.0
		Calcium, Total	4010 J	MG/KG	2.2	1.0
		Cadmium, Total	0.1	MG/KG	0.07	1.0
		Cobalt, Total	7.4	MG/KG	0.14	1.0
		Chromium, Total	6.3	MG/KG	0.13	1.0
		Copper, Total	14.6	MG/KG	0.12	1.0
		Iron, Total	15700	MG/KG	0.54	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1130	MG/KG	77.3	1.0
		Lithium, Total	5.0	MG/KG	0.03	1.0
		Magnesium, Total	3470	MG/KG	3.9	1.0
		Manganese, Total	324	MG/KG	0.03	1.0
		Molybdenum, Total	0.39	MG/KG	0.29	1.0
		Sodium, Total	91.6	MG/KG	2.5	1.0
		Nickel, Total	9.0	MG/KG	0.24	1.0
		Phosphorus, Total	859	MG/KG	0.90	1.0
		Lead, Total	4.8	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	519 J	MG/KG	2.3	1.0
		Tin, Total	1.3	MG/KG	1.1	1.0
		Strontium, Total	20.0	MG/KG	0.01	1.0
		Titanium, Total	1140	MG/KG	0.03	1.0
		Thallium, Total	0.70 u	MG/KG	0.70	1.0
		Uranium, Total	1.8 UJ	MG/KG	0.88	1.0
		Vanadium, Total	35.7	MG/KG	0.09	1.0
		Zinc, Total	41.3	MG/KG	0.16	1.0
		Zirconium, Total	19.4	MG/KG	1.1	1.0

6/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-016	J11KD6	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	4090	MG/KG	2.2	1.0
		Arsenic, Total	2.6	MG/KG	0.58	1.0
		Boron, Total	3.3	MG/KG	0.23	1.0
		Barium, Total	75.0	MG/KG	0.02	1.0
		Beryllium, Total	0.26	MG/KG	0.02	1.0
		Calcium, Total	6970 J	MG/KG	2.1	1.0
		Cadmium, Total	0.1	MG/KG	0.07	1.0
		Cobalt, Total	6.6	MG/KG	0.13	1.0
		Chromium, Total	12.7	MG/KG	0.12	1.0
		Copper, Total	15.8	MG/KG	0.11	1.0
		Iron, Total	14000	MG/KG	0.51	1.0
		Mercury, Total	0.1	MG/KG	0.02	1.0
		Potassium, Total	742	MG/KG	73.2	1.0
		Lithium, Total	4.9	MG/KG	0.03	1.0
		Magnesium, Total	3120	MG/KG	3.7	1.0
		Manganese, Total	264	MG/KG	0.03	1.0
		Molybdenum, Total	0.46	MG/KG	0.28	1.0
		Sodium, Total	154	MG/KG	2.4	1.0
		Nickel, Total	8.1	MG/KG	0.23	1.0
		Phosphorus, Total	896	MG/KG	0.86	1.0
		Lead, Total	7.4	MG/KG	0.29	1.0
		Antimony, Total	0.42 u J	MG/KG	0.42	1.0
		Selenium, Total	0.45 u	MG/KG	0.45	1.0
		Silicon, Total	517 J	MG/KG	2.2	1.0
		Tin, Total	1.3	MG/KG	1.0	1.0
		Strontium, Total	33.1	MG/KG	0.01	1.0
		Titanium, Total	1090	MG/KG	0.03	1.0
		Thallium, Total	0.66 u	MG/KG	0.66	1.0
		Uranium, Total	2.2 UJ	MG/KG	0.84	1.0
		Vanadium, Total	33.9	MG/KG	0.09	1.0
		Zinc, Total	39.0	MG/KG	0.15	1.0
		Zirconium, Total	14.5	MG/KG	1.0	1.0

6/23/06

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-004	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 (115-B) Area 5		**SAF No.** RC-025
Air Quality ☐ 21 days			
Ice Chest No. ERC-03-105	**Field Logbook No.** EL-1585-5	**COA** R10B14 2000	**Method of Shipment** fed ex
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060350		**Bill of Lading/Air Bill No.** SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

000032

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C			
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG			
No. of Container(s)	1	1	1	1	1	1	1	1			
Volume	250g	~~125g~~ 125mL	120mL	120mL	500mL	120mL	120mL	250mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~ Tritium - H3	~~Nickel-63~~, Strontium-89,90 -- Total Sr	Pesticides - 8081, ~~Chloro-Herbicides - 8151A~~			

04/04/06

04/04/06

Sample No.	Matrix *	Sample Date	Sample Time										
J11KB8	SOIL	04/04/06	1235	✓	✓	✓	✓				✓		
J11KB9	SOIL	04/04/06	1240	✓	✓	✓	✓				✓		
J11KC0	SOIL	04/04/06	1245	✓	✓	✓	✓				✓		
J11KC1	SOIL	04/04/06	1345	✓	✓	✓	✓				✓		
J11KC2	SOIL	04/04/06	1355	✓	✓	✓	✓				✓		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Kevin Singleton	Date/Time: 4-4-06 1600	Received By/Stored In: 3728 RefZ	Date/Time: 4-4-06 1600
Relinquished By/Removed From: 3728 RefZA	Date/Time: 4-5-06 0930	Received By/Stored In: T.E. Edmundson	Date/Time: 4-5-06 0930
Relinquished By/Removed From: T.E. Edmundson	Date/Time: 4-5-06 1500	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time: 4/6/06 0910	Received By/Stored In: [illegible]	Date/Time: 4/6/06 0910
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.~~

(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)

~~(3) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}~~

Personnel not available to relinquish samples from 3728 Ref ~~#~~ 2A on 4/5/06

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-025-004	Page 2 of 3

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 (115-B) Area 5		SAF No.: RC-025
Ice Chest No.: ERC-99-063	Field Logbook No.: EL-1585-5	COA: R10314 2000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060350		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

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g 04/04/06	~~125g~~ 120mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Cobalt-60~~; Tritium - 1H3	~~Nickel-63~~; Strontium-89,90 -- Total Sr	Pesticides - 8081; ~~Chlorinated Herbicides - 8151~~ 04/04/06		

0000033

Sample No.	Matrix *	Sample Date	Sample Time									
J11KC3	SOIL	04/04/06	1055	✓	✓	✓	✓				✓	
J11KC4	SOIL	04/04/06	1040	✓	n/a	n/a	✓				n/a	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	4-4-06 1600	3278 Ref 2	4-4-06 1600
3728 #2A	4-5-06 0930	J R Edmundson	4-5-06 0930
J R Edmundson	4-5-06 1500	FED EX	
FED EX	4/6/06 0910	P Kennedy	4/6/06 0910

SPECIAL INSTRUCTIONS

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

(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}~~ 04/04/06

Personnel not available to Relinquish samples from 3728 Ref # 2A on 4/5/06

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-025-006	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 (115-B) BCL Area 5	SAF No.: RC-025	Air Quality ☐ 21 days
Ice Chest No.: GRP-03-009	Field Logbook No.: EL-1585-5; COA: R10B142000	Method of Shipment: fed ex	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060350	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

cool 4 degrees centigrade

0000034

SAMPLE ANALYSIS												
Preservation				None	Cool 4C	Cool 4C	Cool 4C	None		None	Cool 4C	
Type of Container				G/P	G/P	aG	aG	G/P		G/P	aG	
No. of Container(s)				1	1	1	1	1		1	1	
Volume				250g	~~125g~~ 250mL	120mL	120mL	500mL		120mL	250mL	
				See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.		Tritium - H3	Pesticides - 8081; ~~Chlorinated Herbicides - 8151A~~	
Sample No.	Matrix *	Sample Date	Sample Time									
J11KD3	SOIL	04/04/06	0915	✓	✓	✓	✓				✓	
J11KD4	SOIL	04/04/06	0925	✓	✓	✓	✓				✓	
J11KD5	SOIL	04/04/06	0930	✓	✓	✓	✓				✓	
J11KD6	SOIL	04/04/06	0935	✓	✓	✓	✓				✓	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	1600 4-4-06	3728 Ref 2A	1600 4-4-06
3728 #2A	4-5-06 0930	[illegible]	4-5-06 0930
[illegible] WCH	4-5-06 1500	FED EX	
FED EX	4/6/06 0910	[illegible]	4/6/06 0910

SPECIAL INSTRUCTIONS 04/04/06

~~(2) addition to item # 2 Run gross alpha and gross beta on 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)~~ 04/04/06

Personnel not available to relinquish samples from 3728 Ref # 2A on 4/5/06

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

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-B-14:2			DATA PACKAGE: K0286		
VALIDATOR: TCI		LAB: LLP		DATE: 6/12/06	
			SDG: K0286		

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

SAMPLES/MATRIX					
J11KB3	J11KB4	J11KB5	J11KB6	J11KB7	J11KB8
J11KB9	J11KC0	J11KC1	J11KC2	J11KC3	J11KD3
J11KD4	J11KD5	J11KD6		J11KC4	
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: Lithium - UJ C4
Sodium - " "
phosphorous - " "
ED - al, boron, barium, calcium, iron, magnesium, manganese, silicon, strontium, titanium, vanadium, zinc

Uranium - UJ - B8, B9, C1, C2, C3, D3, D4, D5, D6

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

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

Comments: MS - Calcium 68.6 - J all no PQS
MS - Antimony - 59.2 - J all

LCS - Silicon - 50.3 - 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:

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 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0233-MB1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	2.4 u	MG/KG	2.4	1.0
		Arsenic, Total	0.61 u	MG/KG	0.61	1.0
		Boron, Total	0.24 u	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	0.54 u	MG/KG	0.54	1.0
		Potassium, Total	77.1 u	MG/KG	77.1	1.0
		Lithium, Total	0.05	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	3.1	MG/KG	2.5	1.0
		Nickel, Total	0.24 u	MG/KG	0.24	1.0
		Phosphorus, Total	1.0	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 u	MG/KG	1.1	1.0
		Strontium, Total	0.01	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	1.0	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	06C0072-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J11KB3	Silver, Total	4.6	0.07u	5.0	92.0	1.0
		Aluminum, Total	5700	4250	201	717.2*	1.0
		Arsenic, Total	184	2.6	201	90.3	1.0
		Boron, Total	91.4	0.88	100	90.1	1.0
		Barium, Total	236	44.2	201	95.6	1.0
		Beryllium, Total	4.8	0.24	5.0	91.1	1.0
		Calcium, Total	8580	6860	2510	68.6	1.0
		Cadmium, Total	4.6	0.09	5.0	90.2	1.0
		Cobalt, Total	52.4	7.1	50.2	90.2	1.0
		Chromium, Total	25.7	5.8	20.1	99.0	1.0
		Copper, Total	40.0	14.8	25.1	100.4	1.0
		Iron, Total	17200	17300	100	-97. *	1.0
		Potassium, Total	3190	951	2510	89.1	1.0
		Lithium, Total	114	5.6	100	107.7	1.0
		Magnesium, Total	5940	3680	2510	90.0	1.0
		Manganese, Total	334	289	50.2	90.0*	1.0
		Molybdenum, Total	92.3	0.49	100	91.4	1.0
		Sodium, Total	2340	119	2510	88.3	1.0
		Nickel, Total	54.4	8.7	50.2	91.0	1.0
		Phosphorus, Total	1300	939	502	71.5	1.0
		Lead, Total	51.4	5.1	50.2	92.2	1.0
		Antimony, Total	29.7	0.44u	50.2	59.2	1.0
		Selenium, Total	175	0.47u	201	86.9	1.0
		Silicon, Total	791	522	100	267.7*	1.0
		Tin, Total	92.9	1.1	100	91.3	1.0
		Strontium, Total	118	21.6	100	95.9	1.0
		Titanium, Total	1500	1330	100	169.7*	1.0
		Thallium, Total	184	0.70u	201	91.8	1.0
		Uranium, Total	231	0.88u	251	91.8	1.0
		Vanadium, Total	90.5	40.8	50.2	99.0	1.0
		Zinc, Total	83.5	38.8	50.2	89.0	1.0
		Zirconium, Total	438	16.1	502	84.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-008	J11KC0	Mercury, Total	0.17	0.02u	0.16	107.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J11KB3	Silver, Total	0.07u	0.07u	NC	1.0
		Aluminum, Total	4250	5120	18.5	1.0
		Arsenic, Total	2.6	2.8	7.4	1.0
		Boron, Total	0.88	0.74	17.7	1.0
		Barium, Total	44.2	49.7	11.7	1.0
		Beryllium, Total	0.24	0.27	10.9	1.0
		Calcium, Total	6860	7070	3.0	1.0
		Cadmium, Total	0.09	0.13	31.2	1.0
		Cobalt, Total	7.1	8.0	11.9	1.0
		Chromium, Total	5.8	7.6	26.9	1.0
		Copper, Total	14.8	16.5	10.9	1.0
		Iron, Total	17300	18400	6.2	1.0
		Potassium, Total	951	1130	17.4	1.0
		Lithium, Total	5.6	6.7	17.9	1.0
		Magnesium, Total	3680	4210	13.4	1.0
		Manganese, Total	289	309	6.9	1.0
		Molybdenum, Total	0.49	0.48	2.1	1.0
		Sodium, Total	119	144	19.4	1.0
		Nickel, Total	8.7	11.2	25.1	1.0
		Phosphorus, Total	939	931	0.86	1.0
		Lead, Total	5.1	5.2	1.9	1.0
		Antimony, Total	0.44u	0.44u	NC	1.0
		Selenium, Total	0.47u	0.47u	NC	1.0
		Silicon, Total	522	446	15.7	1.0
		Tin, Total	1.1	1.3	16.7	1.0
		Strontium, Total	21.6	23.7	9.3	1.0
		Titanium, Total	1330	1520	13.4	1.0
		Thallium, Total	0.70u	0.70u	NC	1.0
		Uranium, Total	0.88u	0.88u	NC	1.0
		Vanadium, Total	40.8	48.5	17.2	1.0
		Zinc, Total	38.8	41.6	7.0	1.0
		Zirconium, Total	16.1	18.5	13.9	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-008REP	J11KC0	Mercury, Total	0.02u	0.02u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/11/06

CLIENT: TNUHANFORD RC-025 K0286 LVL LOT #: 0604L698

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0233-LC1	Silver, LCS	48.7	50.0	MG/KG	97.4
		Aluminum, LCS	456	500	MG/KG	91.2
		Arsenic, LCS	936	1000	MG/KG	93.6
		Boron, LCS	474	500	MG/KG	94.9
		Barium, LCS	486	500	MG/KG	97.3
		Beryllium, LCS	23.5	25.0	MG/KG	94.0
		Calcium, LCS	2180	2500	MG/KG	87.1
		Cadmium, LCS	24.2	25.0	MG/KG	96.8
		Cobalt, LCS	243	250	MG/KG	97.4
		Chromium, LCS	49.2	50.0	MG/KG	98.4
		Copper, LCS	124	125	MG/KG	99.3
		Iron, LCS	449	500	MG/KG	89.8
		Potassium, LCS	2250	2500	MG/KG	89.8
		Lithium, LCS	505	500	MG/KG	100.9
		Magnesium, LCS	2220	2500	MG/KG	88.8
		Manganese, LCS	75.0	75.0	MG/KG	100
		Molybdenum, LCS	498	500	MG/KG	99.5
		Sodium, LCS	2280	2500	MG/KG	91.3
		Nickel, LCS	195	200	MG/KG	97.7
		Phosphorus, LCS	445	500	MG/KG	89.0
		Lead, LCS	242	250	MG/KG	96.8
		Antimony, LCS	286	300	MG/KG	95.3
		Selenium, LCS	899	1000	MG/KG	89.9
		Silicon, LCS	252	500	MG/KG	50.3
		Tin, LCS	497	500	MG/KG	99.4
		Strontium, LCS	488	500	MG/KG	97.5
		Titanium, LCS	489	500	MG/KG	97.8
		Thallium, LCS	975	1000	MG/KG	97.5
		Uranium, LCS	242	250	MG/KG	96.7
		Vanadium, LCS	244	250	MG/KG	97.6
		Zinc, LCS	96.3	100	MG/KG	96.3
		Zirconium, LCS	457	500	MG/KG	91.4
LCS1	06C0072-LC1	Mercury, LCS	6.4	6.2	MG/KG	102.8

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. K0286-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0286 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	Matrix	Validation	Date
J11KB3	4/4/06	Soil	C	See note 1
J11KB4	4/4/06	Soil	C	See note 1
J11KB5	4/4/06	Soil	C	See note 1
J11KB6	4/4/06	Soil	C	See note 1
J11KB7	4/4/06	Soil	C	See note 1
J11KB8	4/4/06	Soil	C	See note 1
J11KB9	4/4/06	Soil	C	See note 1
J11KC0	4/4/06	Soil	C	See note 1
J11KC1	4/4/06	Soil	C	See note 1
J11KC2	4/4/06	Soil	C	See note 1
J11KC3	4/4/06	Soil	C	See note 1
J11KD3	4/4/06	Soil	C	See note 1
J11KD4	4/4/06	Soil	C	See note 1
J11KD5	4/4/06	Soil	C	See note 1
J11KD6	4/4/06	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 J11KB3 and J11KC3 and the methoxyclor result in sample J11KB4 were qualified as estimates and flagged "J".

Due to surrogate recoveries outside QC limits, the aroclor-1254 result in samples J11KB6, J11KB9, J11KC0 and J11KC3 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 (J11KB6/J11KC3) 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. K0286 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 J11KB3 and J11KC3 and the methoxyclor result in sample J11KB4 were qualified as estimates and flagged "J".

- Due to surrogate recoveries outside QC limits, the aroclor-1254 result in samples J11KB6, J11KB9, J11KC0 and J11KC3 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.

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: K0286	REVIEWER: [illegible]	CONTRACT: 100-8-14-2	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	J11KB3, K11KC3	Surrogate recovery
Methoxyclor	J	J11KB4	Surrogate recovery
Aroclor-1254	J	J11KB6, J11KB9 J11KC0, J11KC3	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: K0286

Sample Number		J11KB3		J11KB4		J11KB5		J11KB6		J11KB7		J11KB8		J11KB9		J11KC0		J11KC1	
Remarks								Main											
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
Extraction Date		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06	
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	15	U	14	U	14	U	15	U	14	U	14	U
Aroclor-1221	100	15	U	14	U	14	U	15	U	14	U	14	U	15	U	14	U	14	U
Aroclor-1232	100	15	U	14	U	14	U	15	U	14	U	14	U	15	U	14	U	14	U
Aroclor-1242	100	15	U	14	U	14	U	15	U	14	U	14	U	15	U	14	U	14	U
Aroclor-1248	100	15	U	14	U	14	U	15	U	14	U	14	U	15	U	14	U	14	U
Aroclor-1254	100	15	U	14	U	3.5		3.9	J	14	U	14	U	2.9	J	4.2	J	14	U
Aroclor-1260	100	15	U	14	U	14	U	15	U	14	U	14	U	15	U	14	U	14	U

Sample Number		J11KB3		J11KB4		J11KB5		J11KB6		J11KB7		J11KB8		J11KB9		J11KC0		J11KC1	
Remarks								Main											
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
Extraction Date		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06	
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	
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	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Gamma-BHC (Lindane)	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Beta-BHC	5	0.62	J	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Heptachlor	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Delta-BHC	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Aldrin	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Heptachlor Epoxide	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
gamma-Chlordane	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Endosulfan I	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
alpha-Chlordane	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
4,4'-DDE	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Dieldrin	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Endrin	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
4,4'-DDD	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Endosulfan II	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
4,4'-DDT	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Endrin Aldehyde	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Endosulfan sulfate	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Methoxyclor	5	1.5	UJ	49	J	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Endrin Ketone	5	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ	1.4	UJ
Toxaphene	5	15	UJ	14	UJ	14	UJ	15	UJ	14	UJ	14	UJ	15	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: K0286												
Sample Number		J11KC2		J11KC3		J11KD3		J11KD4		J11KD5		J11KD6	
Remarks				Duplicate									
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
Extraction Date		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06	
Analysis Date		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
Aroclor-1016	100	16	U	15	U	14	U	14	U	15	U	14	U
Aroclor-1221	100	16	U	15	U	14	U	14	U	15	U	14	U
Aroclor-1232	100	16	U	15	U	14	U	14	U	15	U	14	U
Aroclor-1242	100	16	U	15	U	14	U	14	U	15	U	14	U
Aroclor-1248	100	16	U	15	U	14	U	14	U	15	U	14	U
Aroclor-1254	100	16	U	11	J	14	U	14	U	15	U	14	U
Aroclor-1260	100	16	U	15	U	14	U	14	U	15	U	14	U

Sample Number		J11KC2		J11KC3		J11KD3		J11KD4		J11KD5		J11KD6	
Remarks				Duplicate									
Sample Date		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06		4/4/06	
Extraction Date		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06		4/13/06	
Analysis Date		4/19/06		4/19/06		4/19/06		4/19/06		4/19/06		4/19/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Gamma-BHC (Lindane)	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Beta-BHC	5	1.6	UJ	0.62	J	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Heptachlor	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Delta-BHC	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Aldrin	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Heptachlor Epoxide	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
gamma-Chlordane	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Endosulfan I	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
alpha-Chlordane	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
4,4'-DDE	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Dieldrin	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Endrin	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
4,4'-DDD	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Endosulfan II	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
4,4'-DDT	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Endrin Aldehyde	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Endosulfan sulfate	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Methoxyclor	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Endrin Ketone	5	1.6	UJ	1.5	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.4	UJ
Toxaphene	5	16	UJ	15	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.

000012

PCBs by GC

Report Date: 05/02/06 12:13

RFW Batch Number: 0604L698 Client: TNUHANFORD RC-025 K0286 Work Order: 11343606001 Page: 1

	Cust ID:	J11KB3	J11KB3	J11KB3	J11KB4	J11KB5	J11KB6
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	95 %	96 %	93 %	128 * %	117 %	129 * %
	Decachlorobiphenyl	101 %	103 %	99 %	130 * %	120 %	128 * %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		15 U	82 %	83 %	14 U	14 U	15 U
Aroclor-1221		15 U	15 U	15 U	14 U	14 U	15 U
Aroclor-1232		15 U	15 U	15 U	14 U	14 U	15 U
Aroclor-1242		15 U	15 U	15 U	14 U	14 U	15 U
Aroclor-1248		15 U	15 U	15 U	14 U	14 U	15 U
Aroclor-1254		15 U	15 U	15 U	14 U	3.5 J	3.9 J
Aroclor-1260		15 U	96 %	96 %	14 U	14 U	15 U

	Cust ID:	J11KB7	J11KB8	J11KB9	J11KC0	J11KC1	J11KC2
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	122 * %	120 * %	124 * %	126 * %	129 * %	110 %
	Decachlorobiphenyl	118 %	119 %	122 %	134 * %	128 * %	108 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U	14 U	15 U	14 U	14 U	16 U
Aroclor-1221		14 U	14 U	15 U	14 U	14 U	16 U
Aroclor-1232		14 U	14 U	15 U	14 U	14 U	16 U
Aroclor-1242		14 U	14 U	15 U	14 U	14 U	16 U
Aroclor-1248		14 U	14 U	15 U	14 U	14 U	16 U
Aroclor-1254		14 U	14 U	2.9 J	4.2 J	14 U	16 U
Aroclor-1260		14 U	14 U	15 U	14 U	14 U	16 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

6/23/06

0000013

PCBs by GC

RFW Batch Number: 0604L698 Client: TNUHANFORD RC-025 K0286 Work Order: 11343606001 Page: 2

Report Date: 05/02/06 12:13

	Cust ID:	J11KC3	J11KD3	J11KD4	J11KD5	J11KD6	PBLKFM
Sample Information	RFW#:	011	013	014	015	016	06LE0282-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:	Tetrachloro-m-xylene	130 * %	133 * %	137 * %	128 * %	124 * %	97 %
	Decachlorobiphenyl	128 * %	136 * %	138 * %	128 * %	130 * %	100 %
Aroclor-1016		15 U	14 U	14 U	15 U	14 U	13 U
Aroclor-1221		15 U	14 U	14 U	15 U	14 U	13 U
Aroclor-1232		15 U	14 U	14 U	15 U	14 U	13 U
Aroclor-1242		15 U	14 U	14 U	15 U	14 U	13 U
Aroclor-1248		15 U	14 U	14 U	15 U	14 U	13 U
Aroclor-1254		11 J	14 U	14 U	15 U	14 U	13 U
Aroclor-1260		15 U	14 U	14 U	15 U	14 U	13 U

	Cust ID:	PBLKFM BS
Sample Information	RFW#:	06LE0282-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	UG/KG
Surrogate:	Tetrachloro-m-xylene	92 %
	Decachlorobiphenyl	97 %
Aroclor-1016		82 %
Aroclor-1221		13 U
Aroclor-1232		13 U
Aroclor-1242		13 U
Aroclor-1248		13 U
Aroclor-1254		13 U
Aroclor-1260		89 %

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

6/23/06

5/2/06

000014

Pesticide/PCBs by GC, CLP List

Report Date: 05/01/06 14:19

RFW Batch Number: 0604L698 Client: TNUHANFORD RC-025 K0286 Work Order: 11343606001 Page: 1

	Cust ID:	J11KB3	J11KB3	J11KB3	J11KB4	J11KB5	J11KB6
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	128 * %	146 * %	125 * %	134 * %	129 * %	144 * %
	Decachlorobiphenyl	136 * %	148 * %	128 * %	139 * %	127 * %	138 * %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.5 U J	116 %	109 %	1.4 U J	1.4 U J	1.5 U J
gamma-BHC (Lindane)		1.5 U	118 %	112 %	1.4 U	1.4 U	1.5 U
Beta-BHC		0.62 ~~U~~	117 %	109 %	1.4 U	1.4 U	1.5 U
Heptachlor		1.5 U	113 %	107 %	1.4 U	1.4 U	1.5 U
Delta-BHC		1.5 U	96 %	89 %	1.4 U	1.4 U	1.5 U
Aldrin		1.5 U	109 %	102 %	1.4 U	1.4 U	1.5 U
Heptachlor epoxide		1.5 U	117 %	118 %	1.4 U	1.4 U	1.5 U
gamma-Chlordane		1.5 U	110 %	104 %	1.4 U	1.4 U	1.5 U
Endosulfan I		1.5 U	110 %	104 %	1.4 U	1.4 U	1.5 U
alpha-Chlordane		1.5 U	113 %	107 %	1.4 U	1.4 U	1.5 U
4,4'-DDE		1.5 U	103 %	97 %	1.4 U	1.4 U	1.5 U
Dieldrin		1.5 U	106 %	98 %	1.4 U	1.4 U	1.5 U
Endrin		1.5 U	111 %	106 %	1.4 U	1.3 J	1.5 U
4,4'-DDD		1.5 U	109 %	102 %	1.4 U	1.4 U	1.5 U
Endosulfan II		1.5 U	110 %	103 %	1.4 U	1.4 U	1.5 U
4,4'-DDT		1.5 U	94 %	92 %	1.4 U	1.4 U	1.5 U
Endrin aldehyde		1.5 U	109 %	101 %	1.4 U	1.4 U	1.5 U
Endosulfan sulfate		1.5 U	108 %	103 %	1.4 U	1.4 U	1.5 U
Methoxychlor		1.5 U	112 %	108 %	49	1.4 U	1.5 U
Endrin ketone		1.5 U	117 %	111 %	1.4 U	1.4 U	1.5 U
Toxaphene		15 U	15 U	15 U	14 U	14 U	15 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

6/23/06

	Cust ID:	J11KB7	J11KB8	J11KB9	J11KC0	J11KC1	J11KC2
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	130 * %	126 * %	126 * %	123 * %	122 * %	104 %
	Decachlorobiphenyl	130 * %	128 * %	133 * %	141 * %	137 * %	112 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.4 U J	1.4 U J	1.5 U J	1.4 U J	1.4 U J	1.6 U J
gamma-BHC (Lindane)		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Beta-BHC		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Heptachlor		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Delta-BHC		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Aldrin		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Heptachlor epoxide		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
gamma-Chlordane		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Endosulfan I		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
alpha-Chlordane		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
4,4'-DDE		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Dieldrin		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Endrin		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
4,4'-DDD		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Endosulfan II		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
4,4'-DDT		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Endrin aldehyde		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Endosulfan sulfate		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Methoxychlor		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Endrin ketone		1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.6 U
Toxaphene		14 U	14 U	15 U	14 U	14 U	16 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

000016

6/23/06

Pesticide/PCBs by GC, CLP List

Report Date: 05/01/06 14:19

RFW Batch Number: 0604L698 Client: TNUHANFORD RC-025 K0286 Work Order: 11343606001 Page: 3

	Cust ID:	J11KC3	J11KD3	J11KD4	J11KD5	J11KD6	PBLKFM
Sample Information	RFW#:	011	013	014	015	016	06LE0282-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	4.00	4.00	4.00	4.00	4.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	128 * %	130 * %	141 * %	128 * %	129 * %	111 %
	Decachlorobiphenyl	136 * %	147 * %	145 * %	133 * %	141 * %	113 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.5 U J	1.4 U J	1.4 U J	1.5 U J	1.4 U J	0.33 U
gamma-BHC (Lindane)		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Beta-BHC		0.62 ~~J~~	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Heptachlor		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Delta-BHC		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Aldrin		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Heptachlor epoxide		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
gamma-Chlordane		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Endosulfan I		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
alpha-Chlordane		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
4,4'-DDE		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Dieldrin		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Endrin		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
4,4'-DDD		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Endosulfan II		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
4,4'-DDT		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Endrin aldehyde		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Endosulfan sulfate		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Methoxychlor		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Endrin ketone		1.5 U	1.4 U	1.4 U	1.5 U	1.4 U	0.33 U
Toxaphene		15 U	14 U	14 U	15 U	14 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

6/23/06

000017

	Cust ID:	PBLKFM BS	PBLKFM BS
Sample Information	RFW#:	06LE0282-MB1	06LE0282-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		15 * %	16 * %
Decachlorobiphenyl		18 * %	17 * %
Alpha-BHC		11 * %	11 * %
gamma-BHC (Lindane)		12 * %	12 * %
Beta-BHC		15 * %	15 * %
Heptachlor		13 * %	13 * %
Delta-BHC		10 * %	9 * %
Aldrin		11 * %	12 * %
Heptachlor epoxide		13 * %	13 * %
gamma-Chlordane		13 * %	12 * %
Endosulfan I		12 * %	12 * %
alpha-Chlordane		13 * %	13 * %
4,4'-DDE		12 * %	10 * %
Dieldrin		12 * %	12 * %
Endrin		12 * %	12 * %
4,4'-DDD		12 * %	10 * %
Endosulfan II		13 * %	13 * %
4,4'-DDT		10 * %	10 * %
Endrin aldehyde		14 * %	13 * %
Endosulfan sulfate		13 * %	12 * %
Methoxychlor		12 * %	11 * %
Endrin ketone		14 * %	13 * %
Toxaphene		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

6/23/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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

CHLORINATED PESTICIDES

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 04-17, 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-six (36) of forty (40) 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 6 pages.

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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

5/2/6
Date

som\r:\group\data\pest\tmu hanford\0604-698.pst

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 066-138

Initiator: KLW
Date: 5/1/06
Client: TM

Batch: 0604L698
Samples: ALL
Method: SW846/MCAWW/CLP/ 8081

Parameter: PCST
Matrix: SOIL
Prep Batch: 06LR0212

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.
Surrogate recoveries low for Blank Spike and Blank Spike Reanalysis
Blank Spike recoveries low.

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: ~~Re-leach~~
~~Re-extract~~
Narrate - high surrogate recoveries exceed MOL criteria by 10-25%. marginal impact on final results.
MS/MSD spike recoveries are all w/in control - low LCS recoveries do not impact data quantitation

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: _____ 5/1/06

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

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.

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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

som\r:\group\data\pest\tmu hanford\0604-698.pcbs

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06C-139

Initiator: MGW
Date: 6/2/06
Client: TN

Batch: 06046698
Samples:
Method: SW846/MCAWW/CLP/

Parameter: OPCB
Matrix: SOIL
Prep Batch: 06LR0278

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

[signature] 7/2/06

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: [signature] 7/2/06

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-025-004	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 (115-B) Area 5	SAF No.: RC-025	
Ice Chest No.: GRP-03-009	Field Logbook No.: EL-1585-5	COA: R10B14 2000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060350	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	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g 04/04/06	~~125g~~ 50mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Gross Alpha~~ Tritium - 3H3	~~Nickel-63~~ Strontium-89,90 -- Total Sr	Pesticides - 8081; ~~Chloro Herbicides - 8151~~ 04/04/06		

0000026

Sample No.	Matrix *	Sample Date	Sample Time									
J11KB3	SOIL	04/04/06	1015	✓	✓	✓	✓				✓	
J11KB4	SOIL	04/04/06	1020	✓	✓	✓	✓				✓	
J11KB5	SOIL	04/04/06	1045	✓	✓	✓	✓				✓	
J11KB6	SOIL	04/04/06	1050	✓	✓	✓	✓				✓	
J11KB7	SOIL	04/04/06	1230	✓	✓	✓	✓			✓	✓	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Brian Singleton 4-4-06	1600	3728 Ref 2 4-4-06	1600
3728 #2A 4-5-06	0930	[illegible] 4-5-06	0930
[illegible] 4-5-06	1500	FED EX	
FED EX 4/6/06	0910	[illegible] 4/6/06	0910

SPECIAL INSTRUCTIONS

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

(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)

~~(3) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ 04/04/06

Personnel not available to relinquish samples from 3728 Ref # 2A on 4/5/06

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-025-004	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 (115-B) Area 5	SAF No.: RC-025	Air Quality ☐ 21 days
Ice Chest No.: ERC-03-105	Field Logbook No.: EL-1585-5 — COA: 810814 2000	Method of Shipment: fed ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060350	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	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g	~~125g~~ 125mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Carbon-14~~ Tritium - 3H	~~Nickel-63~~, Strontium-89,90 -- Total Sr	Pesticides - 8081, ~~Chlorinated Herbicides - 8151A~~		

Sample No.	Matrix *	Sample Date	Sample Time									
J11KB8	SOIL	04/04/06	1235	✓	✓	✓	✓				✓	
J11KB9	SOIL	04/04/06	1240	✓	✓	✓	✓				✓	
J11KC0	SOIL	04/04/06	1245	✓	✓	✓	✓				✓	
J11KC1	SOIL	04/04/06	1345	✓	✓	✓	✓				✓	
J11KC2	SOIL	04/04/06	1355	✓	✓	✓	✓				✓	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	1600 4-4-06	3728 RefZ	1600 4-4-06
3728 RefZA	4-5-06 0930	T.E. Edmondson	4-5-06 0930
T.E. Edmondson (WCH)	4-5-06 1500	FED EX	
FED EX	4/6/06 0910	[illegible]	4/6/06 0910

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 RefZA on 4/5/06

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

8HI-EE-011 (08/29/2005)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-025-004	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 (115-B) Area 5		SAF No.: RC-025
Air Quality ☐	21 days		
Ice Chest No.: ERC-99-063	Field Logbook No.: EL-1585-5	COA: R10B14 2000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060350		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	None	None	Cool 4C		
Type of Container	G/P	G/P	aG	aG	G/P	G/P	G/P	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	250g 04/04/06	~~125g~~ 250mL	120mL	120mL	500mL	120mL	120mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Beta-44; Tritium-3H~~	~~Nickel-63~~; Stronium-89,90 -- Total Sr	Pesticides - 8081; ~~Chlorinated Herbicides - 8151~~ 04/04/06		
Sample No.	Matrix *	Sample Date	Sample Time								
J11KC3	SOIL	04/04/06	1055	✓	✓	✓	✓			✓	
J11KC4	SOIL	04/04/06	1040	✓	N/A	N/A	✓			N/A	

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Singleton	4-4-06 1600	3278 Ref 2	4-4-06 1600
3728 #2A	4-5-06 0930	JR Edmundson	4-5-06 0930
JR Edmundson	4-5-06 1500	FED EX	
FED EX	4/6/06 0910	[illegible]	4/6/06 0910

SPECIAL INSTRUCTIONS 04/04/06

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

(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}~~ 04/04/06

Personnel not available to Relinquish samples from 3728 Ref # 2A on 4/5/06

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-025-006	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 (115-B) BCL Area 5		SAF No.: RC-025
Ice Chest No.: GRP-03-009	Field Logbook No.: EL-1585-5	COA: R10B142000	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060350		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	None	Cool 4C			
Type of Container	G/P	G/P	aG	aG	G/P	G/P	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	250g	~~125g~~ 250mL 04/04/06	120mL	120mL	500mL	120mL	250mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.	~~Gamma-Ray~~, Tritium - H3	Pesticides - 8081; ~~Chlorinated Herbicides 8151A~~ 04/04/06			

000029

Sample No.	Matrix *	Sample Date	Sample Time									
J11KD3	SOIL	04/04/06	0915	✓	✓	✓	✓	04/04/06		✓		
J11KD4	SOIL	04/04/06	0925	✓	✓	✓	✓			✓		
J11KD5	SOIL	04/04/06	0930	✓	✓	✓	✓			✓		
J11KD6	SOIL	04/04/06	0935	✓	✓	✓	✓			✓		

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Kevin Singleton	1600 4-4-06	3728 Ref 2A	1600 4-4-06
Relinquished By/Removed From: 3728 Ref 2A	4-5-06 0930	Received By/Stored In: JR Edmundson	4-5-06 0930
Relinquished By/Removed From: JR Edmundson	4-5-06 1500	Received By/Stored In: FED EX	
Relinquished By/Removed From: FED EX	4/6/06 0910	Received By/Stored In: [illegible]	4/6/06 0910
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS 04/04/06

~~(2) addition to item # 2. Run gross alpha and gross beta on 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}~~ 04/04/06

Personnel not available to relinquish samples from 3728 Ref # 2A on 4/5/06

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: K0286		
VALIDATOR: TLT		LAB: LLI		DATE: 6/12/06	
			SDG: K0286		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J11KB3	J11KB4	J11KB5	J11KB6	J11KB7	J11KB8
J11KB9	J11KC0	J11KC1	J11KC2	J11KC3	J11KD3
J11KD4	J11KD5	J11KD6			
					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: surr PCB 54 in B6, B9, C0, C3 – J no RAK
surr Pest – Beta-BHC – B3, C3 + methoxychlor in B4 – J
LCS pesticide – J all but toxaphene
toxaphene – no MS/MSD/LCS – J all

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 toxaphen 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: