0070024

SAF-RC-032
100-F Remaining Sites Burial Grounds - Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 DE/06/08/06
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COMMENTS:

SDG K0259 **SAF-RC-032**

Waste Site: 1607-F-3

Date: 31 May 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 1607-F-3
Subject: Semivolatile - Data Package No. K0259-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0259 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11JN7	3/9/06	Soil	C	See note 1
J11JN8	3/9/06	Soil	C	See note 1
J11JN9	3/9/06	Soil	C	See note 1
J11JP0	3/9/06	Soil	C	See note 1
J11JP1	3/9/06	Soil	C	See note 1
J11JP2	3/9/06	Soil	C	See note 1
J11JP3	3/9/06	Soil	C	See note 1
J11JP4	3/9/06	Soil	C	See note 1
J11JP5	3/9/06	Soil	C	See note 1
J11JP6	3/9/06	Soil	C	See note 1
J11JP7	3/9/06	Soil	C	See note 1
J11JP8	3/9/06	Soil	C	See note 1

1 – Semivolatiles by 8270C.

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

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were met.

- **Method Blanks**

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

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

All other method blank results were acceptable.

Field Blanks

One equipment blank (J11JN7) were submitted for analysis. One analyte (di-n-butylphthalate) was detected in the equipment blank. Under the WCH statement of work, no qualification is required.

· **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

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

Due to matrix spike (59%) and matrix spike duplicate (59%) results outside QC limits, the isophorone results in all samples were qualified as estimates and flagged "J".

Due to matrix spike (54%) and matrix spike duplicate (50%) results outside QC limits, the 1,2,4-trichlorobenzene results in all samples were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (14%), all 2,4-dinitrophenol results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J11JN8/J11JP8) 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. Ninety-six analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0259 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 bis(2-ethylhexyl)phthalate results were raised to the RQL, qualified as undetected and flagged "U".

- Due to matrix spike (59%) and matrix spike duplicate (59%) results outside QC limits, the isophorone results in all samples were qualified as estimates and flagged "J".

- Due to matrix spike (54%) and matrix spike duplicate (50%) results outside QC limits, the 1,2,4-trichlorobenzene results in all samples were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits (14%), all 2,4-dinitrophenol results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the 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

Ninety-six 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 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 DATA QUALIFICATION SUMMARY*

SDG: K0259	REVIEWER: TLI	Project: 1607-F-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethlhexyl)phthalate	U at RQL	All	Blank contamination
Isophorone 1,2,4-Trichlorobenzene	J	All	MS/MSD recovery
2,4-Dinitrophenol	J	All	LCS recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0259																		
Sample Number		J11JN7		J11JN8		J11JN9		J11JP0		J11JP1		J11JP2		J11JP3		J11JP4		J11JP5	
Remarks		E. Blank		Duplicate															
Sample Date		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06	
Extraction Date		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06	
Analysis Date		3/18/06		3/19/06		3/19/06		3/19/06		3/19/06		3/20/06		3/20/06		3/20/06		3/20/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
bis(2-Chloroethyl)ether	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2-Chlorophenol	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
1,3-Dichlorobenzene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
1,4-Dichlorobenzene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
1,2-Dichlorobenzene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2-Methylphenol	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2,2'-oxybis(1-chloropropane)	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
3 and/or 4-Methylphenol	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
N-Nitroso-di-n-propylamine	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Hexachloroethane	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Nitrobenzene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Isophorone	660	330	UJ	360	UJ	360	UJ	360	UJ	370	UJ	350	UJ	360	UJ	360	UJ	360	UJ
2-Nitrophenol	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2,4-Dimethylphenol	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
bis(2-Chloroethoxy)methane	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2,4-Dichlorophenol	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
1,2,4-Trichlorobenzene	660	330	UJ	360	UJ	360	UJ	360	UJ	370	UJ	350	UJ	360	UJ	360	UJ	360	UJ
Naphthalene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
4-Chloroaniline	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Hexachlorobutadiene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
4-Chloro-3-methylphenol	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2-Methylnaphthalene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Hexachlorocyclopentadiene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2,4,6-Trichlorophenol	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2,4,5-Trichlorophenol*	660	840	U	910	U	900	U	910	U	920	U	880	U	900	U	900	U	900	U
2-Chloronaphthalene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2-Nitroaniline*	660	840	U	910	U	900	U	910	U	920	U	880	U	900	U	900	U	900	U
Dimethylphthalate	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Acenaphthylene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2,6-Dinitrotoluene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	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

000011

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0259																		
Sample Number		J11JN7		J11JN8		J11JN9		J11JP0		J11JP1		J11JP2		J11JP3		J11JP4		J11JP5	
Remarks		E. Blank		Duplicate															
Sample Date		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06	
Extraction Date		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06		3/15/06	
Analysis Date		3/18/06		3/19/06		3/19/06		3/19/06		3/19/06		3/20/06		3/20/06		3/20/06		3/20/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	840	U	910	U	900	U	910	U	920	U	880	U	900	U	900	U	900	U
Acenaphthene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2,4-Dinitrophenol*	660	840	UJ	910	UJ	900	UJ	910	UJ	920	UJ	880	UJ	900	UJ	900	UJ	900	UJ
4-Nitrophenol*	660	840	U	910	U	900	U	910	U	920	U	880	U	900	U	900	U	900	U
Dibenzofuran	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
2,4-Dinitrotoluene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Diethylphthalate	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
4-Chlorophenyl-phenyl ether	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Fluorene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
4-Nitroaniline*	660	840	U	910	U	900	U	910	U	920	U	880	U	900	U	900	U	900	U
4,6-Dinitro-2-methylphenol*	660	840	U	910	U	900	U	910	U	920	U	880	U	900	U	900	U	900	U
N-Nitrosodiphenylamine	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
4-Bromophenyl-phenyl ether	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Hexachlorobenzene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Pentachlorophenol*	660	840	U	910	U	900	U	910	U	920	U	880	U	900	U	900	U	900	U
Phenanthrene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Anthracene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Carbazole	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Di-n-butylphthalate	660	97		360	U	360	U	25		370	U	350	U	360	U	360	U	360	U
Fluoranthene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Pyrene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Butylbenzylphthalate	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
3,3'-Dichlorobenzidine	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Benzo(a)anthracene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Chrysene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U	660	U	660	U	660	U	660	U	660	U
Di-n-octylphthalate	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Benzo(b)fluoranthene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Benzo(k)fluoranthene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Benzo(a)pyrene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Indeno(1,2,3-cd)pyrene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Dibenz(a,h)anthracene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	U	360	U
Benzo(g,h,i)perylene	660	330	U	360	U	360	U	360	U	370	U	350	U	360	U	360	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

000012

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0259																		
Sample Number		J11JP6		J11JP7		J11JP8													
Remarks																			
Sample Date		3/9/06		3/9/06		3/9/06													
Extraction Date		3/15/06		3/15/06		3/15/06													
Analysis Date		3/20/06		3/21/06		3/20/06													
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	360	U	370	U	370	U												
bis(2-Chloroethyl)ether	660	360	U	370	U	370	U												
2-Chlorophenol	660	360	U	370	U	370	U												
1,3-Dichlorobenzene	660	360	U	370	U	370	U												
1,4-Dichlorobenzene	660	360	U	370	U	370	U												
1,2-Dichlorobenzene	660	360	U	370	U	370	U												
2-Methylphenol	660	360	U	370	U	370	U												
2,2'-oxybis(1-chloropropane)	660	360	U	370	U	370	U												
3 and/or 4-Methylphenol	660	360	U	370	U	370	U												
N-Nitroso-di-n-propylamine	660	360	U	370	U	370	U												
Hexachloroethane	660	360	U	370	U	370	U												
Nitrobenzene	660	360	U	370	U	370	U												
Isophorone	660	360	UJ	370	UJ	370	UJ												
2-Nitrophenol	660	360	U	370	U	370	U												
2,4-Dimethylphenol	660	360	U	370	U	370	U												
bis(2-Chloroethoxy)methane	660	360	U	370	U	370	U												
2,4-Dichlorophenol	660	360	U	370	U	370	U												
1,2,4-Trichlorobenzene	660	360	UJ	370	UJ	370	UJ												
Naphthalene	660	360	U	370	U	370	U												
4-Chloroaniline	660	360	U	370	U	370	U												
Hexachlorobutadiene	660	360	U	370	U	370	U												
4-Chloro-3-methylphenol	660	360	U	370	U	370	U												
2-Methylnaphthalene	660	360	U	370	U	370	U												
Hexachlorocyclopentadiene	660	360	U	370	U	370	U												
2,4,6-Trichlorophenol	660	360	U	370	U	370	U												
2,4,5-Trichlorophenol*	660	900	U	930	U	930	U												
2-Chloronaphthalene	660	900	U	930	U	930	U												
2-Nitroaniline*	660	900	U	930	U	930	U												
Dimethylphthalate	660	360	U	370	U	370	U												
Acenaphthylene	660	360	U	370	U	370	U												
2,6-Dinitrotoluene	660	360	U	370	U	370	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: K0259																		
Sample Number		J11JP6		J11JP7		J11JP8													
Remarks																			
Sample Date		3/9/06		3/9/06		3/9/06													
Extraction Date		3/15/06		3/15/06		3/15/06													
Analysis Date		3/20/06		3/21/06		3/20/06													
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	900	U	930	U	930	U												
Acenaphthene	660	360	U	370	U	370	U												
2,4-Dinitrophenol*	660	900	UJ	930	UJ	930	UJ												
4-Nitrophenol*	660	900	U	930	U	930	U												
Dibenzofuran	660	360	U	370	U	370	U												
2,4-Dinitrotoluene	660	360	U	370	U	370	U												
Diethylphthalate	660	360	U	370	U	370	U												
4-Chlorophenyl-phenyl ether	660	360	U	370	U	370	U												
Fluorene	660	360	U	370	U	370	U												
4-Nitroaniline*	660	900	U	930	U	930	U												
4,6-Dinitro-2-methylphenol*	660	900	U	930	U	930	U												
N-Nitrosodiphenylamine	660	360	U	370	U	370	U												
4-Bromophenyl-phenyl ether	660	360	U	370	U	370	U												
Hexachlorobenzene	660	360	U	370	U	370	U												
Pentachlorophenol*	660	900	U	930	U	930	U												
Phenanthrene	660	360	U	370	U	370	U												
Anthracene	660	360	U	370	U	370	U												
Carbazole	660	360	U	370	U	370	U												
Di-n-butylphthalate	660	360	U	370	U	370	U												
Fluoranthene	660	360	U	370	U	370	U												
Pyrene	660	360	U	370	U	370	U												
Butylbenzylphthalate	660	360	U	370	U	370	U												
3,3'-Dichlorobenzidine	660	360	U	370	U	370	U												
Benzo(a)anthracene	660	360	U	370	U	370	U												
Chrysene	660	360	U	370	U	22													
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U												
Di-n-octylphthalate	660	360	U	370	U	370	U												
Benzo(b)fluoranthene	660	360	U	370	U	370	U												
Benzo(k)fluoranthene	660	360	U	370	U	29													
Benzo(a)pyrene	660	360	U	370	U	33													
Indeno(1,2,3-cd)pyrene	660	360	U	370	U	22													
Dibenz(a,h)anthracene	660	360	U	370	U	370	U												
Benzo(g,h,i)perylene	660	360	U	370	U	23													

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: 03/28/06 15:20

RFW Batch Number: 0603L511 Client: TNUHANFORD RC-032 K0259 Work Order: 11343606001 Page: 1a

	Cust ID:	J11JN7	J11JN8	J11JN8	J11JN8	J11JN9	J11JP0
Sample Information	RFW#:	001	002	002 MS	002 MSD	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	97 %	66 %	45 %	42 %	59 %	91 %
	2-Fluorobiphenyl	99 %	77 %	91 %	105 %	58 %	101 %
	Terphenyl-d14	93 %	93 %	76 %	92 %	91 %	105 %
	Phenol-d5	106 %	86 %	96 %	118 * %	68 %	102 %
	2-Fluorophenol	107 %	74 %	83 %	96 %	64 %	91 %
	2,4,6-Tribromophenol	98 %	90 %	122 %	153 * %	77 %	117 %
Phenol		330 U	360 U	110 %	148 * %	360 U	360 U
bis(2-Chloroethyl)ether		330 U	360 U	89 %	99 %	360 U	360 U
2-Chlorophenol		330 U	360 U	133 * %	162 * %	360 U	360 U
1,3-Dichlorobenzene		330 U	360 U	90 %	95 %	360 U	360 U
1,4-Dichlorobenzene		330 U	360 U	88 %	100 %	360 U	360 U
1,2-Dichlorobenzene		330 U	360 U	91 %	106 %	360 U	360 U
2-Methylphenol		330 U	360 U	104 %	127 * %	360 U	360 U
2,2'-oxybis(1-Chloropropane)		330 U	360 U	81 %	91 %	360 U	360 U
4-Methylphenol		330 U	360 U	123 %	166 * %	360 U	360 U
N-Nitroso-di-n-propylamine		330 U	360 U	89 %	134 * %	360 U	360 U
Hexachloroethane		330 U	360 U	82 %	91 %	360 U	360 U
Nitrobenzene		330 U	360 U	52 %	48 * %	360 U	360 U
Isophorone		330 U J	360 U J	59 * %	59 * %	360 U J	360 U J
2-Nitrophenol		330 U	360 U	57 %	53 %	360 U	360 U
2,4-Dimethylphenol		330 U	360 U	62 %	65 %	360 U	360 U
bis(2-Chloroethoxy)methane		330 U	360 U	58 %	51 %	360 U	360 U
2,4-Dichlorophenol		330 U	360 U	63 %	63 %	360 U	360 U
1,2,4-Trichlorobenzene		330 U J	360 U J	54 * %	50 * %	360 U J	360 U J
Naphthalene		330 U	360 U	53 %	55 %	360 U	360 U
4-Chloroaniline		330 U	360 U	82 %	85 %	360 U	360 U
Hexachlorobutadiene		330 U	360 U	60 %	55 %	360 U	360 U
4-Chloro-3-methylphenol		330 U	360 U	62 %	65 %	360 U	360 U
2-Methylnaphthalene		330 U	360 U	60 %	63 %	360 U	360 U
Hexachlorocyclopentadiene		330 U	360 U	84 %	83 %	360 U	360 U
2,4,6-Trichlorophenol		330 U	360 U	122 %	159 * %	360 U	360 U
2,4,5-Trichlorophenol		840 U	910 U	113 %	140 %	900 U	910 U

*= Outside of EPA CLP QC limits.

Kr 5/29/06

000000008

000015

RFW Batch Number: 0603L511 Client: TNUHANFORD RC-032 K0259 Work Order: 11343606001 Page: 1b

Cust ID:	J11JN7	J11JN8	J11JN8	J11JN8	J11JN9	J11JP0
RFW#:	001	002	002 MS	002 MSD	003	004
2-Chloronaphthalene	330 U	360 U	111 %	138 * %	360 U	360 U
2-Nitroaniline	840 U	910 U	103 %	128 %	900 U	910 U
Dimethylphthalate	330 U	360 U	103 %	122 %	360 U	360 U
Acenaphthylene	330 U	360 U	108 %	137 * %	360 U	360 U
2,6-Dinitrotoluene	330 U	360 U	101 %	116 * %	360 U	360 U
3-Nitroaniline	840 U	910 U	126 %	147 * %	900 U	910 U
Acenaphthene	330 U	360 U	110 %	141 * %	360 U	360 U
2,4-Dinitrophenol	840 U J	910 U J	69 %	70 %	900 U J	910 U J
4-Nitrophenol	840 U	910 U	97 %	101 %	900 U	910 U
Dibenzofuran	330 U	360 U	109 %	136 * %	360 U	360 U
2,4-Dinitrotoluene	330 U	360 U	103 %	112 %	360 U	360 U
Diethylphthalate	330 U	360 U	96 %	107 %	360 U	360 U
4-Chlorophenyl-phenylether	330 U	360 U	104 %	123 * %	360 U	360 U
Fluorene	330 U	360 U	109 %	128 %	360 U	360 U
4-Nitroaniline	840 U	910 U	96 %	106 %	900 U	910 U
4,6-Dinitro-2-methylphenol	840 U	910 U	119 %	137 %	900 U	910 U
N-Nitrosodiphenylamine (1)	330 U	360 U	98 %	119 %	360 U	360 U
4-Bromophenyl-phenylether	330 U	360 U	110 %	133 * %	360 U	360 U
Hexachlorobenzene	330 U	360 U	135 * %	159 * %	360 U	360 U
Pentachlorophenol	840 U	910 U	112 %	124 %	900 U	910 U
Phenanthrene	330 U	360 U	119 %	138 * %	360 U	360 U
Anthracene	330 U	360 U	120 %	134 * %	360 U	360 U
Carbazole	330 U	360 U	98 %	104 %	360 U	360 U
Di-n-butylphthalate	97 J	360 U	115 %	123 %	360 U	25 J
Fluoranthene	330 U	360 U	119 %	115 %	360 U	360 U
Pyrene	330 U	360 U	92 %	111 %	360 U	360 U
Butylbenzylphthalate	330 U	360 U	110 %	125 %	360 U	360 U
3,3'-Dichlorobenzidine	330 U	360 U	122 %	127 %	360 U	360 U
Benzo(a)anthracene	330 U	360 U	112 %	121 %	360 U	360 U
Chrysene	330 U	360 U	111 %	122 %	360 U	360 U
bis(2-Ethylhexyl)phthalate	660 ~~24~~ 5/24/06 JB U	660 ~~24~~ 5/24/06 JB U	660 106 %	109 %	660 ~~50~~ 5/24/06 JB U	660 ~~57~~ 5/24/06 JB U
Di-n-octyl phthalate	330 U	360 U	102 %	104 %	360 U	360 U
Benzo(b)fluoranthene	330 U	360 U	105 %	103 %	360 U	360 U
Benzo(k)fluoranthene	330 U	360 U	94 %	98 %	360 U	360 U
Benzo(a)pyrene	330 U	360 U	105 %	110 %	360 U	360 U
Indeno(1,2,3-cd)pyrene	330 U	360 U	113 %	118 %	360 U	360 U
Dibenz(a,h)anthracene	330 U	360 U	109 %	119 %	360 U	360 U
Benzo(g,h,i)perylene	330 U	360 U	104 %	115 %	360 U	360 U

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

JB 5/24/06

000000009

000016

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 03/28/06 15:20

RFW Batch Number: 0603L511 Client: TNUHANFORD RC-032 K0259 Work Order: 11343606001 Page: 2a

000000010

	Cust ID:	J11JP1		J11JP2		J11JP3		J11JP4		J11JP5		J11JP6	
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	60	%	71	%	75	%	63	%	65	%	67	%
	2-Fluorobiphenyl	60	%	74	%	76	%	76	%	67	%	80	%
	Terphenyl-d14	68	%	101	%	93	%	96	%	86	%	97	%
	Phenol-d5	64	%	79	%	80	%	73	%	71	%	81	%
	2-Fluorophenol	63	%	76	%	79	%	59	%	65	%	70	%
	2,4,6-Tribromophenol	72	%	73	%	80	%	76	%	69	%	86	%
			fl		fl		fl		fl		fl		fl
Phenol		370	U	350	U	360	U	360	U	360	U	360	U
bis(2-Chloroethyl)ether		370	U	350	U	360	U	360	U	360	U	360	U
2-Chlorophenol		370	U	350	U	360	U	360	U	360	U	360	U
1,3-Dichlorobenzene		370	U	350	U	360	U	360	U	360	U	360	U
1,4-Dichlorobenzene		370	U	350	U	360	U	360	U	360	U	360	U
1,2-Dichlorobenzene		370	U	350	U	360	U	360	U	360	U	360	U
2-Methylphenol		370	U	350	U	360	U	360	U	360	U	360	U
2,2'-oxybis(1-Chloropropane)		370	U	350	U	360	U	360	U	360	U	360	U
4-Methylphenol		370	U	350	U	360	U	360	U	360	U	360	U
N-Nitroso-di-n-propylamine		370	U	350	U	360	U	360	U	360	U	360	U
Hexachloroethane		370	U	350	U	360	U	360	U	360	U	360	U
Nitrobenzene		370	U	350	U	360	U	360	U	360	U	360	U
Isophorone		370	U J	350	U J	360	U J	360	U J	360	U J	360	U J
2-Nitrophenol		370	U	350	U	360	U	360	U	360	U	360	U
2,4-Dimethylphenol		370	U	350	U	360	U	360	U	360	U	360	U
bis(2-Chloroethoxy)methane		370	U	350	U	360	U	360	U	360	U	360	U
2,4-Dichlorophenol		370	U	350	U	360	U	360	U	360	U	360	U
1,2,4-Trichlorobenzene		370	U J	350	U J	360	U J	360	U J	360	U J	360	U J
Naphthalene		370	U	350	U	360	U	360	U	360	U	360	U
4-Chloroaniline		370	U	350	U	360	U	360	U	360	U	360	U
Hexachlorobutadiene		370	U	350	U	360	U	360	U	360	U	360	U
4-Chloro-3-methylphenol		370	U	350	U	360	U	360	U	360	U	360	U
2-Methylnaphthalene		370	U	350	U	360	U	360	U	360	U	360	U
Hexachlorocyclopentadiene		370	U	350	U	360	U	360	U	360	U	360	U
2,4,6-Trichlorophenol		370	U	350	U	360	U	360	U	360	U	360	U
2,4,5-Trichlorophenol		920	U	880	U	900	U	900	U	900	U	900	U

*= Outside of EPA CLP QC limits.

000017

5/29/06

Cust ID:	J11JP1		J11JP2		J11JP3		J11JP4		J11JP5		J11JP6	
RFW#:	005		006		007		008		009		010	
2-Chloronaphthalene	370	U	350	U	360	U	360	U	360	U	360	U
2-Nitroaniline	920	U	880	U	900	U	900	U	900	U	900	U
Dimethylphthalate	370	U	350	U	360	U	360	U	360	U	360	U
Acenaphthylene	370	U	350	U	360	U	360	U	360	U	360	U
2,6-Dinitrotoluene	370	U	350	U	360	U	360	U	360	U	360	U
3-Nitroaniline	920	U	880	U	900	U	900	U	900	U	900	U
Acenaphthene	370	U	350	U	360	U	360	U	360	U	360	U
2,4-Dinitrophenol	920	U J	880	U J	900	U J	900	U J	900	U J	900	U J
4-Nitrophenol	920	U	880	U	900	U	900	U	900	U	900	U
Dibenzofuran	370	U	350	U	360	U	360	U	360	U	360	U
2,4-Dinitrotoluene	370	U	350	U	360	U	360	U	360	U	360	U
Diethylphthalate	370	U	350	U	360	U	360	U	360	U	360	U
4-Chlorophenyl-phenylether	370	U	350	U	360	U	360	U	360	U	360	U
Fluorene	370	U	350	U	360	U	360	U	360	U	360	U
4-Nitroaniline	920	U	880	U	900	U	900	U	900	U	900	U
4,6-Dinitro-2-methylphenol	920	U	880	U	900	U	900	U	900	U	900	U
N-Nitrosodiphenylamine (1)	370	U	350	U	360	U	360	U	360	U	360	U
4-Bromophenyl-phenylether	370	U	350	U	360	U	360	U	360	U	360	U
Hexachlorobenzene	370	U	350	U	360	U	360	U	360	U	360	U
Pentachlorophenol	920	U	880	U	900	U	900	U	900	U	900	U
Phenanthrene	370	U	350	U	360	U	360	U	360	U	360	U
Anthracene	370	U	350	U	360	U	360	U	360	U	360	U
Carbazole	370	U	350	U	360	U	360	U	360	U	360	U
Di-n-butylphthalate	370	U	350	U	360	U	360	U	360	U	360	U
Fluoranthene	370	U	350	U	360	U	360	U	360	U	360	U
Pyrene	370	U	350	U	360	U	360	U	360	U	360	U
Butylbenzylphthalate	370	U	350	U	360	U	360	U	360	U	360	U
3,3'-Dichlorobenzidine	370	U	350	U	360	U	360	U	360	U	360	U
Benzo(a)anthracene	370	U	350	U	360	U	360	U	360	U	360	U
Chrysene	370	U	350	U	360	U	360	U	360	U	360	U
bis(2-Ethylhexyl)phthalate	LLO ~~70~~ 5/24/06	~~JB~~ U	LLO ~~43~~ 5/24/06	~~JB~~ U	LLO ~~36~~ 5/24/06	~~JB~~ U	LLO ~~41~~ 5/24/06	~~JB~~ U	LLO ~~32~~ 5/24/06	~~JB~~ U	LLO ~~65~~ 5/24/06	~~JB~~ U
Di-n-octyl phthalate	370	U	350	U	360	U	360	U	360	U	360	U
Benzo(b)fluoranthene	370	U	350	U	360	U	360	U	360	U	360	U
Benzo(k)fluoranthene	370	U	350	U	360	U	360	U	360	U	360	U
Benzo(a)pyrene	370	U	350	U	360	U	360	U	360	U	360	U
Indeno(1,2,3-cd)pyrene	370	U	350	U	360	U	360	U	360	U	360	U
Dibenz(a,h)anthracene	370	U	350	U	360	U	360	U	360	U	360	U
Benzo(g,h,i)perylene	370	U	350	U	360	U	360	U	360	U	360	U

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

JL 5/25/06

000018

000000011

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 03/28/06 15:20

RFW Batch Number: 0603L511 Client: TNUHANFORD RC-032 K0259 Work Order: 11343606001 Page: 3a

000000012

	Cust ID:	J11JP7		J11JP8		SBLKUY		SBLKUY BS	
Sample Information	RFW#:	011		012		06LE0193-MB1		06LE0193-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	49	%	59	%	79	%	70	%
	2-Fluorobiphenyl	57	%	63	%	73	%	94	%
	Terphenyl-d14	77	%	76	%	103	%	98	%
	Phenol-d5	53	%	65	%	79	%	87	%
	2-Fluorophenol	41	%	62	%	71	%	84	%
	2,4,6-Tribromophenol	63	%	55	%	48	%	95	%
Phenol		370	U	370	U	330	U	92	%
bis(2-Chloroethyl)ether		370	U	370	U	330	U	102	%
2-Chlorophenol		370	U	370	U	330	U	90	%
1,3-Dichlorobenzene		370	U	370	U	330	U	88	%
1,4-Dichlorobenzene		370	U	370	U	330	U	87	%
1,2-Dichlorobenzene		370	U	370	U	330	U	91	%
2-Methylphenol		370	U	370	U	330	U	86	%
2,2'-oxybis(1-Chloropropane)		370	U	370	U	330	U	101	%
4-Methylphenol		370	U	370	U	330	U	85	%
N-Nitroso-di-n-propylamine		370	U	370	U	330	U	99	%
Hexachloroethane		370	U	370	U	330	U	92	%
Nitrobenzene		370	U	370	U	330	U	69	%
Isophorone		370	U J	370	U J	330	U	75	%
2-Nitrophenol		370	U	370	U	330	U	58	%
2,4-Dimethylphenol		370	U	370	U	330	U	54	%
bis(2-Chloroethoxy)methane		370	U	370	U	330	U	70	%
2,4-Dichlorophenol		370	U	370	U	330	U	61	%
1,2,4-Trichlorobenzene		370	U J	370	U J	330	U	63	%
Naphthalene		370	U	370	U	330	U	63	%
4-Chloroaniline		370	U	370	U	330	U	72	%
Hexachlorobutadiene		370	U	370	U	330	U	71	%
4-Chloro-3-methylphenol		370	U	370	U	330	U	60	%
2-Methylnaphthalene		370	U	370	U	330	U	66	%
Hexachlorocyclopentadiene		370	U	370	U	330	U	85	%
2,4,6-Trichlorophenol		370	U	370	U	330	U	88	%
2,4,5-Trichlorophenol		930	U	930	U	840	U	85	%

*= Outside of EPA CLP QC limits.

000019

5/24/06

Cust ID:	J11JP7		J11JP8		SBLKUY		SBLKUY BS	
RFW#:	011		012		06LE0193-MB1		06LE0193-MB1	
2-Chloronaphthalene	370	U	370	U	330	U	92	%
2-Nitroaniline	930	U	930	U	840	U	96	%
Dimethylphthalate	370	U	370	U	330	U	95	%
Acenaphthylene	370	U	370	U	330	U	92	%
2,6-Dinitrotoluene	370	U	370	U	330	U	92	%
3-Nitroaniline	930	U	930	U	840	U	102	%
Acenaphthene	370	U	370	U	330	U	94	%
2,4-Dinitrophenol	930	U J	930	U J	840	U	14 *	%
4-Nitrophenol	930	U	930	U	840	U	74	%
Dibenzofuran	370	U	370	U	330	U	95	%
2,4-Dinitrotoluene	370	U	370	U	330	U	93	%
Diethylphthalate	370	U	370	U	330	U	99	%
4-Chlorophenyl-phenylether	370	U	370	U	330	U	98	%
Fluorene	370	U	370	U	330	U	97	%
4-Nitroaniline	930	U	930	U	840	U	88	%
4,6-Dinitro-2-methylphenol	930	U	930	U	840	U	73	%
N-Nitrosodiphenylamine (1)	370	U	370	U	330	U	80	%
4-Bromophenyl-phenylether	370	U	370	U	330	U	83	%
Hexachlorobenzene	370	U	370	U	330	U	97	%
Pentachlorophenol	930	U	930	U	840	U	62	%
Phenanthrene	370	U	370	U	330	U	104	%
Anthracene	370	U	370	U	330	U	103	%
Carbazole	370	U	370	U	330	U	100	%
Di-n-butylphthalate	370	U	370	U	330	U	103	%
Fluoranthene	370	U	370	U	330	U	103	%
Pyrene	370	U	370	U	330	U	102	%
Butylbenzylphthalate	370	U	370	U	330	U	101	%
3,3'-Dichlorobenzidine	370	U	370	U	330	U	99	%
Benzo(a)anthracene	370	U	370	U	330	U	102	%
Chrysene	370	U	22	J	330	U	104	%
bis(2-Ethylhexyl)phthalate	660 ~~28~~ 5/24/06 JB	U	660 ~~24~~ 5/24/06 JB	U	33	J	106	%
Di-n-octyl phthalate	370	U	370	U	330	U	91	%
Benzo(b)fluoranthene	370	U	370	U	330	U	96	%
Benzo(k)fluoranthene	370	U	29	J	330	U	98	%
Benzo(a)pyrene	370	U	33	J	330	U	97	%
Indeno(1,2,3-cd)pyrene	370	U	22	J	330	U	111	%
Dibenz(a,h)anthracene	370	U	370	U	330	U	108	%
Benzo(g,h,i)perylene	370	U	23	J	330	U	107	%

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

KS 5/24/06

000000013

000020

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Validation Final Checklist

SDG# _____

Narrative

- ☐ Date
- ☐ Title
- ☐ SDG number
- ☐ Lab designation
- ☐ Sample number table
- ☐ OTHER removed/added
- ☐ Field blanks
- ☐ Field duplicates
- ☐ Minor Deficiencies
- ☐ Summary Table

Excel

- ☐ Lab designation
- ☐ Field blank
- ☐ Field duplicates
- ☐ Qualifiers

- ☐ Form 1's match excel
- ☐ Qualifiers added
- ☐ Initialed and dated

☐ Read Narrative

Checklist

- ☐ 1st page complete
- ☐ All pages complete
- ☐ No's explained
- ☐ Qualifiers match
- ☐ FB & EB correct
- ☐ RQLs

☐ All pages present

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0603L511
SDG/SAF # K0259/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 03-14-2006

SEMIVOLATILE

Twelve (12) soil samples were collected on 03-09-2006.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 03-15-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 03-18,19,20,21-2006.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

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

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

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

4. Two (2) of ninety-six (96) surrogate recoveries were outside acceptance criteria. The analysis of associated matrix spike sample fulfills the reanalysis requirement of sample J11JN8 MSD.

5. Twenty-four (24) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

6. One (1) of sixty-four (64) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.

8. Internal standard area criteria were not met for the matrix spike duplicate and the blank spike samples. The GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly.

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 3 pages.

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LIONVILLE LABORATORY INC.

9. 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").

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

4/4/02
Date

som\gorup\data\bna\tnu-hanford\0603-511.doc

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 060508

Initiator: Robert Carter
Date: 3/31/06
Client: TWO Hanford RC032

Batch: 0603511
Samples: 06MS/06MSD/BS
Method: SW846/MCAWW/CLP/

Parameter: 0625H
Matrix: Soil
Prep Batch: 06E093

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)

Diphenone spike recovery outside acceptance limits in MS/MSD 59%/59% (60-120%)
Nitrobenzene spike in MSD (ok in MS) 48% (50-110%)
1,4 Trichlorobenzene spike in MS/MSD 54%/52% (60-120%)
2,4 dinitrophenol spike in BS 14% (20-120%) - ok in MS/MSD
Several spikes high in MS/MSD

2. Known or Probable Causes(s)

phenolic acid spikes are subject to erratic chromatographic behavior especially if GC system contaminated with higher boiling material
Not an extraction problem since other surrogate/spikes ok, spike nature of spike compds.

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: 3/31/06

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

5. Final Action...signature/date: 4/4/06 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	✓	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-032-025	Page 1 of 1

Collector Coffman	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH	Price Code 2E	Data Turnaround 15 DAY
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 1607-F-3 Verification B		SAF No. RC-032	Air Quality ☐	
Ice Chest No. ERC-99-061	Field Logbook No. EFL-1174-1	COA R607F32000	Method of Shipment Fed Ex		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060334		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA
<D.O.T. limits

Special Handling and/or Storage

~~Cool 4 degrees C~~ TRE 3-13-06

Cool 4degrees C

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	250g	120mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)										

Sample No.	Matrix *	Sample Date	Sample Time										
J11JN7	SOIL	3/9/06	0900	X	X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT COFFMAN / RT Coffman	1500 3/9/06	REEE #2A, 3728	1500 3/9/06
3728 #2A	3-16-06 / 1000	TRE Elmendorf / TRE Elmendorf	3-13-06 / 1000
WCH TRE Elmendorf / TRE Elmendorf	3-13-06 / 1000	FED EX	
FED EX	3-14-06 0920	[illegible]	3-14-06 0920
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

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref #2A on 3/13/06

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-032-026	Page 1 of 1

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAY	Air Quality ☐	
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification	SAF No.: RC-032	
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060334	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

LDOT limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.					
Sample No.	Matrix *	Sample Date	Sample Time								
J11JN8	SOIL	3/9/06	0915	X	X	X	X	X			
J11JN9	SOIL		0925	X	X	X	X	X			
J11JP0	SOIL		0935	X	X	X	X	X			
J11JP1	SOIL		0945	X	X	X	X	X			
J11JP2	SOIL	3/9/06	0955	X	X	X	X	X			

RTC 3/9/06

000027

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: RTCOFFMAN/RT Coffman	3/9/06 1500	Received By/Stored In: Refer #2A, 3728	3/9/06 1500
Relinquished By/Removed From: 3728 #2A	3-13-06/1000	Received By/Stored In: TR Schneider TR Schneider	3-13-06/1000
Relinquished By/Removed From: TR Schneider TR Schneider	3-13-06/1500	Received By/Stored In: FED EX	
Relinquished By/Removed From: FED EX	3-14-06 0920	Received By/Stored In:	3-14-06 0920
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

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable)

Personnel not available to Relinquish samples from 3728 Ref #2A on 3/13/06

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-032-026	Page 2 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code: 2E	Data Turnaround: 15 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification		SAF No.: RC-032	Air Quality ☐	
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex		
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060334		Bill of Lading/Air Bill No.: SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

< D.O.T. Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.					

000028

Sample No.	Matrix *	Sample Date	Sample Time										
J11JP3	SOIL	3/9/06	1005	X	X	X	X	X	RTC 3/9/06				
J11JP4	SOIL		1015	X	X	X	X	X					
J11JP5	SOIL		1025	X	X	X	X	X					
J11JP6	SOIL		1035	X	X	X	X	X					
J11JP7	SOIL	3/9/06	1045	X	X	X	X	X					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: RTC	Date/Time: 3/9/06	Received By/Stored In: RTC	Date/Time: 3/9/06
Relinquished By/Removed From: RT Coffman / RT Coffman	Date/Time: 3/9/06 1500	Received By/Stored In: REEF #2A, 3728	Date/Time: 3/9/06 1500
Relinquished By/Removed From: 3728 #2A	Date/Time: 3-13-06 / 1000	Received By/Stored In: TR Chamberlain / TR Chamberlain	Date/Time: 3-13-06 / 1000
Relinquished By/Removed From: WCH / TR Chamberlain / TR Chamberlain	Date/Time: 3-13-06 / 1500	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time: 3-14-06 0920	Received By/Stored In: [illegible]	Date/Time: 3-14-06 0920
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref #2A on 3/13/06

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-032-026	Page 1 of 1

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code: 2E	Data Turnaround: 15 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification		SAF No.: RC-032	Air Quality ☐	
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex		
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: A060334		Bill of Lading/Air Bill No.: SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

< D.O.T. Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	G/P				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	60mL	120mL	120mL	125mL	500mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions. RTC 3/9/06				

Sample No.	Matrix *	Sample Date	Sample Time										
J11JPB	SOIL	3/9/06	0915	X	X	X	X	X					

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: RT Coffman / RT Coffman	3/9/06 1500	Received By/Stored In: Referee #2A, 3728	3/9/06 1500
Relinquished By/Removed From: 3728 #2A	3-13-06 1000	Received By/Stored In: TR Edmundson / TR Edmundson	3-13-06 1000
Relinquished By/Removed From: TR Edmundson / TR Edmundson	3-13-06 1500	Received By/Stored In: FED EX	
Relinquished By/Removed From: FED EX	3-14-06 0920	Received By/Stored In: [illegible]	3-14-06 0920
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable)

Personnel not available to Relinquish samples from 3728 Ref #2A on 3/13/06

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-F-3			DATA PACKAGE: K0255		
VALIDATOR: TLI		LAB: LLI		DATE: 5/20/06	
			SDG: K0255		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)

SAMPLES/MATRIX					
J11JN8	J11JN9	J11JP0	J11JP1	J11JP2	J11JP3
J11JP4	J11JP5	J11JP6	J11JP7	J11JP8	J11NJ7
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: MB bis(2-ethylhexyl)phthalate - U at RQL - all

- FB - di-n-butyl phthalate in 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: MS/MSD isophorone 1,2,4 trichlorobenzene - J all

LCS 2,4-dinitrophenol - J all

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

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

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

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

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

Comments: _____

7. HOLDING TIMES (all levels)

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

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

Comments: 96 over

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 31 May 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 1607-F-3
Subject: Volatile Organics - Data Package No. K0259-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0259 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11JN8	3/9/06	Soil	C	VOAs by 8260B
J11JN9	3/9/06	Soil	C	VOAs by 8260B
J11JP0*	3/9/06	Soil	C	VOAs by 8260B
J11JP1	3/9/06	Soil	C	VOAs by 8260B
J11JP2	3/9/06	Soil	C	VOAs by 8260B
J11JP3	3/9/06	Soil	C	VOAs by 8260B
J11JP4	3/9/06	Soil	C	VOAs by 8260B
J11JP5	3/9/06	Soil	C	VOAs by 8260B
J11JP6	3/9/06	Soil	C	VOAs by 8260B
J11JP7	3/9/06	Soil	C	VOAs by 8260B
J11JP8	3/9/06	Soil	C	VOAs by 8260B

* - Re-prepared & reanalyzed.

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 analyzed within 14 days of the date of sample collection. If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less than twice the limit, all volatile organic results in sample J11JP0R were qualified as estimates and flagged "J".

All other holding times were met.

- **Method Blanks**

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

Due to method blank contamination, the methylene chloride results in all samples (except J11JP0 & J11JP7) were qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

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

Due to the lack of a matrix spike/matrix spike duplicate analysis, all volatile organic results in samples J11JP0, J11JP0R, J11JN9, J11JP3, J11JP7 and J11JP8 were qualified as estimates and flagged "J".

Due to the lack of an LCS analysis, all volatile organic results in samples J11JP0, J11JN9, J11JP3, J11JP7 and J11JP8 were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

Due to the lack of a matrix spike/matrix spike duplicate analysis, all volatile organic results in samples J11JP0, J11JP0R, J11JN9, J11JP3, J11JP7 and J11JP8 were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J11JN8/J11JP8) 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. Thirty-two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. K0259 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the holding time being exceeded by less than twice the limit, all volatile organic results in sample J11JP0R were qualified as estimates and flagged "J".

- Due to method blank contamination, the methylene chloride results in all samples (except J11JP0 & J11JP7) were qualified as undetected and flagged "U".

- Due to the lack of a matrix spike/matrix spike duplicate analysis, all volatile organic results in samples J11JP0, J11JP0R, J11JN9, J11JP3, J11JP7 and J11JP8 were qualified as estimates and flagged "J".

- Due to the lack of an LCS analysis, all volatile organic results in samples J11JP0, J11JN9, J11JP3, J11JP7 and J11JP8 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.

Thirty-two 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.

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Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

VOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: K0259	REVIEWER: TLI	Project: 100-F-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	J11JP0R	Holding time exceeded
Methylene chloride	U	J11JN8, J11JN9 J11JP0R, J11JP1 J11JP2, J11JP3 J11JP4, J11JP5 J11JP6, J11JP8	Blank contamination
All	J	J11JP0, J11JP0R J11JN9, J11JP3 J11JP7, J11JP8	No MS/MSD analysis
All	J	J11JP0, J11JN9 J11JP3, J11JP7 J11JP8	No LCS

* - 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

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI																			
Case:	SDG: K0259																		
Sample Number		J11JN8		J11JN9		J11JP0		J11JP0R		J11JP1		J11JP2		J11JP3		J11JP4		J11JP5	
Remarks		Duplicate						REPREP											
Sample Date		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06	
Analysis Date		3/22/06		3/22/06		3/22/06		3/22/06		3/22/06		3/22/06		3/22/06		3/22/06		3/22/06	
VOA	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	UJ	11	UJ	11	UJ	10	U	10	U	10	UJ	10	U	10	U
Bromomethane	10	10	U	10	UJ	11	UJ	11	UJ	10	U	10	U	10	UJ	10	U	10	U
Vinyl Chloride	10	10	U	10	UJ	11	UJ	11	UJ	10	U	10	U	10	UJ	10	U	10	U
Chloroethane	10	10	U	10	UJ	11	UJ	11	UJ	10	U	10	U	10	UJ	10	U	10	U
Methylene Chloride	10	18	U	15	UJ	37	J	25	UJ	19	U	15	U	19	UJ	11	U	18	U
Acetone	10	10	U	10	UJ	11	UJ	11	UJ	10	U	10	U	10	UJ	10	U	10	U
Carbon Disulfide	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
1,1-Dichloroethene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
1,1-Dichloroethane	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
1,2-Dichloroethene (total)	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Chloroform	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
1,2-Dichloroethane	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
2-Butanone	10	10	U	10	UJ	11	UJ	11	UJ	10	U	10	U	10	UJ	10	U	10	U
1,1,1-Trichloroethane	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Carbon Tetrachloride	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Bromodichloromethane	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
1,2-Dichloropropane	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
cis-1,3-Dichloropropene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Trichloroethene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Dibromochloromethane	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
1,1,2-Trichloroethane	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Benzene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
trans-1,3-Dichloropropene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Bromoform	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
4-Methyl-2-pentanone	10	10	U	10	UJ	11	UJ	11	UJ	10	U	10	U	10	UJ	10	U	10	U
2-Hexanone	10	10	U	10	UJ	11	UJ	11	UJ	10	U	10	U	10	UJ	10	U	10	U
Tetrachloroethene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
1,1,2,2-Tetrachloroethane	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Toluene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Chlorobenzene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Ethylbenzene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	1	
Styrene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
Xylene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	4	
M&P Xylene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	2	
O-Xylene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	1	
cis-1,2-Dichloroethene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U
trans-1,2-Dichloroethene	10	5	U	5	UJ	6	UJ	6	UJ	6	U	5	U	5	UJ	5	U	5	U

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

000016

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI																			
Case:	SDG: K0259																		
Sample Number		J11JP6		J11JP7		J11JP8													
Remarks																			
Sample Date		3/9/06		3/9/06		3/9/06													
Analysis Date		3/22/06		3/23/06		3/23/06													
VOA	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	11	UJ	11	UJ												
Bromomethane	10	10	U	11	UJ	11	UJ												
Vinyl Chloride	10	10	U	11	UJ	11	UJ												
Chloroethane	10	10	U	11	UJ	11	UJ												
Methylene Chloride	10	21	U	43	J	27	UJ												
Acetone	10	10	U	11	UJ	11	UJ												
Carbon Disulfide	10	5	U	6	UJ	6	UJ												
1,1-Dichloroethene	10	5	U	6	UJ	6	UJ												
1,1-Dichloroethane	10	5	U	6	UJ	6	UJ												
1,2-Dichloroethene (total)	10	5	U	6	UJ	6	UJ												
Chloroform	10	5	U	6	UJ	6	UJ												
1,2-Dichloroethane	10	5	U	6	UJ	6	UJ												
2-Butanone	10	10	U	11	UJ	11	UJ												
1,1,1-Trichloroethane	10	5	U	6	UJ	6	UJ												
Carbon Tetrachloride	10	5	U	6	UJ	6	UJ												
Bromodichloromethane	10	5	U	6	UJ	6	UJ												
1,2-Dichloropropane	10	5	U	6	UJ	6	UJ												
cis-1,3-Dichloropropene	10	5	U	6	UJ	6	UJ												
Trichloroethene	10	5	U	6	UJ	6	UJ												
Dibromochloromethane	10	5	U	6	UJ	6	UJ												
1,1,2-Trichloroethane	10	5	U	6	UJ	6	UJ												
Benzene	10	5	U	6	UJ	6	UJ												
trans-1,3-Dichloropropene	10	5	U	6	UJ	6	UJ												
Bromoform	10	5	U	6	UJ	6	UJ												
4-Methyl-2-pentanone	10	10	U	11	UJ	11	UJ												
2-Hexanone	10	10	U	11	UJ	11	UJ												
Tetrachloroethene	10	5	U	2	J	6	UJ												
1,1,2,2-Tetrachloroethane	10	5	U	6	UJ	6	UJ												
Toluene	10	5	U	1	J	6	UJ												
Chlorobenzene	10	5	U	6	UJ	6	UJ												
Ethylbenzene	10	5	U	2	J	6	UJ												
Styrene	10	5	U	6	UJ	6	UJ												
Xylene	10	5	U	6	J	6	UJ												
M&P Xylene	10	5	U	4	J	6	UJ												
O-Xylene	10	5	U	2	J	6	UJ												
cis-1,2-Dichloroethene	10	5	U	6	UJ	6	UJ												
trans-1,2-Dichloroethene	10	5	U	6	UJ	6	UJ												

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

000017

Volatiles by GC/MS, HSL List

Report Date: 03/29/06 16:00

RFW Batch Number: 0603L511 Client: TNUHANFORD RC-032 K0259 Work Order: 11343606001 Page: 1a

	Cust ID:	J11JN8	J11JN9	J11JP0	J11JP0	J11JP1	J11JP2
Sample Information	RFW#:	002	003	004	004	005	006
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.943	0.943	1.00	0.980	0.980	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
					REPREP		
Surrogate Recovery	Toluene-d8	103 %	100 %	118 %	104 %	103 %	98 %
	Bromofluorobenzene	87 %	86 %	94 %	82 %	86 %	85 %
	1,2-Dichloroethane-d4	89 %	84 %	73 %	82 %	91 %	82 %
		fl	fl	fl	fl	fl	fl
Chloromethane		10 U	10 U J	11 U J	11 U J	11 U	10 U
Bromomethane		10 U	10 U	11 U	11 U	11 U	10 U
Vinyl Chloride		10 U	10 U	11 U	11 U	11 U	10 U
Chloroethane		10 U	10 U	11 U	11 U	11 U	10 U
Methylene Chloride		18 ~~B~~U	15 ~~B~~U	37 ~~B~~	25 ~~B~~U	19 ~~B~~U	15 ~~B~~U
Acetone		10 U	10 U	11 U	11 U	11 U	10 U
Carbon Disulfide		5 U	5 U	6 U	6 U	6 U	5 U
1,1-Dichloroethene		5 U	5 U	6 U	6 U	6 U	5 U
1,1-Dichloroethane		5 U	5 U	6 U	6 U	6 U	5 U
1,2-Dichloroethene (total)		5 U	5 U	6 U	6 U	6 U	5 U
Chloroform		5 U	5 U	6 U	6 U	6 U	5 U
1,2-Dichloroethane		5 U	5 U	6 U	6 U	6 U	5 U
2-Butanone		10 U	10 U	11 U	11 U	11 U	10 U
1,1,1-Trichloroethane		5 U	5 U	6 U	6 U	6 U	5 U
Carbon Tetrachloride		5 U	5 U	6 U	6 U	6 U	5 U
Bromodichloromethane		5 U	5 U	6 U	6 U	6 U	5 U
1,2-Dichloropropane		5 U	5 U	6 U	6 U	6 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	6 U	6 U	6 U	5 U
Trichloroethene		5 U	5 U	6 U	6 U	6 U	5 U
Dibromochloromethane		5 U	5 U	6 U	6 U	6 U	5 U
1,1,2-Trichloroethane		5 U	5 U	6 U	6 U	6 U	5 U
Benzene		5 U	5 U	6 U	6 U	6 U	5 U
Trans-1,3-Dichloropropene		5 U	5 U	6 U	6 U	6 U	5 U
Bromoform		5 U	5 U	6 U	6 U	6 U	5 U
4-Methyl-2-pentanone		10 U	10 U	11 U	11 U	11 U	10 U
2-Hexanone		10 U	10 U	11 U	11 U	11 U	10 U
Tetrachloroethene		5 U	5 U	6 U	6 U	6 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	6 U	6 U	6 U	5 U
Toluene		5 U	5 U	6 U	6 U	6 U	5 U

*= Outside of EPA CLP QC limits.

K 5/29/06

000000008

000018

RFW Batch Number: [illegible] Client: [illegible] Work Order: [illegible] Page: [illegible]

Cust ID:	J11JN8	J11JN9	J11JP0	J11JP0	J11JP1	J11JP2
RFW#:	002	003	004	004 REPREP	005	006
Chlorobenzene	5 U	5 U J	6 U J	6 U J	6 U	5 U
Ethylbenzene	5 U	5 U	6 U	6 U	6 U	5 U
Styrene	5 U	5 U	6 U	6 U	6 U	5 U
Xylene (total)	5 U	5 U	6 U	6 U	6 U	5 U
M&P Xylene	5 U	5 U	6 U	6 U	6 U	5 U
O-Xylene	5 U	5 U	6 U	6 U	6 U	5 U
cis-1,2-Dichloroethene	5 U	5 U	6 U	6 U	6 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	6 U	6 U	6 U	5 U

*= Outside of EPA CLP QC limits.

000000009

000019

5/24/06

Volatiles by GC/MS, HSL List

Report Date: 03/29/06 16:00

RFW Batch Number: 0603L511 Client: TNUHANFORD RC-032 K0259 Work Order: 11343606001 Page: 2a

000000010

	Cust ID:	J11JP3	J11JP4	J11JP4	J11JP4	J11JP5	J11JP6
Sample Information	RFW#:	007	008	008 MS	008 MSD	009	010
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.926	0.893	0.909	0.980	0.909	0.962
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	Toluene-d8	98 %	96 %	105 %	106 %	100 %	104 %
	Bromofluorobenzene	81 %	83 %	95 %	95 %	85 %	78 %
	1,2-Dichloroethane-d4	81 %	86 %	95 %	94 %	82 %	86 %
		fl	fl	fl	fl	fl	fl
Chloromethane		10 U J	10 U	79 %	87 %	10 U	10 U
Bromomethane		10 U	10 U	76 %	88 %	10 U	10 U
Vinyl Chloride		10 U	10 U	81 %	93 %	10 U	10 U
Chloroethane		10 U	10 U	88 %	110 %	10 U	10 U
Methylene Chloride		19 ~~B~~U	11 ~~B~~U	88 %	109 %	18 ~~B~~U	21 ~~B~~U
Acetone		10 U	10 U	127 %	114 %	10 U	10 U
Carbon Disulfide		5 U	5 U	99 %	110 %	5 U	5 U
1,1-Dichloroethene		5 U	5 U	99 %	114 %	5 U	5 U
1,1-Dichloroethane		5 U	5 U	91 %	104 %	5 U	5 U
1,2-Dichloroethene (total)		5 U	5 U	91 %	104 %	5 U	5 U
Chloroform		5 U	5 U	88 %	100 %	5 U	5 U
1,2-Dichloroethane		5 U	5 U	85 %	97 %	5 U	5 U
2-Butanone		10 U	10 U	99 %	97 %	10 U	10 U
1,1,1-Trichloroethane		5 U	5 U	87 %	101 %	5 U	5 U
Carbon Tetrachloride		5 U	5 U	89 %	102 %	5 U	5 U
Bromodichloromethane		5 U	5 U	93 %	107 %	5 U	5 U
1,2-Dichloropropane		5 U	5 U	90 %	106 %	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	89 %	103 %	5 U	5 U
Trichloroethene		5 U	5 U	99 %	111 %	5 U	5 U
Dibromochloromethane		5 U	5 U	104 %	121 %	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	95 %	110 %	5 U	5 U
Benzene		5 U	5 U	90 %	104 %	5 U	5 U
Trans-1,3-Dichloropropene		5 U	5 U	87 %	98 %	5 U	5 U
Bromoform		5 U	5 U	110 %	131 %	5 U	5 U
4-Methyl-2-pentanone		10 U	10 U	92 %	95 %	10 U	10 U
2-Hexanone		10 U	10 U	90 %	88 %	10 U	10 U
Tetrachloroethene		5 U	5 U	95 %	109 %	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	84 %	93 %	5 U	5 U
Toluene		5 U	5 U	93 %	108 %	5 U	5 U

*= Outside of EPA CLP QC limits.

5/27/06

000020

RFW Batch Number: [illegible] Client: [illegible] Work Order: [illegible] Page: [illegible]

Cust ID:	J11JP3	J11JP4	J11JP4	J11JP4	J11JP5	J11JP6
RFW#:	007	008	008 MS	008 MSD	009	010
Chlorobenzene	5 U J	5 U	87 %	102 %	5 U	5 U
Ethylbenzene	5 U	5 U	91 %	106 %	1 J	5 U
Styrene	5 U	5 U	85 %	100 %	5 U	5 U
Xylene (total)	5 U	5 U	87 %	102 %	4 J	5 U
M&P Xylene	5 U	5 U	88 %	103 %	2 J	5 U
O-Xylene	5 U	5 U	85 %	101 %	1 J	5 U
cis-1,2-Dichloroethene	5 U	5 U	88 %	99 %	5 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	95 %	109 %	5 U	5 U

*= Outside of EPA CLP QC limits.

5/29/a

000000811

000021

Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

Report Date: 03/29/06 16:00

RFW Batch Number: **0603L511** Client: **TNUHANFORD RC-032 K0259** Work Order: 11343606001 Page: 3a

000000012

	Cust ID:	J11JP7		J11JP8		VBLKUL		VBLKUL BS		VBLKUM		VBLKUC	
Sample Information	RFW#:	011		012		06LVX066-MB1		06LVX066-MB1		06LXV069-MB1		06LVX070-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	0.962		0.980		1.00		1.00		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Toluene-d8	102	%	101	%	98	%	95	%	96	%	99	%
	Bromofluorobenzene	93	%	79	%	94	%	91	%	88	%	88	%
	1,2-Dichloroethane-d4	92	%	85	%	88	%	86	%	83	%	80	%
		fl		fl		fl		fl		fl		fl	
Chloromethane		11	U J	11	U J	10	U	87	%	10	U	10	U
Bromomethane		11	U	11	U	10	U	97	%	10	U	10	U
Vinyl Chloride		11	U	11	U	10	U	94	%	10	U	10	U
Chloroethane		11	U	11	U	10	U	111	%	10	U	10	U
Methylene Chloride		43	B	27	B U	6		101	%	3	J	7	
Acetone		11	U	11	U	10	U	54	%	10	U	10	U
Carbon Disulfide		6	U	6	U	5	U	126	%	5	U	5	U
1,1-Dichloroethene		6	U	6	U	5	U	117	%	5	U	5	U
1,1-Dichloroethane		6	U	6	U	5	U	104	%	5	U	5	U
1,2-Dichloroethene (total)		6	U	6	U	5	U	104	%	5	U	5	U
Chloroform		6	U	6	U	5	U	99	%	5	U	5	U
1,2-Dichloroethane		6	U	6	U	5	U	86	%	5	U	5	U
2-Butanone		11	U	11	U	10	U	52	%	10	U	10	U
1,1,1-Trichloroethane		6	U	6	U	5	U	104	%	5	U	5	U
Carbon Tetrachloride		6	U	6	U	5	U	99	%	5	U	5	U
Bromodichloromethane		6	U	6	U	5	U	100	%	5	U	5	U
1,2-Dichloropropane		6	U	6	U	5	U	98	%	5	U	5	U
cis-1,3-Dichloropropene		6	U	6	U	5	U	94	%	5	U	5	U
Trichloroethene		6	U	6	U	5	U	99	%	5	U	5	U
Dibromochloromethane		6	U	6	U	5	U	99	%	5	U	5	U
1,1,2-Trichloroethane		6	U	6	U	5	U	84	%	5	U	5	U
Benzene		6	U	6	U	5	U	96	%	5	U	5	U
Trans-1,3-Dichloropropene		6	U	6	U	5	U	83	%	5	U	5	U
Bromoform		6	U	6	U	5	U	98	%	5	U	5	U
4-Methyl-2-pentanone		11	U	11	U	10	U	58	%	10	U	10	U
2-Hexanone		11	U	11	U	10	U	49	%	10	U	10	U
Tetrachloroethene		2		6	U	5	U	98	%	5	U	5	U
1,1,2,2-Tetrachloroethane		6	U	6	U	5	U	64	%	5	U	5	U
Toluene		1		6	U	5	U	91	%	5	U	5	U

*= Outside of EPA CLP QC limits.

220000

5/29/06

Cust ID:	J11JP7	J11JP8	VBLKUL	VBLKUL BS	VBLKUM	VBLKUC
RFW#:	011	012	06LVX066-MB1	06LVX066-MB1	06LXV069-MB1	06LVX070-MB1
Chlorobenzene	6 U J	6 U J	5 U	88 %	5 U	5 U
Ethylbenzene	2 J	6 U	5 U	92 %	5 U	5 U
Styrene	6 U	6 U	5 U	92 %	5 U	5 U
Xylene (total)	6	6 U	5 U	88 %	5 U	5 U
M&P Xylene	4 J	6 U	5 U	90 %	5 U	5 U
O-Xylene	2 J	6 U	5 U	85 %	5 U	5 U
cis-1,2-Dichloroethene	6 U	6 U	5 U	98 %	5 U	5 U
trans-1,2-Dichloroethene	6 U	6 U	5 U	111 %	5 U	5 U

*= Outside of EPA CLP QC limits.

5/24/04

000000013

000023

Cust ID: VBLKUC BS

Sample Information

RFW#: 06LVX070-MB1
Matrix: SOIL
D.F.: 1.00
Units: UG/KG

Surrogate Recovery	Toluene-d8	96	%
	Bromofluorobenzene	90	%
	1,2-Dichloroethane-d4	86	%

==========fl==========fl==========fl==========fl==========fl==========fl

Chloromethane	78	%
Bromomethane	92	%
Vinyl Chloride	84	%
Chloroethane	107	%
Methylene Chloride	93	%
Acetone	70	%
Carbon Disulfide	108	%
1,1-Dichloroethene	109	%
1,1-Dichloroethane	101	%
1,2-Dichloroethene (total)	102	%
Chloroform	97	%
1,2-Dichloroethane	87	%
2-Butanone	76	%
1,1,1-Trichloroethane	99	%
Carbon Tetrachloride	96	%
Bromodichloromethane	103	%
1,2-Dichloropropane	100	%
cis-1,3-Dichloropropene	101	%
Trichloroethene	98	%
Dibromochloromethane	113	%
1,1,2-Trichloroethane	99	%
Benzene	99	%
Trans-1,3-Dichloropropene	94	%
Bromoform	125	%
4-Methyl-2-pentanone	84	%
2-Hexanone	76	%
Tetrachloroethene	100	%
1,1,2,2-Tetrachloroethane	88	%
Toluene	98	%

*= Outside of EPA CLP QC limits.

K 5/24/06

000000014

000024

Cust ID: **VBLKUC BS**

RFW#: **06LVX070-MB1**

Chlorobenzene	93	%
Ethylbenzene	98	%
Styrene	99	%
Xylene (total)	96	%
M&P Xylene	97	%
O-Xylene	93	%
cis-1,2-Dichloroethene	99	%
trans-1,2-Dichloroethene	106	%

*= Outside of EPA CLP QC limits.

5/29/06

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000000015

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0603L511
SDG/SAF # K0259/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 03-14-2006

GC/MS VOLATILE

Eleven (11) soil samples were collected on 03-09-2006.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for TCL volatile target compounds on 03-22,23,24-2006.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

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

2. All samples were initially analyzed within required holding time; however, sample J11JP0 was reanalyzed outside the holding time. All analyses were reported. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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

4. All surrogate recoveries were within acceptance criteria.

5. All matrix spike recoveries were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. The method blanks contained the common laboratory contaminant Methylene Chloride at levels less than 2x the CRQL.

8. Internal standard area criteria were not met for sample J11JP0. The sample was reanalyzed on 03-24-2006 and reported.

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 7 pages.

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

9. 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").

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
som\group\data\voa\tmu-hanford\0603-511.doc

4/3/07
Date

LVLI
LIONVILLE LABORATORY INC.

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06VT040

Initiator: [illegible] Batch: 06B3L511 Parameter: 8260
Date: 3/26/06 Samples: 0004 R1 Matrix: Soil
Client: [illegible] Method: SW846/MCAWW/CLP/ Prep Batch: —

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)

First 2 attempts (on 3/22 & 3/23): Sample clogged sponge needle - No good.
3rd attempt (3/23): Sample ran, 15 areas were all low.
Reanalysis was done on 3/24, one day out of hold.

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:

Report run w/ 15 areas low as OOD, report out of hold run as R1. New data.

3/27/06

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: 3/29/06

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
X 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-032-026	Page 1 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification	SAF No.: RC-032	Air Quality ☐
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060334	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

LD.O.T. limits

Special Handling and/or Storage

Cool 4 degrees C

000030

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.					

Sample No.	Matrix *	Sample Date	Sample Time										
J11JN8	SOIL	3/9/06	0915	X	X	X	X	X					
J11JN9	SOIL		0925	X	X	X	X	X					
J11JP0	SOIL		0935	X	X	X	X	X					
J11JP1	SOIL		0945	X	X	X	X	X					
J11JP2	SOIL	3/9/06	0955	X	X	X	X	X					

RTC 3/9/06

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RTCoffman/RT Coffman	3/9/06 1500	Refer #2A, 3728	3/9/06 1500
3728 #2A	3-13-06/1000	TR Edmundson TR Edmundson	3-13-06/1000
TR Edmundson TR Edmundson	3-13-06/1500	FED EX	
FED EX	3-14-06 0920		3-14-06 0920

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}: Gamma Spec - Add-on (Silver-108 metastable)

Personnel not available to Relinquish samples from 3728 Ref #2A on 3/13/06

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-032-026** | Page 2 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAYS	Air Quality ☐	
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification		SAF No.: RC-032
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060334		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

< D.O.T. Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	100mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.					

000031

Sample No.	Matrix *	Sample Date	Sample Time										
J11JP3	SOIL	3/9/06	1005	X	X	X	X	X					
J11JP4	SOIL		1015	X	X	X	X	X					
J11JP5	SOIL		1025	X	X	X	X	X					
J11JP6	SOIL		1035	X	X	X	X	X					
J11JP7	SOIL	3/9/06	1045	X	X	X	X	X					

RTC 3/9/06

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
~~Relinquished By/Removed From~~ RTC	~~3/9/06~~	~~Received By/Stored In~~ RTC	~~3/9/06~~
RT Coffman / RT Coffman	3/9/06 1500	REGEE #2A, 3728	3/9/06 1500
3728 #2A	3-13-06 / 1000	TR Edmundson / TR Edmundson	3-13-06 / 1000
TR Edmundson / TR Edmundson	3-13-06 / 1500	FED EX	
FED EX	3-14-06 0920	[illegible]	3-14-06 0920
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref #2A on 3/13/06

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-032-026	Page 1 of 1

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification		SAF No.: RC-032
Air Quality ☐			
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: A060334		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA
< D.O.T. Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	G/P				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	60mL	120mL	120mL	125mL	500mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions. RTC 3/9/06				

000032

Sample No.	Matrix *	Sample Date	Sample Time									
J11JP8	SOIL	3/9/06	0915	X	X	X	X	X				

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: RT Coffman / RT Coffman — Date/Time: 3/9/06 1500	Received By/Stored In: Reefer #2A, 3728 — Date/Time: 3/9/06 1500
Relinquished By/Removed From: 3728 # 2A — Date/Time: 3-13-06 / 1000	Received By/Stored In: TR Edmundson TR Edmundson — Date/Time: 3-13-06 / 1000
Relinquished By/Removed From: Veh # TR Edmundson TR Edmundson — Date/Time: 3-13-06 1500	Received By/Stored In: FED EX — Date/Time:
Relinquished By/Removed From: FED EX — Date/Time: 3-14-06 0920	Received By/Stored In: [illegible] — Date/Time: 3-14-06 0920
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

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref #2A on 3/13/06

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: 1607-F-3			DATA PACKAGE: K0259		
VALIDATOR: TLI		LAB: LLI		DATE: 5/20/06	
			SDG: K0259		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J11JN4	J11JN9	J11JP6	J11JP1	J11JP2	J11JP3
J11JP4	J11JP5	J11JP6	J11JP7	J11JP8	
					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: methylen Chloride – all U except P05 P7

no PB

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no ms/msD for N9, P0, P0R, P3, P7, P8 – J all

no LCS for N9, P0, ~~P0R~~ 3/2, P3, P7, P8 – J all

no P15

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: no ms/msd for N9, P0, P0R, P3, P7, P8 – Jeff

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: J11JP0R- Hold time exceeded ~ J

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: 32 over

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 31 May 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 1607-F-3
Subject: Radiochemistry - Data Package No. K0259-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0259 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11JN8	3/9/06	Soil	C	See note 1
J11JN9	3/9/06	Soil	C	See note 1
J11JP0	3/9/06	Soil	C	See note 1
J11JP1	3/9/06	Soil	C	See note 1
J11JP2	3/9/06	Soil	C	See note 1
J11JP3	3/9/06	Soil	C	See note 1
J11JP4	3/9/06	Soil	C	See note 1
J11JP5	3/9/06	Soil	C	See note 1
J11JP6	3/9/06	Soil	C	See note 1
J11JP7	3/9/06	Soil	C	See note 1
J11JP8	3/9/06	Soil	C	See note 1

1 – Gamma spectroscopy.

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.

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J11JP8/J11JN8) was submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicates 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. Fifty-three analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0259 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

Fifty-three 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: K0259	REVIEWER: TLI	Project: 1607-F-3	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

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: WASHINGTON CLOSURE HANFORD
Laboratory: EB
Case SDG: K0259

Sample Number		J11JN8		J11JN9		J11JP0		J11JP1		J11JP2		J11JP3		J11JP4		J11JP5	
Remarks		Duplicate															
Sample Date		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Potassium-40		10.6		10.4		13.6		11.6		12.0		9.18		12.9		10.8	
Cobalt 60	0.05	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Cesium 137	0.05	U	U*	U	U*	0.112		U	U*	U	U*	U	U*	U	U*	U	U*
Radium-226		0.437		0.339		0.604		0.342		0.320		0.433		0.471		0.484	
Radium-228		0.626		0.307		0.833		0.609		0.504		0.776		0.526		0.863	
Europium 152	0.1	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*
Europium 155	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Thorium-228		0.667		0.642		0.628		0.402		0.482		0.606		0.829		0.575	
Thorium-232		0.626		0.307		0.833		0.609	J	0.504		0.776		0.526		0.863	
Uranium-235(gea)		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
Americium-241(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Silver-108m		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

Sample Number		J11JP6		J11JP7		J11JP8	
Remarks							
Sample Date		3/9/06		3/9/06		3/9/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q
Potassium-40		13.1		12.4		12.2	
Cobalt 60	0.05	U	U*	U	U*	U	U*
Cesium 137	0.05	U	U*	U	U*	0.140	
Radium-226		0.397		0.598		0.372	
Radium-228		0.825		1.30		0.508	
Europium 152	0.1	U	U*	U	U*	U	U*
Europium 154	0.1	U	U*	U	U*	U	U*
Europium 155	0.1	U	U*	U	U*	U	U*
Thorium-228		0.667		0.651		0.615	
Thorium-232		0.825		1.30		0.508	
Uranium-235(gea)		U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U
Americium-241(gea)		U	U	U	U	U	U
Silver-108m		U	U	U	U	U	U

000070

* - 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 K0259

R603087-01 J11JN8

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG K0259
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R603087-01	Client sample id	J11JN8	
Dept sample id	7741-001	Location/Matrix	1607-F-3 Verification	SOLID
Received	03/14/06	Collected/Weight	03/09/06 09:15	559 g
% solids	90.7	Custody/SAF No	RC-032-026	RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	10.6	2.3	0.74			GAM
Cobalt 60	10198-40-0	U		0.079	0.050	U	GAM
Cesium 137	10045-97-3	U		0.094	0.10	U	GAM
Radium 226	13982-63-3	0.437	0.14	0.13	0.10		GAM
Radium 228	15262-20-1	0.626	0.32	0.34	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		0.17	0.10	U	GAM
Thorium 228	14274-82-9	0.667	0.13	0.12			GAM
Thorium 232	TH-232	0.626	0.32	0.34			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		8.5		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Silver 108m	14391-65-2	U		0.050		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/29/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-02 J11JN9

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-02	Client sample id	J11JN9		
Dept sample id	7741-002	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 09:25	632 g	
% solids	93.4	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	10.4	1.5	0.92			GAM
Cobalt 60	10198-40-0	U		0.075	0.050	U	GAM
Cesium 137	10045-97-3	U		0.084	0.10	U	GAM
Radium 226	13982-63-3	0.339	0.15	0.17	0.10		GAM
Radium 228	15262-20-1	0.307	0.28	0.35	0.20	U	GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	0.642	0.13	0.13			GAM
Thorium 232	TH-232	0.307	0.28	0.35		U	GAM
Uranium 235	15117-96-1	U		0.26		U	GAM
Uranium 238	U-238	U		9.3		U	GAM
Americium 241	14596-10-2	U		0.20		U	GAM
Silver 108m	14391-65-2	U		0.059		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/29/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-03 J11JP0

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG_K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-03	Client sample id	J11JP0		
Dept sample id	7741-003	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 09:35	917 g	
% solids	90.9	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	13.6	1.5	0.65			GAM
Cobalt 60	10198-40-0	U		0.084	0.050	U	GAM
Cesium 137	10045-97-3	0.112	0.084	0.093	0.10		GAM
Radium 226	13982-63-3	0.604	0.14	0.13	0.10		GAM
Radium 228	15262-20-1	0.833	0.28	0.26	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.28	0.10	U	GAM
Europium 155	14391-16-3	U		0.19	0.10	U	GAM
Thorium 228	14274-82-9	0.628	0.086	0.088			GAM
Thorium 232	TH-232	0.833	0.28	0.26			GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		10		U	GAM
Americium 241	14596-10-2	U		0.35		U	GAM
Silver 108m	14391-65-2	U		0.053		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/29/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-04 J11JP1

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-04	Client sample id	J11JP1		
Dept sample id	7741-004	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 09:45	663 g	
% solids	90.9	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	11.6	2.0	0.85			GAM
Cobalt 60	10198-40-0	U		0.083	0.050	U	GAM
Cesium 137	10045-97-3	U		0.073	0.10	U	GAM
Radium 226	13982-63-3	0.342	0.13	0.13	0.10		GAM
Radium 228	15262-20-1	0.609	0.28	0.29	0.20		GAM
Europium 152	14683-23-9	U		0.17	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	0.402	0.071	0.076			GAM
Thorium 232	TH-232	0.609	0.28	0.29			GAM
Uranium 235	15117-96-1	U		0.26		U	GAM
Uranium 238	U-238	U		8.3		U	GAM
Americium 241	14596-10-2	U		0.24		U	GAM
Silver 108m	14391-65-2	U		0.042		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-05 J11JP2

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-05	Client sample id	J11JP2		
Dept sample id	7741-005	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 09:55	725 g	
% solids	96.0	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	12.0	2.0	0.65			GAM
Cobalt 60	10198-40-0	U		0.064	0.050	U	GAM
Cesium 137	10045-97-3	U		0.062	0.10	U	GAM
Radium 226	13982-63-3	0.320	0.12	0.12	0.10		GAM
Radium 228	15262-20-1	0.504	0.26	0.27	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		0.15	0.10	U	GAM
Thorium 228	14274-82-9	0.482	0.11	0.11			GAM
Thorium 232	TH-232	0.504	0.26	0.27			GAM
Uranium 235	15117-96-1	U		0.23		U	GAM
Uranium 238	U-238	U		7.4		U	GAM
Americium 241	14596-10-2	U		0.23		U	GAM
Silver 108m	14391-65-2	U		0.045		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/29/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-06 J11JP3

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-06	Client sample id	J11JP3		
Dept sample id	7741-006	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 10:05	634 g	
% solids	93.0	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	9.18	1.4	0.73			GAM
Cobalt 60	10198-40-0	U		0.088	0.050	U	GAM
Cesium 137	10045-97-3	U		0.072	0.10	U	GAM
Radium 226	13982-63-3	0.433	0.14	0.15	0.10		GAM
Radium 228	15262-20-1	0.776	0.32	0.29	0.20		GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.21	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.606	0.12	0.13			GAM
Thorium 232	TH-232	0.776	0.32	0.29			GAM
Uranium 235	15117-96-1	U		0.28		U	GAM
Uranium 238	U-238	U		9.8		U	GAM
Americium 241	14596-10-2	U		0.20		U	GAM
Silver 108m	14391-65-2	U		0.056		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-07 J11JP4

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-07	Client sample id	J11JP4		
Dept sample id	7741-007	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 10:15	586 g	
% solids	92.3	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	12.9	1.6	0.88			GAM
Cobalt 60	10198-40-0	U		0.090	0.050	U	GAM
Cesium 137	10045-97-3	U		0.075	0.10	U	GAM
Radium 226	13982-63-3	0.471	0.16	0.16	0.10		GAM
Radium 228	15262-20-1	0.526	0.31	0.36	0.20		GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.25	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	0.829	0.14	0.14			GAM
Thorium 232	TH-232	0.526	0.31	0.36			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		0.37		U	GAM
Silver 108m	14391-65-2	U		0.057		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/29/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-08 J11JP5

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG_K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-08	Client sample id	J11JP5		
Dept sample id	7741-008	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 10:25	546 g	
% solids	92.8	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	10.8	2.1	0.79			GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.089	0.10	U	GAM
Radium 226	13982-63-3	0.484	0.15	0.14	0.10		GAM
Radium 228	15262-20-1	0.863	0.34	0.32	0.20		GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.24	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	0.575	0.12	0.12			GAM
Thorium 232	TH-232	0.863	0.34	0.32			GAM
Uranium 235	15117-96-1	U		0.30		U	GAM
Uranium 238	U-238	U		10		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM
Silver 108m	14391-65-2	U		0.049		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

K 5/27/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-09 J11JP6

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-09	Client sample id	J11JP6		
Dept sample id	7741-009	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 10:35	652 g	
% solids	94.2	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	13.1	2.3	0.72			GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.088	0.10	U	GAM
Radium 226	13982-63-3	0.397	0.14	0.15	0.10		GAM
Radium 228	15262-20-1	0.825	0.37	0.38	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.28	0.10	U	GAM
Europium 155	14391-16-3	U		0.21	0.10	U	GAM
Thorium 228	14274-82-9	0.667	0.14	0.14			GAM
Thorium 232	TH-232	0.825	0.37	0.38			GAM
Uranium 235	15117-96-1	U		0.29		U	GAM
Uranium 238	U-238	U		9.8		U	GAM
Americium 241	14596-10-2	U		0.31		U	GAM
Silver 108m	14391-65-2	U		0.055		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/24/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-10 J11JP7

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-10	Client sample id	J11JP7		
Dept sample id	7741-010	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 10:45	588 g	
% solids	89.6	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	12.4	2.1	1.3			GAM
Cobalt 60	10198-40-0	U		0.11	0.050	U	GAM
Cesium 137	10045-97-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	0.598	0.18	0.17	0.10		GAM
Radium 228	15262-20-1	1.30	0.44	0.37	0.20		GAM
Europium 152	14683-23-9	U		0.26	0.10	U	GAM
Europium 154	15585-10-1	U		0.40	0.10	U	GAM
Europium 155	14391-16-3	U		0.25	0.10	U	GAM
Thorium 228	14274-82-9	0.651	0.11	0.11			GAM
Thorium 232	TH-232	1.30	0.44	0.37			GAM
Uranium 235	15117-96-1	U		0.37		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM
Silver 108m	14391-65-2	U		0.084		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/29/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-11 J11JP8

DATA SHEET

SDG	7741	Client/Case no	Hanford	SDG_K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-11	Client sample id	J11JP8		
Dept sample id	7741-011	Location/Matrix	1607-F-3 Verification	SOLID	
Received	03/14/06	Collected/Weight	03/09/06 09:15	607 g	
% solids	92.3	Custody/SAF No	RC-032-026	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	12.2	1.2	0.53			GAM
Cobalt 60	10198-40-0	U		0.063	0.050	U	GAM
Cesium 137	10045-97-3	0.140	0.081	0.074	0.10		GAM
Radium 226	13982-63-3	0.372	0.13	0.14	0.10		GAM
Radium 228	15262-20-1	0.508	0.28	0.32	0.20		GAM
Europium 152	14683-23-9	U		0.14	0.10	U	GAM
Europium 154	15585-10-1	U		0.21	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	0.615	0.072	0.078			GAM
Thorium 232	TH-232	0.508	0.28	0.32			GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		7.7		U	GAM
Americium 241	14596-10-2	U		0.29		U	GAM
Silver 108m	14391-65-2	U		0.047		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

5/29/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0259 was composed of eleven solid (soil) samples designated under SAF No. RC-032 with a Project Designation of: 100-F Remaining Sites Burial Grounds – 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 March 24, 2006.

2.0 ANALYSIS NOTES

2.1 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Mel Mann

Melissa C. Mannion
Senior Program Manager

3/24/6

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-026	Page 1 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification K0259 (7741)	SAF No.: RC-032	Air Quality ☐
Ice Chest No.: ERC-96-571	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060316		Bill of Lading/Air Bill No.: SEE OSPC

~~POSSIBLE SAMPLE~~ HAZARDS/REMARKS

NA

< D.O.T. Limits

Special Handling and/or Storage

~~Cool 4 degrees C~~ TRE 3-13-06 NONE

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.					

Sample No.	Matrix *	Sample Date	Sample Time										
J11JN8	SOIL	3/9/06	0915						X				
J11JN9	SOIL		0925						X				
J11JP0	SOIL		0935						X				
J11JP1	SOIL		0945						X				
J11JP2	SOIL	3/9/06	0955						X				

RJC 3/9/06

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
~~Relinquished By/Removed From~~ PTC	3/9/06	~~Received By/Stored In~~ RJC	3/9/06
Relinquished By/Removed From RTCoffman / RTCoffman	Date/Time 1500 3/9/06	Received By/Stored In REF# 2A, 3728	Date/Time 1500 3/9/06
Relinquished By/Removed From 3728 #2A	Date/Time 3-13-06 / 0830	Received By/Stored In TR Glandson / TR Glandson	Date/Time 3-13-06 / 0830
Relinquished By/Removed From WCH TR Glandson / TR Glandson	Date/Time 3-13-06 / 0900	Received By/Stored In FED EX	Date/Time
Relinquished By/Removed From FED EX	Date/Time	Received By/Stored In FM	Date/Time 03/14/06 9:15
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref # 2A on 3/13/06

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)

000024

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-026	Page 2 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code: 2E	Data Turnaround: 15 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification K0259 (7741)		SAF No.: RC-032	Air Quality ☐	
Ice Chest No.: ERC-96-511	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex		
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060316		Bill of Lading/Air Bill No.: SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

< D.O.T. Limits

Special Handling and/or Storage

Cool 4 degrees C

TRE 3-13-06

NONE

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.					

000025

Sample No.	Matrix *	Sample Date	Sample Time										
J11JP3	SOIL	3/9/06	1005						X				
J11JP4	SOIL		1015						X				
J11JP5	SOIL		1025						X				
J11JP6	SOIL		1035						X				
J11JP7	SOIL	3/9/06	1045						X				

3/9/06

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: R.T. COFFMAN / RT Coffman	Date/Time: 1500 3/9/06	Received By/Stored In: Reece #2A, 3728	Date/Time: 1500 3/9/06
Relinquished By/Removed From: 3728 #2A	Date/Time: 3-13-06 / 0830	Received By/Stored In: TR Edmundson / TR Edmundson	Date/Time: 3-13-06 / 0830
Relinquished By/Removed From: WCH / TR Edmundson / TR Edmundson	Date/Time: 3-16-06 / 0900	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In: FM	Date/Time: 03/14/06 9:15
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

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref # 2A on 3/13/06

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-032-026	Page 3 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code: 2E	Data Turnaround: 15 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification K0259 (7741)		SAF No.: RC-032	Air Quality ☐	
Ice Chest No.: ERC-96-511	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex		
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060316		Bill of Lading/Air Bill No.: SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

< D.O.T. Limits

Special Handling and/or Storage

~~Cool 4 degrees C~~ TRE 3-13-06

NONE

000026

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.					
Sample No. / Matrix * / Sample Date / Sample Time											
J11JP8 / SOIL / 3/9/06 / 0915						X					

RK 3/9/06

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT Coffman / RT COFFMAN	3/9/06 1500	REGER #2A, 3728	3/9/06 1500
inquished By/Removed From: 3728 #2A	3-13-06 / 0830	TR Edmundson / TR Edmundson	3-13-06 / 0830
Relinquished By/Removed From: TR Edmundson / TR Edmundson	3-13-06 / 0900	FED EX	
Relinquished By/Removed From: FED EX		Received By/Stored In: MFW	03/14/06 9:15
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref # 2A on 3/13/06

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

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-3			DATA PACKAGE: K0259		
VALIDATOR: TLT		LAB: LLF		DATE: 5/20/06	
			SDG: K0259		

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

SAMPLES/MATRIX					
J11JN8	J11JN9	J11JP0	J11JP1	J11JP2	J11JP3
J11JP4	J11JP5	J11JP6	J11JP7	J11JP8	
					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: _____

_____

_____

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_____

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: _____

_____

_____

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_____

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: _____

_____

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_____

_____

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: _____

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_____

_____

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

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

Comments: _____

11. Field QC Samples (Levels C, D E) ..... ☐ N/A

Field duplicate sample(s) analyzed? ..... Yes No N/A

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

Field split sample(s) analyzed? ..... Yes No N/A

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

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

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

Comments: no FS or PAS

12. Holding Times (All levels)

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

Comments: _____

13. Results and Detection Limits (All Levels) ..... ☐ N/A

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

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

Results Acceptable? (Levels D, E) ..... Yes No N/A

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

MDA's meet required detection limits? ..... Yes No N/A

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

Comments: See 53 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-13 Method Blank

METHOD BLANK

SDG	7741	Client/Case no	Hanford	SDG K0259	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R603087-13	Client sample id	Method Blank		
Dept sample id	7741-013	Material/Matrix		SOLID	
		SAF No	RC-032		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	U		2.4		U	GAM
Cobalt 60	10198-40-0	U		0.091	0.050	U	GAM
Cesium 137	10045-97-3	U		0.078	0.10	U	GAM
Radium 226	13982-63-3	U		0.22	0.10	U	GAM
Radium 228	15262-20-1	U		0.39	0.20	U	GAM
Europium 152	14683-23-9	U		0.16	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	U		0.11		U	GAM
Thorium 232	TH-232	U		0.39		U	GAM
Uranium 235	15117-96-1	U		0.26		U	GAM
Uranium 238	U-238	U		8.9		U	GAM
Americium 241	14596-10-2	U		0.25		U	GAM
Silver 108m	14391-65-2	U		0.053		U	GAM

100-F RemainSitesBurialGrnds-Soil FP

QC-BLANK #56430

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-12 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7741 Client/Case no Hanford SDG K0259
Contact Melissa C. Mannion Contract No. 630

Lab sample id R603087-12 Client sample id Lab Control Sample
Dept sample id 7741-012 Material/Matrix SOLID
SAF No RC-032

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Cobalt 60	2.75	0.16	0.086	0.050		GAM	2.68	0.11	103	74-126	80-120
Cesium 137	2.64	0.13	0.098	0.10		GAM	2.74	0.11	96	76-124	80-120

100-F RemainSitesBurialGrnds-Soil FP

QC-LCS #56429

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 03/24/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0259

R603087-14 J11JP3

DUPLICATE

SDG	7741	Client/Case no	Hanford SDG K0259
Contact	Melissa C. Mannion	Contract	No. 630
DUPLICATE		ORIGINAL	
Lab sample id	R603087-14	Lab sample id	R603087-06
Dept sample id	7741-014	Dept sample id	7741-006
		Received	03/14/06
% solids	93.0	% solids	93.0
Client sample id	J11JP3		
Location/Matrix	1607-F-3 Verification SOLID		
Collected/Weight	03/09/06 10:05 634 g		
Custody/SAF No	RC-032-026 RC-032		

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Potassium 40	12.2	1.9	1.1			GAM	9.18	1.4	0.73		28	46	1.8
Cobalt 60	U		0.087	0.050	U	GAM	U		0.088	U	-		0
Cesium 137	U		0.080	0.10	U	GAM	U		0.072	U	-		0.1
Radium 226	0.588	0.16	0.16	0.10		GAM	0.433	0.14	0.15		30	70	1.3
Radium 228	0.769	0.35	0.38	0.20		GAM	0.776	0.32	0.29		1	97	0
Europium 152	U		0.20	0.10	U	GAM	U		0.16	U	-		0.3
Europium 154	U		0.27	0.10	U	GAM	U		0.21	U	-		0.3
Europium 155	U		0.21	0.10	U	GAM	U		0.18	U	-		0.2
Thorium 228	0.708	0.15	0.16			GAM	0.606	0.12	0.13		16	54	0.9
Thorium 232	0.769	0.35	0.38			GAM	0.776	0.32	0.29		1	97	0
Uranium 235	U		0.29		U	GAM	U		0.28	U	-		0
Uranium 238	U		12		U	GAM	U		9.8	U	-		0.3
Americium 241	U		0.22		U	GAM	U		0.20	U	-		0.1
Silver 108m	U		0.075		U	GAM	U		0.056	U	-		0.4

100-F RemainSitesBurialGrnds-Soil FP

QC-DUP#6 56431

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	03/24/06

Date: 31 May 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Sites 1607-F-3
Subject: PCB/Pesticide - Data Package No. K0259-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0259 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11JN8	3/9/06	Soil	C	See note 1
J11JN9	3/9/06	Soil	C	See note 1
J11JP0	3/9/06	Soil	C	See note 1
J11JP1	3/9/06	Soil	C	See note 1
J11JP2	3/9/06	Soil	C	See note 1
J11JP3	3/9/06	Soil	C	See note 1
J11JP4	3/9/06	Soil	C	See note 1
J11JP5	3/9/06	Soil	C	See note 1
J11JP6	3/9/06	Soil	C	See note 1
J11JP7	3/9/06	Soil	C	See note 1
J11JP8	3/9/06	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 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 the surrogate outside QC limits, the aroclor-1260 result in sample J11JP2 was qualified as an estimate 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 or matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J11JP8/J11JN8) 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.

- **Completeness**

Data Package No. K0259 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to the surrogate outside QC limits, the aroclor-1260 result in sample J11JP2 was qualified as an estimate 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".

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

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

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: K0259	REVIEWER: TLI	Project: 1607-F-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Arocor-1260	J	J11JP2	Surrogate recovery
Toxaphene	J	All	No MS/MSD/LCS analysis

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD

Laboratory: LLI SDG: K0259

Sample Number		J11JN8		J11JN9		J11JP0		J11JP1		J11JP2		J11JP3		J11JP4		J11JP5	
Remarks		Duplicate															
Sample Date		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06	
Extraction Date		3/17/06		3/17/06		3/17/06		3/17/06		3/17/06		3/17/06		3/17/06		3/17/06	
Analysis Date		3/21/06		3/21/06		3/21/06		3/22/06		3/22/06		3/22/06		3/22/06		3/22/06	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	15	U	14	U	15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1221	100	15	U	14	U	15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1232	100	15	U	14	U	15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1242	100	15	U	14	U	15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1248	100	15	U	14	U	15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1254	100	15	U	14	U	15	U	15	U	14	U	14	U	14	U	14	U
Aroclor-1260	100	15	U	14	U	15	U	15	U	3.5	J	14	U	14	U	14	U

Sample Number		J11JN8		J11JN9		J11JP0		J11JP1		J11JP2		J11JP3		J11JP4		J11JP5	
Remarks		Duplicate															
Sample Date		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06	
Extraction Date		3/17/06		3/17/06		3/17/06		3/17/06		3/17/06		3/17/06		3/17/06		3/17/06	
Analysis Date		3/20/06		3/20/06		3/20/06		3/20/06		3/20/06		3/20/06		3/21/06		3/21/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Gamma-BHC (Lindane)	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Beta-BHC	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Heptachlor	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Delta-BHC	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Aldrin	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Heptachlor Epoxide	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Endosulfan I	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Dieldrin	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
4,4'-DDE	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Endrin	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Endosulfan II	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
4,4'-DDD	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Endosulfan Sulfate	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
4,4'-DDT	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Methoxychlor	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Endrin Ketone	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
Endrin Aldehyde	5	1.5	U	1.4	U	1.5	U	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U
alpha-Chlordane	5	1.5	U	1.4	U	1.5	U	1.5	U	0.63		1.4	U	1.4	U	1.0	
gamma-Chlordane	5	1.5	U	1.4	U	1.5	U	1.5	U	2.6		1.4	U	1.4	U	2.6	
Toxaphene	5	15	UJ	14	UJ	15	UJ	15	UJ	14	UJ	14	UJ	14	UJ	14	UJ

000011

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

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD							
Laboratory: LLI	SDG: K0259						
Sample Number		J11JP6		J11JP7		J11JP8	
Remarks		Duplicate					
Sample Date		3/9/06		3/9/06		3/9/06	
Extraction Date		3/17/06		3/17/06		3/17/06	
Analysis Date		3/22/06		3/21/06		3/21/06	
PCB	RQL	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	14	U	15	U	15	U
Aroclor-1221	100	14	U	15	U	15	U
Aroclor-1232	100	14	U	15	U	15	U
Aroclor-1242	100	14	U	15	U	15	U
Aroclor-1248	100	14	U	15	U	15	U
Aroclor-1254	100	14	U	15	U	15	U
Aroclor-1260	100	14	U	15	U	15	U
Sample Number		J11JP6		J11JP7		J11JP8	
Remarks		Duplicate					
Sample Date		3/9/06		3/9/06		3/9/06	
Extraction Date		3/17/06		3/17/06		3/17/06	
Analysis Date		3/22/06		3/21/06		3/21/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.4	U	1.5	U	1.5	U
Gamma-BHC (Lindane)	5	1.4	U	1.5	U	1.5	U
Beta-BHC	5	1.4	U	1.5	U	1.5	U
Heptachlor	5	1.4	U	1.5	U	1.5	U
Delta-BHC	5	1.4	U	1.5	U	1.5	U
Aldrin	5	1.4	U	1.5	U	1.5	U
Heptachlor Epoxide	5	1.4	U	1.5	U	1.5	U
Endosulfan I	5	1.4	U	1.5	U	1.5	U
Dieldrin	5	1.4	U	1.5	U	1.5	U
4,4'-DDE	5	1.4	U	1.5	U	1.5	U
Endrin	5	1.4	U	1.5	U	1.5	U
Endosulfan II	5	1.4	U	1.5	U	1.5	U
4,4'-DDD	5	1.4	U	1.5	U	1.5	U
Endosulfan Sulfate	5	1.4	U	1.5	U	1.5	U
4,4'-DDT	5	1.4	U	1.5	U	1.5	U
Methoxychlor	5	1.4	U	1.5	U	1.5	U
Endrin Ketone	5	1.4	U	1.5	U	1.5	U
Endrin Aldehyde	5	1.4	U	1.5	U	1.5	U
alpha-Chlordane	5	1.4	U	1.5	U	1.5	U
gamma-Chlordane	5	0.61		1.5	U	1.5	U
Toxaphene	5	14	UJ	15	UJ	15	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.

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Lionville Laboratory, Inc.

PCBs by GC

Report Date: 04/05/06 14:36

RFW Batch Number: 0603L511 Client: TNUHANFORD RC-032 K0259 Work Order: 11343606001 Page: 1

	Cust ID:	J11JN8	J11JN8	J11JN8	J11JN9	J11JP0	J11JP1
Sample Information	RFW#:	002	002 MS	002 MSD	003	004	005
	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	107 %	107 %	124 * %	113 %	109 %	123 * %
	Decachlorobiphenyl	99 %	99 %	108 %	104 %	100 %	106 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		15 U	118 %	115 %	14 U	15 U	15 U
Aroclor-1221		15 U	15 U	15 U	14 U	15 U	15 U
Aroclor-1232		15 U	15 U	15 U	14 U	15 U	15 U
Aroclor-1242		15 U	15 U	15 U	14 U	15 U	15 U
Aroclor-1248		15 U	15 U	15 U	14 U	15 U	15 U
Aroclor-1254		15 U	15 U	15 U	14 U	15 U	15 U
Aroclor-1260		15 U	105 %	101 %	14 U	15 U	15 U

	Cust ID:	J11JP2	J11JP3	J11JP4	J11JP5	J11JP6	J11JP7
Sample Information	RFW#:	006	007	008	009	010	011
	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	121 * %	125 * %	111 %	118 %	112 %	111 %
	Decachlorobiphenyl	106 %	107 %	102 %	106 %	100 %	100 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1221		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1232		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1242		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1248		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1254		14 U	14 U	14 U	14 U	14 U	15 U
Aroclor-1260		3.5 ~~J~~ J	14 U	14 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

5/29/06

4/6/06

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0000000005

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 04/05/06 14:36

RFW Batch Number: **0603L511** Client: **TNUHANFORD RC-032 K0259** Work Order: 11343606001 Page: 2

	Cust ID:	**J11JP8**	**PBLKDO**	**PBLKDO BS**
Sample Information	RFW#:	**012**	**06LE0205-MB1**	**06LE0205-MB1**
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		118 %	119 * %	115 %
Decachlorobiphenyl		108 %	113 %	105 %
Aroclor-1016		15 U	13 U	114 %
Aroclor-1221		15 U	13 U	13 U
Aroclor-1232		15 U	13 U	13 U
Aroclor-1242		15 U	13 U	13 U
Aroclor-1248		15 U	13 U	13 U
Aroclor-1254		15 U	13 U	13 U
Aroclor-1260		15 U	13 U	103 %

000000006

000016

5/29/06

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

4/2/6

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 03/29/06 12:36

RFW Batch Number: 0603L511 Client: TNUHANFORD RC-032 K0259 Work Order: 11343606001 Page: 1

000000004

	Cust ID:	J11JN8	J11JN8	J11JN8	J11JN9	J11JP0	J11JP1
Sample Information	RFW#:	002	002 MS	002 MSD	003	004	005
	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		84 %	80 %	95 %	95 %	87 %	100 %
Decachlorobiphenyl		105 %	100 %	105 %	113 %	104 %	112 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.5 U	77 %	86 %	1.4 U	1.5 U	1.5 U
gamma-BHC (Lindane)		1.5 U	99 %	108 %	1.4 U	1.5 U	1.5 U
Beta-BHC		1.5 U	110 %	117 %	1.4 U	1.5 U	1.5 U
Heptachlor		1.5 U	97 %	104 %	1.4 U	1.5 U	1.5 U
Delta-BHC		1.5 U	78 %	82 %	1.4 U	1.5 U	1.5 U
Aldrin		1.5 U	93 %	98 %	1.4 U	1.5 U	1.5 U
Heptachlor epoxide		1.5 U	100 %	104 %	1.4 U	1.5 U	1.5 U
gamma-Chlordane		1.5 U	102 %	106 %	1.4 U	1.5 U	1.5 U
Endosulfan I		1.5 U	101 %	104 %	1.4 U	1.5 U	1.5 U
alpha-Chlordane		1.5 U	105 %	108 %	1.4 U	1.5 U	1.5 U
4,4'-DDE		1.5 U	103 %	106 %	1.4 U	1.5 U	1.5 U
Dieldrin		1.5 U	98 %	100 %	1.4 U	1.5 U	1.5 U
Endrin		1.5 U	108 %	109 %	1.4 U	1.5 U	1.5 U
4,4'-DDD		1.5 U	107 %	108 %	1.4 U	1.5 U	1.5 U
Endosulfan II		1.5 U	102 %	104 %	1.4 U	1.5 U	1.5 U
4,4'-DDT		1.5 U	101 %	100 %	1.4 U	1.5 U	1.5 U
Endrin aldehyde		1.5 U	99 %	99 %	1.4 U	1.5 U	1.5 U
Endosulfan sulfate		1.5 U	103 %	103 %	1.4 U	1.5 U	1.5 U
Methoxychlor		1.5 U	114 %	115 %	1.4 U	1.5 U	1.5 U
Endrin ketone		1.5 U	108 %	109 %	1.4 U	1.5 U	1.5 U
Toxaphene		15 U J	15 U	15 U	14 U J	15 U J	15 U J

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

5/24/06

5/31/06

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 03/29/06 12:36

RFW Batch Number: **0603L511** Client: **TNUHANFORD RC-032 K0259** Work Order: 11343606001 Page: 2

000000005

	Cust ID:	J11JP2		J11JP3		J11JP4		J11JP5		J11JP6		J11JP7	
Sample Information	RFW#:	006		007		008		009		010		011	
	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	97	%	97	%	94	%	89	%	96	%	83	%
	Decachlorobiphenyl	112	%	115	%	111	%	110	%	110	%	102	%
			fl		fl		fl		fl		fl		fl
Alpha-BHC		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
gamma-BHC (Lindane)		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Beta-BHC		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Heptachlor		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Delta-BHC		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Aldrin		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Heptachlor epoxide		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
gamma-Chlordane		2.6		1.4	U	1.4	U	2.6		0.61	J	1.5	U
Endosulfan I		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
alpha-Chlordane		0.63	J	1.4	U	1.4	U	1.0	J	1.4	U	1.5	U
4,4'-DDE		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Dieldrin		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Endrin		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
4,4'-DDD		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Endosulfan II		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
4,4'-DDT		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Endrin aldehyde		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Endosulfan sulfate		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Methoxychlor		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Endrin ketone		1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.5	U
Toxaphene		14	UJ	14	UJ	14	UJ	14	UJ	14	UJ	15	UJ

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

000018

5/24/06

3/31/06

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 03/29/06 12:36

RFW Batch Number: 0603L511 Client: TNUHANFORD RC-032 K0259 Work Order: 11343606001 Page: 3

000000006

	Cust ID:	J11JP8	PBLKDO	PBLKDO BS
Sample Information	RFW#:	012	06LE0205-MB1	06LE0205-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	4.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG

Surrogate:	Tetrachloro-m-xylene	98	%		90	%		82	%								
	Decachlorobiphenyl	119	%		98	%		86	%								
Alpha-BHC		1.5	U		0.33	U		91	%								
gamma-BHC (Lindane)		1.5	U		0.33	U		102	%								
Beta-BHC		1.5	U		0.33	U		105	%								
Heptachlor		1.5	U		0.33	U		97	%								
Delta-BHC		1.5	U		0.33	U		85	%								
Aldrin		1.5	U		0.33	U		97	%								
Heptachlor epoxide		1.5	U		0.33	U		98	%								
gamma-Chlordane		1.5	U		0.33	U		99	%								
Endosulfan I		1.5	U		0.33	U		100	%								
alpha-Chlordane		1.5	U		0.33	U		100	%								
4,4'-DDE		1.5	U		0.33	U		101	%								
Dieldrin		1.5	U		0.33	U		102	%								
Endrin		1.5	U		0.33	U		92	%								
4,4'-DDD		1.5	U		0.33	U		103	%								
Endosulfan II		1.5	U		0.33	U		101	%								
4,4'-DDT		1.5	U		0.33	U		101	%								
Endrin aldehyde		1.5	U		0.33	U		92	%								
Endosulfan sulfate		1.5	U		0.33	U		98	%								
Methoxychlor		1.5	U		0.33	U		94	%								
Endrin ketone		1.5	U		0.33	U		103	%								
Toxaphene		15	U J		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

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5/29/06

3/31/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0603L511
SDG/SAF # K0259/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 03-14-2006

PCB

Eleven (11) soil samples were collected on 03-09-2006.

The samples and their associated QC samples were extracted on 03-17-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 03-21,22-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

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

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

3. 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.

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

5. Five (5) of thirty (30) surrogate recoveries were outside acceptance criteria. However, the surrogate recovery criteria were met (i.e., no more than one outlier per sample).

6. The blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

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 3 pages.

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

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

4/7/06
Date

som\r:\group\data\pest\tnu hanford\0603-511s.pcbs

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

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RCS-032
LVL #: 0603L511
SDG/SAF # K0259/RCS-032

W.O. #: 11343-606-001-9999-00
Date Received: 03-14-2006

CHLORINATED PESTICIDES

Eleven (11) soil samples were collected on 03-09-2006.

The samples and their associated QC samples were extracted on 03-17-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 03-20,21-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance.
2. Samples were extracted and analyzed within required holding time.
3. The samples and their associated QC samples received a Copper-Sulfur cleanup according to Lionville Laboratory SOPs based on SW846 method 3660A.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All samples required a 4-fold instrument dilutions due to matrix interference.
9. The initial calibrations associated with this data set were within acceptance criteria.
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

3/31/06
Date

kim\r:\group\data\pest\tnu hanford\0603-511.pst
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 3 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-032-026	Page 1 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAY	Air Quality ☐	
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification	SAF No.: RC-032	
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060334	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

LDOT limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.					
Sample No. / Matrix * / Sample Date / Sample Time											
J11JN8 / SOIL / 3/9/06 / 0915	X	X	X	X	X						
J11JN9 / SOIL / 0925	X	X	X	X	X						
J11JP0 / SOIL / 0935	X	X	X	X	X						
J11JP1 / SOIL / 0945	X	X	X	X	X						
J11JP2 / SOIL / 3/9/06 / 0955	X	X	X	X	X						

RT 3/9/06

0000024

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CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RTCoffman/RTCoffman	1500 3/9/06	Refer #2A, 3728	1500 3/9/06
3728 #2A	3-13-06/1000	TRSlaughter TRSlaughter	3-13-06/1000
TRSlaughter TRSlaughter	3-13-06/1500	FED EX	
FedEx	3-14-06 0920	[signature]	3-14-06 0920

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref #2A on 3/13/06

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-032-026	Page 2 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAY	Air Quality ☐	
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification	SAF No.: RC-032	
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060334	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

< D.O.T. Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	100mL					

000025

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.				
J11JP3	SOIL	3/9/06	1005	X	X	X	X	X	RTC 3/9/06				
J11JP4	SOIL		1015	X	X	X	X	X					
J11JP5	SOIL		1025	X	X	X	X	X					
J11JP6	SOIL		1035	X	X	X	X	X					
J11JP7	SOIL	3/9/06	1045	X	X	X	X	X					

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RTC	3/9/06	RTC	3/9/06
RT Coffman / RT Coffman	3/9/06 1500	REEF #2A, 3728	3/9/06 1500
3728 #2A	3-13-06 / 1000	TR Blumberg / TR Blumberg	3-13-06 / 1000
WCH / TR Blumberg / TR Blumberg	3-13-06 / 1500	FED EX	
FED EX	3-14-06 0920	[illegible]	3-14-06 0920

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref #2A on 3/13/06

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-032-026	Page 3 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code: 2E	Data Turnaround: 15 Day
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification		SAF No.: RC-032	Air Quality ☐	
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex		
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: A060334		Bill of Lading/Air Bill No.: SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA
< D.O.T. Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	G/P				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	60mL	120mL	120mL	125mL	500mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions. RTC 3/9/06				

000026

Sample No.	Matrix *	Sample Date	Sample Time									
J11JP8	SOIL	3/9/06	0915	X	X	X	X	X				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT Coffman / RT Coffman	3/9/06 1500	Reece #2A, 3728	3/9/06 1500
3728 #2A	3-13-06 1000	TR Edmundson / TR Edmundson	3-13-06 1000
TR Edmundson / TR Edmundson	3-13-06 1500	FED EX	
FED EX	3-14-06 0920	[illegible]	3-14-06 0920

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref #2A on 3/13/06

Matrix *

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

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

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

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F3			DATA PACKAGE: K0259		
VALIDATOR: TLI		LAB: LLI		DATE: 5/20/06	
			SDG: K0259		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J11JN8	J11JN9	J11JP0	J11JP1	J11JP2	J11JP3
J11JP4	J11JP5	J11JP6	J11JP7	J11JP8	
					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: PCB 1260 in P2 - J (surr) no PAS

no toxaphene MS, MSD or 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 toxaphene MS/MSD - J qual

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: all toxaphene over

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 31 May 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Sites 1607-F-3
Subject: Inorganics - Data Package No. K0259-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0259 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J11JN7	3/9/06	Soil	C	See note 1
J11JN8	3/9/06	Soil	C	See note 1
J11JN9	3/9/06	Soil	C	See note 1
J11JP0	3/9/06	Soil	C	See note 1
J11JP1	3/9/06	Soil	C	See note 1
J11JP2	3/9/06	Soil	C	See note 1
J11JP3	3/9/06	Soil	C	See note 1
J11JP4	3/9/06	Soil	C	See note 1
J11JP5	3/9/06	Soil	C	See note 1
J11JP6	3/9/06	Soil	C	See note 1
J11JP7	3/9/06	Soil	C	See note 1
J11JP8	3/9/06	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.

All preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J11JN7) was submitted for analysis. Aluminum, barium, beryllium, calcium, copper, iron, manganese, magnesium, sodium, silicon 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 a matrix spike recovery outside QC limits (63.3%), all boron results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (39.5%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (21.6%), all silicon 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 (J11JP8/J11JN8) were submitted for analysis. Field duplicates are assessed 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 undetected silver, cadmium and selenium results exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0259 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to a matrix spike recovery outside QC limits (63.3%), all boron results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits (39.5%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (21.6%), all silicon 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.

All undetected silver, cadmium and selenium 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 BHI 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: K0259	REVIEWER: TLI	Project: 1607-F-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Boron	J	All	MS recovery
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0259																		
Sample Number		J11JN7		J11JN8		J11JN9		J11JP0		J11JP1		J11JP2		J11JP3		J11JP4		J11JP5	
Remarks		E. Blank		Duplicate															
Sample Date		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06		3/9/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.52	U	0.57	U	0.56	U	0.57	U	0.58	U	0.55	U	0.57	U	0.57	U	0.56	U
Aluminum		70.1		7380		5380		5290		5530		5610		6550		6540		6320	
Arsenic	10	2.3	U	26.4		23.7		53.9		31.7		7.1		16.5		18.1		27.7	
Boron		0.24	UJ	0.53	J	0.26	UJ	0.28	J	0.29	J	0.25	UJ	0.26	UJ	0.40	J	0.41	J
Barium	2	2.0		81.8		63.7		71.2		60.7		58.6		67.6		72.2		79.7	
Beryllium		0.11		0.29		0.23		0.21		0.23		0.18		0.25		0.26		0.23	
Calcium		30.6		3530		2980		2910		3400		2600		3850		3500		3160	
Cadmium	0.2	0.39	U	0.43	U	0.42	U	0.43	U	0.46		0.41		0.42	U	0.43	U	0.42	U
Cobalt		0.51	U	5.8		5.4		5.4		5.5		4.8		6.7		5.8		5.4	
Chromium	1	0.60	U	10.0		8.0		7.9		7.9		9.6		9.5		8.7		9.7	
Copper		2.0		14.0		13.7		10.3		12.0		12.5		14.7		11.5		12.0	
Iron		2890		16400		12900		12600		13600		13900		16700		14800		14000	
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.04		0.02	U	0.02	U	0.02	U
Potassium		72.1	U	1530		1050		1340		1060		682		918		1150		1330	
Magnesium		13.6		4050		3370		3200		3520		3400		4230		3700		3530	
Manganese		20.4		294		243		254		262		210		280		276		255	
Molybdenum		0.47	U	0.51	U	0.50	U	0.51	U	0.52	U	0.49	U	0.51	U	0.51	U	0.50	U
Sodium		8.5		109		82.2		81.6		86.5		110		115		118		99.1	
Nickel		0.83	U	10.9		9.4		8.6		10.2		8.6		10.6		9.1		10.0	
Lead	5	2.4	U	139		106		277		115		27.2		34.9		25.5		93.3	
Antimony		3.0	UJ	3.2	UJ	3.2	UJ	3.2	UJ	3.3	UJ	3.1	UJ	3.2	UJ	3.2	UJ	3.2	UJ
Selenium	1	3.4	U	3.7	U	3.6	U	3.7	U	3.8	U	3.6	U	4.2		3.7	U	3.7	U
Silicon		64.6	J	490	J	653	J	581	J	643	J	443	J	504	J	618	J	465	J
Vanadium		0.29	U	35.9		28.4		27.2		30.1		33.9		37.4		31.2		29.6	
Zinc	1	4.9		44.8		35.4		37.8		33.9		41.0		36.3		34.8		52.1	

000011

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

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0211																		
Sample Number		J11JP6		J11JP7		J11JP8													
Remarks																			
Sample Date		3/9/06		3/9/06		3/9/06													
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.56	U	0.58	U	0.58	U												
Aluminum		6130		6500		6890													
Arsenic	10	15.4		26.1		27.5													
Boron		0.26	UJ	0.41	J	0.67	J												
Barium	2	56.1		70.1		78.4													
Beryllium		0.20		0.26		0.29													
Calcium		3210		3480		3200													
Cadmium	0.2	0.42	U	0.44	U	0.44	U												
Cobalt		5.8		5.9		6.2													
Chromium	1	10.2		9.9		10.3													
Copper		12.6		11.0		12.7													
Iron		14700		15200		15200													
Mercury	0.2	0.02		0.02	U	0.02	U												
Potassium		1070		1420		1510													
Magnesium		3750		3740		3850													
Manganese		238		282		284													
Molybdenum		0.50	U	0.52	U	0.52	U												
Sodium		102		98.7		98.7													
Nickel		10.5		9.8		10.5													
Lead	5	71.4		106		135													
Antimony		3.2	UJ	3.3	UJ	3.3	UJ												
Selenium	1	3.7	U	3.8	U	3.8	U												
Silicon		391	J	804	J	494	J												
Vanadium		34.5		33.7		32.7													
Zinc	1	38.2		38.0		41.8													

000012

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J11JN7	Silver, Total	0.52	u	MG/KG	0.52	1.0
		Aluminum, Total	70.1		MG/KG	2.2	1.0
		Arsenic, Total	2.3	u	MG/KG	2.3	1.0
		Boron, Total	0.24	u J	MG/KG	0.24	1.0
		Barium, Total	2.0		MG/KG	0.28	1.0
		Beryllium, Total	0.11		MG/KG	0.02	1.0
		Calcium, Total	30.6		MG/KG	2.0	1.0
		Cadmium, Total	0.39	u	MG/KG	0.39	1.0
		Cobalt, Total	0.51	u	MG/KG	0.51	1.0
		Chromium, Total	0.60	u	MG/KG	0.60	1.0
		Copper, Total	2.0		MG/KG	0.21	1.0
		Iron, Total	2890		MG/KG	0.50	1.0
		Mercury, Total	0.02	u	MG/KG	0.02	1.0
		Potassium, Total	72.1	u	MG/KG	72.1	1.0
		Magnesium, Total	13.6		MG/KG	3.7	1.0
		Manganese, Total	20.4		MG/KG	0.30	1.0
		Molybdenum, Total	0.47	u	MG/KG	0.47	1.0
		Sodium, Total	8.5		MG/KG	2.3	1.0
		Nickel, Total	0.83	u	MG/KG	0.83	1.0
		Lead, Total	2.4	u	MG/KG	2.4	1.0
		Antimony, Total	3.0	u J	MG/KG	3.0	1.0
		Selenium, Total	3.4	u	MG/KG	3.4	1.0
		Silicon, Total	64.6	J	MG/KG	0.83	1.0
		Vanadium, Total	0.29	u	MG/KG	0.29	1.0
		Zinc, Total	4.9		MG/KG	0.15	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J11JN8	Silver, Total	0.57 u	MG/KG	0.57	1.0
		Aluminum, Total	7380	MG/KG	2.4	1.0
		Arsenic, Total	26.4	MG/KG	2.5	1.0
		Boron, Total	0.53 J	MG/KG	0.26	1.0
		Barium, Total	81.8	MG/KG	0.31	1.0
		Beryllium, Total	0.29	MG/KG	0.02	1.0
		Calcium, Total	3530	MG/KG	2.2	1.0
		Cadmium, Total	0.43 u	MG/KG	0.43	1.0
		Cobalt, Total	5.8	MG/KG	0.56	1.0
		Chromium, Total	10.0	MG/KG	0.65	1.0
		Copper, Total	14.0	MG/KG	0.22	1.0
		Iron, Total	16400	MG/KG	0.55	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1530	MG/KG	78.5	1.0
		Magnesium, Total	4050	MG/KG	4.0	1.0
		Manganese, Total	294	MG/KG	0.33	1.0
		Molybdenum, Total	0.51 u	MG/KG	0.51	1.0
		Sodium, Total	109	MG/KG	2.6	1.0
		Nickel, Total	10.9	MG/KG	0.91	1.0
		Lead, Total	139	MG/KG	2.6	1.0
		Antimony, Total	3.2 uJ	MG/KG	3.2	1.0
		Selenium, Total	3.7 u	MG/KG	3.7	1.0
		Silicon, Total	490 J	MG/KG	0.91	1.0
		Vanadium, Total	35.9	MG/KG	0.32	1.0
		Zinc, Total	44.8	MG/KG	0.16	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259

LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J11JN9	Silver, Total	0.56 u	MG/KG	0.56	1.0
		Aluminum, Total	5380	MG/KG	2.4	1.0
		Arsenic, Total	23.7	MG/KG	2.5	1.0
		Boron, Total	0.26 u J	MG/KG	0.26	1.0
		Barium, Total	63.7	MG/KG	0.30	1.0
		Beryllium, Total	0.23	MG/KG	0.02	1.0
		Calcium, Total	2980	MG/KG	2.2	1.0
		Cadmium, Total	0.42 u	MG/KG	0.42	1.0
		Cobalt, Total	5.4	MG/KG	0.55	1.0
		Chromium, Total	8.0	MG/KG	0.64	1.0
		Copper, Total	13.7	MG/KG	0.22	1.0
		Iron, Total	12900	MG/KG	0.54	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1050	MG/KG	77.1	1.0
		Magnesium, Total	3370	MG/KG	3.9	1.0
		Manganese, Total	243	MG/KG	0.32	1.0
		Molybdenum, Total	0.50 u	MG/KG	0.50	1.0
		Sodium, Total	82.2	MG/KG	2.5	1.0
		Nickel, Total	9.4	MG/KG	0.89	1.0
		Lead, Total	106	MG/KG	2.6	1.0
		Antimony, Total	3.2 u J	MG/KG	3.2	1.0
		Selenium, Total	3.6 u	MG/KG	3.6	1.0
		Silicon, Total	653 J	MG/KG	0.89	1.0
		Vanadium, Total	28.4	MG/KG	0.31	1.0
		Zinc, Total	35.4	MG/KG	0.16	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J11JP0	Silver, Total	0.57 u	MG/KG	0.57	1.0
		Aluminum, Total	5290	MG/KG	2.4	1.0
		Arsenic, Total	53.9	MG/KG	2.5	1.0
		Boron, Total	0.28 J	MG/KG	0.27	1.0
		Barium, Total	71.2	MG/KG	0.31	1.0
		Beryllium, Total	0.21	MG/KG	0.02	1.0
		Calcium, Total	2910	MG/KG	2.2	1.0
		Cadmium, Total	0.43 u	MG/KG	0.43	1.0
		Cobalt, Total	5.4	MG/KG	0.56	1.0
		Chromium, Total	7.9	MG/KG	0.66	1.0
		Copper, Total	10.3	MG/KG	0.23	1.0
		Iron, Total	12600	MG/KG	0.55	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1340	MG/KG	79.0	1.0
		Magnesium, Total	3200	MG/KG	4.0	1.0
		Manganese, Total	254	MG/KG	0.33	1.0
		Molybdenum, Total	0.51 u	MG/KG	0.51	1.0
		Sodium, Total	81.6	MG/KG	2.6	1.0
		Nickel, Total	8.6	MG/KG	0.91	1.0
		Lead, Total	277	MG/KG	2.7	1.0
		Antimony, Total	3.2 u J	MG/KG	3.2	1.0
		Selenium, Total	3.7 u	MG/KG	3.7	1.0
		Silicon, Total	581 J	MG/KG	0.91	1.0
		Vanadium, Total	27.2	MG/KG	0.32	1.0
		Zinc, Total	37.8	MG/KG	0.16	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259

LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J11JP1	Silver, Total	0.58 u	MG/KG	0.58	1.0
		Aluminum, Total	5530	MG/KG	2.4	1.0
		Arsenic, Total	31.7	MG/KG	2.5	1.0
		Boron, Total	0.29 J	MG/KG	0.27	1.0
		Barium, Total	60.7	MG/KG	0.31	1.0
		Beryllium, Total	0.23	MG/KG	0.02	1.0
		Calcium, Total	3400	MG/KG	2.3	1.0
		Cadmium, Total	0.46	MG/KG	0.43	1.0
		Cobalt, Total	5.5	MG/KG	0.57	1.0
		Chromium, Total	7.9	MG/KG	0.66	1.0
		Copper, Total	12.0	MG/KG	0.23	1.0
		Iron, Total	13600	MG/KG	0.56	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1060	MG/KG	79.7	1.0
		Magnesium, Total	3520	MG/KG	4.0	1.0
		Manganese, Total	262	MG/KG	0.33	1.0
		Molybdenum, Total	0.52 u	MG/KG	0.52	1.0
		Sodium, Total	86.5	MG/KG	2.6	1.0
		Nickel, Total	10.2	MG/KG	0.92	1.0
		Lead, Total	115	MG/KG	2.7	1.0
		Antimony, Total	3.3 uJ	MG/KG	3.3	1.0
		Selenium, Total	3.8 u	MG/KG	3.8	1.0
		Silicon, Total	643 J	MG/KG	0.92	1.0
		Vanadium, Total	30.1	MG/KG	0.32	1.0
		Zinc, Total	33.9	MG/KG	0.17	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J11JP2	Silver, Total	0.55 u	MG/KG	0.55	1.0
		Aluminum, Total	5610	MG/KG	2.3	1.0
		Arsenic, Total	7.1	MG/KG	2.4	1.0
		Boron, Total	0.25 u J	MG/KG	0.25	1.0
		Barium, Total	58.6	MG/KG	0.29	1.0
		Beryllium, Total	0.18	MG/KG	0.02	1.0
		Calcium, Total	2600	MG/KG	2.1	1.0
		Cadmium, Total	0.41 u	MG/KG	0.41	1.0
		Cobalt, Total	4.8	MG/KG	0.54	1.0
		Chromium, Total	9.6	MG/KG	0.63	1.0
		Copper, Total	12.5	MG/KG	0.22	1.0
		Iron, Total	13900	MG/KG	0.53	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Potassium, Total	682	MG/KG	75.5	1.0
		Magnesium, Total	3400	MG/KG	3.8	1.0
		Manganese, Total	210	MG/KG	0.31	1.0
		Molybdenum, Total	0.49 u	MG/KG	0.49	1.0
		Sodium, Total	110	MG/KG	2.5	1.0
		Nickel, Total	8.6	MG/KG	0.87	1.0
		Lead, Total	27.2	MG/KG	2.5	1.0
		Antimony, Total	3.1 u J	MG/KG	3.1	1.0
		Selenium, Total	3.6 u	MG/KG	3.6	1.0
		Silicon, Total	443 J	MG/KG	0.87	1.0
		Vanadium, Total	33.9	MG/KG	0.30	1.0
		Zinc, Total	41.0	MG/KG	0.16	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUMANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J11JP3	Silver, Total	0.57 u	MG/KG	0.57	1.0
		Aluminum, Total	6550	MG/KG	2.4	1.0
		Arsenic, Total	16.5	MG/KG	2.5	1.0
		Boron, Total	0.26 u J	MG/KG	0.26	1.0
		Barium, Total	67.6	MG/KG	0.30	1.0
		Beryllium, Total	0.25	MG/KG	0.02	1.0
		Calcium, Total	3850	MG/KG	2.2	1.0
		Cadmium, Total	0.42 u	MG/KG	0.42	1.0
		Cobalt, Total	6.7	MG/KG	0.56	1.0
		Chromium, Total	9.5	MG/KG	0.65	1.0
		Copper, Total	14.7	MG/KG	0.22	1.0
		Iron, Total	16700	MG/KG	0.55	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	918	MG/KG	77.9	1.0
		Magnesium, Total	4230	MG/KG	4.0	1.0
		Manganese, Total	280	MG/KG	0.32	1.0
		Molybdenum, Total	0.51 u	MG/KG	0.51	1.0
		Sodium, Total	115	MG/KG	2.5	1.0
		Nickel, Total	10.6	MG/KG	0.90	1.0
		Lead, Total	34.9	MG/KG	2.6	1.0
		Antimony, Total	3.2 u J	MG/KG	3.2	1.0
		Selenium, Total	4.2	MG/KG	3.7	1.0
		Silicon, Total	504 J	MG/KG	0.90	1.0
		Vanadium, Total	37.4	MG/KG	0.31	1.0
		Zinc, Total	36.3	MG/KG	0.16	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259

LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	J11JP4	Silver, Total	0.57 u	MG/KG	0.57	1.0
		Aluminum, Total	6540	MG/KG	2.4	1.0
		Arsenic, Total	18.1	MG/KG	2.5	1.0
		Boron, Total	0.40 J	MG/KG	0.26	1.0
		Barium, Total	72.2	MG/KG	0.30	1.0
		Beryllium, Total	0.26	MG/KG	0.02	1.0
		Calcium, Total	3500	MG/KG	2.2	1.0
		Cadmium, Total	0.43 u	MG/KG	0.43	1.0
		Cobalt, Total	5.8	MG/KG	0.56	1.0
		Chromium, Total	8.7	MG/KG	0.65	1.0
		Copper, Total	11.5	MG/KG	0.22	1.0
		Iron, Total	14800	MG/KG	0.55	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1150	MG/KG	78.1	1.0
		Magnesium, Total	3700	MG/KG	4.0	1.0
		Manganese, Total	276	MG/KG	0.32	1.0
		Molybdenum, Total	0.51 u	MG/KG	0.51	1.0
		Sodium, Total	118	MG/KG	2.5	1.0
		Nickel, Total	9.1	MG/KG	0.90	1.0
		Lead, Total	25.5	MG/KG	2.6	1.0
		Antimony, Total	3.2 u J	MG/KG	3.2	1.0
		Selenium, Total	3.7 u	MG/KG	3.7	1.0
		Silicon, Total	618 J	MG/KG	0.90	1.0
		Vanadium, Total	31.2	MG/KG	0.31	1.0
		Zinc, Total	34.8	MG/KG	0.16	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J11JP5	Silver, Total	0.56 u	MG/KG	0.56	1.0
		Aluminum, Total	6320	MG/KG	2.4	1.0
		Arsenic, Total	27.7	MG/KG	2.5	1.0
		Boron, Total	0.41 J	MG/KG	0.26	1.0
		Barium, Total	79.7	MG/KG	0.30	1.0
		Beryllium, Total	0.23	MG/KG	0.02	1.0
		Calcium, Total	3160	MG/KG	2.2	1.0
		Cadmium, Total	0.42 u	MG/KG	0.42	1.0
		Cobalt, Total	5.4	MG/KG	0.55	1.0
		Chromium, Total	9.7	MG/KG	0.64	1.0
		Copper, Total	12.0	MG/KG	0.22	1.0
		Iron, Total	14000	MG/KG	0.54	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1330	MG/KG	77.6	1.0
		Magnesium, Total	3530	MG/KG	3.9	1.0
		Manganese, Total	255	MG/KG	0.32	1.0
		Molybdenum, Total	0.50 u	MG/KG	0.50	1.0
		Sodium, Total	99.1	MG/KG	2.5	1.0
		Nickel, Total	10.0	MG/KG	0.90	1.0
		Lead, Total	93.3	MG/KG	2.6	1.0
		Antimony, Total	3.2 u J	MG/KG	3.2	1.0
		Selenium, Total	3.7 u	MG/KG	3.7	1.0
		Silicon, Total	465 J	MG/KG	0.90	1.0
		Vanadium, Total	29.6	MG/KG	0.31	1.0
		Zinc, Total	52.1	MG/KG	0.16	1.0

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-010	J11JP6	Silver, Total	0.56 u	MG/KG	0.56	1.0
		Aluminum, Total	6130	MG/KG	2.4	1.0
		Arsenic, Total	15.4	MG/KG	2.5	1.0
		Boron, Total	0.26 u J	MG/KG	0.26	1.0
		Barium, Total	56.1	MG/KG	0.30	1.0
		Beryllium, Total	0.20	MG/KG	0.02	1.0
		Calcium, Total	3210	MG/KG	2.2	1.0
		Cadmium, Total	0.42 u	MG/KG	0.42	1.0
		Cobalt, Total	5.8	MG/KG	0.55	1.0
		Chromium, Total	10.2	MG/KG	0.64	1.0
		Copper, Total	12.6	MG/KG	0.22	1.0
		Iron, Total	14700	MG/KG	0.54	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Potassium, Total	1070	MG/KG	77.2	1.0
		Magnesium, Total	3750	MG/KG	3.9	1.0
		Manganese, Total	238	MG/KG	0.32	1.0
		Molybdenum, Total	0.50 u	MG/KG	0.50	1.0
		Sodium, Total	102	MG/KG	2.5	1.0
		Nickel, Total	10.5	MG/KG	0.89	1.0
		Lead, Total	71.4	MG/KG	2.6	1.0
		Antimony, Total	3.2 u J	MG/KG	3.2	1.0
		Selenium, Total	3.7 u	MG/KG	3.7	1.0
		Silicon, Total	391 J	MG/KG	0.89	1.0
		Vanadium, Total	34.5	MG/KG	0.31	1.0
		Zinc, Total	38.2	MG/KG	0.16	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J11JP7	Silver, Total	0.58 u	MG/KG	0.58	1.0
		Aluminum, Total	6500	MG/KG	2.5	1.0
		Arsenic, Total	26.1	MG/KG	2.6	1.0
		Boron, Total	0.41 J	MG/KG	0.27	1.0
		Barium, Total	70.1	MG/KG	0.31	1.0
		Beryllium, Total	0.26	MG/KG	0.02	1.0
		Calcium, Total	3480	MG/KG	2.3	1.0
		Cadmium, Total	0.44 u	MG/KG	0.44	1.0
		Cobalt, Total	5.9	MG/KG	0.57	1.0
		Chromium, Total	9.9	MG/KG	0.67	1.0
		Copper, Total	11.0	MG/KG	0.23	1.0
		Iron, Total	15200	MG/KG	0.56	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1420	MG/KG	80.3	1.0
		Magnesium, Total	3740	MG/KG	4.1	1.0
		Manganese, Total	282	MG/KG	0.33	1.0
		Molybdenum, Total	0.52 u	MG/KG	0.52	1.0
		Sodium, Total	98.7	MG/KG	2.6	1.0
		Nickel, Total	9.8	MG/KG	0.93	1.0
		Lead, Total	106	MG/KG	2.7	1.0
		Antimony, Total	3.3 u J	MG/KG	3.3	1.0
		Selenium, Total	3.8 u	MG/KG	3.8	1.0
		Silicon, Total	804 J	MG/KG	0.93	1.0
		Vanadium, Total	33.7	MG/KG	0.32	1.0
		Zinc, Total	38.0	MG/KG	0.17	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-012	J11JP8	Silver, Total	0.58 u	MG/KG	0.58	1.0
		Aluminum, Total	6890	MG/KG	2.5	1.0
		Arsenic, Total	27.5	MG/KG	2.6	1.0
		Boron, Total	0.67 J	MG/KG	0.27	1.0
		Barium, Total	78.4	MG/KG	0.31	1.0
		Beryllium, Total	0.29	MG/KG	0.02	1.0
		Calcium, Total	3200	MG/KG	2.3	1.0
		Cadmium, Total	0.44 u	MG/KG	0.44	1.0
		Cobalt, Total	6.2	MG/KG	0.57	1.0
		Chromium, Total	10.3	MG/KG	0.67	1.0
		Copper, Total	12.7	MG/KG	0.23	1.0
		Iron, Total	15200	MG/KG	0.56	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1510	MG/KG	80.3	1.0
		Magnesium, Total	3850	MG/KG	4.1	1.0
		Manganese, Total	284	MG/KG	0.33	1.0
		Molybdenum, Total	0.52 u	MG/KG	0.52	1.0
		Sodium, Total	98.7	MG/KG	2.6	1.0
		Nickel, Total	10.5	MG/KG	0.93	1.0
		Lead, Total	135	MG/KG	2.7	1.0
		Antimony, Total	3.3 u J	MG/KG	3.3	1.0
		Selenium, Total	3.8 u	MG/KG	3.8	1.0
		Silicon, Total	494 J	MG/KG	0.93	1.0
		Vanadium, Total	32.7	MG/KG	0.32	1.0
		Zinc, Total	41.8	MG/KG	0.17	1.0

5/29/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032
LVL#: 0603L511
SDG/SAF#: K0259/RC-032

W.O.#: 11343-606-001-9999-00
Date Received: 03-14-06

METALS CASE NARRATIVE

1. This narrative covers the analyses of 12 soil samples.

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

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of the ending CCV for Cadmium in file PS0328A. All samples were surrounded by QC within control, except sample J11JP8, which was rerun for Cadmium in file PS0328B.

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

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

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

9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 21.6%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

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

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

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 41 pages.

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

following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J11JN8	Aluminum	40,000	108.5
	Boron	100	79.3
	Iron	40,000	89.0
	Manganese	2,000	97.8
	Antimony	200	102.3
	Silicon	2,200	100.3

12. The duplicate analyses for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

14. 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.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

3/31/06
Date

jjw/m03-511

LVLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-025	Page 1 of 1

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code: 2E	Data Turnaround: 15 DAY
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification B		SAF No.: RC-032	Air Quality ☐	
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex		
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A06 0334		Bill of Lading/Air Bill No.: SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA
<D.O.T. limits

Special Handling and/or Storage

~~Cool 4 degrees C~~ TRE 3-13-06

Cool 4degrees C

Preservation	None	Cool 4C
Type of Container	aG	aG
No. of Container(s)	1	1
Volume	250g	120mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)

Sample No.	Matrix *	Sample Date	Sample Time		
J11JN7	SOIL	3/9/06	0900	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RT Coffman / RT Coffman	3/9/06 1500	RGEE #2A, 3728	3/9/06 1500
3728 #2A	3-16-06 / 1000	TRE Henderson TRE Henderson	3-13-06 / 1000
TRE Henderson TRE Henderson (WCH)	3-13-06 / 1000	FED EX	
FED EX	3-14-06 0920	Neumann	3-14-06 0920
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

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref #2A on 3/13/06

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

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

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

000028

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-026	Page 1 of 1

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAY	Air Quality ☐	
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification	SAF No.: RC-032	
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060334	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

< D.O.T. limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	G/P				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	60mL	120mL	120mL	125mL	500mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions.				

Sample No.	Matrix *	Sample Date	Sample Time									
J11JN8	SOIL	3/9/06	0915	X	X	X	X	X	RT 3/9/06			
J11JN9	SOIL		0925	X	X	X	X	X				
J11JP0	SOIL		0935	X	X	X	X	X				
J11JP1	SOIL		0945	X	X	X	X	X				
J11JP2	SOIL	3/9/06	0955	X	X	X	X	X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RTCoffman / RT Coffman	1500 3/9/06	Refer # 2A, 3728	1500 3/9/06
3728 #2A	3-13-06 / 1000	TR Blanchard TR Blanchard	3-13-06 / 1000
TR Blanchard TR Blanchard	3-13-06 / 1500	EFS EX	
EFS EX	3-14-06 0920	[illegible]	3-14-06 0920
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

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}: Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref #2A on 3/13/06

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

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

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

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-026	Page 2 of 3

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification	SAF No.: RC-032	Air Quality ☐
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060334	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

< D.O.T. Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	G/P				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	60mL	120mL	120mL	125mL	100mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions. RTC 3/9/06				

Sample No.	Matrix *	Sample Date	Sample Time									
J11JP3	SOIL	3/9/06	1005	X	X	X	X	X				
J11JP4	SOIL		1015	X	X	X	X	X				
J11JP5	SOIL		1025	X	X	X	X	X				
J11JP6	SOIL		1035	X	X	X	X	X				
J11JP7	SOIL	3/9/06	1045	X	X	X	X	X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
~~RTC~~	~~3/9/06~~	~~RTC~~	~~3/9/06~~
RT Coffman / RT Coffman	3/9/06 1500	Reece #2A, 3728	3/9/06 1500
3728 #2A	3-13-06 / 1000	TR Edmundson / TR Edmundson	3-13-06 / 1000
TR Edmundson / TR Edmundson	3-13-06 / 1500	FED EX	
FED EX	3-14-06 0920	[illegible]	3-14-06 0920
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref #2A on 3/13/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solid
DL=Drum Liqu
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)

000030

000000039

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-026	Page 1 of 1

Collector: Coffman	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 2E	Data Turnaround: 15 DAY	Air Quality ☐	
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 1607-F-3 Verification	SAF No.: RC-032	
Ice Chest No.: ERC-99-061	Field Logbook No.: EFL-1174-1	COA: R607F32000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: A060334	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

< D.O.T. Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	60mL	120mL	120mL	125mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	See item (2) in Special Instructions. RTC 3/9/06					

Sample No.	Matrix *	Sample Date	Sample Time										
J11JP8	SOIL	3/9/06	0915	X	X	X	X	X					

000031

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: RT Coffman / RT Coffman 3/9/06	1500	Received By/Stored In: Refer #2A, 3728 3/9/06	1500
Relinquished By/Removed From: 3728 # 2A 3-13-06 /	1000	Received By/Stored In: TR Shandon TR Shandon 3-13-06 /	1000
Relinquished By/Removed From: TR Shandon TR Shandon 3-13-06	1500	Received By/Stored In: FED EX	
Relinquished By/Removed From: FED EX 3-14-06	0920	Received By/Stored In: [illegible] 3-14-06	0920
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref #2A on 3/13/06

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

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

000000040

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-F-3			DATA PACKAGE: K0259		
VALIDATOR: TCJ		LAB: LLI		DATE: 5/20/06	
			SDG: K0259		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J11JN7	J11JN8	J11JN9	J11JP0	J11JP1	J11JP2
J11JP3	J11JP4	J11JP5	J11JP6	J11JP7	J11JP8
					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:

FB - al, barium, beryl, calcium, Copper, Fe, mn, mg, NG, silicon + zinc

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

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

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

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

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

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

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

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

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

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

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

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

Comments: MS - antimony - 39.5% - J all no PAS

boron - 63.3% - J all

LCS - Silicon 21.6% - 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:

Silver, cadmium selenium - all ~~K~~ 4/7d undated ones

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0168-MB1	Silver, Total	0.56 u	MG/KG	0.56	1.0
		Aluminum, Total	2.4 u	MG/KG	2.4	1.0
		Arsenic, Total	2.5 u	MG/KG	2.5	1.0
		Boron, Total	0.26 u	MG/KG	0.26	1.0
		Barium, Total	0.30 u	MG/KG	0.30	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	0.42 u	MG/KG	0.42	1.0
		Cobalt, Total	0.55 u	MG/KG	0.55	1.0
		Chromium, Total	0.64 u	MG/KG	0.64	1.0
		Copper, Total	0.22 u	MG/KG	0.22	1.0
		Iron, Total	0.54 u	MG/KG	0.54	1.0
		Potassium, Total	77.1 u	MG/KG	77.1	1.0
		Magnesium, Total	3.9 u	MG/KG	3.9	1.0
		Manganese, Total	0.32 u	MG/KG	0.32	1.0
		Molybdenum, Total	0.50 u	MG/KG	0.50	1.0
		Sodium, Total	2.5 u	MG/KG	2.5	1.0
		Nickel, Total	0.89 u	MG/KG	0.89	1.0
		Lead, Total	2.6 u	MG/KG	2.6	1.0
		Antimony, Total	3.2 u	MG/KG	3.2	1.0
		Selenium, Total	3.6 u	MG/KG	3.6	1.0
		Silicon, Total	0.89 u	MG/KG	0.89	1.0
		Vanadium, Total	0.31 u	MG/KG	0.31	1.0
		Zinc, Total	0.16 u	MG/KG	0.16	1.0
BLANK1	06C0051-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259

LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J11JN8	Silver, Total	4.5	0.57u	5.1	88.2	1.0
		Aluminum, Total	8090	7380	204	351.2*	1.0
		Arsenic, Total	211	26.4	204	90.5	1.0
		Boron, Total	65.0	0.53	102	63.3	1.0
		Barium, Total	261	81.8	204	88.0	1.0
		Beryllium, Total	5.0	0.29	5.1	92.4	1.0
		Calcium, Total	5640	3530	2540	82.7	1.0
		Cadmium, Total	4.7	0.43u	5.1	92.2	1.0
		Cobalt, Total	50.7	5.8	50.9	88.2	1.0
		Chromium, Total	28.4	10.0	20.4	90.2	1.0
		Copper, Total	35.4	14.0	25.5	83.9	1.0
		Iron, Total	16000	16400	102	-390. *	1.0
		Potassium, Total	3780	1530	2540	88.2	1.0
		Magnesium, Total	6350	4050	2540	90.2	1.0
		Manganese, Total	325	294	50.9	60.1*	1.0
		Molybdenum, Total	85.3	0.51u	102	83.8	1.0
		Sodium, Total	2400	109	2540	89.9	1.0
		Nickel, Total	55.4	10.9	50.9	87.4	1.0
		Lead, Total	179	139	50.9	77.6	1.0
		Antimony, Total	20.1	3.2 u	50.9	39.5	1.0
		Selenium, Total	182	3.7 u	204	89.5	1.0
		Silicon, Total	564	490	102	72.6*	1.0
		Vanadium, Total	77.3	35.9	50.9	81.3	1.0
		Zinc, Total	88.2	44.8	50.9	85.3	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	J11JP0	Mercury, Total	0.18	0.02u	0.18	101.1	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J11JN8	Silver, Total	0.57u	0.57u	NC	1.0
		Aluminum, Total	7380	7120	3.6	1.0
		Arsenic, Total	26.4	25.6	3.1	1.0
		Boron, Total	0.53	0.65	21.0	1.0
		Barium, Total	81.8	75.2	8.4	1.0
		Beryllium, Total	0.29	0.26	9.5	1.0
		Calcium, Total	3530	3420	3.1	1.0
		Cadmium, Total	0.43u	0.43u	NC	1.0
		Cobalt, Total	5.8	6.3	8.3	1.0
		Chromium, Total	10.0	10.3	3.0	1.0
		Copper, Total	14.0	12.3	12.9	1.0
		Iron, Total	16400	16500	0.84	1.0
		Potassium, Total	1530	1520	1.1	1.0
		Magnesium, Total	4050	3990	1.6	1.0
		Manganese, Total	294	288	2.2	1.0
		Molybdenum, Total	0.51u	0.51u	NC	1.0
		Sodium, Total	109	112	2.6	1.0
		Nickel, Total	10.9	9.9	9.6	1.0
		Lead, Total	139	133	4.5	1.0
		Antimony, Total	3.2 u	3.2 u	NC	1.0
		Selenium, Total	3.7 u	3.7 u	NC	1.0
		Silicon, Total	490	461	6.2	1.0
		Vanadium, Total	35.9	34.0	5.4	1.0
		Zinc, Total	44.8	43.1	3.9	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-004REP	J11JP0	Mercury, Total	0.02u	0.02u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 03/29/06

CLIENT: TNUHANFORD RC-032 K0259 LVL LOT #: 0603L511

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0168-LC1	Silver, LCS	43.8	50.0	MG/KG	87.6
		Aluminum, LCS	450	500	MG/KG	90.0
		Arsenic, LCS	893	1000	MG/KG	89.3
		Boron, LCS	445	500	MG/KG	89.0
		Barium, LCS	458	500	MG/KG	91.6
		Beryllium, LCS	23.3	25.0	MG/KG	93.2
		Calcium, LCS	2180	2500	MG/KG	87.4
		Cadmium, LCS	21.6	25.0	MG/KG	86.4
		Cobalt, LCS	222	250	MG/KG	88.8
		Chromium, LCS	44.7	50.0	MG/KG	89.4
		Copper, LCS	112	125	MG/KG	89.8
		Iron, LCS	444	500	MG/KG	88.9
		Potassium, LCS	2260	2500	MG/KG	90.5
		Magnesium, LCS	2200	2500	MG/KG	87.9
		Manganese, LCS	65.9	75.0	MG/KG	87.9
		Molybdenum, LCS	458	500	MG/KG	91.6
		Sodium, LCS	2240	2500	MG/KG	89.6
		Nickel, LCS	177	200	MG/KG	88.4
		Lead, LCS	213	250	MG/KG	85.1
		Antimony, LCS	262	300	MG/KG	87.2
		Selenium, LCS	901	1000	MG/KG	90.1
		Silicon, LCS	108	500	MG/KG	21.6
		Vanadium, LCS	220	250	MG/KG	88.0
		Zinc, LCS	87.2	100	MG/KG	87.2
LCS1	06C0051-LC1	Mercury, LCS	6.3	6.2	MG/KG	100.8