

**SAF-RC-029**  
**Remaining Sites Confirmation Sampling -**  
**Soil**  
**FINAL VALIDATION PACKAGE**

**COMPLETE COPY OF VALIDATION PACKAGE TO:**

Jeanette Duncan (2) H9-02

*mjr* 4/4/06  
INITIAL/DATE

**COMMENTS:**

**SDG K0173**

**SAF-RC-029**

**Waste Site: 100-D-9**

**RECEIVED**  
APR 24 2006  
**EDMC**

Date: 8 March 2006  
To: Washington Closure Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling – Soil – Full Protocol - Waste Site 100-D-9  
Subject: Semivolatile - Data Package No. K0173-LLI

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. K0173 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
J10VL0	1/4/06	Soil	C	See note 1
J10VL1	1/4/06	Soil	C	See note 1
J10VL2	1/4/06	Soil	C	See note 1
J10VL3	1/4/06	Soil	C	See note 1
J10VL4	1/4/06	Soil	C	See note 1

1 - Semivolatiles by 8270C.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) 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

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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 qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

#### Field Blanks

One field blank (J10VL0) was submitted for analysis. Diethylphthalate and di-n-butylphthalate were detected in the field 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

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as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

#### Surrogate Recovery

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

All surrogate results were acceptable.

#### • Precision

##### Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

##### Field Duplicate Samples

One set of field duplicates (J10VL1/J10VCL4) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

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• **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. Forty analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

• **Completeness**

Data package No. K0173-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

**MAJOR DEFICIENCIES**

None found.

**MINOR DEFICIENCIES**

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

Forty 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.

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**Appendix 1**  
**Glossary of Data Reporting Qualifiers**

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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).

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**Appendix 2**  
**Summary of Data Qualification**

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SEMIVOLATILE DATA QUALIFICATION SUMMARY\*

SDG: KC173	REVIEWER: [illegible]	Project: 100-D-9	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U at RQL	All	Blank contamination

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

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**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

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Project: WASHINGTON CLOSURE HANFORD											
Laboratory: LLI		SDG: K0173									
Sample Number	J10VL0		J10VL1		J10VL2		J10VL3		J10VL4		
Remarks	E. Blank		orig						Duplicate		
Sample Date	1/4/06		1/4/06		1/4/06		1/4/06		1/4/06		
Extraction Date	1/11/06		1/11/06		1/11/06		1/11/06		1/11/06		
Analysis Date	1/13/06		1/13/06		1/13/06		1/13/06		1/13/06		
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	330	U	340	U	340	U	340	U	340	U
bis(2-Chloroethyl)ether	660	330	U	340	U	340	U	340	U	340	U
2-Chlorophenol	660	330	U	340	U	340	U	340	U	340	U
1,3-Dichlorobenzene	660	330	U	340	U	340	U	340	U	340	U
1,4-Dichlorobenzene	660	330	U	340	U	340	U	340	U	340	U
1,2-Dichlorobenzene	660	330	U	340	U	340	U	340	U	340	U
2-Methylphenol	660	330	U	340	U	340	U	340	U	340	U
2,2'-oxybis(1-chloropropane)	660	330	U	340	U	340	U	340	U	340	U
3 and/or 4-Methylphenol	660	330	U	340	U	340	U	340	U	340	U
N-Nitroso-di-n-propylamine	660	330	U	340	U	340	U	340	U	340	U
Hexachloroethane	660	330	U	340	U	340	U	340	U	340	U
Nitrobenzene	660	330	U	340	U	340	U	340	U	340	U
Isophorone	660	330	U	340	U	340	U	340	U	340	U
2-Nitrophenol	660	330	U	340	U	340	U	340	U	340	U
2,4-Dimethylphenol	660	330	U	340	U	340	U	340	U	340	U
bis(2-Chloroethoxy)methane	660	330	U	340	U	340	U	340	U	340	U
2,4-Dichlorophenol	660	330	U	340	U	340	U	340	U	340	U
1,2,4-Trichlorobenzene	660	330	U	340	U	340	U	340	U	340	U
Naphthalene	660	330	U	340	U	340	U	340	U	340	U
4-Chloroaniline	660	330	U	340	U	340	U	340	U	340	U
Hexachlorobutadiene	660	330	U	340	U	340	U	340	U	340	U
4-Chloro-3-methylphenol	660	330	U	340	U	340	U	340	U	340	U
2-Methylnaphthalene	660	330	U	340	U	340	U	340	U	340	U
Hexachlorocyclopentadiene	660	330	U	340	U	340	U	340	U	340	U
2,4,6-Trichlorophenol	660	330	U	340	U	340	U	340	U	340	U
2,4,5-Trichlorophenol*	660	830	U	860	U	860	U	860	U	860	U
2-Chloronaphthalene	660	330	U	340	U	340	U	340	U	340	U
2-Nitroaniline*	660	830	U	860	U	860	U	860	U	860	U
Dimethylphthalate	660	330	U	340	U	340	U	340	U	340	U
Acenaphthylene	660	330	U	340	U	340	U	340	U	340	U
2,6-Dinitrotoluene	660	330	U	340	U	340	U	340	U	340	U

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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

Project: WASHINGTON CLOSURE HANFORD											
Laboratory: LLJ		SDG: K0173									
Sample Number	J10VL0		J10VL1		J10VL2		J10VL3		J10VL4		
Remarks	E. Blank		orig						Duplicate		
Sample Date	1/4/06		1/4/06		1/4/06		1/4/06		1/4/06		
Extraction Date	1/11/06		1/11/06		1/11/06		1/11/06		1/11/06		
Analysis Date	1/13/06		1/13/06		1/13/06		1/13/06		1/13/06		
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	830	U	860	U	860	U	860	U	860	U
Acenaphthene	660	330	U	340	U	340	U	340	U	340	U
2,4-Dinitrophenol*	660	830	U	860	U	860	U	860	U	860	U
4-Nitrophenol*	660	830	U	860	U	860	U	860	U	860	U
Dibenzofuran	660	330	U	340	U	340	U	340	U	340	U
2,4-Dinitrotoluene	660	330	U	340	U	340	U	340	U	340	U
Diethylphthalate	660	22		340	U	340	U	340	U	340	U
4-Chlorophenyl-phenyl ether	660	330	U	340	U	340	U	340	U	340	U
Fluorene	660	330	U	340	U	340	U	340	U	340	U
4-Nitroaniline*	660	830	U	860	U	860	U	860	U	860	U
4,6-Dinitro-2-methylphenol*	660	830	U	860	U	860	U	860	U	860	U
N-Nitrosodiphenylamine	660	330	U	340	U	340	U	340	U	340	U
4-Bromophenyl-phenyl ether	660	330	U	340	U	340	U	340	U	340	U
Hexachlorobenzene	660	330	U	340	U	340	U	340	U	340	U
Pentachlorophenol*	660	830	U	860	U	860	U	860	U	860	U
Phenanthrene	660	330	U	340	U	340	U	340	U	340	U
Anthracene	660	330	U	340	U	340	U	340	U	340	U
Carbazole	660	330	U	340	U	340	U	340	U	340	U
Di-n-butylphthalate	660	130		340	U	340	U	25		340	U
Fluoranthene	660	330	U	340	U	340	U	340	U	340	U
Pyrene	660	330	U	340	U	340	U	340	U	340	U
Butylbenzylphthalate	660	330	U	340	U	340	U	340	U	340	U
3,3'-Dichlorobenzidine	660	330	U	340	U	340	U	340	U	340	U
Benzo(a)anthracene	660	330	U	340	U	340	U	340	U	340	U
Chrysene	660	330	U	340	U	340	U	340	U	340	U
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U	660	U
Di-n-octylphthalate	660	330	U	340	U	340	U	340	U	340	U
Benzo(b)fluoranthene	660	330	U	340	U	340	U	340	U	340	U
Benzo(k)fluoranthene	660	330	U	340	U	340	U	340	U	340	U
Benzo(a)pyrene	660	330	U	340	U	340	U	340	U	340	U
Indeno(1,2,3-cd)pyrene	660	330	U	340	U	340	U	340	U	340	U
Dibenz(a,h)anthracene	660	330	U	340	U	340	U	340	U	340	U
Benzo(g,h,i)perylene	660	330	U	340	U	340	U	340	U	340	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

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Cust ID: J10VL0 J10VL1 J10VL2 J10VL3 J10VL3 J10VL3

RFW#: 001 002 003 004 004 MS 004 MSD

2-Chloronaphthalene	330 U	340 U	340 U	340 U	87 %	95 %
2-Nitroaniline	830 U	860 U	860 U	860 U	94 %	100 %
Dimethylphthalate	330 U	340 U	340 U	340 U	95 %	101 %
Acenaphthylene	330 U	340 U	340 U	340 U	88 %	95 %
2,6-Dinitrotoluene	330 U	340 U	340 U	340 U	94 %	101 %
3-Nitroaniline	830 U	860 U	860 U	860 U	120 %	123 %
Acenaphthene	330 U	340 U	340 U	340 U	87 %	94 %
2,4-Dinitrophenol	830 U	860 U	860 U	860 U	33 %	55 %
4-Nitrophenol	830 U	860 U	860 U	860 U	98 %	103 %
Dibenzofuran	330 U	340 U	340 U	340 U	90 %	97 %
2,4-Dinitrotoluene	330 U	340 U	340 U	340 U	101 %	105 %
Diethylphthalate	22 J	340 U	340 U	340 U	95 %	100 %
4-Chlorophenyl-phenylether	330 U	340 U	340 U	340 U	92 %	100 %
Fluorene	330 U	340 U	340 U	340 U	90 %	96 %
4-Nitroaniline	830 U	860 U	860 U	860 U	103 %	105 %
4,6-Dinitro-2-methylphenol	830 U	860 U	860 U	860 U	91 %	106 %
N-Nitrosodiphenylamine (1)	330 U	340 U	340 U	340 U	80 %	85 %
4-Bromophenyl-phenylether	330 U	340 U	340 U	340 U	86 %	94 %
Hexachlorobenzene	330 U	340 U	340 U	340 U	99 %	107 %
Pentachlorophenol	830 U	860 U	860 U	860 U	105 %	119 %
Phenanthrene	330 U	340 U	340 U	340 U	93 %	97 %
Anthracene	330 U	340 U	340 U	340 U	96 %	101 %
Carbazole	330 U	340 U	340 U	340 U	97 %	101 %
Di-n-butylphthalate	130 J	340 U	340 U	25 J	96 %	103 %
Fluoranthene	330 U	340 U	340 U	340 U	99 %	103 %
Pyrene	330 U	340 U	340 U	340 U	92 %	97 %
Butylbenzylphthalate	330 U	340 U	340 U	340 U	101 %	108 %
3,3'-Dichlorobenzidine	330 U	340 U	340 U	340 U	126 %	130 %
Benzo(a)anthracene	330 U	340 U	340 U	340 U	97 %	103 %
Chrysene	330 U	340 U	340 U	340 U	96 %	102 %
bis(2-Ethylhexyl)phthalate	660-30 JB U 3/12/06	660-22 JB U 3/12/06	660-20 JB U 3/12/06	660-24 JB U 3/12/06	101 %	109 %
Di-n-octyl phthalate	330 U	340 U	340 U	340 U	105 %	112 %
Benzo(b)fluoranthene	330 U	340 U	340 U	340 U	101 %	104 %
Benzo(k)fluoranthene	330 U	340 U	340 U	340 U	97 %	102 %
Benzo(a)pyrene	330 U	340 U	340 U	340 U	97 %	102 %
Indeno(1,2,3-cd)pyrene	330 U	340 U	340 U	340 U	102 %	108 %
Dibenz(a,h)anthracene	330 U	340 U	340 U	340 U	101 %	108 %
Benzo(g,h,i)perylene	330 U	340 U	340 U	340 U	99 %	108 %

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

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RFW Batch Number: 0601L043

Client: TNUHANFORD RC-029 K0173

Work Order: 11343606001

Page: 2a

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	Cust ID:	J10VL4	SBLXSO	SBLXSO BS
Sample	RFW#:	005	06LE0031-MB1	06LE0031-MB1
Information	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg

	Nitrobenzene-d5	78 %	64 %	63 %
Surrogate	2-Fluorobiphenyl	75 %	62 %	74 %
Recovery	Terphenyl-d14	112 %	90 %	96 %
	Phenol-d5	85 %	65 %	74 %
	2-Fluorophenol	81 %	64 %	70 %
	2,4,6-Tribromophenol	80 %	68 %	108 %

	fl	fl	fl	fl	fl
Phenol	340 U	330 U	82 %		
bis(2-Chloroethyl) ether	340 U	330 U	82 %		
2-Chlorophenol	340 U	330 U	82 %		
1,3-Dichlorobenzene	340 U	330 U	78 %		
1,4-Dichlorobenzene	340 U	330 U	76 %		
1,2-Dichlorobenzene	340 U	330 U	80 %		
2-Methylphenol	340 U	330 U	81 %		
2,2'-oxybis(1-Chloropropane)	340 U	330 U	79 %		
4-Methylphenol	340 U	330 U	85 %		
N-Nitroso-di-n-propylamine	340 U	330 U	81 %		
Hexachloroethane	340 U	330 U	75 %		
Nitrobenzene	340 U	330 U	69 %		
Isophorone	340 U	330 U	82 %		
2-Nitrophenol	340 U	330 U	72 %		
2,4-Dimethylphenol	340 U	330 U	62 %		
bis(2-Chloroethoxy) methane	340 U	330 U	75 %		
2,4-Dichlorophenol	340 U	330 U	74 %		
1,2,4-Trichlorobenzene	340 U	330 U	70 %		
Naphthalene	340 U	330 U	68 %		
4-Chloroaniline	340 U	330 U	86 %		
Hexachlorobutadiene	340 U	330 U	77 %		
4-Chloro-3-methylphenol	340 U	330 U	84 %		
2-Methylnaphthalene	340 U	330 U	74 %		
Hexachlorocyclopentadiene	340 U	330 U	51 %		
2,4,6-Trichlorophenol	340 U	330 U	86 %		
2,4,5-Trichlorophenol	860 U	830 U	86 %		

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3/3/06

\*= Outside of EPA CLP QC limits.

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Cust ID: J10VL4 SBLKSO SBLKSO BS

RFW#: 005 06LE0031-MB1 06LE0031-MB1

2-Chloronaphthalene	340	U	330	U	81	%
2-Nitroaniline	860	U	830	U	85	%
Dimethylphthalate	340	U	330	U	79	%
Acenaphthylene	340	U	330	U	83	%
2,6-Dinitrotoluene	340	U	330	U	73	%
3-Nitroaniline	860	U	830	U	100	%
Acenaphthene	340	U	330	U	66	%
2,4-Dinitrophenol	860	U	830	U	55	%
4-Nitrophenol	860	U	830	U	141	* %
Dibenzofuran	340	U	330	U	85	%
2,4-Dinitrotoluene	340	U	330	U	90	%
Diethylphthalate	340	U	330	U	87	%
4-Chlorophenyl-phenylether	340	U	330	U	79	%
Fluorene	340	U	330	U	94	%
4-Nitroaniline	860	U	830	U	106	%
4,6-Dinitro-2-methylphenol	860	U	830	U	96	%
N-Nitrosodiphenylamine (1)	340	U	330	U	77	%
4-Bromophenyl-phenylether	340	U	330	U	80	%
Hexachlorobenzene	340	U	330	U	103	%
Pentachlorophenol	860	U	830	U	114	%
Phenanthrene	340	U	330	U	79	%
Anthracene	340	U	330	U	98	%
Carbazole	340	U	330	U	100	%
Di-n-butylphthalate	340	U	330	U	103	%
Fluoranthene	340	U	330	U	100	%
Pyrene	340	U	330	U	98	%
Butylbenzylphthalate	340	U	330	U	101	%
3,3'-Dichlorobenzidine	340	U	330	U	130	%
Benzo(a)anthracene	340	U	330	U	89	%
Chrysene	340	U	330	U	91	%
bis(2-Ethylhexyl)phthalate	29	JB	23	J	94	%
Di-n-octyl phthalate	340	U	330	U	95	%
Benzo(b)fluoranthene	340	U	330	U	97	%
Benzo(k)fluoranthene	340	U	330	U	82	%
Benzo(a)pyrene	340	U	330	U	87	%
Indeno(1,2,3-cd)pyrene	340	U	330	U	89	%
Dibenz(a,h)anthracene	340	U	330	U	90	%
Benzo(g,h,i)perylene	340	U	330	U	88	%

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

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**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000016**



## Case Narrative

Client: TNU-HANFORD RC-029  
LVL #: 0601L043  
SDG/SAF # K0173/RC-029

W.O. #: 11343-606-001-9999-00  
Date Received: 01-06-2006

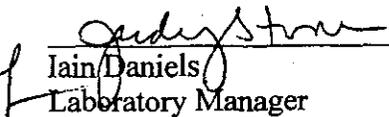
### SEMIVOLATILE

Five (5) soil samples were collected on 01-04-2006.

The samples and there associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 01-11-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 01-13-2006.

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 LVL's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. Two (2) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria.
6. One (1) of sixty-four (64) blank spike recoveries was outside acceptance criteria.
7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.
8. Internal standard area and retention time criteria were met.
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. LVL 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

1/19/06  
Date

son\group\data\bna\tnu-hanford\0601-043.doc

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 19 pages.

000017

Washington Closure Hanford  
 Collector STANKOVICH/HUDSON  
 Project Designation Remaining Sites Confirmation Sampling - Soil  
 Ice Chest No. **ERC-02-043**

Company Contact Mike Stankovich Telephone No. 531-7620  
 Sampling Location 100-D-9  
 Field Logbook No. EL-1578-9  
 Offsite Property No. **A060205**

Project Coordinator KESSNER, JH  
 SAF No. RC-029  
 Method of Shipment Fed Ex  
 Bill of Lading/Air Bill No. **See OSPC**

Prices Code 8C  
 Data Turnaround 15 Days  
 Air Quality

Shipped To **EBERLINE SERVICES LIONVILLE**  
 POSSIBLE SAMPLE HANDLING MARKS  
 < POT limits  
 Special Handling and/or Storage  
 Cool 4°C

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Name	Notes	Cool 4C	Cool 4C	Cool 4C	Cool 4C
J10VL0	SOIL	1-4-06	0935		GP					
J10VL1	SOIL	1-4-06	0945		GP					
J10VL2	SOIL	1-4-06	0950		GP					
J10VL3	SOIL	1-4-06	0955		GP					
J10VL4	Soil	1-4-06	0945		GP					

**SAMPLE ANALYSIS**

See Item (2) in Special Instructions  
 PCBs - 8002  
 PCBs - 8270A (TCL)  
 PCBs - 8270B (TCL)  
 PCBs - 8270C (TCL)  
 PCBs - 8270D (TCL)  
 PCBs - 8270E (TCL)  
 PCBs - 8270F (TCL)  
 PCBs - 8270G (TCL)  
 PCBs - 8270H (TCL)  
 PCBs - 8270I (TCL)  
 PCBs - 8270J (TCL)  
 PCBs - 8270K (TCL)  
 PCBs - 8270L (TCL)  
 PCBs - 8270M (TCL)  
 PCBs - 8270N (TCL)  
 PCBs - 8270O (TCL)  
 PCBs - 8270P (TCL)  
 PCBs - 8270Q (TCL)  
 PCBs - 8270R (TCL)  
 PCBs - 8270S (TCL)  
 PCBs - 8270T (TCL)  
 PCBs - 8270U (TCL)  
 PCBs - 8270V (TCL)  
 PCBs - 8270W (TCL)  
 PCBs - 8270X (TCL)  
 PCBs - 8270Y (TCL)  
 PCBs - 8270Z (TCL)

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Name	Notes	Cool 4C	Cool 4C	Cool 4C	Cool 4C
J10VL0	SOIL	1-4-06	0935		GP					
J10VL1	SOIL	1-4-06	0945		GP					
J10VL2	SOIL	1-4-06	0950		GP					
J10VL3	SOIL	1-4-06	0955		GP					
J10VL4	Soil	1-4-06	0945		GP					

**CHAIN OF POSSESSION**

Received By/Removed From	Date/Time	Received By/Stored In	Date/Time
MS Stankovich	1/4/06 1400	MS Stankovich	1/4/06 1400
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728/38	1-5-06 1000	RZ Stettin	1-5-06 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RZ Stettin	1-5-06 1030	RZ Stettin	1-5-06 1030
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RZ Stettin	1-6-06 0915	RZ Stettin	1-6-06 0915
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) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Gross Alpha & Gross Beta; Nickel-63; Isotope Potassium (Potassium-238, Potassium-239, Potassium-240); Strontium-89, 90 - Total Str; Technetium-99; Isotope Uranium (Uranium-233, Uranium-235, Uranium-238); Total Uranium (2) KCP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref # 38 on 1/5/06

**Appendix 5**  
**Data Validation Supporting Documentation**

**000019**

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	100-D-9		DATA PACKAGE: K0173		
VALIDATOR:	TLI	LAB:	LLP	DATE: 2/27/06	
			SDG:	K0173	
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	<b>SW-846 8270</b>		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J10VLO J10VLI J10VL2 J10VL3 J10VLY					
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: MRB bis(2-ethylhexyl)phthalate - U all at RQL

diethylphthalate - in FB

di-n-butylphthalate - 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: NO PA

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  
Internal 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: 40 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: 8 March 2006  
To: Washington Closure Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling – Soil – Full Protocol - Waste Site 100-D-9  
Subject: Inorganics - Data Package No. K0173-LLI

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. K0173 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
J10VL0	1/4/06	Soil	C	See note 1
J10VL1	1/4/06	Soil	C	See note 1
J10VL2	1/4/06	Soil	C	See note 1
J10VL3	1/4/06	Soil	C	See note 1
J10VL4	1/4/06	Soil	C	See note 1

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

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

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

## **DATA QUALITY PARAMETERS**

### **• Holding Times**

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

All holding times were acceptable.

**000001**

## · Preparation (Method) Blanks

### Preparation Blanks

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

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

Due to method blank contamination, the chromium result in sample J10VLO was qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

### Field (Equipment) Blank

One field blank (J10VLO) was submitted for analysis. Aluminum, barium, calcium, iron, potassium, manganese, magnesium, sodium, silicon, vanadium and zinc were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

## · Accuracy

### Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70%

000002

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 MS recovery outside QC limits (61.6%), all calcium results were qualified as estimates and flagged "J".

Due to a MS recovery outside QC limits (61.2%), all magnesium results were qualified as estimates and flagged "J".

Due to a MS recovery outside QC limits (66.5%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (56.3%), 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.

Due to an RPD outside QC limits (34.1%), all aluminum results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

##### Field Duplicate

One set of field duplicates (J10VL1/J10VL4) were submitted for analysis. Field duplicates are assessed using the same criteria as for laboratory duplicates. The RPDs for aluminum (34%), sodium (32%) and vanadium (41.5%) exceeded QC limits. Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

000003

## **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 analytes met the RQL.

## **Completeness**

Data package No. K0173 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

## **MAJOR DEFICIENCIES**

None found.

## **MINOR DEFICIENCIES**

The following minor deficiencies were noted:

- Due to method blank contamination, the chromium result in sample J10VLO was qualified as an estimate and flagged "UJ".
- Due to a MS recovery outside QC limits (61.6%), all calcium results were qualified as estimates and flagged "J".
- Due to a MS recovery outside QC limits (61.2%), all magnesium results were qualified as estimates and flagged "J".
- Due to a MS recovery outside QC limits (66.5%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (56.3%), all silicon results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (34.1%), all aluminum 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.

000004

**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.

000005

**Appendix 1**  
**Glossary of Data Reporting Qualifiers**

000006

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).

000007

**Appendix 2**  
**Summary of Data Qualification**

**000008**

METALS DATA QUALIFICATION SUMMARY\*

SDG # 0473		REVIEWER	Project: 100-D-9	PAGE 11 OF 11
COMMENTS:				
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON	
Chromium	UJ	J10VLO	Blank contamination	
Calcium Magnesium Antimony	J	All	MS recovery	
Silicon	J	All	LCS recovery	
Aluminum	J	All	RPD	

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

000009

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000010**

Project: WASHINGTON CLOSURE HANFORD											
Lab: LLI		SDG: K0173									
Sample Number	J10VL0	J10VL1	J10VL2	J10VL3	J10VL4						
Remarks	E. Blank	orig				Duplicate					
Sample Date	1/4/06	1/4/06	1/4/06	1/4/06	1/4/06						
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U
Aluminum		38.7	J	3890	J	3170	J	3380	J	2610	J
Arsenic	10	0.31	U	1.0		1.2		1.1		0.89	
Boron		0.25	U	0.62		0.82		0.78		0.66	
Barium	2	1.0		62.2		60.3		63.8		53.9	
Beryllium		0.009	U	0.19		0.47		0.15		0.11	
Calcium		21.6	J	7260	J	5820	J	5470	J	5650	J
Cadmium	0.2	0.06	U	0.20	U	0.17		0.20	U	0.20	U
Cobalt		0.11	U	8.6		8.1		8.0		7.0	
Chromium	1	0.19	UJ	3.3		3.3		3.5		2.0	
Copper		0.11	U	14.3		13.5		13.6		13.2	
Iron		89.8		24800		24600		25100		19500	
Mercury	0.2	0.02	U	0.02	U	0.01	U	0.02	U	0.01	U
Potassium		18.4		471		412		438		340	
Magnesium		6.2	J	4410	J	4000	J	3940	J	3280	J
Manganese		2.6		299		278		275		255	
Molybdenum		0.12	U	0.37	U	0.45		0.37	U	0.37	U
Sodium		9.0		325		284		208		234	
Nickel		0.12	U	9.1		8.9		7.2		6.9	
Lead	5	0.28	U	2.0		2.0		1.7		1.6	
Antimony		0.36	UJ	0.38	UJ	0.38	UJ	0.38	UJ	0.38	UJ
Selenium	1	0.33	U	0.34	U	0.34	U	0.34	U	0.34	U
Silicon		37.5	J	562	J	488	J	539	J	426	J
Vanadium		0.12		66.9		65.2		67.3		43.9	
Zinc	1	0.56		42.9		43.0		43.1		33.7	

000011

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/20/06

CLIENT: TNUHANFORD RC-029 K0173  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L043

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10VLO	Silver, Total	0.13	u MG/KG	0.13	1.0
		Aluminum, Total	38.7	J MG/KG	1.7	1.0
		Arsenic, Total	0.31	u MG/KG	0.31	1.0
		Boron, Total	0.25	u MG/KG	0.25	1.0
		Barium, Total	1.0	MG/KG	0.02	1.0
		Beryllium, Total	0.009	u MG/KG	0.009	1.0
		Calcium, Total	21.6	J MG/KG	1.1	1.0
		Cadmium, Total	0.06	u MG/KG	0.06	1.0
		Cobalt, Total	0.11	u MG/KG	0.11	1.0
		Chromium, Total	0.19	UJ MG/KG	0.15	1.0
		Copper, Total	0.11	u MG/KG	0.11	1.0
		Iron, Total	89.8	MG/KG	2.9	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Potassium, Total	18.4	MG/KG	5.0	1.0
		Magnesium, Total	6.2	J MG/KG	1.2	1.0
		Manganese, Total	2.6	MG/KG	0.02	1.0
		Molybdenum, Total	0.12	u MG/KG	0.12	1.0
		Sodium, Total	9.0	MG/KG	0.15	1.0
		Nickel, Total	0.12	u MG/KG	0.12	1.0
		Lead, Total	0.28	u MG/KG	0.28	1.0
		Antimony, Total	0.36	u JMG/KG	0.36	1.0
		Selenium, Total	0.33	u MG/KG	0.33	1.0
		Silicon, Total	37.5	J MG/KG	0.75	1.0
		Vanadium, Total	0.12	MG/KG	0.08	1.0
		Zinc, Total	0.56	MG/KG	0.05	1.0

*R*  
 3/3/06

000012

000000012

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/20/06

CLIENT: TNUHANFORD RC-029 K0173

LVL LOT #: 0601L043

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J10VLI	Silver, Total	0.13	u MG/KG	0.13	1.0
		Aluminum, Total	3890	J MG/KG	5.2	3.0
		Arsenic, Total	1.0	MG/KG	0.32	1.0
		Boron, Total	0.62	MG/KG	0.25	1.0
		Barium, Total	62.2	MG/KG	0.06	3.0
		Beryllium, Total	0.19	MG/KG	0.03	3.0
		Calcium, Total	7260	J MG/KG	3.4	3.0
		Cadmium, Total	0.20	u MG/KG	0.20	3.0
		Cobalt, Total	8.6	MG/KG	0.34	3.0
		Chromium, Total	3.3	MG/KG	0.45	3.0
		Copper, Total	14.3	MG/KG	0.34	3.0
		Iron, Total	24800	MG/KG	9.1	3.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Potassium, Total	471	MG/KG	15.6	3.0
		Magnesium, Total	4410	J MG/KG	3.8	3.0
		Manganese, Total	299	MG/KG	0.06	3.0
		Molybdenum, Total	0.37	u MG/KG	0.37	3.0
		Sodium, Total	325	MG/KG	0.48	3.0
		Nickel, Total	9.1	MG/KG	0.37	3.0
		Lead, Total	2.0	MG/KG	0.88	3.0
		Antimony, Total	0.38	u J MG/KG	0.38	1.0
		Selenium, Total	0.34	u MG/KG	0.34	1.0
		Silicon, Total	562	J MG/KG	2.3	3.0
		Vanadium, Total	66.9	MG/KG	0.25	3.0
		Zinc, Total	42.9	MG/KG	0.14	3.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/20/06

CLIENT: TNUHANFORD RC-029 K0173  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L043

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J10VL2	Silver, Total	0.13	u MG/KG	0.13	1.0
		Aluminum, Total	3170	J MG/KG	1.7	1.0
		Arsenic, Total	1.2	MG/KG	0.32	1.0
		Boron, Total	0.82	MG/KG	0.26	1.0
		Barium, Total	60.3	MG/KG	0.02	1.0
		Beryllium, Total	0.47	MG/KG	0.01	1.0
		Calcium, Total	5820	J MG/KG	1.1	1.0
		Cadmium, Total	0.17	MG/KG	0.07	1.0
		Cobalt, Total	8.1	MG/KG	0.11	1.0
		Chromium, Total	3.3	MG/KG	0.15	1.0
		Copper, Total	13.5	MG/KG	0.11	1.0
		Iron, Total	24600	MG/KG	3.1	1.0
		Mercury, Total	0.01	u MG/KG	0.01	1.0
		Potassium, Total	412	MG/KG	5.3	1.0
		Magnesium, Total	4000	J MG/KG	1.3	1.0
		Manganese, Total	278	MG/KG	0.02	1.0
		Molybdenum, Total	0.45	MG/KG	0.12	1.0
		Sodium, Total	284	MG/KG	0.16	1.0
		Nickel, Total	8.9	MG/KG	0.12	1.0
		Lead, Total	2.0	MG/KG	0.29	1.0
		Antimony, Total	0.38	u J MG/KG	0.38	1.0
		Selenium, Total	0.34	u MG/KG	0.34	1.0
		Silicon, Total	488	J MG/KG	0.78	1.0
		Vanadium, Total	65.2	MG/KG	0.09	1.0
		Zinc, Total	43.0	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/20/06

CLIENT: TNUHANFORD RC-029 KD173

LVL LOT #: 0601L043

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J10VL3	Silver, Total	0.13	u MG/KG	0.13	1.0
		Aluminum, Total	3280	J MG/KG	5.2	3.0
		Arsenic, Total	1.1	MG/KG	0.32	1.0
		Boron, Total	0.78	MG/KG	0.25	1.0
		Barium, Total	63.8	MG/KG	0.06	3.0
		Beryllium, Total	0.15	MG/KG	0.03	3.0
		Calcium, Total	5470	J MG/KG	3.4	3.0
		Cadmium, Total	0.20	u MG/KG	0.20	3.0
		Cobalt, Total	8.0	MG/KG	0.34	3.0
		Chromium, Total	2.5	MG/KG	0.45	3.0
		Copper, Total	13.6	MG/KG	0.34	3.0
		Iron, Total	25100	MG/KG	9.1	3.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Potassium, Total	438	MG/KG	15.7	3.0
		Magnesium, Total	3940	J MG/KG	3.8	3.0
		Manganese, Total	275	MG/KG	0.06	3.0
		Molybdenum, Total	0.27	u MG/KG	0.37	3.0
		Sodium, Total	208	MG/KG	0.48	3.0
		Nickel, Total	7.2	MG/KG	0.37	3.0
		Lead, Total	1.7	MG/KG	0.88	3.0
		Antimony, Total	0.38	u J MG/KG	0.38	1.0
		Selenium, Total	0.34	u MG/KG	0.34	1.0
		Silicon, Total	539	J MG/KG	2.3	3.0
		Vanadium, Total	67.3	MG/KG	0.25	3.0
		Zinc, Total	42.1	MG/KG	0.14	3.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/20/06

CLIENT: TNUHANFORD RC-029 K0173  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L043

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J10VL4	Silver, Total	0.13	u MG/KG	0.13	1.0
		Aluminum, Total	2610	J MG/KG	5.2	3.0
		Arsenic, Total	0.89	MG/KG	0.32	1.0
		Boron, Total	0.66	MG/KG	0.25	1.0
		Barium, Total	53.9	MG/KG	0.06	3.0
		Beryllium, Total	0.11	MG/KG	0.03	3.0
		Calcium, Total	5650	J MG/KG	3.4	3.0
		Cadmium, Total	0.20	u MG/KG	0.20	3.0
		Cobalt, Total	7.0	MG/KG	0.34	3.0
		Chromium, Total	2.0	MG/KG	0.45	3.0
		Copper, Total	13.2	MG/KG	0.34	3.0
		Iron, Total	19500	MG/KG	9.0	3.0
		Mercury, Total	0.01	u MG/KG	0.01	1.0
		Potassium, Total	340	MG/KG	15.6	3.0
		Magnesium, Total	3280	J MG/KG	3.8	3.0
		Manganese, Total	255	MG/KG	0.06	2.0
		Molybdenum, Total	0.37	u MG/KG	0.37	3.0
		Sodium, Total	234	MG/KG	0.48	3.0
		Nickel, Total	6.9	MG/KG	0.37	3.0
		Lead, Total	1.6	MG/KG	0.87	3.0
		Antimony, Total	0.38	u J MG/KG	0.38	1.0
		Selenium, Total	0.34	u MG/KG	0.34	1.0
		Silicon, Total	426	J MG/KG	2.3	3.0
		Vanadium, Total	43.9	MG/KG	0.25	3.0
		Zinc, Total	33.7	MG/KG	0.14	3.0

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**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000017**



## Analytical Report

Client: TNU-HANFORD RC-029  
LVL#: 0601L043  
SDG/SAF#: K0173/RC-029

W.O.#: 11343-606-001-9999-00  
Date Received: 01-06-06

### METALS CASE NARRATIVE

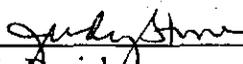
1. This narrative covers the analyses of 5 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LvLI's 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's for some analytes in file TA0117B. Affected samples/analytes were rerun in file TA0718B
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 56.3%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.
10. The matrix spike (MS) recoveries for 8 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 following analytes:

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 23 pages.

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<u>Sample ID</u>	<u>Element</u>	<u>PDS Concentration (ppb)</u>	<u>PDS % Recovery</u>
J10VL1	Aluminum	30,000	96.6
	Calcium	60,000	91.8
	Iron	60,000	99.2
	Magnesium	60,000	92.3
	Manganese	3,000	94.7
	Antimony	300	95.9
	Silicon	3,300	94.3
	Vanadium	3,000	96.9

12. The duplicate analyses for 8 analytes were 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

1/23/06  
 \_\_\_\_\_  
 Date

jjw/m01-043



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Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-029-021		Page 1 of 1				
Collector STANKOVICH/HUDSON		Company Contact Mike Stankovich		Telephone No. 531-7620		Project Coordinator KESSNER, JH		Price Code 8C		Data Turnaround			
Project Designation Remaining Sites Confirmation Sampling - Soil		Sampling Location 100-D-9		SAF No. RC-029		Air Quality <input type="checkbox"/>		15 Days					
Ice Chest No. <b>ERC-02-043</b>		Field Logbook No. EL-1578-9		COA CI0DR16700		Method of Shipment Fed Ex							
Shipped To EBERLINE SERVICE / LIONVILLE		Offsite Property No. <b>A060205</b>			Bill of Lading/Air Bill No. <b>See OSPC</b>								
POSSIBLE SAMPLE HAZARDS/REMARKS  < DOT limits  Special Handling and/or Storage  Cool 4°C  000020				Preservation		None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
				Type of Container		G/P	G/P	aG	aG	G	G		
				No. of Container(s)		1	1	1	1	1	1		
				Volume		250mL	250mL	250mL	250mL	60mL	250mL		
SAMPLE ANALYSIS				See Item (1) in Special Instructions		See Item (2) in Special Instructions		PCHs - 8082; 8083; 1/4/05	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1		
				Sample No.	Matrix *	Sample Date	Sample Time						
1	J10VL0	SOIL	1-4-06	0935		X		X	X				
2	J10VL1	SOIL	1-4-06	0945		X	X	X	X	X			
3	J10VL2	SOIL	1-4-06	0950		X	X	X	X	X			
4	J10VL3	SOIL	1-4-06	0955		X	X	X	X	X			
5	J10VL4	SOIL	1-4-06	0945		X	X	X	X	X			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS					
Relinquished By/Removed From M Stankovich		Date/Time 1/4/06 1400		Received By/Stored In 3728/SB		Date/Time 1/4/06 1400		(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium (2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)  Personnel not available to relinquish samples from 3728 Ref # 38 on 1/5/06					
Relinquished By/Removed From 3728/SB		Date/Time 1-5-06 1000		Received By/Stored In RZ Stettin A.J. Stettin		Date/Time 1-5-06							
Relinquished By/Removed From RZ Stettin A.J. Stettin		Date/Time 1-5-06 1030		Received By/Stored In Fed Ex		Date/Time							
Relinquished By/Removed From Fed Ex		Date/Time 1-6-06 0915		Received By/Stored In J Stettin		Date/Time 1-6-06 0915							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix * S-Soil SS-Sediment SO-Solid Sludge W-Water O-Oil A-Air DS-Drum Solids DL-Drum Liquids T-Tissue WY-Wipe L-Liquid V-Vegetation X-Other					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
LABORATORY SECTION	Received By		Title				Date/Time						
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By				Date/Time						

**Appendix 5**

**Data Validation Supporting Documentation**

**000021**

**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	100-D-9		DATA PACKAGE: K0173		
VALIDATOR:	TLJ	LAB: LLI	DATE: 2/27/06		
			SDG:	K0173	
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J10VLO	J10VLI	J10VL2	J10VL3	J10VL4	
sol'					

**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: Chromium - UJ LO

FB - Al, barium, calcium, iron, potassium, magnesium, manganese,  
sodium, silicon, vanadium, 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: Calcium 61.6% - J cell  
magnesium 61.2% - J cell  
antimony 66.5% - J cell } MS  
Silicon 56.3% - J all LCS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

- Duplicate RPD values acceptable?..... Yes  No  N/A
- Duplicate results acceptable?..... 2/2 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?..... 2/2 Yes  No  N/A
- Transcription/calculation errors? (Levels D, E)..... Yes  No  N/A

Comments: al - 39.170 - J cell

FD - al 3470 ~~Gallium~~ - Sodium 3270 Vanadium 41.52

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: \_\_\_\_\_

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\_\_\_\_\_

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**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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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**Appendix 6**

**Additional Documentation Requested by Client**

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/20/06

CLIENT: TNUMANFORD RC-029 K0173

LVL LOT #: 0601L043

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0029-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	1.8 u	MG/KG	1.8	1.0
		Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Boron, Total	0.27 u	MG/KG	0.27	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	1.2 u	MG/KG	1.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.22 u	MG/KG	0.16	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	3.2 u	MG/KG	3.2	1.0
		Potassium, Total	5.5 u	MG/KG	5.5	1.0
		Magnesium, Total	1.4 u	MG/KG	1.4	1.0
		Manganese, Total	0.02 u	MG/KG	0.02	1.0
		Molybdenum, Total	0.13 u	MG/KG	0.13	1.0
		Sodium, Total	0.17 u	MG/KG	0.17	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.40 u	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	0.82 u	MG/KG	0.82	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.05 u	MG/KG	0.05	1.0
BLANK1	06C0011-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/20/06

CLIENT: TNUHANFORD RC-029 K0173  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 06DIL043

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	J10VL1	Silver, Total	4.4	0.13u	4.8	91.7	1.0
		Aluminum, Total	3700	3890	190	-97. *	3.0
		Arsenic, Total	176	1.0	190	92.1	1.0
		Boron, Total	86.5	0.62	95.0	90.4	1.0
		Barium, Total	236	62.2	190	91.2	3.0
		Beryllium, Total	4.6	0.19	4.8	91.8	3.0
		Calcium, Total	6720	7260	2380	61.6	3.0
		Cadmium, Total	4.3	0.20u	4.8	89.6	3.0
		Cobalt, Total	50.8	8.6	47.5	88.2	3.0
		Chromium, Total	20.5	3.3	19.0	90.5	3.0
		Copper, Total	37.8	14.3	23.8	98.7	3.0
		Iron, Total	22300	24800	95.0	-2600. *	3.0
		Mercury, Total	0.15	0.02u	0.17	91.6	1.0
		Potassium, Total	2430	471	2380	82.4	3.0
		Magnesium, Total	5860	4410	2380	61.2	3.0
		Manganese, Total	320	299	47.5	44.2*	3.0
		Molybdenum, Total	87.7	0.37u	95.0	92.3	3.0
		Sodium, Total	2390	328	2380	86.8	3.0
		Nickel, Total	50.1	9.1	47.5	86.3	3.0
		Lead, Total	44.9	2.0	47.5	90.3	3.0
		Antimony, Total	11.6	0.38u	47.5	66.5	1.0
		Selenium, Total	166	0.34u	190	87.5	1.0
		Silicon, Total	682	562	95.0	126.5*	3.0
		Vanadium, Total	101	66.9	47.5	71.4	3.0
		Zinc, Total	81.3	42.9	47.5	80.8	3.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/20/06

CLIENT: TNUHANFORD RC-029 K0173

LVL LOT #: 0601L043

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE	RPD	FACTOR (REP)
-002REF	J10VL1	Silver, Total	0.13u	0.13u	NC	1.0
		Aluminum, Total	2890	2750	34.1	3.0
		Arsenic, Total	1.0	0.93	6.8	1.0
		Boron, Total	0.62	0.58	6.9	1.0
		Barium, Total	62.2	52.3	17.3	3.0
		Beryllium, Total	0.19	0.14	35.0	3.0
		Calcium, Total	7260	5580	26.1	3.0
		Cadmium, Total	0.20u	0.20u	NC	3.0
		Cobalt, Total	8.6	7.4	15.0	3.0
		Chromium, Total	3.3	2.8	16.4	3.0
		Copper, Total	14.3	12.5	13.4	3.0
		Iron, Total	24800	21400	14.6	3.0
		Mercury, Total	0.02u	0.01u	NC	1.0
		Potassium, Total	471	377	22.2	3.0
		Magnesium, Total	4410	3420	25.1	3.0
		Manganese, Total	299	256	15.6	3.0
		Molybdenum, Total	0.37u	0.37u	NC	3.0
		Sodium, Total	325	244	28.3	3.0
		Nickel, Total	9.1	6.4	34.8	3.0
		Lead, Total	2.0	1.8	10.5	3.0
		Antimony, Total	0.38u	0.38u	NC	1.0
		Selenium, Total	0.34u	0.34u	NC	1.0
		Silicon, Total	562	594	5.5	3.0
		Vanadium, Total	66.9	54.3	20.8	3.0
		Zinc, Total	42.9	35.4	19.2	3.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/20/06

CLIENT: TNUHANFORD RC-029 K0173  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L043

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0029-LC1	Silver, LCS	49.7	50.0	MG/KG	99.4
		Aluminum, LCS	506	500	MG/KG	101.1
		Arsenic, LCS	962	1000	MG/KG	96.2
		Boron, LCS	484	500	MG/KG	96.9
		Barium, LCS	500	500	MG/KG	100.1
		Beryllium, LCS	25.5	25.0	MG/KG	102.0
		Calcium, LCS	2540	2500	MG/KG	101.8
		Cadmium, LCS	25.4	25.0	MG/KG	101.6
		Cobalt, LCS	254	250	MG/KG	101.7
		Chromium, LCS	51.6	50.0	MG/KG	103.2
		Copper, LCS	128	125	MG/KG	102.2
		Iron, LCS	512	500	MG/KG	102.4
		Potassium, LCS	2300	2500	MG/KG	91.8
		Magnesium, LCS	2480	2500	MG/KG	99.0
		Manganese, LCS	78.3	75.0	MG/KG	104.4
		Molybdenum, LCS	500	500	MG/KG	100.0
		Sodium, LCS	2390	2500	MG/KG	95.4
		Nickel, LCS	201	200	MG/KG	100.6
		Lead, LCS	248	250	MG/KG	99.4
		Antimony, LCS	288	300	MG/KG	95.8
		Selenium, LCS	920	1000	MG/KG	92.0
		Silicon, LCS	282	500	MG/KG	56.3
		Vanadium, LCS	255	250	MG/KG	102.0
		Zinc, LCS	99.4	100	MG/KG	99.4
LCS1	06C0011-LC1	Mercury, LCS	6.5	6.2	MG/KG	106.9

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Date: 8 March2006  
To: Washington Closure Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling – Soil – Full Protocol - Waste Site 100-D-9  
Subject: PCB - Data Package No. K0173-LLI

## INTRODUCTION

This memo presents the results of data validation on Data Package No. K0173 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
J10VL1	1/4/06	Soil	C	See note 1
J10VL2	1/4/06	Soil	C	See note 1
J10VL3	1/4/06	Soil	C	See note 1
J10VL4	1/4/06	Soil	C	See note 1

1 - PCBs by 8082.

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

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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.

All 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

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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.

All 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.

- All precision results were acceptable.

- Field Duplicate Samples

- One set of field duplicates (J10VL1/J10VL4) 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 analytes met the RQL.

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· **Completeness**

Data Package No. K0173 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

**MAJOR DEFICIENCIES**

None found.

**MINOR DEFICIENCIES**

None found.

**REFERENCES**

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

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

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**Appendix 1**  
**Glossary of Data Reporting Qualifiers**

**000005**

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).

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**Appendix 2**  
**Summary of Data Qualification**

**000007**

PCB DATA QUALIFICATION SUMMARY\*

SDG: K0173	REVIEWER: TLI	PROJECT: 100-D-9	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

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

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**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000009**

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: LLI					SDG: K0173				
Sample Number		J10VL1		J10VL2		J10VL3		J10VL4	
Remarks		orig						Duplicate	
Sample Date		1/4/06		1/4/06		1/4/06		1/4/06	
Extraction Date		1/9/06		1/9/06		1/9/06		1/9/06	
Analysis Date		1/11/06		1/11/06		1/11/06		1/11/06	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	14	U	14	U	14	U	14	U
Aroclor-1221	100	14	U	14	U	14	U	14	U
Aroclor-1232	100	14	U	14	U	14	U	14	U
Aroclor-1242	100	14	U	14	U	14	U	14	U
Aroclor-1248	100	14	U	14	U	14	U	14	U
Aroclor-1254	100	14	U	14	U	14	U	14	U
Aroclor-1260	100	14	U	14	U	14	U	14	U

000010

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.

000000004

Cust ID:	J10VL1	J10VL1	J10VL1	J10VL2	J10VL3	J10VL4
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	73 %	80 %	80 %	78 %	86 %
	Decachlorobiphenyl	76 %	85 %	85 %	79 %	87 %
		-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----
Aroclor-1016	14 U	84 %	86 %	14 U	14 U	14 U
Aroclor-1221	14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1232	14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1242	14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1248	14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1254	14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1260	14 U	93 %	96 %	14 U	14 U	14 U

Cust ID: PBLKZ PBLKZ BS

Cust ID:	PBLKZ	PBLKZ BS
Sample Information	RFW#: 06LE0019-MB1	06LE0019-MB1
	Matrix: SOIL	SOIL
	D.F.: 1.00	1.00
	Units: UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	112 %
	Decachlorobiphenyl	103 %
		-----fl-----
Aroclor-1016	13 U	95 %
Aroclor-1221	13 U	13 U
Aroclor-1232	13 U	13 U
Aroclor-1242	13 U	13 U
Aroclor-1248	13 U	13 U
Aroclor-1254	13 U	13 U
Aroclor-1260	13 U	103 %

000011

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

*PR* 3/3/06

*[Signature]* 1/18/06

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000012**



Case Narrative

Client: TNU-HANFORD RC-029  
LVL #: 0601L043  
SDG/SAF # K0173/RC-029

W.O. #: 11343-606-001-9999-00  
Date Received: 01-06-2006

PCB

Four (4) soil samples were collected on 01-04-2006.

The samples and their associated QC samples were extracted on 01-09-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 01-10,11-2006. 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. The 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. All surrogate recoveries were within acceptance criteria.
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.
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

1/17/06  
Date

son\vr\group\data\pest\tnu\_hanford\0601-043.pobs

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 7 pages.

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U601040

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-029-021		Page 1 of 1				
Collector STANKOVICH/HUDSON		Company Contact Mike Stankovich		Telephone No. 531-7620		Project Coordinator KESSNER, JH		Price Code 8C		Data Turnaround 15 Days			
Project Designation Remaining Sites Confirmation Sampling - Soil		Sampling Location 100-D-9		SAF No. RC-029		Air Quality <input type="checkbox"/>							
Ice Chest No. ERC-02-043		Field Logbook No. EL-1578-9		COA C10DR16700		Method of Shipment Fed Ex							
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. A060205			Bill of Lading/Air Bill No. See OSPC								
POSSIBLE SAMPLE HAZARDS/REMARKS  < DOT limits  Special Handling and/or Storage Cool 4°C				Preservation		None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
				Type of Container		G/P	G/P	aG	aG	G	G		
				No. of Container(s)		1	1	1	1	1	1		
				Volume		250mL	250mL	250mL	250mL	60mL	250mL		
SAMPLE ANALYSIS  000014				See Item (1) in Special Instructions		See Item (2) in Special Instructions		PCBs - 2062	Semi-VOA - 2270A (TCL)	VOA - 2264A (TCL)	TPH (Total) - 418.1		
								W3 1/4/05					
Sample No.	Matrix *	Sample Date	Sample Time										
1 J10VL0	SOIL	1-4-06	0935		X		X	X					
2 J10VL1	SOIL	1-4-06	0945		X	X	X	X	X				
3 J10VL2	SOIL	1-4-06	0950		X	X	X	X	X				
4 J10VL3	SOIL	1-4-06	0955		X	X	X	X	X				
5 J10VL4	SOIL	1-4-06	0945		X	X	X	X	X				
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *					
Relinquished By/Removed From MT Stankovich		Date/Time 1/4/06 1400		Received By/Stored In 3728/38		Date/Time 1/4/06 1400		(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium (2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)					
Relinquished By/Removed From RZ Steffler R.J. Steffler		Date/Time 1-5-06 1000		Received By/Stored In RZ Steffler R.J. Steffler		Date/Time 1-5-06 1000							
Relinquished By/Removed From RZ Steffler R.J. Steffler		Date/Time 1-5-06 1030		Received By/Stored In Fed Ex		Date/Time							
Relinquished By/Removed From Fed Ex		Date/Time 1-6-06 0915		Received By/Stored In RZ Steffler R.J. Steffler		Date/Time 1-6-06 0915							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
LABORATORY SECTION		Received By		Title		Date/Time							
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time							

**Appendix 5**  
**Data Validation Supporting Documentation**

**000015**

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	100-D-9		DATA PACKAGE: K0173		
VALIDATOR:	TLP	LAB:	LLI	DATE: 2/27/06	
			SDG:	K0173	
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	<u>SW-846 8082</u>	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J10VL1 J10VL2 J10VL3 J10VL4					
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: no PAS

**PCB DATA VALIDATION CHECKLIST**

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

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**6. SYSTEM PERFORMANCE (Levels D and E)**

- Chromatographic performance acceptable? ..... Yes No  N/A
- Positive results resolved acceptably? ..... Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**7. HOLDING TIMES (all levels)**

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PCB DATA VALIDATION CHECKLIST**

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

Compound identification acceptable? (Levels D, E).....	Yes	No	N/A
Compound quantitation acceptable? (Levels D, E).....	Yes	No	N/A
Results reported for all requested analyses?.....	Yes	No	N/A
Results supported in the raw data? (Levels D, E).....	Yes	No	N/A
Samples properly prepared? (Levels D, E).....	Yes	No	N/A
Detection limits meet RDL?.....	Yes	No	N/A
Transcription/calculation errors? (Levels D, E).....	Yes	No	N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**9. SAMPLE CLEANUP (Levels D and E)**

Fluorilil ® (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: 8 March 2006  
To: Washington Closure Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-D-9  
Subject: Volatile - Data Package No. K0173-LLI

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. K0173 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	Method
J10VLO	1/4/06	Soil	C	VOAs by 8260B
J10VL1	1/4/06	Soil	C	VOAs by 8260B
J10VL2	1/4/06	Soil	C	VOAs by 8260B
J10VL2	1/4/06	Soil	C	VOAs by 8260B
J10VL4	1/4/06	Soil	C	VOAs by 8260B

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

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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 methylene chloride results were qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

Field Blanks

One field blank (J10VLO) was submitted for analysis. Acetone was detected in the field 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

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spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike (290%) and a matrix spike duplicate (247%) recoveries outside QC limits, all acetone 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.

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### Field Duplicate Samples

One set of field duplicates (J10VL1/J10VL4) 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. Fourteen analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

### · **Completeness**

Data package No. K0173 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

### **MAJOR DEFICIENCIES**

None found.

### **MINOR DEFICIENCIES**

Due to method blank contamination, all methylene chloride results were qualified as undetected, raised to the RQL and flagged "U". Due to matrix spike (290%) and a matrix spike duplicate (247%) recoveries outside QC limits, all acetone 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.

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## REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

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

000005

**Appendix 1**  
**Glossary of Data Reporting Qualifiers**

**000006**

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).

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**Appendix 2**  
**Summary of Data Qualification**

**000008**

VOLATILE DATA QUALIFICATION SUMMARY\*

SDG: K0173		REVIEWER: [REDACTED]	Project: 100-D-9	PAGE: 1 OF 1
COMMENTS:				
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON	
Methylene chloride	U at RQL	All	Blank contamination	
Acetone	J	All	MS/MSD 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.

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**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000010**

Project: WASHINGTON CLOSURE HANFORD											
Laboratory: LLI											
Case:		SDG: K0173									
Sample Number	J10VLO		J10VL1		J10VL2		J10VL3		J10VL4		
Remarks	E. Blank		orig						Duplicate		
Sample Date	1/4/06		1/4/06		1/4/06		1/4/06		1/4/06		
Analysis Date	1/18/06		1/18/06		1/18/06		1/18/06		1/18/06		
VOA	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	9	U	11	U	10	U	10	U	11	U
Bromomethane	10	9	U	11	U	10	U	10	U	11	U
Vinyl Chloride	10	9	U	11	U	10	U	10	U	11	U
Chloroethane	10	9	U	11	U	10	U	10	U	11	U
Methylene Chloride	10	10	U	10	U	10	U	10	U	10	U
Acetone	10	5	J	4	J	4	J	7	J	6	J
Carbon Disulfide	10	5	U	6	U	5	U	5	U	6	U
1,1-Dichloroethene	10	5	U	6	U	5	U	5	U	6	U
1,1-Dichloroethane	10	5	U	6	U	5	U	5	U	6	U
1,2-Dichloroethene (total)	10	5	U	6	U	5	U	5	U	6	U
Chloroform	10	5	U	6	U	5	U	5	U	6	U
1,2-Dichloroethane	10	5	U	6	U	5	U	5	U	6	U
2-Butanone	10	9	U	11	U	10	U	10	U	11	U
1,1,1-Trichloroethane	10	5	U	6	U	5	U	5	U	6	U
Carbon Tetrachloride	10	5	U	6	U	5	U	5	U	6	U
Bromodichloromethane	10	5	U	6	U	5	U	5	U	6	U
1,2-Dichloropropane	10	5	U	6	U	5	U	5	U	6	U
cis-1,3-Dichloropropene	10	5	U	6	U	5	U	5	U	6	U
Trichloroethene	10	5	U	6	U	5	U	5	U	6	U
Dibromochloromethane	10	5	U	6	U	5	U	5	U	6	U
1,1,2-Trichloroethane	10	5	U	6	U	5	U	5	U	6	U
Benzene	10	5	U	6	U	5	U	5	U	6	U
trans-1,3-Dichloropropene	10	5	U	6	U	5	U	5	U	6	U
Bromoform	10	5	U	6	U	5	U	5	U	6	U
4-Methyl-2-pentanone	10	9	U	11	U	10	U	10	U	11	U
2-Hexanone	10	9	U	11	U	10	U	10	U	11	U
Tetrachloroethene	10	5	U	6	U	5	U	5	U	6	U
1,1,2,2-Tetrachloroethane	10	5	U	6	U	5	U	5	U	6	U
Toluene	10	5	U	6	U	5	U	5	U	6	U
Chlorobenzene	10	5	U	6	U	5	U	5	U	6	U
Ethylbenzene	10	5	U	6	U	5	U	5	U	6	U
Styrene	10	5	U	6	U	5	U	5	U	6	U
M&P Xylene	10	5	U	6	U	5	U	5	U	6	U
O-Xylene	10	5	U	6	U	5	U	5	U	6	U
cis-1,2-Dichloroethene	10	5	U	6	U	5	U	5	U	6	U
trans-1,2-Dichloroethene	10	5	U	6	U	5	U	5	U	6	U

000011

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.

\*\*\*\*\*

Sample Information	RMW#	Matrix	D.R.	Units
J10V14	001	SOIL	0.909	UG/KG
J10V11	002	SOIL	1.04	UG/KG
J10V12	003	SOIL	1.02	UG/KG
J10V13	004	SOIL	1.02	UG/KG
J10V14	005	SOIL	1.06	UG/KG
J10V14	005 MS	SOIL	0.943	UG/KG

Surrogate	90	92	94	93	98	92	95	99	88
Toluene-d8	%	%	%	%	%	%	%	%	%
Bromofluorobenzene	%	%	%	%	%	%	%	%	%
1,2-Dichloroethane-d4 Recovery	87	92	94	93	98	93	95	98	88

Chloromethane	9	11	11	11	10	10	11	10	11
Chloromethane	9	11	11	11	10	10	11	10	11
Bromomethane	9	11	11	11	10	10	11	10	11
Vinyl Chloride	9	11	11	11	10	10	11	10	11
Chloroethane	9	11	11	11	10	10	11	10	11
Methylene Chloride	10	10	10	10	10	10	10	10	10
Acetone	5	6	6	6	5	5	5	5	6
Carbon Disulfide	5	6	6	6	5	5	5	5	6
1,1-Dichloroethane	5	6	6	6	5	5	5	5	6
1,1-Dichloroethane	5	6	6	6	5	5	5	5	6
1,2-Dichloroethane (total)	5	6	6	6	5	5	5	5	6
Chloroform	5	6	6	6	5	5	5	5	6
1,2-Dichloroethane	5	6	6	6	5	5	5	5	6
2-Butanone	9	11	11	11	10	10	11	10	11
1,1,1-Trichloroethane	5	6	6	6	5	5	5	5	6
Carbon Tetrachloride	5	6	6	6	5	5	5	5	6
Bromodichloromethane	5	6	6	6	5	5	5	5	6
1,2-Dichloropropane	5	6	6	6	5	5	5	5	6
cis-1,3-Dichloropropene	5	6	6	6	5	5	5	5	6
Trichloroethene	5	6	6	6	5	5	5	5	6
Dibromochloromethane	5	6	6	6	5	5	5	5	6
1,1,2-Trichloroethane	5	6	6	6	5	5	5	5	6
Benzene	5	6	6	6	5	5	5	5	6
Trans-1,3-Dichloropropene	5	6	6	6	5	5	5	5	6
Bromoform	5	6	6	6	5	5	5	5	6
4-Methyl-2-pentanone	9	11	11	11	10	10	11	10	11
2-Hexanone	9	11	11	11	10	10	11	10	11
Tetrachloroethene	5	6	6	6	5	5	5	5	6
1,1,2,2-Tetrachloroethane	5	6	6	6	5	5	5	5	6
Toluene	5	6	6	6	5	5	5	5	6

\* = Outside of EPA CLP GC limits.

000012

3/3/06

RFW Batch Number: 0601L043

Client: TROBANDER RC-029 KUL73

WORK ORDER: 11323000VVL

DATE: 04

Cust ID:

J10VL0

J10VL1

J10VL2

J10VL3

J10VL4

J10VL4

RFW#:

001

002

003

004

005

005 MS

	001	002	003	004	005	005 MS	
Chlorobenzene	5 U	6 U	5 U	5 U	6 U	89	%
Ethylbenzene	5 U	6 U	5 U	5 U	6 U	95	%
Styrene	5 U	6 U	5 U	5 U	6 U	96	%
Xylene (total)	5 U	6 U	5 U	5 U	6 U	93	%
M&P Xylene	5 U	6 U	5 U	5 U	6 U	93	%
O-Xylene	5 U	6 U	5 U	5 U	6 U	91	%
cis-1,2-Dichloroethene	5 U	6 U	5 U	5 U	6 U	100	%
trans-1,2-Dichloroethene	5 U	6 U	5 U	5 U	6 U	104	%

\*= Outside of EPA CLP QC limits.

RRRRRRR7

000013

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3/2/00

RFW Batch Number: 0601L043

Client: TNUHANFORD RC-029 K0173 Work Order: 11343606001 Page: 2a

Sample Information	Cust ID:	J10VL4	VBLKOP	VBLKOP BS
RFW#:	005 MSD	06LVX012-MB1	06LVX012-MB1	
Matrix:	SOIL	SOIL	SOIL	
D.F.:	0.893	1.00	1.00	
Units:	UG/KG	UG/KG	UG/KG	

Surrogate	Recovery	Toluene-d8	Bromofluorobenzene	1,2-Dichloroethane-d4
		86 %	90 %	90 %
		90 %	93 %	97 %
		89 %	87 %	95 %
-----fl-----fl-----fl-----fl-----fl-----fl				
Chloromethane		64 %	10 U	64 %
Bromomethane		98 %	10 U	97 %
Vinyl Chloride		83 %	10 U	82 %
Chloroethane		110 %	10 U	111 %
Methylene Chloride		89 %	5	96 %
Acetone		247 * %	10 U	96 %
Carbon Disulfide		104 %	5 U	102 %
1,1-Dichloroethene		104 %	5 U	100 %
1,1-Dichloroethane		99 %	5 U	98 %
1,2-Dichloroethene (total)		104 %	5 U	102 %
Chloroform		110 %	5 U	107 %
1,2-Dichloroethane		94 %	5 U	100 %
2-Butanone		186 %	10 U	96 %
1,1,1-Trichloroethane		120 %	5 U	115 %
Carbon Tetrachloride		120 %	5 U	114 %
Bromodichloromethane		101 %	5 U	108 %
1,2-Dichloropropane		86 %	5 U	90 %
cis-1,3-Dichloropropene		90 %	5 U	97 %
Trichloroethene		109 %	5 U	98 %
Dibromochloromethane		109 %	5 U	117 %
1,1,2-Trichloroethane		93 %	5 U	100 %
Benzene		90 %	5 U	95 %
Trans-1,3-Dichloropropene		93 %	5 U	101 %
Bromoform		133 %	5 U	141 * %
4-Methyl-2-pentanone		99 %	10 U	89 %
2-Hexanone		144 %	10 U	100 %
Tetrachloroethene		99 %	5 U	101 %
1,1,2,2-Tetrachloroethane		78 %	5 U	101 %
Toluene		94 %	5 U	98 %

\*= Outside of EPA CLP QC limits.

000014

*Handwritten signature*  
 3/3/06

0000000008

Cust ID: J10VLA VBLKOP VBLKOP BS

RFW#: 005 MSD 06LVX012-MB1 06LVX012-MB1

Chlorobenzene	90	%	5	U	94	%
Ethylbenzene	94	%	5	U	99	%
Styrene	99	%	5	U	108	%
Xylene (total)	95	%	5	U	97	%
M&P Xylene	96	%	5	U	97	%
O-Xylene	93	%	5	U	97	%
cis-1,2-Dichloroethene	103	%	5	U	101	%
trans-1,2-Dichloroethene	106	%	5	U	103	%

\*= Outside of EPA CLP QC limits.

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*Handwritten signature*  
3/3/06

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**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000016**



## Case Narrative

Client: TNU-HANFORD RC-029  
LVL #: 0601L043  
SDG/SAF # K0173/RC-029

W.O. #: 11343-606-001-9999-00  
Date Received: 01-06-2006

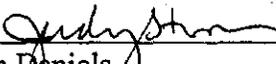
### GC/MS VOLATILE

Five (5) soil samples were collected on 01-04-2006.

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 01-18-2006.

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. Samples were analyzed within required holding time.
3. Non-target compounds were not detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. Three (3) of seventy-four (74) matrix spike recoveries were outside acceptance criteria.
6. One (1) of thirty-seven (37) blank spike recoveries was outside acceptance criteria.
7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than 2x the CRQL.
8. Internal standard area and retention time criteria were met.
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

1/23/06  
Date

son\group\data\voaltnu-hanford\0601-043.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

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00000002

<b>Washington Closure Hanford</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>			RC-029-021	Page 1 of 1
Collector STANKOVICH/HUDSON	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KESSNER, JH	Price Code 8C	Data Turnaround 15 Days	
Project Designation Remaining Sites Confirmation Sampling - Soil		Sampling Location 100-D-9	SAF No. RC-029	Air Quality <input type="checkbox"/>		
Ice Chest No. ERC-02-043	Field Logbook No. EL-1578-9	COA C10DR16700	Method of Shipment Fed Ex			
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. A060205	Bill of Lading/Air Bill No. See OSPC			

<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>  < POT limits  Special Handling and/or Storage Cool 4°C	Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
	Type of Container	G/P	G/P	aG	aG	G	G				
	No. of Container(s)	1	1	1	1	1	1				
	Volume	250ml	250ml	250ml	250ml	60ml	250ml				

<b>SAMPLE ANALYSIS</b>		Sec (1) in Special Instructions	Sec Item (2) in Special Instructions	PCBs - 8082 1/4/05	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1				
------------------------	--	---------------------------------	--------------------------------------	-----------------------	------------------------	-------------------	---------------------	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time								
J10VL0	SOIL	1-4-06	0935		X		X	X			
J10VL1	SOIL	1-4-06	0945		X	X	X	X	X		
J10VL2	SOIL	1-4-06	0950		X	X	X	X	X		
J10VL3	SOIL	1-4-06	0955		X	X	X	X	X		
J10VL4	SOIL	1-4-06	0945		X	X	X	X	X		

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From M.S. Stankovich	Date/Time 1/4/06 1000	Received By/Stored In R2 Steffler	Date/Time 1/4/06 1400
Relinquished By/Removed From 3728/38	Date/Time 1-5-06 1000	Received By/Stored In R2 Steffler	Date/Time 1-5-06 1000
Relinquished By/Removed From R2 Steffler	Date/Time 1-5-06 1030	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 1-6-06 0915	Received By/Stored In H. Stankovich	Date/Time 1-6-06 0915
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

<b>SPECIAL INSTRUCTIONS</b>  (1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium (2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)	<b>Matrix *</b>  S=Soil SS=Sludge SO=Solid SI=Sludge W=Water O=Oil A=Air OS=Other Solid DL=Drum Liquid T=Trace W=Wipe L=Liquid V=Volatile X=Other
Personnel not available to relinquish samples from 3728 Ref # 38 on 1/5/06	

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

000001005

00000001

**Appendix 5**  
**Data Validation Supporting Documentation**

**000019**

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	106-D-9		DATA PACKAGE: K0173		
VALIDATOR:	TLI	LAB:	LLI	DATE: 2/22/06	
			SDG:	K0173	
ANALYSES PERFORMED					
<b>SW-846 8260</b>		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J10LV0 J10LV1 J10LV2 J10LV3 J10LV4					
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- methylene chloride U all at RQL

acetone in FB

---



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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: acetone MS/MSD (290/247) - J ell

no pts

---



---

**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  
Internal 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: <u>None</u>			

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: 8 March 2006  
To: Washington Closure Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: Remaining Sites Confirmation Sampling – Soil – Full Protocol - Waste Site 100-D-9  
Subject: Wet Chemistry - Data Package No. K0173-LLI

## INTRODUCTION

This memo presents the results of data validation on Data Package No. K0173 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
J10VL1	1/4/06	Soil	C	See note 1
J10VL2	1/4/06	Soil	C	See note 1
J10VL3	1/4/06	Soil	C	See note 1
J10VL4	1/4/06	Soil	C	See note 1

1 - Total petroleum hydrocarbons by 9071/418.1.

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

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

## DATA QUALITY PARAMETERS

### • Holding Times

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

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".

000001

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

000002

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 (J10VL1/J10VL4) were submitted for analysis. Field duplicates are analyzed using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

#### **Analytical Detection Levels**

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

#### **Completeness**

Data package K0173 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**

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

000003

## 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**

000005

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).

000006

**Appendix 2**

**Summary of Data Qualification**

000007

WET CHEMISTRY DATA QUALIFICATION SUMMARY\*

SDG: K0173	REVIEWER: TLI	PROJECT: 100-D-9	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

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

000008

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000009**

Project: WASHINGTON CLOSURE HANFORD										
Lab: LLI		SDG: K0173								
Sample Number		J10VL1		J10VL2		J10VL3		J10VL4		
Remarks		orig								Duplicate
Sample Date		1/4/06		1/4/06		1/4/06		1/4/06		
Wet Chemistry		RQL	Result	Q	Result	Q	Result	Q	Result	Q
Total Petroleum Hydrocarbons		5	132	U	136	U	136	U	136	U

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/18/06

CLIENT: TNUHANFORD RC-029 K0173  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L043

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10VL0	% Solids	99.9	%	0.01	1.0
-002	J10VL1	% Solids	96.6	%	0.01	1.0
		Petroleum Hydrocarbons	132	u MG/KG	136	1.0
-003	J10VL2	% Solids	97.4	%	0.01	1.0
		Petroleum Hydrocarbons	136	u MG/KG	136	1.0
-004	J10VL3	% Solids	97.3	%	0.01	1.0
		Petroleum Hydrocarbons	136	u MG/KG	136	1.0
-005	J10VL4	% Solids	96.8	%	0.01	1.0
		Petroleum Hydrocarbons	136	u MG/KG	136	1.0

*Handwritten:*  
 ✓  
 3/3/06

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000012**



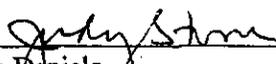
## Analytical Report

Client: TNU-HANFORD RC-029 K0173  
LVL#: 0601L043

W.O.#: 11343-606-001-9999-00  
Date Received: 01-06-06

### INORGANIC NARRATIVE

1. This narrative covers the analyses of 5 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.  
  
LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. The method blank for Petroleum Hydrocarbons (PHC) was within the method criteria.
6. The Laboratory Control Sample (LCS) for PHC was within the laboratory control limits.
7. The matrix spike recovery for PHC was within the 75-125% control limits.
8. The replicate analysis for PHC was within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

  
Date

njpl01-043

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 11 pages.

000013

02

Collector STANKOVICH/HUDSON Company Contact Mike Stankovich Telephone No. 531-7620 Project Coordinator KESSNER, JH Price Code 8C Data Turnaround 15 Days

Project Designation Remaining Sites Confirmation Sampling - Soil Sampling Location 100-D-9 SAF No. RC-029 Air Quality

Ice Chest No. ERC-02-043 Field Logbook No. EL-1578-9 COA C10DR16700 Method of Shipment Fed Ex

Shipped To EBERLINE SERVICE/LIONVILLE Offsite Property No. A060205 Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage	Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C
	Type of Container	G/P	G/P	nG	nG	G	G
	No. of Container(s)	1	1	1	1	1	1
	Volume	100mL	250mL	250mL	250mL	60mL	250mL

SAMPLE ANALYSIS	See Item (1) in Instructions	See Item (2) in Special Instructions	PCBs - 8082	Seal-VDA - 8770A (TCL)	VDA - 8260A (TCL)	TPH (Total) - 418.1
				1/4/05		

Sample No.	Matrix *	Sample Date	Sample Time						
1 J10VL0	SOIL	1-4-06	0935		X		X	X	
2 J10VL1	SOIL	1-4-06	0945		X	X	X	X	X
3 J10VL2	SOIL	1-4-06	0950		X	X	X	X	X
4 J10VL3	SOIL	1-4-06	0955		X	X	X	X	X
5 J10VL4	SOIL	1-4-06	0945		X	X	X	X	X

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MTS Stankovich	1/4/06 1400	3728/SB	1/4/06 1400
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728/SB	1-5-06 1000	RE STELLER R. J. STELLER	1-5-06 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RE STELLER R. J. STELLER	1-5-06 1030	Fed Ex	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FE/EP	1-6-06 0915	RE STELLER R. J. STELLER	1-6-06 0915
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

**SPECIAL INSTRUCTIONS**

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium.

(2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from 3728 Ref # 38 on 1/5/06

**Matrix \***

S=Soil  
SE=Soil/Element  
SO=Soil  
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

**Appendix 5**

**Data Validation Supporting Documentation**

**000015**

**GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	100-D-9		DATA PACKAGE: K0173		
VALIDATOR:	TLI	LAB:	LLF	DATE: 2/27/06	
			SDG:	K0173	
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	<b>TPH-418.1</b>	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO <sub>3</sub> /NO <sub>2</sub>
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J10V L1    J10V L2    J10V L3    J10V L4					
Soil					

**1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE**

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

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

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

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

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

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

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

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_

**GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST**

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

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

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

Spike samples analyzed? ..... Yes No N/A  
Spike recoveries acceptable? ..... Yes No N/A  
Spike standards NIST traceable? (Levels D, E) ..... Yes No N/A  
Spike standards expired? (Levels D, E) ..... Yes No N/A  
LCS/BSS samples analyzed? ..... Yes No N/A  
LCS/BSS results acceptable? ..... Yes No N/A  
Standards traceable? (Levels D, E) ..... Yes No N/A  
Standards expired? (Levels D, E) ..... Yes No N/A  
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A  
Performance audit sample(s) analyzed? ..... Yes No N/A  
Performance audit sample results acceptable? ..... Yes No N/A  
Comments: no Pts

**GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST**

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

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**6. HOLDING TIMES (all levels)**

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST**

**7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)**

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Appendix 6**

**Additional Documentation Requested by Client**

**000020**

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/18/06

CLIENT: TNUHANFORD RC-029 K0173  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L043

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LHC003-MB1	Petroleum Hydrocarbons	133	u MG/KG	133	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/18/06

CLIENT: TNUHANFORD RC-029 K0173  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L043

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	J10VL1	Petroleum Hydrocarbons	541	24.6	554	93.2	1.0
BLANK10	06LHC003-MB1	Petroleum Hydrocarbons	548	133 u	560	97.9	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/18/06

CLIENT: TNUHANFORD RC-029 K0173  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L043

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-002REP	J10VLL	Petroleum Hydrocarbons	132 u	132 u	NC	1.0

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