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SAF-D05-003
RCBRA Tribal Plant Sampling
FINAL VALIDATION PACKAGE

MAIL VALIDATION PACKAGE TO:

Jeanette Duncan – 1 copy mjp 8-4-05 INITIAL/DATE

Steve Weiss H0-23 mjp 8-4-05 INITIAL/DATE

SDG H3138 **SAF-D05-003**

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Date: 14 June 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: RCBRA Tribal Plant Sampling - Soil
Subject: Semivolatile - Data Package No. H3138-LLI (SDG No. H3138)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3138-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J030V7	4/19/05	Soil	C	Semivolatiles by 8270C
J030V8	4/19/05	Soil	C	Semivolatiles by 8270C
J030V9	4/19/05	Soil	C	Semivolatiles by 8270C
J030W0	4/19/05	Soil	C	Semivolatiles by 8270C
J030W1	4/20/05	Soil	C	Semivolatiles by 8270C
J030W2	4/20/05	Soil	C	Semivolatiles by 8270C
J030W3	4/20/05	Soil	C	Semivolatiles by 8270C
J030W4	4/20/05	Soil	C	Semivolatiles by 8270C
J030W5	4/20/05	Soil	C	Semivolatiles by 8270C
J03125	4/25/05	Soil	C	Semivolatiles by 8270C

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the RCBRA (BHI-01754, March 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were met.

- **Method Blanks**

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

Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in all samples (except J030V9 and J030W5) were qualified as undetected, raised to the RDL and flagged "U".

All other method blank results were acceptable.

<u>Field Blanks</u>

No method blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

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

All accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-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 (J030V8/J030V9) 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. All undetected analytes were reported above the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H3138-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, the bis(2-ethylhexyl)phthalate result in all samples (except J030V9 and J030W5) were qualified as undetected, raised to the RDL and flagged "U".

All undetected analytes were reported above the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01754, *Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the River Corridor Baseline Risk Assessment*, March 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: H3138	REVIEWER: TLI	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
bis(2-ethylhexyl)phthalate	U at RDL	All except J030V9 and J030W5	Method 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.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																					
Laboratory: LLI	SDG: H3138																				
Sample Number		J030V7		J030V8		J030V9		J030W0		J030W1		J030W2		J030W3		J030W4		J030W5		J03125	
Remarks						Duplicate															
Sample Date		4/19/05		4/19/05		4/19/05		4/19/05		4/19/05		4/20/05		4/20/05		4/20/05		4/20/05		4/20/05	
Extraction Date		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05	
Analysis Date		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
bis(2-Chloroethyl)ether	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2-Chlorophenol	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
1,3-Dichlorobenzene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
1,4-Dichlorobenzene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
1,2-Dichlorobenzene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2-Methylphenol	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2,2'-oxybis(1-chloropropane)	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
3 and/or 4-Methylphenol	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
N-Nitroso-di-n-propylamine	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Hexachloroethane	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Nitrobenzene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Isophorone	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2-Nitrophenol	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2,4-Dimethylphenol	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
bis(2-Chloroethoxy)methane	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2,4-Dichlorophenol	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
1,2,4-Trichlorobenzene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Naphthalene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
4-Chloroaniline	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Hexachlorobutadiene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
4-Chloro-3-methylphenol	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2-Methylnaphthalene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Hexachlorocyclopentadiene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2,4,6-Trichlorophenol	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2,4,5-Trichlorophenol	330	840	U	930	U	1100	U	920	U	890	U	850	U	900	U	950	U	1700	U	1800	U
2-Chloronaphthalene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2-Nitroaniline	330	840	U	930	U	1100	U	920	U	890	U	850	U	900	U	950	U	1700	U	1800	U
Dimethylphthalate	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Acenaphthylene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2,6-Dinitrotoluene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	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.

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																					
Laboratory: LLI	SDG: H3138																				
Sample Number		J030V7		J030V8		J030V9		J030W0		J030W1		J030W2		J030W3		J030W4		J030W5		J03125	
Remarks						Duplicate															
Sample Date		4/19/05		4/19/05		4/19/05		4/19/05		4/19/05		4/20/05		4/20/05		4/20/05		4/20/05		4/20/05	
Extraction Date		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05		4/28/05	
Analysis Date		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05		5/2/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	330	840	U	930	U	1100	U	920	U	890	U	850	U	900	U	950	U	1700	U	1800	U
Acenaphthene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2,4-Dinitrophenol	330	840	U	930	U	1100	U	920	U	890	U	850	U	900	U	950	U	1700	U	1800	U
4-Nitrophenol	330	840	U	930	U	1100	U	920	U	890	U	850	U	900	U	950	U	1700	U	1800	U
Dibenzofuran	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
2,4-Dinitrotoluene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Diethylphthalate	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
4-Chlorophenyl-phenyl ether	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Fluorene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
4-Nitroaniline	330	840	U	930	U	1100	U	920	U	890	U	850	U	900	U	950	U	1700	U	1800	U
4,6-Dinitro-2-methylphenol	330	840	U	930	U	1100	U	920	U	890	U	850	U	900	U	950	U	1700	U	1800	U
N-Nitrosodiphenylamine	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
4-Bromophenyl-phenyl ether	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Hexachlorobenzene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Pentachlorophenol	330	840	U	930	U	1100	U	920	U	890	U	850	U	900	U	950	U	1700	U	1800	U
Phenanthrene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Anthracene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Carbazole	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Di-n-butylphthalate	330	340	U	370	U	420	U	370	U	360	U	340	U	32		380	U	690	U	710	U
Fluoranthene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Pyrene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Butylbenzylphthalate	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
3,3'-Dichlorobenzidine	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(a)anthracene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Chrysene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
bis(2-Ethylhexyl)phthalate	330	330	U	330	U	420	U	330	U	330	U	330	U	330	U	330	U	690	U	330	U
Di-n-octylphthalate	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(b)fluoranthene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(k)fluoranthene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(a)pyrene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Indeno(1,2,3-cd)pyrene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Dibenz(a,h)anthracene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(g,h,i)perylene	330	340	U	370	U	420	U	370	U	360	U	340	U	360	U	380	U	690	U	710	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.

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 05/03/05 14:48

RFW Batch Number: **0504L303** Client: **TNU-HANFORD D05-003** Work Order: 11343606001 Page: 1a

	Cust ID:	J030V7		J030V7		J030V7		J030V8		J030V9		J030W0	
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 Recovery	Nitrobenzene-d5	75	%	79	%	74	%	67	%	68	%	73	%
	2-Fluorobiphenyl	81	%	83	%	81	%	61	%	69	%	76	%
	Terphenyl-d14	89	%	90	%	97	%	90	%	86	%	81	%
	Phenol-d5	82	%	84	%	77	%	76	%	75	%	79	%
	2-Fluorophenol	74	%	77	%	72	%	70	%	68	%	72	%
	2,4,6-Tribromophenol	85	%	88	%	95	%	82	%	84	%	81	%
			fl		fl		fl		fl		fl		fl
Phenol		340	U	71	%	67	%	370	U	420	U	370	U
bis(2-Chloroethyl)ether		340	U	340	U	340	U	370	U	420	U	370	U
2-Chlorophenol		340	U	70	%	66	%	370	U	420	U	370	U
1,3-Dichlorobenzene		340	U	340	U	340	U	370	U	420	U	370	U
1,4-Dichlorobenzene		340	U	66	%	63	%	370	U	420	U	370	U
1,2-Dichlorobenzene		340	U	340	U	340	U	370	U	420	U	370	U
2-Methylphenol		340	U	340	U	340	U	370	U	420	U	370	U
2,2'-oxybis(1-Chloropropane)		340	U	340	U	340	U	370	U	420	U	370	U
3/4-Methylphenol		340	U	340	U	340	U	370	U	420	U	370	U
N-Nitroso-di-n-propylamine		340	U	76	%	76	%	370	U	420	U	370	U
Hexachloroethane		340	U	340	U	340	U	370	U	420	U	370	U
Nitrobenzene		340	U	340	U	340	U	370	U	420	U	370	U
Isophorone		340	U	340	U	340	U	370	U	420	U	370	U
2-Nitrophenol		340	U	340	U	340	U	370	U	420	U	370	U
2,4-Dimethylphenol		340	U	340	U	340	U	370	U	420	U	370	U
bis(2-Chloroethoxy)methane		340	U	340	U	340	U	370	U	420	U	370	U
2,4-Dichlorophenol		340	U	340	U	340	U	370	U	420	U	370	U
1,2,4-Trichlorobenzene		340	U	69	%	67	%	370	U	420	U	370	U
Naphthalene		340	U	340	U	340	U	370	U	420	U	370	U
4-Chloroaniline		340	U	340	U	340	U	370	U	420	U	370	U
Hexachlorobutadiene		340	U	340	U	340	U	370	U	420	U	370	U
4-Chloro-3-methylphenol		340	U	71	%	75	%	370	U	420	U	370	U
2-Methylnaphthalene		340	U	340	U	340	U	370	U	420	U	370	U
Hexachlorocyclopentadiene		340	U	340	U	340	U	370	U	420	U	370	U
2,4,6-Trichlorophenol		340	U	340	U	340	U	370	U	420	U	370	U
2,4,5-Trichlorophenol		840	U	840	U	840	U	930	U	1100	U	920	U

*= Outside of EPA CLP QC limits.

R 6/13/05

000014

RFW Batch Number: 0504L303 Client: TNU-HANFORD D05-003 Work Order: 11343606001 Page: 1b

Cust ID:	J030V7	J030V7	J030V7	J030V8	J030V9	J030W0
RFW#:	002	002 MS	002 MSD	003	004	005
2-Chloronaphthalene	340 U	340 U	340 U	370 U	420 U	370 U
2-Nitroaniline	840 U	840 U	840 U	930 U	1100 U	920 U
Dimethylphthalate	340 U	340 U	340 U	370 U	420 U	370 U
Acenaphthylene	340 U	340 U	340 U	370 U	420 U	370 U
2,6-Dinitrotoluene	340 U	340 U	17 J	370 U	420 U	370 U
3-Nitroaniline	840 U	840 U	840 U	930 U	1100 U	920 U
Acenaphthene	340 U	76 %	75 %	370 U	420 U	370 U
2,4-Dinitrophenol	840 U	840 U	840 U	930 U	1100 U	920 U
4-Nitrophenol	840 U	69 %	69 %	930 U	1100 U	920 U
Dibenzofuran	340 U	340 U	340 U	370 U	420 U	370 U
2,4-Dinitrotoluene	340 U	76 %	78 %	370 U	420 U	370 U
Diethylphthalate	340 U	340 U	340 U	370 U	420 U	370 U
4-Chlorophenyl-phenylether	340 U	340 U	340 U	370 U	420 U	370 U
Fluorene	340 U	340 U	340 U	370 U	420 U	370 U
4-Nitroaniline	840 U	840 U	840 U	930 U	1100 U	920 U
4,6-Dinitro-2-methylphenol	840 U	840 U	840 U	930 U	1100 U	920 U
N-Nitrosodiphenylamine (1)	340 U	340 U	340 U	370 U	420 U	370 U
4-Bromophenyl-phenylether	340 U	340 U	340 U	370 U	420 U	370 U
Hexachlorobenzene	340 U	340 U	340 U	370 U	420 U	370 U
Pentachlorophenol	840 U	57 %	55 %	930 U	1100 U	920 U
Phenanthrene	340 U	340 U	340 U	370 U	420 U	370 U
Anthracene	340 U	340 U	340 U	370 U	420 U	370 U
Carbazole	340 U	340 U	340 U	370 U	420 U	370 U
Di-n-butylphthalate	340 U	340 U	340 U	370 U	420 U	370 U
Fluoranthene	340 U	340 U	340 U	370 U	420 U	370 U
Pyrene	340 U	78 %	82 %	370 U	420 U	370 U
Butylbenzylphthalate	340 U	340 U	340 U	370 U	420 U	370 U
3,3'-Dichlorobenzidine	340 U	340 U	340 U	370 U	420 U	370 U
Benzo(a)anthracene	340 U	340 U	340 U	370 U	420 U	370 U
Chrysene	340 U	340 U	340 U	370 U	420 U	370 U
bis(2-Ethylhexyl)phthalate	330 ~~22~~ 24 ~~JB~~ U	~~19 JB~~	23 JB	330 ~~24~~ ~~JB~~ U	420 U	330 ~~25~~ ~~JB~~ U
Di-n-octyl phthalate	340 U	340 U	340 U	370 U	420 U	370 U
Benzo(b)fluoranthene	340 U	340 U	340 U	370 U	420 U	370 U
Benzo(k)fluoranthene	340 U	340 U	340 U	370 U	420 U	370 U
Benzo(a)pyrene	340 U	340 U	340 U	370 U	420 U	370 U
Indeno(1,2,3-cd)pyrene	340 U	340 U	340 U	370 U	420 U	370 U
Dibenz(a,h)anthracene	340 U	340 U	340 U	370 U	420 U	370 U
Benzo(g,h,i)perylene	340 U	340 U	340 U	370 U	420 U	370 U

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

6/13/05

000015

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 05/03/05 14:48

RFW Batch Number: **0504L303** Client: **TNU-HANFORD D05-003** Work Order: 11343606001 Page: 2a

	Cust ID:	J030W1		J030W2		J030W3		J030W4		J030W5		J03125	
Sample Information	RFW#:	006		007		008		009		010		011	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		2.00		2.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Nitrobenzene-d5	62	%	70	%	62	%	54	%	81	%	97	%
	2-Fluorobiphenyl	76	%	73	%	70	%	66	%	86	%	105	%
	Terphenyl-d14	93	%	83	%	85	%	80	%	96	%	118	%
	Phenol-d5	75	%	74	%	73	%	66	%	86	%	106	%
	2-Fluorophenol	57	%	68	%	62	%	54	%	73	%	87	%
	2,4,6-Tribromophenol	95	%	76	%	83	%	82	%	96	%	121	%
		fl		fl		fl		fl		fl		fl	
Phenol		360	U	340	U	360	U	380	U	690	U	710	U
bis(2-Chloroethyl)ether		360	U	340	U	360	U	380	U	690	U	710	U
2-Chlorophenol		360	U	340	U	360	U	380	U	690	U	710	U
1,3-Dichlorobenzene		360	U	340	U	360	U	380	U	690	U	710	U
1,4-Dichlorobenzene		360	U	340	U	360	U	380	U	690	U	710	U
1,2-Dichlorobenzene		360	U	340	U	360	U	380	U	690	U	710	U
2-Methylphenol		360	U	340	U	360	U	380	U	690	U	710	U
2,2'-oxybis(1-Chloropropane)		360	U	340	U	360	U	380	U	690	U	710	U
3/4-Methylphenol		360	U	340	U	360	U	380	U	690	U	710	U
N-Nitroso-di-n-propylamine		360	U	340	U	360	U	380	U	690	U	710	U
Hexachloroethane		360	U	340	U	360	U	380	U	690	U	710	U
Nitrobenzene		360	U	340	U	360	U	380	U	690	U	710	U
Isophorone		360	U	340	U	360	U	380	U	690	U	710	U
2-Nitrophenol		360	U	340	U	360	U	380	U	690	U	710	U
2,4-Dimethylphenol		360	U	340	U	360	U	380	U	690	U	710	U
bis(2-Chloroethoxy)methane		360	U	340	U	360	U	380	U	690	U	710	U
2,4-Dichlorophenol		360	U	340	U	360	U	380	U	690	U	710	U
1,2,4-Trichlorobenzene		360	U	340	U	360	U	380	U	690	U	710	U
Naphthalene		360	U	340	U	360	U	380	U	690	U	710	U
4-Chloroaniline		360	U	340	U	360	U	380	U	690	U	710	U
Hexachlorobutadiene		360	U	340	U	360	U	380	U	690	U	710	U
4-Chloro-3-methylphenol		360	U	340	U	360	U	380	U	690	U	710	U
2-Methylnaphthalene		360	U	340	U	360	U	380	U	690	U	710	U
Hexachlorocyclopentadiene		360	U	340	U	360	U	380	U	690	U	710	U
2,4,6-Trichlorophenol		360	U	340	U	360	U	380	U	690	U	710	U
2,4,5-Trichlorophenol		890	U	850	U	900	U	950	U	1700	U	1800	U

*= Outside of EPA CLP QC limits.

6/13/05

000016

RFW Batch Number: 0504L303 Client: TNU-HANFORD D05-003 Work Order: 11343606001 Page: 2b

Cust ID:	J030W1		J030W2		J030W3		J030W4		J030W5		J03125	
RFW#:	006		007		008		009		010		011	
2-Chloronaphthalene	360	U	340	U	360	U	380	U	690	U	710	U
2-Nitroaniline	890	U	850	U	900	U	950	U	1700	U	1800	U
Dimethylphthalate	360	U	340	U	360	U	380	U	690	U	710	U
Acenaphthylene	360	U	340	U	360	U	380	U	690	U	710	U
2,6-Dinitrotoluene	360	U	340	U	360	U	380	U	690	U	710	U
3-Nitroaniline	890	U	850	U	900	U	950	U	1700	U	1800	U
Acenaphthene	360	U	340	U	360	U	380	U	690	U	710	U
2,4-Dinitrophenol	890	U	850	U	900	U	950	U	1700	U	1800	U
4-Nitrophenol	890	U	850	U	900	U	950	U	1700	U	1800	U
Dibenzofuran	360	U	340	U	360	U	380	U	690	U	710	U
2,4-Dinitrotoluene	360	U	340	U	360	U	380	U	690	U	710	U
Diethylphthalate	360	U	340	U	360	U	380	U	690	U	710	U
4-Chlorophenyl-phenylether	360	U	340	U	360	U	380	U	690	U	710	U
Fluorene	360	U	340	U	360	U	380	U	690	U	710	U
4-Nitroaniline	890	U	850	U	900	U	950	U	1700	U	1800	U
4,6-Dinitro-2-methylphenol	890	U	850	U	900	U	950	U	1700	U	1800	U
N-Nitrosodiphenylamine (1)	360	U	340	U	360	U	380	U	690	U	710	U
4-Bromophenyl-phenylether	360	U	340	U	360	U	380	U	690	U	710	U
Hexachlorobenzene	360	U	340	U	360	U	380	U	690	U	710	U
Pentachlorophenol	890	U	850	U	900	U	950	U	1700	U	1800	U
Phenanthrene	360	U	340	U	360	U	380	U	690	U	710	U
Anthracene	360	U	340	U	360	U	380	U	690	U	710	U
Carbazole	360	U	340	U	360	U	380	U	690	U	710	U
Di-n-butylphthalate	360	U	340	U	32	J	380	U	690	U	710	U
Fluoranthene	360	U	340	U	360	U	380	U	690	U	710	U
Pyrene	360	U	340	U	360	U	380	U	690	U	710	U
Butylbenzylphthalate	360	U	340	U	360	U	380	U	690	U	710	U
3,3'-Dichlorobenzidine	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(a)anthracene	360	U	340	U	360	U	380	U	690	U	710	U
Chrysene	360	U	340	U	360	U	380	U	690	U	710	U
bis(2-Ethylhexyl)phthalate	330 ~~19~~ JB	U	330 ~~23~~ JB	U	330 ~~32~~ JB	U	330 ~~45~~ JB	U	690	U	330 ~~49~~ JB	U
Di-n-octyl phthalate	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(b)fluoranthene	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(k)fluoranthene	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(a)pyrene	360	U	340	U	360	U	380	U	690	U	710	U
Indeno(1,2,3-cd)pyrene	360	U	340	U	360	U	380	U	690	U	710	U
Dibenz(a,h)anthracene	360	U	340	U	360	U	380	U	690	U	710	U
Benzo(g,h,i)perylene	360	U	340	U	360	U	380	U	690	U	710	U

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

6/13/05

000017

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 05/03/05 14:48

RFW Batch Number: **0504L303** Client: **TNU-HANFORD D05-003** Work Order: 11343606001 Page: 3a

	Cust ID:	**SBLKIN**	**SBLKIN BS**
Sample Information	RFW#:	**05LE0330-MB1**	**05LE0330-MB1**
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG

Surrogate Recovery	Nitrobenzene-d5	83	%	74	%
	2-Fluorobiphenyl	84	%	75	%
	Terphenyl-d14	97	%	84	%
	Phenol-d5	89	%	79	%
	2-Fluorophenol	85	%	78	%
	2,4,6-Tribromophenol	78	%	78	%

Phenol	330	U	63	%
bis(2-Chloroethyl)ether	330	U	330	U
2-Chlorophenol	330	U	63	%
1,3-Dichlorobenzene	330	U	330	U
1,4-Dichlorobenzene	330	U	61	%
1,2-Dichlorobenzene	330	U	330	U
2-Methylphenol	330	U	330	U
2,2'-oxybis(1-Chloropropane)	330	U	330	U
3/4-Methylphenol	330	U	330	U
N-Nitroso-di-n-propylamine	330	U	64	%
Hexachloroethane	330	U	330	U
Nitrobenzene	330	U	330	U
Isophorone	330	U	330	U
2-Nitrophenol	330	U	330	U
2,4-Dimethylphenol	330	U	330	U
bis(2-Chloroethoxy)methane	330	U	330	U
2,4-Dichlorophenol	330	U	330	U
1,2,4-Trichlorobenzene	330	U	61	%
Naphthalene	330	U	330	U
4-Chloroaniline	330	U	330	U
Hexachlorobutadiene	330	U	330	U
4-Chloro-3-methylphenol	330	U	62	%
2-Methylnaphthalene	330	U	330	U
Hexachlorocyclopentadiene	330	U	330	U
2,4,6-Trichlorophenol	330	U	330	U
2,4,5-Trichlorophenol	830	U	830	U

*= Outside of EPA CLP QC limits.

6/13/05

000018

Cust ID:	SBLKIN	SBLKIN BS
RFW#:	05LE0330-MB1	05LE0330-MB1

2-Chloronaphthalene	330	U	330	U
2-Nitroaniline	830	U	830	U
Dimethylphthalate	330	U	330	U
Acenaphthylene	330	U	330	U
2,6-Dinitrotoluene	330	U	330	U
3-Nitroaniline	830	U	830	U
Acenaphthene	330	U	64	%
2,4-Dinitrophenol	830	U	830	U
4-Nitrophenol	830	U	60	%
Dibenzofuran	330	U	330	U
2,4-Dinitrotoluene	330	U	68	%
Diethylphthalate	330	U	330	U
4-Chlorophenyl-phenylether	330	U	330	U
Fluorene	330	U	330	U
4-Nitroaniline	830	U	830	U
4,6-Dinitro-2-methylphenol	830	U	830	U
N-Nitrosodiphenylamine (1)	330	U	330	U
4-Bromophenyl-phenylether	330	U	330	U
Hexachlorobenzene	330	U	330	U
Pentachlorophenol	830	U	26	%
Phenanthrene	330	U	330	U
Anthracene	330	U	330	U
Carbazole	330	U	330	U
Di-n-butylphthalate	330	U	330	U
Fluoranthene	330	U	330	U
Pyrene	330	U	72	%
Butylbenzylphthalate	330	U	330	U
3,3'-Dichlorobenzidine	330	U	330	U
Benzo(a)anthracene	330	U	330	U
Chrysene	330	U	330	U
bis(2-Ethylhexyl)phthalate	19	J	23	JB
Di-n-octyl phthalate	330	U	330	U
Benzo(b)fluoranthene	330	U	330	U
Benzo(k)fluoranthene	330	U	330	U
Benzo(a)pyrene	330	U	330	U
Indeno(1,2,3-cd)pyrene	330	U	330	U
Dibenz(a,h)anthracene	330	U	330	U
Benzo(g,h,i)perylene	330	U	330	U

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

6/13/05

000019

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD D05-003
LVL #: 0504L303
SDG/SAF # H3138/D05-003

W.O. #: 11343-606-001-9999-00
Date Received: 04-26-2005

SEMIVOLATILE

Ten (10) soil samples were collected on 04-19,20,25-2005.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 04-28-2005 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 05-02-2005.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. Due to matrix the following samples had adjusted final volumes: J030W5, J03125 – 2 mls. These samples required no instrument dilutions. Due to programming limitations this dilution factor is reflected on the Form 1 summary.
5. All surrogate recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All blank spike recoveries were within acceptance criteria.
8. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate/19J at a level less than the CRQL.
9. Internal standard area and retention time criteria were met.
10. 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").
11. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/23/05
Date

jak\gorup\data\bna\tnu-hanford\0504-303.bna
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 28 pages.

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

0504L303

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	D05-003-1	Page 1 of 1

Collector: Siankovich/Gale/Singleton	Company Contact: Steve Weiss	Telephone No.: (509) 372-9495	Project Coordinator: WEISS, RL
Price Code: Air Quality ☐	Data Turnaround: 21 Days		
Project Designation: RCBRA Tribal Plant Sampling - Soil	Sampling Location: UPSTREAM, 100-H OUTFALL		SAF No.: D05-003
Ice Chest No.: ERC-03-104 and ERC-99-041	Field Logbook No.: EFL-1133-11	COA: BRASCC6520	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050206		Bill of Lading/Air Bill No.: See OSAC

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P D	aG B	aG C	aG A	G/P E						
No. of Container(s)	1	1	1	1	1						
Volume	250ml	250ml	120ml	250ml.	250ml.						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045						
Sample No. / Matrix * / Sample Date / Sample Time											
J030V6 / SOIL / 4-19-05 / 0940	X										
2 J030V7 / Soil / 4-19-05 / 1100	X	X	X	X	X						
3 J030V8 / Soil / 4-19-05 / 1400	X	X	X	X	X						
4 J030V9 / Soil / 4-19-05 / 1400	X	X	X	X	X						
5 J030W0 / Soil / 4-19-05 / 1410	X	X	X	X	X						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: [signature]	1600 4/19/05	Received By/Stored In: 3728/3B	4/19/05 1600
Relinquished By/Removed From: 3728 Rec 3B	4/25/05 1100	Received By/Stored In: D ST JOHN [signature]	4/25/05 1100
Relinquished By/Removed From: D ST JOHN ERC [signature]	4/25/05 1100	Received By/Stored In: Fed EX.	
Relinquished By/Removed From: Fed EX	4/26/05 0910	Received By/Stored In: [signature]	4/26/05 0915
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List); Mercury - 7471 - (CV); Chromium Hex - 7196; Percent Solids

Matrix *

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

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

0000028

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

D05-003-1

Collector: Stankovich/Gale/Singleton

Company Contact: Steve Weiss — Telephone No.: (509) 372-9495

Project Coordinator: WEISS, RL

Price Code: Air Quality ☐

Data Turnaround: 21 Days

Project Designation: RCBRA Tribal Plant Sampling - Soil

Sampling Location: 100-H

SAF No.: D05-003

Ice Chest No.: ERC-03-104 and ERC-99-041

Field Logbook No.: EFL-1133-11

COA: BRASCC6520

Method of Shipment: FedEx

Shipped To: EBERLINE SERVICES / LIONVILLE

Offsite Property No.: A050206

Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P D	aG B	~~aG~~ C	aG A	G/P E						
No. of Container(s)	1	1	1	1	1						
Volume	250ml	250ml	120ml	250mL	250mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045						
Sample No.	Matrix *	Sample Date	Sample Time								
6 J030W1	SOIL	4/20/05	1000	✓	✓	✓	✓	✓			
7 J030W2	Soil	4/20/05	1020	✓	✓	✓	✓	✓			
8 J030W3	Soil	4/20/05	1115	✓	✓	✓	✓	✓			
9 J030W4	Soil	4/20/05	1245	✓	✓	✓	✓	✓			
10 J030W5	Soil	4/20/05	1315	✓	✓	✓	✓	✓			

000023

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MJ Stankovich	1530 4/20/05	3728/315	4/20/05 1530
3728 RCE 3B	4/25/05 1100	D Stubbs	4/25/05 1100
D Stubbs ERC	4/25/05 1100	Fed Ex	
Fed Ex	4/26/05 0915		4/26/05 0915

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List); Mercury - 7471 - (CV); Chromium Hex - 7196; Percent Solids

Matrix *

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

LABORATORY SECTION: Received By — Title — Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method — Disposed By — Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

D05-003-1

Bechtel Hanford Inc.

Collector: Stankovich/Gale/Singleton

Company Contact: Steve Weiss — Telephone No.: (509) 372-9495

Project Coordinator: WEISS, RL

Price Code: Air Quality ☐

Data Turnaround: 21 Days

Project Designation: RCBRA Tribal Plant Sampling - Soil

Sampling Location: UPSTREAM, 100-H OUTFALL

SAF No.: D05-003

Ice Chest No.: ERC-03-104 and ERC-99-041

Field Logbook No.: EFL-1133-11

COA: BRASCC6520

Method of Shipment: FedEx

Shipped To: EBERLINE SERVICES (LIONVILLE)

Offsite Property No.: A05D206

Bill of Lading/Air Bill No.: SEE COC

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

~~N/A~~ cool 4°C

D05-003-1 4/25/05

00024

Preservation	None	Cool 4C B	Cool 4C	Cool 4C	None						
Type of Container	G/P D	aG	aG C	aG A	G/P E						
No. of Container(s)	1	1	1	1	1						
Volume	250ml	250ml	120ml	250mL	250mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045						
Sample No.	Matrix *	Sample Date	Sample Time								
11 J03125	SOIL	4-25-05	0830	X	X	X	X	X			
	Soil										
	Soil										
	Soil										
	Soil										

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
ERC Joyce Mitchell	4-25-05 0945	FED EX	
FedEx	4/26/05 0915	U Hemmel	4/26/05 0915

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List: Mercury - 7471 - (CV); Chromium Hex - 7196; Percent Solids

Matrix *

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

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

[redacted]

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCRA			DATA PACKAGE: H3138		
VALIDATOR: TLI		LAB: LLI		DATE: 6/10/05	
			SDG: H3138		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J030V7	J030V8	J030V9	J030W0	J030W1	
J030W2	J030W3	J030W4	J030W5	J0312S	
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

NO PB

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: NO PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

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

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

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

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

Comments: _____

7. HOLDING TIMES (all levels)

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

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

Comments: all underlines 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: 14 June 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: RCBRA Tribal Plant Sampling - Other Solid
Subject: Wet Chemistry - Data Package No. H3138-LLI (SDG No. H3138)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3138-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J030V6	4/19/05	Soil	C	See note 1
J030V7	4/19/05	Soil	C	See note 2
J030V8	4/19/05	Soil	C	See note 2
J030V9	4/19/05	Soil	C	See note 2
J030W0	4/19/05	Soil	C	See note 2
J030W1	4/20/05	Soil	C	See note 2
J030W2	4/20/05	Soil	C	See note 2
J030W3	4/20/05	Soil	C	See note 2
J030W4	4/20/05	Soil	C	See note 2
J030W5	4/20/05	Soil	C	See note 2
J03125	4/25/05	Soil	C	See note 2

1 - Chromium VI by 7196A.
2 - Chromium VI by 7196A and pH by 9045C.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the RCBRA (BHI-01754, March 2005). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI and immediately (24 hours) for pH.

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

Due to the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J".

All other 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

One equipment blank (J030V6) was submitted for analysis. No analytes were detected in the method blank.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations.

Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J030V8/J030V9) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. H3138-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 the holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All undetected chromium VI results exceeded the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01754, *Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the River Corridor Baseline Risk Assessment*, March 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H3138	REVIEWER: TLI	Project: RCBRA	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH	J	All	Holding time

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

WET CHEMISTRY ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD																	
Laboratory: LLI																	
Case	SDG: H3138																
Sample Number		J030V6		J030V7		J030V8		J030V9		J030W0		J030W1		J030W2		J030W3	
Remarks		E. Blank						Duplicate									
Sample Date		04/19/05		04/19/05		04/19/05		04/19/05		04/19/05		04/20/05		04/20/05		04/20/05	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.1	0.20	U	0.20	U	0.28		0.28		0.33		0.25		0.48		0.22	U
pH*		NA		6.9	J	6.3	J	6.5	J	6.5	J	6.5	J	7.5	J	6.5	J
Sample Number		J030W4		J030W5		J03125											
Remarks																	
Sample Date		04/20/05		04/20/05		04/25/05											
Wet Chemistry	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q						
Chromium VI	0.1	0.23	U	0.21	U	0.36											
pH*		6.5	J	6.4	J	6.6	J										
NA - Not anayzed																	
* - Units are pH units																	

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

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/09/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J030V6	% Solids	99.9	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-002	J030V7	% Solids	98.9	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
		pH	6.9 J	PH UNIT	0.01	1.0
-003	J030V8	% Solids	89.3	%	0.01	1.0
		Chromium VI	0.28	MG/KG	0.22	1.0
		pH	6.3 J	PH UNIT	0.01	1.0
-004	J030V9	% Solids	79.1	%	0.01	1.0
		Chromium VI	0.28	MG/KG	0.25	1.0
		pH	6.5 J	PH UNIT	0.01	1.0
-005	J030W0	% Solids	90.8	%	0.01	1.0
		Chromium VI	0.33	MG/KG	0.22	1.0
		pH	6.5 J	PH UNIT	0.01	1.0
-006	J030W1	% Solids	93.7	%	0.01	1.0
		Chromium VI	0.25	MG/KG	0.21	1.0
		pH	6.5 J	PH UNIT	0.01	1.0
-007	J030W2	% Solids	98.5	%	0.01	1.0
		Chromium VI	0.48	MG/KG	0.20	1.0
		pH	7.5 J	PH UNIT	0.01	1.0
-008	J030W3	% Solids	92.9	%	0.01	1.0
		Chromium VI	0.22 u	MG/KG	0.22	1.0
		pH	6.5 J	PH UNIT	0.01	1.0
-009	J030W4	% Solids	87.4	%	0.01	1.0
		Chromium VI	0.23 u	MG/KG	0.23	1.0
		pH	6.5 J	PH UNIT	0.01	1.0
-010	J030W5	% Solids	96.9	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
		pH	6.4 J	PH UNIT	0.01	1.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/09/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J03125	% Solids	93.3	%	0.01	1.0
		Chromium VI	0.36	MG/KG	0.21	1.0
		pH	6.6 J	PH UNIT	0.01	1.0

R
4/13/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD D05-003 H3138
LVL#: 0504L303

W.O.#: 11343-606-001-9999-00
Date Received: 04-26-05

INORGANIC NARRATIVE

1. This narrative covers the analyses of 11 soil samples.

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

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

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

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

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

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

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

9. Results for solid samples are reported on a dry weight basis.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/10/05
Date

njp\i04-303

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 16 pages.

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

0504L303

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

D05-003-1

Bechtel Hanford Inc.

Collector: Stankovich/Gale/Singleton

Company Contact: Steve Weiss — Telephone No.: (509) 372-9495

Project Coordinator: WEISS, RL

Price Code: Air Quality ☐

Data Turnaround: 21 Days

Project Designation: RCBRA Tribal Plant Sampling - Soil

Sampling Location: UPSTREAM, 100-H OUTFALL

SAF No.: D05-003

Ice Chest No.: ERC-03-104 and ERC-99-041

Field Logbook No.: EFL-1133-11

COA: BRASCC6520

Method of Shipment: FedEx

Shipped To: EBERLINE SERVICES / LIONVILLE

Offsite Property No.: A050206

Bill of Lading/Air Bill No.: See OSAC

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

0000015

Preservation			None	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container			G/P D	aG B	aG C	aG A	G/P E				
No. of Container(s)			1	1	1	1	1				
Volume			250ml	250ml	120ml	250ml.	250ml.				
SAMPLE ANALYSIS			See item (1) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045				
Sample No.	Matrix *	Sample Date	Sample Time								
1 J030V6	SOIL	4-19-05	0940	X							
2 J030V7	Soil	4-19-05	1100	X	X	X	X	X			
3 J030V8	Soil	4-19-05	1400	X	X	X	X	X			
4 J030V9	Soil	4-19-05	1400	X	X	X	X	X			
5 J030W0	Soil	4-19-05	1410	X	X	X	X	X			

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature] JMStankovich	1600 4/19/05	3728/3B	4/19/05 1600
3728 Rec 3B	4/25/05 1100	D St John [signature]	4/25/05 1100
D St John ERC [signature]	4/25/05 1100	Fed EX.	
Fed EX	4/26/05 0915	[signature]	4/26/05 0915

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List); Mercury - 7471 - (CV); Chromium Hex - 7196; Percent Solids

Matrix *

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	D05-003-1	Page 1 of 1

Collector: Stankovich/Gale/Singleton	Company Contact: Steve Weiss	Telephone No.: (509) 372-9495	Project Coordinator: WEISS, RL
Price Code: Air Quality ☐	Data Turnaround: 21 Days		
Project Designation: RCBRA Tribal Plant Sampling - Soil	Sampling Location: 100-H		SAF No.: D05-003
Ice Chest No.: ERC-03-104 and ERC-99-041	Field Logbook No.: EFL-1133-11	COA: BRASCC6520	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050206		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

SAMPLE ANALYSIS												
Preservation				None	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container				G/P D	aG B	aG C	aG A	G/P E				
No. of Container(s)				1	1	1	1	1				
Volume				250ml	250ml	120ml	250mL	250ml.				
				See item (1) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045				
Sample No.	Matrix *	Sample Date	Sample Time									
6. J030W1	SOIL	4/20/05	1000	X	X	X	X	X				
7. J030W2	Soil	4/20/05	1020	X	X	X	X	X				
8. J030W3	Soil	4/20/05	1115	X	X	X	X	X				
9. J030W4	Soil	4/20/05	1245	X	X	X	X	X				
10. J030W5	Soil	4/20/05	1315	X	X	X	X	X				

000016

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	M Stankovich	4/20/05 1530	3728/315	4/20/05 1530
Relinquished By/Removed From	3728 RCE 3B	4/25/05 1100	D Studhalter	4/25/05 1100
Relinquished By/Removed From	D Studhalter ERC	4/25/05 1100	Fed Ex	
Relinquished By/Removed From	Fed Ex	4/26/05 0915	[illegible]	4/26/05 0915
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List); Mercury - 7471 - (CV); Chromium Hex - 7196; Percent Solids

Matrix *

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	D05-003-1	Page 1 of 1

Collector: Stankovich/Gale/Singleton	Company Contact: Steve Weiss	Telephone No.: (509) 372-9495	Project Coordinator: WEISS, RL
Project Designation: RCBRA Tribal Plant Sampling - Soil	Sampling Location: UPSTREAM, 100-H OUTFALL		SAF No.: D05-003
Ice Chest No.: ERC-03-104 and ERC-99-041	Field Logbook No.: EFL-1133-11	COA: BRASCC6520	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A05D206		Bill of Lading/Air Bill No.: SEE COC

Price Code: Air Quality ☐

Data Turnaround: 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: ~~N/A~~ cool 4°C

DAS 4/25/05

Preservation	None	Cool 4C B	Cool 4C	Cool 4C	None							
Type of Container	G/P D	aG	aG C	aG A	G/P E							
No. of Container(s)	1	1	1	1	1							
Volume	250ml	250ml	120ml	250mL	250mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045							
Sample No.	Matrix *	Sample Date	Sample Time									
J03125	SOIL	4-25-05	0820	X	X	X	X	X				
	Soil											
	Soil											
	Soil											
	Soil											

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	ERC Joyce Gale	4-25-05 0945	FED EX	
Relinquished By/Removed From	FedEx	4/26/05 0915	Received By/Stored In: [illegible]	4/26/05 0915
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List); Mercury - 7471 - (CV); Chromium Hex - 7196; Percent Solids

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

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

[redacted]

RECEIVED
MAY 2005

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD D05-003 H3138

DATE RECEIVED: 04/26/05 LVL LOT # :0504L303

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J030V6						
% SOLIDS	001	S	05L%S058	04/19/05	04/27/05	04/28/05
% SOLIDS	001 REP	S	05L%S058	04/19/05	04/27/05	04/28/05
CHROMIUM VI	001	S	05LVI033	04/19/05	04/27/05	04/27/05
J030V7						
% SOLIDS	002	S	05L%S058	04/19/05	04/27/05	04/28/05
CHROMIUM VI	002	S	05LVI033	04/19/05	04/27/05	04/27/05
PH	002	S	05LPH027	04/19/05	04/26/05	04/26/05
J030V8						
% SOLIDS	003	S	05L%S058	04/19/05	04/27/05	04/28/05
CHROMIUM VI	003	S	05LVI033	04/19/05	04/27/05	04/27/05
PH	003	S	05LPH027	04/19/05	04/26/05	04/26/05
J030V9						
% SOLIDS	004	S	05L%S058	04/19/05	04/27/05	04/28/05
CHROMIUM VI	004	S	05LVI033	04/19/05	04/27/05	04/27/05
PH	004	S	05LPH027	04/19/05	04/26/05	04/26/05
J030W0						
% SOLIDS	005	S	05L%S058	04/19/05	04/27/05	04/28/05
CHROMIUM VI	005	S	05LVI033	04/19/05	04/27/05	04/27/05
PH	005	S	05LPH027	04/19/05	04/26/05	04/26/05
J030W1						
% SOLIDS	006	S	05L%S058	04/20/05	04/27/05	04/28/05
CHROMIUM VI	006	S	05LVI033	04/20/05	04/27/05	04/27/05
PH	006	S	05LPH027	04/20/05	04/26/05	04/26/05
J030W2						
% SOLIDS	007	S	05L%S058	04/20/05	04/27/05	04/28/05

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD D05-003 H3138

DATE RECEIVED: 04/26/05 LVL LOT # :0504L303

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	007	S	05LVI033	04/20/05	04/27/05	04/27/05
PH	007	S	05LPH027	04/20/05	04/26/05	04/26/05
J030W3						
% SOLIDS	008	S	05L%S058	04/20/05	04/27/05	04/28/05
CHROMIUM VI	008	S	05LVI033	04/20/05	04/27/05	04/27/05
PH	008	S	05LPH027	04/20/05	04/26/05	04/26/05
J030W4						
% SOLIDS	009	S	05L%S058	04/20/05	04/27/05	04/28/05
CHROMIUM VI	009	S	05LVI033	04/20/05	04/27/05	04/27/05
CHROMIUM VI	009 REP	S	05LVI033	04/20/05	04/27/05	04/27/05
CHROMIUM VI	009 MS	S	05LVI033	04/20/05	04/27/05	04/27/05
CHROMIUM VI	009 MSD	S	05LVI033	04/20/05	04/27/05	04/27/05
PH	009	S	05LPH027	04/20/05	04/26/05	04/26/05
J030W5						
% SOLIDS	010	S	05L%S058	04/20/05	04/27/05	04/28/05
CHROMIUM VI	010	S	05LVI033	04/20/05	04/27/05	04/27/05
PH	010	S	05LPH027	04/20/05	04/26/05	04/26/05
J03125						
% SOLIDS	011	S	05L%S058	04/25/05	04/27/05	04/28/05
CHROMIUM VI	011	S	05LVI033	04/25/05	04/27/05	04/27/05
PH	011	S	05LPH027	04/25/05	04/26/05	04/26/05

LAB QC:

CHROMIUM VI	MB1	S	05LVI033	N/A	04/27/05	04/27/05
CHROMIUM VI	MB1 BS	S	05LVI033	N/A	04/27/05	04/27/05
CHROMIUM VI	MB1 BSD	S	05LVI033	N/A	04/27/05	04/27/05

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	RCBRA		DATA PACKAGE:	H3138	
VALIDATOR:	TLT	LAB:	LLT	DATE:	6/10/05
			SDG:	H3138	

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

SAMPLES/MATRIX				
J030V6	J030V7	J030V8	J030V9	J030W0
J030W1	J030W1	J030W2	J030W4	J030W5
J03125				
				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:

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

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

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

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

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

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

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

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

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

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

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

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

Comments: NO PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. HOLDING TIMES (all levels)

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

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

Comments: pH >2 x J all

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: all conductivity CR VI over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/09/05

CLIENT: TNUHANFORD D05-003 H3138

LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LVI033-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/09/05

CLIENT: TNUHANFORD D05-003 H3138

LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-009	J030W4	Soluble Chromium VI	5.0	0.23u	4.6	109.1	1.0
		Insoluble Chromium VI	1250	0.23u	1200	103.8	100
BLANK10	05LVI033-MB1	Soluble Chromium VI	3.9	0.20u	4.0	98.5	1.0
		Insoluble Chromium VI	1250	0.20u	1120	111.4	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/09/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J030V6	% Solids	99.9	99.9	0.020	1.0
-009REP	J030W4	Chromium VI	0.23u	0.23u	NC	1.0

Date: 14 June 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: RCBRA Tribal Plant Sampling - Soil
Subject: PCB/Pesticides - Data Package No. H3138-LLI (SDG No. H3138)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3138-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J030V7	4/19/05	Soil	C	See note 1
J030V8	4/19/05	Soil	C	See note 1
J030V9	4/19/05	Soil	C	See note 1
J030W0	4/19/05	Soil	C	See note 1
J030W1	4/20/05	Soil	C	See note 1
J030W2	4/20/05	Soil	C	See note 1
J030W3	4/20/05	Soil	C	See note 1
J030W4	4/20/05	Soil	C	See note 1
J030W5	4/20/05	Soil	C	See note 1
J03125	4/25/05	Soil	C	See note 1

1- PCBs by 8082 and pesticides by 8081A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the RCBRA (BHI-01754, March 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

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

All method blank target compound results were acceptable.

Field Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

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

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

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

Due to an LCS recovery outside QC limits (59%), all PCB results (except aroclor-1016) were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

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.

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

Field Duplicate Samples

One set of field duplicates (J030V8/J030V9) 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 Remaining Waste Sites RQLs to ensure that laboratory detection levels meet the required criteria. All methoxychlor and toxaphene results exceeded the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data Package No. H3138-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 the lack of an LCS, matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J". Due to an LCS recovery outside QC limits (59%), all PCB results (except aroclor-1016) were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

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

REFERENCES

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

BHI-01754, *Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the River Corridor Baseline Risk Assessment*, March 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

PESTICIDE/PCB DATA QUALIFICATION SUMMARY*

SDG: H3138	REVIEWER: TLI	Project: RCBRA	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All except aroclor-1016	J	All	LCS recovery
Toxaphene	J	All	No MS, MSD or LCS analysis

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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

Project: BECHTEL-HANFORD																					
Laboratory: Lionville Laboratory Inc.																					
Case:	SDG: H3138																				
Sample Number		J030V7		J030V8		J030V9		J030W0		J030W1		J030W2		J030W3		J030W4		J030W5		J03125	
Remarks						Duplicate															
Sample Date		4/19/05		4/19/05		4/19/05		4/19/05		4/19/05		4/20/05		4/20/05		4/20/05		4/20/05		4/20/05	
Extraction Date		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05	
Analysis Date		5/3/05		5/3/05		5/3/05		5/3/05		5/3/05		5/3/05		5/3/05		5/3/05		5/3/05		5/3/05	
PCB/Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	20	13	U	15	U	17	U	15	U	14	U	14	U	14	U	15	U	14	U	14	U
Aroclor-1221	20	13	UJ	15	UJ	17	UJ	15	UJ	14	UJ	14	UJ	14	UJ	15	UJ	14	UJ	14	UJ
Aroclor-1232	20	13	UJ	15	UJ	17	UJ	15	UJ	14	UJ	14	UJ	14	UJ	15	UJ	14	UJ	14	UJ
Aroclor-1242	20	13	UJ	15	UJ	17	UJ	15	UJ	14	UJ	14	UJ	14	UJ	15	UJ	14	UJ	14	UJ
Aroclor-1248	20	13	UJ	15	UJ	17	UJ	15	UJ	14	UJ	14	UJ	14	UJ	15	UJ	14	UJ	14	UJ
Aroclor-1254	20	13	UJ	15	UJ	17	UJ	15	UJ	14	UJ	14	UJ	14	UJ	15	UJ	14	UJ	14	UJ
Aroclor-1260	20	13	UJ	15	UJ	17	UJ	15	UJ	16	J	14	UJ	14	UJ	15	UJ	14	UJ	14	UJ
Sample Date		4/19/05		4/19/05		4/19/05		4/19/05		4/19/05		4/20/05		4/20/05		4/20/05		4/20/05		4/20/05	
Extraction Date		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05		4/29/05	
Analysis Date		5/4/05		5/4/05		5/4/05		5/4/05		5/4/05		5/4/05		5/4/05		5/4/05		5/4/05		5/4/05	
Alpha-BHC	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
Beta-BHC	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
Delta-BHC	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
Gamma-BHC (Lindane)	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
Heptachlor	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
Aldrin	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
Heptachlor Epoxide	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
Endosulfan I	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
Dieldrin	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
4,4'-DDE	5	3.4	U	3.7	U	4.2	U	3.7	U	3.6	U	3.4	U	3.6	U	3.8	U	3.4	U	3.6	U
Endrin	5	3.4	U	3.7	U	4.2	U	3.7	U	3.6	U	3.4	U	3.6	U	3.8	U	3.4	U	3.6	U
Endosulfan II	5	3.4	U	3.7	U	4.2	U	3.7	U	3.6	U	3.4	U	3.6	U	3.8	U	3.4	U	3.6	U
4,4'-DDD	5	3.4	U	3.7	U	4.2	U	3.7	U	3.6	U	3.4	U	3.6	U	3.8	U	3.4	U	3.6	U
Endosulfan Sulfate	5	3.4	U	3.7	U	4.2	U	3.7	U	3.6	U	3.4	U	3.6	U	3.8	U	3.4	U	3.6	U
4,4'-DDT	5	3.4	U	3.7	U	4.2	U	3.7	U	3.6	U	3.4	U	3.6	U	3.8	U	3.4	U	3.6	U
Methoxychlor	5	17	U	19	U	21	U	18	U	18	U	17	U	18	U	19	U	17	U	18	U
Endrin Ketone	5	3.4	U	3.7	U	4.2	U	3.7	U	3.6	U	3.4	U	3.6	U	3.8	U	3.4	U	3.6	U
Endrin Aldehyde	5	3.4	U	3.7	U	4.2	U	3.7	U	3.6	U	3.4	U	3.6	U	3.8	U	3.4	U	3.6	U
alpha-Chlordane	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
gamma-Chlordane	5	1.7	U	1.9	U	2.1	U	1.8	U	1.8	U	1.7	U	1.8	U	1.9	U	1.7	U	1.8	U
Toxaphene	5	170	UJ	190	UJ	210	UJ	180	UJ	180	UJ	170	UJ	180	UJ	190	UJ	170	UJ	180	UJ

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

000011

Lionville Laboratory, Inc.
PCBs by GC

Report Date: 05/03/05 14:03

RFW Batch Number: 0504L303 Client: TNU-HANFORD D05-003 Work Order: 11343606001 Page: 1

	Cust ID:	J030V7	J030V7	J030V7	J030V8	J030V9	J030W0
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	84 %	82 %	79 %	73 %	77 %	90 %
	Decachlorobiphenyl	77 %	79 %	78 %	82 %	80 %	92 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		13 U	70 %	68 %	15 U	17 U	15 U
Aroclor-1221		13 U J	13 U	13 U	15 U J	17 U J	15 U J
Aroclor-1232		13 U	13 U	13 U	15 U	17 U	15 U
Aroclor-1242		13 U	13 U	13 U	15 U	17 U	15 U
Aroclor-1248		13 U	13 U	13 U	15 U	17 U	15 U
Aroclor-1254		13 U	13 U	13 U	15 U	17 U	15 U
Aroclor-1260		13 U	64 %	66 %	15 U	17 U	15 U

	Cust ID:	J030W1	J030W2	J030W3	J030W4	J030W5	J03125
Sample Information	RFW#:	006	007	008	009	010	011
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	81 %	83 %	77 %	89 %	80 %	84 %
	Decachlorobiphenyl	84 %	86 %	80 %	92 %	92 %	88 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U	14 U	14 U	15 U	14 U	14 U
Aroclor-1221		14 U J	14 U J	14 U J	15 U J	14 U J	14 U J
Aroclor-1232		14 U	14 U	14 U	15 U	14 U	14 U
Aroclor-1242		14 U	14 U	14 U	15 U	14 U	14 U
Aroclor-1248		14 U	14 U	14 U	15 U	14 U	14 U
Aroclor-1254		14 U	14 U	14 U	15 U	14 U	14 U
Aroclor-1260		16	14 U	14 U	15 U	14 U	14 U

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

JL 6/13/05

JS 5/13/05

000012

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 05/03/05 14:03

RFW Batch Number: **0504L303** Client: **TNU-HANFORD D05-003** Work Order: 11343606001 Page: 2

	Cust ID:	**PBLKKD**	**PBLKKD BS**
Sample Information	RFW#:	**05LE0334-MB1**	**05LE0334-MB1**
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG

Surrogate:	Tetrachloro-m-xylene	68	%	87	%
	Decachlorobiphenyl	68	%	75	%
Aroclor-1016		13	U	61	%
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	59 *	%

000013

VR
6/13/05

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

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 05/04/05 12:57

RFW Batch Number: 0504L303 Client: TNU-HANFORD D05-003 Work Order: 11343606001 Page: 1

	Cust ID:	J030V7	J030V7	J030V7	J030V8	J030V9	J030W0
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:	Decachlorobiphenyl	96 %	95 %	92 %	85 %	91 %	88 %
	Tetrachloro-m-xylene	81 %	87 %	84 %	75 %	82 %	77 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.7 U	100 %	95 %	1.9 U	2.1 U	1.8 U
Beta-BHC		1.7 U	87 %	82 %	1.9 U	2.1 U	1.8 U
Delta-BHC		1.7 U	105 %	96 %	1.9 U	2.1 U	1.8 U
gamma-BHC (Lindane)		1.7 U	99 %	94 %	1.9 U	2.1 U	1.8 U
Heptachlor		1.7 U	96 %	90 %	1.9 U	2.1 U	1.8 U
Aldrin		1.7 U	98 %	92 %	1.9 U	2.1 U	1.8 U
Heptachlor epoxide		1.7 U	96 %	91 %	1.9 U	2.1 U	1.8 U
Endosulfan I		1.7 U	94 %	89 %	1.9 U	2.1 U	1.8 U
Dieldrin		1.7 U	100 %	93 %	1.9 U	2.1 U	1.8 U
4,4'-DDE		3.4 U	102 %	96 %	3.7 U	4.2 U	3.7 U
Endrin		3.4 U	102 %	97 %	3.7 U	4.2 U	3.7 U
Endosulfan II		3.4 U	97 %	91 %	3.7 U	4.2 U	3.7 U
4,4'-DDD		3.4 U	96 %	91 %	3.7 U	4.2 U	3.7 U
Endosulfan sulfate		3.4 U	96 %	91 %	3.7 U	4.2 U	3.7 U
4,4'-DDT		3.4 U	107 %	102 %	3.7 U	4.2 U	3.7 U
Methoxychlor		17 U	97 %	94 %	19 U	21 U	18 U
Endrin ketone		3.4 U	98 %	93 %	3.7 U	4.2 U	3.7 U
Endrin aldehyde		3.4 U	92 %	88 %	3.7 U	4.2 U	3.7 U
alpha-Chlordane		1.7 U	93 %	88 %	1.9 U	2.1 U	1.8 U
gamma-Chlordane		1.7 U	94 %	89 %	1.9 U	2.1 U	1.8 U
Toxaphene		170 U J	170 U	170 U	190 U J	210 U J	180 U J

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

000014

JK 6/13/05

7-7-05

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 05/04/05 12:57

RFW Batch Number: 0504L303 Client: TNU-HANFORD D05-003 Work Order: 11343606001 Page: 2

	Cust ID:	J030W1	J030W2	J030W3	J030W4	J030W5	J03125
Sample Information	RFW#:	006	007	008	009	010	011
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Decachlorobiphenyl	83 %	88 %	75 %	95 %	91 %	86 %
	Tetrachloro-m-xylene	74 %	85 %	72 %	87 %	78 %	79 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
Beta-BHC		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
Delta-BHC		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
gamma-BHC (Lindane)		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
Heptachlor		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
Aldrin		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
Heptachlor epoxide		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
Endosulfan I		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
Dieldrin		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
4,4'-DDE		3.6 U	3.4 U	3.6 U	3.8 U	3.4 U	3.6 U
Endrin		3.6 U	3.4 U	3.6 U	3.8 U	3.4 U	3.6 U
Endosulfan II		3.6 U	3.4 U	3.6 U	3.8 U	3.4 U	3.6 U
4,4'-DDD		3.6 U	3.4 U	3.6 U	3.8 U	3.4 U	3.6 U
Endosulfan sulfate		3.6 U	3.4 U	3.6 U	3.8 U	3.4 U	3.6 U
4,4'-DDT		3.6 U	3.4 U	3.6 U	3.8 U	3.4 U	3.6 U
Methoxychlor		18 U	17 U	18 U	19 U	17 U	18 U
Endrin ketone		3.6 U	3.4 U	3.6 U	3.8 U	3.4 U	3.6 U
Endrin aldehyde		3.6 U	3.4 U	3.6 U	3.8 U	3.4 U	3.6 U
alpha-Chlordane		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
gamma-Chlordane		1.8 U	1.7 U	1.8 U	1.9 U	1.7 U	1.8 U
Toxaphene		180 U J	170 U J	180 U J	190 U J	170 U J	180 U J

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

0000015

6/13/05

Lionville Laboratory, Inc.
Pesticide/PCBs by GC, CLP List

Report Date: 05/04/05 12:57

RFW Batch Number: 0504L303 Client: TNU-HANFORD D05-003 Work Order: 11343606001 Page: 3

	Cust ID:	PBLKKD	PBLKKD BS
Sample Information	RFW#:	05LE0334-MB1	05LE0334-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG

Surrogate:	Decachlorobiphenyl	95	%	98	%
	Tetrachloro-m-xylene	82	%	86	%
Alpha-BHC		1.7	U	99	%
Beta-BHC		1.7	U	92	%
Delta-BHC		1.7	U	104	%
gamma-BHC (Lindane)		1.7	U	98	%
Heptachlor		1.7	U	93	%
Aldrin		1.7	U	96	%
Heptachlor epoxide		1.7	U	96	%
Endosulfan I		1.7	U	95	%
Dieldrin		1.7	U	99	%
4,4'-DDE		3.3	U	100	%
Endrin		3.3	U	101	%
Endosulfan II		3.3	U	97	%
4,4'-DDD		3.3	U	99	%
Endosulfan sulfate		3.3	U	97	%
4,4'-DDT		3.3	U	100	%
Methoxychlor		17	U	96	%
Endrin ketone		3.3	U	100	%
Endrin aldehyde		3.3	U	94	%
alpha-Chlordane		1.7	U	95	%
gamma-Chlordane		1.7	U	95	%
Toxaphene		170	U	170	U

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

6/13/05

7/17/05

000016

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD D05-003
LVL #: 0504L303
SDG/SAF # H3138 /D05-003

W.O. #: 11343-606-001-9999-00
Date Received: 04-26-2005

CHLORINATED PESTICIDES

Ten (10) soil samples were collected on 04-19-2005, 04-20-05 and 4-25-05.

The samples and their associated QC samples were extracted on 04-29-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 05-04-2005. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. The samples were extracted and analyzed within required holding time.
3. The samples and their associated QC samples received Copper-Sulfur cleanups according to Lionville Laboratory SOP's based on SW846 method 3660A.
4. The Method Blank was below the reporting limits for all target compounds.
5. All obtainable surrogate recoveries were within acceptance criteria.
6. All Blank spike recoveries were with 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. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/23/05
Date

000018

jak\r:\group\data\pest\tnu hanford\0504-303.pes

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 11 pages.

000000002

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD D05-003
LVL #: 0504L303
SDG/SAF # H3138 /D05-003

W.O. #: 11343-606-001-9999-00
Date Received: 04-26-2005

PCB

Ten (10) soil samples were collected on 04-19-2005, 04-20-2005 and 04-25-2005.

The samples and their associated QC samples were extracted on 04-29-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 05-02-2005 and 05-03-2005. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. One (1) of two (2) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#05GC167) has been enclosed.
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. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/23/05
Date

jak\r:\group\data\pest\tnu hanford\0504-303.pcb

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.

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 05GC167

Initiator: M. Mensally
Date: 5/2/05
Client: INV

Batch: 05D4L303
Samples: BS
Method: SW846/MCAWW/CLP/

Parameter: OPCBR
Matrix: Soil
Prep Batch: 05LE0334

1. Reason for SDR

a. COC Discrepancy

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

b. General Discrepancy

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

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

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

- BS was low for recovery of 1260 @ 59%, (Range: 60-140).
- MS and MSD were OK, and Blank was clean.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

4. Project Manager Instructions...signature/date: _____ 5/3/05

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

5. Final Action...signature/date: _____ 5/12/05 Other Explanation:

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

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

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
1	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file): Alberts	__	__ Log-in: Melnic
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

QA-105-A-0801

0504L303

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

D05-003-1 | Page 1 of 1

Bechtel Hanford Inc.

Collector: Stankovich/Gale/Singleton

Company Contact: Steve Weiss | Telephone No.: (509) 372-9495

Project Coordinator: WEISS, RL

Price Code: Air Quality ☐

Data Turnaround: 21 Days

Project Designation: RCBRA Tribal Plant Sampling - Soil

Sampling Location: UPSTREAM, 100-H OUTFALL

SAF No.: D05-003

Ice Chest No.: ERC-03-104 and ERC-99-041

Field Logbook No.: EFL-1133-11

COA: BRASCC6520

Method of Shipment: FedEx

Bill of Lading/Air Bill No.: See USAC

Offsite Property No.: A050206

Shipped To: EMERLINE SERVICES / LIONVILLE

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	GP D	aG B	aG C	aG A	GP E
No. of Container(s)	1	1	1	1	1
Volume	250ml	250ml	120ml	250ml.	250ml
SAMPLE ANALYSIS	See item (1) in Special Instructions	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045

000021

	Sample No.	Matrix *	Sample Date	Sample Time					
1	J030V6	SOIL	4-19-05	0940	X				
2	J030V7	Soil	4-19-05	1100	X	X	X	X	X
3	J030V8	Soil	4-19-05	1400	X	X	X	X	X
4	J030V9	Soil	4-19-05	1400	X	X	X	X	X
5	J030W0	Soil	4-19-05	1410	X	X	X	X	X

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	1600 4/19/05	3728/3B	4/19/05 1600
3728 Rec 3B	4/25/05 1100	DST JOHN [signature]	4/25/05 1100
DST JOHN ERC [signature]	4/25/05 1100	Fed EX.	
[signature]	4/26/05 0915	[signature]	4/26/05 0915

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List), Mercury - 7471 - (CV), Chromium Hex - 7196, Percent Solids

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

LABORATORY SECTION: Received By | Disposed By | Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method

[redacted]

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	D05-003-1	Page 1 of 1

Collector: Stankovich/Gale/Singleton	Company Contact: Steve Weiss	Telephone No.: (509) 372-9495	Project Coordinator: WEISS, RL
Price Code: Air Quality J	Data Turnaround: 21 Days		
Project Designation: RCBRA Tribal Plant Sampling - Soil	Sampling Location: 100-H		SAF No.: D05-003
Ice Chest No.: ERC-03-104 and ERC-99-041	Field Logbook No.: EFL-1133-11	COA: BRASC06520	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050206		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	G/P D	aG B	aG C	aG A	(P) E					
No. of Container(s)	1	1	1	1	1					
Volume	250ml	250ml	120ml	250ml.	250ml.					
SAMPLE ANALYSIS	See item (1) in Special Instructions	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045					

000022

	Sample No.	Matrix *	Sample Date	Sample Time										
6.	J030W1	SOIL	4/20/05	1000	X	X	X	X	X					
7.	J030W2	Soil	4/20/05	1020	X	X	X	X	X					
8.	J030W3	Soil	4/20/05	1115	X	X	X	X	X					
9.	J030W4	Soil	4/20/05	1245	X	X	X	X	X					
10.	J030W5	Soil	4/20/05	1315	X	X	X	X	X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M STANKOVICH	1530 4/20/05	3728/3B	4/20/05 1530
3728 RCE 3B	4/25/05 1100	D STORM	4/25/05 1100
D STORM ERC	4/25/05 1100	Fed EX	
Fed EX	4/26/05 0915		4/26/05 0915

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List); Mercury - 7471 - (CVA); Chromium Hex - 7196; Percent Solids

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

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

[redacted]

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

D05-003-1

Bechtel Hanford Inc.

Collector: Stankovich/Gale/Singleton

Project Designation: RCBRA Tribal Plant Sampling - Soil

Ice Chest No. ERC-03-104 and ERC-99-041

Shipped To: EBERLINE SERVICES (LIONVILLE)

Company Contact: Steve Weiss

Telephone No.: (509) 372-9495

Sampling Location: UPSTREAM, 100-H OUTFALL

Field Logbook No.: EFL-1133-11

COA: BRASCC6520

Offsite Property No.: A050206

Project Coordinator: WEISS, RL

SAF No.: D05-003

Price Code

Air Quality ☐

Data Turnaround: 21 Days

Method of Shipment: FedEx

Bill of Lading/Air Bill No.: SEE COC

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: ~~N/A~~ cool 4°C

DAS 4/26/05

Sample No.	Matrix *	Sample Date	Sample Time										
Preservation				None	Cool 4C B	Cool 4C	Cool 4C	None					
Type of Container				G/P D	aG	aG C	aG A	G/P E					
No. of Container(s)				1	1	1	1	1					
Volume				250ml	250ml	120ml	250ml.	250ml					
SAMPLE ANALYSIS				See item (1) in Special Instructions	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045					
11 J03125	SOIL	4-25-05	0830	X	X	X	X	X					
	Soil												
	Soil												
	Soil												
	Soil												

00023

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
ERC Jodee Stankovich	4-25-05 0945	FED EX	
FED EX	4/26/05 0915	[illegible]	4/26/05 0915

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Chem List Metals - 7471 - (CV) Chromium Hex - 7196; Percent Solids

Matrix *

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

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

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCRA			DATA PACKAGE: H3138		
VALIDATOR: MJP		LAB: LLI		DATE: 6/10/03	
			SDG: H3138		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J030V7	J030V8	J030V9	J030W0	J030W1	
J030W2	J030W3	J030W4	J030W5	J03125	

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: aroclor - 1260 LCS 399% - J all but aroclor 1016

NO toxaphene MS/MSD/LCS - J all NO PAS

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

no toxaphene MS/MSD - J all

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: Toxaphene + Methoxychlor over

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 14 June 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: RCBRA Tribal Plant Sampling - Soil
Subject: Inorganics - Data Package No. H3138-LLI (SDG No. H3138)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3138-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J030V6	4/19/05	Soil	C	See note 1
J030V7	4/19/05	Soil	C	See note 1
J030V8	4/19/05	Soil	C	See note 1
J030V9	4/19/05	Soil	C	See note 1
J030W0	4/19/05	Soil	C	See note 1
J030W1	4/20/05	Soil	C	See note 1
J030W2	4/20/05	Soil	C	See note 1
J030W3	4/20/05	Soil	C	See note 1
J030W4	4/20/05	Soil	C	See note 1
J030W5	4/20/05	Soil	C	See note 1
J03125	4/25/05	Soil	C	See note 1

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

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the RCBRA (BHI-01754, March 2005). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

Due to method blank contamination, the lithium, tin, lead and zinc results in sample J030V6 were qualified as estimates and flagged "UJ".

Due to method blank contamination, the molybdenum result in samples J030V8 and J030W5 were qualified as estimates and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank was submitted for analysis. Aluminum, barium, beryllium, calcium, chromium, iron, magnesium, manganese, sodium, phosphorous, vanadium, silicon,

tin and strontium were detected in the field blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

Due to a matrix spike recovery outside QC limits (52%), all antimony results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 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 (35%), all silicon results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J030V8/J030V9) 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 remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All silver, antimony, uranium and selenium results (except those in sample J0W0V6) exceeded the analyte specific RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H3138-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

The following minor deficiencies were noted:

- Due to method blank contamination, the lithium, tin, lead and zinc results in sample J030V6 were qualified as estimates and flagged "UJ".
- Due to method blank contamination, the molybdenum result in samples J030V8 and J030W5 were qualified as estimates and flagged "UJ".
- Due to a matrix spike recovery outside QC limits (52%), all antimony results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (35%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making

purposes. All other validated results are considered accurate within the standard error associated with the methods.

All silver, antimony, uranium and selenium results (except those in sample J0W0V6) exceeded the analyte specific RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01754, *Sampling Analysis Instruction for Tribal Plant Sampling in Support of the 100 Area and 300 Area Component of the River Corridor Baseline Risk Assessment*, March 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: H3138	REVIEWER: TLI	Project: RCBRA	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Lithium Tin Lead Zinc	UJ	J030V6	Method blank contamination
Molybdenum	UJ	J030V8, J030W5	Method blank contamination
Antimony	All	J	MS recovery
Silicon	All	J	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																									
Laboratory: LLI																									
Case	SDG: H3138																								
Sample Number		J030V6		J030V7		J030V8		J030V9		J030W0		J030W1		J030W2		J030W3		J030W4		J030W5		J03125	
Remarks		E. Blank						Duplicate															
Sample Date		04/19/05		4/19/05		4/19/05		4/19/05		4/19/05		4/20/05		4/20/05		4/20/05		4/20/05		4/20/05		4/25/05	
Inorganics	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.08	U	0.52	U	0.60	U	0.64	U	0.57	U	0.55	U	0.55	U	0.48	U	0.58	U	0.51	U	0.54	U
Aluminum		56.9		5750		5030		5980		5440		6080		4980		6140		5970		7240		7790	
Arsenic	1	0.41	U	4.3		3.9		4.0		2.8	U	4.3		2.7	U	3.7		3.7		9.2		5.1	
Boron	2	0.21	U	1.7		1.5	U	1.6	U	1.4	U	1.4	U	1.4	U	1.2	U	1.5	U	1.3	U	2.9	
Barium	0.5	1.7		63.8		44.3		48.1		53.1		60.4		42.3		55.8		66.5		78.2		83.8	
Beryllium	0.2	0.03		0.29		0.25		0.28	U	0.34		0.33		0.30		0.31		0.34		0.33		0.39	
Bismuth		0.29	U	1.9	U	2.2	U	2.3	U	2.0	U	2.0	U	2.4		1.7	U	2.1	U	1.8	U	2.1	
Calcium		26.7		3210		3220		3710		3240		3460		3180		3800		3270		3930		4010	
Cadmium	0.2	0.03	U	0.93		0.72		0.68		0.47		0.83		0.35		0.57		0.63		1.7		2.1	
Cobalt	2	0.08	U	5.6		4.4		5.0		5.5		5.5		5.2		5.5		6.3		6.9		7.1	
Chromium	0.2	0.09		13.8		19.9		24.6		18.6		26.6		14.6		68.7		32.4		23.9		20.7	
Copper	1	0.07	U	15.6		17.8		19.1		18.3		19.6		13.5		20.5		21.7		37.1		23.4	
Iron		385		15300		14000		16500		16700		17100		15100		19100		18800		18700		18000	
Mercury		0.01	U	0.02		0.02	U	0.02	U	0.02	U	0.04		0.04		0.02		0.02	U	0.02		0.08	
Potassium		49.1	U	822		697		677		640		969		685		625		627		1190		1660	
Lithium		0.09	UJ	6.9		5.6		6.5		5.9		6.7		5.7		6.6		7.7		9.1		9.4	
Magnesium		8.6		3970		3090		3600		3710		3750		3590		3620		3770		4420		4820	
Manganese	5	12.0		274		227		263		243		273		209		290		427		249		301	
Molybdenum	2	0.14	U	0.92	U	1.1	UJ	1.7		1.0	U	1.4		0.97	U	0.86	U	1.0	U	1.2	UJ	0.95	U
Sodium		35.6		142		186		210		182		161		112		189		164		202		184	
Nickel	4	0.20	U	14.1		10.1		11.0		11.5		11.5		9.4		13.3		12.8		14.9		16.6	
Phosphorus		8.6		591		499		606		631		630		587		700		647		714		775	
Lead	0.5	0.54	UJ	24.4		21.9		27.4		19.9		29.0		16.5		31.2		23.1		105		43.9	
Antimony	0.6	0.36	UJ	2.3	UJ	2.7	UJ	2.9	UJ	2.5	UJ	2.5	UJ	2.4	UJ	2.2	UJ	2.6	UJ	2.3	UJ	2.4	UJ
Selenium	1	0.44	U	2.8	U	3.3	U	3.5	U	3.1	U	3.0	U	3.0	U	2.6	U	3.1	U	2.8	U	2.9	U
Silicon		41.9	J	218	J	264	J	201	J	269	J	230	J	288	J	87.1	J	282	J	398	J	394	J
Tin		0.80	UJ	3.2	U	3.8	U	4.0	U	3.5	U	3.4	U	3.4	U	3.0	U	3.6	U	3.3	U	3.3	U
Strontium		0.21		20.2		19.2		18.6		15.8		20.9		17.5		20.4		18.2		27.1		28.9	
Thallium		0.71	U	4.5	U	5.3	U	5.7	U	5.0	U	4.9	U	4.8	U	4.3	U	5.1	U	4.5	U	4.7	U
Uranium	5	1.8	U	11.3	U	13.3	U	14.2	U	12.5	U	12.2	U	12.1	U	10.7	U	12.7	U	11.3	U	11.8	U
Vanadium	2.5	0.08		34.6		33.6		38.1		42.8		38.7		39.7		46.1		45.7		34.7		38.5	
Zinc	1	0.87	UJ	153		141		163		116		187		78.8		172		157		511		276	

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138

LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J030V6	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Aluminum, Total	56.9	MG/KG	2.1	1.0
		Arsenic, Total	0.41 u	MG/KG	0.41	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	1.7	MG/KG	0.02	1.0
		Beryllium, Total	0.03	MG/KG	0.009	1.0
		Bismuth, Total	0.29 u	MG/KG	0.29	1.0
		Calcium, Total	26.7	MG/KG	1.7	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Cobalt, Total	0.08 u	MG/KG	0.08	1.0
		Chromium, Total	0.09	MG/KG	0.06	1.0
		Copper, Total	0.07 u	MG/KG	0.07	1.0
		Iron, Total	385	MG/KG	2.6	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	49.1 u	MG/KG	49.1	1.0
		Lithium, Total	0.09 UJ	MG/KG	0.02	1.0
		Magnesium, Total	8.6	MG/KG	0.60	1.0
		Manganese, Total	12.0	MG/KG	0.02	1.0
		Molybdenum, Total	0.14 u	MG/KG	0.14	1.0
		Sodium, Total	35.6	MG/KG	2.1	1.0
		Nickel, Total	0.20 u	MG/KG	0.20	1.0
		Phosphorus, Total	8.6	MG/KG	1.0	1.0
		Lead, Total	0.54 UJ	MG/KG	0.23	1.0
		Antimony, Total	0.36 uJ	MG/KG	0.36	1.0
		Selenium, Total	0.44 u	MG/KG	0.44	1.0
		Silicon, Total	41.9 J	MG/KG	0.61	1.0
		Tin, Total	0.80 UJ	MG/KG	0.51	1.0
		Strontium, Total	0.21	MG/KG	0.009	1.0
		Thallium, Total	0.71 u	MG/KG	0.71	1.0
		Uranium, Total	1.8 u	MG/KG	1.8	1.0
		Vanadium, Total	0.08	MG/KG	0.05	1.0
		Zinc, Total	0.87 UJ	MG/KG	0.05	1.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J030V7	Silver, Total	0.52 u	MG/KG	0.52	6.0
		Aluminum, Total	5750	MG/KG	2.3	1.0
		Arsenic, Total	4.3	MG/KG	2.6	6.0
		Boron, Total	1.7	MG/KG	1.3	6.0
		Barium, Total	63.8	MG/KG	0.11	6.0
		Beryllium, Total	0.29	MG/KG	0.06	6.0
		Bismuth, Total	1.9 u	MG/KG	1.9	6.0
		Calcium, Total	3210	MG/KG	1.8	1.0
		Cadmium, Total	0.93	MG/KG	0.17	6.0
		Cobalt, Total	5.6	MG/KG	0.52	6.0
		Chromium, Total	13.8	MG/KG	0.40	6.0
		Copper, Total	15.6	MG/KG	0.46	6.0
		Iron, Total	15300	MG/KG	16.8	6.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Potassium, Total	822	MG/KG	51.9	1.0
		Lithium, Total	6.9	MG/KG	0.11	6.0
		Magnesium, Total	3970	MG/KG	3.8	6.0
		Manganese, Total	274	MG/KG	0.11	6.0
		Molybdenum, Total	0.92 u	MG/KG	0.92	6.0
		Sodium, Total	142	MG/KG	2.2	1.0
		Nickel, Total	14.1	MG/KG	1.3	6.0
		Phosphorus, Total	591	MG/KG	1.1	1.0
		Lead, Total	24.4	MG/KG	1.4	6.0
		Antimony, Total	2.3 u J	MG/KG	2.3	6.0
		Selenium, Total	2.8 u	MG/KG	2.8	6.0
		Silicon, Total	218 J	MG/KG	3.9	6.0
		Tin, Total	3.2 u	MG/KG	3.2	6.0
		Strontium, Total	20.2	MG/KG	0.06	6.0
		Thallium, Total	4.5 u	MG/KG	4.5	6.0
		Uranium, Total	11.3 u	MG/KG	11.3	6.0
		Vanadium, Total	34.6	MG/KG	0.34	6.0
		Zinc, Total	153	MG/KG	0.29	6.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138

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

LVL LOT #: 0504L303

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J030V8	Silver, Total	0.60 u	MG/KG	0.60	6.0
		Aluminum, Total	5030	MG/KG	2.7	1.0
		Arsenic, Total	3.9	MG/KG	3.0	6.0
		Boron, Total	1.5 u	MG/KG	1.5	6.0
		Barium, Total	44.3	MG/KG	0.13	6.0
		Beryllium, Total	0.25	MG/KG	0.07	6.0
		Bismuth, Total	2.2 u	MG/KG	2.2	6.0
		Calcium, Total	3220	MG/KG	2.1	1.0
		Cadmium, Total	0.72	MG/KG	0.20	6.0
		Cobalt, Total	4.4	MG/KG	0.60	6.0
		Chromium, Total	19.9	MG/KG	0.47	6.0
		Copper, Total	17.8	MG/KG	0.54	6.0
		Iron, Total	14000	MG/KG	19.7	6.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	697	MG/KG	61.0	1.0
		Lithium, Total	5.6	MG/KG	0.13	6.0
		Magnesium, Total	3090	MG/KG	4.5	6.0
		Manganese, Total	227	MG/KG	0.13	6.0
		Molybdenum, Total	1.1 uJ	MG/KG	1.1	6.0
		Sodium, Total	186	MG/KG	2.6	1.0
		Nickel, Total	10.1	MG/KG	1.5	6.0
		Phosphorus, Total	499	MG/KG	1.3	1.0
		Lead, Total	21.9	MG/KG	1.7	6.0
		Antimony, Total	2.7 uJ	MG/KG	2.7	6.0
		Selenium, Total	3.3 u	MG/KG	3.3	6.0
		Silicon, Total	264 J	MG/KG	4.6	6.0
		Tin, Total	3.8 u	MG/KG	3.8	6.0
		Strontium, Total	19.2	MG/KG	0.07	6.0
		Thallium, Total	5.3 u	MG/KG	5.3	6.0
		Uranium, Total	13.3 u	MG/KG	13.3	6.0
		Vanadium, Total	33.6	MG/KG	0.40	6.0
		Zinc, Total	141	MG/KG	0.34	6.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138

LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J030V9	Silver, Total	0.64	u	MG/KG	0.64	6.0
		Aluminum, Total	5980		MG/KG	2.8	1.0
		Arsenic, Total	4.0		MG/KG	3.2	6.0
		Boron, Total	1.6	u	MG/KG	1.6	6.0
		Barium, Total	48.1		MG/KG	0.14	6.0
		Beryllium, Total	0.28		MG/KG	0.07	6.0
		Bismuth, Total	2.3	u	MG/KG	2.3	6.0
		Calcium, Total	3710		MG/KG	2.2	1.0
		Cadmium, Total	0.68		MG/KG	0.21	6.0
		Cobalt, Total	5.0		MG/KG	0.64	6.0
		Chromium, Total	24.6		MG/KG	0.50	6.0
		Copper, Total	19.1		MG/KG	0.57	6.0
		Iron, Total	16500		MG/KG	21.0	6.0
		Mercury, Total	0.02	u	MG/KG	0.02	1.0
		Potassium, Total	677		MG/KG	64.9	1.0
		Lithium, Total	6.5		MG/KG	0.14	6.0
		Magnesium, Total	3600		MG/KG	4.8	6.0
		Manganese, Total	263		MG/KG	0.14	6.0
		Molybdenum, Total	1.7		MG/KG	1.1	6.0
		Sodium, Total	210		MG/KG	2.8	1.0
		Nickel, Total	11.0		MG/KG	1.6	6.0
		Phosphorus, Total	606		MG/KG	1.4	1.0
		Lead, Total	27.4		MG/KG	1.8	6.0
		Antimony, Total	2.9	u J	MG/KG	2.9	6.0
		Selenium, Total	3.5	u	MG/KG	3.5	6.0
		Silicon, Total	201	J	MG/KG	4.9	6.0
		Tin, Total	4.0	u	MG/KG	4.0	6.0
		Strontium, Total	18.6		MG/KG	0.07	6.0
		Thallium, Total	5.7	u	MG/KG	5.7	6.0
		Uranium, Total	14.2	u	MG/KG	14.2	6.0
		Vanadium, Total	38.1		MG/KG	0.43	6.0
		Zinc, Total	163		MG/KG	0.36	6.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J030W0	Silver, Total	0.57	u	MG/KG	0.57	6.0
		Aluminum, Total	5440		MG/KG	2.5	1.0
		Arsenic, Total	2.8	u	MG/KG	2.8	6.0
		Boron, Total	1.4	u	MG/KG	1.4	6.0
		Barium, Total	53.1		MG/KG	0.13	6.0
		Beryllium, Total	0.34		MG/KG	0.06	6.0
		Bismuth, Total	2.0	u	MG/KG	2.0	6.0
		Calcium, Total	3240		MG/KG	1.9	1.0
		Cadmium, Total	0.47		MG/KG	0.19	6.0
		Cobalt, Total	5.5		MG/KG	0.57	6.0
		Chromium, Total	18.6		MG/KG	0.44	6.0
		Copper, Total	18.3		MG/KG	0.50	6.0
		Iron, Total	16700		MG/KG	18.4	6.0
		Mercury, Total	0.02	u	MG/KG	0.02	1.0
		Potassium, Total	640		MG/KG	57.1	1.0
		Lithium, Total	5.9		MG/KG	0.13	6.0
		Magnesium, Total	3710		MG/KG	4.2	6.0
		Manganese, Total	243		MG/KG	0.13	6.0
		Molybdenum, Total	1.0	u	MG/KG	1.0	6.0
		Sodium, Total	182		MG/KG	2.4	1.0
		Nickel, Total	11.5		MG/KG	1.4	6.0
		Phosphorus, Total	631		MG/KG	1.2	1.0
		Lead, Total	19.9		MG/KG	1.6	6.0
		Antimony, Total	2.5	u J	MG/KG	2.5	6.0
		Selenium, Total	3.1	u	MG/KG	3.1	6.0
		Silicon, Total	269	J	MG/KG	4.3	6.0
		Tin, Total	3.5	u	MG/KG	3.5	6.0
		Strontium, Total	15.8		MG/KG	0.06	6.0
		Thallium, Total	5.0	u	MG/KG	5.0	6.0
		Uranium, Total	12.5	u	MG/KG	12.5	6.0
		Vanadium, Total	42.8		MG/KG	0.38	6.0
		Zinc, Total	116		MG/KG	0.31	6.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J030W1	Silver, Total	0.55	u	MG/KG	0.55	6.0
		Aluminum, Total	6080		MG/KG	2.4	1.0
		Arsenic, Total	4.3		MG/KG	2.8	6.0
		Boron, Total	1.4	u	MG/KG	1.4	6.0
		Barium, Total	60.4		MG/KG	0.12	6.0
		Beryllium, Total	0.33		MG/KG	0.06	6.0
		Bismuth, Total	2.0	u	MG/KG	2.0	6.0
		Calcium, Total	3460		MG/KG	1.9	1.0
		Cadmium, Total	0.83		MG/KG	0.18	6.0
		Cobalt, Total	5.5		MG/KG	0.55	6.0
		Chromium, Total	26.6		MG/KG	0.43	6.0
		Copper, Total	19.6		MG/KG	0.49	6.0
		Iron, Total	17100		MG/KG	18.0	6.0
		Mercury, Total	0.04		MG/KG	0.01	1.0
		Potassium, Total	969		MG/KG	55.9	1.0
		Lithium, Total	6.7		MG/KG	0.12	6.0
		Magnesium, Total	3750		MG/KG	4.1	6.0
		Manganese, Total	273		MG/KG	0.12	6.0
		Molybdenum, Total	1.4		MG/KG	0.98	6.0
		Sodium, Total	161		MG/KG	2.4	1.0
		Nickel, Total	11.5		MG/KG	1.4	6.0
		Phosphorus, Total	630		MG/KG	1.2	1.0
		Lead, Total	29.0		MG/KG	1.5	6.0
		Antimony, Total	2.5	u J	MG/KG	2.5	6.0
		Selenium, Total	3.0	u	MG/KG	3.0	6.0
		Silicon, Total	230	J	MG/KG	4.2	6.0
		Tin, Total	3.4	u	MG/KG	3.4	6.0
		Strontium, Total	20.9		MG/KG	0.06	6.0
		Thallium, Total	4.9	u	MG/KG	4.9	6.0
		Uranium, Total	12.2	u	MG/KG	12.2	6.0
		Vanadium, Total	38.7		MG/KG	0.37	6.0
		Zinc, Total	187		MG/KG	0.31	6.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138

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

LVL LOT #: 0504L303

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J030W2	Silver, Total	0.55	u	MG/KG	0.55	6.0
		Aluminum, Total	4980		MG/KG	2.4	1.0
		Arsenic, Total	2.7	u	MG/KG	2.7	6.0
		Boron, Total	1.4	u	MG/KG	1.4	6.0
		Barium, Total	42.3		MG/KG	0.12	6.0
		Beryllium, Total	0.30		MG/KG	0.06	6.0
		Bismuth, Total	2.4		MG/KG	2.0	6.0
		Calcium, Total	3180		MG/KG	1.9	1.0
		Cadmium, Total	0.35		MG/KG	0.18	6.0
		Cobalt, Total	5.2		MG/KG	0.55	6.0
		Chromium, Total	14.6		MG/KG	0.43	6.0
		Copper, Total	13.5		MG/KG	0.49	6.0
		Iron, Total	15100		MG/KG	17.8	6.0
		Mercury, Total	0.04		MG/KG	0.01	1.0
		Potassium, Total	685		MG/KG	55.3	1.0
		Lithium, Total	5.7		MG/KG	0.12	6.0
		Magnesium, Total	3590		MG/KG	4.1	6.0
		Manganese, Total	209		MG/KG	0.12	6.0
		Molybdenum, Total	0.97	u	MG/KG	0.97	6.0
		Sodium, Total	112		MG/KG	2.3	1.0
		Nickel, Total	9.4		MG/KG	1.3	6.0
		Phosphorus, Total	587		MG/KG	1.2	1.0
		Lead, Total	16.5		MG/KG	1.5	6.0
		Antimony, Total	2.4	u J	MG/KG	2.4	6.0
		Selenium, Total	3.0	u	MG/KG	3.0	6.0
		Silicon, Total	288	J	MG/KG	4.1	6.0
		Tin, Total	3.4	u	MG/KG	3.4	6.0
		Strontium, Total	17.5		MG/KG	0.06	6.0
		Thallium, Total	4.8	u	MG/KG	4.8	6.0
		Uranium, Total	12.1	u	MG/KG	12.1	6.0
		Vanadium, Total	39.7		MG/KG	0.37	6.0
		Zinc, Total	78.8		MG/KG	0.30	6.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	J030W3	Silver, Total	0.48	u	MG/KG	0.48	6.0
		Aluminum, Total	6140		MG/KG	2.1	1.0
		Arsenic, Total	3.7		MG/KG	2.4	6.0
		Boron, Total	1.2	u	MG/KG	1.2	6.0
		Barium, Total	55.8		MG/KG	0.11	6.0
		Beryllium, Total	0.31		MG/KG	0.05	6.0
		Bismuth, Total	1.7	u	MG/KG	1.7	6.0
		Calcium, Total	3800		MG/KG	1.7	1.0
		Cadmium, Total	0.57		MG/KG	0.16	6.0
		Cobalt, Total	5.5		MG/KG	0.48	6.0
		Chromium, Total	68.7		MG/KG	0.38	6.0
		Copper, Total	20.5		MG/KG	0.43	6.0
		Iron, Total	19100		MG/KG	15.8	6.0
		Mercury, Total	0.02		MG/KG	0.02	1.0
		Potassium, Total	625		MG/KG	48.8	1.0
		Lithium, Total	6.6		MG/KG	0.11	6.0
		Magnesium, Total	3620		MG/KG	3.6	6.0
		Manganese, Total	290		MG/KG	0.11	6.0
		Molybdenum, Total	0.86	u	MG/KG	0.86	6.0
		Sodium, Total	189		MG/KG	2.1	1.0
		Nickel, Total	13.3		MG/KG	1.2	6.0
		Phosphorus, Total	700		MG/KG	1.0	1.0
		Lead, Total	31.2		MG/KG	1.3	6.0
		Antimony, Total	2.2	u	MG/KG	2.2	6.0
		Selenium, Total	2.6	u	MG/KG	2.6	6.0
		Silicon, Total	87.1		MG/KG	3.7	6.0
		Tin, Total	3.0	u	MG/KG	3.0	6.0
		Strontium, Total	20.4		MG/KG	0.05	6.0
		Thallium, Total	4.3	u	MG/KG	4.3	6.0
		Uranium, Total	10.7	u	MG/KG	10.7	6.0
		Vanadium, Total	46.1		MG/KG	0.32	6.0
		Zinc, Total	172		MG/KG	0.27	6.0

R 6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138

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

LVL LOT #: 0504L303

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J030W4	Silver, Total	0.58	u	MG/KG	0.58	6.0
		Aluminum, Total	5970		MG/KG	2.5	1.0
		Arsenic, Total	3.7		MG/KG	2.9	6.0
		Boron, Total	1.5	u	MG/KG	1.5	6.0
		Barium, Total	66.5		MG/KG	0.13	6.0
		Beryllium, Total	0.34		MG/KG	0.06	6.0
		Bismuth, Total	2.1	u	MG/KG	2.1	6.0
		Calcium, Total	3270		MG/KG	2.0	1.0
		Cadmium, Total	0.63		MG/KG	0.19	6.0
		Cobalt, Total	6.3		MG/KG	0.58	6.0
		Chromium, Total	32.4		MG/KG	0.45	6.0
		Copper, Total	21.7		MG/KG	0.51	6.0
		Iron, Total	18800		MG/KG	18.8	6.0
		Mercury, Total	0.02	u	MG/KG	0.02	1.0
		Potassium, Total	627		MG/KG	58.2	1.0
		Lithium, Total	7.7		MG/KG	0.13	6.0
		Magnesium, Total	3770		MG/KG	4.3	6.0
		Manganese, Total	427		MG/KG	0.13	6.0
		Molybdenum, Total	1.0	u	MG/KG	1.0	6.0
		Sodium, Total	164		MG/KG	2.5	1.0
		Nickel, Total	12.8		MG/KG	1.4	6.0
		Phosphorus, Total	647		MG/KG	1.2	1.0
		Lead, Total	23.1		MG/KG	1.6	6.0
		Antimony, Total	2.6	u J	MG/KG	2.6	6.0
		Selenium, Total	3.1	u	MG/KG	3.1	6.0
		Silicon, Total	282	J	MG/KG	4.4	6.0
		Tin, Total	3.6	u	MG/KG	3.6	6.0
		Strontium, Total	18.2		MG/KG	0.06	6.0
		Thallium, Total	5.1	u	MG/KG	5.1	6.0
		Uranium, Total	12.7	u	MG/KG	12.7	6.0
		Vanadium, Total	45.7		MG/KG	0.38	6.0
		Zinc, Total	157		MG/KG	0.32	6.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138

LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-010	J030W5	Silver, Total	0.51 u	MG/KG	0.51	6.0
		Aluminum, Total	7240	MG/KG	2.2	1.0
		Arsenic, Total	9.2	MG/KG	2.6	6.0
		Boron, Total	1.3 u	MG/KG	1.3	6.0
		Barium, Total	78.2	MG/KG	0.11	6.0
		Beryllium, Total	0.33	MG/KG	0.06	6.0
		Bismuth, Total	1.8 u	MG/KG	1.8	6.0
		Calcium, Total	3930	MG/KG	1.8	1.0
		Cadmium, Total	1.7	MG/KG	0.17	6.0
		Cobalt, Total	6.9	MG/KG	0.51	6.0
		Chromium, Total	23.9	MG/KG	0.40	6.0
		Copper, Total	37.1	MG/KG	0.45	6.0
		Iron, Total	18700	MG/KG	16.6	6.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Potassium, Total	1190	MG/KG	51.6	1.0
		Lithium, Total	9.1	MG/KG	0.11	6.0
		Magnesium, Total	4420	MG/KG	3.8	6.0
		Manganese, Total	249	MG/KG	0.11	6.0
		Molybdenum, Total	1.2 UJ	MG/KG	0.91	6.0
		Sodium, Total	202	MG/KG	2.2	1.0
		Nickel, Total	14.9	MG/KG	1.3	6.0
		Phosphorus, Total	714	MG/KG	1.1	1.0
		Lead, Total	105	MG/KG	1.4	6.0
		Antimony, Total	2.3 uJ	MG/KG	2.3	6.0
		Selenium, Total	2.8 u	MG/KG	2.8	6.0
		Silicon, Total	398 J	MG/KG	3.9	6.0
		Tin, Total	3.3	MG/KG	3.2	6.0
		Strontium, Total	27.1	MG/KG	0.06	6.0
		Thallium, Total	4.5 u	MG/KG	4.5	6.0
		Uranium, Total	11.3 u	MG/KG	11.3	6.0
		Vanadium, Total	34.7	MG/KG	0.34	6.0
		Zinc, Total	511	MG/KG	0.28	6.0

6/13/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J03125	Silver, Total	0.54 u	MG/KG	0.54	6.0
		Aluminum, Total	7790	MG/KG	2.4	1.0
		Arsenic, Total	5.1	MG/KG	2.7	6.0
		Boron, Total	2.9	MG/KG	1.4	6.0
		Barium, Total	83.8	MG/KG	0.12	6.0
		Beryllium, Total	0.39	MG/KG	0.06	6.0
		Bismuth, Total	2.1	MG/KG	1.9	6.0
		Calcium, Total	4010	MG/KG	1.8	1.0
		Cadmium, Total	2.1	MG/KG	0.18	6.0
		Cobalt, Total	7.1	MG/KG	0.54	6.0
		Chromium, Total	20.7	MG/KG	0.42	6.0
		Copper, Total	23.4	MG/KG	0.48	6.0
		Iron, Total	18000	MG/KG	17.4	6.0
		Mercury, Total	0.08	MG/KG	0.02	1.0
		Potassium, Total	1660	MG/KG	54.0	1.0
		Lithium, Total	9.4	MG/KG	0.12	6.0
		Magnesium, Total	4820	MG/KG	4.0	6.0
		Manganese, Total	301	MG/KG	0.12	6.0
		Molybdenum, Total	0.95 u	MG/KG	0.95	6.0
		Sodium, Total	184	MG/KG	2.3	1.0
		Nickel, Total	16.6	MG/KG	1.3	6.0
		Phosphorus, Total	775	MG/KG	1.1	1.0
		Lead, Total	43.9	MG/KG	1.5	6.0
		Antimony, Total	2.4 u J	MG/KG	2.4	6.0
		Selenium, Total	2.9 u	MG/KG	2.9	6.0
		Silicon, Total	394 J	MG/KG	4.0	6.0
		Tin, Total	3.3 u	MG/KG	3.3	6.0
		Strontium, Total	28.9	MG/KG	0.06	6.0
		Thallium, Total	4.7 u	MG/KG	4.7	6.0
		Uranium, Total	11.8 u	MG/KG	11.8	6.0
		Vanadium, Total	38.5	MG/KG	0.36	6.0
		Zinc, Total	276	MG/KG	0.30	6.0

6/13/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD D05-003
LVL#: 0504L303
SDG/SAF#: H3138/D05-003

W.O.#: 11343-606-001-9999-00
Date Received: 04-26-05

METALS CASE NARRATIVE

1. This narrative covers the analyses of 11 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. All samples except for sample J030V6 were reported with 6-fold dilutions for ICP metals. Aluminum, Calcium, Potassium, Sodium, and Phosphorous were reported without dilution.

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).

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

7. The preparation/method blank for 1 analyte was outside 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.

   a). The MB result for Zinc was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and sample J030V6 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

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

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

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 39 pages.

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

10. The matrix spike (MS) recoveries for 4 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:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J030V7	Aluminum	72,000	98.6
	Calcium	50,000	94.0
	Iron	72,000	92.7
	Antimony	600	99.8

12. The duplicate analyses for 5 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. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/24/05
Date

jjw/m04-303

LVLI LIONVILLE LABORATORY INC.

0504L303

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	D05-003-1	Page 1 of 1

Collector: Stankovich/Gale/Singleton	Company Contact: Steve Weiss — Telephone No.: (509) 372-9495	Project Coordinator: WEISS, RL	Price Code / Data Turnaround: 21 Days
Project Designation: RCBRA Tribal Plant Sampling - Soil	Sampling Location: UPSTREAM, 100-H OUTFALL	SAF No.: D05-003	Air Quality ☐
Ice Chest No.: ERC-03-104 and ERC-99-041	Field Logbook No.: EFL-1133-11 — COA: BRASCC6520	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050206	Bill of Lading/Air Bill No.: See OSAC	

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P D	aG B	aG C	aG A	G/P E						
No. of Container(s)	1	1	1	1	1						
Volume	250ml	250ml	120ml	250ml.	250ml.						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045						

	Sample No.	Matrix *	Sample Date	Sample Time										
1	J030V6	SOIL	4-19-05	0940	X									
2	J030V7	Soil	4-19-05	1100	X	X	X	X	X					
3	J030V8	Soil	4-19-05	1400	X	X	X	X	X					
4	J030V9	Soil	4-19-05	1400	X	X	X	X	X					
5	J030W0	Soil	4-19-05	1410	X	X	X	X	X					

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	[signature]	4/19/05 1600	3728/3B	4/19/05 1600
Relinquished By/Removed From	3728 Rec 3B	4/25/05 1100	D St John [signature]	4/25/05 1100
Relinquished By/Removed From	D St John ERC [signature]	4/25/05 1100	Fed EX.	
Relinquished By/Removed From	[signature]	4/26/05 0915	[signature]	4/26/05 0915
Relinquished By/Removed From			Received By Stored In	
Relinquished By/Removed From			Received By Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List: Mercury - 7471 - (CV); Chromium Hex - 7196; Percent Solids

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

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

9000026

9000026

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	D05-003-1	Page 1 of 1

Collector: Stankovich/Gale/Singleton	Company Contact: Steve Weiss — Telephone No.: (509) 372-9495	Project Coordinator: WEISS, RL	Price Code: Air Quality ☐ — Data Turnaround: 21 Days
Project Designation: RCBRA Tribal Plant Sampling - Soil	Sampling Location: 100-H	SAF No.: D05-003	
Ice Chest No.: ERC-03-104 and ERC-99-041	Field Logbook No.: EFL-1133-11 — COA: BRASCC6520	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050206	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS: None

Special Handling and/or Storage: Cool 4°C

Preservation		None	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container		G/P D	aG B	aG C	aG A	G/P E					
No. of Container(s)		1	1	1	1	1					
Volume		250ml	250ml	120ml	250mL	250ml					
SAMPLE ANALYSIS		See item (1) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil) - 9045					
Sample No.	Matrix *	Sample Date	Sample Time								
J030W1	SOIL	4/20/05	1000	X	X	X	X	X			
J030W2	Soil	4/20/05	1020	X	X	X	X	X			
J030W3	Soil	4/20/05	1115	X	X	X	X	X			
J030W4	Soil	4/20/05	1245	X	X	X	X	X			
J030W5	Soil	4/20/05	1315	X	X	X	X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MTT M Stankovich	1530 4/20/05	3728/3B	4/20/05 1530
3728 RCF 3B	4/25/05 1100	D Studing / Dave Sutton	4/25/05 1100
D Studing ERC / Dave Sutton	4/25/05 1100	Fed Ex	
Fed Ex	4/26/05 0915	[illegible]	4/26/05 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) ICP Metals - 6010 (Client List); Mercury - 7471 - (CV); Chromium Hex - 7196; Percent Solids

Matrix *

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

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

Collector: Stankovich/Gale/Singleton	Company Contact: Steve Weiss	Telephone No.: (509) 372-9495	Project Coordinator: WEISS, RL
Project Designation: RCBRA Tribal Plant Sampling - Soil	Sampling Location: UPSTREAM, 100-H OUTFALL		SAF No.: D05-003
Ice Chest No.: ERC-03-104 and ERC-99-041	Field Logbook No.: EFL-1133-11	COA: BRASCC6520	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050206		Bill of Lading/Air Bill No.: SEE COC

Price Code: Air Quality ☐

Data Turnaround: 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: ~~N/A~~ cool 4°C

DAS 4/25/05

SAMPLE ANALYSIS												
Preservation				None	Cool 4C B	Cool 4C	Cool 4C	None				
Type of Container				G/P D	aG	aG C	aG A	G/P E				
No. of Container(s)				1	1	1	1	1				
Volume				250ml	250ml	120ml	250mL	250mL				
				See item (1) in Special Instructions.	PCBs - 8082	Pesticides - 8081	Semi-VOA - 8270A (TCL)	pH (Soil - 9045)				
Sample No.	Matrix *	Sample Date	Sample Time									
J03125	SOIL	4-25-05	0830	X	X	X	X	X				
	Soil											
	Soil											
	Soil											
	Soil											

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: ERC SGDCE	4-25-05 0945	FED EX	
Relinquished By/Removed From: FEDEX	4/26/05 0915	[illegible]	4/26/05 0915
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List: Mercury - 7471 - (CV); Chromium Hex - 7196; Percent Solids

Matrix *

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

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

00000028

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: RCBRA			DATA PACKAGE: H3138		
VALIDATOR: TLI		LAB: LLI		DATE: 6/10/03	
			SDG: H3138		

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

SAMPLES/MATRIX				
J030V6	J030V7	J030V8	J030V9	J030W0
J030W1	J030W2	J030W3	J030W4	J030W5
J03125				
				Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: lithium - V4 moly V8 ows -UJ
tin - lead - V4 } UJ
zinc - V4
FB al, barium, beryllium, calcium, chromium, iron, magnesium, manganese, Sodium, phosphorus, silicon, strontium, Vanadium, tin

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: antimony - 52% J all

NO PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: Silicon – 35.5% – J alf

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A
ICP serial dilution %D values acceptable? ..... Yes No N/A
ICP post digestion spike required? ..... Yes No N/A
ICP post digestion spike values acceptable? ..... Yes No N/A
Standards traceable? ..... Yes No N/A
Standards expired? ..... Yes No N/A
Transcription/calculation errors? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

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

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

MSA performed as required? ..... Yes No N/A

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: Silver, antimony, Selenium, uranium - all but V6 ok

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/18/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	05L0253-MB1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	2.4 u	MG/KG	2.4	1.0
		Arsenic, Total	0.45 u	MG/KG	0.45	1.0
		Boron, Total	0.23 u	MG/KG	0.23	1.0
		Barium, Total	0.03	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Bismuth, Total	0.32 u	MG/KG	0.32	1.0
		Calcium, Total	2.3	MG/KG	1.8	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Cobalt, Total	0.09 u	MG/KG	0.09	1.0
		Chromium, Total	0.07 u	MG/KG	0.07	1.0
		Copper, Total	0.08 u	MG/KG	0.08	1.0
		Iron, Total	2.9 u	MG/KG	2.9	1.0
		Potassium, Total	73.8	MG/KG	54.4	1.0
		Lithium, Total	0.02	MG/KG	0.02	1.0
		Magnesium, Total	1.0	MG/KG	0.67	1.0
		Manganese, Total	0.03	MG/KG	0.02	1.0
		Molybdenum, Total	0.27	MG/KG	0.16	1.0
		Sodium, Total	2.9	MG/KG	2.3	1.0
		Nickel, Total	0.22 u	MG/KG	0.22	1.0
		Phosphorus, Total	1.2 u	MG/KG	1.2	1.0
		Lead, Total	0.36	MG/KG	0.25	1.0
		Antimony, Total	0.40 u	MG/KG	0.40	1.0
		Selenium, Total	0.49 u	MG/KG	0.49	1.0
		Silicon, Total	1.4	MG/KG	0.68	1.0
		Tin, Total	1.1	MG/KG	0.56	1.0
		Strontium, Total	0.02	MG/KG	0.01	1.0
		Thallium, Total	0.79 u	MG/KG	0.79	1.0
		Uranium, Total	2.0 u	MG/KG	2.0	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.60	MG/KG	0.05	1.0
BLANK1	05C0102-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138

LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J030V7	Silver, Total	4.0	0.52u	4.4	90.9	6.0
		Aluminum, Total	6200	5750	177	256.3*	1.0
		Arsenic, Total	167	4.3	177	91.9	6.0
		Boron, Total	79.5	1.7	88.7	87.7	6.0
		Barium, Total	224	63.8	177	90.2	6.0
		Beryllium, Total	4.4	0.29	4.4	93.4	6.0
		Bismuth, Total	412	1.9 u	444	93.0	6.0
		Calcium, Total	4810	3210	2220	72.3	1.0
		Cadmium, Total	5.0	0.93	4.4	92.4	6.0
		Cobalt, Total	46.6	5.6	44.3	92.6	6.0
		Chromium, Total	30.6	13.8	17.7	94.9	6.0
		Copper, Total	36.2	15.6	22.2	92.8	6.0
		Iron, Total	15000	15300	88.7	-370. *	6.0
		Mercury, Total	0.20	0.02	0.16	112.7	1.0
		Potassium, Total	2630	822	2220	81.7	1.0
		Lithium, Total	92.1	6.9	88.7	96.1	6.0
		Magnesium, Total	6120	3970	2220	97.2	6.0
		Manganese, Total	312	274	44.3	86.7*	6.0
		Molybdenum, Total	82.4	0.92u	88.7	92.9	6.0
		Sodium, Total	2170	142	2220	91.4	1.0
		Nickel, Total	55.2	14.1	44.3	92.8	6.0
		Phosphorus, Total	966	591	444	84.6	1.0
		Lead, Total	64.7	24.4	44.3	91.0	6.0
		Antimony, Total	23.2	2.3 u	44.3	52.4	6.0
		Selenium, Total	163	2.8 u	177	91.9	6.0
		Silicon, Total	297	218	88.7	89.5	6.0
		Tin, Total	81.2	3.2 u	88.7	91.5	6.0
		Strontium, Total	102	20.2	88.7	92.4	6.0
		Thallium, Total	166	4.5 u	177	93.7	6.0
		Uranium, Total	413	11.3 u	444	93.2	6.0
		Vanadium, Total	73.1	34.6	44.3	86.9	6.0
		Zinc, Total	187	153	44.3	77.2	6.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J030V7	Silver, Total	0.52u	0.52u	NC	6.0
		Aluminum, Total	5750	6510	12.4	1.0
		Arsenic, Total	4.3	4.1	4.8	6.0
		Boron, Total	1.7	1.3 u	~~NC~~ 200 MW 5/23/05	6.0
		Barium, Total	63.8	64.6	1.2	6.0
		Beryllium, Total	0.29	0.32	8.5	6.0
		Bismuth, Total	1.9 u	2.6	~~NC~~ 200 MW 5/23/05	6.0
		Calcium, Total	3210	3480	8.3	1.0
		Cadmium, Total	0.93	0.75	21.6	6.0
		Cobalt, Total	5.6	6.0	6.9	6.0
		Chromium, Total	13.8	16.0	14.8	6.0
		Copper, Total	15.6	16.5	5.6	6.0
		Iron, Total	15300	17300	12.3	6.0
		Mercury, Total	0.02	0.03	36.4	1.0
		Potassium, Total	822	734	11.3	1.0
		Lithium, Total	6.9	7.6	9.7	6.0
		Magnesium, Total	3970	4280	7.6	6.0
		Manganese, Total	274	289	5.5	6.0
		Molybdenum, Total	0.92u	0.92u	NC	6.0
		Sodium, Total	142	163	13.6	1.0
		Nickel, Total	14.1	15.7	10.7	6.0
		Phosphorus, Total	591	666	11.9	1.0
		Lead, Total	24.4	25.7	5.2	6.0
		Antimony, Total	2.3 u	2.3 u	NC	6.0
		Selenium, Total	2.8 u	2.8 u	NC	6.0
		Silicon, Total	218	312	35.5	6.0
		Tin, Total	3.2 u	3.2 u	NC	6.0
		Strontium, Total	20.2	21.7	7.2	6.0
		Thallium, Total	4.5 u	4.6 u	NC	6.0
		Uranium, Total	11.3 u	11.4 u	NC	6.0
		Vanadium, Total	34.6	40.4	15.5	6.0
		Zinc, Total	153	158	2.8	6.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/18/05

CLIENT: TNUHANFORD D05-003 H3138 LVL LOT #: 0504L303

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	05L0253-LC1	Silver, LCS	49.2	50.0	MG/KG	98.4
		Aluminum, LCS	445	500	MG/KG	89.0
		Arsenic, LCS	934	1000	MG/KG	93.4
		Boron, LCS	480	500	MG/KG	95.9
		Barium, LCS	495	500	MG/KG	99.0
		Beryllium, LCS	24.3	25.0	MG/KG	97.2
		Bismuth, LCS	484	500	MG/KG	96.8
		Calcium, LCS	2140	2500	MG/KG	85.5
		Cadmium, LCS	24.3	25.0	MG/KG	97.2
		Cobalt, LCS	249	250	MG/KG	99.4
		Chromium, LCS	50.0	50.0	MG/KG	100
		Copper, LCS	127	125	MG/KG	101.3
		Iron, LCS	499	500	MG/KG	99.8
		Potassium, LCS	2260	2500	MG/KG	90.5
		Lithium, LCS	515	500	MG/KG	103.0
		Magnesium, LCS	2440	2500	MG/KG	97.7
		Manganese, LCS	75.8	75.0	MG/KG	101.1
		Molybdenum, LCS	502	500	MG/KG	100.4
		Sodium, LCS	2300	2500	MG/KG	92.2
		Nickel, LCS	199	200	MG/KG	99.6
		Phosphorus, LCS	466	500	MG/KG	93.2
		Lead, LCS	245	250	MG/KG	98.2
		Antimony, LCS	289	300	MG/KG	96.3
		Selenium, LCS	900	1000	MG/KG	90.0
		Silicon, LCS	407	500	MG/KG	81.4
		Tin, LCS	495	500	MG/KG	98.9
		Strontium, LCS	498	500	MG/KG	99.5
		Thallium, LCS	978	1000	MG/KG	97.8
		Uranium, LCS	493	500	MG/KG	98.5
		Vanadium, LCS	243	250	MG/KG	97.1
		Zinc, LCS	97.7	100	MG/KG	97.7
LCS1	05C0102-LC1	Mercury, LCS	6.7	6.2	MG/KG	107.7