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SAF-B05-003
100 BC Remaining Pipelines and Sewers - Soil Full Protocol
FINAL VALIDATION PACKAGE

H3344

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan H9-02 MJP 11/9/05 copies clipped
INITIAL/DATE

Waste Site: 100-C-9:1

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Date: 9 November 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines and Sewers – Soil Full Protocol – Waste Site 100:C-9:1
Subject: Inorganics - Data Package No. H3344-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3344 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J03WX7	8/23/05	Soil	C	See note 1
J03WX8	8/23/05	Soil	C	See note 1
J03WX9	8/23/05	Soil	C	See note 1
J03WY0	8/23/05	Soil	C	See note 1
J03WY1	8/23/05	Soil	C	See note 1
J03WY2	8/23/05	Soil	C	See note 1
J03WY3	8/23/05	Soil	C	See note 1
J03WY4	8/23/05	Soil	C	See note 1
J03WY5	8/23/05	Soil	C	See note 1
J03WY6	8/23/05	Soil	C	See note 1
J03WY7	8/23/05	Soil	C	See note 1
J03WY8	8/23/05	Soil	C	See note 1
J03WY9	8/23/05	Soil	C	See note 1
J03X00	8/23/05	Soil	C	See note 1
J03W01	8/23/05	Soil	C	See note 1
J03X02	8/23/05	Soil	C	See note 1
J03X03	8/23/05	Soil	C	See note 1
J03X04	8/23/05	Soil	C	See note 1
J03X05	8/23/05	Soil	C	See note 1
J03X06	8/23/05	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 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

Due to method blank contamination, the silver result in samples J03WY9, J03X04 and J03X06 were qualified as estimates and flagged "UJ".

Due to method blank contamination, the selenium result in samples J03X03, J03X04 and J03X06 were qualified as estimates and flagged "UJ".

Due to method blank contamination, the lead result in sample J03WY7 was qualified as an estimate and flagged "UJ".

Due to method blank contamination, all arsenic and molybdenum results were qualified as estimates and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

Due to a matrix spike recovery outside QC limits (56.8%), 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.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **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 analytes met the RQL.

- **Completeness**

Data package No. H3344 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 silver result in samples J03WY9, J03X04 and J03X06 were qualified as estimates and flagged "UJ".

Due to method blank contamination, the selenium result in samples J03X03, J03X04 and J03X06 were qualified as estimates and flagged "UJ".

Due to method blank contamination, the lead result in sample J03WY7 was qualified as an estimate and flagged "UJ".

Due to method blank contamination, all arsenic and molybdenum results were qualified as estimate and flagged "UJ".

Due to a matrix spike recovery outside QC limits (56.8%), all antimony 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.

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: H3344	REVIEWER: TLI	Project: 100-C-9:1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Silver	UJ	J03WY9, J03X04 J03X06	Blank contamination
Selenium	UJ	J03X03, J03X04 J03X06	Blank contamination
Lead	UJ	J03WY7	Blank contamination
Arsenic Molybdenum	UJ	All	Blank contamination
Antimony	J	All	MS recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																					
Lab: LLI	SDG: H3344																				
Sample Number		J03WX7		J03WX8		J03WX9		J03WY0		J03WY1		J03WY2		J03WY3		J03WY4		J03WY5		J03WY6	
Remarks																					
Sample Date		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Arsenic	10	2.9	UJ	3.7	UJ	3.7	UJ	2.5	UJ	3.9	UJ	2.4	UJ	2.9	UJ	4.7	UJ	2.2	UJ	4.9	UJ
Boron		0.89		0.87		0.40		0.21	U	0.61		0.21	U	0.59		0.52		0.21	U	0.48	
Barium	2	64.4		53.9		74.1		54.0		65.9		55.2		70.5		78.1		61.0		105	
Beryllium		0.24		0.25		0.31		0.27		0.30		0.24		0.32		0.36		0.25		0.34	
Cadmium	0.2	0.05		0.07		0.11		0.09		0.18		0.11		0.12		0.17		0.13		0.17	
Cobalt		5.2		5.2		6.2		5.1		6.0		5.2		6.4		7.3		5.2		6.3	
Chromium	1	7.5		11.1		9.9		8.5		9.6		8.7		9.4		9.6		9.2		11.9	
Copper		13.1		16.1		17.2		13.0		15.9		12.8		15.1		17.8		11.4		17.6	
Mercury	0.2	0.01	U	0.01	U	0.04		0.02	U	0.02		0.01	U	0.02	U	0.01	U	0.12		0.01	U
Manganese		279		262		288		245		277		242		295		330		229		298	
Molybdenum		0.29	UJ	0.28	UJ	0.33	UJ	0.32	UJ	0.36	UJ	0.24	UJ	0.24	UJ	0.28	UJ	0.18	UJ	0.37	UJ
Nickel		10.1		12.9		11.1		10.7		10.7		11.7		12.2		12.4		7.8		14.9	
Lead	5	3.4		3.6		6.9		3.3		3.7		3.0		4.2		4.8		2.2		5.1	
Antimony		0.27	UJ	0.47	J	0.28	UJ	0.28	UJ	0.28	UJ	0.27	UJ	0.27	UJ	0.28	UJ	0.28	UJ	0.28	UJ
Selenium	1	0.39	U	0.40	U	0.40	U	0.40	U	0.40	U	0.39	U	0.39	U	0.40	U	0.40	U	0.40	U
Vanadium		28.8		24.4		32.7		29.9		31.4		34.0		37.1		38.0		27.7		27.9	
Zinc	1	29.4		29.5		37.8		30.1		33.1		31.2		36.0		37.9		25.9		37.8	

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

INORGANIC ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD																					
Lab: LLI	SDG: H3344																				
Sample Number		J03WY7		J03WY8		J03WY9		J03X00		J03X01		J03X02		J03X03		J03X04		J03X05		J03X06	
Remarks																					
Sample Date		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05		8/23/05	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.07	U	0.07	U	0.13	UJ	0.07	U	0.07	U	0.07	U	0.07	U	0.11	UJ	0.07	U	0.07	UJ
Arsenic	10	2.2	UJ	1.9	UJ	3.4	UJ	3.4	UJ	2.5	UJ	2.4	UJ	2.6	UJ	3.5	UJ	2.5	UJ	2.8	UJ
Boron		0.21	U	0.21	U	0.92		0.65		0.21	U	0.21	U	1.2		1.0		0.94		1.1	
Barium	2	52.6		54.4		63.2		66.6		47.8		52.5		80.2		60.9		69.0		62.5	
Beryllium		0.28		0.30		0.35		0.36		0.24		0.24		0.39		0.36		0.38		0.34	
Cadmium	0.2	0.11	U	0.23		0.20		0.18		0.16		0.13		0.13		0.12		0.12		0.12	
Cobalt		8.6		8.3		8.8		10.4		5.9		5.3		10.2		9.40		8.7		9.6	
Chromium	1	3.4		2.9		9.0		7.7		4.9		5.8		6.0		6.1		6.4		8.7	
Copper		15.1		15.6		15.1		16.6		13.7		13.2		19.5		18.6		18.1		18.5	
Mercury	0.2	0.01	U	0.02	U	0.02		0.08		0.06		0.05		0.04		0.03		0.02	U	0.03	
Manganese		297		286		357		375		238		213		367		319		317		356	
Molybdenum		0.41	UJ	0.47	UJ	0.53	UJ	0.63	UJ	0.35	UJ	0.37	UJ	0.53	UJ	0.51	UJ	0.30	UJ	0.52	UJ
Nickel		6.5		5.4		11.2		9.9		7.4		7.2		9.7		7.7		8.6		8.8	
Lead	5	1.7	UJ	2.9		4.4		3.8		2.8		2.6		3.7		3.0		3.7		4.7	
Antimony		0.27	UJ	0.28	UJ	0.27	UJ	0.27	UJ	0.28	UJ	0.28	UJ	0.27	UJ	0.41	UJ	0.28	UJ	0.27	UJ
Selenium	1	0.39	U	0.39	U	0.39	U	0.39	U	0.40	U	0.40	U	0.47	UJ	0.46	UJ	0.40	U	0.41	UJ
Vanadium		56.8		58.1		48.8		58.1		24.2		32.9		59.3		53.9		47.6		52.7	
Zinc	1	41.0		42.0		45.0		51.6		29.8		29.7		47.5		43.4		43.3		45.4	

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 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03WX7	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.9 UJ	MG/KG	0.43	1.0
		Boron, Total	0.89	MG/KG	0.21	1.0
		Barium, Total	64.4	MG/KG	0.009	1.0
		Beryllium, Total	0.24	MG/KG	0.009	1.0
		Cadmium, Total	0.05	MG/KG	0.04	1.0
		Cobalt, Total	5.2	MG/KG	0.06	1.0
		Chromium, Total	7.5	MG/KG	0.06	1.0
		Copper, Total	13.1	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	279	MG/KG	0.02	1.0
		Molybdenum, Total	0.29 UJ	MG/KG	0.16	1.0
		Nickel, Total	10.1	MG/KG	0.12	1.0
		Lead, Total	3.4	MG/KG	0.26	1.0
		Antimony, Total	0.27 u J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	28.8	MG/KG	0.05	1.0
		Zinc, Total	29.4	MG/KG	0.06	1.0
-002	J03WX8	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	3.7 UJ	MG/KG	0.43	1.0
		Boron, Total	0.87	MG/KG	0.21	1.0
		Barium, Total	53.9	MG/KG	0.009	1.0
		Beryllium, Total	0.25	MG/KG	0.009	1.0
		Cadmium, Total	0.07	MG/KG	0.04	1.0
		Cobalt, Total	5.2	MG/KG	0.06	1.0
		Chromium, Total	11.1	MG/KG	0.06	1.0
		Copper, Total	16.1	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	262	MG/KG	0.02	1.0
		Molybdenum, Total	0.28 UJ	MG/KG	0.17	1.0
		Nickel, Total	12.9	MG/KG	0.12	1.0
		Lead, Total	3.6	MG/KG	0.27	1.0
		Antimony, Total	0.47 J	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	24.4	MG/KG	0.06	1.0
		Zinc, Total	29.5	MG/KG	0.06	1.0

11/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J03WX9	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	3.7 UJ	MG/KG	0.43	1.0
		Boron, Total	0.40	MG/KG	0.21	1.0
		Barium, Total	74.1	MG/KG	0.009	1.0
		Beryllium, Total	0.31	MG/KG	0.009	1.0
		Cadmium, Total	0.11	MG/KG	0.04	1.0
		Cobalt, Total	6.2	MG/KG	0.06	1.0
		Chromium, Total	9.9	MG/KG	0.06	1.0
		Copper, Total	17.2	MG/KG	0.12	1.0
		Mercury, Total	0.04	MG/KG	0.01	1.0
		Manganese, Total	288	MG/KG	0.02	1.0
		Molybdenum, Total	0.33 UJ	MG/KG	0.17	1.0
		Nickel, Total	11.1	MG/KG	0.12	1.0
		Lead, Total	6.9	MG/KG	0.27	1.0
		Antimony, Total	0.28 u J	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	32.7	MG/KG	0.06	1.0
		Zinc, Total	37.8	MG/KG	0.06	1.0
-004	J03WY0	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.5 UJ	MG/KG	0.44	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	54.0	MG/KG	0.009	1.0
		Beryllium, Total	0.27	MG/KG	0.009	1.0
		Cadmium, Total	0.09	MG/KG	0.04	1.0
		Cobalt, Total	5.1	MG/KG	0.07	1.0
		Chromium, Total	8.5	MG/KG	0.07	1.0
		Copper, Total	13.0	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	245	MG/KG	0.02	1.0
		Molybdenum, Total	0.32 UJ	MG/KG	0.17	1.0
		Nickel, Total	10.7	MG/KG	0.12	1.0
		Lead, Total	3.3	MG/KG	0.27	1.0
		Antimony, Total	0.28 u J	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	29.9	MG/KG	0.06	1.0
		Zinc, Total	30.1	MG/KG	0.07	1.0

11/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J03WY1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	3.9 UJ	MG/KG	0.44	1.0
		Boron, Total	0.61	MG/KG	0.21	1.0
		Barium, Total	65.9	MG/KG	0.009	1.0
		Beryllium, Total	0.30	MG/KG	0.009	1.0
		Cadmium, Total	0.18	MG/KG	0.11	3.0
		Cobalt, Total	6.0	MG/KG	0.07	1.0
		Chromium, Total	9.6	MG/KG	0.07	1.0
		Copper, Total	15.9	MG/KG	0.12	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Manganese, Total	277	MG/KG	0.02	1.0
		Molybdenum, Total	0.36 UJ	MG/KG	0.17	1.0
		Nickel, Total	10.7	MG/KG	0.12	1.0
		Lead, Total	3.7	MG/KG	0.81	3.0
		Antimony, Total	0.28 uJ	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	31.4	MG/KG	0.06	1.0
		Zinc, Total	33.1	MG/KG	0.07	1.0
-006	J03WY2	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.4 UJ	MG/KG	0.43	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	55.2	MG/KG	0.009	1.0
		Beryllium, Total	0.24	MG/KG	0.009	1.0
		Cadmium, Total	0.11	MG/KG	0.11	3.0
		Cobalt, Total	5.2	MG/KG	0.06	1.0
		Chromium, Total	8.7	MG/KG	0.06	1.0
		Copper, Total	12.8	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	242	MG/KG	0.02	1.0
		Molybdenum, Total	0.24 UJ	MG/KG	0.16	1.0
		Nickel, Total	11.7	MG/KG	0.12	1.0
		Lead, Total	3.0	MG/KG	0.80	3.0
		Antimony, Total	0.27 uJ	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	34.0	MG/KG	0.05	1.0
		Zinc, Total	31.2	MG/KG	0.06	1.0

11/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J03WY3	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.9 UJ	MG/KG	0.43	1.0
		Boron, Total	0.59	MG/KG	0.21	1.0
		Barium, Total	70.5	MG/KG	0.009	1.0
		Beryllium, Total	0.32	MG/KG	0.009	1.0
		Cadmium, Total	0.12	MG/KG	0.11	3.0
		Cobalt, Total	6.4	MG/KG	0.06	1.0
		Chromium, Total	9.4	MG/KG	0.06	1.0
		Copper, Total	15.1	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	295	MG/KG	0.02	1.0
		Molybdenum, Total	0.24 UJ	MG/KG	0.16	1.0
		Nickel, Total	12.2	MG/KG	0.12	1.0
		Lead, Total	4.2	MG/KG	0.80	3.0
		Antimony, Total	0.27 uJ	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	37.1	MG/KG	0.05	1.0
		Zinc, Total	36.0	MG/KG	0.06	1.0
-008	J03WY4	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	4.7 UJ	MG/KG	0.44	1.0
		Boron, Total	0.52	MG/KG	0.21	1.0
		Barium, Total	78.1	MG/KG	0.009	1.0
		Beryllium, Total	0.36	MG/KG	0.009	1.0
		Cadmium, Total	0.17	MG/KG	0.11	3.0
		Cobalt, Total	7.3	MG/KG	0.07	1.0
		Chromium, Total	9.6	MG/KG	0.07	1.0
		Copper, Total	17.8	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	330	MG/KG	0.02	1.0
		Molybdenum, Total	0.28 UJ	MG/KG	0.17	1.0
		Nickel, Total	12.4	MG/KG	0.12	1.0
		Lead, Total	4.8	MG/KG	0.81	3.0
		Antimony, Total	0.28 uJ	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	38.0	MG/KG	0.06	1.0
		Zinc, Total	37.9	MG/KG	0.07	1.0

4/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J03WY5	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.2 UJ	MG/KG	0.44	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	61.0	MG/KG	0.009	1.0
		Beryllium, Total	0.25	MG/KG	0.009	1.0
		Cadmium, Total	0.13	MG/KG	0.11	3.0
		Cobalt, Total	5.2	MG/KG	0.06	1.0
		Chromium, Total	9.2	MG/KG	0.06	1.0
		Copper, Total	11.4	MG/KG	0.12	1.0
		Mercury, Total	0.12	MG/KG	0.01	1.0
		Manganese, Total	229	MG/KG	0.02	1.0
		Molybdenum, Total	0.18 UJ	MG/KG	0.17	1.0
		Nickel, Total	7.8	MG/KG	0.12	1.0
		Lead, Total	2.2	MG/KG	0.81	3.0
		Antimony, Total	0.28 uJ	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	27.7	MG/KG	0.06	1.0
		Zinc, Total	25.9	MG/KG	0.06	1.0
-010	J03WY6	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	4.9 UJ	MG/KG	0.44	1.0
		Boron, Total	0.48	MG/KG	0.21	1.0
		Barium, Total	105	MG/KG	0.009	1.0
		Beryllium, Total	0.34	MG/KG	0.009	1.0
		Cadmium, Total	0.17	MG/KG	0.11	3.0
		Cobalt, Total	6.3	MG/KG	0.07	1.0
		Chromium, Total	11.9	MG/KG	0.07	1.0
		Copper, Total	17.6	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	298	MG/KG	0.02	1.0
		Molybdenum, Total	0.37UJ	MG/KG	0.17	1.0
		Nickel, Total	14.9	MG/KG	0.12	1.0
		Lead, Total	5.1	MG/KG	0.81	3.0
		Antimony, Total	0.28 uJ	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	27.9	MG/KG	0.06	1.0
		Zinc, Total	37.8	MG/KG	0.07	1.0

11/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J03WY7	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.2 UJ	MG/KG	0.43	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	52.6	MG/KG	0.009	1.0
		Beryllium, Total	0.28	MG/KG	0.009	1.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	8.6	MG/KG	0.06	1.0
		Chromium, Total	3.4	MG/KG	0.06	1.0
		Copper, Total	15.1	MG/KG	0.12	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	297	MG/KG	0.02	1.0
		Molybdenum, Total	0.41 UJ	MG/KG	0.16	1.0
		Nickel, Total	6.5	MG/KG	0.12	1.0
		Lead, Total	1.7 UJ	MG/KG	0.79	3.0
		Antimony, Total	0.27 uJ	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	56.8	MG/KG	0.05	1.0
		Zinc, Total	41.0	MG/KG	0.06	1.0
-012	J03WY8	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	1.9 UJ	MG/KG	0.43	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	54.4	MG/KG	0.009	1.0
		Beryllium, Total	0.30	MG/KG	0.009	1.0
		Cadmium, Total	0.23	MG/KG	0.11	3.0
		Cobalt, Total	8.3	MG/KG	0.06	1.0
		Chromium, Total	2.9	MG/KG	0.06	1.0
		Copper, Total	15.6	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	286	MG/KG	0.02	1.0
		Molybdenum, Total	0.47 UJ	MG/KG	0.17	1.0
		Nickel, Total	5.4	MG/KG	0.12	1.0
		Lead, Total	2.9	MG/KG	0.80	3.0
		Antimony, Total	0.28 uJ	MG/KG	0.28	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	58.1	MG/KG	0.06	1.0
		Zinc, Total	42.0	MG/KG	0.06	1.0

11/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-013	J03WY9	Silver, Total	0.13 UJ	MG/KG	0.07	1.0
		Arsenic, Total	3.4 UJ	MG/KG	0.42	1.0
		Boron, Total	0.92	MG/KG	0.21	1.0
		Barium, Total	63.2	MG/KG	0.009	1.0
		Beryllium, Total	0.35	MG/KG	0.009	1.0
		Cadmium, Total	0.20	MG/KG	0.11	3.0
		Cobalt, Total	8.8	MG/KG	0.06	1.0
		Chromium, Total	9.0	MG/KG	0.06	1.0
		Copper, Total	15.1	MG/KG	0.12	1.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Manganese, Total	357	MG/KG	0.02	1.0
		Molybdenum, Total	0.53 UJ	MG/KG	0.16	1.0
		Nickel, Total	11.2	MG/KG	0.12	1.0
		Lead, Total	4.4	MG/KG	0.78	3.0
		Antimony, Total	0.27 u J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	48.8	MG/KG	0.05	1.0
		Zinc, Total	45.0	MG/KG	0.06	1.0
-014	J03X00	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	3.4 UJ	MG/KG	0.42	1.0
		Boron, Total	0.65	MG/KG	0.21	1.0
		Barium, Total	66.6	MG/KG	0.009	1.0
		Beryllium, Total	0.36	MG/KG	0.009	1.0
		Cadmium, Total	0.18	MG/KG	0.11	3.0
		Cobalt, Total	10.4	MG/KG	0.06	1.0
		Chromium, Total	7.7	MG/KG	0.06	1.0
		Copper, Total	16.6	MG/KG	0.12	1.0
		Mercury, Total	0.08	MG/KG	0.01	1.0
		Manganese, Total	375	MG/KG	0.02	1.0
		Molybdenum, Total	0.63 UJ	MG/KG	0.16	1.0
		Nickel, Total	9.9	MG/KG	0.12	1.0
		Lead, Total	3.8	MG/KG	0.78	3.0
		Antimony, Total	0.27 u J	MG/KG	0.27	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	58.1	MG/KG	0.05	1.0
		Zinc, Total	51.6	MG/KG	0.06	1.0

11/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-015	J03X01	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.5 UJ	MG/KG	0.43	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	47.8	MG/KG	0.009	1.0
		Beryllium, Total	0.24	MG/KG	0.009	1.0
		Cadmium, Total	0.16	MG/KG	0.11	3.0
		Cobalt, Total	5.9	MG/KG	0.06	1.0
		Chromium, Total	4.9	MG/KG	0.06	1.0
		Copper, Total	13.7	MG/KG	0.12	1.0
		Mercury, Total	0.06	MG/KG	0.01	1.0
		Manganese, Total	238	MG/KG	0.02	1.0
		Molybdenum, Total	0.35 UJ	MG/KG	0.17	1.0
		Nickel, Total	7.4	MG/KG	0.12	1.0
		Lead, Total	2.8	MG/KG	0.80	3.0
		Antimony, Total	0.28 uJ	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	24.2	MG/KG	0.06	1.0
		Zinc, Total	29.8	MG/KG	0.06	1.0
-016	J03X02	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.4 UJ	MG/KG	0.43	1.0
		Boron, Total	0.21 u	MG/KG	0.21	1.0
		Barium, Total	52.5	MG/KG	0.009	1.0
		Beryllium, Total	0.24	MG/KG	0.009	1.0
		Cadmium, Total	0.13	MG/KG	0.11	3.0
		Cobalt, Total	5.3	MG/KG	0.06	1.0
		Chromium, Total	5.8	MG/KG	0.06	1.0
		Copper, Total	13.2	MG/KG	0.12	1.0
		Mercury, Total	0.05	MG/KG	0.01	1.0
		Manganese, Total	213	MG/KG	0.02	1.0
		Molybdenum, Total	0.37 UJ	MG/KG	0.17	1.0
		Nickel, Total	7.2	MG/KG	0.12	1.0
		Lead, Total	2.6	MG/KG	0.80	3.0
		Antimony, Total	0.28 uJ	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	32.9	MG/KG	0.06	1.0
		Zinc, Total	29.7	MG/KG	0.06	1.0

11/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-017	J03X03	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.6 UJ	MG/KG	0.43	1.0
		Boron, Total	1.2	MG/KG	0.21	1.0
		Barium, Total	80.2	MG/KG	0.009	1.0
		Beryllium, Total	0.39	MG/KG	0.009	1.0
		Cadmium, Total	0.13	MG/KG	0.04	1.0
		Cobalt, Total	10.2	MG/KG	0.06	1.0
		Chromium, Total	6.0	MG/KG	0.06	1.0
		Copper, Total	19.5	MG/KG	0.12	1.0
		Mercury, Total	0.04	MG/KG	0.01	1.0
		Manganese, Total	367	MG/KG	0.02	1.0
		Molybdenum, Total	0.53 UJ	MG/KG	0.16	1.0
		Nickel, Total	9.7	MG/KG	0.12	1.0
		Lead, Total	3.7	MG/KG	0.26	1.0
		Antimony, Total	0.27 u J	MG/KG	0.27	1.0
		Selenium, Total	0.47 UJ	MG/KG	0.39	1.0
		Vanadium, Total	59.3	MG/KG	0.05	1.0
		Zinc, Total	47.5	MG/KG	0.06	1.0
-018	J03X04	Silver, Total	0.11 UJ	MG/KG	0.07	1.0
		Arsenic, Total	3.5 UJ	MG/KG	0.43	1.0
		Boron, Total	1.0	MG/KG	0.21	1.0
		Barium, Total	60.9	MG/KG	0.009	1.0
		Beryllium, Total	0.36	MG/KG	0.009	1.0
		Cadmium, Total	0.12	MG/KG	0.04	1.0
		Cobalt, Total	9.4	MG/KG	0.06	1.0
		Chromium, Total	6.1	MG/KG	0.06	1.0
		Copper, Total	18.6	MG/KG	0.12	1.0
		Mercury, Total	0.03	MG/KG	0.01	1.0
		Manganese, Total	319	MG/KG	0.02	1.0
		Molybdenum, Total	0.51 UJ	MG/KG	0.17	1.0
		Nickel, Total	7.7	MG/KG	0.12	1.0
		Lead, Total	3.0	MG/KG	0.27	1.0
		Antimony, Total	0.41 J	MG/KG	0.28	1.0
		Selenium, Total	0.46 UJ	MG/KG	0.40	1.0
		Vanadium, Total	53.9	MG/KG	0.06	1.0
		Zinc, Total	43.4	MG/KG	0.06	1.0

11/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/13/05

CLIENT: TNUHANFORD 805-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-019	J03X05	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.5 UJ	MG/KG	0.44	1.0
		Boron, Total	0.94	MG/KG	0.21	1.0
		Barium, Total	69.0	MG/KG	0.009	1.0
		Beryllium, Total	0.38	MG/KG	0.009	1.0
		Cadmium, Total	0.12	MG/KG	0.04	1.0
		Cobalt, Total	8.7	MG/KG	0.06	1.0
		Chromium, Total	6.4	MG/KG	0.06	1.0
		Copper, Total	18.1	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	317	MG/KG	0.02	1.0
		Molybdenum, Total	0.30 UJ	MG/KG	0.17	1.0
		Nickel, Total	8.6	MG/KG	0.12	1.0
		Lead, Total	3.7	MG/KG	0.27	1.0
		Antimony, Total	0.28 uJ	MG/KG	0.28	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Vanadium, Total	47.6	MG/KG	0.06	1.0
		Zinc, Total	43.3	MG/KG	0.06	1.0
-020	J03X06	Silver, Total	0.07 UJ	MG/KG	0.07	1.0
		Arsenic, Total	2.8 UJ	MG/KG	0.43	1.0
		Boron, Total	1.1	MG/KG	0.21	1.0
		Barium, Total	62.5	MG/KG	0.009	1.0
		Beryllium, Total	0.34	MG/KG	0.009	1.0
		Cadmium, Total	0.12	MG/KG	0.04	1.0
		Cobalt, Total	9.6	MG/KG	0.06	1.0
		Chromium, Total	8.7	MG/KG	0.06	1.0
		Copper, Total	18.5	MG/KG	0.12	1.0
		Mercury, Total	0.03	MG/KG	0.01	1.0
		Manganese, Total	356	MG/KG	0.02	1.0
		Molybdenum, Total	0.52 UJ	MG/KG	0.16	1.0
		Nickel, Total	8.8	MG/KG	0.12	1.0
		Lead, Total	4.7	MG/KG	0.27	1.0
		Antimony, Total	0.27 uJ	MG/KG	0.27	1.0
		Selenium, Total	0.41 UJ	MG/KG	0.39	1.0
		Vanadium, Total	52.7	MG/KG	0.05	1.0
		Zinc, Total	45.4	MG/KG	0.06	1.0

pw 11/7/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B05-003
LVL#: 0508L224
SDG/SAF#: H3344/B05-003

W.O.#: 11343-606-001-9999-00
Date Received: 08-25-05

METALS CASE NARRATIVE

1. This narrative covers the analyses of 20 soil samples.

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

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of the ending CCV's for Cadmium and Lead in file TA0908C. All associated samples were rerun in file TA0910C.

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

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

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

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

10. The matrix spike (MS) recoveries for 2 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 28 pages.

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Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J03WX7	Manganese	1,500	90.5
	Antimony	100	102.0

12. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9/13/08
Date

jjw/m08-224

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-028 | Page 1 of 6

Collector: C. Martinez/Doug Bowers

Company Contact: C. Martinez | Telephone No.: 539-2816

Project Coordinator: KESSNER, JH

Price Code | Data Turnaround: Air Quality 21 days

Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol

Sampling Location: 100-C-9:1 North box culvert line at 100BC

SAF No.: B05-003

Ice Chest No. ERC-03-107, ERC-99-062 AND ERC-02-403

Field Logbook No.: EFL-1173-6

COA 2000 DZ R100C9~~2000~~ 8-21-05

Method of Shipment: fed ex

Shipped To: EBERLINE SERVICES / LIONVILLE

Offsite Property No.: A050359

Bill of Lading/Air Bill No.: SEE DSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Non-Rad area

Special Handling and/or Storage

Cool 4 degrees Centigrade

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	250mL	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196										
Sample No.	Matrix *	Sample Date	Sample Time									
J03WX7	SOIL	8-23-05	0825	X	X							
J03WX8	SOIL		0830	X	X							
J03WX9	SOIL		0842	X	X							
J03WY0	SOIL		0846	X	X							
J03WY1	SOIL		0855	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-23-05/1600	Rif 2A 3723	8-23-05/1600
3728 RCF 2A	8/24/05 1000	DAST JOHN	8/24/05 1000
DAST JOHN ERC	8/24/05 1000	FED EX	
FedEx			8/25/05 0905

SPECIAL INSTRUCTIONS

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

A-08-19-05

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

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

BHI-EE-011 (03/01/2002)

000026

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-028 | Page 2 of 6

Collector: C. Martinez/Doug Bowers

Company Contact: C. Martinez | Telephone No.: 539-2816

Project Coordinator: KESSNER, JH

Price Code: Air Quality

Data Turnaround: 21 days

Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol

Sampling Location: 100-C-9:1 North box culvert line at 100BC

SAF No.: B05-003

Ice Chest No.: ERC-03-07, ERC-99-062 AND ERC-02-403

Field Logbook No.: ERL-1173-6

COA: 1000 R100C92~~600~~ 8-23-05 BRD

Method of Shipment: fed ex

Shipped To: EBERLINE SERVICES / LIONVILLE

Offsite Property No.: A050359

Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Non-Rad area

Special Handling and/or Storage

Cool 4 degrees Centigrade

Preservation	None	Cool 4C
Type of Container	aG	aG
No. of Container(s)	1	1
Volume	250mL	250mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196

Sample No.	Matrix *	Sample Date	Sample Time		
J03WY2	SOIL	8-23-05	0900	X	X
J03WY3	SOIL		0914	X	X
J03WY4	SOIL		0920	X	X
J03WY5	SOIL		0933	X	X
J03WY6	SOIL		0938	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-23-05 1600	RIF DA 3728	8-23-05 1600
DA 3728 RCF-2A	8/24/05 1000	DA 3728 JOHW ERC	8/24/05 1000
DA 3728 JOHW ERC	8/24/05 1020	FED EX	
FEDEX			8/25/05 0905

SPECIAL INSTRUCTIONS

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

BRD 8-19-05

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

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

BHI-EE-011 (03/01/2002)

000027

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-028 | Page 3 of 6

Collector	C. Martinez/Doug Bowers
Company Contact	C. Martinez
Telephone No.	539-2816
Project Coordinator	KESSNER, JH
Price Code	
Data Turnaround	
Project Designation	100 BC Remaining Pipelines and Sewers - Soil Full Protocol
Sampling Location	100-C-9:1 North box culvert line at 100BC
SAF No.	B05-003
Air Quality	21 days
Ice Chest No.	ERC-03-107, ERC-99-062 AND ERC-02-403
Field Logbook No.	EFL-1173-6
COA	2000 BZ0 R100C92000 8-23-05
Method of Shipment	fed ex
Shipped To	EBERLINE SERVICES / LIONVILLE
Offsite Property No.	A050359
Bill of Lading/Air Bill No.	SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Non-Rad area

Special Handling and/or Storage

Cool 4 degrees Centigrade

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	250mL	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196										

Sample No.	Matrix *	Sample Date	Sample Time										
J03WY7	SOIL	8-23-05	0955	X	X								
J03WY8	SOIL		0957	X	X								
J03WY9	SOIL		0959	X	X								
J03X00	SOIL		1014	X	X								
J03X01	SOIL		1017	X	X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-23-05/1600	RCA 2A 3728	8-23-05/1600
3728 RCA 2A	8/24/05 1000	D. Ashton	8/24/05 1000
D. Ashton ERC	8/24/05 1000		
FEDEX		FED EX	
			8/25/05 0905

SPECIAL INSTRUCTIONS

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

8-19-05

Matrix *

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

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

BHI-EE-011 (03/01/2002)

820028

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-028 | Page 1 of 6

Collector: C. Martinez/Doug Bowers

Company Contact: C. Martinez | Telephone No.: 539-2816

Project Coordinator: KESSNER, JH

Price Code | Data Turnaround

Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol

Sampling Location: 100-C-9:1 North box culvert line at 100BC

SAF No.: B05-003

Air Quality | 21 days

Ice Chest No.: ERE-03-107, ERC-99-062 AND ERC-02-403

Field Logbook No.: EFC-1173-6

COA: R100C92~~600~~ 2000 8-21-05

Method of Shipment: fed ex

Shipped To: EBERLINE SERVICES / LIONVILLE

Offsite Property No.: A050359

Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Non-Rad area

Special Handling and/or Storage

Cool 4 degrees Centigrade

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	250mL	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196										

Sample No.	Matrix *	Sample Date	Sample Time										
J03X02	SOIL	8-23-05	1020	X	X								
J03X03	SOIL		1025	X	X								
J03X04	SOIL		1042	X	X								
J03X05	SOIL		1046	X	X								
J03X06	SOIL		1049	X	X								

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	1049 8-23-05	Ref 24 3728	8-23-05 1600
3728 REF24	8/24/05 1000	DART JOHN [illegible]	8/24/05 1000
DART JOHN ERC [illegible]	8/24/05 1000	FED EX	
FedEX		[illegible]	8/25/05 0905

SPECIAL INSTRUCTIONS

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

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

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

BHI-EE-011 (03/01/2002)

000029

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 100:C-9:1			DATA PACKAGE: H3344		
VALIDATOR: TLI		LAB: LLI		DATE: 11/2/03	
			SDG: H3344		

ANALYSES PERFORMED

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

SAMPLES/MATRIX

J03W47 J03W48 J03W49 J03X00 J03X01 J03X02
J03X03 J03X04 J03X05 J03X06 ~~J03X07~~ 2 ~~J03X08~~
J03WX7 J03WX8 J03WX9 J03W40 J03W41 J03W42
J03W43 J03W44 J03W45 J03W46

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: Silver 49 X04 X06 no FB

arsenic - all over

moly - all over

lead - 47

antimony - X03, X04, X06

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 MS - 56.8% J all no pts

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments:

6. ICP QUALITY CONTROL (Levels D and E)

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	05L0505-MB1	Silver, Total	0.11	MG/KG	0.08	1.0
		Arsenic, Total	1.2	MG/KG	0.47	1.0
		Boron, Total	0.23 u	MG/KG	0.23	1.0
		Barium, Total	0.38	MG/KG	0.01	1.0
		Beryllium, Total	0.02	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Cobalt, Total	0.14	MG/KG	0.07	1.0
		Chromium, Total	0.17	MG/KG	0.07	1.0
		Copper, Total	0.13 u	MG/KG	0.13	1.0
		Manganese, Total	0.08	MG/KG	0.02	1.0
		Molybdenum, Total	0.40	MG/KG	0.18	1.0
		Nickel, Total	0.30	MG/KG	0.13	1.0
		Lead, Total	0.37	MG/KG	0.29	1.0
		Antimony, Total	0.30 u	MG/KG	0.30	1.0
		Selenium, Total	0.64	MG/KG	0.43	1.0
		Vanadium, Total	0.21	MG/KG	0.06	1.0
		Zinc, Total	0.11	MG/KG	0.07	1.0
BLANK1	05C0219-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J03WX7	Silver, Total	4.4	0.07u	4.6	95.7	1.0
		Arsenic, Total	177	2.9	182	95.3	1.0
		Boron, Total	83.9	0.89	91.2	91.0	1.0
		Barium, Total	227	64.4	182	88.9	1.0
		Beryllium, Total	4.6	0.24	4.6	94.7	1.0
		Cadmium, Total	4.4	0.05	4.6	94.6	1.0
		Cobalt, Total	47.9	5.2	45.6	93.6	1.0
		Chromium, Total	27.2	7.5	18.2	108.2	1.0
		Copper, Total	35.3	13.1	22.8	97.4	1.0
		Mercury, Total	0.16	0.01u	0.14	114.4	1.0
		Manganese, Total	282	279	45.6	7.0*	1.0
		Molybdenum, Total	87.0	0.29	91.2	95.1	1.0
		Nickel, Total	53.8	10.1	45.6	95.8	1.0
		Lead, Total	47.1	3.4	45.6	95.8	1.0
		Antimony, Total	25.9	0.27u	45.6	56.8	1.0
		Selenium, Total	170	0.39u	182	93.4	1.0
		Vanadium, Total	72.9	28.8	45.6	96.7	1.0
		Zinc, Total	74.1	29.4	45.6	98.0	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J03WX7	Silver, Total	0.07u	0.07u	NC	1.0
		Arsenic, Total	2.9	2.6	10.9	1.0
		Boron, Total	0.89	0.50	56.1	1.0
		Barium, Total	64.4	56.2	13.6	1.0
		Beryllium, Total	0.24	0.23	4.7	1.0
		Cadmium, Total	0.05	0.07	35.9	1.0
		Cobalt, Total	5.2	5.0	3.9	1.0
		Chromium, Total	7.5	7.4	1.3	1.0
		Copper, Total	13.1	12.7	3.1	1.0
		Mercury, Total	0.01u	0.03	~~NC~~ 200	1.0
		Manganese, Total	279	242	14.3	1.0
		Molybdenum, Total	0.29	0.25	14.5	1.0
		Nickel, Total	10.1	8.9	12.6	1.0
		Lead, Total	3.4	3.3	3.0	1.0
		Antimony, Total	0.27u	0.27u	NC	1.0
		Selenium, Total	0.39u	0.39u	NC	1.0
		Vanadium, Total	28.8	25.2	13.3	1.0
		Zinc, Total	29.4	28.5	3.1	1.0

pd 9/13/05

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/13/05

CLIENT: TNUHANFORD B05-003 H3344

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

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	05L0505-LC1	Silver, LCS	49.4	50.0	MG/KG	98.8
		Arsenic, LCS	959	1000	MG/KG	95.9
		Boron, LCS	491	500	MG/KG	98.2
		Barium, LCS	487	500	MG/KG	97.4
		Beryllium, LCS	24.4	25.0	MG/KG	97.6
		Cadmium, LCS	24.2	25.0	MG/KG	96.8
		Cobalt, LCS	244	250	MG/KG	97.7
		Chromium, LCS	49.3	50.0	MG/KG	98.6
		Copper, LCS	124	125	MG/KG	99.3
		Manganese, LCS	75.2	75.0	MG/KG	100.3
		Molybdenum, LCS	482	500	MG/KG	96.4
		Nickel, LCS	194	200	MG/KG	97.0
		Lead, LCS	242	250	MG/KG	96.8
		Antimony, LCS	282	300	MG/KG	93.9
		Selenium, LCS	961	1000	MG/KG	96.1
		Vanadium, LCS	244	250	MG/KG	97.6
		Zinc, LCS	96.4	100	MG/KG	96.4
LCS1	05C0219-LC1	Mercury, LCS	6.5	6.2	MG/KG	104.1

Date: 9 November 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Remaining Pipelines and Sewers – Soil Full Protocol – Waste Site 100:C-9:1
Subject: Wet Chemistry - Data Package No. H3344-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3344-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	Date
J03WX7	8/23/05	Soil	C	See note 1
J03WX8	8/23/05	Soil	C	See note 1
J03WX9	8/23/05	Soil	C	See note 1
J03WY0	8/23/05	Soil	C	See note 1
J03WY1	8/23/05	Soil	C	See note 1
J03WY2	8/23/05	Soil	C	See note 1
J03WY3	8/23/05	Soil	C	See note 1
J03WY4	8/23/05	Soil	C	See note 1
J03WY5	8/23/05	Soil	C	See note 1
J03WY6	8/23/05	Soil	C	See note 1
J03WY7	8/23/05	Soil	C	See note 1
J03WY8	8/23/05	Soil	C	See note 1
J03WY9	8/23/05	Soil	C	See note 1
J03X00	8/23/05	Soil	C	See note 1
J03W01	8/23/05	Soil	C	See note 1
J03X02	8/23/05	Soil	C	See note 1
J03X03	8/23/05	Soil	C	See note 1
J03X04	8/23/05	Soil	C	See note 1
J03X05	8/23/05	Soil	C	See note 1
J03X06	8/23/05	Soil	C	See note 1

1 - Chromium VI by 4197A.

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

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

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

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **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 results met the RQL.

- **Completeness**

Data package No. H3344-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

None found.

REFERENCES

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

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

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: H3344	REVIEWER: TLI	PROJECT: 100-C-9:1	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

WET CHEMISTRY ANALYSIS, SOIL MATRIX, MG/KG

Project: WASHINGTON CLOSURE HANFORD																					
Lab: LLI	SDG: H3344																				
Sample Number		J03WX7		J03WX8		J03WX9		J03WY0		J03WY1		J03WY2		J03WY3		J03WY4		J03WY5		J03WY6	
Remarks																					
Sample Date		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.20	U	0.23		0.57		0.20	U	0.20	U	0.20	U	0.20	U	0.22		1.3		0.20	U
Sample Number		J03WY7		J03WY8		J03WY9		J03X00		J03X01		J03X02		J03X03		J03X04		J03X05		J03X06	
Remarks																					
Sample Date		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305		8/2/305	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.25		0.20	U	0.21		0.30		0.20	U	0.24		0.27		0.86		0.21		0.20	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.

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/31/05

CLIENT: TNU-HANFORD B05-003 H3344
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03WX7	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-002	J03WX8	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.23	MG/KG	0.20	1.0
-003	J03WX9	% Solids	99.6	%	0.01	1.0
		Chromium VI	0.57	MG/KG	0.20	1.0
-004	J03WY0	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-005	J03WY1	% Solids	99.3	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-006	J03WY2	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-007	J03WY3	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-008	J03WY4	% Solids	98.4	%	0.01	1.0
		Chromium VI	0.22	MG/KG	0.20	1.0
-009	J03WY5	% Solids	98.9	%	0.01	1.0
		Chromium VI	1.3	MG/KG	0.20	1.0
-010	J03WY6	% Solids	97.5	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0

11/7/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/31/05

CLIENT: TNU-HANFORD B05-003 H3344
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J03WY7	% Solids	99.3	%	0.01	1.0
		Chromium VI	0.25	MG/KG	0.20	1.0
-012	J03WY8	% Solids	99.0	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-013	J03WY9	% Solids	99.3	%	0.01	1.0
		Chromium VI	0.21	MG/KG	0.20	1.0
-014	J03X00	% Solids	99.5	%	0.01	1.0
		Chromium VI	0.30	MG/KG	0.20	1.0
-015	J03X01	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-016	J03X02	% Solids	99.5	%	0.01	1.0
		Chromium VI	0.24	MG/KG	0.20	1.0
-017	J03X03	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.27	MG/KG	0.20	1.0
-018	J03X04	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.86	MG/KG	0.20	1.0
-019	J03X05	% Solids	98.9	%	0.01	1.0
		Chromium VI	0.21	MG/KG	0.20	1.0
-020	J03X06	% Solids	99.5	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0

11/7/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B05-003 H3344
LVL#: 0508L224

W.O.#: 11343-606-001-9999-00
Date Received: 08-25-05

INORGANIC NARRATIVE

1. This narrative covers the analyses of 20 soil samples.

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

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

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

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

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

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

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

8. The replicate analysis for Chromium VI was outside the 20% Relative Percent Difference (RPD) control limit that may be attributed to sample inhomogeneity.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9/9/05
Date

njp\i08-224

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 19 pages.

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-028 | Page 1 of 6

Collector: C. Martinez/Doug Bowers

Company Contact: C. Martinez | Telephone No.: 539-2816

Project Coordinator: KESSNER, JH

Price Code | Data Turnaround: Air Quality 21 days

Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol

Sampling Location: 100-C-9:1 North box culvert line at 100BC

SAF No.: B05-003

Ice Chest No. ERC-03-107, ERC-99-062 AND ERC-02-403

Field Logbook No.: EFL-1173-6

COA 2000 DZ9 R100C92000 8-23-05

Method of Shipment: fed ex

Shipped To: EBERLINE SERVICES / LIONVILLE

Offsite Property No.: A050359

Bill of Lading/Air Bill No.: SEE DSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Non-Rad area

Special Handling and/or Storage

Cool 4 degrees Centigrade

Preservation	None	Cool 4C									
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	250mL	250mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196									

Sample No.	Matrix *	Sample Date	Sample Time										
J03WX7	SOIL	8-23-05	0825	X	X								
J03WX8	SOIL		0830	X	X								
J03WX9	SOIL		0842	X	X								
J03WY0	SOIL		0846	X	X								
J03WY1	SOIL		0855	X	X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-23-05/1600	RLF 2A 3727	8-23-05/1600
3727 RLF 2A	8/24/05 1000	DASTJOHN	8/24/05 1000
DASTJOHN ERC	8/24/05 1000	FED EX	
FedEx			8/25/05 0905

SPECIAL INSTRUCTIONS

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

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

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

BHI-EE-011 (03/01/2002)

000045

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-028 | Page 2 of 6

Collector	C. Martinez/Doug Bowers
Company Contact	C. Martinez
Telephone No.	539-2816
Project Coordinator	KESSNER, JH
Price Code	
Data Turnaround	
Project Designation	100 BC Remaining Pipelines and Sewers - Soil Full Protocol
Sampling Location	100-C-9:1 North box culvert line at 100BC
SAF No.	B05-003
Air Quality	21 days
Ice Chest No.	ERC-03-07, ERC-A-062 AND ERC-02-403
Field Logbook No.	ERC-1173-6
COA	1000 R100C92~~600~~ 8-27-05
Method of Shipment	fed ex
Shipped To	EBERLINE SERVICES / LIONVILLE
Offsite Property No.	A050359
Bill of Lading/Air Bill No.	SEE OSRC

POSSIBLE SAMPLE HAZARDS/REMARKS

Non-Rad area

Special Handling and/or Storage

Cool 4 degrees Centigrade

Preservation	None	Cool 4C									
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	250mL	250mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196									

Sample No.	Matrix *	Sample Date	Sample Time										
J03WY2	SOIL	8-27-05	0900	X	X								
J03WY3	SOIL		0914	X	X								
J03WY4	SOIL		0920	X	X								
J03WY5	SOIL		0933	X	X								
J03WY6	SOIL		0938	X	X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	8-27-05 1600	AIR DA 3728	8-27-05 1600
3728 REF2A	8/24/05 1000	DA ST JOHN [illegible]	8/24/05 1000
DA ST JOHN ERC [illegible]	8/24/05 1000	FED EX	
FEDEX		[illegible]	8/25/05 0905

SPECIAL INSTRUCTIONS

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

ATW 8-19-05

Matrix *

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

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

BHI-EE-011 (03/01/2002)

000016

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-028 | Page 3 of 6

Collector: C. Martinez/Doug Bowers	Company Contact: C. Martinez	Telephone No.: 539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-C-9:1 North box culvert line at 100BC		SAF No.: B05-003
Ice Chest No. ERC-03-107, ERC-99-062 AND ERC-02-403	Field Logbook No.: EFL-1173-6	COA 2000 B30 R100C92000 8-23-05	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050359		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: Air Quality — Data Turnaround: 21 days

POSSIBLE SAMPLE HAZARDS/REMARKS

Non-Rad area

Special Handling and/or Storage

Cool 4 degrees Centigrade

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	250mL	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196										
Sample No.	Matrix *	Sample Date	Sample Time									
J03WY7	SOIL	8-23-05	0955	X	X							
J03WY8	SOIL		0957	X	X							
J03WY9	SOIL		0959	X	X							
J03X00	SOIL		1014	X	X							
J03X01	SOIL		1017	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-23-05 1600	RCF 2A 3728	8-23-05 1600
3728 RCF 2A	8/24/05 1000	P. Martinez	8/24/05 1000
P. Martinez	8/24/05 1000	FED EX	
FedEx		J Perry	8/25/05 0905

SPECIAL INSTRUCTIONS

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

RTD 8-19-05

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

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

BHI-EE-011 (03/01/2002)

000037

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B05-003-028 | Page 1 of 6

Collector: C. Martinez/Doug Bowers	Company Contact: C. Martinez	Telephone No.: 539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100 BC Remaining Pipelines and Sewers - Soil Full Protocol	Sampling Location: 100-C-9:1 North box culvert line at 100BC		SAF No.: B05-003
Ice Chest No.: ERC-03-107, ERC-99-062 AND ERC-02-403	Field Logbook No.: EFC-1173-6	COA 2000 R100C92~~600~~	Method of Shipment: fed ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A050359		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: Air Quality — Data Turnaround: 21 days

POSSIBLE SAMPLE HAZARDS/REMARKS

Non-Rad area

Special Handling and/or Storage

Cool 4 degrees Centigrade

Preservation	None	Cool 4C										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	250mL	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196										
Sample No. / Matrix * / Sample Date / Sample Time												
J03X02 / SOIL / 8-23-05 / 1020	X	X										
J03X03 / SOIL / 1025	X	X										
J03X04 / SOIL / 1042	X	X										
J03X05 / SOIL / 1046	X	X										
J03X06 / SOIL / 1049	X	X										

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	8-23-05 1600	Ref 24 3728	8-23-05 1600
3728 REF24	8/24/05 1000	BART JOHN [signature]	8/24/05 1000
BART JOHN ERC [signature]	8/24/05 1000	FED EX	
FedEX		[signature]	8/25/05 0905

SPECIAL INSTRUCTIONS

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

Lot # 8768

Matrix *

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

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

BHI-EE-011 (03/01/2002)

000018

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-C-9:1			DATA PACKAGE: H3344		
VALIDATOR: JLI		LAB: LLI		DATE: 11/1/05	
			SDG: H3344		
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					
J03WX7	J03WX8	J03WX9	J03WY0	J03WY1	J03WY2
J03WY3	J03WY4	~~J03WY4~~	J03WY5	J03WY6	J03WY7
J03WY8	J03WY9	J03X00	J03X01	J03X02	J03X03
J03X04	J03X05	J03X06			
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. HOLDING TIMES (all levels)

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/31/05

CLIENT: TNU-HANFORD B05-003 H3344
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LVI060-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 08/31/05

CLIENT: TNU-HANFORD B05-003 H3344
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J03WX7	Soluble Chromium VI	3.9	0.20u	4.0	93.5	1.0
		Insoluble Chromium VI	1280	0.20u	1210	105.9	100
BLANK10	05LVI060-MB1	Soluble Chromium VI	4.1	0.20u	4.0	102.5	1.0
		Insoluble Chromium VI	1270	0.20u	1150	109.8	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 08/31/05

CLIENT: TNU-HANFORD B05-003 H3344
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L224

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J03WX7	Chromium VI	0.20u	0.28	45.3	1.0