H1628

0056598

JAN 2002 RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-012 H1628

DATE RECEIVED: 11/30/01 LVL LOT # :0111L464

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13LK8						
SILVER, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
SILVER, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
SILVER, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
ALUMINUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
ALUMINUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
ALUMINUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
BARIUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/13/01
BARIUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/13/01
BARIUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/13/01
BERYLLIUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/13/01
BERYLLIUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/13/01
BERYLLIUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/13/01
CALCIUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
CALCIUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
CALCIUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
CADMIUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
CADMIUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
CADMIUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
COBALT, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
COBALT, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
COBALT, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
CHROMIUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
CHROMIUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
CHROMIUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
COPPER, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
COPPER, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
COPPER, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
IRON, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
IRON, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
IRON, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
POTASSIUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
POTASSIUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
POTASSIUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
MAGNESIUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
MAGNESIUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01

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Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-012 H1628

DATE RECEIVED: 11/30/01 LVL LOT # :0111L464

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
MANGANESE, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
MANGANESE, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
MANGANESE, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
SODIUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
SODIUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
SODIUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
NICKEL, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
NICKEL, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
NICKEL, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
ANTIMONY, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
ANTIMONY, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
ANTIMONY, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
VANADIUM, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
VANADIUM, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
VANADIUM, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01
ZINC, TOTAL	001	W	01L0811	11/28/01	12/12/01	12/12/01
ZINC, TOTAL	001 REP	W	01L0811	11/28/01	12/12/01	12/12/01
ZINC, TOTAL	001 MS	W	01L0811	11/28/01	12/12/01	12/12/01

LAB QC:

SILVER LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
SILVER, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
ALUMINUM LABORTORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
ALUMINUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
BARIUM LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/13/01
BARIUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/13/01
BERYLLIUM LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/13/01
BERYLLIUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/13/01
CALCIUM LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
CALCIUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
CADMIUM LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
CADMIUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
COBALT LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
COBALT, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
CHROMIUM LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
CHROMIUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-012 H1628

DATE RECEIVED: 11/30/01 LVL LOT # :0111L464

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
COPPER LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
COPPER, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
IRON LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
IRON, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
POTASSIUM LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
POTASSIUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
MAGNESIUM LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
MAGNESIUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
MANGANESE LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
MANGANESE, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
SODIUM LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
SODIUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
NICKEL LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
NICKEL, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
ANTIMONY LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
ANTIMONY, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
VANADIUM LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
VANADIUM, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01
ZINC LABORATORY	LC1 BS	W	01L0811	N/A	12/12/01	12/12/01
ZINC, TOTAL	MB1	W	01L0811	N/A	12/12/01	12/12/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B99-012
LVL#: 0111L464
SDG/SAF#: H1628/B99-012

W.O.#: 11343-606-001-9999-00
Date Received: 11-30-01

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 water sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary. The sample was weakly acidic (pH @ 5). The sample bottle was preserved with additional HNO3.

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

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits with the exception of the ICV for Barium. All samples were rerun for Barium in file PS1213C.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL) with the exception of Beryllium. All samples were rerun for Beryllium in file PS1213C.

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, 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. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision 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 14 pages.

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12. 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.

13. 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
Deputy Laboratory Manager
Lionville Laboratory Incorporated

12-14-01
Date

gmb/m11-464

LVLI
LIONVILLE LABORATORY INC

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0111L464

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: ✓__3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	✓6010B		200.7				99
Antimony	✓6010B	7041 [5]	200.7	204.2			99
Arsenic	6010B	7060A [5]	200.7	206.2	3113B		99
Barium	✓6010B		200.7				99
Beryllium	✓6010B		200.7				99
Bismuth	6010B [1]		200.7 [1]			1620	99
Boron	6010B		200.7				99
Cadmium	✓6010B	7131A [5]	200.7	213.2			99
Calcium	✓6010B		200.7				99
Chromium	✓6010B	7191 [5]	200.7	218.2			SS17
Cobalt	✓6010B		200.7				99
Copper	✓6010B	7211 [5]	200.7	220.2			99
Iron	✓6010B		200.7				99
Lead	6010B	7421 [5]	200.7	239.2	3113B		99
Lithium	6010B	7430 [4]	200.7			1620	99
Magnesium	✓6010B		200.7				99
Manganese	✓6010B		200.7				99
Mercury	7470A [3]	7471A [3]	245.1 [2]	245.5 [2]			99
Molybdenum	✓6010B		200.7				99
Nickel	✓6010B		200.7				99
Potassium	✓6010B	7610 [4]	200.7	258.1 [4]			99
Rare Earths	6010B [1]		200.7 [1]			1620	99
Selenium	6010B	7740 [5]	200.7	270.2	3113B		99
Silicon	6010B [1]		200.7			1620	99
Silica	✓6010B		200.7			1620	99
Silver	✓6010B	7761 [5]	200.7	272.2			99
Sodium	✓6010B	7770 [4]	200.7	273.1 [4]			99
Strontium	6010B		200.7				99
Thallium	6010B	7841 [5]	200.7	279.2 200.9			99
Tin	6010B		200.7				99
Titanium	6010B		200.7				99
Uranium	✓6010B [1]		200.7 [1]			1620	99
Vanadium	✓6010B		200.7				99
Zinc	✓6010B		200.7				99
Zirconium	6010B [1]		200.7 [1]			1620	99

Other:_____ Method:_____

L-WI-033/M-03/01

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/13/01

CLIENT: TNUHANFORD B99-012 H1628 LVL LOT #: 0111L464

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13LK8	Silver, Total	5.1	u	UG/L	5.1	1.0
		Aluminum, Total	22.1	u	UG/L	22.1	1.0
		Barium, Total	26.1		UG/L	4.8	1.0
		Beryllium, Total	0.40	u	UG/L	0.40	1.0
		Calcium, Total	17100		UG/L	44.5	1.0
		Cadmium, Total	5.7	u	UG/L	5.7	1.0
		Cobalt, Total	9.1	u	UG/L	9.1	1.0
		Chromium, Total	5.8	u	UG/L	5.8	1.0
		Copper, Total	2.8	u	UG/L	2.8	1.0
		Iron, Total	8.9		UG/L	6.4	1.0
		Potassium, Total	783		UG/L	377	1.0
		Magnesium, Total	4170		UG/L	37.6	1.0
		Manganese, Total	2.0		UG/L	1.7	1.0
		Sodium, Total	1900		UG/L	35.4	1.0
		Nickel, Total	15.4	u	UG/L	15.4	1.0
		Antimony, Total	27.0	u	UG/L	27.0	1.0
		Vanadium, Total	4.9	u	UG/L	4.9	1.0
		Zinc, Total	1.8	u	UG/L	1.8	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/13/01

CLIENT: TNUHANFORD B99-012 H1628 LVL LOT #: 0111L464

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0811-MB1	Silver, Total	5.1	u	UG/L	5.1	1.0
		Aluminum, Total	22.1	u	UG/L	22.1	1.0
		Barium, Total	4.8	u	UG/L	4.8	1.0
		Beryllium, Total	0.40	u	UG/L	0.40	1.0
		Calcium, Total	44.5	u	UG/L	44.5	1.0
		Cadmium, Total	5.7	u	UG/L	5.7	1.0
		Cobalt, Total	9.1	u	UG/L	9.1	1.0
		Chromium, Total	5.8	u	UG/L	5.8	1.0
		Copper, Total	2.8	u	UG/L	2.8	1.0
		Iron, Total	6.4	u	UG/L	6.4	1.0
		Potassium, Total	377	u	UG/L	377	1.0
		Magnesium, Total	37.6	u	UG/L	37.6	1.0
		Manganese, Total	1.7	u	UG/L	1.7	1.0
		Sodium, Total	35.4	u	UG/L	35.4	1.0
		Nickel, Total	15.4	u	UG/L	15.4	1.0
		Antimony, Total	27.0	u	UG/L	27.0	1.0
		Vanadium, Total	4.9	u	UG/L	4.9	1.0
		Zinc, Total	1.8	u	UG/L	1.8	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/13/01

CLIENT: TNUHANFORD B99-012 H1628 LVL LOT #: 0111L464

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B13LK8	Silver, Total	49.0	5.1 u	50.0	98.0	1.0
		Aluminum, Total	1890	22.1 u	2000	94.4	1.0
		Barium, Total	1960	26.1	2000	96.9	1.0
		Beryllium, Total	47.7	0.40u	50.0	95.4	1.0
		Calcium, Total	41500	17100	25000	97.6	1.0
		Cadmium, Total	46.1	5.7 u	50.0	92.2	1.0
		Cobalt, Total	476	9.1 u	500	95.3	1.0
		Chromium, Total	193	5.8 u	200	96.4	1.0
		Copper, Total	238	2.8 u	250	95.1	1.0
		Iron, Total	970	8.9	1000	96.1	1.0
		Potassium, Total	24800	783	25000	96.0	1.0
		Magnesium, Total	28100	4170	25000	95.9	1.0
		Manganese, Total	478	2.0	500	95.2	1.0
		Sodium, Total	25900	1900	25000	96.0	1.0
		Nickel, Total	488	15.4 u	500	97.6	1.0
		Antimony, Total	446	27.0 u	500	89.2	1.0
		Vanadium, Total	455	4.9 u	500	91.0	1.0
		Zinc, Total	491	1.8 u	500	98.1	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/13/01

CLIENT: TNUHANFORD B99-012 H1628 LVL LOT #: 0111L464

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B13LK8	Silver, Total	5.1 u	5.1 u	NC	1.0
		Aluminum, Total	22.1 u	22.1 u	NC	1.0
		Barium, Total	26.1	25.6	1.9	1.0
		Beryllium, Total	0.40u	0.40u	NC	1.0
		Calcium, Total	17100	17000	0.67	1.0
		Cadmium, Total	5.7 u	5.7 u	NC	1.0
		Cobalt, Total	9.1 u	9.1 u	NC	1.0
		Chromium, Total	5.8 u	5.8 u	NC	1.0
		Copper, Total	2.8 u	2.8 u	NC	1.0
		Iron, Total	8.9	15.5	54.1	1.0
		Potassium, Total	783	477	48.5	1.0
		Magnesium, Total	4170	4170	0.18	1.0
		Manganese, Total	2.0	2.0	0.00	1.0
		Sodium, Total	1900	1930	1.5	1.0
		Nickel, Total	15.4 u	15.4 u	NC	1.0
		Antimony, Total	27.0 u	27.0 u	NC	1.0
		Vanadium, Total	4.9 u	4.9 u	NC	1.0
		Zinc, Total	1.8 u	1.8 u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/13/01

CLIENT: TNUHANFORD B99-012 H1628 LVL LOT #: 0111L464

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0811-LC1	Silver, LCS	440	500	UG/L	88.0
		Aluminum, LCS	5020	5000	UG/L	100.4
		Barium, LCS	4950	5000	UG/L	99.1
		Beryllium, LCS	245	250	UG/L	98.1
		Calcium, LCS	23700	25000	UG/L	94.7
		Cadmium, LCS	243	250	UG/L	97.1
		Cobalt, LCS	2460	2500	UG/L	98.4
		Chromium, LCS	485	500	UG/L	96.9
		Copper, LCS	1250	1250	UG/L	99.7
		Iron, LCS	4960	5000	UG/L	99.3
		Potassium, LCS	24900	25000	UG/L	99.5
		Magnesium, LCS	24900	25000	UG/L	99.7
		Manganese, LCS	737	750	UG/L	98.2
		Sodium, LCS	25100	25000	UG/L	100.4
		Nickel, LCS	1990	2000	UG/L	99.5
		Antimony, LCS	2920	3000	UG/L	97.2
		Vanadium, LCS	2450	2500	UG/L	98.1
		Zinc, LCS	969	1000	UG/L	96.9

Lionville Laboratory Use Only

0111L464

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TWU-Hanford B99-012

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 21 days

Date Rec'd: 11-30-01 Date Due: 12-21-01

		A	B
Refrigerator #		2	2
#/Type Container	Liquid	1 PL	1 PL
	Solid		
Volume	Liquid	500	500
	Solid		
Preservatives			

ANALYSES REQUESTED →

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	INORG ICP Metal Tl	CN	IC Anions
001	B13LK8	✓	✓	W	11-28-01	0843					X		X

Lionville Laboratory Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Special Instructions: SAF # B99-012

DATE/REVISIONS:
IC ① 1. ICCL, ICFL, ICNO3, ICNO2, ICSO4
MET ① 2. Al, Ag, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe,
3. K, Mg, Mn, Na, Ni, Sb, V, Zn
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # Low
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N

Tamper Resistant Seal was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec'l Y or N
Cooler Temp. 1.3 °C

Relinquished by	Received by	Date	Time
FED EX	[signature]	11-30-01	0945

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 4235 7954 9357

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B99-012-227	Page 1 of 1
Collector: Mike Baechler/Bob Fahlberg	Company Contact: Bob Raidl	Telephone No.: 372-9351	Project Coordinator: TRENT, SJ	Price Code: 7L; Air Quality ☐; Data Turnaround: 21 Days
Project Designation: Aquifer Tube Sampling	Sampling Location: Redox River Water		SAF No.: B99-012	
Ice Chest No.: SML-556	Field Logbook No.: EL 1566	COA: H10COM351C	Method of Shipment: ~~Gnrl. Vehicle~~ Fed Ex RT 11-27-01	
Shipped To: TMA/RECRA	Offsite Property No.: A020047		Bill of Lading/Air Bill No.: 42357954-9357	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	HNO3 to pH <2										
Type of Container	P	P										
No. of Container(s)	1	1										
Volume	500mL	500mL										
SAMPLE ANALYSIS	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate)	ICP Metals - 6010A (TAL)										

Sample No.	Matrix *	Sample Date	Sample Time										
B13LK8	WATER	11/28/01	0942	X	X								

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By: R. Fahlberg / R. Fahlberg Date/Time: 1545 11-28-01	Received By: Stored 117 Ref 2-A Date/Time: 1545 11-28-01	Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 11-29-01
Relinquished By: Removed from Ref 2A 3728 Date/Time: 1000 11-29-01	Received By: R. Thoren Date/Time: 1000 11-29-01	SAMPLES STORED IN REF.# 2A AT THE 3728 SHIPPING FACILITY ON 11/28/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 11/29/01 FOR SHIPMENT. RT 11-29-01
Relinquished By: R. Thoren ERC Date/Time: 1000 11-29-01	Received By: FED EX Date/Time:	
Relinquished By: FEDEX Date/Time: 11-30-01 0945	Received By: Carl Hanrof Date/Time: 11-30-01 0945	
Relinquished By: Date/Time:	Received By: Date/Time:	
Relinquished By: Date/Time:	Received By: Date/Time:	

Matrix *: S=Soil; SD=Sediment; SO=Solid; S=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

14

JAN 2002
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-012 H1628

DATE RECEIVED: 11/30/01 LVL LOT # :0111L464

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13LK8						
CHLORIDE BY IC	001	W	01LICC80	11/28/01	11/30/01	11/30/01
CHLORIDE BY IC	001 REP	W	01LICC80	11/28/01	11/30/01	11/30/01
CHLORIDE BY IC	001 MS	W	01LICC80	11/28/01	11/30/01	11/30/01
FLUORIDE BY IC	001	W	01LICC80	11/28/01	11/30/01	11/30/01
FLUORIDE BY IC	001 REP	W	01LICC80	11/28/01	11/30/01	11/30/01
FLUORIDE BY IC	001 MS	W	01LICC80	11/28/01	11/30/01	11/30/01
NITRITE BY IC	001	W	01LICC80	11/28/01	11/30/01	11/30/01
NITRITE BY IC	001 REP	W	01LICC80	11/28/01	11/30/01	11/30/01
NITRITE BY IC	001 MS	W	01LICC80	11/28/01	11/30/01	11/30/01
NITRATE BY IC	001	W	01LICC80	11/28/01	11/30/01	11/30/01
NITRATE BY IC	001 REP	W	01LICC80	11/28/01	11/30/01	11/30/01
NITRATE BY IC	001 MS	W	01LICC80	11/28/01	11/30/01	11/30/01
SULFATE BY IC	001	W	01LICC80	11/28/01	11/30/01	11/30/01
SULFATE BY IC	001 REP	W	01LICC80	11/28/01	11/30/01	11/30/01
SULFATE BY IC	001 MS	W	01LICC80	11/28/01	11/30/01	11/30/01

LAB QC:

CHLORIDE BY IC	MB1	W	01LICC80	N/A	11/30/01	11/30/01
CHLORIDE BY IC	MB1 BS	W	01LICC80	N/A	11/30/01	11/30/01
FLUORIDE BY IC	MB1	W	01LICC80	N/A	11/30/01	11/30/01
FLUORIDE BY IC	MB1 BS	W	01LICC80	N/A	11/30/01	11/30/01
NITRITE BY IC	MB1	W	01LICC80	N/A	11/30/01	11/30/01
NITRITE BY IC	MB1 BS	W	01LICC80	N/A	11/30/01	11/30/01
NITRATE BY IC	MB1	W	01LICC80	N/A	11/30/01	11/30/01
NITRATE BY IC	MB1 BS	W	01LICC80	N/A	11/30/01	11/30/01
SULFATE BY IC	MB1	W	01LICC80	N/A	11/30/01	11/30/01
SULFATE BY IC	MB1 BS	W	01LICC80	N/A	11/30/01	11/30/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B99-012 H1628
LVL#: 0111L464

W.O.#: 11343-606-001-9999-00
Date Received: 11-30-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with the method checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of Nitrate and Nitrite that were received past hold.

4. The cooler temperature was recorded on the chain of custody.

5. The method blanks were within the method criteria.

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

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

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. 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
Deputy Laboratory Manager
Lionville Laboratory Incorporated

12-12-01
Date

njp\i11-464

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

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	EPA /600	SW846	OTHER
Acidity	___ 305.1		
___Alkalinity ___Bicarbonate ___Carbonate	___ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chromatography:			
___Bromide ✓ Chloride ___✓ Fluoride	✓ 300.0	___ 9056	
✓ Nitrate ___✓ Nitrite ___Phosphate	✓ 300.0	___ 9056	
___✓ Sulfate ___Formate ___Acetate ___Oxalate	✓ 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chlorination	___ 335.2	___ 9010B	
Cyanide, Total	___ 335.2	___ 9010B ___ 9014	___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable		___	___ 412 (a) ___ 4500CN-I (b)
COD	___ 410.4(mod)		___ 5220C (b)
Color	___ 110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	___ 340.2		___ 4500-FC
Hardness, Calcium	___ 215.2		
Hardness, Total	___ 130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	___ 425.1		
___Nitrate-Nitrite ___Nitrate ___Nitrite	___ 353.2		
Ammonia	___ 350.3		
Total___ Kjeldahl ___ Organic Nitrogen	___ 351.3		
Total___ Organic ___ Inorganic Carbon	___ 415.1	___ 9060	
Oil & Grease	___ 413.1	___ 9070	
___ pH ____ pH; paper	___ 150.1	___ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	___ 418.1		
Phenol	___ 420.1 ___ 420.2	___ 9065 ___ 9066	
___Ortho ___Total Phosphate	___ 365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	___ 160.5		
Sulfide	___ 376.1	___ 9030B/9034 (acid soluble)	
Reactive ___Cyanide ___Sulfide		___ Section 7.3 (__9014__9030B)	
Silica	___ 370.1		
Sulfite	___ 377.1		
Sulfate	___ 375.4	___ 9038	
Specific Conductance	___ 120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach	___ 1312		
Total ___Dissolved __Suspended ___Solids	160 ___.1 ___.2 ___.3		
Total Organic Halides	___ 450.1	___ 9020B	
Turbidity	___ 180.1		
Volatile Solids:			
__Total __Dissolved __Suspended	___ 160.4		
Other:		**Method:**	

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/11/01

CLIENT: TNUHANFORD B99-012 H1628 LVL LOT #: 0111L464

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13LK8	Chloride by IC	0.83	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.40	MG/L	0.25	1.0
		Sulfate by IC	9.5	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/11/01

CLIENT: TNUHANFORD B99-012 H1628 LVL LOT #: 0111L464

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LICC80-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/11/01

CLIENT: TNUHANFORD B99-012 H1628 LVL LOT #: 0111L464

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B13LK8	Chloride by IC	5.6	0.83	5.0	95.8	1.0
		Fluoride by IC	10.8	0.00	10.0	108.0	1.0
		Nitrite by IC	4.90	0.25u	5.00	98.0	1.0
		Nitrate by IC	5.13	0.40	5.00	94.6	1.0
		Sulfate by IC	19.4	9.5	10.0	99.1	2.0
BLANK10	01LICC80-MB1	Chloride by IC	4.7	0.25u	5.0	93.6	1.0
		Fluoride by IC	10.8	0.50u	10.0	107.9	1.0
		Nitrite by IC	4.67	0.25u	5.00	93.4	1.0
		Nitrate by IC	4.70	0.25u	5.00	94.0	1.0
		Sulfate by IC	4.7	0.25u	5.0	93.1	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/11/01

CLIENT: TNUHANFORD B99-012 H1628 LVL LOT #: 0111L464

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B13LK8	Chloride by IC	0.83	0.81	2.6	1.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	0.40	0.38	4.3	1.0
		Sulfate by IC	9.5	9.5	0.34	1.0

Lionville Laboratory Use Only
0111L464

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TWU-Hanford B99-012
Est. Final Proj. Sampling Date:
Project #: 11343-606-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: SPEC Del: STD TAT: 21 days

Date Rec'd: 11-30-01 Date Due: 12-21-01

		A	B
Refrigerator #		2	2
#/Type Container	Liquid	1 PL	1 PL
	Solid		
Volume	Liquid	500	500
	Solid		
Preservatives			

ANALYSES REQUESTED →

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	INORG ICP Metal Tal	CN	IC Anions
001	B13LK8	✓	✓	W	11-28-01	0843					X		X

Lionville Laboratory Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Special Instructions: SAF # B99-012

DATE/REVISIONS:
IC ①, 1. ICCL, ICFL, ICNO3, ICNO2, ICSO4
MET ①, 2. Al, Ag, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe,
3. K, Mg, Mn, Na, Ni, Sb, V, Zn
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # Com below
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N → NO_2, NO_3 rec'd past hold

Tamper Resistant Seal was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 1.3 °C

Relinquished by	Received by	Date	Time
FED EX	[signature]	11-30-01	0945

Relinquished by	Received by	Date	Time
COMPOSITE WASTE		ORIGINAL REWRITTEN	

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 4235 7954 9357

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B99-012-227	Page 1 of 1
Collector: Mike Baechler/Bob Fahlberg	Company Contact: Bob Raidl	Telephone No.: 372-9351	Project Coordinator: TRENT, SJ	Price Code: 7L; Data Turnaround: 21 Days
Project Designation: Aquifer Tube Sampling	Sampling Location: Redox River Water		SAF No.: B99-012	Air Quality ☐
Ice Chest No.: SML-556	Field Logbook No.: EL 1566	COA: H10COM351C	Method of Shipment: RT 11-27-01 ~~Govt. Vehicle~~ Fed Ex	
Shipped To: TMA/RECRA	Offsite Property No.: A020047		Bill of Lading/Air Bill No.: 42357954-9357	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	HNO3 to pH <2									
	Type of Container	P	P									
	No. of Container(s)	1	1									
Special Handling and/or Storage	Volume	500mL	500mL									
SAMPLE ANALYSIS		IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate)	ICP Metals - 6010A (TAL)									

Sample No.	Matrix *	Sample Date	Sample Time									
B13LK8	WATER	11/28/01	0942	X	X							

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By: R. Fahlberg / R. Fahlberg — Date/Time: 1545 11-28-01	Received By: Stored in Ref Z-A — Date/Time: 1545 11-28-01	Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 11-29-01	S=Soil, SE=Sediment, SO=Solid, S=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other
Relinquished By: Removed from Ref ZA 3728 — Date/Time: 1000 11-29-01	Received By: R.T. Thoren — Date/Time: 1000 11-29-01	SAMPLES STORED IN REF.# ZA AT THE 3728 SHIPPING FACILITY ON 11/28/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 11/29/01 FOR SHIPMENT. RT 11-29-01	
Relinquished By: R.T. Thoren ERC — Date/Time: 1000 11-29-01	Received By: FED EX — Date/Time:		
Relinquished By: FEDEX — Date/Time: 11-30-01 0945	Received By: Carl Hennig — Date/Time: 11-30-01 0945		
Relinquished By: — Date/Time:	Received By: — Date/Time:		
Relinquished By: — Date/Time:	Received By: — Date/Time:		

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

BHI-EE-011 (10/99)

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Figure 1. Sample Check-in List

Date/Time Received: 11-30-01

SDG#: 0111L464

Work Order Number: _____ SAF# B99-012

Shipping Container ID: 4235 7954 9357 Chain of Custody # B99-012-227

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 1.3
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 7
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ✓ tape
   - ✓ custody seals
   - ____ hazard labels
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ broken
   - ____ leaking
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: Carlo Hemmf Date: 11-30-01

Telephoned to: _____ On _____ By _____