

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD I05-005 H2836

DATE RECEIVED: 11/17/04

LVL LOT # :0411L177

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B1BKB9						
BROMIDE BY IC	001	W	04LICZ67	11/16/04	11/18/04	11/18/04
BROMIDE BY IC	001 REP	W	04LICZ67	11/16/04	11/18/04	11/18/04
BROMIDE BY IC	001 MS	W	04LICZ67	11/16/04	11/18/04	11/18/04
CHLORIDE BY IC	001	W	04LIC066	11/16/04	11/17/04	11/17/04
FLUORIDE BY IC	001	W	04LIC067	11/16/04	11/18/04	11/18/04
FLUORIDE BY IC	001 REP	W	04LIC067	11/16/04	11/18/04	11/18/04
FLUORIDE BY IC	001 MS	W	04LIC067	11/16/04	11/18/04	11/18/04
NITRITE BY IC	001	W	04LICZ67	11/16/04	11/18/04	11/18/04
NITRITE BY IC	001 REP	W	04LICZ67	11/16/04	11/18/04	11/18/04
NITRITE BY IC	001 MS	W	04LICZ67	11/16/04	11/18/04	11/18/04
NITRATE BY IC	001	W	04LICA66	11/16/04	11/17/04	11/17/04
PHOSPHATE BY IC	001	W	04LICZ67	11/16/04	11/18/04	11/18/04
PHOSPHATE BY IC	001 REP	W	04LICZ67	11/16/04	11/18/04	11/18/04
PHOSPHATE BY IC	001 MS	W	04LICZ67	11/16/04	11/18/04	11/18/04
SULFATE BY IC	001	W	04LIC066	11/16/04	11/17/04	11/17/04

LAB QC:

BROMIDE BY IC	MB1	W	04LICZ67	N/A	11/18/04	11/18/04
BROMIDE BY IC	MB1 BS	W	04LICZ67	N/A	11/18/04	11/18/04
CHLORIDE BY IC	MB1	W	04LIC066	N/A	11/17/04	11/17/04
CHLORIDE BY IC	MB1 BS	W	04LIC066	N/A	11/17/04	11/17/04
FLUORIDE BY IC	MB1	W	04LIC067	N/A	11/18/04	11/18/04
FLUORIDE BY IC	MB1 BS	W	04LIC067	N/A	11/18/04	11/18/04
NITRITE BY IC	MB1	W	04LICZ67	N/A	11/18/04	11/18/04
NITRITE BY IC	MB1 BS	W	04LICZ67	N/A	11/18/04	11/18/04
NITRATE BY IC	MB1	W	04LICA66	N/A	11/17/04	11/17/04
NITRATE BY IC	MB1 BS	W	04LICA66	N/A	11/17/04	11/17/04
PHOSPHATE BY IC	MB1	W	04LICZ67	N/A	11/18/04	11/18/04
PHOSPHATE BY IC	MB1 BS	W	04LICZ67	N/A	11/18/04	11/18/04
SULFATE BY IC	MB1	W	04LIC066	N/A	11/17/04	11/17/04
SULFATE BY IC	MB1 BS	W	04LIC066	N/A	11/17/04	11/17/04



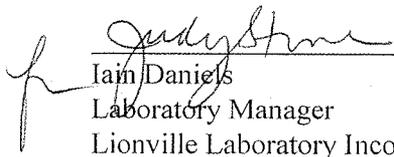
## Analytical Report

**Client:** TNU-HANFORD I05-005 H2836  
**LVL#:** 0411L177

**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 11-17-04

### INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.
2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.
3. Sample holding times as required by the method and/or contract were met with the exception of Nitrite and Phosphate (see the sample chronology summary for analyses times for short hold samples).
4. The results presented in this report are derived from samples that met LVL's sample acceptance policy.
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 for Bromide, Fluoride, Nitrite and Phosphate were within the 75-125% control limits.
8. The replicate analyses for Bromide, Fluoride, Nitrite and Phosphate were within the 20% Relative Percent Difference (RPD) control limit.
9. The matrix quality control analyses for Chloride, Nitrate and Sulfate were inadvertently omitted due to an analyst's oversight.
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

12/30/04  
Date

njpl11-177

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.

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WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	<u>EPA /600</u>	<u>SW846</u>	<u>OTHER</u>
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	
Chlorine, 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:	

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## 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 12/29/04

CLIENT: TNUHANFORD I05-005 H2836  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0411L177

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	B1BKB9	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	20.1	MG/L	2.5	10.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	24.2	MG/L	2.50	10.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	38.1	MG/L	2.5	10.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/29/04

CLIENT: TNUHANFORD I05-005 H2836  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0411L177

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK10	04LICZ67-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	04LIC066-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	04LIC067-MB1	Fluoride by IC	0.25 u	MG/L	0.25	1.0
BLANK10	04LICA66-MB1	Nitrate by IC	0.25 u	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/29/04

CLIENT: TNUHANFORD I05-005 H2836  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0411L177

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
=====	=====	=====	=====	=====	=====	=====	=====
-001	B1BKB9	Bromide by IC	10	0.00	10.0	99.5	2.0
		Fluoride by IC	9.9	0.12	10.0	97.5	2.0
		Nitrite by IC	10.4	0.25u	10.0	103.8	2.0
		Phosphate by IC	8.9	0.25u	10.0	88.7	2.0
BLANK10	04LICZ67-MB1	Bromide by IC	5.0	0.25u	5.0	100.6	1.0
		Nitrite by IC	4.85	0.25u	5.00	96.9	1.0
		Phosphate by IC	4.8	0.25u	5.0	95.3	1.0
BLANK10	04LIC066-MB1	Chloride by IC	4.7	0.25u	5.0	94.9	1.0
		Sulfate by IC	4.8	0.25u	5.0	96.1	1.0
BLANK10	04LIC067-MB1	Fluoride by IC	4.8	0.25u	5.0	95.8	1.0
BLANK10	04LICA66-MB1	Nitrate by IC	4.94	0.25u	5.00	98.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/29/04

CLIENT: TNUHANFORD I05-005 H2836  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0411L177

SAMPLE	SITE ID	ANALYTE	INITIAL		DILUTION
			RESULT	REPLICATE RPD	
-001REP	B1BKB9	Bromide by IC	0.25u	0.25u NC	1.0
		Fluoride by IC	0.25u	0.25u NC	1.0
		Nitrite by IC	0.25u	0.25u NC	1.0
		Phosphate by IC	0.25u	0.25u NC	1.0





**Lionville Laboratory Incorporated**  
**SAMPLE RECEIPT CHECKLIST (SRC)**

CLIENT: *TNU - HANFORD*

Date: *11/17/04*

Purchase Order / Project# /  
 SAF# / SOW# / Release #: *105-005*

LvLI Batch #: *04112177*

Sample Custodian: *V. Hernandez*

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |   |   |          |
|---|---|---|----------|
| 1. Samples Hand <del>Delivered</del> or <u>Shipped</u>  | Carrier <i>Fed Ex</i>   | Airbill# <i>790339798644</i>  |          |
| 2. Custody seals on coolers or shipping container intact, signed and dated?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals                                   | Comments |
| 3. Outside of coolers or shipping containers are free from damage?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |          |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |          |
| 5. Samples received cooled or ambient?  | Temp <i>2.1</i> °C  | Cooler # <i>SAWS 500</i>  |          |
| 6. Custody seals on sample containers intact, signed and dated?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals                                   |          |
| 7. coc signed and dated?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |          |
| 8. Sample containers are intact?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |          |
| 9. All samples on coc received? All samples received on coc?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |          |
| 10. All sample label information matches coc?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |          |
| 11. Samples properly preserved?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |          |
| 12. Samples received within hold times? Short holds taken to wet lab?   | <input checked="" type="checkbox"/> Yes                             |   |          |
| 13. VOA, TOC, TOX free of headspace?  | <input checked="" type="checkbox"/> Yes                             | <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A |          |
| 14. QC stickers placed on bottles designated by client?   | <input type="checkbox"/> Yes <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A                             |          |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)     | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |          |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)                             | <input type="checkbox"/> Yes <input type="checkbox"/> No            | <input checked="" type="checkbox"/> No Discrepancies                |          |

Lionville Laboratory, Inc.  
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 TNUHANFORD I05-005 H2836

DATE RECEIVED: 11/17/04

LVL LOT # :0411L177

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B1BKB9						
SILVER, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
SILVER, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
ALUMINUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
ALUMINUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
BARIUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
BARIUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
BERYLLIUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
BERYLLIUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
CALCIUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
CALCIUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
CADMIUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
CADMIUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
COBALT, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
COBALT, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
CHROMIUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
CHROMIUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
COPPER, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
COPPER, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
IRON, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
IRON, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
POTASSIUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
POTASSIUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
MAGNESIUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
MAGNESIUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
MANGANESE, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
MANGANESE, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
SODIUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
SODIUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
NICKEL, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
NICKEL, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
ANTIMONY, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
ANTIMONY, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
VANADIUM, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04
VANADIUM, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
ZINC, TOTAL	001	W	04L0704	11/16/04	11/22/04	11/22/04

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CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	001 REP	W	04L0704	11/16/04	11/22/04	11/22/04
B1BKCO						
SILVER, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
SILVER, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
ALUMINUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
ALUMINUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
BARIUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
BARIUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
BERYLLIUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
BERYLLIUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
CALCIUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
CALCIUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
CADMIUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
CADMIUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
COBALT, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
COBALT, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
CHROMIUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
CHROMIUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/23/04
COPPER, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
COPPER, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
IRON, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
IRON, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/23/04
POTASSIUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
POTASSIUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
MAGNESIUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
MAGNESIUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
MANGANESE, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
MANGANESE, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/23/04
SODIUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
SODIUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
NICKEL, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
NICKEL, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/23/04
ANTIMONY, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
ANTIMONY, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04
VANADIUM, SOLUBLE	002	W	04L0704	11/16/04	11/22/04	11/22/04
VANADIUM, SOLUBLE	002 MS	W	04L0704	11/16/04	11/22/04	11/22/04

00000002



Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD I05-005 H2836

DATE RECEIVED: 11/17/04

LVL LOT # :0411L177

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	MB1	W	04L0704	N/A	11/22/04	11/22/04
ZINC LABORATORY	LC1 BS	W	04L0704	N/A	11/22/04	11/22/04
ZINC, TOTAL	MB1	W	04L0704	N/A	11/22/04	11/22/04



## Analytical Report

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**Client:** TNU-HANFORD I05-005  
**LVL#:** 0411L177  
**SDG/SAF#:** H2836/I05-005

**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 11-17-04

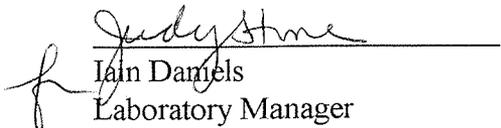
### METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 water 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.
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. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
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

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 17 pages.

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.

  
\_\_\_\_\_  
Ian Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

1/7/05  
Date

jjw/ml1-177



# METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0411L177.

Leaching Procedure:  1310  1311  1312  Other: \_\_\_\_\_

CLP Metals  Digestion and  Analysis Methods:  ILM03.0  ILM04.0

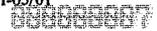
Metals Digestion Methods:  3005A  3010A  3015  3020A  3050B  3051  200.7  SS17  
 Other: \_\_\_\_\_

## Metals Analysis Methods

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

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.

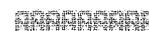
## ABBREVIATIONS

MB = Method or Preparation Blank.  
MS = Matrix Spike.  
MSD = Matrix Spike Duplicate.  
REP = Sample Replicate  
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, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Flame AA.
4. Graphite Furnace AA.

L-WI-033/N-04/98



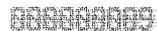
Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/05/05

CLIENT: TNUHANFORD I05-005 H2836  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0411L177

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	B1BKB9	Silver, Total	1.0	u UG/L	1.0	1.0
		Aluminum, Total	31.3	u UG/L	31.3	1.0
		Barium, Total	56.6	UG/L	0.40	1.0
		Beryllium, Total	0.10	u UG/L	0.10	1.0
		Calcium, Total	47000	UG/L	27.9	1.0
		Cadmium, Total	0.30	u UG/L	0.30	1.0
		Cobalt, Total	0.70	u UG/L	0.70	1.0
		Chromium, Total	38.7	UG/L	0.80	1.0
		Copper, Total	1.5	UG/L	1.4	1.0
		Iron, Total	202	UG/L	27.9	1.0
		Potassium, Total	5030	UG/L	18.9	1.0
		Magnesium, Total	9870	UG/L	6.9	1.0
		Manganese, Total	0.70	UG/L	0.30	1.0
		Sodium, Total	10700	UG/L	5.1	1.0
		Nickel, Total	1.2	u UG/L	1.2	1.0
		Antimony, Total	2.8	u UG/L	2.8	1.0
		Vanadium, Total	6.4	UG/L	0.70	1.0
		Zinc, Total	165	UG/L	1.3	1.0



Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/05/05

CLIENT: TNUHANFORD I05-005 H2836

LVL LOT #: 0411L177

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B1BKCO	Silver, Soluble	1.0	u UG/L	1.0	1.0
		Aluminum, Soluble	31.3	u UG/L	31.3	1.0
		Barium, Soluble	57.2	UG/L	0.40	1.0
		Beryllium, Soluble	0.10	u UG/L	0.10	1.0
		Calcium, Soluble	47900	UG/L	27.9	1.0
		Cadmium, Soluble	0.30	u UG/L	0.30	1.0
		Cobalt, Soluble	0.70	u UG/L	0.70	1.0
		Chromium, Soluble	39.2	UG/L	0.80	1.0
		Copper, Soluble	1.4	u UG/L	1.4	1.0
		Iron, Soluble	27.9	u UG/L	27.9	1.0
		Potassium, Soluble	5160	C UG/L	18.9	1.0
		Magnesium, Soluble	10100	UG/L	6.9	1.0
		Manganese, Soluble	0.30	u UG/L	0.30	1.0
		Sodium, Soluble	10900	C UG/L	5.1	1.0
		Nickel, Soluble	1.2	u UG/L	1.2	1.0
		Antimony, Soluble	2.8	u UG/L	2.8	1.0
		Vanadium, Soluble	6.2	UG/L	0.70	1.0
		Zinc, Soluble	154	C UG/L	1.3	1.0



Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/05/05

CLIENT: TNUHANFORD I05-005 H2836  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0411L177

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	04L0704-MB1	Silver, Total	1.0	u UG/L	1.0	1.0
		Aluminum, Total	31.3	u UG/L	31.3	1.0
		Barium, Total	0.40	u UG/L	0.40	1.0
		Beryllium, Total	0.10	u UG/L	0.10	1.0
		Calcium, Total	27.9	u UG/L	27.9	1.0
		Cadmium, Total	0.30	u UG/L	0.30	1.0
		Cobalt, Total	0.70	u UG/L	0.70	1.0
		Chromium, Total	0.80	u UG/L	0.80	1.0
		Copper, Total	1.4	u UG/L	1.4	1.0
		Iron, Total	27.9	u UG/L	27.9	1.0
		Potassium, Total	226	UG/L	18.9	1.0
		Magnesium, Total	6.9	u UG/L	6.9	1.0
		Manganese, Total	0.30	u UG/L	0.30	1.0
		Sodium, Total	15.2	UG/L	5.1	1.0
		Nickel, Total	1.2	u UG/L	1.2	1.0
		Antimony, Total	2.8	u UG/L	2.8	1.0
		Vanadium, Total	0.70	u UG/L	0.70	1.0
		Zinc, Total	2.0	UG/L	1.3	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/05/05

CLIENT: TNUHANFORD I05-005 H2836  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0411L177

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	B1BKCO	Silver, Soluble	50.6	1.0 u	50.0	101.2	1.0
		Aluminum, Soluble	2020	31.3 u	2000	101.0	1.0
		Barium, Soluble	1990	57.2	2000	96.5	1.0
		Beryllium, Soluble	49.6	0.10u	50.0	99.2	1.0
		Calcium, Soluble	71800	47900	25000	95.7	1.0
		Cadmium, Soluble	49.2	0.30u	50.0	98.4	1.0
		Cobalt, Soluble	502	0.70u	500	100.5	1.0
		Chromium, Soluble	250	39.2	200	105.2	1.0
		Copper, Soluble	266	1.4 u	250	106.2	1.0
		Iron, Soluble	1140	27.9 u	1000	113.6	1.0
		Potassium, Soluble	31800	5160	25000	106.7	1.0
		Magnesium, Soluble	35300	10100	25000	100.8	1.0
		Manganese, Soluble	538	0.30u	500	107.5	1.0
		Sodium, Soluble	35000	10900	25000	96.3	1.0
		Nickel, Soluble	528	1.2 u	500	105.5	1.0
		Antimony, Soluble	497	2.8 u	500	99.5	1.0
		Vanadium, Soluble	510	6.2	500	100.7	1.0
		Zinc, Soluble	647	154	500	98.6	1.0

Lionville Laboratory, Inc.

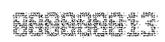
INORGANICS PRECISION REPORT 01/05/05

CLIENT: TNUHANFORD I05-005 H2836  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0411L177

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	B1BKB9	Silver, Total	1.0 u	1.0 u	NC	1.0
		Aluminum, Total	31.3 u	31.3 u	NC	1.0
		Barium, Total	56.6	57.3	1.2	1.0
		Beryllium, Total	0.10u	0.10u	NC	1.0
		Calcium, Total	47000	48100	2.2	1.0
		Cadmium, Total	0.30u	0.38	NC	1.0
		Cobalt, Total	0.70u	0.70u	NC	1.0
		Chromium, Total	38.7	39.7	2.6	1.0
		Copper, Total	1.5	1.6	6.5	1.0
		Iron, Total	202	288	35.1	1.0
		Potassium, Total	5030	5200	3.2	1.0
		Magnesium, Total	9870	10000	1.6	1.0
		Manganese, Total	0.70	1.1	44.4	1.0
		Sodium, Total	10700	10800	1.1	1.0
		Nickel, Total	1.2 u	1.2 u	NC	1.0
		Antimony, Total	2.8 u	2.8 u	NC	1.0
		Vanadium, Total	6.4	6.6	3.1	1.0
		Zinc, Total	165	165	0.18	1.0

*200  
 NW 1/6/05*







0711111

<b>PNNL</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>	C.O.C. # <b>105-005-278</b>
		Page 1 of 1

Collector <b>DURATEK F. M. HALL</b>	Contact/Requester	Telephone No. <b>MSIN FAX</b>
SAF No. 105-005	Sampling Origin	Purchase Order/Charge Code
Project Title CERCLA 100HR31AM (1&2) GW MONITORING NOVEMBER 2004	<b>SAWS - H82</b>	Ice Chest No. <b>SAWS - 500</b> Temp.
Shipped To (Lab) Lionville Laboratory Incorporated	Method of Shipment	Bill of Lading/Air Bill No. <b>79033979 8644</b>
Protocol CERCLA	Priority: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS ** **	SPECIAL INSTRUCTIONS	Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	----------------------	-----------	---

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1BKB9		W	11/16/04	0852	1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B1BKB9		W	↓	↓	1x500-mL P	IC Anions - 300.0	Cool 4C
B1BKB9		W	↓	↓	1x20-mL P	Activity Scan	None
B1BKC0 (F)		W	↓	↓	1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2

Relinquished By <b>DURATEK F. M. HALL</b>	Print	Sign	Date/Time <b>NOV 16 2004</b>	Received By <b>FED Ex</b>	Print	Sign	Date/Time	<b>Matrix *</b> S = Soil      DS = Drum Solid SF = Sediment      DL = Drum Liquid SO = Solid      T = Tissue SL = Sludge      WI = Wine W = Water      L = Liquid O = Oil      V = Vegetation A = Air      X = Other
Relinquished By <i>Fed Ex</i>			Date/Time <i>11/17/04 0925</i>	Received By <i>J. Pleschard</i>			Date/Time <i>11/17/04 0925</i>	
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g., Return to customer, per lab procedure, used in process)						Disposed By	Date/Time

**Lionville Laboratory Incorporated**  
**SAMPLE RECEIPT CHECKLIST (SRC)**

CLIENT: *TNU - HANFORD*

Date: *11/17/04*

Purchase Order / Project# /  
 SAF# / SOW# / Release #: *105-005*

LvLI Batch #: *0411177*

Sample Custodian: *V. Hernandez*

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |   |                                   |  |
|---|---|-----------------------------------|--|
| 1. Samples Hand Delivered or <u>Shipped</u>   | Carrier <i>Fed Ex</i>   | Airbill# <i>790339798644</i>      |  |
| 2. Custody seals on coolers or shipping container intact, signed and dated?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals | Comments   |
| 3. Outside of coolers or shipping containers are free from damage?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                   |  |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                   |  |
| 5. Samples received cooled or ambient?  | Temp <i>2.1</i> °C  | Cooler # <i>SAWS 500</i>          |  |
| 6. Custody seals on sample containers intact, signed and dated?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |  |
| 7. coc signed and dated?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                   |  |
| 8. Sample containers are intact?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                   |  |
| 9. All samples on coc received? All samples received on coc?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                   |  |
| 10. All sample label information matches coc?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                   |  |
| 11. Samples properly preserved?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                   |  |
| 12. Samples received within hold times? Short holds taken to wet lab?   | <input checked="" type="checkbox"/> Yes                             | <input type="checkbox"/> No       |  |
| 13. VOA, TOC, TOX free of headspace?  | <input checked="" type="checkbox"/> Yes                             | <input type="checkbox"/> No       | <input checked="" type="checkbox"/> N/A              |
| 14. QC stickers placed on bottles designated by client?   | <input type="checkbox"/> Yes  | <input type="checkbox"/> No       | <input checked="" type="checkbox"/> N/A              |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)     | <input checked="" type="checkbox"/> Yes                             | <input type="checkbox"/> No       |  |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)                             | <input type="checkbox"/> Yes  | <input type="checkbox"/> No       | <input checked="" type="checkbox"/> No Discrepancies |

