



2 July 2003

Mr. Steve Trent
 Fluor Hanford Inc.
 825 Jadwin Ave.
 Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0305L589
SDG #	H2256
SAF #	F03-005
Date Received	6-06-03
# Samples	3
Matrix	Water
Volatiles	
Semivolatiles	
Pest/PCB	
DRO/GRO/KRO	
Herbicides	
GC Alcohol	
Metals	X
Inorganics	X



The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
 Lionville Laboratory Incorporated

Orlette S. Johnson
 Orlette S. Johnson
 Project Manager

RECEIVED
 AUG 11 2003
 EDMC

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD F02-005 H2256

DATE RECEIVED: 06/06/03

LVL LOT # :0306L589

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	ANALYSIS TIME
B171T7							
CHLORIDE BY IC	001	W	03LIC037	06/03/03	06/10/03	06/10/03	
CHLORIDE BY IC	001 REP	W	03LIC037	06/03/03	06/10/03	06/10/03	
CHLORIDE BY IC	001 MS	W	03LIC037	06/03/03	06/10/03	06/10/03	
FLUORIDE BY IC	001	W	03LIC037	06/03/03	06/10/03	06/10/03	
FLUORIDE BY IC	001 REP	W	03LIC037	06/03/03	06/10/03	06/10/03	
FLUORIDE BY IC	001 MS	W	03LIC037	06/03/03	06/10/03	06/10/03	
NITRITE BY IC	001	W	03LIC037	06/03/03	06/10/03	06/10/03	1605
NITRITE BY IC	001 REP	W	03LIC037	06/03/03	06/10/03	06/10/03	1619
NITRITE BY IC	001 MS	W	03LIC037	06/03/03	06/10/03	06/10/03	1633
NITRATE BY IC	001	W	03LIC037	06/03/03	06/10/03	06/10/03	1605
NITRATE BY IC	001 REP	W	03LIC037	06/03/03	06/10/03	06/10/03	1619
NITRATE BY IC	001 MS	W	03LIC037	06/03/03	06/10/03	06/10/03	1632
SULFATE BY IC	001	W	03LIC037	06/03/03	06/10/03	06/10/03	
SULFATE BY IC	001 REP	W	03LIC037	06/03/03	06/10/03	06/10/03	
SULFATE BY IC	001 MS	W	03LIC037	06/03/03	06/10/03	06/10/03	

LAB QC:

CHLORIDE BY IC	MB1	W	03LIC037	N/A	06/10/03	06/10/03	
CHLORIDE BY IC	MB1 BS	W	03LIC037	N/A	06/10/03	06/10/03	
FLUORIDE BY IC	MB1	W	03LIC037	N/A	06/10/03	06/10/03	
FLUORIDE BY IC	MB1 BS	W	03LIC037	N/A	06/10/03	06/10/03	
NITRITE BY IC	MB1	W	03LIC037	N/A	06/10/03	06/10/03	
NITRITE BY IC	MB1 BS	W	03LIC037	N/A	06/10/03	06/10/03	
NITRATE BY IC	MB1	W	03LIC037	N/A	06/10/03	06/10/03	
NITRATE BY IC	MB1 BS	W	03LIC037	N/A	06/10/03	06/10/03	
SULFATE BY IC	MB1	W	03LIC037	N/A	06/10/03	06/10/03	
SULFATE BY IC	MB1 BS	W	03LIC037	N/A	06/10/03	06/10/03	





Analytical Report

Client: TNU-HANFORD F02-005 H2256
LVL#: 0306L589

W.O.#: 11343-606-001-9999-00
Date Received: 06-06-03

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 (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 LvLI's sample acceptance policy with the exception of Nitrate and Nitrite as noted on the Sample Receipt Checklist.
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 Chloride, Fluoride, Nitrite, Nitrate and Sulfate were within the 75-125% control limits.
8. The replicate analyses for Chloride, Nitrite, Nitrate and Sulfate 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
Laboratory Manager
Lionville Laboratory Incorporated

6/29/03
Date

njp006-589

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

	<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 <input checked="" type="checkbox"/> Chloride <input checked="" type="checkbox"/> Fluoride	<input checked="" type="checkbox"/> 300.0	9056	
<input checked="" type="checkbox"/> Nitrate <input checked="" type="checkbox"/> Nitrite ___ Phosphate	<input checked="" type="checkbox"/> 300.0	9056	
<input checked="" type="checkbox"/> Sulfate ___ Formate ___ Acetate ___ Oxalate	<input checked="" type="checkbox"/> 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-1 (
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:	

Lionville Laboratory Incorporated

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 06/19/03

CLIENT: TNUHANFORD F02-005 H2256
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0306L589

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B171T7	Chloride by IC	12.6	MG/L	1.2	5.0
		Fluoride by IC	0.36	MG/L	0.25	1.0
		Nitrite by IC	1.60	MG/L	0.25	1.0
		Nitrate by IC	5.81	MG/L	0.25	1.0
		Sulfate by IC	311	MG/L	25.0	100

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/19/03

CLIENT: TNUHANFORD P02-005 H2256
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0306L589

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
BLANK10	03LIC037-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		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	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 06/19/03

CLIENT: TNUHANFORD F02-005 H2256
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0306L589

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B171T7	Chloride by IC	39.2	12.6	25.0	106.5	5.0
		Fluoride by IC	10.5	0.36	10.0	101.8	2.0
		Nitrite by IC	11.7	1.60	10.0	101.4	2.0
		Nitrate by IC	15.9	5.81	10.0	101.4	2.0
		Sulfate by IC	834	311	500	104.6	100
BLANK10	03LIC037-MB1	Chloride by IC	4.9	0.25u	5.0	98.2	1.0
		Fluoride by IC	5.0	0.25u	5.0	99.3	1.0
		Nitrite by IC	5.05	0.25u	5.00	101.0	1.0
		Nitrate by IC	5.04	0.25u	5.00	100.8	1.0
		Sulfate by IC	5.0	0.25u	5.0	99.6	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/19/03

CLIENT: TNUHANFORD F02-005 H2256
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0306L589

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE RPD		DILUTION FACTOR (REP)
-----	-----	-----	-----	-----	-----	-----
-001REP	B171T7	Chloride by IC	12.6	12.4	0.87	5.0
		Fluoride by IC	0.36	0.36	1.1	1.0
		Nitrite by IC	1.60	1.57	1.7	1.0
		Nitrate by IC	5.81	5.76	0.73	1.0
		Sulfate by IC	311	307	1.5	100

FLUOR Hanford Inc.		CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					F02-005-007		Page 1 of 1			
Collector <i>R. Pfister / S.S. POPE</i>		Company Contact Steve Trent		Telephone No. 373-5869		Project Coordinator TRENT, SJ		Price Code 7L		Data Turnaround 21 Days		
Project Designation 100-HR-3 ISRM Treatment System Monitoring		Sampling Location 100 Area		SAF No. F02-005		Air Quality <input type="checkbox"/>						
Ice Chest No. <i>SAWS 026</i>		Field Logbook No. <i>NA</i>		COA 117561ES10		Method of Shipment Federal Express						
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. <i>A030280</i>		Bill of Lading/Air Bill No. <i>SEK 03PL</i>								
POSSIBLE SAMPLE HAZARDS/REMARKS Samples did not originate in radiological controlled area. No total activity associated with sample/samples.			Special Handling and/or Storage <i>COO 14C</i>	Preservation HNO3 to pH <i>2</i> Cool 4C HNO3 to pH <i>2</i>	Type of Container G/P	No. of Container(s) 1	Volume 500mL	500mL	100mL			
SAMPLE ANALYSIS				See item (1) in Special Instructions.	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate)	Total Uranium <i>6.203</i>						
Sample No.	Matrix *	Sample Date	Sample Time									
B171T7	WATER	6/3/03	1150	X	X	X						
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS ** No radiological sampling is required prior to shipping samples off-site. ** Fluor Hanford acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 or method 9056 will not be met.				Matrix * S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WT=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
<i>S.S. POPE</i>		<i>6/4/03 1330</i>		<i>MO-026 Fricke #1</i>		<i>6/4/03 1330</i>						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
<i>MO-026 Fricke #1</i>		<i>6/4/03 1415</i>		<i>[Signature]</i>		<i>6/4/03 1415</i>						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
<i>[Signature]</i>		<i>6/4/03 1430</i>		<i>[Signature]</i>		<i>6/4/03 1430</i>						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
<i>R. Fall</i>		<i>6-4-03</i>		<i>SFB 3728</i>		<i>6-4-03</i>						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
<i>313 3728</i>		<i>6-5-03 1000</i>		<i>R. Fall</i>		<i>6-5-03</i>						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
<i>ERE</i>		<i>6-5-03</i>		<i>Fed Ex</i>		<i>6-5-03</i>						
LABORATORY SECTION	Received By			Title			Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By			Date/Time					

Relinquished - Fricke 6-4-03 0945 REC. Fall 6-6-03 0945

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: TNU-HANFORD
Purchase Order/Project:

DATE: 6-6-03

Job # / SOW# / Release #: F02-005

Laboratory SDG #: 03064589

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

- | | | | | |
|--|---|--|---|---|
| 1. Custody seals on coolers or shipping container intact, signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 2. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 3. Airbill # recorded? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 5. Sample containers are intact? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 7. All samples on coc received? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 8. All sample label information matches coc? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 10. Shipment meets LVLJ Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy) | <input checked="" type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> see Comment # (1) |
| 11. Where applicable, bar code labels are affixed to coc? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 12. coc signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 13. coc will be faxed or emailed to client? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |

Cooler # / temp (°C) and Comments:

SAWS-026 1°

(1) NO₂ and NO₃ received past hold

Laboratory Sample Custodian:

Carl King

Laboratory Project Manager:



Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F02-005 H2256

DATE RECEIVED: 06/06/03

LVL LOT # :0306L589

CLIENT ID /ANALYSIS LVL # MTX PREP # COLLECTION EXTR/PREP ANALYSIS

B171T7

SILVER, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
SILVER, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
SILVER, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
SILVER, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
ALUMINUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
ALUMINUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
ALUMINUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
ALUMINUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
ARSENIC, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
ARSENIC, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
ARSENIC, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
ARSENIC, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
BARIUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
BARIUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
BARIUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
BARIUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
CALCIUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
CALCIUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
CALCIUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
CALCIUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
CADMIUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
CADMIUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
CADMIUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
CADMIUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
CERIUM, TOTAL	001	W	03L0356	06/03/03	06/25/03	06/26/03
CERIUM, TOTAL	001 REP	W	03L0356	06/03/03	06/25/03	06/26/03
CERIUM, TOTAL	001 MS	W	03L0356	06/03/03	06/25/03	06/26/03
CERIUM, TOTAL	001 MSD	W	03L0356	06/03/03	06/25/03	06/26/03
CHROMIUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
CHROMIUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
CHROMIUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
CHROMIUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
COPPER, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
COPPER, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
COPPER, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD F02-005 H2256

DATE RECEIVED: 06/06/03

LVL LOT # :0306L589

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
COPPER, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
IRON, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
IRON, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
IRON, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
IRON, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
POTASSIUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/25/03
POTASSIUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/25/03
POTASSIUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/25/03
POTASSIUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/25/03
MAGNESIUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
MAGNESIUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
MAGNESIUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
MAGNESIUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
MANGANESE, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
MANGANESE, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
MANGANESE, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
MANGANESE, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
MOLYBDENUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
MOLYBDENUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
MOLYBDENUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
MOLYBDENUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
SODIUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/25/03
SODIUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/25/03
SODIUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/25/03
SODIUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/25/03
LEAD, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
LEAD, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
LEAD, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
LEAD, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
SILICA, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/25/03
SILICA, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/25/03
SILICA, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/25/03
SILICA, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/25/03
SELENIUM, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03
SELENIUM, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
SELENIUM, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
SELENIUM, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03
ZINC, TOTAL	001	W	03L0350	06/03/03	06/23/03	06/23/03

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD F02-005 H2256

DATE RECEIVED: 06/06/03

LVL LOT # :0306L589

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	001 REP	W	03L0350	06/03/03	06/23/03	06/23/03
ZINC, TOTAL	001 MS	W	03L0350	06/03/03	06/23/03	06/23/03
ZINC, TOTAL	001 MSD	W	03L0350	06/03/03	06/23/03	06/23/03

LAB QC:

SILVER LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
SILVER, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
ALUMINUM LABORTORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
ALUMINUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
ARSENIC LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
ARSENIC, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
BARIUM LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
BARIUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
CALCIUM LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
CALCIUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
CADMIUM LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
CADMIUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
CERIUM, LAB	LC1 BS	W	03L0356	N/A	06/25/03	06/26/03
CERIUM, TOTAL	MB1	W	03L0356	N/A	06/25/03	06/26/03
CHROMIUM LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
CHROMIUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
COPPER LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
COPPER, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
IRON LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
IRON, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
POTASSIUM LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/25/03
POTASSIUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/25/03
MAGNESIUM LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
MAGNESIUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
MANGANESE LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
MANGANESE, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
MOLYBDENUM LABORATOR	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
MOLYBDENUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
SODIUM LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/25/03
SODIUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/25/03
LEAD LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
LEAD, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F02-005 H2256

DATE RECEIVED: 06/06/03

LVL LOT # :0306L589

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILICA LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/25/03
SILICA, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/25/03
SELENIUM LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
SELENIUM, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03
ZINC LABORATORY	LC1 BS	W	03L0350	N/A	06/23/03	06/23/03
ZINC, TOTAL	MB1	W	03L0350	N/A	06/23/03	06/23/03



Analytical Report

Client: TNU-HANFORD F02-005
LVL#: 0306L589
SDG/SAF#: H2256/F02-005

W.O.#: 11343-606-001-9999-00
Date Received: 06-06-03

METALS CASE NARRATIVE

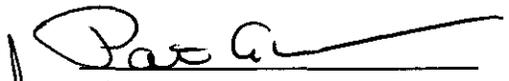
1. This narrative covers the analysis of 1 water sample.
2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LvLI's 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. The preparation/method blanks for 2 analytes were outside 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.
 - a). The MB results for Copper and Zinc were greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and all samples read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

10. The matrix spike (MS) and matrix spike duplicate (MSD) recoveries for 1 analyte 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 serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

<u>Sample ID</u>	<u>Element</u>	<u>PDS Concentration (ppb)</u>	<u>PDS % Recovery</u>
B171T7	Sulfur	2,000	102.5

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. 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

gmb/m06-589

06-30-03
 Date

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this

Lot#: 03062589

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 <u>7041^s</u>	200.7	<u>204.2</u>		99
Arsenic	<input checked="" type="checkbox"/> 6010B <u>7060A^s</u>	200.7	<u>206.2</u>	<u>3113B</u>	99
Barium	<input checked="" type="checkbox"/> 6010B	200.7			99
Beryllium	<input checked="" type="checkbox"/> 6010B	200.7			99
Bismuth	<input checked="" type="checkbox"/> 6010B ¹	200.7 ¹		<u>1620</u>	99
Boron	<input checked="" type="checkbox"/> 6010B	200.7			99
Cadmium	<input checked="" type="checkbox"/> 6010B <u>7131A^s</u>	200.7	<u>213.2</u>		99
Calcium	<input checked="" type="checkbox"/> 6010B	200.7			99
Chromium	<input checked="" type="checkbox"/> 6010B <u>7191^s</u>	200.7	<u>218.2</u>		<u>SS17</u>
Cobalt	<input checked="" type="checkbox"/> 6010B	200.7			99
Copper	<input checked="" type="checkbox"/> 6010B <u>7211^s</u>	200.7	<u>220.2</u>		99
Iron	<input checked="" type="checkbox"/> 6010B	200.7			99
Lead	<input checked="" type="checkbox"/> 6010B <u>7421^s</u>	200.7	<u>239.2</u>	<u>3113B</u>	99
Lithium	<input checked="" type="checkbox"/> 6010B <u>7430⁴</u>	200.7		<u>1620</u>	99
Magnesium	<input checked="" type="checkbox"/> 6010B	200.7			99
Manganese	<input checked="" type="checkbox"/> 6010B	200.7			99
Mercury	<input checked="" type="checkbox"/> <u>7470A³</u> <u>7471A³</u>	<u>245.1²</u> <u>245.5²</u>			99
Molybdenum	<input checked="" type="checkbox"/> 6010B	200.7			99
Nickel	<input checked="" type="checkbox"/> 6010B	200.7			99
Potassium	<input checked="" type="checkbox"/> 6010B <u>7610⁴</u>	200.7	<u>258.1⁴</u>		99
Rare Earths	<input checked="" type="checkbox"/> 6010B ¹	200.7 ¹		<u>1620</u>	99
Selenium	<input checked="" type="checkbox"/> 6010B <u>7740^s</u>	200.7	<u>270.2</u>	<u>3113B</u>	99
Silicon	<input checked="" type="checkbox"/> 6010B ¹	200.7		<u>1620</u>	99
Silica	<input checked="" type="checkbox"/> 6010B	200.7		<u>1620</u>	99
Silver	<input checked="" type="checkbox"/> 6010B <u>7761^s</u>	200.7	<u>272.2</u>		99
Sodium	<input checked="" type="checkbox"/> 6010B <u>7770⁴</u>	200.7	<u>273.1⁴</u>		99
Strontium	<input checked="" type="checkbox"/> 6010B	200.7			99
Thallium	<input checked="" type="checkbox"/> 6010B <u>7841^s</u>	200.7	<u>279.2</u> <u>200.9</u>		99
Tin	<input checked="" type="checkbox"/> 6010B	200.7			99
Titanium	<input checked="" type="checkbox"/> 6010B	200.7			99
Uranium	<input checked="" type="checkbox"/> 6010B ¹	200.7 ¹		<u>1620</u>	99
Vanadium	<input checked="" type="checkbox"/> 6010B	200.7			99
Zinc	<input checked="" type="checkbox"/> 6010B	200.7			99
Zirconium	<input checked="" type="checkbox"/> 6010B ¹	200.7 ¹		<u>1620</u>	99

Other: Sulfur

Method: 6010B

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 06/27/03

CLIENT: TNUHANFORD F02-005 H2256
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0306L589

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B171T7	Silver, Total	1.2	u UG/L	1.2	1.0
		Aluminum, Total	36.0	UG/L	13.1	1.0
		Arsenic, Total	5.7	UG/L	3.3	1.0
		Barium, Total	125	UG/L	0.20	1.0
		Calcium, Total	24600	UG/L	7.3	1.0
		Cadmium, Total	0.40	u UG/L	0.40	1.0
		Sulfur, Total	111000	UG/L	100	10.0
		Chromium, Total	2.3	UG/L	1.0	1.0
		Copper, Total	2.6	UG/L	0.60	1.0
		Iron, Total	230	UG/L	25.8	1.0
		Potassium, Total	210000	UG/L	4640	6.0
		Magnesium, Total	9610	UG/L	8.3	1.0
		Manganese, Total	124	UG/L	0.20	1.0
		Molybdenum, Total	25.8	UG/L	1.6	1.0
		Sodium, Total	85400	UG/L	224	6.0
		Lead, Total	2.3	u UG/L	2.3	1.0
		SILICA, Total	16100	UG/L	143	2.1
		Selenium, Total	4.2	u UG/L	4.2	1.0
		Zinc, Total	1.2	UG/L	0.60	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/27/03

CLIENT: TNUHANFORD P02-005 H2256
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0306L589

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0356-MB1	Silver, Total	1.2	u UG/L	1.2	1.0
		Aluminum, Total	13.1	u UG/L	13.1	1.0
		Arsenic, Total	3.3	u UG/L	3.3	1.0
		Barium, Total	0.24	UG/L	0.20	1.0
		Calcium, Total	20.6	UG/L	7.3	1.0
		Cadmium, Total	0.40	u UG/L	0.40	1.0
		Chromium, Total	1.0	u UG/L	1.0	1.0
		Copper, Total	6.8	UG/L	0.60	1.0
		Iron, Total	25.8	u UG/L	25.8	1.0
		Potassium, Total	774	u UG/L	774	1.0
		Magnesium, Total	8.3	u UG/L	8.3	1.0
		Manganese, Total	0.20	u UG/L	0.20	1.0
		Molybdenum, Total	1.6	u UG/L	1.6	1.0
		Sodium, Total	37.3	u UG/L	37.3	1.0
		Lead, Total	2.3	u UG/L	2.3	1.0
		SILICA, Total	143	u UG/L	143	2.1
		Selenium, Total	4.2	u UG/L	4.2	1.0
		Zinc, Total	37.4	UG/L	0.60	1.0
BLANK1	03L0356-MB1	Sulfur, Total	10.8	UG/L	10.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/27/03

CLIENT: TNUHANFORD F02-005 H2256
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0306L589

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B171T7	Silver, Total	51.1	1.2 u	50.0	102.2	1.0
		Silver, Total MSD	50.8	1.2 u	50.0	101.6	1.0
		Aluminum, Total	2000	36.0	2000	98.2	1.0
		Aluminum, Total MSD	1980	36.0	2000	97.2	1.0
		Arsenic, Total	1980	5.7	2000	98.8	1.0
		Arsenic, Total MSD	1960	5.7	2000	97.7	1.0
		Barium, Total	2060	125	2000	97.0	1.0
		Barium, Total MSD	2050	125	2000	96.4	1.0
		Calcium, Total	49100	24600	25000	98.1	1.0
		Calcium, Total MSD	48700	24600	25000	96.6	1.0
		Cadmium, Total	49.3	0.40u	50.0	98.6	1.0
		Cadmium, Total MSD	49.0	0.40u	50.0	98.0	1.0
		Sulfur, Total	119000	111000	5000	155.4*	10.0
		Sulfur, Total MSD	118000	111000	5000	144.8*	10.0
		Chromium, Total	202	2.3	200	100.1	1.0
		Chromium, Total MSD	201	2.3	200	99.2	1.0
		Copper, Total	258	2.6	250	102.1	1.0
		Copper, Total MSD	256	2.6	250	101.4	1.0
		Iron, Total	1250	230	1000	101.9	1.0
		Iron, Total MSD	1240	230	1000	101.0	1.0
		Potassium, Total	241000	210000	25000	122.2*	6.0
		Potassium, Total MSD	236000	210000	25000	102.2*	6.0
		Magnesium, Total	33800	9610	25000	96.7	1.0
		Magnesium, Total MSD	33500	9610	25000	95.5	1.0
		Manganese, Total	636	124	500	102.3	1.0
		Manganese, Total MSD	632	124	500	101.7	1.0
		Molybdenum, Total	1040	25.8	1000	101.1	1.0
		Molybdenum, Total MSD	1030	25.8	1000	100.5	1.0
		Sodium, Total	111000	85400	25000	103.6	6.0
		Sodium, Total MSD	111000	85400	25000	100.6	6.0
		Lead, Total	495	2.3 u	500	99.0	1.0
		Lead, Total MSD	490	2.3 u	500	98.1	1.0
		SILICA, Total	17800	16100	2140	79.6*	2.1
		SILICA, Total MSD	17900	16100	2140	84.0*	2.1
		Selenium, Total	1940	4.2 u	2000	97.2	1.0
		Selenium, Total MSD	1940	4.2 u	2000	97.2	1.0
		Zinc, Total	501	1.2	500	99.9	1.0
		Zinc, Total MSD	498	1.2	500	99.4	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/27/03

CLIENT: TNUHANFORD F02-005 H2256
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0306LS89

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (RBP)
			RESULT	REPLICATE	RPD	
001REP	B171T7	Silver, Total	1.2 u	1.2 u	NC	1.0
		Aluminum, Total	36.0	13.1 u	NC 210	1.0
		Arsenic, Total	5.7	5.8	1.7	1.0
		Barium, Total	125	122	2.3	1.0
		Calcium, Total	24600	24500	0.26	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Sulfur, Total	111000	112000	0.84	10.0
		Chromium, Total	2.3	1.8	24.4	1.0
		Copper, Total	2.6	2.8	7.4	1.0
		Iron, Total	230	224	2.6	1.0
		Potassium, Total	210000	207000	1.6	6.0
		Magnesium, Total	9610	9520	0.90	1.0
		Manganese, Total	124	124	0.40	1.0
		Molybdenum, Total	25.8	23.9	7.6	1.0
		Sodium, Total	85400	84500	1.0	6.0
		Lead, Total	2.3 u	2.3 u	NC	1.0
		SILICA, Total	16100	15700	2.8	2.1
		Selenium, Total	4.2 u	4.2 u	NC	1.0
		Zinc, Total	1.2	0.90	28.6	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 06/27/03

CLIENT: TNUHANFORD F02-005 H2256

LVL LOT #: 0306L589

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
*****	*****	*****	*****	*****	*****	*****
LCS1	03L0350-LC1	Silver, LCS	499	500	UG/L	99.8
		Aluminum, LCS	5030	5000	UG/L	100.7
		Arsenic, LCS	9680	10000	UG/L	96.8
		Barium, LCS	4940	5000	UG/L	98.9
		Calcium, LCS	24800	25000	UG/L	99.1
		Cadmium, LCS	245	250	UG/L	98.1
		Chromium, LCS	502	500	UG/L	100.3
		Copper, LCS	1260	1250	UG/L	100.5
		Iron, LCS	5000	5000	UG/L	99.9
		Potassium, LCS	24100	25000	UG/L	96.4
		Magnesium, LCS	24700	25000	UG/L	98.8
		Manganese, LCS	756	750	UG/L	100.8
		Molybdenum, LCS	4970	5000	UG/L	99.4
		Sodium, LCS	24600	25000	UG/L	98.5
		Lead, LCS	2460	2500	UG/L	98.6
		SILICA, LCS	10600	10700	UG/L	99.0
		Selenium, LCS	9860	10000	UG/L	98.6
		Zinc, LCS	989	1000	UG/L	98.9
LCS1	03L0356-LC1	Sulfur, LCS	5100	5000	UG/L	102.0

FLUOR Hanford Inc.		CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F02-005-007	Page 1 of 1
Collector <i>R. P. Star / J.S. POPE</i>	Company Contact Steve Trent	Telephone No. 373-5869	Project Coordinator TRENT, SJ		Price Code 7L	Data Turnaround 21 Days
Project Designation 100-HR-3 ISRM Treatment System Monitoring		Sampling Location 100 Area	SAF No. F02-005		Air Quality <input type="checkbox"/>	
Ice Chest No. SAWS 026	Field Logbook No. <i>NA</i>	COA 117561ES10	Method of Shipment Federal Express			
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. A030280	Bill of Lading/Air Bill No. SEK 03PC			

POSSIBLE SAMPLE HAZARDS/REMARKS Samples did not originate in radiological controlled area. No total activity associated with sample/samples. R Special Handling and/or Storage <i>COO 14C</i>	Preservation	HNO3 to pH <2	Cool 4C	HNO3 to pH <2						
	Type of Container	G/P	P	G/P						
	No. of Container(s)	1	1	1						
	Volume	500mL	500mL	100mL						

SAMPLE ANALYSIS				See item (1) in Special Instructions.	IC Arsenic - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate)	Total Uranium								
------------------------	--	--	--	---------------------------------------	--	---------------	--	--	--	--	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time											
B171T7	WATER	6/3/03	1150	X	X	X								

CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		** No radiological sampling is required prior to shipping samples off-site. ** Fluor Hanford acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 or method 9056 will not be met. (1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Potassium, Silica, Sodium, Sulfur, Zinc)			
<i>J.S. POPE</i>		<i>6/4/03 1330</i>		<i>MO-026 Fricke #1</i>		<i>6/4/03 1330</i>					
<i>MO-026 Fricke #1</i>		<i>6/4/03 1415</i>		<i>[Signature]</i>		<i>6/4/03 1415</i>					
<i>[Signature]</i>		<i>6/4/03 1430</i>		<i>[Signature]</i>		<i>6/4/03</i>					
<i>R. Bell</i>		<i>6/4/03</i>		<i>[Signature]</i>		<i>6/4/03</i>					
<i>313 3728</i>		<i>6/5/03 1000</i>		<i>[Signature]</i>		<i>6/5/03</i>					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		S=Soil SE=Settlement SO=Solid S=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Trace WI=Wipe L=Liquid V=Vegetation X=Other			
<i>[Signature]</i>		<i>6/5/03</i>		<i>Fed Ex</i>		<i>6/5/03</i>					

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

15

A-6003-618(03/03)
not needed - FRIEDY 6-6-03 0945 REC. Calbert 6-6-03 0945

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: TNU-HANFORD
Purchase Order/Project:

DATE: 6-6-03

LAB# / SOW# / Release #: F02-005

Laboratory SDG #: 03064589

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

- | | | | | |
|--|---|-----------------------------|---|--|
| 1. Custody seals on coolers or shipping container intact, signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 2. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 3. Airbill # recorded? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 5. Sample containers are intact? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 7. All samples on coc received? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 8. All sample label information matches coc? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 10. 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 | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 11. Where applicable, bar code labels are affixed to coc? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 12. coc signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 13. coc will be faxed or emailed to client? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |

Cooler # / temp (°C) and Comments:

SAWS-026 1°

Laboratory Sample Custodian:

Carl King

Laboratory Project Manager:



EBERLINE SERVICES

June 26, 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352



Reference: P.O. #630
Eberline Services R3-06-016-7533, SDG H2256

Dear Mr. Trent:

Enclosed is the data report for one water sample designated under SAF No. F02-005 received at Eberline Services on June 6, 2003. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Program Manager

MCM

Enclosure: Data Package

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2256 was composed of one water sample designated under SAF No. F02-005 with a Project Designation of: 100-HR-3 ISRM Treatment System Monitoring.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

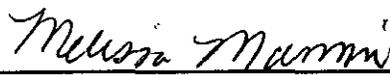
2.0 ANALYSIS NOTES

2.1 Total Uranium Analyses

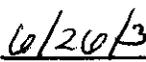
The LCS percent recovery (76%) was below the laboratory protocol limits (80 to 120%), but was within the contract limits (70 to 130%). No other problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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



Melissa C. Mannion
Program Manager



Date

EBRLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2256

SDG 7533
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG_H2256

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S				
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Melissa Mannion
Prepared by
Melissa Mannion
Reviewed by

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 06/26/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2256

SDG 7533
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2256

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/26/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2256

SDG 7533
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford
Contract No. 630
Case no SDG H2256

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

Page 2

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/26/03

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2256

LAB SAMPLE SUMMARY

SDG 7533
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Case no SDG H2256

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R306016-01	B171T7	100 Area	WATER		F02-005	F02-005-007	06/03/03 11:50
R306016-02	Lab Control Sample		WATER		F02-005		
R306016-03	Method Blank		WATER		F02-005		
R306016-04	Duplicate (R306016-01)	100 Area	WATER		F02-005		06/03/03 11:50

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LS
 Version 3.06
 Report date 06/26/03

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2256

SDG 7533
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Case no SDG H2256

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7533	F02-005-007	B17117	WATER		0.135 L		06/06/03	3	R306016-01	7533-001
		Method Blank	WATER						R306016-03	7533-003
		Lab Control Sample	WATER						R306016-02	7533-002
		Duplicate (R306016-01)	WATER		0.135 L		06/06/03	3	R306016-04	7533-004

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 06/26/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2256

SDG 7533
 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H2256

TEST MATRIX	METHOD	PREPARATION ERROR			PLANCHETS ANALYZED			QUALIFIERS
		BATCH	2σ %	CLIENT MORE	RE BLANK	LCS	DUP/ORIG MS/ORIG	
Kinetic Phosphorimetry (KPA)								
U_T	WATER	Uranium, Total in Water	7071-062	9.0	1	1	1	1/1

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
 Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-PBS
 Version 3.06
 Report date 06/26/03

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2256

SDG 7533
 Contact Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H2256

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R306016-01 06/03/03 06/06/03	B17117 100 Area F02-005-007	F02-005	WATER	7533-001	U_T		06/17/03	06/26/03	MCM	Uranium, Total in Water
R306016-02	Lab Control Sample	F02-005	WATER	7533-002	U_T		06/17/03	06/26/03	MCM	Uranium, Total in Water
R306016-03	Method Blank	F02-005	WATER	7533-003	U_T		06/17/03	06/26/03	MCM	Uranium, Total in Water
R306016-04 06/03/03 06/06/03	Duplicate (R306016-01) 100 Area	F02-005	WATER	7533-004	U_T		06/17/03	06/26/03	MCM	Uranium, Total in Water

COUNTS OF TESTS BY SAMPLE TYPE											
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
U_T	F02-005	Uranium, Total in Water	UTOT_KPA	1			1	1	1		4
TOTALS				1			1	1	1		4

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LWS
 Version 3.06
 Report date 06/26/03

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2256

7533-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7533</u>	Client/Case no <u>Hanford</u>	<u>SDG H2256</u>
Contact <u>Melissa C. Mannion</u>	Contract No, <u>630</u>	
Lab sample id <u>R306016-02</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7533-002</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>F02-005</u>	

ANALYTE	RESULT ug/L	2σ ERR (COUNT)	MDA ug/L	RDL ug/L	QUALI- FIERS	TEST	ADDED ug/L	2σ ERR ug/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Uranium	63.0	7.2	<u>0.17</u>	0.10		U_T	82.5	3.3	<u>76</u>	82-118	80-120

100-HR-3 IRSM Treatment System Mon.

QC-LCS #44912

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>06/26/03</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2256

7533-004

B171T7

DUPLICATE

SDG <u>7533</u>	Client/Case no <u>Hanford</u>	SDG <u>H2256</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R306016-04</u>	Lab sample id <u>R306016-01</u>	Client sample id <u>B171T7</u>
Dept sample id <u>7533-004</u>	Dept sample id <u>7533-001</u>	Location/Matrix <u>100 Area</u> <u>WATER</u>
	Received <u>06/06/03</u>	Collected/Volume <u>06/03/03 11:50</u> <u>0.135 L</u>
		Custody/SAF No <u>F02-005-007</u> <u>F02-005</u>

ANALYTE	DUPLICATE ug/L	2σ ERR (COUNT)	MDA ug/L	RDL ug/L	QUALI- FIERS	TEST	ORIGINAL ug/L	2σ ERR (COUNT)	MDA ug/L	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Uranium	0.502	0.055	0.017	0.10		U_T	0.506	0.056	0.017		1	30

100-HR-3 IRSM Treatment System Mon.

QC-DUP#1 44914

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>06/26/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2256

7533-001

B171T7

DATA SHEET

SDG <u>7533</u>	Client/Case no <u>Hanford</u>	SDG <u>H2256</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R306016-01</u>	Client sample id <u>B171T7</u>	
Dept sample id <u>7533-001</u>	Location/Matrix <u>100 Area</u>	<u>WATER</u>
Received <u>06/06/03</u>	Collected/Volume <u>06/03/03 11:50</u>	<u>0.135 L</u>
	Custody/SAF No <u>F02-005-007</u>	<u>F02-005</u>

ANALYTE	CAS NO	RESULT ug/L	2σ ERR (COUNT)	MDA ug/L	RDL ug/L	QUALI- FIERS	TEST
Total Uranium	7440-61-1	0.506	0.056	0.017	0.10		U_T

100-HR-3 IRSM Treatment System Mon.

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/26/03</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2256

LAB METHOD SUMMARY

URANIUM, TOTAL IN WATER
KINETIC PHOSPHORIMETRY (KPA)

Test U T Matrix WATER
SDG 7533
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H2256

RESULTS

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Uranium
Preparation batch 7071-062				
R306016-01		7533-001	B171T7	0.506
R306016-02		7533-002	LCS (QC ID=44912)	<u>LOW</u>
R306016-03		7533-003	BLK (QC ID=44913)	U
R306016-04		7533-004	Duplicate (R306016-01)	ok

Nominal values and limits from method RDLs (ug/L) 0.10
100-HR-3 IRSM Treatment System Mon.

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	ug/L	L	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR
Preparation batch 7071-062			2σ prep error 9.0 %		Reference Lab Notebook 7071 pg. 062								
R306016-01		B171T7	0.017	0.0200								14 06/17/03	06/17 KPA-001
R306016-02		LCS (QC ID=44912)	<u>0.17</u>	0.0200								06/17/03	06/17 KPA-001
R306016-03		BLK (QC ID=44913)	0.017	0.0200								06/17/03	06/17 KPA-001
R306016-04		Duplicate (R306016-01) (QC ID=44914)	0.017	0.0200								14 06/17/03	06/17 KPA-001

Nominal values and limits from method 0.10 0.0200 180

PROCEDURES	REFERENCE	UTOT_KPA
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 4
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 5

AVERAGES ± 2 SD	MDA <u>0.055 ± 0.15</u>
FOR 4 SAMPLES	YIELD _____ ± _____

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

Page 11

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 06/26/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2256

SDG 7533
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2256

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 12

Lab id EBRLINE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/26/03

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2256

SDG 7533
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2256

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity).

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If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 1. A fixed percentage specified in the protocol.

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2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Preparation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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Collector <i>R. Pistor / J.S. POPE</i>	Company Contact Steve Trent	Telephone No. 373-5869	Project Coordinator TRENT, SJ	Price Code 7L	Data Turnaround 21 Days
Project Designation 100-HR-3 ISRM Treatment System Monitoring	Sampling Location 100 Area	<i>H2256 (7533)</i>	SAF No. F02-005	Air Quality <input type="checkbox"/>	
Ice Chest No. <i>ERC 01-059</i>	Field Logbook No. <i>NA</i>	COA 117561ES10	Method of Shipment Federal Express		
Shipped To EBERLINE SERVICES (Formerly TMA)	Offsite Property No. <i>ADD 272</i>	Bill of Lading/Air Bill No. <i>SEK 05PC</i>			

POSSIBLE SAMPLE HAZARDS/REMARKS Samples did not originate in radiological controlled area. No total activity associated with sample/samples. Special Handling and/or Storage <i>None</i>	Preservation	HNO3 to pH <	Cool AC	HNO3 to pH <									
	Type of Container	G/P	P	G/P									
	No. of Container(s)	1	1	1									
	Volume	500mL	500mL	100mL									

SAMPLE ANALYSIS		See item (1) in Special Instructions <i>6.5.0</i>	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate)	Total Uranium									
-----------------	--	--	---	---------------	--	--	--	--	--	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time										
B17177	WATER	6/3/03	1150	X	X	X							

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From <i>J.S. POPE</i>	Date/Time <i>6/4/03 1330</i>	Received By/Stored In <i>me-026 friche #1</i>	Date/Time <i>6/4/03 1330</i>	** No radiological sampling is required prior to shipping samples off-site. ** Fluor Hanford acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 or method 9056 will not be met. (1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Potassium, Silica, Sodium, Sulfur, Zinc)				S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue W=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From <i>me-026 friche #1</i>	Date/Time <i>6/4/03 1415</i>	Received By/Stored In <i>[Signature]</i>	Date/Time <i>6/4/03 1415</i>					
Relinquished By/Removed From <i>[Signature]</i>	Date/Time <i>6/4/03 1430</i>	Received By/Stored In <i>[Signature]</i>	Date/Time <i>6/4/03 1430</i>					
Relinquished By/Removed From <i>R. Kelly R. Galt</i>	Date/Time <i>6.4.03</i>	Received By/Stored In <i>SP 3728</i>	Date/Time <i>6.4.03</i>					
Relinquished By/Removed From <i>313 3728</i>	Date/Time <i>6.5.03 1000</i>	Received By/Stored In <i>R. Kelly R. Galt</i>	Date/Time <i>6.5.03</i>					
Relinquished By/Removed From <i>ERC</i>	Date/Time <i>1000</i>	Received By/Stored In <i>Fed Ex</i>	Date/Time					

LABORATORY SECTION	Received By <i>[Signature]</i>	Title <i>Eberline services</i>	Date/Time <i>1000 6-6-03</i>
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

