0054695 H1179

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-009 H1179

DATE RECEIVED: 12/13/00 RFW LOT # :0012L564

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10R62						
BROMIDE BY IC	002	W	00LIC080	12/06/00	12/15/00	12/15/00
CHLORIDE BY IC	002	W	00LZC080	12/06/00	12/15/00	12/15/00
FLUORIDE BY IC	002	W	00LIC080	12/06/00	12/15/00	12/15/00
NITRITE BY IC	002	W	00LIC080	12/06/00	12/15/00	12/15/00
NITRATE BY IC	002	W	00LIC080	12/06/00	12/15/00	12/15/00
PHOSPHATE BY IC	002	W	00LIC080	12/06/00	12/15/00	12/15/00
SULFATE BY IC	002	W	00LIC080	12/06/00	12/15/00	12/15/00
B10R66						
BROMIDE BY IC	004	W	00LIC080	12/06/00	12/15/00	12/15/00
CHLORIDE BY IC	004	W	00LZC080	12/06/00	12/15/00	12/15/00
FLUORIDE BY IC	004	W	00LIC080	12/06/00	12/15/00	12/15/00
NITRITE BY IC	004	W	00LIC080	12/06/00	12/15/00	12/15/00
NITRATE BY IC	004	W	00LIC080	12/06/00	12/15/00	12/15/00
PHOSPHATE BY IC	004	W	00LIC080	12/06/00	12/15/00	12/15/00
SULFATE BY IC	004	W	00LIC080	12/06/00	12/15/00	12/15/00
B10R68						
BROMIDE BY IC	006	W	00LIC080	12/07/00	12/15/00	12/15/00
BROMIDE BY IC	006 REP	W	00LIC080	12/07/00	12/15/00	12/15/00
BROMIDE BY IC	006 MS	W	00LIC080	12/07/00	12/15/00	12/15/00
CHLORIDE BY IC	006	W	00LZC080	12/07/00	12/15/00	12/15/00
CHLORIDE BY IC	006 REP	W	00LZC080	12/07/00	12/15/00	12/15/00
CHLORIDE BY IC	006 MS	W	00LZC080	12/07/00	12/15/00	12/15/00
FLUORIDE BY IC	006	W	00LIC080	12/07/00	12/15/00	12/15/00
FLUORIDE BY IC	006 REP	W	00LIC080	12/07/00	12/15/00	12/15/00
FLUORIDE BY IC	006 MS	W	00LIC080	12/07/00	12/15/00	12/15/00
NITRITE BY IC	006	W	00LIC080	12/07/00	12/15/00	12/15/00
NITRITE BY IC	006 REP	W	00LIC080	12/07/00	12/15/00	12/15/00
NITRITE BY IC	006 MS	W	00LIC080	12/07/00	12/15/00	12/15/00
NITRATE BY IC	006	W	00LIC080	12/07/00	12/15/00	12/15/00
NITRATE BY IC	006 REP	W	00LIC080	12/07/00	12/15/00	12/15/00
NITRATE BY IC	006 MS	W	00LIC080	12/07/00	12/15/00	12/15/00

RECEIVED
APR 0 2 2001
EDMC

JAN 2001
RECEIVED

01
08

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-009 H1179

DATE RECEIVED: 12/13/00 RFW LOT # :0012L564

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
PHOSPHATE BY IC	006	W	00LIC080	12/07/00	12/15/00	12/15/00
PHOSPHATE BY IC	006 REP	W	00LIC080	12/07/00	12/15/00	12/15/00
PHOSPHATE BY IC	006 MS	W	00LIC080	12/07/00	12/15/00	12/15/00
SULFATE BY IC	006	W	00LIC080	12/07/00	12/15/00	12/15/00
SULFATE BY IC	006 REP	W	00LIC080	12/07/00	12/15/00	12/15/00
SULFATE BY IC	006 MS	W	00LIC080	12/07/00	12/15/00	12/15/00

LAB QC:

BROMIDE BY IC	MB1	W	00LIC080	N/A	12/15/00	12/15/00
BROMIDE BY IC	MB1 BS	W	00LIC080	N/A	12/15/00	12/15/00
CHLORIDE BY IC	MB1	W	00LZC080	N/A	12/15/00	12/15/00
CHLORIDE BY IC	MB1 BS	W	00LZC080	N/A	12/15/00	12/15/00
FLUORIDE BY IC	MB1	W	00LIC080	N/A	12/15/00	12/15/00
FLUORIDE BY IC	MB1 BS	W	00LIC080	N/A	12/15/00	12/15/00
NITRITE BY IC	MB1	W	00LIC080	N/A	12/15/00	12/15/00
NITRITE BY IC	MB1 BS	W	00LIC080	N/A	12/15/00	12/15/00
NITRATE BY IC	MB1	W	00LIC080	N/A	12/15/00	12/15/00
NITRATE BY IC	MB1 BS	W	00LIC080	N/A	12/15/00	12/15/00
PHOSPHATE BY IC	MB1	W	00LIC080	N/A	12/15/00	12/15/00
PHOSPHATE BY IC	MB1 BS	W	00LIC080	N/A	12/15/00	12/15/00
SULFATE BY IC	MB1	W	00LIC080	N/A	12/15/00	12/15/00
SULFATE BY IC	MB1 BS	W	00LIC080	N/A	12/15/00	12/15/00

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD C01-009 H1179
RFW# : 0012L564

W.O. # : 10985-001-001-9999-00
Date Received: 12-13-00

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 3 water samples.

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

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

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

5. The method blanks were within method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits with the exception of LCS 00LIC080-MB1 for Fluoride which was above the 90-110% acceptance limits, however the associated sample results were less than the reporting limit and are not considered biased high.

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

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

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

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

01-22-01
Date

njp\i12-564

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Recra LabNet Philadelphia

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	EPA /600	SW846	OTHER
Acidity	___ 305.1		
___Alkalinity ___Bicarbonate ___Carbonate	___ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chormatography:			
✓ Bromide ✓ Chloride ✓ Fluoride	✓ 300.0	___ 9056	
✓ Nitrate ✓ Nitrite ✓ Phosphate	✓ 300.0	___ 9056	
✓ Sulfate ___Formate ___Acetate ___Oxalate	✓ 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chorination	___ 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	___ 351.4		
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 ___ 376.2	___ 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:**

04

Recra LabNet Philadelphia
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.

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INORGANICS DATA SUMMARY REPORT 01/22/01

CLIENT: TNUHANFORD C01-009 H1179 RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B10R62	Bromide by IC	0.50 u	MG/L	0.50	2.0
		Chloride by IC	29.1	MG/L	2.5	10.0
		Fluoride by IC	1.0 u	MG/L	1.0	2.0
		Nitrite by IC	0.50 u	MG/L	0.50	2.0
		Nitrate by IC	45	MG/L	2.5	10
		Phosphate by IC	0.50 u	MG/L	0.50	2.0
		Sulfate by IC	199	MG/L	12.5	50.0
-004	B10R66	Bromide by IC	0.50 u	MG/L	0.50	2.0
		Chloride by IC	27.3	MG/L	2.5	10.0
		Fluoride by IC	1.0 u	MG/L	1.0	2.0
		Nitrite by IC	0.50 u	MG/L	0.50	2.0
		Nitrate by IC	46	MG/L	2.5	10
		Phosphate by IC	0.50 u	MG/L	0.50	2.0
		Sulfate by IC	196	MG/L	12.5	50.0
-006	B10R68	Bromide by IC	0.50 u	MG/L	0.50	2.0
		Chloride by IC	24.6	MG/L	1.2	5.0
		Fluoride by IC	1.0 u	MG/L	1.0	2.0
		Nitrite by IC	1.2 u	MG/L	1.2	5.0
		Nitrate by IC	37	MG/L	1.2	5.0
		Phosphate by IC	0.50 u	MG/L	0.50	2.0
		Sulfate by IC	159	MG/L	5.0	20.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/22/01

CLIENT: TNUHANFORD C01-009 H1179 RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	00LIC080-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	00LZC080-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 01/22/01

CLIENT: TNUHANFORD C01-009 H1179 RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-006	B10R68	Bromide by IC	8.6	0.00	10.0	85.9	2.0
		Chloride by IC	72.1	24.6	50.0	94.9	10.0
		Fluoride by IC	21.9	0.002	20.0	109.4	2.0
		Nitrite by IC	50	1.2 u	50	100.0	10
		Nitrate by IC	88	37	50	102.7	10
		Phosphate by IC	9.1	0.50u	10.0	90.5	2.0
		Sulfate by IC	411	159	250	100.6	50.0
BLANK10	00LIC080-MB1	Bromide by IC	4.8	0.25u	5.0	96.7	1.0
		Fluoride by IC	11.1	0.50u	10.0	110.8	1.0
		Nitrite by IC	4.9	0.25u	5.0	98.2	1.0
		Nitrate by IC	4.8	0.25u	5.0	96.8	1.0
		Phosphate by IC	5.1	0.25u	5.0	101.6	1.0
		Sulfate by IC	4.9	0.25u	5.0	97.5	1.0
BLANK10	00LZC080-MB1	Chloride by IC	5.0	0.25u	5.0	99.7	1.0

08

~~06~~ 2/20/01

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 01/22/01

CLIENT: TNUHANFORD C01-009 H1179 RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-006REP	B10R68	Bromide by IC	0.50u	0.50u	NC	2.0
		Chloride by IC	24.6	24.5	0.47	5.0
		Fluoride by IC	1.0 u	1.0 u	NC	2.0
		Nitrite by IC	1.2 u	1.2 u	NC	5.0
		Nitrate by IC	37	37	0.62	5.0
		Phosphate by IC	0.50u	0.50u	NC	2.0
		Sulfate by IC	159	160	0.21	20.0

09

DT 1/22/01

RECRA LabNet Use Only
00121564

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: THU-Hanford C01-009
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 12-13-00 Date Due: 1-12-01
Account #:

Refrigerator #		A	B
#/Type Container	Liquid	6	6
	Solid	1P	1P
Volume	Liquid	500	500
	Solid		
Preservatives		HNO3	–

ANALYSES REQUESTED →

ORGANIC				INORG	
VOA	BNA	Pest/PCB	Herb	Metal	CN

RECRA LabNet Use Only

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Metal (1)	IC (1)
001	B10B61 (F)			W	12-6-00	1228	✓	
002	2					↓		✓
003	5 (F)					1228	✓	
004	6					↓		✓
005	7 (F)				12-7-00	0919	✓	
006	8			↓	12-7-00	↓		✓

Special Instructions: Saf C01-009

Run Matrix QC

DATE/REVISIONS:
Mrt (1) 1. Al, Ag, Ba, Br, Ca, Cd, Cr, Co, Cu, Fe, K,
↓ 2. Mg, Mn, Ni, Na, Sb, Sr, V, Zn
IC (1) 3. Br, Cl, F, NO2, NO3, PO4, SO4
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # See below
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N (NO2 NO3 PO4)

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 4.1 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
8214 8983 1875

Relinquished by	Received by	Date	Time
FedEx	TKrippel	12-13-00	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL! REWRITTEN		

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SDG H1179

C.O.C.# C01-009-15

Page 1 of 1

Contact: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-009	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: ISRM GW MONITORING, NOVEMBER 2000	Logbook No.: WM-SAWS-439	Ice Chest No.: SMC-161 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7957 1194
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: 06383

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit invoices & deliverables to JH Kessner, BHI.
Fax copies of TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10R61 (F)		W	12-6-00	1228	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10R62		W	↓	↓	1x500-mL P	IC Anions - 300.0	Cool 4C
B10R62		W	↓	↓	1x20-mL P	Activity Scan	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. R. BREWINGTON	D.R. Brewington		12/7/00	Fed Ex	(FEDERAL EXPRESS)		12-07-00
FEDERAL EXPRESS			12-08-00 10 AM	E. SEGURO		E. Segura	12-08-00 10 AM
[illegible]			12-12-00 16:12	Fed Ex			12-12
Fed Ex			12-13-00 1000	[illegible]			12-13-00 1000

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHem SOG H117-9

C.O.C.# C01-009-16

Page 1 of 1

Collector: D.R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-009	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: ISRM GW MONITORING NOVEMBER 2000	Logbook No.: WM-SHWS-H39	Ice Chest No.: 3ML-141 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 1194
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: 06383

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit invoices & deliverables to JH Kessner, BHI.
Fax copies of TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10R65 (F)		W	12-6-00	12.28	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10R66		W	↓	↓	1x500-mL P	IC Anions - 300.0	Cool 4C
B10R66		W	↓	↓	1x20-mL P	Activity Scan	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. R. BREWINGTON		D.R. Brewington	12/7/00	Fed Ex			12-07-00
FED. EXPRESS			12-08-00 10 AM	E. STEURO		E. Segura	12-08-00 10 AM
JR Corso		JRCorso	12-12-00 16:00	Fed Ex			12-12-00
FedEx			12-13-00 1000				12-13-00 1000

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SDG H1179

C.O.C. # C01-009-19

Page 1 of 1

Collector D. E. PARCHEN	Contact/Requester JH KESSNER	Telephone No. (509) 375-4688 MSIN FAX
SAF No. C01-009	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title ISRM GW MONITORING NOVEMBER 2000	Logbook No. WM-SAWS H 38	Ice Chest No. SMC-573 Temp.
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 4235 7954 1209
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No. 06383

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit invoices & deliverables to JH Kessner, BHI.
Fax copies of TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10R67 (F)		W	12-7-00	0919	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10R68		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10R68		W			1x20-mL P	Activity Scan	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. E. PARCHEN			12/7/00 1300	FEDERAL EXPRESS			12-07-00
FEDERAL EXPRESS			12-08-00 10 AM	E. SEGURO			12-08-00 10 AM
JR Corso			12-12-00 16:40				
FedEx			12-13-00 1000	T Keppel			12-13-00 1000

Matrix *

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

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

PAGE 1 Thermo NUtech CHAIN OF CUSTODY ORD # R0-12-058

12/08/00 20:05:41 WORK ID: SAF C01-009 SDG H1179

RCVD: 12/08/00 DUE: 01/22/01 KEEP: 01/22/02 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS
01A	B10R61(F)	RECRA	DISPOS E011
01B	B10R61(F)MS	RECRA	E011
01C	B10R61(F)DUP	RECRA	E011
02A	B10R62	RECRA	DISPOS E260
02B	B10R62 MS	RECRA	E260
02C	B10R62 DUP	RECRA	E260
03A	B10R65(F)	RECRA	DISPOS E011
04A	B10R66	RECRA	DISPOS E260
05A	B10R67(F)	RECRA	DISPOS E011
06A	B10R68	RECRA	DISPOS E260

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
[illegible]	12-12-00	Fed Ex	12-12-00		
FedEx	12-13-00	RECRA	12-13-00	[illegible]	12-13-00

JAN 2001
RECEIVED

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-009 H1179

DATE RECEIVED: 12/13/00 RFW LOT # :0012L564

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10R61 (F)						
SILVER, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
SILVER, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
SILVER, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
ALUMINUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
ALUMINUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
ALUMINUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
BARIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
BARIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
BARIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
BERYLLIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
BERYLLIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
BERYLLIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
CALCIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
CALCIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
CALCIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
CADMIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
CADMIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
CADMIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
COBALT, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
COBALT, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
COBALT, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
CHROMIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
CHROMIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
CHROMIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
COPPER, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
COPPER, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
COPPER, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
IRON, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
IRON, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
IRON, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
POTASSIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
POTASSIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
POTASSIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
MAGNESIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
MAGNESIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-009 H1179

DATE RECEIVED: 12/13/00 RFW LOT # :0012L564

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
MANGANESE, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/29/00
MANGANESE, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/29/00
MANGANESE, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/29/00
SODIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
SODIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
SODIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
NICKEL, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/29/00
NICKEL, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/29/00
NICKEL, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/29/00
ANTIMONY, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
ANTIMONY, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
ANTIMONY, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
STRONTIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
STRONTIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
STRONTIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
VANADIUM, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/29/00
VANADIUM, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/29/00
VANADIUM, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/29/00
ZINC, TOTAL	001	W	99L1846	12/06/00	12/21/00	12/28/00
ZINC, TOTAL	001 REP	W	99L1846	12/06/00	12/21/00	12/28/00
ZINC, TOTAL	001 MS	W	99L1846	12/06/00	12/21/00	12/28/00
B10R65 (F)						
SILVER, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
ALUMINUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
BARIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
BERYLLIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
CALCIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
CADMIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
COBALT, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
CHROMIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
COPPER, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
IRON, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
POTASSIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
MAGNESIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
MANGANESE, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-009 H1179

DATE RECEIVED: 12/13/00 RFW LOT # :0012L564

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SODIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
NICKEL, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
ANTIMONY, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
STRONTIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
VANADIUM, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
ZINC, TOTAL	003	W	99L1846	12/06/00	12/21/00	12/28/00
B10R67 (F)						
SILVER, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
ALUMINUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
BARIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
BERYLLIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
CALCIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
CADMIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
COBALT, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
CHROMIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
COPPER, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
IRON, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
POTASSIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
MAGNESIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
MANGANESE, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
SODIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
NICKEL, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
ANTIMONY, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
STRONTIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
VANADIUM, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00
ZINC, TOTAL	005	W	99L1846	12/07/00	12/21/00	12/28/00

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
SILVER, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
ALUMINUM LABORTORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
ALUMINUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
BARIUM LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
BARIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
BERYLLIUM LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-009 H1179

DATE RECEIVED: 12/13/00 RFW LOT # :0012L564

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BERYLLIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
CALCIUM LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
CALCIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
CADMIUM LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
CADMIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
COBALT LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
COBALT, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
CHROMIUM LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
CHROMIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
COPPER LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
COPPER, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
IRON LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
IRON, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
POTASSIUM LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
POTASSIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
MAGNESIUM LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
MAGNESIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
MANGANESE LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
MANGANESE, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
SODIUM LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
SODIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
NICKEL LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
NICKEL, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
ANTIMONY LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
ANTIMONY, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
STRONTIUM LCS STANDA	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
STRONTIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
VANADIUM LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
VANADIUM, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00
ZINC LABORATORY	LC1 BS	W	99L1846	N/A	12/21/00	12/28/00
ZINC, TOTAL	MB1	W	99L1846	N/A	12/21/00	12/28/00

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD C01-009
RFW#: 0012L564
SDG/SAF#: H1179/C01-009

W.O.#: 10985-001-001-9999-00
Date Received: 12-13-00

METALS CASE NARRATIVE

1. This narrative covers the analyses of 3 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. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to form 7.

10. The matrix spike (MS) recovery for 1 analyte was 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 levels, due to high concentrations of the following analytes:

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 19 pages.

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B10R61 (F)	Iron	1000	100.1

12. The duplicate analyses for 4 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.

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

01-17-01
Date

gmb/m12-564

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0012L564

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: ✓3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	✓6010B		__200.7				__99
Antimony	✓6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	__6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	✓6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	✓6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	✓6010B		__200.7				__99
Copper	✓6010B	__7211 [5]	__200.7	__220.2			__99
Iron	✓6010B		__200.7				__99
Lead	__6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	✓6010B		__200.7				__99
Manganese	✓6010B		__200.7				__99
Mercury	__7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	✓6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	__6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	✓6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	✓6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-11/99

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/17/01

CLIENT: TNUHANFORD C01-009 H1179 RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B10R61 (F)	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	261		UG/L	19.1	1.0
		Barium, Total	156		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	99900		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	22.0		UG/L	5.6	1.0
		Chromium, Total	282		UG/L	4.9	1.0
		Copper, Total	13.1		UG/L	2.6	1.0
		Iron, Total	430		UG/L	3.8	1.0
		Potassium, Total	23400		UG/L	303	1.0
		Magnesium, Total	21800		UG/L	27.4	1.0
		Manganese, Total	6.9		UG/L	2.3	1.0
		Sodium, Total	24200		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	546		UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	55.3		UG/L	2.7	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/17/01

CLIENT: TNUHANFORD C01-009 H1179 RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B10R65 (F)	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	82.2		UG/L	19.1	1.0
		Barium, Total	145		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	97500		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	23.7		UG/L	5.6	1.0
		Chromium, Total	263		UG/L	4.9	1.0
		Copper, Total	11.2		UG/L	2.6	1.0
		Iron, Total	88.6		UG/L	3.8	1.0
		Potassium, Total	22000		UG/L	303	1.0
		Magnesium, Total	20900		UG/L	27.4	1.0
		Manganese, Total	3.4		UG/L	2.3	1.0
		Sodium, Total	22600		UG/L	22.9	1.0
		Nickel, Total	16.0		UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	526		UG/L	5.5	1.0
		Vanadium, Total	5.1		UG/L	4.8	1.0
		Zinc, Total	52.0		UG/L	2.7	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/17/01

CLIENT: TNUHANFORD C01-009 H1179 RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	B10R67 (F)	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	107		UG/L	19.1	1.0
		Barium, Total	183		UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	53100		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	11.4		UG/L	5.6	1.0
		Chromium, Total	4.9	u	UG/L	4.9	1.0
		Copper, Total	5.3		UG/L	2.6	1.0
		Iron, Total	99.9		UG/L	3.8	1.0
		Potassium, Total	70600		UG/L	303	1.0
		Magnesium, Total	14800		UG/L	27.4	1.0
		Manganese, Total	512		UG/L	2.3	1.0
		Sodium, Total	22400		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	19.9		UG/L	17.0	1.0
		Strontium, Total	359		UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	29.0		UG/L	2.7	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/17/01

CLIENT: TNUHANFORD C01-009 H1179

RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1846-MB1	Silver, Total	2.5	u	UG/L	2.5	1.0
		Aluminum, Total	19.1	u	UG/L	19.1	1.0
		Barium, Total	3.0	u	UG/L	3.0	1.0
		Beryllium, Total	0.60	u	UG/L	0.60	1.0
		Calcium, Total	32.7		UG/L	15.4	1.0
		Cadmium, Total	3.4	u	UG/L	3.4	1.0
		Cobalt, Total	5.6	u	UG/L	5.6	1.0
		Chromium, Total	4.9	u	UG/L	4.9	1.0
		Copper, Total	2.6	u	UG/L	2.6	1.0
		Iron, Total	3.8	u	UG/L	3.8	1.0
		Potassium, Total	303	u	UG/L	303	1.0
		Magnesium, Total	27.4	u	UG/L	27.4	1.0
		Manganese, Total	2.3	u	UG/L	2.3	1.0
		Sodium, Total	58.8		UG/L	22.9	1.0
		Nickel, Total	12.5	u	UG/L	12.5	1.0
		Antimony, Total	17.0	u	UG/L	17.0	1.0
		Strontium, Total	5.5	u	UG/L	5.5	1.0
		Vanadium, Total	4.8	u	UG/L	4.8	1.0
		Zinc, Total	2.7	u	UG/L	2.7	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 01/17/01

CLIENT: TNUHANFORD C01-009 H1179 RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B10R61 (F)	Silver, Total	45.9	2.5 u	50.0	91.8	1.0
		Aluminum, Total	2020	261	2000	88.0	1.0
		Barium, Total	2050	156	2000	94.6	1.0
		Beryllium, Total	47.2	0.60u	50.0	94.4	1.0
		Calcium, Total	122000	99900	25000	87.8	1.0
		Cadmium, Total	49.0	3.4 u	50.0	98.0	1.0
		Cobalt, Total	505	22.0	500	96.6	1.0
		Chromium, Total	453	282	200	85.2	1.0
		Copper, Total	247	13.1	250	93.4	1.0
		Iron, Total	1050	430	1000	62.1	1.0
		Potassium, Total	46500	23400	25000	92.5	1.0
		Magnesium, Total	45600	21800	25000	95.0	1.0
		Manganese, Total	478	6.9	500	94.3	1.0
		Sodium, Total	47500	24200	25000	93.2	1.0
		Nickel, Total	495	12.5 u	500	99.0	1.0
		Antimony, Total	518	17.0 u	500	103.7	1.0
		Strontium, Total	1510	546	1000	96.1	1.0
		Vanadium, Total	475	4.8 u	500	95.0	1.0
		Zinc, Total	525	55.3	500	94.0	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 01/17/01

CLIENT: TNUHANFORD C01-009 H1179 RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B10R61 (F)	Silver, Total	2.5 u	2.5 u	NC	1.0
		Aluminum, Total	261	113	79.5	1.0
		Barium, Total	156	150	3.9	1.0
		Beryllium, Total	0.60u	0.60u	NC	1.0
		Calcium, Total	99900	97100	2.8	1.0
		Cadmium, Total	3.4 u	3.4 u	NC	1.0
		Cobalt, Total	22.0	21.8	0.91	1.0
		Chromium, Total	282	266	6.2	1.0
		Copper, Total	13.1	14.4	9.5	1.0
		Iron, Total	430	254	51.5	1.0
		Potassium, Total	23400	22100	5.4	1.0
		Magnesium, Total	21800	21100	3.2	1.0
		Manganese, Total	6.9	2.5	93.6	1.0
		Sodium, Total	24200	23400	3.4	1.0
		Nickel, Total	12.5 u	17.2	~~NC~~ 200	1.0
		Antimony, Total	17.0 u	17.0 u	NC	1.0
		Strontium, Total	546	581	6.3	1.0
		Vanadium, Total	4.8 u	4.8 u	NC	1.0
		Zinc, Total	55.3	51.3	7.5	1.0

wy: 1/17/01

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/17/01

CLIENT: TNUHANFORD C01-009 H1179

RECRA LOT #: 0012L564

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1846-LC1	Silver, LCS	487	500	UG/L	97.4
		Aluminum, LCS	5030	5000	UG/L	100.6
		Barium, LCS	4950	5000	UG/L	99.1
		Beryllium, LCS	246	250	UG/L	98.4
		Calcium, LCS	24800	25000	UG/L	99.4
		Cadmium, LCS	236	250	UG/L	94.2
		Cobalt, LCS	2490	2500	UG/L	99.8
		Chromium, LCS	497	500	UG/L	99.4
		Copper, LCS	1240	1250	UG/L	98.8
		Iron, LCS	5010	5000	UG/L	100.3
		Potassium, LCS	24700	25000	UG/L	98.8
		Magnesium, LCS	24700	25000	UG/L	98.6
		Manganese, LCS	742	750	UG/L	98.9
		Sodium, LCS	24900	25000	UG/L	99.7
		Nickel, LCS	1990	2000	UG/L	99.5
		Antimony, LCS	2990	3000	UG/L	99.6
		Strontium, LCS	5040	5000	UG/L	100.7
		Vanadium, LCS	2500	2500	UG/L	99.9
		Zinc, LCS	981	1000	UG/L	98.1

RECRA LabNet Use Only
00121564

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: Thru-Hanford C01-009
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: DJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 12-13-00 Date Due: 1-12-01
Account #:

		A	B
Refrigerator #		6	6
#/Type Container	Liquid	1P	1P
	Solid		
Volume	Liquid	500	500
	Solid		
Preservatives		HNO3	–
ANALYSES REQUESTED	ORGANIC: VOA		
	BNA		
	Pest/PCB		
	Herb		
	INORG: Metal		
	CN		
RECRA LabNet Use Only		1 Metal	1 IC

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Metal	IC
001	B10B61 (F)			W	12-6-00	1228	✓	
002	2					↓		✓
003	5 (F)					1228	✓	
004	6					↓		✓
005	7 (F)				12-7-00	0819	✓	
006	8			↓	12-7-00	↓		✓

Special Instructions: Saf C01-009

Run Matrix QC

DATE/REVISIONS:
Mrt 1 1. Al, Ag, Ba, Be, Ca, Cd, Cr, Co, Cu, Fe, K,
↓ 2. Mg, Mn, Ni, Na, Sb, Sr, V, Zn
IC 1 3. Br, Cl, F, NO2, NO3, PO4, SO4
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # See below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times Y or (N) NO2 NO3

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec'd (Y) or N
Cooler Temp. 4.1 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
8214 8983 1875

Relinquished by	Received by	Date	Time
FedEx	TBrown	12-13-00	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL! REWRITTEN		

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PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SDG H1179

C.O.C. # C01-009-15

Page 1 of 1

Contact: D.R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-009	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: ISRM GW MONITORING, NOVEMBER 2000	Logbook No.: WM-SAWS-439	Ice Chest No.: SMC-161 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT VEHICLE	Bill of Lading/Air Bill No.: 4235 7957 1194
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: 06383

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit invoices & deliverables to JH Kessner, BHI.
Fax copies of TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10R61 (F)		W	12-6-00	1228	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10R62		W	↓	↓	1x500-mL P	IC Anions - 300.0	Cool 4C
B10R62		W	↓	↓	1x20-mL P	Activity Scan	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. R. BREWINGTON	D.R. Brewington		12/7/00	FedEx	(FEDERAL EXPRESS)		12-07-00
FEDERAL EXPRESS			12-08-00 10 AM	E. SEGURO	E. Segure		12-08-00 10 AM
[illegible]			12-12-00 16:40	Fed Ex			12-12-00
Fed Ex			12-13-00 1000	[illegible]			12-13-00 1000

Matrix *

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

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Chem 50G H117-9

C.O.C. # C01-009-16

Page 1 of 1

Contact: D.R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-009	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: ISRM GW MONITORING NOVEMBER 2000	Logbook No.: WM-SHW3-139	Ice Chest No.: 3MC-141 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235 7554 1194
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: 06383

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit invoices & deliverables to JH Kessner, BHI.
Fax copies of TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10R85 (F)		W	12-6-00	1228	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10R86		W	↓	↓	1x500-mL P	IC Anions - 300.0	Cool 4C
B10R88		W	↓	↓	1x20-mL P	Activity Scan	None

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
D. R. BREWINGTON D.R. Brewington	12/7/00 1300	Fed Ex	12-07-00
FED. EXPRESS	12-08-00 10 AM	E. SEGURO E. Segura	12-08-00 10 AM
JR Corso JRCorso	12-12-00 16:00	Fed Ex	12-12-00
FedEx	12-13-00 1000	Thippel	12-13-00 1000

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SDG H1179

C.O.C. # C01-009-19

Page 1 of 1

Collector: D. E. PARCHEN	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-009	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: ISRM GW MONITORING NOVEMBER 2000	Logbook No.: WM-SAWS H 38	Ice Chest No.: SMC-573 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT VEHICLE	Bill of Lading/Air Bill No.: 4235 7954 1209
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: 06383

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
Submit invoices & deliverables to JH Kessner, BHI.
Fax copies of TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10R67 (F) ✓		W	12-7-00	0919	1x500-mL G/P ✓	ICP Metals - 6010A RCRA GW ✓	HNO3 to pH <2
B10R68 ✓		W	↓	↓	1x500-mL P ✓	IC Anions - 300.0 ✓	Cool 4C
B10R68 ✓		W	↓	↓	1x20-mL P ✓	Activity Scan ✓	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. E. PARCHEN			12/7/00 1300	FEDERAL EXPRESS			12-08-00
FEDERAL EXPRESS			12-08-00 10 AM	E. SEGURO			12-08-00 10 AM
JR Cotson			12-12-00 16:40				
FedEx			12-13-00 1000	T Kappel			12-13-00 1000

Matrix *

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

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By Date/Time