H1142

0054604

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1142 was composed of two water samples designated under SAF No. C01-008 with a Project Designation of: 100HR3 IAM (1 &2) GW Monitoring, November 2000.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Tritium Analyses

No 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 Mannion
Melissa C. Mannion
Program Manager

1/9/01
Date

RECEIVED
MAR 2 8 2001
EDMC

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

SAMPLE SUMMARY

SDG 7566
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1142

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B10LF1	Hanford Site	WATER		R011127-02	C01-008	C01-008-70	11/15/00 10:56
B10LT9	Hanford Site	WATER		R011127-01	C01-008	C01-008-70	11/15/00 12:51
Method Blank		WATER		R011127-04	C01-008		
Lab Control Sample		WATER		R011127-03	C01-008		
Duplicate (R011127-01)	Hanford Site	WATER		R011127-05	C01-008		11/15/00 12:51
Spike (R011127-01)	Hanford Site	WATER		R011127-06	C01-008		11/15/00 12:51

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

QC SUMMARY

SDG 7566
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1142

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7566	C01-008-70	B10LF1	WATER				11/16/00	1	R011127-02	7566-002
		B10LT9	WATER				11/16/00	1	R011127-01	7566-001
		Method Blank	WATER						R011127-04	7566-004
		Lab Control Sample	WATER						R011127-03	7566-003
		Duplicate (R011127-01)	WATER				11/16/00	1	R011127-05	7566-005
		Spike (R011127-01)	WATER				11/16/00	1	R011127-06	7566-006

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

PREP BATCH SUMMARY

SDG 7566
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1142

TEST	MATRIX	METHOD	PREPARATION ERROR BATCH	2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
82B	WATER	Gross Beta in Water	6962-112	15.0	2			1	1	1/1		
88A	WATER	Gross Alpha in Water	6962-112	20.0	2			1	1	1/1		
Liquid Scintillation Counting												
H	WATER	Tritium in Water	6962-112	10.0	2			1	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 TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

WORK SUMMARY

SDG 7566
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1142

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B10LF1			R011127-02	7566-002	82B/82		01/02/01	01/09/01	MCM	Gross Beta in Water
Hanford Site		WATER	11/15/00	7566-002	88A/88		01/08/01	01/09/01	MCM	Gross Alpha in Water
C01-008-70	C01-008		11/16/00	7566-002	H		12/15/00	01/09/01	MCM	Tritium in Water
B10LT9			R011127-01	7566-001	82B/82		01/02/01	01/09/01	MCM	Gross Beta in Water
Hanford Site		WATER	11/15/00	7566-001	88A/88		01/05/01	01/09/01	MCM	Gross Alpha in Water
C01-008-70	C01-008		11/16/00	7566-001	H		12/15/00	01/09/01	MCM	Tritium in Water
Method Blank			R011127-04	7566-004	82B/82		01/02/01	01/09/01	MCM	Gross Beta in Water
		WATER		7566-004	88A/88		01/08/01	01/09/01	MCM	Gross Alpha in Water
	C01-008			7566-004	H		12/15/00	01/09/01	MCM	Tritium in Water
Lab Control Sample			R011127-03	7566-003	82B/82		01/02/01	01/09/01	MCM	Gross Beta in Water
		WATER		7566-003	88A/88		01/08/01	01/09/01	MCM	Gross Alpha in Water
	C01-008			7566-003	H		12/15/00	01/09/01	MCM	Tritium in Water
Duplicate (R011127-01)			R011127-05	7566-005	82B/82		01/02/01	01/09/01	MCM	Gross Beta in Water
Hanford Site		WATER	11/15/00	7566-005	88A/88		01/08/01	01/09/01	MCM	Gross Alpha in Water
	C01-008		11/16/00	7566-005	H		12/15/00	01/09/01	MCM	Tritium in Water
Spike (R011127-01)			R011127-06	7566-006	H		12/15/00	01/09/01	MCM	Tritium in Water
Hanford Site		WATER	11/15/00							
	C01-008		11/16/00							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
82B/82	C01-008	Gross Beta in Water	900.0_ALPHABETA_GPC	2			1	1	1		5
88A/88	C01-008	Gross Alpha in Water	900.0_ALPHABETA_GPC	2			1	1	1		5
H	C01-008	Tritium in Water	906.0_H3_LSC	2			1	1	1	1	6
TOTALS				6			3	3	3	1	16

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/09/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1142

R011127-04 **Method Blank**

METHOD BLANK

SDG	7566	Client/Case no	Hanford	SDG H1142	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R011127-04	Client sample id	Method Blank		
Dept sample id	7566-004	Material/Matrix		WATER	
		SAF No	C01-008		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0	0.53	1.1	3.0	U	88A
Gross Beta	12587-47-2	0.156	1.1	1.8	4.0	U	82B
Tritium	10028-17-8	-145	230	400	400	U	H

100HR3 IAM (1&2) GW Mon.-Nov. 2000

QC-BLANK 36826

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

R011127-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7566
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1142
Case no TRC-SBB-207925

Lab sample id R011127-03
Dept sample id 7566-003

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No C01-008

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	72.7	5.3	1.2	3.0		88A	67.0	2.7	108	65-135	70-130
Gross Beta	75.1	3.5	2.0	4.0		82B	73.3	2.9	102	75-125	70-130
Tritium	8430	470	410	400		H	9320	370	90	83-117	80-120

100HR3 IAM (1&2) GW Mon.-Nov. 2000

QC-LCS 36825

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

R011127-05 B10LT9

DUPLICATE

SDG	7566			Client/Case no	Hanford SDG H1142
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R011127-05	Lab sample id	R011127-01	Client sample id	B10LT9
Dept sample id	7566-005	Dept sample id	7566-001	Location/Matrix	Hanford Site WATER
		Received	11/16/00	Collected	11/15/00 12:51
				Custody/SAF No	C01-008-70 C01-008

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	0.098	0.79	1.6	3.0	U	88A	0.447	0.69	1.2	U	-		
Gross Beta	4.12	1.3	1.8	4.0		82B	2.61	1.7	2.7	U	45	101	
Tritium	1590	170	200	400		H	1630	170	200		2	31	

100HR3 IAM (1&2) GW Mon.-Nov. 2000

QC-DUP#1 36827

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

R011127-06 B10LT9

MATRIX SPIKE

SDG	7566			Client/Case no	Hanford SDG H1142
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R011127-06	Lab sample id	R011127-01	Client sample id	B10LT9
Dept sample id	7566-006	Dept sample id	7566-001	Location/Matrix	Hanford Site WATER
		Received	11/16/00	Collected	11/15/00 12:51
				Custody/SAF No	C01-008-70 C01-008

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	19600	480	220	400		H	17900	720	1630	170	100	82-118	60-140

100HR3 IAM (1&2) GW Mon.-Nov. 2000

QC-MS#1 36828

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 01/09/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1142

R011127-02 B10LF1

DATA SHEET

SDG	7566	Client/Case no	Hanford SDG H1142
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R011127-02	Client sample id	B10LF1
Dept sample id	7566-002	Location/Matrix	Hanford Site WATER
Received	11/16/00	Collected	11/15/00 10:56
		Custody/SAF No	C01-008-70 C01-008

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.106	1.3	2.3	3.0	U	88A
Gross Beta	12587-47-2	44.4	2.9	2.2	4.0		82B
Tritium	10028-17-8	4710	240	200	400		H

100HR3 IAM (1&2) GW Mon.-Nov. 2000

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/09/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1142

R011127-01 **B10LT9**

DATA SHEET

SDG	7566	Client/Case no	Hanford	SDG H1142	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R011127-01	Client sample id	B10LT9		
Dept sample id	7566-001	Location/Matrix	Hanford Site	WATER	
Received	11/16/00	Collected	11/15/00 12:51		
		Custody/SAF No	C01-008-70	C01-008	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.447	0.69	1.2	3.0	U	88A
Gross Beta	12587-47-2	2.61	1.7	2.7	4.0	U	82B
Tritium	10028-17-8	1630	170	200	400		H

100HR3 IAM (1&2) GW Mon.-Nov. 2000

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Test 82B Matrix WATER
SDG 7566
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1142

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Gross Beta	2: Sum, Beta Emitters	RESULT RATIO (%) 2÷1	2σ
Preparation batch 6962-112								
B10LF1	R011127-02	82		7566-002	44.4			
B10LT9	R011127-01	82		7566-001	U			
BLK (QC ID=36826)	R011127-04	82		7566-004	U			
LCS (QC ID=36825)	R011127-03	82		7566-003	ok			
Duplicate (R011127-01)	R011127-05	82		7566-005	ok			
Nominal values and limits from method				RDLs (pCi/L)	4.0			
100HR3 IAM (1&2) GW Mon.-Nov. 2000						Average		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6962-112	2σ prep error 15.0 %				Reference Lab Notebook 6962 pg. 112											
B10LF1	R011127-02	82		2.2	0.300			124		100			48	12/07/00	01/02	GRB-115
B10LT9	R011127-01	82		2.7	0.300			66		100			48	12/07/00	01/02	GRB-114
BLK (QC ID=36826)	R011127-04	82		1.8	0.300			24		100				12/07/00	01/02	GRB-105
LCS (QC ID=36825)	R011127-03	82		2.0	0.300			25		100				12/07/00	01/02	GRB-115
Duplicate (R011127-01) (QC ID=36827)	R011127-05	82		1.8	0.300			60		100			48	12/07/00	01/02	GRB-107
Nominal values and limits from method				4.0	0.300			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-120	Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES				
	MDA	2.1	±	0.75
	RESIDUE	60	±	82

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Test 88A Matrix WATER
SDG 7566
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1142

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 6962-112						
B10LF1	R011127-02	88		7566-002	U	
B10LT9	R011127-01	88		7566-001	U	
BLK (QC ID=36826)	R011127-04	88		7566-004	U	
LCS (QC ID=36825)	R011127-03	88		7566-003	ok	
Duplicate (R011127-01)	R011127-05	88		7566-005	-	U
Nominal values and limits from method 100HR3 IAM (1&2) GW Mon.-Nov. 2000				RDLs (pCi/L)	3.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6962-112 2σ prep error 20.0 % Reference Lab Notebook 6962 pg. 112																
B10LF1	R011127-02	88		2.3	0.300			106		100			54	12/07/00	01/08	GRB-107
B10LT9	R011127-01	88		1.2	0.300			55		100			51	12/07/00	01/05	GRB-116
BLK (QC ID=36826)	R011127-04	88		1.1	0.300			23		100				12/07/00	01/08	GRB-110
LCS (QC ID=36825)	R011127-03	88		1.2	0.300			23		100				12/07/00	01/08	GRB-108
Duplicate (R011127-01) (QC ID=36827)	R011127-05	88		1.6	0.300			56		100			54	12/07/00	01/08	GRB-111
Nominal values and limits from method				3.0	0.300			5-250		100			180			

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 1.5 ± 0.99
RESIDUE 53 ± 68

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/09/01

Test H Matrix WATER
SDG 7566
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1142

METHOD SUMMARY

TRITIUM IN WATER
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1142

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium
Preparation batch 6962-112					
B10LF1	R011127-02			7566-002	4710
B10LT9	R011127-01			7566-001	1630
BLK (QC ID=36826)	R011127-04			7566-004	U
LCS (QC ID=36825)	R011127-03			7566-003	ok
Duplicate (R011127-01)	R011127-05			7566-005	ok
Spike (R011127-01)	R011127-06			7566-006	ok
Nominal values and limits from method				RDLs (pCi/L)	400
100HR3 IAM (1&2) GW Mon.-Nov. 2000					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6962-112	2σ prep error 10.0 %			Reference Lab Notebook 6962 pg. 112												
B10LF1	R011127-02			200	0.0500			20		100			30	12/14/00	12/15	LSC-005
B10LT9	R011127-01			200	0.0500			20		100			30	12/14/00	12/15	LSC-005
BLK (QC ID=36826)	R011127-04			400	0.0500			10		100				12/14/00	12/15	LSC-005
LCS (QC ID=36825)	R011127-03			410	0.0500			10		100				12/14/00	12/15	LSC-005
Duplicate (R011127-01) (QC ID=36827)	R011127-05			200	0.0500			20		100			30	12/14/00	12/15	LSC-005
Spike (R011127-01) (QC ID=36828)	R011127-06			220	0.0500			18		100			30	12/14/00	12/15	LSC-005
Nominal values and limits from method				400	0.0500					25			180			

PROCEDURES REFERENCE 906.0_H3_LSC
CP-210 Tritium in Water Samples by Distillation, rev 3

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 270 ± 210
YIELD 16 ± 10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/09/01

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # C01-008-70

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-008	Sampling Origin: HANFORD SITE H1142 (7566)	Purchase Order/Charge Code
Project Title: 100HR3 IAM (1&2) GW MONITORING, NOVEMBER, 2000	Logbook No.: WM-SAWS-1437	Ice Chest No.: PL46 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235795 4 0647
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100036

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

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

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
[redacted]		W	11/15/00	1251	[redacted]	[redacted]	HNO3 to pH <2
[redacted]		W			[redacted]	[redacted]	HNO3 to pH <2
[redacted]		W			[redacted]	[redacted]	Cool 4C
B10LT9		W			1x20-mL P	Activity Scan	None
B10LT9		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10LT9		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10LT9		W			1x250-mL P	Tritium - H3	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. R. BREWINGTON		DR Brewington	11/15/00 1430	FEDX			11-15-00
FED. EXPRESS			11-16-00 10:AM	E. Segura			11/16/00 10:11

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

C.O.C. # C01-008-114

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-008	Sampling Origin: HANFORD SITE H1142 (7566)	Purchase Order/Charge Code
Project Title: 100HR3 IAM (1&2) GW MONITORING, NOVEMBER, 2000	Logbook No.: WM-SAWS-H37	Ice Chest No.: PLUG Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235795406 47
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W01 00036

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

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

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10LF0 (P) ✓		W	11/15/00	1056	[illegible]	ICP Metals 6010A RCRA GW ✓	HNO3 to pH <2
B10LF1 ✓		W			[illegible]	ICP Metals 6010A RCRA GW ✓	HNO3 to pH <2
B10LF1 ✓		W			[illegible]	[illegible] ✓	Cool 4C
B10LF1 ✓		W			1x20-mL P	Activity Scan ✓	None
B10LF1 ✓		W			2x1000-mL G/P	Gross Alpha ✓	HNO3 to pH <2
B10LF1 ✓		W			2x1000-mL G/P	Gross Beta ✓	HNO3 to pH <2
B10LF1 ✓		W			1x250-mL P	Tritium - H3 ✓	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. R. BREWINGTON		D. R. Brewington	11/15/00 1430	FEDX			11-15-00
FED. EXPRESS			11/16/00 10:AM	E. Reguro			11-16-00 10:AM

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

ThermoRetec
Richmond Laboratory

Analytical Services

ICE CHEST RECEIPT LOG

Use one form per shipment. Refer to Thermometer Correction Log for correction factor.

Customer: Date:

Ice chest # or description	PLUG					
Thermometer: time in	10:30					
Thermometer: time out	11:00					
Thermometer reading	4°C					
Thermometer number	2132					
Correction factor	NONE					
Actual temperature*	—					
Custody seals on ice chest intact?	Yes					
Custody seals dated ?	Yes					
Custody seals signed?	Yes					
Custody seals on samples?	Yes					
Ice chest scanned for activity?	Yes					

* Temperature is in degrees centigrade.

Technician:

Comments:

ThermoRetec
Richmond Laboratory

Analytical Services

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: (WMTS) BECHTEL HANFORD (PNNL) Date/Time received 11-16-00 10:AM

CoC No. C01-008-70-G C01-008-114

Container I.D. No. PLUG Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 4
7. Number of containers per sample: CHECK FOR (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____
13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by E. Segura Date: 11-16-00 Time: 10:AM

Customer Sample No.	cpm	mr/hr	Customer Sample No.	Cpm	mr/hr

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

JAN 2001 RECEIVED

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-008 H1142

DATE RECEIVED: 11/21/00 RFW LOT # :0011L348

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10LT9						
BROMIDE BY IC	002	W	00LIC076	11/15/00	11/29/00	11/29/00
BROMIDE BY IC	002 REP	W	00LIC076	11/15/00	11/29/00	11/29/00
BROMIDE BY IC	002 MS	W	00LIC076	11/15/00	11/29/00	11/29/00
CHLORIDE BY IC	002	W	00LIC076	11/15/00	11/29/00	11/29/00
CHLORIDE BY IC	002 REP	W	00LIC076	11/15/00	11/29/00	11/29/00
CHLORIDE BY IC	002 MS	W	00LIC076	11/15/00	11/29/00	11/29/00
FLUORIDE BY IC	002	W	00LIC076	11/15/00	11/29/00	11/29/00
FLUORIDE BY IC	002 REP	W	00LIC076	11/15/00	11/29/00	11/29/00
FLUORIDE BY IC	002 MS	W	00LIC076	11/15/00	11/29/00	11/29/00
NITRITE BY IC	002	W	00LIC076	11/15/00	11/29/00	11/29/00
NITRITE BY IC	002 REP	W	00LIC076	11/15/00	11/29/00	11/29/00
NITRITE BY IC	002 MS	W	00LIC076	11/15/00	11/29/00	11/29/00
NITRATE BY IC	002	W	00LIC076	11/15/00	11/29/00	11/29/00
NITRATE BY IC	002 REP	W	00LIC076	11/15/00	11/29/00	11/29/00
NITRATE BY IC	002 MS	W	00LIC076	11/15/00	11/29/00	11/29/00
PHOSPHATE BY IC	002	W	00LIC076	11/15/00	11/29/00	11/29/00
PHOSPHATE BY IC	002 REP	W	00LIC076	11/15/00	11/29/00	11/29/00
PHOSPHATE BY IC	002 MS	W	00LIC076	11/15/00	11/29/00	11/29/00
SULFATE BY IC	002	W	00LIC076	11/15/00	11/29/00	11/29/00
SULFATE BY IC	002 REP	W	00LIC076	11/15/00	11/29/00	11/29/00
SULFATE BY IC	002 MS	W	00LIC076	11/15/00	11/29/00	11/29/00
B10LF1						
BROMIDE BY IC	004	W	00LIC076	11/15/00	11/29/00	11/29/00
CHLORIDE BY IC	004	W	00LIC076	11/15/00	11/29/00	11/29/00
FLUORIDE BY IC	004	W	00LIC076	11/15/00	11/29/00	11/29/00
NITRITE BY IC	004	W	00LIC076	11/15/00	11/29/00	11/29/00
NITRATE BY IC	004	W	00LIC076	11/15/00	11/29/00	11/29/00
PHOSPHATE BY IC	004	W	00LIC076	11/15/00	11/29/00	11/29/00
SULFATE BY IC	004	W	00LIC076	11/15/00	11/29/00	11/29/00

LAB QC:

BROMIDE BY IC	MB1	W	00LIC076	N/A	11/29/00	11/29/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-008 H1142

DATE RECEIVED: 11/21/00 RFW LOT # :0011L348

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BROMIDE BY IC	MB1 BS	W	00LIC076	N/A	11/29/00	11/29/00
CHLORIDE BY IC	MB1	W	00LIC076	N/A	11/29/00	11/29/00
CHLORIDE BY IC	MB1 BS	W	00LIC076	N/A	11/29/00	11/29/00
FLUORIDE BY IC	MB1	W	00LIC076	N/A	11/29/00	11/29/00
FLUORIDE BY IC	MB1 BS	W	00LIC076	N/A	11/29/00	11/29/00
NITRITE BY IC	MB1	W	00LIC076	N/A	11/29/00	11/29/00
NITRITE BY IC	MB1 BS	W	00LIC076	N/A	11/29/00	11/29/00
NITRATE BY IC	MB1	W	00LIC076	N/A	11/29/00	11/29/00
NITRATE BY IC	MB1 BS	W	00LIC076	N/A	11/29/00	11/29/00
PHOSPHATE BY IC	MB1	W	00LIC076	N/A	11/29/00	11/29/00
PHOSPHATE BY IC	MB1 BS	W	00LIC076	N/A	11/29/00	11/29/00
SULFATE BY IC	MB1	W	00LIC076	N/A	11/29/00	11/29/00
SULFATE BY IC	MB1 BS	W	00LIC076	N/A	11/29/00	11/29/00

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD C01-008 H1142
RFW# : 0011L348

W.O. # : 10985-001-001-9999-00
Date Received: 11-21-00

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 2 water samples.

2. The samples were 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, 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.

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

01-05-01
Date

njp\i11-348

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 13 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:

L-WI-034/A-02/00

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.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/06/00

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B10LT9	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	9.6	MG/L	1.2	5.0
		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	16	MG/L	1.2	5.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	33.5	MG/L	1.2	5.0
-004	B10LF1	Bromide by IC	0.50 u	MG/L	0.50	2.0
		Chloride by IC	23.4	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	58.3	MG/L	2.5	10.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/06/00

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	00LIC076-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 12/06/00

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	B10LT9	Bromide by IC	9.4	0.00	10.0	94.3	2.0
		Chloride by IC	57.2	9.6	50.0	95.1	10.0
		Fluoride by IC	21.7	0.098	20.0	107.8	2.0
		Nitrite by IC	10	0.25u	10	102.9	2.0
		Nitrate by IC	66	16	50	98.7	10
		Phosphate by IC	9.7	0.25u	10.0	97.0	2.0
		Sulfate by IC	84.2	33.5	50.0	101.5	10.0
BLANK10	00LIC076-MB1	Bromide by IC	4.9	0.25u	5.0	98.1	1.0
		Chloride by IC	5.0	0.25u	5.0	99.9	1.0
		Fluoride by IC	10.8	0.50u	10.0	108.0	1.0
		Nitrite by IC	5.0	0.25u	5.0	100.3	1.0
		Nitrate by IC	4.9	0.25u	5.0	98.5	1.0
		Phosphate by IC	5.0	0.25u	5.0	99.5	1.0
		Sulfate by IC	4.8	0.25u	5.0	96.9	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/06/00

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	B10LT9	Bromide by IC	0.25u	0.25u	NC	1.0
		Chloride by IC	9.6	9.7	0.84	5.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	16	16	0.061	5.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	33.5	33.7	0.62	5.0

RECRA LabNet Use Only
0011L348

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TWU-HANFORD SAF C01-008
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: 11-21-00 Date Due: 12-21-00
Account #:

Refrigerator #		A	B
#/Type Container	Liquid	1PL	1PL
	Solid		
Volume	Liquid	500	500
	Solid		
Preservatives		HNO3	—
ANALYSES REQUESTED → ORGANIC: VOA			
ORGANIC: BNA			
ORGANIC: Pest/PCB			
ORGANIC: Herb			
INORG: Metal			
INORG: CN			
INORG: IC		4/4/4/4	
RECRA LabNet Use Only		(1) MET	(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	A	B
001	B10LT8			W	11/15/00	1251	1	
002	T9				⊥	⊥	1	1
003	F0				11/15/00	1056	1	
004	F1				⊥	⊥	1	1

Special Instructions: Saf C01-008
Run Matrix QC

DATE/REVISIONS:
Met(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, Fl, NO_2, NO_3, PO_4, SO_4
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # Fedex
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

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. 5°C

Relinquished by	Received by	Date	Time
[signature]	[signature]	11/21/00	1015

Relinquished by	Received by	Date	Time
COMPOSITE	ORIGINAL / REVISED		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
8214 8983 0170

PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SDG H1142

C.O.C. # C01-008-7

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-008	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100HR3 IAM (1&2) GW MONITORING NOVEMBER 2000	Logbook No.: WM-SAWS-H37	Ice Chest No.: PL46 Temp.
Shipped To (Lab): TMA/RCRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235795406 47
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100036

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

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

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10LT8 (F)		W	11/15/00	1251	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10LT9		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10LT9		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10LT9		W			1x20-mL P	Activity Scan	None
B10LT9		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10LT9		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10LT9		W			1x250-mL P	Tritium - H3	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. R. BREWINGTON		DR Brewington	11/15/00 1430	FED X			11-15-00
FED. EXPRESS			11-16-00 10:AM	E. Segura			11/16/00 10:AM
DR Cerso		DR Cerso	11-20-00 16:00	Fed Ex			11-20-00
Fed Ex			11/21/00 1015	[illegible]			11/21/00 1015

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 SOL H1142

C.O.C. # C01-008-114

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-008	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100HR3 IAM (1&2) GW MONITORING, NOVEMBER, 2000	Logbook No.: WM-SAWS-H37	Ice Chest No.: PLLIG Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235795406 47
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W01 00036

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time
Fax TMA log-in to JH Kessner (372-9487) & DL Stewart (372-1704).

Total Activity Exemption: Yes ☑ No ☐

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10LF0 (F)		W	11/15/00	1056	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10LF1		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10LF1		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10LF1		W			1x20-mL P	Activity Scan	None
B10LF1		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10LF1		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10LF1		W			1x250-mL P	Tritium - H3	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. R. BREWINGTON	D. R. Brewington		11/15/00	FED X			11-15-00
FED. EXPRESS			11/16/00	E. Reguro			11-16-00
JR Corso	JR Corso		11-20-00 16:00	Fed Ex			11-20-00
Fed Ex			11/21/00 1015	V. Hunt			11/21/00 10:15

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 # R0-11-131

11/16/00 14:40:49 WORK ID: SAP C01-008 SDG H1142

RCVD: 11/16/00 DUE: 12/31/00 KEEP: 12/31/01 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS
01A	B10LT8(F)	RECRA	DISPOS E011
02A	B10LT9	RECRA	DISPOS E011 E260
02B	B10LT9 MS	RECRA	E011 E260
02C	B10LT9 DUP	RECRA	E011 E260
03A	B10LF0(F)	RECRA	DISPOS E011
04A	B10LF1	RECRA	DISPOS E011 E260

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
[illegible]	11-20-00	Fed Ex	11-20-00		

JAN 2001
RECEIVED

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-008 H1142

DATE RECEIVED: 11/21/00 RFW LOT # :0011L348

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10LT8						
SILVER, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
SILVER, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
SILVER, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
ALUMINUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
ALUMINUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
ALUMINUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
BARIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
BARIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
BARIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
BERYLLIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
BERYLLIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
BERYLLIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
CALCIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
CALCIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
CALCIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
CADMIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
CADMIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
CADMIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
COBALT, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
COBALT, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
COBALT, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
CHROMIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
CHROMIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
CHROMIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
COPPER, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
COPPER, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
COPPER, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
IRON, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
IRON, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
IRON, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
POTASSIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
POTASSIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
POTASSIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
MAGNESIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
MAGNESIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-008 H1142

DATE RECEIVED: 11/21/00 RFW LOT # :0011L348

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
MANGANESE, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
MANGANESE, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
MANGANESE, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
SODIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
SODIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
SODIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
NICKEL, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
NICKEL, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
NICKEL, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
ANTIMONY, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
ANTIMONY, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
ANTIMONY, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
STRONTIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
STRONTIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
STRONTIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
VANADIUM, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
VANADIUM, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
VANADIUM, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
ZINC, TOTAL	001	W	99L1826	11/15/00	12/15/00	12/21/00
ZINC, TOTAL	001 REP	W	99L1826	11/15/00	12/15/00	12/21/00
ZINC, TOTAL	001 MS	W	99L1826	11/15/00	12/15/00	12/21/00
B10LT9						
SILVER, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
ALUMINUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
BARIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
BERYLLIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
CALCIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
CADMIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
COBALT, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
CHROMIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
COPPER, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
IRON, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
POTASSIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
MAGNESIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
MANGANESE, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-008 H1142

DATE RECEIVED: 11/21/00 RFW LOT # :0011L348

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SODIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
NICKEL, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
ANTIMONY, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
STRONTIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
VANADIUM, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
ZINC, TOTAL	002	W	99L1826	11/15/00	12/15/00	12/21/00
B10LF0						
SILVER, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
ALUMINUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
BARIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
BERYLLIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
CALCIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
CADMIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
COBALT, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
CHROMIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
COPPER, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
IRON, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
POTASSIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
MAGNESIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
MANGANESE, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
SODIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
NICKEL, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
ANTIMONY, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
STRONTIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
VANADIUM, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
ZINC, TOTAL	003	W	99L1826	11/15/00	12/15/00	12/21/00
B10LF1						
SILVER, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
ALUMINUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
BARIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
BERYLLIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
CALCIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
CADMIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
COBALT, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-008 H1142

DATE RECEIVED: 11/21/00 RFW LOT # :0011L348

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
COPPER, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
IRON, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
POTASSIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
MAGNESIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
MANGANESE, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
SODIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
NICKEL, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
ANTIMONY, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
STRONTIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
VANADIUM, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00
ZINC, TOTAL	004	W	99L1826	11/15/00	12/15/00	12/21/00

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
SILVER, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
ALUMINUM LABORTORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
ALUMINUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
BARIUM LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
BARIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
BERYLLIUM LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
BERYLLIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
CALCIUM LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
CALCIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
CADMIUM LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
CADMIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
COBALT LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
COBALT, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
CHROMIUM LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
CHROMIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
COPPER LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
COPPER, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
IRON LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
IRON, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
POTASSIUM LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
POTASSIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
MAGNESIUM LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD C01-008 H1142

DATE RECEIVED: 11/21/00 RFW LOT # :0011L348

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
MANGANESE LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
MANGANESE, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
SODIUM LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
SODIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
NICKEL LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
NICKEL, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
ANTIMONY LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
ANTIMONY, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
STRONTIUM LCS STANDA	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
STRONTIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
VANADIUM LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
VANADIUM, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00
ZINC LABORATORY	LC1 BS	W	99L1826	N/A	12/15/00	12/21/00
ZINC, TOTAL	MB1	W	99L1826	N/A	12/15/00	12/21/00

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD C01-008
RFW#: 0011L348
SDG/SAF#: H1142/C01-008

W.O.#: 10985-001-001-9999-00
Date Received: 11-21-00

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 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. The preparation/method blank for 1 analyte was 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 result for Zinc was 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 form 7.

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 20 pages.

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10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

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

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

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

01-05-01
Date

gmb/m11-348

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0011L348

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

08

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 01/04/01

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B10LT8	Silver, Total	1.1	u	UG/L	1.1	1.0
		Aluminum, Total	22.7	u	UG/L	22.7	1.0
		Barium, Total	55.0		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Calcium, Total	38000		UG/L	19.2	1.0
		Cadmium, Total	0.30	u	UG/L	0.30	1.0
		Cobalt, Total	0.90	u	UG/L	0.90	1.0
		Chromium, Total	18.7		UG/L	0.60	1.0
		Copper, Total	0.90	u	UG/L	0.90	1.0
		Iron, Total	21.8	u	UG/L	21.8	1.0
		Potassium, Total	3990		UG/L	40.9	1.0
		Magnesium, Total	8740		UG/L	6.7	1.0
		Manganese, Total	0.20	u	UG/L	0.20	1.0
		Sodium, Total	10400		UG/L	4.1	1.0
		Nickel, Total	1.2		UG/L	0.90	1.0
		Antimony, Total	2.3	u	UG/L	2.3	1.0
		Strontium, Total	184		UG/L	0.10	1.0
		Vanadium, Total	5.5		UG/L	0.80	1.0
		Zinc, Total	2.5		UG/L	0.40	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/04/01

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B10LT9	Silver, Total	1.1	u	UG/L	1.1	1.0
		Aluminum, Total	22.7	u	UG/L	22.7	1.0
		Barium, Total	54.7		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Calcium, Total	37900		UG/L	19.2	1.0
		Cadmium, Total	0.30	u	UG/L	0.30	1.0
		Cobalt, Total	0.90	u	UG/L	0.90	1.0
		Chromium, Total	20.7		UG/L	0.60	1.0
		Copper, Total	0.90	u	UG/L	0.90	1.0
		Iron, Total	26.4		UG/L	21.8	1.0
		Potassium, Total	3990		UG/L	40.9	1.0
		Magnesium, Total	8690		UG/L	6.7	1.0
		Manganese, Total	0.74		UG/L	0.20	1.0
		Sodium, Total	10300		UG/L	4.1	1.0
		Nickel, Total	1.9		UG/L	0.90	1.0
		Antimony, Total	2.3	u	UG/L	2.3	1.0
		Strontium, Total	182		UG/L	0.10	1.0
		Vanadium, Total	5.3		UG/L	0.80	1.0
		Zinc, Total	5.7		UG/L	0.40	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/04/01

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B10LF0	Silver, Total	1.1	u	UG/L	1.1	1.0
		Aluminum, Total	22.7	u	UG/L	22.7	1.0
		Barium, Total	31.2		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Calcium, Total	77100		UG/L	19.2	1.0
		Cadmium, Total	0.30	u	UG/L	0.30	1.0
		Cobalt, Total	0.90	u	UG/L	0.90	1.0
		Chromium, Total	20.7		UG/L	0.60	1.0
		Copper, Total	1.2		UG/L	0.90	1.0
		Iron, Total	37.9		UG/L	21.8	1.0
		Potassium, Total	3260		UG/L	40.9	1.0
		Magnesium, Total	9940		UG/L	6.7	1.0
		Manganese, Total	0.66		UG/L	0.20	1.0
		Sodium, Total	7940		UG/L	4.1	1.0
		Nickel, Total	2.0		UG/L	0.90	1.0
		Antimony, Total	2.3	u	UG/L	2.3	1.0
		Strontium, Total	332		UG/L	0.10	1.0
		Vanadium, Total	2.8		UG/L	0.80	1.0
		Zinc, Total	4.3		UG/L	0.40	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/04/01

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	B10LF1	Silver, Total	1.1	u	UG/L	1.1	1.0
		Aluminum, Total	32.1		UG/L	22.7	1.0
		Barium, Total	34.0		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Calcium, Total	83700		UG/L	19.2	1.0
		Cadmium, Total	0.30	u	UG/L	0.30	1.0
		Cobalt, Total	0.90	u	UG/L	0.90	1.0
		Chromium, Total	24.9		UG/L	0.60	1.0
		Copper, Total	0.90	u	UG/L	0.90	1.0
		Iron, Total	69.9		UG/L	21.8	1.0
		Potassium, Total	3510		UG/L	40.9	1.0
		Magnesium, Total	10800		UG/L	6.7	1.0
		Manganese, Total	1.6		UG/L	0.20	1.0
		Sodium, Total	8520		UG/L	4.1	1.0
		Nickel, Total	3.2		UG/L	0.90	1.0
		Antimony, Total	2.3	u	UG/L	2.3	1.0
		Strontium, Total	363		UG/L	0.10	1.0
		Vanadium, Total	2.8		UG/L	0.80	1.0
		Zinc, Total	3.6		UG/L	0.40	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/04/01

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1826-MB1	Silver, Total	1.1	u	UG/L	1.1	1.0
		Aluminum, Total	22.7	u	UG/L	22.7	1.0
		Barium, Total	0.42		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Calcium, Total	20.2		UG/L	19.2	1.0
		Cadmium, Total	0.30	u	UG/L	0.30	1.0
		Cobalt, Total	0.91		UG/L	0.90	1.0
		Chromium, Total	0.90		UG/L	0.60	1.0
		Copper, Total	1.3		UG/L	0.90	1.0
		Iron, Total	21.8	u	UG/L	21.8	1.0
		Potassium, Total	43.7		UG/L	40.9	1.0
		Magnesium, Total	6.7	u	UG/L	6.7	1.0
		Manganese, Total	0.28		UG/L	0.20	1.0
		Sodium, Total	47.6		UG/L	4.1	1.0
		Nickel, Total	1.8		UG/L	0.90	1.0
		Antimony, Total	2.3	u	UG/L	2.3	1.0
		Strontium, Total	0.18		UG/L	0.10	1.0
		Vanadium, Total	0.80	u	UG/L	0.80	1.0
		Zinc, Total	5.3		UG/L	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 01/04/01

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B10LT8	Silver, Total	51.2	1.1 u	50.0	102.4	1.0
		Aluminum, Total	2060	22.7 u	2000	103.0	1.0
		Barium, Total	2060	55.0	2000	100.3	1.0
		Beryllium, Total	51.6	0.10u	50.0	103.2	1.0
		Calcium, Total	64100	38000	25000	104.4	1.0
		Cadmium, Total	52.6	0.30u	50.0	105.2	1.0
		Cobalt, Total	513	0.90u	500	102.5	1.0
		Chromium, Total	224	18.7	200	102.6	1.0
		Copper, Total	250	0.90u	250	100.2	1.0
		Iron, Total	1040	21.8 u	1000	104.1	1.0
		Potassium, Total	30900	3990	25000	107.5	1.0
		Magnesium, Total	35400	8740	25000	106.6	1.0
		Manganese, Total	528	0.20u	500	105.5	1.0
		Sodium, Total	35600	10400	25000	100.7	1.0
		Nickel, Total	505	1.2	500	100.7	1.0
		Antimony, Total	537	2.3 u	500	107.4	1.0
		Strontium, Total	1220	184	1000	103.4	1.0
		Vanadium, Total	527	5.5	500	104.3	1.0
		Zinc, Total	511	2.5	500	101.7	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 01/04/01

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B10LT8	Silver, Total	1.1 u	1.1 u	NC	1.0
		Aluminum, Total	22.7 u	22.7 u	NC	1.0
		Barium, Total	55.0	55.8	1.4	1.0
		Beryllium, Total	0.10u	0.10u	NC	1.0
		Calcium, Total	38000	38000	0.080	1.0
		Cadmium, Total	0.30u	0.30u	NC	1.0
		Cobalt, Total	0.90u	0.90u	NC	1.0
		Chromium, Total	18.7	19.4	3.7	1.0
		Copper, Total	0.90u	0.90u	NC	1.0
		Iron, Total	21.8 u	26.6	~~NC~~ 200	1.0
		Potassium, Total	3990	4030	0.93	1.0
		Magnesium, Total	8740	8760	0.16	1.0
		Manganese, Total	0.20u	0.30	~~NC~~ 200	1.0
		Sodium, Total	10400	10500	0.86	1.0
		Nickel, Total	1.2	1.4	15.4	1.0
		Antimony, Total	2.3 u	2.3 u	NC	1.0
		Strontium, Total	184	186	0.76	1.0
		Vanadium, Total	5.5	5.5	0.00	1.0
		Zinc, Total	2.5	1.7	38.1	1.0

yjs 1/4/01

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/04/01

CLIENT: TNUHANFORD C01-008 H1142 RECRA LOT #: 0011L348

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1826-LC1	Silver, LCS	504	500	UG/L	100.9
		Aluminum, LCS	5110	5000	UG/L	102.1
		Barium, LCS	4940	5000	UG/L	98.8
		Beryllium, LCS	247	250	UG/L	98.8
		Calcium, LCS	24500	25000	UG/L	98.1
		Cadmium, LCS	246	250	UG/L	98.6
		Cobalt, LCS	2480	2500	UG/L	99.3
		Chromium, LCS	496	500	UG/L	99.3
		Copper, LCS	1240	1250	UG/L	99.1
		Iron, LCS	5000	5000	UG/L	100.0
		Potassium, LCS	26000	25000	UG/L	103.8
		Magnesium, LCS	25500	25000	UG/L	101.9
		Manganese, LCS	768	750	UG/L	102.4
		Sodium, LCS	24900	25000	UG/L	99.8
		Nickel, LCS	1970	2000	UG/L	98.7
		Antimony, LCS	3020	3000	UG/L	100.7
		Strontium, LCS	4950	5000	UG/L	99.0
		Vanadium, LCS	2540	2500	UG/L	101.7
		Zinc, LCS	994	1000	UG/L	99.4

RECRA LabNet Use Only

00IIL348

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU-HANFORD SAF 001-008

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: 11-21-00 Date Due: 12-21-00

Account #:

		A	B
Refrigerator #		A	B
#/Type Container	Liquid	1PL	1PL
	Solid		
Volume	Liquid	500	500
	Solid		
Preservatives		HNO3	—
ANALYSES REQUESTED → ORGANIC: VOA			
ORGANIC: BNA			
ORGANIC: Pest/PCB			
ORGANIC: Herb			
INORG: Metal		Hg	IC 4/4/4
INORG: CN			
RECRA LabNet Use Only		1	1

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														
001	B10LT8			W	11/15/00	0851														
002	T9				⊥	⊥														
003	F0				11/15/00	1056														
004	F1				⊥	⊥														

Special Instructions: SAF 001-008

Run Matrix QC

DATE/REVISIONS:

Mt1(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, Fl, NO_2, NO_3, PO_4, SO_4

4.

5.

6.

RECRA LabNet Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # 546 [illegible]
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

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 5.0 °C

Relinquished by	Received by	Date	Time
FedEx	[illegible]	11/21/00	1015

Relinquished by	Received by	Date	Time
	ORIGINAL!		
COMPOSITE	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 8214 8983 0170

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PNNL

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CHEM SOG 11/1/42

C.O.C. # C01-008-7

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-008	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100HR3 IAM (1&2) GW MONITORING NOVEMBER, 2000	Logbook No.: WM-5446-1437	Ice Chest No.: PL46 Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235795 4 0647
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W0100036

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

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

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10LT8 (F)		W	11/15/00	1251	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10LT9		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10LT9		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10LT9		W			1x20-mL P	Activity Scan	None
B10LT9		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10LT9		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10LT9		W			1x250-mL P	Tritium - H3	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
D. R. BREWINGTON		DR Brewington	11/15/00 1430	FEDX			11-15-00
FED. EXPRESS			11-16-00 10:AM	E. Segura			11/16/00 10:00
M Corso		M Corso	11-20-00 16:00	Fed Ex			11-20-00
Fed Ex			11/21/00 1015	[illegible]			11/21/00 1015

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 H1142

C.O.C. # C01-008-11

Page 1 of 1

Collector: D. R. BREWINGTON	Contact/Requester: JH KESSNER	Telephone No.: (509) 375-4688 MSIN FAX
SAF No.: C01-008	Sampling Origin: HANFORD SITE	Purchase Order/Charge Code
Project Title: 100HR3 IAM (1&2) GW MONITORING, NOVEMBER, 2000	Logbook No.: WM-SAWS-H37	Ice Chest No.: PLLG Temp.
Shipped To (Lab): TMA/RECRA	Method of Shipment: GOVT. VEHICLE	Bill of Lading/Air Bill No.: 4235795406 47
Protocol: CERCLA	Data Turnaround: 45 Days	Offsite Property No.: W01 00036

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

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

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B10LF0 (F)		W	11/15/00	1056	1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10LF1		W			1x500-mL G/P	ICP Metals - 6010A RCRA GW	HNO3 to pH <2
B10LF1		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B10LF1		W			1x20-mL P	Activity Scan	None
B10LF1		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B10LF1		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B10LF1		W			1x250-mL P	Tritium - H3	None

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
D. R. BREWINGTON D.R. Brewington	11/15/00 1430	FED X	11-15-00
FED. EXPRESS	11/16/00 10:AM	E. Ragum	11-16-00 10:AM
JR Corso JRCorso	11-20-00 16:00	Fed Ex	11-20-00
Fed Ex	11/21/00 1015	V. Hunt	11/21/00 10:15

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

C0