H1108

0054584

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1108 was composed of two other solid samples designated under SAF No. B99-028 with a Project Designation of: 100-HR-3 Pump & Treat-Resin Sampling.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on December 12, 21, and 30, 2000.

RECEIVED
MAR 2 8 2001
EDMC

2.0 ANALYSIS NOTES

2.1 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.4 Tritium Analyses

Due to a low LCS recovery (83%) and a failed RPD (116%) for the tritium sample duplicate the tritium samples were realiquoted. The data from the reanalyzed samples are reported herein. No problems were encountered during the course of the reanalyses.

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

12/30/00
Date

JAN 2001
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

SAMPLE SUMMARY

SDG 7540
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1108

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B10ML0	100-HR-3	SOLID		R010185-01	B99-028	B99-028-55	10/26/00 10:35
B10ML1	100-HR-3	SOLID		R010185-02	B99-028	B99-028-55	10/26/00 10:45
Method Blank		SOLID		R010185-04	B99-028		
Method Blank		SOLID		R010185-07	B99-028		
Lab Control Sample		SOLID		R010185-03	B99-028		
Lab Control Sample		SOLID		R010185-06	B99-028		
Duplicate (R010185-01)	100-HR-3	SOLID		R010185-05	B99-028		10/26/00 10:35
Duplicate (R010185-01)	100-HR-3	SOLID		R010185-08	B99-028		10/26/00 10:35

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

QC SUMMARY

SDG 7540
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1108

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
7540	B99-028-55	B10ML0	SOLID	100.0			10/31/00	5	R010185-01	7540-001
		B10ML1	SOLID	100.0			10/31/00	5	R010185-02	7540-002
		Method Blank	SOLID						R010185-04	7540-004
		Method Blank	SOLID						R010185-07	7540-007
		Lab Control Sample	SOLID						R010185-03	7540-003
		Lab Control Sample	SOLID						R010185-06	7540-006
		Duplicate (R010185-01)	SOLID	100.0			10/31/00	5	R010185-05	7540-005
		Duplicate (R010185-01)	SOLID	100.0			10/31/00	5	R010185-08	7540-008

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

SDG 7540
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1108

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
U	SOLID	Uranium, Isotopic in Soil	6962-030	5.0	2			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6962-030	10.0	2			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	6962-030	10.0	2			1	1	1/1		
Liquid Scintillation Counting												
H	SOLID	Tritium in Soil	6962-030	10.0	2			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 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

WORK SUMMARY

SDG 7540
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1108

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B10ML0			R010185-01	7540-001	H	A1	12/21/00	12/30/00	MCM	Tritium in Soil
100-HR-3		SOLID	10/26/00	7540-001	SR		11/17/00	12/14/00	MCM	Total Strontium in Soil
B99-028-55	B99-028		10/31/00	7540-001	TC		12/20/00	12/21/00	MCM	Technetium 99 in Soil
				7540-001	U		11/17/00	12/14/00	MCM	Uranium, Isotopic in Soil
B10ML1			R010185-02	7540-002	H	A1	12/21/00	12/30/00	MCM	Tritium in Soil
100-HR-3		SOLID	10/26/00	7540-002	SR		11/17/00	12/14/00	MCM	Total Strontium in Soil
B99-028-55	B99-028		10/31/00	7540-002	TC		12/16/00	12/21/00	MCM	Technetium 99 in Soil
				7540-002	U		11/17/00	12/14/00	MCM	Uranium, Isotopic in Soil
Method Blank			R010185-04	7540-004	SR		11/17/00	12/14/00	MCM	Total Strontium in Soil
		SOLID		7540-004	TC		12/16/00	12/21/00	MCM	Technetium 99 in Soil
	B99-028			7540-004	U		11/17/00	12/14/00	MCM	Uranium, Isotopic in Soil
Method Blank			R010185-07	7540-007	H		12/21/00	12/30/00	MCM	Tritium in Soil
		SOLID								
	B99-028									
Lab Control Sample			R010185-03	7540-003	SR		11/17/00	12/14/00	MCM	Total Strontium in Soil
		SOLID		7540-003	TC		12/12/00	12/21/00	MCM	Technetium 99 in Soil
	B99-028			7540-003	U		11/17/00	12/14/00	MCM	Uranium, Isotopic in Soil
Lab Control Sample			R010185-06	7540-006	H		12/21/00	12/30/00	MCM	Tritium in Soil
		SOLID								
	B99-028									
Duplicate (R010185-01)			R010185-05	7540-005	SR		11/17/00	12/14/00	MCM	Total Strontium in Soil
100-HR-3		SOLID	10/26/00	7540-005	TC		12/16/00	12/21/00	MCM	Technetium 99 in Soil
	B99-028		10/31/00	7540-005	U		11/17/00	12/14/00	MCM	Uranium, Isotopic in Soil
Duplicate (R010185-01)			R010185-08	7540-008	H		12/21/00	12/30/00	MCM	Tritium in Soil
100-HR-3		SOLID	10/26/00							
	B99-028		10/31/00							

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

SDG 7540
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1108

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
H	B99-028	Tritium in Soil	TRITIUM_COX_LSC	2			1	1	1	5
SR	B99-028	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	2			1	1	1	5
TC	B99-028	Technetium 99 in Soil	TC99_TR_SEP_LSC	2			1	1	1	5
U	B99-028	Uranium, Isotopic in Soil	UISO_PLATE_AEA	2			1	1	1	5
TOTALS				8			4	4	4	20

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/30/00

TMA / RICHMOND
SAMPLE DELIVERY GROUP H1108

R010185-04 Method Blank

METHOD BLANK

SDG	7540	Client/Case no	Hanford	SDG H1108	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R010185-04	Client sample id	Method Blank		
Dept sample id	7540-004	Material/Matrix		SOLID	
		SAF No	B99-028		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.020	0.12	0.24	1.0	U	SR
Technetium 99	14133-76-7	-0.082	0.16	0.57	15	U	TC
Uranium 233	U-233/234	0.037	0.050	0.095	1.0	U	U
Uranium 235	15117-96-1	0	0.030	0.11	1.0	U	U
Uranium 238	U-238	0.012	0.025	0.095	1.0	U	U

100-HR-3 Pump & Treat-Resin Sampling

QC-BLANK 36513

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

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SAMPLE DELIVERY GROUP H1108

R010185-07 **Method Blank**

METHOD BLANK

SDG	7540	Client/Case no	Hanford	SDG H1108	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R010185-07	Client sample id	Method Blank		
Dept sample id	7540-007	Material/Matrix		SOLID	
		SAF No	B99-028		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.496	3.4	5.8	400	U	H

100-HR-3 Pump & Treat-Resin Sampling

QC-BLANK 37007

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

R010185-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7540
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1108
Case no TRC-SBB-207925

Lab sample id R010185-03
Dept sample id 7540-003

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-028

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Strontium	24.7	0.88	0.24	1.0		SR	23.2	0.93	106	82-118	80-120
Technetium 99	128	2.1	0.57	15		TC	120	4.8	107	83-117	80-120
Uranium 233	10.6	1.1	0.50	1.0		U	9.66	0.39	110	80-120	80-120
Uranium 235	8.49	0.95	0.12	1.0		U	7.85	0.31	108	79-121	80-120
Uranium 238	11.3	1.2	0.48	1.0		U	10.5	0.42	108	80-120	80-120

100-HR-3 Pump & Treat-Resin Sampling

QC-LCS 36512

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

R010185-06 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7540
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1108
Case no TRC-SBB-207925

Lab sample id R010185-06
Dept sample id 7540-006

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-028

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	1490	20	6.0	400		H	1480	59	101	84-116	80-120

100-HR-3 Pump & Treat-Resin Sampling

QC-LCS 37006

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

R010185-05 B10ML0

DUPLICATE

SDG	7540			Client/Case no	Hanford SDG H1108
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R010185-05	Lab sample id	R010185-01	Client sample id	B10ML0
Dept sample id	7540-005	Dept sample id	7540-001	Location/Matrix	100-HR-3 SOLID
		Received	10/31/00	Collected	10/26/00 10:35
% solids	100.0	% solids	100.0	Custody/SAF No	B99-028-55 B99-028

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Total Strontium	0.090	0.11	0.20	1.0	U	SR	0.105	0.12	0.22	U	-	
Technetium 99	-0.123	0.29	1.0	15	U	TC	0.011	0.38	1.3	U	-	
Uranium 233	0.051	0.068	0.13	1.0	U	U	0.080	0.069	0.087	U	-	
Uranium 235	0	0.041	0.16	1.0	U	U	0	0.028	0.11	U	-	
Uranium 238	0.017	0.034	0.13	1.0	U	U	0.023	0.023	0.087	U	-	

100-HR-3 Pump & Treat-Resin Sampling

QC-DUP#1 36514

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

R010185-08 B10ML0

DUPLICATE

SDG	7540			Client/Case no	Hanford SDG H1108
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R010185-08	Lab sample id	R010185-01	Client sample id	B10ML0
Dept sample id	7540-008	Dept sample id	7540-001	Location/Matrix	100-HR-3 SOLID
		Received	10/31/00	Collected	10/26/00 10:35
% solids	100.0	% solids	100.0	Custody/SAF No	B99-028-55 B99-028

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	4.73	3.7	6.1	400	U	H	3.53	3.7	6.0	U	-	

100-HR-3 Pump & Treat-Resin Sampling

QC-DUP#1A1 37008

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/30/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1108

R010185-01 B10ML0

DATA SHEET

SDG	7540	Client/Case no	Hanford	SDG H1108	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R010185-01	Client sample id	B10ML0		
Dept sample id	7540-001	Location/Matrix	100-HR-3	SOLID	
Received	10/31/00	Collected	10/26/00 10:35		
% solids	100.0	Custody/SAF No	B99-028-55	B99-028	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	3.53	3.7	6.0	400	U	H
Total Strontium	SR-RAD	0.105	0.12	0.22	1.0	U	SR
Technetium 99	14133-76-7	0.011	0.38	1.3	15	U	TC
Uranium 233	U-233/234	0.080	0.069	0.087	1.0	U	U
Uranium 235	15117-96-1	0	0.028	0.11	1.0	U	U
Uranium 238	U-238	0.023	0.023	0.087	1.0	U	U

100-HR-3 Pump & Treat-Resin Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

TMA/RICHMOND
SAMPLE DELIVERY GROUP H1108

R010185-02 B10ML1

DATA SHEET

SDG	7540	Client/Case no	Hanford	SDG H1108	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R010185-02	Client sample id	B10ML1		
Dept sample id	7540-002	Location/Matrix	100-HR-3	SOLID	
Received	10/31/00	Collected	10/26/00 10:45		
% solids	100.0	Custody/SAF No	B99-028-55	B99-028	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	5.15	3.4	5.5	400	U	H
Total Strontium	SR-RAD	0.051	0.12	0.22	1.0	U	SR
Technetium 99	14133-76-7	-0.146	0.28	1.0	15	U	TC
Uranium 233	U-233/234	0.014	0.057	0.11	1.0	U	U
Uranium 235	15117-96-1	0.017	0.034	0.13	1.0	U	U
Uranium 238	U-238	0.014	0.028	0.11	1.0	U	U

100-HR-3 Pump & Treat-Resin Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7540
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1108

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233		2: Uranium 235		3: Uranium 238		RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 6962-030														
B10ML0	R010185-01			7540-001	U		U		U					
B10ML1	R010185-02			7540-002	U		U		U					
BLK (QC ID=36513)	R010185-04			7540-004	U		U		U					
LCS (QC ID=36512)	R010185-03			7540-003	ok		ok		ok					
Duplicate (R010185-01)	R010185-05			7540-005	-	U	-	U	-	U				
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0		1.0		100		4	
100-HR-3 Pump & Treat-Resin Sampling											Averages			

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6962-030	2σ prep error 5.0 %			Reference Lab Notebook 6962 pg. 030												
B10ML0	R010185-01			0.11	1.10			83		110			22	11/15/00	11/17	SS-029
B10ML1	R010185-02			0.13	1.02			83		102			22	11/15/00	11/17	SS-041
BLK (QC ID=36513)	R010185-04			0.11	1.00			89		109				11/15/00	11/17	SS-027
LCS (QC ID=36512)	R010185-03			0.50	1.00			89		102				11/15/00	11/17	SS-042
Duplicate (R010185-01) (QC ID=36514)	R010185-05			0.16	1.01			61		110			22	11/15/00	11/17	SS-029
Nominal values and limits from method				1.0	1.00			20-105		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-911	Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 2
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES				
	MDA	0.20	±	0.34
	YIELD	81	±	23

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

Test SR	Matrix SOLID
SDG 7540	
Contact Melissa C. Mannion	

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRC-SBB-207925	
Contract SDG H1108	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 6962-030						
B10ML0	R010185-01			7540-001	U	
B10ML1	R010185-02			7540-002	U	
BLK (QC ID=36513)	R010185-04			7540-004	U	
LCS (QC ID=36512)	R010185-03			7540-003	ok	
Duplicate (R010185-01)	R010185-05			7540-005	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
100-HR-3 Pump & Treat-Resin Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6962-030	2σ prep error 10.0 % Reference Lab Notebook 6962 pg. 030															
B10ML0	R010185-01			0.22	1.16			89		100			22	11/17/00	11/17	GRB-229
B10ML1	R010185-02			0.22	1.10			92		100			22	11/17/00	11/17	GRB-231
BLK (QC ID=36513)	R010185-04			0.24	1.00			88		100				11/17/00	11/17	GRB-232
LCS (QC ID=36512)	R010185-03			0.24	1.00			93		100				11/17/00	11/17	GRB-207
Duplicate (R010185-01) (QC ID=36514)	R010185-05			0.20	1.07			88		100			22	11/17/00	11/17	GRB-220
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-502	Strontium in Solids, rev 2
	CP-519	Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES				
	MDA	0.22	±	0.033
	YIELD	90	±	5

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	12/30/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

Test TC Matrix SOLID
SDG 7540
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1108

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 6962-030						
B10ML0	R010185-01			7540-001	U	
B10ML1	R010185-02			7540-002	U	
BLK (QC ID=36513)	R010185-04			7540-004	U	
LCS (QC ID=36512)	R010185-03			7540-003	ok	
Duplicate (R010185-01)	R010185-05			7540-005	-	U
Nominal values and limits from method				RDLs (pCi/g)	15	
100-HR-3 Pump & Treat-Resin Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6962-030	2σ prep error 10.0 % Reference Lab Notebook 6962 pg. 030															
B10ML0	R010185-01			1.3	1.01			38		50			55	11/30/00	12/20	GRB-220
B10ML1	R010185-02			1.0	1.05			47		50			51	11/30/00	12/16	GRB-218
BLK (QC ID=36513)	R010185-04			0.57	1.00			92		50				11/30/00	12/16	GRB-219
LCS (QC ID=36512)	R010185-03			0.57	1.00			87		50				11/30/00	12/12	GRB-203
Duplicate (R010185-01) (QC ID=36514)	R010185-05			1.0	1.01			49		50			51	11/30/00	12/16	GRB-222
Nominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-060	Soil Preparation, rev 2
	CP-021	Preparation of Tc-99m Tracer, rev 0
	CP-002	Q.C. Preparation, rev 2
	CP-003	Tracing, rev 2
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.89 ± 0.63
YIELD 63 ± 50

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/30/00

Test H Matrix SOLID
SDG 7540
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1108

METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1108

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 6962-030						
B10ML0	R010185-01		A1	7540-001	U	
B10ML1	R010185-02		A1	7540-002	U	
BLK (QC ID=37007)	R010185-07			7540-007	U	
LCS (QC ID=37006)	R010185-06			7540-006	ok	
Duplicate (R010185-01)	R010185-08			7540-008	-	U

Nominal values and limits from method RDLs (pCi/g) 400
100-HR-3 Pump & Treat-Resin Sampling

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6962-030	2σ prep error 10.0 % Reference Lab Notebook 6962 pg. 030															
B10ML0	R010185-01		A1	6.0	0.204			100		100			56	12/18/00	12/21	LSC-004
B10ML1	R010185-02		A1	5.5	0.218			100		100			56	12/18/00	12/21	LSC-004
BLK (QC ID=37007)	R010185-07			5.8	0.200			100		100				12/18/00	12/21	LSC-004
LCS (QC ID=37006)	R010185-06			6.0	0.200			100		100				12/18/00	12/21	LSC-004
Duplicate (R010185-01) (QC ID=37008)	R010185-08			6.1	0.202			100		100			56	12/18/00	12/21	LSC-004
Nominal values and limits from method				400	0.200					25			180			

PROCEDURES	REFERENCE	TRITIUM_COX_LSC
	CP-060	Soil Preparation, rev 2
	CP-251	Tritium/Carbon-14 Oxidation, rev 2

AVERAGES ± 2 SD MDA 5.9 ± 0.48
FOR 5 SAMPLES YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/30/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-028-55	Page 1 of 1

Collector: T.M. Johansen	Company Contact: T Pickett — Telephone No.: 373-4630	Project Coordinator: TRENT, SJ	Price Code: 9N — Data Turnaround: 45 Days
Project Designation: 100-HR-3 Pump & Treat - Resin Sampling	Sampling Location: 100-HR-3 H1108 (7540)	SAF No.: B99-028	Air Quality ☐
Ice Chest No.: ERC99-031 (1 OF 1)	Field Logbook No.: EL-1516 — COA: R10HR3C570	Method of Shipment: Gov vehicle / FEDEX	
Shipped To: TMA/~~REGRA~~ MD 10-26-00	Offsite Property No.: AP10019	Bill of Lading/Air Bill No.: 4235 7953 - 0051	

POSSIBLE SAMPLE HAZARDS/REMARKS

HISTORICAL DATA INDICATES SAMPLES ARE LESS THAN 2000 pci TOTAL ACTIVITY. NO TOTAL ACTIVITY REQUIRED.

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	Cool 4C	None			
Type of Container	aG	aG	aG	aG	aG	aG	G	aG			
No. of Container(s)	1	1	1	1	1	1	1	1			
Volume	60mL	60mL	60mL	125mL	250mL	250mL	250mL	500mL			
SAMPLE ANALYSIS	Isotopic Uranium	Strontium-89,90 – Total Sr	Technetium-99	Tritium - H3	Semi-VOA - 8270A (TCL) [Bis(2-ethylhexyl) phthalate]	IC Anions - 300.0 (Nitrate)	See item (1) in Special Instructions	See item (2) in Special Instructions			
Sample No. / Matrix * / Sample Date / Sample Time											
✓ B10ML0 / OTHER SOLID ✓ / 10-26-00 ✓ / 1035 ✓	X ✓	X ✓	X ✓	X ✓	X						97712
✓ B10ML1 / OTHER SOLID ✓ / 10-26-00 ✓ / 1045 ✓	X ✓	X ✓	X ✓	X ✓	X						97717

MD 10-26-00

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature]	1545	MD 10-26-00 Stored in Ref # 2B	10-26-00 1545
Removed from Ref #2B 3728	10/30/00 0900	R. Thorner	10/30/00 0900
R. Thorner	10/30/00 0900	FED EXP	10/30/00
FED. EXPRESS	10/31/00 10:AM	E Aguirre	10/31/00

RT 10/30/00

SPECIAL INSTRUCTIONS

** If a limited quantity of sample material is received, perform analyses in order listed on the FSR.

~~(1) VOA - 8260A (TCL) (Chloroform, Methylenechloride); VOA - 8260A (Add-On) (Trichlorotrifluoromethane)~~

~~(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP (TCLP) Add-on - 1311/6010 (Antimony, Beryllium, Nickel)~~

RT 10/30/00

Samples stored in Ref.# 2B at the 3728 Shipping Facility on 10/26/00.
Collector not available to relinquish samples on 10/30/00 for shipment.

RT 10/30/00

Matrix *

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

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

BHI-EE-011 (10/99)

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: BECHTEL HANFORD INC. Date/Time received 10/31/00 10: AM

CoC No. B99-028-55

Container I.D. No. ERC 99-031 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: 2x4 = 8
7. Number of containers per sample: (4 EACH) (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 Aguiro Date: 10/31/00 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 _____

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-028 H1108

DATE RECEIVED: 10/31/00 RFW LOT # :0010L093

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10ML0						
% SOLIDS	001	SO	00L%S174	10/26/00	11/03/00	11/06/00
% SOLIDS	001 REP	SO	00L%S174	10/26/00	11/03/00	11/06/00
NITRATE BY IC	001	SO	00LXC076	10/26/00	11/29/00	11/29/00
NITRATE BY IC	001 REP	SO	00LXC076	10/26/00	11/29/00	11/29/00
NITRATE BY IC	001 MS	SO	00LXC076	10/26/00	11/29/00	11/29/00
TCLP	001	SO	00LTO140	10/26/00	12/12/00	12/13/00
B10ML1						
% SOLIDS	002	SO	00L%S174	10/26/00	11/03/00	11/06/00
NITRATE BY IC	002	SO	00LXC076	10/26/00	11/29/00	11/29/00
TCLP	002	SO	00LTO140	10/26/00	12/12/00	12/13/00

LAB QC:

NITRATE BY IC	MB1	S	00LXC076	N/A	11/29/00	11/29/00
NITRATE BY IC	MB1 BS	S	00LXC076	N/A	11/29/00	11/29/00

JAN 2001 RECEIVED

01
08

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-028 H1108
RFW# : 0010L093

W.O. # : 10985-001-001-9999-00
Date Received: 10-31-00

INORGANIC CASE NARRATIVE

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

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

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperatures were recorded on the chain-of-custody.

5. The method blank for Nitrate was within method criteria.

6. The Laboratory Control Sample (LCS) for Nitrate was within the laboratory control limits.

7. The matrix spike recovery for Nitrate was within the 75-125% control limits.

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

9. Results for solid samples are reported on a dry weight basis.

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

for J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

12-17-00
Date

njp\i10-093

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 10 pages.

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

Recra LabNet Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		__ 3060A/7196A	
Corrosivity __ by coupon __ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		9095A	

Other: Nitrate **Method:** EPA 300.0 (mod)

Other: **Method**

L-WI-034/B-2/00

0203
1.4mo

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.

L-WI-034/D-6/99

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/14/00

CLIENT: TNUHANFORD B99-028 H1108 RECRA LOT #: 0010L093

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B10ML0	% Solids	44.2	%	0.01	1.0
		Nitrate by IC	29	MG/KG	2.8	1.0
-002	B10ML1	% Solids	44.4	%	0.01	1.0
		Nitrate by IC	35	MG/KG	2.8	1.0

05
~~04~~ 12/21

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/14/00

CLIENT: TNUHANFORD B99-028 H1108 RECRA LOT #: 0010L093

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	00LXC076-MB1	Nitrate by IC	1.2 u	MG/KG	1.2	1.0

06
05 12/14/00

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 12/14/00

CLIENT: TNUHANFORD B99-028 H1108 RECRA LOT #: 0010L093

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B10ML0	Nitrate by IC	88	29	57	102.9	1.0
BLANK10	00LXC076-MB1	Nitrate by IC	25	1.2 u	25	98.5	1.0

07
06

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/14/00

CLIENT: TNUHANFORD B99-028 H1108 RECRA LOT #: 0010L093

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B10ML0	% Solids	44.2	45.0	1.9	1.0
		Nitrate by IC	29	28	2.9	1.0

08
07 1/4/01

RECRA LabNet Use Only

00101093

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - Hanford B99-028

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: 10.31.00 Date Due: 11-30-00

Account #:

		A	B	C	D
Refrigerator #		1	5	5	5
#/Type Container	Liquid				
	Solid	1 jag	1 jag	1 jag	1 jag
Volume	Liquid	0	0	0	0
	Solid	250	250	500	250
Preservatives		—	—	—	—
ANALYSES REQUESTED	ORGANIC: VOA	OLC24X	OLC25X		
	ORGANIC: BNA				
	ORGANIC: Pest/PCB				
	ORGANIC: Herb				
	INORG: TCLP Metal			ITCLP	
	INORG: CN				
	INORG: IC Anions			ICno3	
					Met(1)

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	OLC24X	OLC25X	ITCLP	ICno3	Met(1)
001	B10MLO			SO	10/26/00	1035	X	X	X	X	
002	B10MLI			L	L	1045	X	X	X	X	
003	B10MLO tcp of 001			L	*	-					✓
004	L 1 L 002			L	L	-					✓

Special Instructions: Saf B99-028

Run Matrix QC

DATE/REVISIONS:

Met(1) 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni

* 2. See lab chron

3.

4.

5.

6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered ___

Airbill #

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't (Y) or N

Cooler Temp. 4.3 °C

3.6°C

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

NOTES:

42357954 0073

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	10/31/00	0915

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-028-55	Page 1 of 1

Collector: T.M. Johansen	Company Contact: T Pickett	Telephone No.: 373-4630	Project Coordinator: TRENT, SJ
Project Designation: 100-HR-3 Pump & Treat - Resin Sampling	Sampling Location: 100-HR-3		SAF No.: B99-028
Ice Chest No.: ERC 96-019 (1 of 2)	Field Logbook No.: EL-1516	COA: R10HR3C570	Method of Shipment: Gov vehicle / FEDEX
Shipped To: ~~TMA~~/RECRA TMJ 10-26-00	Offsite Property No.: A010006		Bill of Lading/Air Bill No.: 42357953-0062

Price Code: 9N — Data Turnaround: 45 Days — Air Quality: ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

HISTORICAL DATA INDICATES SAMPLES ARE LESS THAN 2000 pci TOTAL ACTIVITY. NO TOTAL ACTIVITY REQUIRED.

Special Handling and/or Storage

TMJ 10-26-00 Out-Fed

SAMPLE ANALYSIS	Isotopic Uranium	Strontium 89,90 -- Total Sr	Technetium-99	Tritium - H3	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	IC Anions - 300.0 (Nitrate)	See item (1) in Special Instructions	See item (2) in Special Instructions		
Preservation	None	None	None	None	Cool 4C	None	Cool 4C	None		
Type of Container	aG	aG	aG	aG	aG	aG	G	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	125mL	250mL	250mL	250mL	500mL		

Sample No.	Matrix *	Sample Date	Sample Time	Isotopic Uranium	Strontium 89,90 -- Total Sr	Technetium-99	Tritium - H3	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	IC Anions - 300.0 (Nitrate)	See item (1) in Special Instructions	See item (2) in Special Instructions		
B10ML0	OTHER SOLID	10-26-00	1035					X	X	X	X		97712
B10ML1	OTHER SOLID	10-26-00	1045					X	X	X	X		97717

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By	Date/Time	Received By	Date/Time
[signature]	10-26-00 1545	TMJ 10-26-00	1545
Removed from Ref #2B 3728	10/30/00 0400	Stored in Ref #2B	10-26-00
R. Thoren	10/30/00 0400	R. Thoren	10/30/00 0400
FED EX	10-31-00/0915	FED EX	10-31-00/0915
		[signature]	

RT 0400

SPECIAL INSTRUCTIONS

** If a limited quantity of sample material is received, perform analyses in order listed on the FSR.

(1) VOA - 8260A (TCL) {Chloroform, Methylenechloride}; VOA - 8260A (Add-On) {Trichloromonofluoromethane}
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel}

Samples stored in Ref.#2B at the 3728 Shipping Facility on 10/26/00. Collector not available to relinquish samples on 10/30/00 for shipment. RT 10/30/00

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

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

BHI-EE-011 (10/99)

RECEIVED JAN 2001

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-028 H1108

DATE RECEIVED: 10/31/00 RFW LOT # :0010L093

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10ML0						
TCLP	001	SO	00LTO140	10/26/00	12/12/00	12/13/00
B10ML1						
TCLP	002	SO	00LTO140	10/26/00	12/12/00	12/13/00
B10ML0						
SILVER, TCLP LEACHAT	003	W	99L1808	12/13/00	12/13/00	12/14/00
SILVER, TCLP LEACHAT	003 REP	W	99L1808	12/13/00	12/13/00	12/14/00
SILVER, TCLP LEACHAT	003 MS	W	99L1808	12/13/00	12/13/00	12/14/00
ARSENIC, TCLP LEACHA	003	W	99L1808	12/13/00	12/13/00	12/15/00
ARSENIC, TCLP LEACHA	003 REP	W	99L1808	12/13/00	12/13/00	12/15/00
ARSENIC, TCLP LEACHA	003 MS	W	99L1808	12/13/00	12/13/00	12/15/00
BARIUM, TCLP LEACHAT	003	W	99L1808	12/13/00	12/13/00	12/14/00
BARIUM, TCLP LEACHAT	003 REP	W	99L1808	12/13/00	12/13/00	12/14/00
BARIUM, TCLP LEACHAT	003 MS	W	99L1808	12/13/00	12/13/00	12/14/00
BERYLLIUM, TCLP LEAC	003	W	99L1808	12/13/00	12/13/00	12/14/00
BERYLLIUM, TCLP LEAC	003 REP	W	99L1808	12/13/00	12/13/00	12/14/00
BERYLLIUM, TCLP LEAC	003 MS	W	99L1808	12/13/00	12/13/00	12/14/00
CADMIUM, TCLP LEACHA	003	W	99L1808	12/13/00	12/13/00	12/14/00
CADMIUM, TCLP LEACHA	003 REP	W	99L1808	12/13/00	12/13/00	12/14/00
CADMIUM, TCLP LEACHA	003 MS	W	99L1808	12/13/00	12/13/00	12/14/00
CHROMIUM, TCLP LEACH	003	W	99L1808	12/13/00	12/13/00	12/14/00
CHROMIUM, TCLP LEACH	003 REP	W	99L1808	12/13/00	12/13/00	12/14/00
CHROMIUM, TCLP LEACH	003 MS	W	99L1808	12/13/00	12/13/00	12/14/00
NICKEL, TCLP LEACHAT	003	W	99L1808	12/13/00	12/13/00	12/14/00
NICKEL, TCLP LEACHAT	003 REP	W	99L1808	12/13/00	12/13/00	12/14/00
NICKEL, TCLP LEACHAT	003 MS	W	99L1808	12/13/00	12/13/00	12/14/00
LEAD, TCLP LEACHATE	003	W	99L1808	12/13/00	12/13/00	12/14/00
LEAD, TCLP LEACHATE	003 REP	W	99L1808	12/13/00	12/13/00	12/14/00
LEAD, TCLP LEACHATE	003 MS	W	99L1808	12/13/00	12/13/00	12/14/00
ANTIMONY, TCLP LEACH	003	W	99L1808	12/13/00	12/13/00	12/14/00
ANTIMONY, TCLP LEACH	003 REP	W	99L1808	12/13/00	12/13/00	12/14/00
ANTIMONY, TCLP LEACH	003 MS	W	99L1808	12/13/00	12/13/00	12/14/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-028 H1108

DATE RECEIVED: 10/31/00 RFW LOT # :0010L093

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TCLP LEACH	003	W	99L1808	12/13/00	12/13/00	12/14/00
SELENIUM, TCLP LEACH	003 REP	W	99L1808	12/13/00	12/13/00	12/14/00
SELENIUM, TCLP LEACH	003 MS	W	99L1808	12/13/00	12/13/00	12/14/00
B10ML1						
SILVER, TCLP LEACHAT	004	W	99L1808	12/13/00	12/13/00	12/14/00
ARSENIC, TCLP LEACHA	004	W	99L1808	12/13/00	12/13/00	12/15/00
BARIUM, TCLP LEACHAT	004	W	99L1808	12/13/00	12/13/00	12/14/00
BERYLLIUM, TCLP LEAC	004	W	99L1808	12/13/00	12/13/00	12/14/00
CADMIUM, TCLP LEACHA	004	W	99L1808	12/13/00	12/13/00	12/14/00
CHROMIUM, TCLP LEACH	004	W	99L1808	12/13/00	12/13/00	12/14/00
NICKEL, TCLP LEACHAT	004	W	99L1808	12/13/00	12/13/00	12/14/00
LEAD, TCLP LEACHATE	004	W	99L1808	12/13/00	12/13/00	12/14/00
ANTIMONY, TCLP LEACH	004	W	99L1808	12/13/00	12/13/00	12/14/00
SELENIUM, TCLP LEACH	004	W	99L1808	12/13/00	12/13/00	12/14/00

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/14/00
SILVER, TCLP LEACHAT	MB1	W	99L1808	N/A	12/13/00	12/14/00
SILVER, TCLP LEACHAT	MB2	W	99L1808	N/A	12/13/00	12/14/00
ARSENIC LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/15/00
ARSENIC, TCLP LEACHA	MB1	W	99L1808	N/A	12/13/00	12/15/00
ARSENIC, TCLP LEACHA	MB2	W	99L1808	N/A	12/13/00	12/15/00
BARIUM LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/14/00
BARIUM, TCLP LEACHAT	MB1	W	99L1808	N/A	12/13/00	12/14/00
BARIUM, TCLP LEACHAT	MB2	W	99L1808	N/A	12/13/00	12/14/00
BERYLLIUM LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/14/00
BERYLLIUM, TCLP LEAC	MB1	W	99L1808	N/A	12/13/00	12/14/00
BERYLLIUM, TCLP LEAC	MB2	W	99L1808	N/A	12/13/00	12/14/00
CADMIUM LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/14/00
CADMIUM, TCLP LEACHA	MB1	W	99L1808	N/A	12/13/00	12/14/00
CADMIUM, TCLP LEACHA	MB2	W	99L1808	N/A	12/13/00	12/14/00
CHROMIUM LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/14/00
CHROMIUM, TCLP LEACH	MB1	W	99L1808	N/A	12/13/00	12/14/00
CHROMIUM, TCLP LEACH	MB2	W	99L1808	N/A	12/13/00	12/14/00
NICKEL LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/14/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-028 H1108

DATE RECEIVED: 10/31/00 RFW LOT # :0010L093

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NICKEL, TCLP LEACHAT	MB1	W	99L1808	N/A	12/13/00	12/14/00
NICKEL, TCLP LEACHAT	MB2	W	99L1808	N/A	12/13/00	12/14/00
LEAD LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/14/00
LEAD, TCLP LEACHATE	MB1	W	99L1808	N/A	12/13/00	12/14/00
LEAD, TCLP LEACHATE	MB2	W	99L1808	N/A	12/13/00	12/14/00
ANTIMONY LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/14/00
ANTIMONY, TCLP LEACH	MB1	W	99L1808	N/A	12/13/00	12/14/00
ANTIMONY, TCLP LEACH	MB2	W	99L1808	N/A	12/13/00	12/14/00
SELENIUM LABORATORY	LC1 BS	W	99L1808	N/A	12/13/00	12/14/00
SELENIUM, TCLP LEACH	MB1	W	99L1808	N/A	12/13/00	12/14/00
SELENIUM, TCLP LEACH	MB2	W	99L1808	N/A	12/13/00	12/14/00

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-028
RFW#: 0010L093
SDG/SAF#: H1108/B99-028

W.O.#: 10985-001-001-9999-00
Date Received: 10-31-00

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 TCLP leachate samples.

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

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

4. All cooler temperatures have 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) with the exception of Arsenic in file PS1214C. All samples were rerun for Arsenic in file PS1215A.

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. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

11. The TCLP extract from sample B10ML0 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

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

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

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

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

12-19-00
Date

gmb/m10-093

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 001DL093

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 12/19/00

CLIENT: TNUHANFORD B99-028 H1108 RECRA LOT #: 0010L093

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B10ML0	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	33.9	u	UG/L	33.9	1.0
		Barium, TCLP Leachate	21.5		UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	5490		UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0
-004	B10ML1	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	33.9	u	UG/L	33.9	1.0
		Barium, TCLP Leachate	15.8		UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	5640		UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/19/00

CLIENT: TNUHANFORD B99-028 H1108 RECRA LOT #: 0010L093

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1808-MB1	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	33.9	u	UG/L	33.9	1.0
		Barium, TCLP Leachate	3.0	u	UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	4.9	u	UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0
BLANK2	99L1808-MB2	Silver, TCLP Leachate	2.5	u	UG/L	2.5	1.0
		Arsenic, TCLP Leachate	33.9	u	UG/L	33.9	1.0
		Barium, TCLP Leachate	3.0	u	UG/L	3.0	1.0
		Beryllium,TCLP Leachate	0.60	u	UG/L	0.60	1.0
		Cadmium, TCLP Leachate	3.4	u	UG/L	3.4	1.0
		Chromium, TCLP Leachate	4.9	u	UG/L	4.9	1.0
		Nickel, TCLP Leachate	12.5	u	UG/L	12.5	1.0
		Lead, TCLP Leachate	25.0	u	UG/L	25.0	1.0
		Antimony, TCLP Leachate	17.0	u	UG/L	17.0	1.0
		Selenium, TCLP Leachate	62.3	u	UG/L	62.3	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 12/19/00

CLIENT: TNUHANFORD B99-028 H1108 RECRA LOT #: 0010L093

WORK ORDER: I0985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	B10ML0	Silver, TCLP Leachate	4510	2.5 u	5000	90.2	1.0
		Arsenic, TCLP Leachate	5090	33.9 u	5000	101.7	1.0
		Barium, TCLP Leachate	97500	21.5	100000	97.5	1.0
		Beryllium, TCLP Leacha	899	0.60u	1000	89.9	1.0
		Cadmium, TCLP Leachate	948	3.4 u	1000	94.8	1.0
		Chromium, TCLP Leachat	10200	5490	5000	93.8	1.0
		Nickel, TCLP Leachate	926	12.5 u	1000	92.6	1.0
		Lead, TCLP Leachate	4800	25.0 u	5000	96.0	1.0
		Antimony, TCLP Leachat	649	17.0 u	1000	64.9	1.0
		Selenium, TCLP Leachat	933	62.3 u	1000	93.3	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 12/19/00

CLIENT: TNUHANFORD B99-028 H1108 RECRA LOT #: 0010L093

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-003REP	B10ML0	Silver, TCLP Leachate	2.5 u	2.5 u	NC	1.0
		Arsenic, TCLP Leachate	33.9 u	33.9 u	NC	1.0
		Barium, TCLP Leachate	21.5	22.6	5.0	1.0
		Beryllium TCLP Leachate	0.60u	0.60u	NC	1.0
		Cadmium, TCLP Leachate	3.4 u	3.4 u	NC	1.0
		Chromium, TCLP Leachate	5490	5640	2.7	1.0
		Nickel, Leachate	12.5 u	12.5 u	NC	1.0
		Lead, TCLP Leachate	25.0 u	25.0 u	NC	1.0
		Antimony, Leachate	17.0 u	17.0 u	NC	1.0
		Selenium, TCLP Leachate	62.3 u	62.3 u	NC	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/19/00

CLIENT: TNUHANFORD B99-028 H1108 RECRA LOT #: 0010L093

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1808-LC1	Silver, LCS	499	500	UG/L	99.8
		Arsenic, LCS	9890	10000	UG/L	98.9
		Barium, LCS	4860	5000	UG/L	97.3
		Beryllium, LCS	243	250	UG/L	97.2
		Cadmium, LCS	248	250	UG/L	99.2
		Chromium, LCS	489	500	UG/L	97.8
		Nickel, LCS	1950	2000	UG/L	97.3
		Lead, LCS	2420	2500	UG/L	96.8
		Antimony, LCS	2920	3000	UG/L	97.4
		Selenium, LCS	9100	10000	UG/L	91.0

RECRA LabNet Use Only

00101093

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - Hanford B99-028
Est. Final Proj. Sampling Date:
Project #: 109185-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: DJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 10.31.00 Date Due: 11-30-00
Account #:

		A	B	C	D	
Refrigerator #		1	5	5	5	5
#/Type Container	Liquid					
	Solid	1 jar	1 jar	1 jar	1 jar	1 jar
Volume	Liquid	0	0	0	0	0
	Solid	250	250	500	250	0
Preservatives		—	—	—	—	0
ANALYSES REQUESTED	ORGANIC: VOA	0624X	0625X			
	ORGANIC: BNA					
	ORGANIC: Pest/PCB					
	ORGANIC: Herb					
	INORG: TCLP Metal			ITCLP		
	INORG: CN					
	INORG: IC Anions			ICan3		
						21

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	VOA	BNA	Pest/PCB	Herb	TCLP Metal	CN	IC Anions	
001	B10M10			SO	10/26/00	1035	X	X			X		X	
002	B10M11			⊥	⊥	1045	X	X			X		X	
003	B10M10 top of 001			L	*	-								✓
004	⊥ 1 ⊥ 002			⊥	⊥	-								✓

Special Instructions: SOF B99-028

Run Matrix QC

DATE/REVISIONS:

Met① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni
* 2. See lab chron
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill #
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't (Y) or N
Cooler Temp. 4.3 °C
3.6°C

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	10/31/00	0915

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235795400 73

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-028-55	Page 1 of 1

Collector: T.M. Johansen	Company Contact: T Pickett	Telephone No.: 373-4630	Project Coordinator: TRENT, SJ
Price Code: 9N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100-HR-3 Pump & Treat - Resin Sampling	Sampling Location: 100-HR-3	SAF No.: B99-028	
Ice Chest No.: ERC 96-019 (1 of 2)	Field Logbook No.: EL-1516	COA: R10HR3C570	Method of Shipment: Gov vehicle / FEDEX
Shipped To: ~~TMA~~/RECRA TMJ 10-26-00	Offsite Property No.: A010006		Bill of Lading/Air Bill No.: 42357953-0062

POSSIBLE SAMPLE HAZARDS/REMARKS

HISTORICAL DATA INDICATES SAMPLES ARE LESS THAN 2000 pci TOTAL ACTIVITY. NO TOTAL ACTIVITY REQUIRED.

Special Handling and/or Storage

TMJ 10-26-00

SAMPLE ANALYSIS													
			Preservation	None	None	None	None	Cool 4C	None	Cool 4C	None		
			Type of Container	aG	aG	aG	aG	aG	aG	G	aG		
			No. of Container(s)	1	1	1	1	1	1	1	1		
			Volume	60mL	60mL	60mL	125mL	250mL	250mL	250mL	500mL		
				Isotopic Uranium	Strontium 89,90 -- Total Sr	Technetium-99	Tritium - H3	Semi-VOA - 8270A (TCL) (Bis(2-ethylhexyl) phthalate)	IC Anions - 300.0 (Nitrate)	See item (1) in Special Instructions.	See item (2) in Special Instructions.		
Sample No.	Matrix *	Sample Date	Sample Time										
B10ML0	OTHER SOLID	10-26-00	1035					X	X	X	X		97712
B10ML1	OTHER SOLID	10-26-00	1045					X	X	X	X		97717

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature]	10-26-00 1545	TMJ 10-26-00 / Stored in Ref #2B	10-26-00 1545
Removed from Ref #2B 3728	10/30/00 0400	R. Thoren	10/30/00 0400
R. Thoren	10/30/00 0400	FEDEX	
Fed Ex	10-31-00/0915	[signature]	10-31-00/0915

RT 10/30/00

SPECIAL INSTRUCTIONS

** If a limited quantity of sample material is received, perform analyses in order listed on the FSR.

(1) VOA - 8260A (TCL) {Chloroform, Methylenechloride}; VOA - 8260A (Add-On) {Trichloromonofluoromethane}
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel}

Samples stored in Ref.# 2B at the 3728 Shipping Facility on 10/26/00.
Collector not available to relinquish samples on 10/30/00 for shipment. RT 10/30/00

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

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

BHI-EE-011 (10/99)

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-028 H1108

DATE RECEIVED: 10/31/00 RFW LOT # :0010L093

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10ML0	001	SO	00LE1392	10/26/00	11/01/00	11/24/00
B10ML0	001 R1	SO	00LE1587	10/26/00	12/05/00	12/14/00
B10ML0	001 MS	SO	00LE1392	10/26/00	11/01/00	11/24/00
B10ML0	001 MSD	SO	00LE1392	10/26/00	11/01/00	11/24/00
B10ML1	002	SO	00LE1392	10/26/00	11/01/00	11/24/00
B10ML1	002 R1	SO	00LE1587	10/26/00	12/05/00	12/13/00
B10ML1	002 MS R1	SO	00LE1587	10/26/00	12/05/00	12/13/00
B10ML1	002 MSD R1	SO	00LE1587	10/26/00	12/05/00	12/13/00

LAB QC:

SBLKFG	MB1	S	00LE1392	N/A	11/01/00	11/23/00
SBLKFG	MB1 BS	S	00LE1392	N/A	11/01/00	11/23/00
SBLKJP	MB1	S	00LE1587	N/A	12/05/00	12/13/00
SBLKJP	MB1 BS	S	00LE1587	N/A	12/05/00	12/13/00

JAN 2001
RECEIVED

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-028
RFW #: 0010L093
SDG/SAF #: H1108/B99-028

W.O. #: 10985-001-001-9999-00
Date Received: 10-31-2000

SEMIVOLATILE

Two (2) solid samples were collected on 10-26-2000.

The samples and their associated QC samples were extracted on 11-01-2000, 12-05-2000 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270C for client specified Semivolatile target compound Bis(2-Ethylhexyl)phthalate on 11-23,24-2000 and 12-13,14-2000.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.
2. The samples were extracted and analyzed within required holding times with the exception of re-extraction of these samples, which were performed outside of extraction holding time.
3. Two (2) of thirty-six (36) surrogate recoveries were outside EPA QC limits. The initial analysis fulfills the reanalysis requirement of sample B10ML1 MS RE.
4. Seven (7) of twenty-four (24) base neutral matrix spike recoveries were outside EPA QC limits.

   All base neutral blank spike recoveries were within acceptance criteria.

   The target compound is not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.)
5. The method blank contained the common laboratory contaminant Bis(2-Ethylhexyl)phthalate at levels less than 3x the CRQL. All associated analyses of method blank (00LE1587-MB1) yielded Bis (2-Ethylhexyl) phthalate at levels less than the CRQL.
6. Internal standard area and retention time criteria were met.
7. The re-extracted analyses were spiked with 75ug of base neutral surrogates instead of the method specified 50ug. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
8. Both samples were re-extracted to confirm the level of Bis (2-Ethylhexyl) phthalate in the samples. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
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."

for J. Michael Taylor
V.P./Laboratory General Manager
Lionville Laboratory

01-04-01
Date

som\group\data\bna\mu-hanford-10-093.doc

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 1 3 pages.

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

RECRA **Sample Discrepancy Report (SDR)** SDR #: OOMS 325

Initiator: John W. Smith Batch: 0010L093 Parameter: BNA 0025X
Date: 11/27/00 Samples: MS/MSD+BS Matrix: SOLID
Client: TMI Hanford 699028 H1108 Method: SW846/MCAWW/CLP/ Prep Batch: 00C41312

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

1) Four spikes fail low in MS/MSD.
2) One spike fails low in BS.

2. Known or Probable Causes(s) (To be used for trend analysis)

__ Lack of Organization
__ Lack of Training
__ Lack of Discipline
__ Lack of Resources
__ Lack of Time
__ Lack of Management Support
__ Other (Please explain):

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
✓ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:
All spikes failing low are Acids. Target cmpd is a Base. All Base surrogates met criteria. Minimum impact on data
Report + Narrate

4. Project Manager Instructions...signature/date: 12/1/00

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 12/1/00

✓ Verified re-[log][leach][extract][digest][analysis] (circle)
X Included in Case Narrative on 1/3/01
X Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

Other Explanation:
Batch 1587 - 12/5/00

When Final Action has been recorded, forward original to QA for distribution and filing.

Route/Distribution of SDR

__ Initiator
__ Lab Manager: M. Taylor
__ Project Mgr: Stone/Carey/Johnson
__ Section Mgr: Wesson/Daniels
X QA (file): Schrenkel
__ Data Management: Feldman
__ Sample Prep: Bickel/Kauffman

Route Distribution of Completed SDR

__ Metals: Doughty
__ Inorganic: Perrone
__ GC/LC: Pastor
__ MS: Layman/Rycklak
__ Log-in: Keppel
__ Admin: Soos
__ Other: _____

Pl Leake 12/4/00

L-WI-006/E-08/00

Recra LabNet Philadelphia Sample Discrepancy Report (SDR) SDR #: WCX/15

Initiator: Bernard Foley Batch: 00100093 Parameter: BNA
Date: 12/6/00 Samples: 1,2 Matrix: S
Client: TNV Method: SW846/MCAWW/CLP/ Prep Batch: 00LE1587

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

Surrogate concentrations switched

2. Known or Probable Causes(s)

analyst error

3. Discussion and Proposed Action Other Description: Reference SDR # WCX176

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

4. Project Manager Instructions...signature/date: [signature] 12/7/00

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: [signature] 1/3/01 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
X Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Doughty
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
1	X Project Mgr: Stone/Johnson	__	__ GC/LC: Pastor
__	X Technical Mgr: Wesson/Daniels	2	X MS: Rycklak/Layman
__	X QA (file): Popp	__	__ Log-in: Keppel
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Doughty/Kiger	__	__ Other: _____

L-WI-006/E-11/00

4

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.bna

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

mmz\10-94\gloss.bna

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, Special List — Report Date: 01/03/01 14:35

RFW Batch Number: **0010L093** — Client: **TNUHANFORD B99-028 H1108** — Work Order: 10985001001 — Page: 1a

	Cust ID:	B10ML0	B10ML0	B10ML0	B10ML0	B10ML1	B10ML1
Sample Information	RFW#:	001	001	001 MS	001 MSD	002	002
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
			REPREP				REPREP
Surrogate Recovery	Nitrobenzene-d5	95 %	53 %	103 %	75 %	71 %	67 %
	2-Fluorobiphenyl	85 %	48 %	102 %	71 %	64 %	59 %
	p-Terphenyl-d14	105 %	91 %	122 %	89 %	84 %	86 %
bis(2-Ethylhexyl)phthalate		430 JB	100 JB	780 B	300 JB	5200 B	750 U

	Cust ID:	B10ML1	B10ML1	SBLKFG	SBLKFG BS	SBLKJP	SBLKJP BS
Sample Information	RFW#:	002 MS	002 MSD	00LE1392-MB1	00LE1392-MB1	00LE1587-MB1	00LE1587-MB1
	Matrix:	SOLID	SOLID	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
		REPREP	REPREP				
Surrogate Recovery	Nitrobenzene-d5	22 * %	65 %	67 %	71 %	57 %	43 %
	2-Fluorobiphenyl	20 * %	60 %	72 %	78 %	63 %	43 %
	p-Terphenyl-d14	33 %	93 %	89 %	89 %	99 %	66 %
bis(2-Ethylhexyl)phthalate		750 U	53 JB	95 J	100 JB	820	160 JB

*= Outside of EPA CLP QC limits.

3D

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD B99-028 H1108 RFW Lot No.: 0010L093-001

MATRIX Spike - Sample No.: B10ML0

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC.
Phenol	5660	0	4820	85	26 - 90
2-Chlorophenol	5660	0	4990	88	25 -102
1,4-Dichlorobenzene	3770	0	3410	90	28 -104
N-Nitroso-di-n-prop.(1)	3770	0	3530	93	41 -126
1,2,4-Trichlorobenzene	3770	0	3460	92	38 -107
4-Chloro-3-methylphenol	5660	0	5010	89	26 -103
Acenaphthene	3770	0	3900	103	31 -137
4-Nitrophenol	5660	0	0	0 *	11 -114
2,4-Dinitrotoluene	3770	0	3490	92 *	28 - 89
Pentachlorophenol	5660	0	0	0 *	17 -109
Pyrene	3770	0	4030	107	35 -142

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Phenol	5660	3530	62	31	35	26 - 90
2-Chlorophenol	5660	3540	63	33	50	25 -102
1,4-Dichlorobenzene	3770	2440	65	32 *	27	28 -104
N-Nitroso-di-n-prop.(1)	3770	2610	69	29	38	41 -126
1,2,4-Trichlorobenzene	3770	2640	70	27 *	23	38 -107
4-Chloro-3-methylphenol	5660	3230	57	43 *	33	26 -103
Acenaphthene	3770	2710	72	35 *	19	31 -137
4-Nitrophenol	5660	0	0 *	0	50	11 -114
2,4-Dinitrotoluene	3770	2100	56	48 *	47	28 - 89
Pentachlorophenol	5660	0	0 *	0	47	17 -109
Pyrene	3770	2670	71	40 *	36	35 -142

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 6 out of 11 outside limits
Spike Recovery: 5 out of 22 outside limits

COMMENTS: 1 out of 12 base/neutral compounds ok 1/3/01

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD B99-028 H1108 RFW Lot No.: 0010L093-002

MATRIX Spike - Sample No.: B10ML1RE Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	3740	0	655	18 *	28 -104
N-Nitroso-Di-n-propylamine	3740	0	856	23 *	41 -126
1,2,4-Trichlorobenzene	3740	0	690	18 *	38 -107
Acenaphthene	3740	0	807	22 *	31 -137
2,4-Dinitrotoluene	3740	0	694	19 *	28 -89
Pyrene	3740	0	949	25 *	35 -142

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
1,4-Dichlorobenzene	3680	1990	54	100 *	27	28 -104
N-Nitroso-Di-n-propylamine	3680	2730	74	106 *	38	41 -126
1,2,4-Trichlorobenzene	3680	2100	57	105 *	23	38 -107
Acenaphthene	3680	2420	66	100 *	19	31 -137
2,4-Dinitrotoluene	3680	2460	67	111 *	47	28 -89
Pyrene	3680	2820	77	101 *	36	35 -142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 6 out of 6 outside limits
Spike Recovery: 6 out of 12 outside limits

COMMENTS:

3D

SOIL SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD B99-029 H1107 RFW Lot No.: 0010L094

BLANK Spike - Sample No.: SBLKFGLE1392-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	BS CONCENTRATION UG/KG	BS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	1670	0	1050	63	28 -104
N-Nitroso-Di-n-propylamine	1670	0	915	55	41 -126
1,2,4-Trichlorobenzene	1670	0	1170	70	38 -107
Acenaphthene	1670	0	1180	71	31 -137
2,4-Dinitrotoluene	1670	0	1080	65	28 -89
Pyrene	1670	0	1350	81	35 -142

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS:

SOIL SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet Contract: 0985-01-01

Case No.: TNUHANFORD B99-028 H1108 RFW Lot No.: 0010L093

BLANK Spike - Sample No.: SBLKJPLE1587-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	BS CONCENTRATION UG/KG	BS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	1670	0	660	40	28 -104
N-Nitroso-Di-n-propylamine	1670	0	795	48	41 -126
1,2,4-Trichlorobenzene	1670	0	683	41	38 -107
Acenaphthene	1670	0	777	47	31 -137
2,4-Dinitrotoluene	1670	0	803	48	28 -89
Pyrene	1670	0	980	59	35 -142

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS:

RECRA LabNet Use Only

00101093

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - Hanford B99-028

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: 10.31.00 Date Due: 11-30-00

Account #:

Refrigerator #		A	B							C		D					
#/Type Container	Liquid																
	Solid	1 jag	1 jag							1 jag		1 jag					
Volume	Liquid	1	1							1		1					
	Solid	250	250							500		250					
Preservatives		—	—							—		—					
ANALYSES REQUESTED →		ORGANIC								INORG							
		VOA	BNA	Pest/PCB	Herb					TCLP Metal	CN	TC Anions					
RECRA LabNet Use Only		0a24X	0a25X							TTCLP		Icno3		Mt①			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
S - Soil	001	BIOMLO			SO	10/26/00	1035	X	X					X		X				
SE - Sediment	002	BIOMLI			L	L	1045	X	X					X		X				
SO - Solid	003	BIOMLO top of 001			L	*	-											✓		
SL - Sludge	004	L 1 L 002			L	L	-											✓		
W - Water																				
O - Oil																				
A - Air																				
DS - Drum Solids																				
DL - Drum Liquids																				
L - EP/TCLP Leachate																				
Wi - Wipe																				
X - Other																				
F - Fish																				

Special Instructions: Saf B99-028

Run Matrix QC

DATE/REVISIONS:

Mt① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Br, Ni

* 2. See lab chron

3.

4.

5.

6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill #

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't (Y) or N

Cooler Temp. 4.3 °C

3.6 °C

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

NOTES:

42357954 0073

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	10/31/00	0915

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-028-55	Page 1 of 1

Collector: T.M. Johansen	Company Contact: T Pickett	Telephone No.: 373-4630	Project Coordinator: TRENT, SJ
Price Code: 9N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100-HR-3 Pump & Treat - Resin Sampling	Sampling Location: 100-HR-3	SAF No.: B99-028	
Ice Chest No.: ERC 96-019 (1 of 2)	Field Logbook No.: EL-1516	COA: R10HR3C570	Method of Shipment: Gov vehicle / FEDEX
Shipped To: ~~TMA~~/RECRA TMD 10-26-00	Offsite Property No.: A010006		Bill of Lading/Air Bill No.: 4235 7953 - 0062

POSSIBLE SAMPLE HAZARDS/REMARKS

HISTORICAL DATA INDICATES SAMPLES ARE LESS THAN 2000 pci TOTAL ACTIVITY. NO TOTAL ACTIVITY REQUIRED.

Special Handling and/or Storage

TMD 10-26-00 Outfile

SAMPLE ANALYSIS												
Preservation	None	None	None	None	Cool 4C	None	Cool 4C	None		
Type of Container	aG	aG	aG	aG	aG	aG	G	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	125mL	250mL	250mL	250mL	500mL		
	Isotopic Uranium	Strontium 89,90 -- Total Sr	Technetium 99	Tritium - H3	Semi-VOA - 8270A (TCL) [Bis(2-ethylhexyl) phthalate]	IC Anions - 300.0 [Nitrate]	See item (1) in Special Instructions	See item (2) in Special Instructions		
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**									
B10ML0	OTHER SOLID	10-26-00	1035					X	X	X	X		97712
B10ML1	OTHER SOLID	10-26-00	1045					X	X	X	X		97717

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Sign/Print Names	Date/Time
Relinquished By	[signature]	10-26-00 1545	Received By: TMD 10-26-00 / Stored in Ref #2B	10-26-00 1545
Relinquished By: Removed from Ref #2B 3728		10/30/00 0900	Received By: R Thoren	10/30/00 0900
Relinquished By: R. Thoren	[signature]	10/30/00 0900	Received By: FEDEX	
Relinquished By: FedEx		10-31-00 / 0915	Received By	10-31-00 / 0915
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

** If a limited quantity of sample material is received, perform analyses in order listed on the FSR.

(1) VOA - 8260A (TCL) (Chloroform, Methylenechloride); VOA - 8260A (Add-On) (Trichloromonofluoromethane)
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Metals by ICP (TCLP) Add-on - 1311/6010 (Antimony, Beryllium, Nickel)

Samples stored in Ref.# 2B at the 3728 Shipping Facility on 10/26/00.
Collector not available to relinquish samples on 10/30/00 for shipment. RT 10/30/00

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (10/99)

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-028 H1108

DATE RECEIVED: 10/31/00 RFW LOT # :0010L093

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10ML0	001	SO	00LVX345	10/26/00	N/A	11/02/00
B10ML0	001 R1	SO	00LVX345	10/26/00	N/A	11/02/00
B10ML1	002	SO	00LVX345	10/26/00	N/A	11/02/00
B10ML1	002 MS	SO	00LVX345	10/26/00	N/A	11/02/00
B10ML1	002 MSD	SO	00LVX345	10/26/00	N/A	11/02/00

LAB QC:

VBLKBN	MB1	S	00LVX345	N/A	N/A	11/02/00
VBLKBN	MB1 BS	S	00LVX345	N/A	N/A	11/02/00

RECEIVED JAN 2001

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B00-028
RFW #: 0010L093
SDG/SAF #: H1108/B00-028

W.O. #: 10985-001-001-9999-00
Date Received: 10-31-00

GC/MS VOLATILE

The set of samples consisted of two (2) solid samples collected on 10-26-00.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for client specified Volatile target compounds on 11-02-00.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The samples were analyzed within required holding time.

3. One (1) of twenty-one (21) surrogate recoveries was outside EPA QC limits. Analysis of the original sample for Sample B10ML0 RE fulfilled its re-analysis requirement.

4. Two (2) of ten (10) matrix spike recoveries were outside EPA QC limits. However, the target compound is not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.)

5. All blank spike recoveries were within EPA QC limits.

6. The method blank contained the common laboratory contaminant Methylene Chloride and Acetone at a level less than 2x the CRQL.

7. "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."

by J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

12-11-00
Date

pef\group\data\voa\tnu-hanford-10-093.doc

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 10 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.voa

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

mmz\10-94\gloss.voa

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, Special List Report Date: 12/05/00 [illegible]

RFW Ref. Number: 0010L093 Client: TNUHANFORD B99-028 H1108 Work Order: [illegible] Page: 1a

05

	Cust ID:	B10ML0		B10ML0		B10ML1		B10ML1		B10ML1		VBLKBN	
Sample Information	RFW#:	001		001		002		002 MS		002 MSD		00LVX345-MB1	
	Matrix:	SOLID		SOLID		SOLID		SOLID		SOLID		SOIL	
	D.F.:	1.00		1.02		1.04		1.02		1.00		1.00	
	Units:	UG/KG		UG/KG REPREP		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	1,2-Dichloroethane-d4	98	%	100	%	96	%	91	%	99	%	95	%
	Toluene-d8	131	%	159 *	%	138	%	134	%	131	%	99	%
	Bromofluorobenzene	75	%	73	%	72	%	73	%	74	%	98	%
Trichlorofluoromethane		3	J	3	J	4	J	3	J	3	J	5	U
Methylene Chloride		41	B	38	B	35	B	47	B	53	B	6	
Chloroform		4	J	5	J	4	J	3	J	3	J	5	U

	Cust ID:	VBLKBN BS	
Sample Information	RFW#:	00LVX345-MB1	
	Matrix:	SOIL	
	D.F.:	1.00	
	Units:	UG/KG	
Surrogate Recovery	1,2-Dichloroethane-d4	94	%
	Toluene-d8	96	%
	Bromofluorobenzene	95	%
Trichlorofluoromethane		5	U
Methylene Chloride		6	B
Chloroform		5	U

*= Outside of EPA CLP QC limits.

3B

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet.Philadelphia Contract: 10985-001-001-9999-00

Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L093

Matrix Spike - EPA Sample No.: B10ML1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	114.86	0.0000	120.48	105	61-145
Trichloroethene	114.86	0.0000	108.99	95	71-120
Benzene	114.86	0.0000	107.30	93	76-127
Toluene	114.86	2.963	159.24	136*	76-125
Chlorobenzene	114.86	0.0000	107.99	94	75-130

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	112.56	117.51	104	1	14	61-145
Trichloroethene	112.56	107.90	96	1	14	71-120
Benzene	112.56	105.90	94	1	11	76-127
Toluene	112.56	148.89	130*	4	13	76-125
Chlorobenzene	112.56	104.49	93	1	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 2 out of 10 outside limits

COMMENTS: _____

3B
SOIL VOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet.Philadelphia Contract: 10985-001-001-9999-00

Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L093

Matrix Spike - EPA Sample No.: VBLKBN Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	BLANK CONCENTRATION (ug/Kg)	BS CONCENTRATION (ug/Kg)	BS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50.000	0.0000	43.556	87	61-145
Trichloroethene	50.000	0.0000	46.099	92	71-120
Benzene	50.000	0.0000	46.307	93	76-127
Toluene	50.000	0.0000	46.134	92	76-125
Chlorobenzene	50.000	0.0000	45.160	90	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS:

RECRA LabNet Use Only

00101093

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - Hanford B99-028

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: 10.31.00 Date Due: 11-30-00

Account #:

		A	B	C	D
Refrigerator #		1	5	5	5
#/Type Container	Liquid				
	Solid	1 jar	1 jar	1 jar	1 jar
Volume	Liquid	0	0	0	0
	Solid	250	250	500	250
Preservatives		—	—	—	—
ANALYSES REQUESTED	ORGANIC: VOA				
	ORGANIC: BNA				
	ORGANIC: Pest/PCB				
	ORGANIC: Herb				
	INORG: TCLP Metal				
	INORG: CN				
	INORG: TC Anions				

RECRA LabNet Use Only

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OC24X	OC25X	ITCLP	ICnO3	Met①
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	001	BIOMLO			SO	10/26/00	1035	X	X	X	X	
	002	BIOMLI			⊥	⊥	1045	X	X	X	X	
	003	BIOMLO top of 001			L	*	-					✓
	004	⊥ 1 ⊥ 002			⊥	⊥	-					✓

Special Instructions: Saf B99-028

Run Matrix QC

DATE/REVISIONS:

Met① 1. As, Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni

* 2. See lab chron

3.

4.

5.

6.

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	10/31/00	0915

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # ___
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't (Y) or N

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

NOTES: # 4235 7954 0073

Cooler Temp. 4.3 °C 3.6°

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-028-55	Page 1 of 1

Collector: T.M. Johansen	Company Contact: T Pickett — Telephone No.: 373-4630	Project Coordinator: TRENT, SJ	Price Code: 9N — Data Turnaround: 45 Days
Project Designation: 100-HR-3 Pump & Treat - Resin Sampling	Sampling Location: 100-HR-3	SAF No.: B99-028	Air Quality ☐
Ice Chest No.: ERC 96-019 (1 of 2)	Field Logbook No.: EL-1516 — COA: R10HR3C570	Method of Shipment: Gov vehicle / FEDEX	
Shipped To: ~~TMA~~/RECRA TMD 10-26-00	Offsite Property No.: A010006	Bill of Lading/Air Bill No.: 4235 7453 - 0062	

POSSIBLE SAMPLE HAZARDS/REMARKS

HISTORICAL DATA INDICATES SAMPLES ARE LESS THAN 2000 pci TOTAL ACTIVITY. NO TOTAL ACTIVITY REQUIRED

Special Handling and/or Storage

SAMPLE ANALYSIS	Isotopic Uranium	Strontium 89,90 -- Total Sr	Technetium 99	Tritium - H3	Semi-VOA - 8270A (TCL) {Bis(2-ethylhexyl) phthalate}	IC Anions - 300.0 {Nitrate}	See item (1) in Special Instructions	See item (2) in Special Instructions		
Preservation	None	None	None	None	Cool 4C	None	Cool 4C	None		
Type of Container	aG	aG	aG	aG	aG	aG	G	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	60mL	125mL	250mL	250mL	250mL	500mL		

TMD 10-26-00

Sample No.	Matrix *	Sample Date	Sample Time										
B10ML0	OTHER SOLID	10-26-00	1035					X	X	X	X		97712
B10ML1	OTHER SOLID	10-26-00	1045					X	X	X	X		97717

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
TMD 10-26-00	10-26-00 1545	TMD 10-26-00	1545
Removed from Ref #2B 3728	10/30/00 0400	R Thoren	10/30/00 0400
R Thoren	10/30/00 0400	FEDEX	
Fed Ex	10-31-00/0915		10-31-00/0915

Stored in Ref #2B 10-26-00

SPECIAL INSTRUCTIONS

** If a limited quantity of sample material is received, perform analyses in order listed on the FSR.

(1) VOA - 8260A (TCL) {Chloroform, Methylenechloride}; VOA - 8260A (Add-On) {*Trichloromonofluoromethane*}
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel}

Samples stored in Ref.#2B at the 3728 Shipping Facility on 10/26/00. Collector not available to relinquish samples on 10/30/00 for shipment. RT 10/30/00

Matrix *

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 10-31-00 / 0915

SDG#: 00101093

Work Order Number: — SAF# B99-028

Shipping Container ID: — Chain of Custody # B99-028-55

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 4.3°C 3.6°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 8
7. Sample holding times exceeded? Yes [ ] No [✓]

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

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

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

Sample Custodian/Laboratory: Thoppel Beera Date: 10-31-00

Telephoned to: _____ On _____ By _____