H0597-TMA/RECR

RECEIVED
FEB 14 2000
EDMC

Thermo Retec
W.O. No. N9-10-224-7263

Bechtel Hanford Inc.
SDG H0597

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0597 is composed of two water samples designated under SAF No. B99-085 with a Project Designation of: 200 Area Source Characterization – 200-CW-1 OU-QC Sa.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. The results were transmitted to BHI via facsimile on January 5, 2000.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

JAN 2000
RECEIVED
Data
Log In

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0597

SAMPLE SUMMARY

PEG 2263
Contact Melissa C. Marsh

Client Hanford
Contract TMP-HP-162625
Case no H0597

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
FUWNX3	Hanford Site	WATER		N910224-01	B99-085	B99-085-03	10/22/99 07:00
Method Blank		WATER		N910224-03	B99-085		
Lab Control Sample		WATER		N910224-02	B99-085		
Duplicate (N910224-01)	Hanford Site	WATER		N910224-04	B99-085		10/22/99 07:00

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/05/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP HC597

SDG 7263
Contact Melissa C. Marsden

QC SUMMARY

Client Hanford
Contract DOE-DE-AC05-91OR22925
Case no SDG HC597

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DATE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7263	P99-085-13	B:WNX3	WATER				10/27/99	5	N910224-01	7263-001
		Method Blank	WATER						N910224-03	7263-003
		Lab Control Sample	WATER						N910224-02	7263-002
		Duplicate (N910224-01)	WATER				10/27/99	5	N910224-04	7263-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/05/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0597

PREP BATCH SUMMARY

SDG 7263
Contact Melissa C. Marsden

Client Hanford
Contract SLE SLE-207525
Case no SDG H0597

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	BLANKETS ANALYZED CLIENT	MOKE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
80A	WATER	Gross Alpha in Water	6904-196	20.0	1			1	1	1/1		
80B	WATER	Gross Beta in Water	6904-196	15.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS blanketts 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 01/05/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0597

WORK SUMMARY

SDG 7263
Contract Melissa C. Manchin

Client Hanford
Contract TRP-SRP-267915
Case no SDG H0597

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B:WNX3			N910224-01	7263-001	80A/80		12/14/99	12/30/99	NJV	Gross Alpha in Water
Hanford Site		WATER	10/22/99	7263-001	80B/80		12/14/99	12/30/99	NJV	Gross Beta in Water
B99-095-13	B99-085		10/27/99							
Method Blank			N910224-03	7263-003	80A/80		12/16/99	12/30/99	NJV	Gross Alpha in Water
		WATER		7263-003	80B/80		12/16/99	12/30/99	NJV	Gross Beta in Water
	B99-085									
Lab Control Sample			N910224-02	7263-002	80A/80		12/14/99	12/30/99	NJV	Gross Alpha in Water
		WATER		7263-002	80B/80		12/14/99	12/30/99	NJV	Gross Beta in Water
	B99-085									
Duplicate (N910224-01)			N910224-04	7263-004	80A/80		12/16/99	12/30/99	NJV	Gross Alpha in Water
Hanford Site		WATER	10/22/99	7263-004	80B/80		12/16/99	12/30/99	NJV	Gross Beta in Water
	B99-085		10/27/99							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
80A/80	B99-085	Gross Alpha in Water	EPA900.0	1			1	1	1	4
80B/80	B99-085	Gross Beta in Water	EPA900.0	1			1	1	1	4
TOTALS				2			2	2	2	8

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form CVD-CWS
Version 3.06
Report date 01/05/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0597

N910224-03

Method Blank

METHOD BLANK

SDG	7763	Client/Case no	Hanford
Contact	Melissa C. Mannion	Contract	TLB-SEP-207825
Lab sample id	N910224-03	Client sample id	Method Blank
Dept sample id	7763-003	Material/Matrix	WATER
		SAF No	P99-085

SDG H0597

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.164	0.33	0.89	3.0	U	80A
Gross Beta	12587-47-2	-0.345	1.2	2.0	4.0	U	80B

200 East, 200 Area Source Chara.

QC-BLANK 32607

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/05/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H01.97

N910224-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG	7263	Client/Case no	Hanford SDG H01.97
Contact	Melissa C. Munson	Case no	TRP-TRP-107025
Lab sample id	N910224-02	Client sample id	Lab Control Sample
Lept sample id	7263-002	Material/Matrix	WATER
		SAF No	F99-085

ANALYTE	RESULT pCi/L	2σ ERR (COUNT) pCi/L	MDA pCi/L	MDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	65.9	4.7	1.2	3.0		900A	71.7	2.9	92	70-130	80-120
Gross Beta	84.6	3.8	1.9	4.0		900B	82.7	3.3	102	75-125	

200 Host, 100 Area Source Chara.

QC-LCS 32006

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 8

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	LVD-LCS
Version	3.06
Report date	01/05/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0997

N910224 04 L0WNX3

DUPLICATE

SDG 2263

Contact Melissa C. Manning

Client/Case no Hanford SDG H0997

Case no CBF/CBF 222925

DUPLICATE	ORIGINAL	
Lab sample id N910224 04	Lab sample id N910224 01	Client sample id L0WNX3
Dept sample id 2263-004	Dept sample id 2263-001	Location/Matrix Hanford Site WATER
	Received 10/17/99	Collected 10/11/99 07:00
		Custody/TAF No P99-085-13 P99-085

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	PRCT LIMIT
Gross Alpha	-0.045	0.35	0.80	3.0	U	80A	0.059	0.40	0.79	U	-		
Gross Beta	-0.169	1.3	2.3	4.0	U	81B	-0.189	1.2	2.1	U	-		

200 East, 100 Area Source Chara.

QC-LUI#1 32608

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form LVD-DUP
Version 3.06
Report date 01/05/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0597

N910224-01 B0WNX3

DATA SHEET

SDG	7203	Client/Case no	Hanford
Contact	Melissa C. Maunion	Contract	TBR SPP-207925
Lab sample id	N910224-01	Client sample id	B0WNX3
Dept sample id	7203-001	Location/Matrix	Hanford Site WATER
Received	10/27/99	Collected	10/22/99 07:00
		Custody/SAF No	P99-085-13 P99-085

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.099	0.40	0.79	3.0	U	80A
Gross Beta	12587-47-2	-0.189	1.2	2.1	4.0	U	80B

200 East, 200 Area Source Chara.

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/05/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0597

METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Test GA Matrix WATER
SDG 7263
Contact Melissa C. Marvin

Client Hanford
Contract CKP CLP-[illegible]
Case no SDG H0597

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 6904-196						
[illegible] WNX3	N910224 01	80		7263-001	U	
BLK (QC ID 32607)	N910224-03	80		7263-003	U	
LCS (QC ID=32606)	N910224-02	80		7263-002	ok	
Duplicate (N910224-02)	N910224 04	80		7263-004	-	U

Nominal values and limits from method RDLs (pCi/L) 3.0
200 East, 200 Area Source Chara.

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 6904-196 2σ prep error 20.0 % Reference Lab Notebook 6904 pg. 196																
[illegible] WNX3	N910224 01	80		0.79	0.300			0		100			53	12/[illegible]/99	12/24	[illegible]-124
BLK (QC ID 32607)	N910224 03	80		0.89	0.300			19		100				12/14/99	12/16	[illegible]-111
LCS (QC ID=32606)	N910224-02	80		1.2	0.300			19		100				12/16/99	12/24	[illegible]-115
Duplicate (N910224-02) (QC ID=32608)	N910224-04	80		0.80	0.300			0		100			55	12/16/99	12/26	[illegible]-112
Nominal values and limits from method				3.0	0.300			5-150		100			180			

PROCEDURES REFERENCE EPA900.0
EP 120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD MDA 0.92 ± 0.38
FOR 4 SAMPLES RESIDUE 10 ± 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/05/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0L97

METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Test RCB Matrix WATER
SDG 7263
Project Melissa C. Marsden

Client Hanford
Contract DOE-[illegible]
Case no [illegible]

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	FLANCHET	Gross Beta	
Preparation Batch 6904 196						
PWNX3	N910124-01	80		7263-001	U	
PLK (QC ID-91607)	N910124-03	80		7263-003	U	
LCS (QC ID 91606)	N910124-02	80		7263-002	ok	
Duplicate (N910124-01)	N910124-04	80		7263-004	-	U

Nominal values and limits from method RDLs (pCi/L) 4.0
200 East, 200 Area Source Chara.

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	DAYS ANALYZED	ANAL-YZED	DETECTOR
Preparation Batch 6904 196 2σ prep error 15.0 % Reference Lab Notebook 6904 pg. 196																
PWNX3	N910124-01	80		2.1	0.300			0		100			53	12/09/99	12/14	GBP-114
PLK (QC ID-91607)	N910124-03	80		2.0	0.300			19		100				12/08/99	12/16	GBP-111
LCS (QC ID 91606)	N910124-02	80		1.9	0.300			19		100				12/08/99	12/14	GBP-115
Duplicate (N910124-01) (QC ID-91608)	N910124-04	80		2.3	0.300			0		100			15	12/09/99	12/16	GBP-112
Nominal values and limits from method				4.0	0.300			5 150		100			180			

PROCEDURES REFERENCE EPA900.0
EP 120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD MDA 2.1 ± 0.24
FOR 4 SAMPLES RESIDUE 10 ± 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form IVD-GMS
Version 3.06
Report date 01/05/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-13	Page 1 of 1

Collector: Bowers/Trice	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sa	Sampling Location: 200 East		SAF No.: B99-085
Ice Chest No.: ERC 99 029	Field Logbook No.: EL1511		Method of Shipment: Fed EX
Shipped To: TMA/RECRA 10-22-99	Offsite Property No.: A00010		Bill of Lading/Air Bill No.: 42357953 10168
			COA B20CW1 67/C

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
	Type of Container	P	P	P	aG	P	aGs*	P			
	No. of Container(s)	1	1	1	2	2	3	3			
Special Handling and/or Storage	Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS		Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
B0WNX2	Water	10-22-99	0515					X RT 10-26-99					
B0WNX3	Water	10-22-99	0700					X				RT 10-26-99 BOWSCT	

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: Doug Bowers Date/Time: Doug Bowers 10-22-99/1115	Received By: R.F. 2C Date/Time: R.F. 2C 10-22-99/1115	
Relinquished By: Date/Time: Ref 2C 10-26-99/0800	Received By: Rikki Thoren Date/Time: R. Thoren 10-26-99/0800	
Relinquished By: Rikki Thoren Date/Time: R. Thoren 10-26-99/1430	Received By: FEDEX Date/Time: 10-26-99	
Relinquished By: Date/Time: FedEx 10/27/99 10:00	Received By: TW McGoldenberg Date/Time: 10/27/99 10:00	

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc)

Sample did not originate from A Radiologically Controlled AREA NO TA Required

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 10-27-99 10:00

CoC No. B99-085-13

Container I.D. No. ERC 99-029 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: 1
7. Number of containers per sample: 1 (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 M. Goldberg Date: 10-27-99 Time: 10:00

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9910L528
SDG# : H0597
SAF# : B99-085

W.O. # : 10985-001-001-9999-00
Date Received: 10-27-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of pH, 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. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

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

8. The replicate analyses were within the 20% RPD control limit.

Pat E.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-13-99
Date

njp\i10 528

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 12 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	
✓Nitrite ✓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	
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:**

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 11/22/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9910L528

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	E0WNX3	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
		Nitrate Nitrite	0.02 u	MG-N/L	0.02	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0
		pH	6.3	PH UNITS	0.01	1.0
		Sulfide	2.0 u	MG/L	2.0	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/22/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9910L528

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LIC088-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99LAN055-MB1	Nitrate Nitrite	0.02 u	MG-N/L	0.02	1.0
BLANK10	99LAMA43-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	99LSDA64-MB1	Sulfide	2.0 u	MG/L	2.0	1.0

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INORGANICS ACCURACY REPORT 11/22/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9910L528

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	E0WNX3	Chloride by IC	5.0	0.23	5.0	94.7	1.0
		Fluoride by IC	10.7	0.00	10.0	106.6	1.0
		Nitrite by IC	5.1	0.25u	5.0	102.0	1.0
		Nitrate by IC	4.9	0.25u	5.0	98.4	1.0
		Phosphate by IC	4.9	0.25u	5.0	98.5	1.0
		Sulfate by IC	5.0	0.25u	5.0	99.1	1.0
		Nitrate Nitrite	0.49	0.02u	0.50	98.6	1.0
		Ammonia, as N	0.94	0.10u	1.0	94.4	1.0
		Sulfide	9.8	0.10	10.0	97.0	1.0
BLANK10	99LIC088-MB1	Chloride by IC	4.9	0.25u	5.0	97.1	1.0
		Fluoride by IC	10.6	0.25u	10.0	105.6	1.0
		Nitrite by IC	5.0	0.25u	5.0	99.2	1.0
		Nitrate by IC	4.8	0.25u	5.0	96.1	1.0
		Phosphate by IC	5.0	0.25u	5.0	99.2	1.0
		Sulfate by IC	4.7	0.25u	5.0	94.4	1.0
BLANK10	99LAN055-MB1	Nitrate Nitrite	0.49	0.02u	0.50	98.4	1.0
		Nitrate Nitrite MSD	0.50	0.02u	0.50	100.8	1.0
BLANK10	99LAMA43-MB1	Ammonia, as N	1.0	0.10u	1.0	104.0	1.0
		Ammonia, as N MSD	1.0	0.10u	1.0	103.0	1.0
BLANK10	99LSDA64-MB1	Sulfide	10.0	2.0 u	10.0	100	1.0

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INORGANICS DUPLICATE SPIKE REPORT 11/22/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9910L528

WORK ORDER: 10965-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	99LAN055-MB1	Nitrate Nitrite	98.4	100.8	2.4
BLANK10	99LAMA43-MB1	Ammonia, as N	104.0	103.0	0.97

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/22/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 9910L528

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	E0WNX3	Chloride by IC	0.25u	0.25u	NC	1.0
		Fluoride by IC	0.25u	0.25u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	0.25u	0.25u	NC	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	0.25u	0.25u	NC	1.0
		Nitrate Nitrite	0.02u	0.02u	NC	1.0
		Ammonia, as N	0.10u	0.10u	NC	1.0
		pH	6.3	6.3	0.6	1.0
		Sulfide	2.0 u	2.0 u	NC	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/27/99 RFW LOT # :9910L528

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNX3						
CHLORIDE BY IC	002	W	99LIC088	10/22/99	10/28/99	10/28/99
CHLORIDE BY IC	002 REP	W	99LIC088	10/22/99	10/28/99	10/28/99
CHLORIDE BY IC	002 MS	W	99LIC088	10/22/99	10/28/99	10/28/99
FLUORIDE BY IC	002	W	99LIC088	10/22/99	10/28/99	10/28/99
FLUORIDE BY IC	002 REP	W	99LIC088	10/22/99	10/28/99	10/28/99
FLUORIDE BY IC	002 MS	W	99LIC088	10/22/99	10/28/99	10/28/99
NITRITE BY IC	002	W	99LIC088	10/22/99	10/28/99	10/28/99
NITRITE BY IC	002 REP	W	99LIC088	10/22/99	10/28/99	10/28/99
NITRITE BY IC	002 MS	W	99LIC088	10/22/99	10/28/99	10/28/99
NITRATE BY IC	002	W	99LIC088	10/22/99	10/28/99	10/28/99
NITRATE BY IC	002 REP	W	99LIC088	10/22/99	10/28/99	10/28/99
NITRATE BY IC	002 MS	W	99LIC088	10/22/99	10/28/99	10/28/99
PHOSPHATE BY IC	002	W	99LIC088	10/22/99	10/28/99	10/28/99
PHOSPHATE BY IC	002 REP	W	99LIC088	10/22/99	10/28/99	10/28/99
PHOSPHATE BY IC	002 MS	W	99LIC088	10/22/99	10/28/99	10/28/99
SULFATE BY IC	002	W	99LIC088	10/22/99	10/28/99	10/28/99
SULFATE BY IC	002 REP	W	99LIC088	10/22/99	10/28/99	10/28/99
SULFATE BY IC	002 MS	W	99LIC088	10/22/99	10/28/99	10/28/99
NITRATE NITRITE	002	W	99LAN055	10/22/99	11/18/99	11/18/99
NITRATE NITRITE	002 REP	W	99LAN055	10/22/99	11/18/99	11/18/99
NITRATE NITRITE	002 MS	W	99LAN055	10/22/99	11/18/99	11/18/99
AMMONIA	002	W	99LAMA43	10/22/99	11/08/99	11/08/99
AMMONIA	002 REP	W	99LAMA43	10/22/99	11/08/99	11/08/99
AMMONIA	002 MS	W	99LAMA43	10/22/99	11/08/99	11/08/99
PH	002	W	99LPH116	10/22/99	10/27/99	10/27/99
PH	002 REP	W	99LPH116	10/22/99	10/27/99	10/27/99
SULFIDE	002	W	99LSDA64	10/22/99	10/29/99	10/29/99
SULFIDE	002 REP	W	99LSDA64	10/22/99	10/29/99	10/29/99
SULFIDE	002 MS	W	99LSDA64	10/22/99	10/29/99	10/29/99

LAB QC:

CHLORIDE BY IC	MB1	W	99LIC088	N/A	10/28/99	10/28/99
CHLORIDE BY IC	MB1 BS	W	99LIC088	N/A	10/28/99	10/28/99
FLUORIDE BY IC	MB1	W	99LIC088	N/A	10/28/99	10/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/27/99 RFW LOT # :9910L528

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
FLUORIDE BY IC	MB1 BS	W	99LIC088	N/A	10/28/99	10/28/99
NITRITE BY IC	MB1	W	99LIC088	N/A	10/28/99	10/28/99
NITRITE BY IC	MB1 BS	W	99LIC088	N/A	10/28/99	10/28/99
NITRATE BY IC	MB1	W	99LIC088	N/A	10/28/99	10/28/99
NITRATE BY IC	MB1 BS	W	99LIC088	N/A	10/28/99	10/28/99
PHOSPHATE BY IC	MB1	W	99LIC088	N/A	10/28/99	10/28/99
PHOSPHATE BY IC	MB1 BS	W	99LIC088	N/A	10/28/99	10/28/99
SULFATE BY IC	MB1	W	99LIC088	N/A	10/28/99	10/28/99
SULFATE BY IC	MB1 BS	W	99LIC088	N/A	10/28/99	10/28/99
NITRATE NITRITE	MB1	W	99LAN055	N/A	11/18/99	11/18/99
NITRATE NITRITE	MB1 BS	W	99LAN055	N/A	11/18/99	11/18/99
NITRATE NITRITE	MB1 BSD	W	99LAN055	N/A	11/18/99	11/18/99
AMMONIA	MB1	W	99LAMA43	N/A	11/08/99	11/08/99
AMMONIA	MB1 BS	W	99LAMA43	N/A	11/08/99	11/08/99
AMMONIA	MB1 BSD	W	99LAMA43	N/A	11/08/99	11/08/99
SULFIDE	MB1	W	99LSDA64	N/A	10/29/99	10/29/99
SULFIDE	MB1 BS	W	99LSDA64	N/A	10/29/99	10/29/99

RECRA LabNet Use Only

9910L528

Custody Transfer Record/Lab Work Request

Page 1 of 1

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FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU Hanford B99-085

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: 10.27.99 Date Due: 11/26/99

Account #:

Refrigerator #		1	2									2											
#/Type Container	Liquid	3AG	2AG									3PL		1PL	1PL	1PL							
	Solid																						
Volume	Liquid	40	1L									500		500	1L	1L							
	Solid																						
Preservatives		HCl	—									HNO_3		ZNAC NaOH	—	H_2SO_4							
ANALYSES REQUESTED		ORGANIC										INORG											
		VOA	BNA	Pest/PCB	Herb							ICP Metal	CN	Sulfide	IC Anions	NO_2/NO_3	NH_3						

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	CO 24H	CO 25H				Met Q	11/27/99	15FD	Ang Q	1N3N2	1NH3N
S - Soil	001	BOWNX2			W	10/22/99	0515	X										
SE - Sediment	002	BOWNX3	X	X	⊥	⊥	0700	X	X				X	X	X	X	X	
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																		

RECRA LabNet Use Only

Special Instructions:

Saf# B99-085

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
2. Met Q = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
3. Ni, V, Zn, Be
4. Ang Q = ICCl, ICFl, ICNO2, ICNO3, ICPO4,
5. ICSO4, IPH
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) ~~IC Anions~~ 12-13-99 PH

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

NOTES:

* 42357953108 0

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. 2.1 °C

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	10/27/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

NO2, NO3 and PO4

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector Bowers/Trice	**Company Contact** C Cearlock	**Telephone No.** 372-9574	**Project Coordinator** TRENT, SJ
Price Code 7N	**Data Turnaround** 45 Days		
Project Designation 200 Area Source characterization - 200-CW-1 OU - QC Sa	**Sampling Location** 200 East		**SAF No.** B99-085
Ice Chest No. ERC 99 028	**Field Logbook No.** EL1511		**Method of Shipment** Fed EX
Shipped To ~~LMA~~/RECRA 0 70. 10-22-99	**Offsite Property No.** A00011		**Bill of Lading/Air Bill No.** 42357953 1080
			COA B20CW1 67/C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1, Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha, Gross Beta	VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
B0WNX2	Water	~~0515~~ 10-22-99	0515						X				
B0WNX3	Water	~~0700~~ 10-22-99	0700	X	X	X	X		X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers	Date/Time 10-22-99/1115	Received By Ref DC	Date/Time 10-22-99/1115
Relinquished By Ref DC	Date/Time 10-26-99/0800	Received By R. Thoren	Date/Time 10-26-99/0800
Relinquished By Rikki Thoren R. Thoren	Date/Time 10/26/99/1430	Received By FED EX	Date/Time
Relinquished By Fed Ex	Date/Time 10-27-99/0930	Received By	Date/Time 10-27-99/0930

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc)

Sample material did not originate from a radiologically controlled area
No total activity required.
9910L528 - Item 2.1

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9910L528
SDG/SAF# : H0597/B99-085

W.O.# : 10985-001-001-9999-00
Date Received: 10-27-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

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

4. The cooler temperature has been recorded on the Chain of Custody.

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

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) 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 laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

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

11. The duplicate analyses for 4 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

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

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.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-16-99
Date

mld/m10-528

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9910L528

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:_____

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 11/16/99

CLIENT: TNU-HANFORD B99-085

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

RECRA LOT #: S910L528

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B0WNX3	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	2.7 u	UG/L	2.7	1.0
		Barium, Total	0.29	UG/L	0.20	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Chromium, Total	0.70 u	UG/L	0.70	1.0
		Copper, Total	0.50 u	UG/L	0.50	1.0
		Nickel, Total	1.0 u	UG/L	1.0	1.0
		Lead, Total	2.1 u	UG/L	2.1	1.0
		Selenium, Total	4.1 u	UG/L	4.1	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zinc, Total	0.65	UG/L	0.50	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/16/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 991CL528

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0770-MB1	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	2.7 u	UG/L	2.7	1.0
		Barium, Total	0.30	UG/L	0.20	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Chromium, Total	0.70 u	UG/L	0.70	1.0
		Copper, Total	0.50 u	UG/L	0.50	1.0
		Nickel, Total	1.0 u	UG/L	1.0	1.0
		Lead, Total	2.1 u	UG/L	2.1	1.0
		Selenium, Total	4.1 u	UG/L	4.1	1.0
		Vanadium, Total	0.60 u	UG/L	0.60	1.0
		Zinc, Total	0.51	UG/L	0.50	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/16/99

CLIENT: TNU-HANFORD E99-085 RECRA LOT #: 9910L528

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	EOWNX3	Silver, Total	48.0	0.80u	50.0	96.0	1.0
		Arsenic, Total	1990	2.7 u	2000	99.3	1.0
		Barium, Total	1930	0.29	2000	96.4	1.0
		Beryllium, Total	49.4	0.10u	50.0	98.8	1.0
		Cadmium, Total	48.8	0.40u	50.0	97.6	1.0
		Chromium, Total	196	0.70u	200	97.8	1.0
		Copper, Total	242	0.50u	250	96.8	1.0
		Nickel, Total	476	1.0 u	500	95.2	1.0
		Lead, Total	488	2.1 u	500	97.6	1.0
		Selenium, Total	1970	4.1 u	2000	98.6	1.0
		Vanadium, Total	503	0.60u	500	100.6	1.0
		Zinc, Total	478	0.65	500	95.5	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/16/99

CLIENT: TNU-HANFORD E99-085

RECRA LOT #: 9910L528

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	EOWNX3	Silver, Total	0.80u	0.80u	NC	1.0
		Arsenic, Total	2.7 u	2.7 u	NC	1.0
		Barium, Total	0.29	0.45	43.2	1.0
		Beryllium, Total	0.10u	0.10u	NC	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Chromium, Total	0.70u	0.70u	NC	1.0
		Copper, Total	0.50u	0.99	~~NC~~ 200	1.0
		Nickel, Total	1.0 u	1.0 u	NC	1.0
		Lead, Total	2.1 u	2.6	~~NC~~ 200	1.0
		Selenium, Total	4.1 u	4.1 u	NC	1.0
		Vanadium, Total	0.60u	0.60u	NC	1.0
		Zinc, Total	0.65	1.5	79.1	1.0

Corrections MD 11/16/99

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/16/99

CLIENT: TNU-HANFORD B99-085 RECRA LOT #: 991CL528

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0770-LC1	Silver, LCS	491	500	UG/L	98.2
		Arsenic, LCS	9740	10000	UG/L	97.4
		Barium, LCS	4820	5000	UG/L	96.3
		Beryllium, LCS	245	250	UG/L	97.9
		Cadmium, LCS	242	250	UG/L	97.0
		Chromium, LCS	486	500	UG/L	97.3
		Copper, LCS	1210	1250	UG/L	96.5
		Nickel, LCS	1910	2000	UG/L	95.5
		Lead, LCS	2400	2500	UG/L	96.0
		Selenium, LCS	9710	10000	UG/L	97.1
		Vanadium, LCS	2510	2500	UG/L	100.4
		Zinc, LCS	967	1000	UG/L	96.7

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/27/99 RFW LOT # :9910L528

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNX3						
SILVER, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
SILVER, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
SILVER, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
ARSENIC, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
ARSENIC, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
ARSENIC, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
BARIUM, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
BARIUM, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
BARIUM, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
BERYLLIUM, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
BERYLLIUM, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
BERYLLIUM, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
CADMIUM, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
CADMIUM, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
CADMIUM, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
CHROMIUM, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
CHROMIUM, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
CHROMIUM, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
COPPER, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
COPPER, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
COPPER, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
NICKEL, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
NICKEL, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
NICKEL, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
LEAD, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
LEAD, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
LEAD, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
SELENIUM, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
SELENIUM, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
SELENIUM, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
VANADIUM, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
VANADIUM, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99
VANADIUM, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99
ZINC, TOTAL	002	W	99L0770	10/22/99	11/11/99	11/11/99
ZINC, TOTAL	002 REP	W	99L0770	10/22/99	11/11/99	11/11/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/27/99 RFW LOT # :9910L528

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	002 MS	W	99L0770	10/22/99	11/11/99	11/11/99

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
SILVER, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
ARSENIC LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
ARSENIC, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
BARIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
BARIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
BERYLLIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
BERYLLIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
CADMIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
CADMIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
CHROMIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
CHROMIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
COPPER LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
COPPER, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
NICKEL LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
NICKEL, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
LEAD LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
LEAD, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
SELENIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
SELENIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
VANADIUM LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
VANADIUM, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99
ZINC LABORATORY	LC1 BS	W	99L0770	N/A	11/11/99	11/11/99
ZINC, TOTAL	MB1	W	99L0770	N/A	11/11/99	11/11/99

RECRA LabNet Use Only

9910L528

Custody Transfer Record/Lab Work Request

Page 1 of 1

All

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: Tnu Hanford B99-085

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 days

Date Rec'd: 10.27.99 Date Due: 11/26/99

Account #:

Refrigerator #		1 2	2
#/Type Container	Liquid	3AG 2AG	3PL 1PL 1PL 1PL
	Solid		
Volume	Liquid	40 1L	500 500 1L 1L
	Solid		
Preservatives		HCL —	HNO_3 ZNAC NaOH — H_2SO_4

ANALYSES REQUESTED →

ORGANIC				INORG					
VOA	BNA	Pest/PCB	Herb	ICP Metal	CN	Sulfide	I.C. Anions	NO_2/NO_3	NH_3

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	624	8260	625	Metal	Hg	1SFD	CN	1N3N2	1NH3
001	BOWNX2			W	10/27/99	0515	X								
002	BOWNX3	X	X	⊥	⊥	0700	X	X		X	X	X	X	X	

Special Instructions:

Saf# B99-085

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
2. Met ① = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
3. Ni, V, Zn, Be
4. Anq ① = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
5. ICSO4, IPH
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) IC Anions → pH

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. 2.1 °C

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

NOTES:

* 423579531080

Relinquished by	Received by	Date	Time
Fed Ex	D. Jones	10/27/99	0530

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-13	Page 1 of 1

Collector: Bowers/Trice	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sa	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: ERC 99 028	Field Logbook No.: EL1511	Method of Shipment: Fed EX	
Shipped To: ~~TMA/RECRA~~ 0 70 10-22-99	Offsite Property No.: A00001L	Bill of Lading/Air Bill No.: 42357953 1080	
		COA: B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha, Gross Beta	VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
B0WNX2	Water	~~0510~~ 10-22-99	0515						X				
B0WNX3	Water	~~0700~~ 10-22-99 ~~0700~~ 10-22-99	0700	X	X	X	X		X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	10-22-99/1115	Ref DC	10-22-99/1115
Ref DC	10-26-99/0800	R. Thoren	10-26-99/0800
Rikki Thoren / R. Thoren	10/26/99/1430	FED EX	
Fed Ex	10-27-99/0930		10-27-99/0930

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc)

Sample material did not originate from a radiologically controlled area
No total activity required.
9910L528 - Temp 21

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

01

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report
****REVISION****

Client: TNU HANFORD B99-085
RFW #: 9910L528
SDG/SAF#: H0597/B99-085

W.O. #: #: 10985-001-001-9999-00
Date Received: 10-27-99

GC SCAN

The set of samples consisted of two (2) water samples collected on 10-22-99.

The samples and their associated QC samples were prepared on 11-04-99 and 12-02-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and 1-Propanol on 11-05-99 and 12-02-99.

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 samples were packaged and stored as specified in the method protocol; the cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The analysis hold time criteria were exceeded for sample B0WNX2. A copy of the Sample Discrepancy Report (SDR) has been enclosed in the data package.

3. All initial calibrations associated with this data set were within acceptance criteria.

4. All continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

5. Surrogates were not used for this analysis.

6. All blank spike recoveries were within advisory control limits of 50%-150%.

7. All matrix spike recoveries were within advisory control limits of 50%-150%.

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

JAN 2000

12-3-99
Date

r:\share\c\gescan\10-528.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 7 pages (includes 002A)

GLOSSARY OF OGCSC DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification 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.

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

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking 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 = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Recra LabNet Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 99LC063

99LC528-001

Initiator: C. Schnell RFW Batch: 99111581 Parameter: OGCSC

Date: 11/20/99 Samples: 001 Matrix: Water

Client: TNU Hanford Method: SW846/MCAWW/CLP/ Prep Batch:

A0605, B99-085

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)

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

__ 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: Brett E. Johnson

__ 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: 12/13/99 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ 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
2	X Initiator	__	__ Metals: Doughty
__	X Lab Manager: M. Taylor	__	__ Inorganic: Perrone
1	X Project Mgr: Stone/Carey/Schrenkel/Johnson	__	__ GC/LC: Schnell
__	X Section Mgr: Wesson/Daniels	__	__ MS: Taylor
4	X QA (file): Racioppi	__	__ Log-in: Janson
3	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Doughty/Kauffman	__	__ Other: _____

L-WI-006/E-03/99

002A

Recra LabNet - Lionville Laboratory

GC SCAN

Report Date: 12/03/99 11:20

RFW Batch Number: 9910L528 Client: TNU-HANFORD B99-085 Work Order: 10985-001-001-9999-00 Page: 1

003

	Cust ID:	B0WNX2	B0WNX3	B0WNX3	B0WNX3	BLK	BLK BS
Sample Information	RFW#:	001	002	002 MS	002 MSD	99LLC181-MB1	99LLC181-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
n-Propyl Alcohol		5.0 U	5.0 U	100 %	103 %	5.0 U	97 %
Ethanol		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

	Cust ID:	BLK	BLK BS
Sample Information	RFW#:	99LLC170-MB1	99LLC170-MB1
	Matrix:	WATER	WATER
	D.F.:	1.00	1.00
	Units:	mg/L	mg/L
n-Propyl Alcohol		5.0 U	99 %
Ethanol		5.0 U	5.0 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

12/3/99

Recra LabNet - Lionville Laboratory
CCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/27/99 RFW LOT # :9910L528

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BCWNX2	001	W	99LLC181	10/22/99	12/02/99	12/02/99
BCWNX3	002	W	99LLC170	10/22/99	11/04/99	11/05/99
BCWNX3	002 MS	W	99LLC170	10/22/99	11/04/99	11/05/99
BCWNX3	002 MSD	W	99LLC170	10/22/99	11/04/99	11/05/99

LAB QC:

BLK	MB1	W	99LLC181	N/A	12/02/99	12/02/99
BLK	MB1 BS	W	99LLC181	N/A	12/02/99	12/02/99
BLK	MB1	W	99LLC170	N/A	11/04/99	11/05/99
BLK	MB1 BS	W	99LLC170	N/A	11/04/99	11/05/99

12/3/99

RECRA LabNet Use Only

9910L528

Custody Transfer Record/Lab Work Request

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A11

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU Hanford B99-085

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 30 days

Date Rec'd: 10-27-99 Date Due: 11/26/99

Account #:

Refrigerator #		1	2							2							
#/Type Container	Liquid	3AG	2AG							3PL		1PL	1PL	1PL			
	Solid																
Volume	Liquid	40	1L							500		500	1L	1L			
	Solid																
Preservatives		HCL	—							HNO_3		ZNAC NaOH	—	H_2SO_4			
ANALYSES REQUESTED		ORGANIC								INORG							
		VOA	BNA	Pest/PCB	Herb					ICP Metal	CN	Sulfide	IC Anions	Nc/NO3	NH3		

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	06 24H 06CSC	06 25H						Met Q	10/27/99	15FD	Amg Q	1N3N2 1NH3N		
001	BOWNX2			W	10/22/99	0515	X													
002	BOWNX3	X	X	⊥	⊥	0700	X	X						X	⊗	X	X	X		

Special Instructions:

Saf # B99-085

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
Met Q = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
3. Ni, V, Zn, Be
Amg Q = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
5. ICSO4, IPH
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) IC Anions + pH

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. 2.1 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
* 423579531080

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	10/27/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-085-13	Page 1 of 1

Collector: Bowers/Trice	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 7N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sa	Sampling Location: 200 East	SAF No.: B99-085	
Ice Chest No.: ERC 99 028	Field Logbook No.: EL1511	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA D70 10-22-99	Offsite Property No.: A00011	Bill of Lading/Air Bill No.: 42357953 1080	
		COA B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
B0WNX2	Water	~~0515~~ 10-22-99	0515						X				
B0WNX3	Water	~~0700~~ 10-22-99	0700	X	X	X	X		X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 10-22-99/1115	Received By: Ref 2C	Date/Time: 10-22-99/1115
Relinquished By: Ref 2C	Date/Time: 10-26-99/0800	Received By: R. Thoren	Date/Time: 10-26-99/0800
Relinquished By: Rikki Thoren / R. Thoren	Date/Time: 10/26/99/1430	Received By: FED EX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10-27-99/0930	Received By: [signature]	Date/Time: 10-27-99/0930

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc)

Sample material did not originate from a radiologically controlled area

No total activity required.

9910L528 - temp. 2.1

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9910L528
SDG/SAF #: H0597/B99-085

W.O. #: 10985-001-001-9999-00
Date Received: 10-27-99

SEMIVOLATILE

One (1) water sample was collected on 10-22-99.

The sample and it's associated QC samples was extracted on 10-29-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Methods 3520C and 8270B for TCL Semivolatile target compounds on 11-04,05-99.

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 required holding times for extraction and analysis were met.

3. Non-target compounds were detected in the samples.

4. Ten (10) of thirty (30) surrogate recoveries were outside the USEPA QC limits. Surrogate recovery criteria were not met for sample BOWNX3, the matrix spike duplicate for BOWNX3, and the method blank 99LE1319-MB1.

5. Six (6) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.

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

7. The sample was spectrally searched for Butylated Hydroxytoluene and Tributyl Phosphate; however, they were not identified in the samples.

by J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

01-04-00
Date

JAN 2000

pef\group\data\bna\tna10528.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. 01 of 10 pages.

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

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, HSL List

Report Date: 12/24/99 17:35

RFW Batch Number: 9910L528 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 1a

C4

	Cust ID:	B0WNX3	B0WNX3	B0WNX3	SBLKFM	SBLKFM BS
Sample Information	RFW#:	002	002 MS	002 MSD	99LE1319-MB1	99LE1319-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate Recovery	Nitrobenzene-d5	23 * %	78 %	1 * %	0 * %	72 %
	2-Fluorobiphenyl	55 %	81 %	27 * %	8 * %	75 %
	Terphenyl-d14	98 %	91 %	85 %	77 %	78 %
	Phenol-d5	28 %	68 %	7 * %	2 * %	56 %
	2-Fluorophenol	9 * %	73 %	0 * %	0 * %	64 %
	2,4,6-Tribromophenol	55 %	93 %	67 %	48 %	60 %
Phenol		11 U	69 %	8 * %	10 U	54 %
bis(2-Chloroethyl)ether		11 U	22 U	22 U	10 U	10 U
2-Chlorophenol		11 U	78 %	1 * %	10 U	65 %
1,3-Dichlorobenzene		11 U	22 U	22 U	10 U	10 U
1,4-Dichlorobenzene		11 U	66 %	0 * %	10 U	63 %
1,2-Dichlorobenzene		11 U	22 U	22 U	10 U	10 U
2-Methylphenol		11 U	22 U	22 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		11 U	22 U	22 U	10 U	10 U
4-Methylphenol		11 U	22 U	22 U	10 U	10 U
N-Nitroso-di-n-propylamine		11 U	78 %	19 * %	10 U	60 %
Hexachloroethane		11 U	22 U	22 U	10 U	10 U
Nitrobenzene		11 U	22 U	22 U	10 U	10 U
Isophorone		11 U	22 U	22 U	10 U	10 U
2-Nitrophenol		11 U	22 U	22 U	10 U	10 U
2,4-Dimethylphenol		11 U	22 U	22 U	10 U	10 U
bis(2-Chloroethoxy)methane		11 U	22 U	22 U	10 U	10 U
2,4-Dichlorophenol		11 U	22 U	22 U	10 U	10 U
1,2,4-Trichlorobenzene		11 U	76 %	0 * %	10 U	73 %
Naphthalene		11 U	22 U	22 U	10 U	10 U
4-Chloroaniline		11 U	22 U	22 U	10 U	10 U
Hexachlorobutadiene		11 U	22 U	22 U	10 U	10 U
4-Chloro-3-methylphenol		11 U	68 %	48 %	10 U	53 %
2-Methylnaphthalene		11 U	22 U	22 U	10 U	10 U
Hexachlorocyclopentadiene		11 U	22 U	22 U	10 U	10 U
2,4,6-Trichlorophenol		11 U	22 U	22 U	10 U	10 U
2,4,5-Trichlorophenol		28 U	55 U	55 U	25 U	25 U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9910L528 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 1b

Cust ID:	B0WNX3		B0WNX3		B0WNX3		SBLKFM		SBLKFM BS	
RFW#:	002		002 MS		002 MSD		99LE1319-MB1		99LE1319-MB1	
2-Chloronaphthalene	11	U	22	U	22	U	10	U	10	U
2-Nitroaniline	28	U	55	U	55	U	25	U	25	U
Dimethylphthalate	11	U	22	U	22	U	10	U	10	U
Acenaphthylene	11	U	22	U	22	U	10	U	10	U
2,6-Dinitrotoluene	11	U	22	U	22	U	10	U	10	U
3-Nitroaniline	28	U	55	U	55	U	25	U	25	U
Acenaphthene	11	U	80	%	45 *	%	10	U	70	%
2,4-Dinitrophenol	28	U	55	U	55	U	25	U	25	U
4-Nitrophenol	28	U	79	%	69	%	25	U	59	%
Dibenzofuran	11	U	22	U	22	U	10	U	10	U
2,4-Dinitrotoluene	11	U	79	%	67	%	10	U	64	%
Diethylphthalate	11	U	22	U	22	U	10	U	10	U
4-Chlorophenyl-phenylether	11	U	22	U	22	U	10	U	10	U
Fluorene	11	U	22	U	22	U	10	U	10	U
4-Nitroaniline	28	U	55	U	55	U	25	U	25	U
4,6-Dinitro-2-methylphenol	28	U	55	U	55	U	25	U	25	U
N-Nitrosodiphenylamine (1)	11	U	22	U	22	U	10	U	10	U
4-Bromophenyl-phenylether	11	U	22	U	22	U	10	U	10	U
Hexachlorobenzene	11	U	22	U	22	U	10	U	10	U
Pentachlorophenol	28	U	76	%	71	%	25	U	57	%
Phenanthrene	11	U	22	U	22	U	10	U	10	U
Anthracene	11	U	22	U	22	U	10	U	10	U
Carbazole	11	U	22	U	22	U	10	U	10	U
Di n-butylphthalate	0.7	J	22	U	22	U	10	U	10	U
Fluoranthene	11	U	22	U	22	U	10	U	10	U
Pyrene	11	U	96	%	87	%	10	U	79	%
Butylbenzylphthalate	11	U	22	U	22	U	10	U	10	U
3,3'-Dichlorobenzidine	11	U	22	U	22	U	10	U	10	U
Benzo(a)anthracene	11	U	22	U	22	U	10	U	10	U
Chrysene	11	U	22	U	22	U	10	U	10	U
bis(2-Ethylhexyl)phthalate	11	U	22	U	22	U	10	U	10	U
Di n-octyl phthalate	11	U	22	U	22	U	10	U	10	U
Benzo(b)fluoranthene	11	U	22	U	22	U	10	U	10	U
Benzo(k)fluoranthene	11	U	22	U	22	U	10	U	10	U
Benzo(a)pyrene	11	U	22	U	22	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	11	U	22	U	22	U	10	U	10	U
Dibenz(a,h)anthracene	11	U	22	U	22	U	10	U	10	U
Benzo(g,h,i)perylene	11	U	22	U	22	U	10	U	10	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0WNX3

Lab Name: Recra LabNet Work Order: 10985001001

Client: TNU-HANFORD 899-085

Matrix: (soil/water) WATER Lab Sample ID: 99101128-002

Sample wt/vol: 900 (g/mL) ML Lab File ID: D110408

Level: (low/med) LOW Date Received: 10/27/99

% Moisture: ____ decanted: (Y/N) __ Date Extracted: 10/29/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/04/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	23.72	4	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE No.

SBLKFM

Lab Name: Ferma LabNet Work Order: 10985001001

Client: TNU-HANFORD H99-085

Matrix: (soil/water) WATER Lab Sample ID: 991F1319-MB1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: D110406

Level: (low/med) LOW Date Received: 10/29/99

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 10/29/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/04/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

Reeta LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/27/99 RFW LOT # :9910L528

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNX3	002	W	99LE1319	10/22/99	10/29/99	11/04/99
B0WNX3	002 MS	W	99LE1319	10/22/99	10/29/99	11/04/99
B0WNX3	002 MSD	W	99LE1319	10/22/99	10/29/99	11/05/99

LAB QC:

PBLKFM	MB1	W	99LE1319	N/A	10/29/99	11/04/99
SPLKFM	MB1 BS	W	99LE1319	N/A	10/29/99	11/04/99

RECRA LabNet Use Only

9910L528

Custody Transfer Record/Lab Work Request

Page 1 of 1

All

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU Hanford B99-085

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: DJ

QC: spec Del: std TAT: 30 days

Date Rec'd: 10.27.99 Date Due: 11/26/99

Account #:

Refrigerator #		1	2							2							
#/Type Container	Liquid	3AG	2AG							2PL		1PL	1PL	1PL			
	Solid																
Volume	Liquid	40	1L							500		500	1L	1L			
	Solid																
Preservatives		HCl	—							HNO3		ZNAC NaOH	—	H2SO4			
ANALYSES REQUESTED		ORGANIC								INORG							
		VOA	BNA	Pest/ PCB	Herb					ICP Metal	CN	SulFide	IC Anions	NO2/NO3	NH3		

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	02 24H 06CSC	02 25H					Met Q	1/27/99	ISFD	Ang Q	1N3N2 1NH3N		
001	BOWNX2			W	10/26/99	0515	X												
002	BOWNX3	X	X	⊥	"	0700	X	X					X	X	X	X	X		

RECRA LabNet Use Only

Special Instructions:

Saf# B99-085

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
Met Q = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
3. Ni, V, Zn, Be
Ang Q = ICCl, ICFl, ICNO2, ICNO3, ICPO4,
5. ICSO4, IPH
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) IC Anions + pH

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. 2.1 °C

Relinquished by	Received by	Date	Time
Leo Ex	[signature]	10/27/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

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

NOTES:

* 423579531080

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: Bowers/Trice	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sa	Sampling Location: 200 East		SAF No.: B99-085
Ice Chest No.: ERC 99 028	Field Logbook No.: EL1511		Method of Shipment: Fed EX
Shipped To: TMA/RECRA D 30 10-22-99	Offsite Property No.: A00011		Bill of Lading/Air Bill No.: 42357953 1080
			COA B20CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha, Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions			

Sample No.	Matrix *	Sample Date	Sample Time										
B0WNX2	Water	~~D 30 10-22-99~~ ~~0515~~ 10-22-99	0515						X				
B0WNX3	Water	~~0700~~ ~~D 40 10-22-99~~ 10-22-99	0700	X	X	X	X		X	X			

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

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	10-22-99/1115	Ref DC	10-22-99/1115
Ref DC	10-26-99/0800	R. Thoren	10-26-99/0800
Rikki Thoren / R. Thoren	10/26/99/1430	FED EX	
Fed Ex	10-27-99/0930		10-27-99/0930

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc)

Sample material did not originate from a radiologically controlled area
No total activity required.
9910L528 - temp. 2.1

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION — Received By: _____ Title: _____ Date/Time: _____

FINAL SAMPLE DISPOSITION — Disposal Method: _____ Disposed By: _____ Date/Time: _____

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-085
RFW # : 9910L528
SDG/SAF #: H0597/B99-085

W.O. #: 10985-001-001-9999-00
Date Received: 10-27-99

GC/MS VOLATILE

Two (2) water samples were collected on 10-22-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 11-02-99.

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 required holding time for analysis was met.

3. Non-target compounds were not detected in the samples.

4. Three (3) of eighteen (18) surrogate recoveries were outside EPA QC limits. The analysis of matrix spike sample fulfills the reanalysis requirement for sample B0WNX3. The surrogate recoveries were biased slightly high for out of criteria samples. There were no significant impact on the data because no significant target compounds were detected in the samples; consequently, sample B0WNX2 was not reanalyzed. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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

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

7. The method blank contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than 2x the CRQL.

By J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-15-99
Date

JAN 2000
Data Log In

som\group\data\voa\tnu10528.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 9 pages.

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

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 Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 9GVT24G

Initiator: S. Wesson RFW Batch: 9910L528 Parameter: 062YH
Date: 12-14-99 Samples: 001, 002, 002 MSD Matrix: WSW
Client: TNU-Hmbr Method: (SW846) MCAWW/CLP/ Prep Batch: 99GV1512

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)

1,2-DCE-d4 recoveries just high Limit 76-114%
001 = 115%
002 = 115%
002ms = 119%

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

Report w Narrate, No impact on data.

4. Project Manager Instructions...signature/date: Arlette G. Johnson 12/15/99

__ 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: SCD wem 12-15-99 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ 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 Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Carey/Schrenkel/Johnson	__	__ GC/LC: Schnell
__	X Section Mgr: Wesson/Daniels	__	__ MS: Taylor
__	X QA (file): Racioppi	__	__ Log-in: Janson
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Doughty/Kauffman	__	__ Other: _____

L-WI-006/E-03/99

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 12/14/99 15:33

RFW Batch Number: **9910L528** Client: **TNU-HANFORD B99-085** Work Order: 10985001001 Page: 1a

	Cust ID:	B0WNX2	B0WNX3	B0WNX3	B0WNX3	VBLKBE	VBLKBE BS
Sample Information	RFW#:	001	002	002 MS	002 MSD	99LVH512-MB1	99LVH512-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate Recovery	Toluene-d8	96 %	94 %	93 %	99 %	95 %	97 %
	Bromofluorobenzene	100 %	98 %	96 %	103 %	97 %	101 %
	1,2-Dichloroethane-d4	116 * %	115 * %	114 %	119 * %	110 %	109 %
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride		5 B	5 B	3 JB	2 JB	7	8 B
Acetone		10 U	10 U	10 U	10 U	5 J	10 U
Carbon Disulfide		5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	5 U	85 %	86 %	5 U	82 %
1,1-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		5 U	5 U	5 U	5 U	5 U	5 U
Chloroform		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride		5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene		5 U	5 U	94 %	95 %	5 U	84 %
Dibromochloromethane		5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Benzene		5 U	5 U	93 %	94 %	5 U	83 %
Trans-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U
Bromoform		5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene		5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Toluene		5 U	5 U	95 %	97 %	5 U	89 %

*= Outside of EPA CLP QC limits.

12-15-99

RFW Batch Number: 9910L528 Client: TNU-HANFORD B99-085 Work Order: 10985001001 Page: 1b

90

Cust ID:	B0WNX2	B0WNX3	B0WNX3	B0WNX3	VBLKBE	VBLKBE BS
RFW#:	001	002	002 MS	002 MSD	99LVH512-MB1	99LVH512-MB1
Chlorobenzene	5 U	5 U	96 %	99 %	5 U	90 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/27/99 RFW LOT # :9910L528

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0WNX2	001	W	99LVH512	10/22/99	N/A	11/02/99
B0WNX3	002	W	99LVH512	10/22/99	N/A	11/02/99
B0WNX3	002 MS	W	99LVH512	10/22/99	N/A	11/02/99
B0WNX3	002 MSD	W	99LVH512	10/22/99	N/A	11/02/99

LAB QC:

VBLKBE	MB1	W	99LVH512	N/A	N/A	11/02/99
VBLKBE	MB1 BS	W	99LVH512	N/A	N/A	11/02/99

gw
12-15-99

RECRA LabNet Use Only
9910L528

Custody Transfer Record/Lab Work Request

Page 1 of 1

A11

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU Hanford B99-085

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: DJ

QC: spec Del: std TAT: 30 days

Date Rec'd: 10.27.99 Date Due: 11/26/99

Account #:

Refrigerator #		1	2						2						
#/Type Container	Liquid	3AG	2AG						3PL		1PL	1PL	1PL		
	Solid														
Volume	Liquid	40	1L						500		500	1L	1L		
	Solid														
Preservatives		HCL	—						HNO_3		ZNAC NaOH	—	H_2SO_4		
ANALYSES REQUESTED		ORGANIC							INORG						
		VOA	BNA	Pest/PCB	Herb				ICP Metal	CN	Sulfide	IC Anions	NO2/NO3 NH3		

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H 0625C	0625H					Met Q	18/12/99	15FD	Anq Q	1N3N2 1NH3N			
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	BOWNX2			W	10/22/99	0515	X													
	002	BOWNX3	X	X	⊥	⊥	0700	X	X					X	X	X	X	X			

RECRA LabNet Use Only

Special Instructions:

Saf# B99-085

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
2. Met Q = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
3. Ni, V, Zn, Be
4. Anq Q = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
5. ICSO4, IPH
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) IC Anions + PH

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. 2.1 °C

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

NOTES:

* 423579531080

Relinquished by	Received by	Date	Time
Fed Ex	D. Jones	10/27/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-085-15

60

Collector: Bowers/Trice	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU - QC Sa	Sampling Location: 200 East		SAF No.: B99-085
Ice Chest No.: ERC 99 028	Field Logbook No.: EL1511		Method of Shipment: Fed EX
Shipped To: TMA/RECRA 0730 10-22-99	Offsite Property No.: A00011		Bill of Lading/Air Bill No.: 42357953 1080
			COA: B20CW167C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	aG	P	aGs*	P			
No. of Container(s)	1	1	1	2	2	3	3			
Volume	500mL	1000mL	1000mL	1000mL	1000mL	40mL	500mL			
SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (2) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
B0WNX2	Water	~~0700~~ 10-22-99	0515						X				
B0WNX3	Water	~~0700~~ 10-22-99	0700	X	X	X	X		X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 10-22-99/1115	Received By: Ref DC	Date/Time: 10-22-99/1115
Relinquished By: Ref DC	Date/Time: 10-26-99/0800	Received By: R. Thoren	Date/Time: 10-26-99/0800
Relinquished By: Rikki Thoren R. Thoren	Date/Time: 10/26/99/1430	Received By: FEDEX	Date/Time:
Relinquished By: Fed Ex	Date/Time: 10-27-99/0930	Received By: [signature]	Date/Time: 10-27-99/0930

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc)

Sample material did not originate from a radiologically controlled area

No total activity required.

9910L528 - Temp. 2.1

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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