

H0165-7/w

0049903

Thermo Nutech
W.O. No. N8-07-037-7483, SDG H0165

Bechtel Hanford Inc.
P.O. TRB-SBB-207925

Case Narrative

1.0 GENERAL

Thermo Nutech Sample Delivery Group H0165 is comprised of a single soil sample designated under SAF No. B98-093 with a Project Designation of : 216-A-29 Ditch - Water

The samples were received as stated on the Chain-of-Custody documents.

2.0 ANALYSIS NOTES

2.1 Gross Alpha/Gross Beta Analyses

The LCS recovery for the initial gross alpha analysis was 65%. The sample was reanalyzed with new QC samples. No problems were encountered with the reanalysis.

2.2 Strontium-90 Analyses

No problems were encountered with the analyses.

2.3 Gamma Scan Analyses

No problems were encountered with the analyses.



Sample Disposition Record

Control #: B98-066
Revision#: 0
Date Initiated: 7/7/98

Section 1 - BACKGROUND

SAF#: B98-093, B98-088
OU: 200-BP-11
Project ID: 216-A-29 Ditch
Task ID: 1
Sampling Event: 216-A-29 Ditch
Laboratory: Quanterra Incorporated
Project Coordinator: TRENT, SJ
Task Manager: MITCHEM, GB

Section 2 - SAMPLE INFORMATION

Number of Samples: 5
ID Numbers: B0P6Y0, B0P708, B0P710, B0P712, B0P714
MATRIX:
Collection Date:

Section 3 - ISSUE

Class: Customer Concurrence
NCR Number: N/A
Type: Other-Cooler Temperature/Custody Sealing
Description: Storage cooler at ERC sample storage facility failed. Sample temperatures exceeded requirements for approximately 20 hours.

N/A

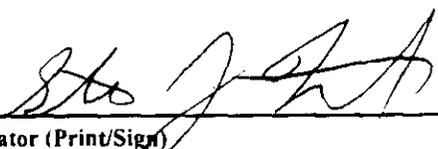
NCR Validation (Print/Sign)

Date

Section 4 - DISPOSITION

Type: Use As Is
Description: Perform all analyses listed on COC.

TRENT, SJ



7/8/98

Project Coordinator (Print/Sign)

Date

MITCHEM, GB

Task Manager (Print/Sign)

Date

N/A

QA (Print/Sign)

Date

Section 5 - INSPECTION (Issue Class: Nonconformance Only)

Inspection Number: N/A
Inspection Results: N/A

N/A

Inspector (Print/Sign)

Date

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0165

SAMPLE SUMMARY

SDG 7483
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		CHAIN OF	
				SAMPLE ID	SAF NO	CUSTODY	COLLECTED
B0P6Y0		WATER		N807037-01	B98-093	B98-093-01	07/06/98 12:15
Method Blank		WATER		N807037-03	B98-093		
Method Blank		WATER		N807037-06	B98-093		
Lab Control Sample		WATER		N807037-02	B98-093		
Lab Control Sample		WATER		N807037-05	B98-093		
Duplicate (N807037-01)		WATER		N807037-04	B98-093		07/06/98 12:15
Duplicate (N807037-01)		WATER		N807037-07	B98-093		07/06/98 12:15

SAMPLE SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

QC SUMMARY

SDG 7483
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7483	B98-093-01	B0P6Y0	WATER					N807037-01	7483-001
		Method Blank	WATER					N807037-03	7483-003
		Method Blank	WATER					N807037-06	7483-006
		Lab Control Sample	WATER					N807037-02	7483-002
		Lab Control Sample	WATER					N807037-05	7483-005
		Duplicate (N807037-01)	WATER					N807037-04	7483-004
		Duplicate (N807037-01)	WATER					N807037-07	7483-007

Lab id EMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 08/14/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0165

SDG 7483
 Contact N. Joseph Verville

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0165

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Beta Counting										
SR	WATER	Strontium, Total in Water	2785-098	10.0	1			1	1	1/1
Gas Proportional Counting										
80A	WATER	Gross Alpha in Water	2785-098	20.0	1			1	1	1/1
80B	WATER	Gross Beta in Water	2785-098	15.0	1			1	1	1/1
Gamma Scan										
GAM	WATER	Gamma Emitters	2785-098	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 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 08/14/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0165

WORK SUMMARY

SDG 7483
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED	SUF-							
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
B0P6Y0		N807037-01	7483-001	80A/80	A1	08/10/98	08/14/98	NJV	Gross Alpha in Water	
	WATER	07/06/98	7483-001	80B/80	A1	08/10/98	08/14/98	NJV	Gross Beta in Water	
B98-093-01	B98-093		7483-001	GAM		07/23/98	08/03/98	NJV	Gamma Emitters	
			7483-001	SR		07/23/98	08/03/98	NJV	Strontium, Total in Water	
Method Blank		N807037-03	7483-003	GAM		07/23/98	08/03/98	NJV	Gamma Emitters	
	WATER		7483-003	SR		07/23/98	08/03/98	NJV	Strontium, Total in Water	
	B98-093									
Method Blank		N807037-06	7483-006	80A/80		08/10/98	08/14/98	NJV	Gross Alpha in Water	
	WATER		7483-006	80B/80		08/10/98	08/14/98	NJV	Gross Beta in Water	
	B98-093									
Lab Control Sample		N807037-02	7483-002	GAM		07/23/98	08/03/98	NJV	Gamma Emitters	
	WATER		7483-002	SR		07/23/98	08/03/98	NJV	Strontium, Total in Water	
	B98-093									
Lab Control Sample		N807037-05	7483-005	80A/80		08/10/98	08/14/98	NJV	Gross Alpha in Water	
	WATER		7483-005	80B/80		08/10/98	08/14/98	NJV	Gross Beta in Water	
	B98-093									
Duplicate (N807037-01)		N807037-04	7483-004	GAM		07/23/98	08/03/98	NJV	Gamma Emitters	
	WATER	07/06/98	7483-004	SR		07/23/98	08/03/98	NJV	Strontium, Total in Water	
	B98-093									
Duplicate (N807037-01)		N807037-07	7483-007	80A/80		08/10/98	08/14/98	NJV	Gross Alpha in Water	
	WATER	07/06/98	7483-007	80B/80		08/10/98	08/14/98	NJV	Gross Beta in Water	
	B98-093									

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/14/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0165

WORK SUMMARY, cont.

SDG 7483
 Contact N. Joseph Verville

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0165

COUNTS OF TESTS BY SAMPLE TYPE										
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
80A/80	B98-093	Gross Alpha in Water	EPA900.0	1			1	1	1	4
80B/80	B98-093	Gross Beta in Water	EPA900.0	1			1	1	1	4
GAM	B98-093	Gamma Emitters	GAMMAHI	1			1	1	1	4
SR	B98-093	Strontium, Total in Water	SR8990	1			1	1	1	4
TOTALS				4			4	4	4	16

WORK SUMMARY

Page 2

SUMMARY DATA SECTION

Page 7

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
 Version 3.06
 Report date 08/14/98

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0165

N807037-03

Method Blank

METHOD BLANK

SDG 7483 Client/Case no Hanford SDG H0165
 Contact N. Joseph Verville Case no TRB-SBB-207925
 Lab sample id N807037-03 Client sample id Method Blank
 Dept sample id 7483-003 Material/Matrix WATER
 SAF No B98-093

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Total Strontium	SR-89/90	-0.055	0.12	0.17	2.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		78		U	GAM
Cobalt 60	10198-40-0	U		6.2	25	U	GAM
Cesium 137	10045-97-3	U		6.4	15	U	GAM
Europium 152	14683-23-9	U		15	50	U	GAM
Europium 154	15585-10-1	U		18	50	U	GAM
Europium 155	14391-16-3	U		15	50	U	GAM

QC-BLANK 28677

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-DS
 Version 3.06
 Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

N807037-06

Method Blank

METHOD BLANK

SDG <u>7483</u>	Client/Case no <u>Hanford</u>	SDG <u>H0165</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N807037-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7483-006</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B98-093</u>	

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.033	0.51	1.1	3.0	U	80A
Gross Beta	12587-47-2	-1.1	1.1	1.9	4.0	U	80B

QC-BLANK 28799

METHOD BLANKS

Page 2

SUMMARY DATA SECTION

Page 9

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>08/14/98</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

N807037-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7483</u>	Client/Case no <u>Hanford</u> SDG <u>H0165</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SBB-207925</u>
Lab sample id <u>N807037-02</u>	Client sample id <u>Lab Control Sample</u>
Dept sample id <u>7483-002</u>	Material/Matrix _____ <u>WATER</u>
	SAP No <u>B98-093</u>

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Strontium	9.9	0.43	0.19	2.0	SR	9.00	0.36	110	81-119	
GAMMA SCAN ANALYTES	U									
Cobalt 60	440	35	21	25	GAM	420	17	105	73-127	80-120
Cesium 137	400	29	<u>25</u>	15	GAM	398	16	100	74-126	80-120

QC-LCS 28676

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0165

N807037-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7483
 Contact N. Joseph Verville

Client/Case no Hanford SDG H0165
 Case no TRB-SBB-207925

Lab sample id N807037-05
 Dept sample id 7483-005

Client sample id Lab Control Sample
 Material/Matrix WATER
 SAF No B96-093

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	68	4.7	0.99	3.0	80A	64.0	2.6	106	66-134	80-120
Gross Beta	61	3.5	2.5	4.0	80B	66.0	2.6	92	77-123	80-120

QC-LCS 28798

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LCS
 Version 3.06
 Report date 08/14/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0165

N807037-04

B0P6Y0

DUPLICATE

SDG <u>7483</u>	Client/Case no <u>Hanford</u>	SDG <u>H0165</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N807037-04</u>	Lab sample id <u>N807037-01</u>	Client sample id <u>B0P6Y0</u>
Dept sample id <u>7483-004</u>	Dept sample id <u>7483-001</u>	Location/Matrix <u>WATER</u>
	Received _____	Collected <u>07/06/98 12:15</u>
		Custody/SAF No <u>B98-093-01</u> <u>B98-093</u>

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Total Strontium	-0.11	0.13	0.18	2.0	U	SR	-0.065	0.14	0.18	U	-		
GAMMA SCAN ANALYTES	U						U						
Potassium 40	U		170		U	GAM	U		160	U	-		
Cobalt 60	U		16	25	U	GAM	U		19	U	-		
Cesium 137	U		13	15	U	GAM	U		13	U	-		
Europium 152	U		34	50	U	GAM	U		35	U	-		
Europium 154	U		46	50	U	GAM	U		44	U	-		
Europium 155	U		20	50	U	GAM	U		21	U	-		

QC-DUP#1 28678

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>08/14/98</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

N807037-07

B0P6Y0

DUPLICATE

SDG <u>7483</u>	Client/Case no <u>Hanford</u>	SDG <u>H0165</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N807037-07</u>	Lab sample id <u>N807037-01</u>	Client sample id <u>B0P6Y0</u>
Dept sample id <u>7483-007</u>	Dept sample id <u>7483-001</u>	Location/Matrix <u>WATER</u>
	Received _____	Collected <u>07/06/98 12:15</u>
		Custody/SAF No <u>B98-093-01</u> <u>B98-093</u>

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	-0.053	0.31	0.75	3.0	U	80A	0.099	0.36	0.72	U	-		
Gross Beta	-1.4	1.4	2.5	4.0	U	80B	-0.66	1.1	2.0	U	-		

QC-DUP#1 28800

DUPLICATES

Page 2

SUMMARY DATA SECTION

Page 13

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>08/14/98</u>

TMA / RICHMOND
 SAMPLE DELIVERY GROUP H0165

N807037-01

B0P6Y0

DATA SHEET

SDG 7483 Client/Case no Hanford SDG H0165
 Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807037-01 Client sample id B0P6Y0
 Dept sample id 7483-001 Location/Matrix WATER
 Received _____ Collected 07/06/98 12:15
 Custody/SAF No B98-093-01 B98-093

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	0.36	0.72	3.0	U	80A
Gross Beta	12587-47-2	-0.66	1.1	2.0	4.0	U	80B
Total Strontium	SR-89/90	-0.065	0.14	0.18	2.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		160		U	GAM
Cobalt 60	10198-40-0	U		19	25	U	GAM
Cesium 137	10045-97-3	U		13	15	U	GAM
Europium 152	14683-23-9	U		35	50	U	GAM
Europium 154	15585-10-1	U		44	50	U	GAM
Europium 155	14391-16-3	U		21	50	U	GAM

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-DS
 Version 3.06
 Report date 08/14/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0165

METHOD SUMMARY

STRONTIUM, TOTAL IN WATER

BETA COUNTING

Test SR Matrix WATER
SDG 7483
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 2785-098					
B0P6Y0	N807037-01			7483-001	U
BLK (QC ID=28677)	N807037-03			7483-003	U
LCS (QC ID=28676)	N807037-02			7483-002	ok
Duplicate (N807037-01)	N807037-04			7483-004	- U

Nominal values and limits from method RDLs (pCi/L) 2.0

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS ⁺ HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2785-098 2σ prep error 10.0 % Reference Lab Notebook #2785 pg. 98																
B0P6Y0	N807037-01			0.18	1.00			91		400			17	07/23/98	07/23	GRB-201
BLK (QC ID=28677)	N807037-03			0.17	1.00			84		400				07/23/98	07/23	GRB-203
LCS (QC ID=28676)	N807037-02			0.19	1.00			81		200				07/23/98	07/23	GRB-201
Duplicate (N807037-01) (QC ID=28678)	N807037-04			0.18	1.00			90		400			17	07/23/98	07/23	GRB-204

Nominal values and limits from method 2.0 1.00 100 180

PROCEDURES	REFERENCE	SR8990
EP-040	Environmental Water Dissolution, rev 1	
EP-500	Strontium-89,90 - Purification, rev 0	
EP-519	Strontium-89,90 Planchet Demounting and Yttrium Purification, rev 0	

AVERAGES ± 2 SD	MDA	0.18	±	0.016
FOR 4 SAMPLES	YIELD	86	±	10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/14/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0165

METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Test 80A Matrix WATER
 SDG 7483
 Contact N. Joseph Verville

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0165

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Gross	2: Sum, Alpha	RESULT RATIO (%)	
					Alpha	Emitters	2+1	2σ
Preparation batch 2785-098								
BOP6Y0	N807037-01	80	A1	7483-001	U			
BLK (QC ID=28799)	N807037-06	80		7483-006	U			
LCS (QC ID=28798)	N807037-05	80		7483-005	ok			
Duplicate (N807037-01)	N807037-07	80		7483-007	-	U		

Nominal values and limits from method RDLs (pCi/L) 3.0

Average

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
BOP6Y0	N807037-01	80	A1	0.72	0.300			2		100			35	08/06/98	08/10	GRB-113
BLK (QC ID=28799)	N807037-06	80		1.1	0.300			17		100				08/06/98	08/10	GRB-115
LCS (QC ID=28798)	N807037-05	80		0.99	0.300			15		100				08/06/98	08/10	GRB-114
Duplicate (N807037-01)	N807037-07	80		0.75	0.300			2		100			35	08/06/98	08/10	GRB-116
	(QC ID=28800)															

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 0.89 ± 0.37
 FOR 4 SAMPLES RESIDUE 9 ± 16

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 08/14/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0165

METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Test 80B Matrix WATER
SDG 7483
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Gross	2: Sum, Beta	RESULT RATIO (%)	
					Beta	Emitters	2+1	2σ
Preparation batch 2785-098								
BOP6Y0	N807037-01	80	A1	7483-001	U			
BLK (QC ID=28799)	N807037-06	80		7483-006	U			
LCS (QC ID=28798)	N807037-05	80		7483-005	ok			
Duplicate (N807037-01)	N807037-07	80		7483-007	-	U		

Nominal values and limits from method RDLs (pCi/L) 4.0

Average

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2785-098 2σ prep error 15.0 % Reference Lab Notebook #2785 pg. 98																
BOP6Y0	N807037-01	80	A1	2.0	0.300			2		100			35	08/06/98	08/10	GRB-113
BLK (QC ID=28799)	N807037-06	80		1.9	0.300			17		100				08/06/98	08/10	GRB-115
LCS (QC ID=28798)	N807037-05	80		2.5	0.300			15		100				08/06/98	08/10	GRB-114
Duplicate (N807037-01) (QC ID=28800)	N807037-07	80		2.5	0.300			2		100			35	08/06/98	08/10	GRB-116

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 2.2 ± 0.64
FOR 4 SAMPLES RESIDUE 9 ± 16

Lab id TMAC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

Test GAM Matrix WATER
SDG 7483
Contact N. Joseph Verville

METHOD SUMMARY
GAMMA EMITTERS
GAMMA SCAN

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Cobalt 60	Cesium 137
------------------	------------------	-----------------	------------------	-----------	------------

Preparation batch 2785-098

BOP6Y0	N807037-01		7483-001	U	U
BLK (QC ID=28677)	N807037-03		7483-003	U	U
LCS (QC ID=28676)	N807037-02		7483-002	ok	ok
Duplicate (N807037-01)	N807037-04		7483-004	- U	- U

Nominal values and limits from method RDLs (pCi/L) 25 15

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/L	MAX MDA L	ALIQ L	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS. HELD	ANAL- PREPARED	YZED	DETECTOR
------------------	------------------	-----------------	---------------	--------------	-----------	-------------	---------------	------------	----------	--------------	-------------	--------------	---------------	-------------------	------	----------

Preparation batch 2785-098 2σ prep error 15.0 % Reference Lab Notebook #2785 pg. 98

BOP6Y0	N807037-01		13	0.500						526		17	07/23/98	07/23	01,01,00
BLK (QC ID=28677)	N807037-03		6.4	0.500						473			07/23/98	07/23	01,04,00
LCS (QC ID=28676)	N807037-02		25	0.500						526			07/23/98	07/23	01,03,00
Duplicate (N807037-01)	N807037-04		13	0.500						569		17	07/23/98	07/23	01,01,00
	(QC ID=28678)														

Nominal values and limits from method 15 0.500 400 180

PROCEDURES REFERENCE GAMMAHI
EP-100 Ge(Li) Preparation for Environmental Samples,
rev 0

AVERAGES ± 2 SD MDA 14 ± 16
FOR 4 SAMPLES YIELD _____ ± _____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

Page 20

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

WORK SUMMARY

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

The following notes apply to this report:

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

REPORT GUIDES

Page 3

SUMMARY DATA SECTION

Page 21

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

DATA SHEET

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

REPORT GUIDES

Page 4

SUMMARY DATA SECTION

Page 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

DATA SHEET

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

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

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

The following values are underlined to indicate possible problems:

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

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

DATA SHEET

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

REPORT GUIDES

Page 7

SUMMARY DATA SECTION

Page 25

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

REPORT GUIDE

DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

DUPLICATE

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

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

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

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

REPORT GUIDES

Page 9

SUMMARY DATA SECTION

Page 27

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

2. The error of ADDED.

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG_H0165

GUIDE, cont.

MATRIX SPIKE

for the recovery.

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

GUIDE, cont.

METHOD SUMMARY

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

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

MDAs are underlined if greater than the printed RDL.

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

METHOD SUMMARY

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

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

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

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

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

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

REPORT GUIDES

Page 14

SUMMARY DATA SECTION

Page 32

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0165

SDG 7483
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0165

METHOD SUMMARY

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

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

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

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

REPORT GUIDES

Page 15

SUMMARY DATA SECTION

Page 33

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/14/98

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-093-01

Page 1 of 1

Collector Robert Fahlberg / <i>D.L. Bannas</i>	Company Contact Scott Petersen	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Data Turnaround 15 Days
Project Designation 216-A-29 Ditch - Water	Sampling Location 200 East	SAF No. B98-093		
Ice Chest No. <i>ERC-96-061</i>	Field Logbook No. <i>EL 1381</i>	Method of Shipment Hand deliver		
Shipped To <i>DNA 7-6-98</i> Quanterra Incorporated <i>TMA</i>	Offsite Property No.	Bill of Lading/Air Bill No.		

Waste Designation: D002, D006, U133, and WT02. COA

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	HNO3 to pH	HNO3 to pH	HNO3 to pH	Cool 4C	Cool 4C	HNO3 to pH	HNO3 to pH
		Type of Container	P	aG	P	P	aG	aG	P
	No. of Container(s)	1	1	1	1	2	2	3	3
Special Handling and/or Storage Cool 4C	Volume	20ml	500ml	500ml	1000ml	1000ml	1000ml	1000ml	1000ml

SAMPLE ANALYSIS	Activity Scan	Mercury - 7470 - (CV)	See item (1) in Special Instructions.	Gross Alpha; Gross Beta	Pesticides - 8080	Sem. VOA - 8270A (TCL)	Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60)	Strontium-89,90 - Total Sr

Sample No.	Matrix *	Sample Date	Sample Time								
B0P6Y0	Water	7-6-98	1215	X	X	X	X	X	X	X	X
											B0P714
											B0P709 DAS
											7/9/98

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix * S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Dioxin Solids DL - Dioxin Liquids T - Tissue WI - Waste L - Leachate V - Volatile X - Other		
	Relinquished By <i>K. Nicks</i>	Date/Time <i>7/19/98</i>	Received By <i>FedEx</i>	Date/Time	(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver) Note: Above indicated sample containers shipped directly to <i>Thermo Richards Co</i> RECPA, <i>Conville, PA</i> Other analytes sent to <i>Thermo</i> <i>Lionville PA</i> <i>Richardson CA</i> DAS 7/9/98				
	Relinquished By	Date/Time	Received By <i>E. SANGRUKING</i>	Date/Time <i>7/10/98 1130</i>					
	Relinquished By	Date/Time	Received By	Date/Time					
Relinquished By	Date/Time	Received By	Date/Time						

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

Ice Chest Receipt Log

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

Customer: WHC

Date: 7/10/98

Ice chest # or description	ERC 96-061					
Thermometer: time in	1145					
Thermometer: time out	1205					
Thermometer reading	14°C					
Thermometer number	204					
Correction factor						
Actual temperature*						
Custody seals on ice chest intact?	yes					
Custody seals dated?	yes					
Custody seals signed?	yes					
Custody seals on samples?	yes					
Ice chest scanned for activity?	yes					

* Temperature is in degrees centigrade.

Technician: [Signature]

Comments: _____

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 7/10/98 / 1130 S.G.#: ^{DG} # 0165
Work Order Number: KB-9-037 SAF #: B98-093
Shipping Container ID: ERC-96-061 Chain of Custody #: B98-093-01

- 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 _____
- 5. Vermiculite/packing materials is Wet Dry
- 6. Number of samples in shipping container: 1 (8 bottles)
- 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. Where any anomalies identified in sample receipt? Yes No

11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [Signature] / TNU Date: 7/10/98

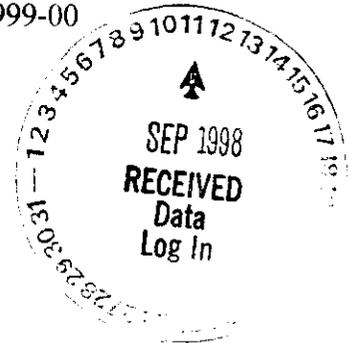
Telephoned To: _____ On _____ By _____



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD
RFW# : 9807L796
SDG/SAF# : H0165/B98-093

W.O.# : 10985-001-001-9999-00
Date Received: 07-10-98

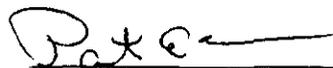


METALS CASE NARRATIVE

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 control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits.
7. All preparation/method blanks were within method criteria. 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) and matrix spike duplicate (MSD) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. All MSs and MSDs were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Matrix Spike Duplicate Report.
12. The duplicate analyses for 2 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 14 pages.

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



 Chuck Stefanosky
Laboratory Director
Lionville Analytical Laboratory

mld/m07-796

9-26-98

Date



METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9807L796

Leaching Procedure: 1310 1311 1312 Other:_____

CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: ✓3005A 3010A 3015 3020A 3050A 3051 200.7 SS17
 Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Antimony	<u> 6010B </u> <u> 7041⁵ </u>	<u> 200.7 </u> <u> 204.2 </u>			<u> 99 </u>
Arsenic	<u> ✓6010B </u> <u> 7060A⁵ </u>	<u> 200.7 </u> <u> 206.2 </u>	<u> 3113B </u>		<u> 99 </u>
Barium	<u> ✓6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Beryllium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Bismuth	<u> 6010B¹ </u>	<u> 200.7¹ </u>		<u> 1620 </u>	<u> 99 </u>
Boron	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Cadmium	<u> ✓6010B </u> <u> 7131A⁵ </u>	<u> 200.7 </u> <u> 213.2 </u>			<u> 99 </u>
Calcium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Chromium	<u> ✓6010B </u> <u> 7191⁵ </u>	<u> 200.7 </u> <u> 218.2 </u>			<u> SS17 </u>
Cobalt	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Copper	<u> 6010B </u> <u> 7211⁵ </u>	<u> 200.7 </u> <u> 220.2 </u>			<u> 99 </u>
Iron	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Lead	<u> ✓6010B </u> <u> 7421⁵ </u>	<u> 200.7 </u> <u> 239.2 </u>	<u> 3113B </u>		<u> 99 </u>
Lithium	<u> 6010B </u> <u> 7430⁴ </u>	<u> 200.7 </u>		<u> 1620 </u>	<u> 99 </u>
Magnesium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Manganese	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Mercury	<u> ✓7470A³ </u> <u> 7471A³ </u>	<u> 245.1² </u> <u> 245.5² </u>			<u> 99 </u>
Molybdenum	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Nickel	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Potassium	<u> 6010B </u> <u> 7610⁴ </u>	<u> 200.7 </u> <u> 258.1⁴ </u>			<u> 99 </u>
Rare Earths	<u> 6010B¹ </u>	<u> 200.7¹ </u>		<u> 1620 </u>	<u> 99 </u>
Selenium	<u> ✓6010B </u> <u> 7740⁵ </u>	<u> 200.7 </u> <u> 270.2 </u>	<u> 3113B </u>		<u> 99 </u>
Silicon	<u> 6010B¹ </u>	<u> 200.7 </u>		<u> 1620 </u>	<u> 99 </u>
Silica	<u> 6010B </u>	<u> 200.7 </u>		<u> 1620 </u>	<u> 99 </u>
Silver	<u> ✓6010B </u> <u> 7761⁵ </u>	<u> 200.7 </u> <u> 272.2 </u>			<u> 99 </u>
Sodium	<u> 6010B </u> <u> 7770⁴ </u>	<u> 200.7 </u> <u> 273.1⁴ </u>			<u> 99 </u>
Strontium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Thallium	<u> 6010B </u> <u> 7841⁵ </u>	<u> 200.7 </u> <u> 279.2 </u> <u> 200.9 </u>			<u> 99 </u>
Tin	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Titanium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Uranium	<u> 6010B¹ </u>	<u> 200.7¹ </u>		<u> 1620 </u>	<u> 99 </u>
Vanadium	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Zinc	<u> 6010B </u>	<u> 200.7 </u>			<u> 99 </u>
Zirconium	<u> 6010B¹ </u>	<u> 200.7¹ </u>		<u> 1620 </u>	<u> 99 </u>

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 08/12/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9807L796

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
*****	*****	*****	*****	*****	*****	*****
-001	BOP6YO	Silver, Total	1.1	u UG/L	1.1	1.0
		Arsenic, Total	3.3	u UG/L	3.3	1.0
		Barium, Total	0.84	UG/L	0.20	1.0
		Cadmium, Total	0.50	u UG/L	0.50	1.0
		Chromium, Total	6.3	UG/L	1.1	1.0
		Mercury, Total	0.10	u UG/L	0.10	1.0
		Lead, Total	2.5	u UG/L	2.5	1.0
		Selenium, Total	4.0	u UG/L	4.0	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/12/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9807L796

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	98L0974-MB1	Silver, Total	1.1	u UG/L	1.1	1.0
		Arsenic, Total	3.3	u UG/L	3.3	1.0
		Barium, Total	0.21	UG/L	0.20	1.0
		Cadmium, Total	0.50	u UG/L	0.50	1.0
		Chromium, Total	1.1	u UG/L	1.1	1.0
		Lead, Total	2.5	u UG/L	2.5	1.0
		Selenium, Total	4.0	u UG/L	4.0	1.0
BLANK1	98C0357-MB1	Mercury, Total	0.10	u UG/L	0.10	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 08/12/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9807L796

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-----	-----	-----	-----	-----	-----	-----	-----
-001	BOP6YO	Silver, Total	50.1	1.1 u	50.0	100.2	1.0
		Silver, Total MSD	49.8	1.1 u	50.0	99.6	1.0
		Arsenic, Total	2010	3.3 u	2000	100.4	1.0
		Arsenic, Total MSD	1990	3.3 u	2000	99.5	1.0
		Barium, Total	1990	0.84	2000	99.4	1.0
		Barium, Total MSD	1980	0.84	2000	98.9	1.0
		Cadmium, Total	51.0	0.50u	50.0	102.0	1.0
		Cadmium, Total MSD	50.4	0.50u	50.0	100.8	1.0
		Chromium, Total	202	6.3	200	98.1	1.0
		Chromium, Total MSD	201	6.3	200	97.2	1.0
		Mercury, Total	0.95	0.10u	1.0	94.9	1.0
		Lead, Total	506	2.5 u	500	101.1	1.0
		Lead, Total MSD	502	2.5 u	500	100.4	1.0
		Selenium, Total	2020	4.0 u	2000	101.1	1.0
		Selenium, Total MSD	2000	4.0 u	2000	100	1.0

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 08/12/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9807L796

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1		SPIKE#2	
			%RECOV	%RECOV	%RECOV	%DIFF
-001	BOP6YO	Silver, Total	100.2	99.6	0.60	
		Arsenic, Total	100.4	99.5	0.85	
		Barium, Total	99.4	98.9	0.54	
		Cadmium, Total	102.0	100.8	1.2	
		Chromium, Total	98.1	97.2	0.97	
		Lead, Total	101.1	100.4	0.69	
		Selenium, Total	101.1	100	1.1	

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 08/12/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9807L796

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	BOP6YO	Silver, Total	1.1 u	1.1 u	NC	1.0
		Arsenic, Total	3.3 u	3.3 u	NC	1.0
		Barium, Total	0.84	0.55	41.7	1.0
		Cadmium, Total	0.50u	0.50u	NC	1.0
		Chromium, Total	6.3	1.1 u	NC 200	1.0
		Mercury, Total	0.10u	0.10u	NC	1.0
		Lead, Total	2.5 u	2.5 u	NC	1.0
		Selenium, Total	4.0 u	4.0 u	NC	1.0

*Correction
MTE 8/25/98*

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 08/12/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9807L796

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

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	98L0974-LC1	Silver, LCS	503	500	UG/L	100.6
		Arsenic, LCS	9890	10000	UG/L	98.9
		Barium, LCS	4960	5000	UG/L	99.1
		Cadmium, LCS	252	250	UG/L	100.9
		Chromium, LCS	498	500	UG/L	99.7
		Lead, LCS	2520	2500	UG/L	100.6
		Selenium, LCS	9940	10000	UG/L	99.4
LCS1	98C0357-LC1	Mercury, LCS	5.3	5.0	UG/L	105.7

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

DATE RECEIVED: 07/10/98

RFW LOT # :9807L796

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOP6YO						
SILVER, TOTAL	001	W	98L0974	07/06/98	07/20/98	07/22/98
SILVER, TOTAL	001 REP	W	98L0974	07/06/98	07/20/98	07/22/98
SILVER, TOTAL	001 MS	W	98L0974	07/06/98	07/20/98	07/22/98
SILVER, TOTAL	001 MSD	W	98L0974	07/06/98	07/20/98	07/22/98
ARSENIC, TOTAL	001	W	98L0974	07/06/98	07/20/98	07/22/98
ARSENIC, TOTAL	001 REP	W	98L0974	07/06/98	07/20/98	07/22/98
ARSENIC, TOTAL	001 MS	W	98L0974	07/06/98	07/20/98	07/22/98
ARSENIC, TOTAL	001 MSD	W	98L0974	07/06/98	07/20/98	07/22/98
BARIUM, TOTAL	001	W	98L0974	07/06/98	07/20/98	07/22/98
BARIUM, TOTAL	001 REP	W	98L0974	07/06/98	07/20/98	07/22/98
BARIUM, TOTAL	001 MS	W	98L0974	07/06/98	07/20/98	07/22/98
BARIUM, TOTAL	001 MSD	W	98L0974	07/06/98	07/20/98	07/22/98
CADMIUM, TOTAL	001	W	98L0974	07/06/98	07/20/98	07/22/98
CADMIUM, TOTAL	001 REP	W	98L0974	07/06/98	07/20/98	07/22/98
CADMIUM, TOTAL	001 MS	W	98L0974	07/06/98	07/20/98	07/22/98
CADMIUM, TOTAL	001 MSD	W	98L0974	07/06/98	07/20/98	07/22/98
CHROMIUM, TOTAL	001	W	98L0974	07/06/98	07/20/98	07/22/98
CHROMIUM, TOTAL	001 REP	W	98L0974	07/06/98	07/20/98	07/22/98
CHROMIUM, TOTAL	001 MS	W	98L0974	07/06/98	07/20/98	07/22/98
CHROMIUM, TOTAL	001 MSD	W	98L0974	07/06/98	07/20/98	07/22/98
MERCURY, TOTAL	001	W	98C0357	07/06/98	07/24/98	07/27/98
MERCURY, TOTAL	001 REP	W	98C0357	07/06/98	07/24/98	07/27/98
MERCURY, TOTAL	001 MS	W	98C0357	07/06/98	07/24/98	07/27/98
LEAD, TOTAL	001	W	98L0974	07/06/98	07/20/98	07/22/98
LEAD, TOTAL	001 REP	W	98L0974	07/06/98	07/20/98	07/22/98
LEAD, TOTAL	001 MS	W	98L0974	07/06/98	07/20/98	07/22/98
LEAD, TOTAL	001 MSD	W	98L0974	07/06/98	07/20/98	07/22/98
SELENIUM, TOTAL	001	W	98L0974	07/06/98	07/20/98	07/22/98
SELENIUM, TOTAL	001 REP	W	98L0974	07/06/98	07/20/98	07/22/98
SELENIUM, TOTAL	001 MS	W	98L0974	07/06/98	07/20/98	07/22/98
SELENIUM, TOTAL	001 MSD	W	98L0974	07/06/98	07/20/98	07/22/98

LAB QC:

SILVER LABORATORY	LC1 BS	W	98L0974	N/A	07/20/98	07/22/98
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Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD

DATE RECEIVED: 07/10/98

RFW LOT # :9807L796

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILVER, TOTAL	MB1	W	98L0974	N/A	07/20/98	07/22/98
ARSENIC LABORATORY	LC1 BS	W	98L0974	N/A	07/20/98	07/22/98
ARSENIC, TOTAL	MB1	W	98L0974	N/A	07/20/98	07/22/98
BARIUM LABORATORY	LC1 BS	W	98L0974	N/A	07/20/98	07/22/98
BARIUM, TOTAL	MB1	W	98L0974	N/A	07/20/98	07/22/98
CADMIUM LABORATORY	LC1 BS	W	98L0974	N/A	07/20/98	07/22/98
CADMIUM, TOTAL	MB1	W	98L0974	N/A	07/20/98	07/22/98
CHROMIUM LABORATORY	LC1 BS	W	98L0974	N/A	07/20/98	07/22/98
CHROMIUM, TOTAL	MB1	W	98L0974	N/A	07/20/98	07/22/98
MERCURY LABORATORY	LC1 BS	W	98C0357	N/A	07/24/98	07/27/98
MERCURY, TOTAL	MB1	W	98C0357	N/A	07/24/98	07/27/98
LEAD LABORATORY	LC1 BS	W	98L0974	N/A	07/20/98	07/22/98
LEAD, TOTAL	MB1	W	98L0974	N/A	07/20/98	07/22/98
SELENIUM LABORATORY	LC1 BS	W	98L0974	N/A	07/20/98	07/22/98
SELENIUM, TOTAL	MB1	W	98L0974	N/A	07/20/98	07/22/98

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-093-01

Page 1 of 1

Collector Robert Fahberg / <i>D.L. Barons</i>	Company Contact Scott Petersen	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Data Turnaround 15 Days
Project Designation 216-A-29 Ditch - Water	Sampling Location 200 East	SAF No. B98-093		
Ice Chest No.	Field Logbook No. <i>EL 1381</i>	Method of Shipment Hand deliver		
Shipped To <i>BAB 7-6-98</i> <i>Quantro-Incorporated TMA</i>	Offsite Property No.	Bill of Lading/Air Bill No.		
Waste Designation D002, D006, U133, and WT02.		COA		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	HNO3 to pH <2	HNO3 to pH <2
	Type of Container	P	aG	P	P	aG	aG	P	P
	No. of Container(s)	1	1	1	1	2	2	3	3
	Special Handling and/or Storage Cool 4C	Volume	20ml	500ml	500ml	1000ml	1000ml	1000ml	1000ml

SAMPLE ANALYSIS				Activity Scan	Mercury - 7470 - (CV)	See item (1) in Special Instructions	Gross Alpha, Gross Beta	Pesticides - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60)	Strontium-89,90 - Total Sr
Sample No.	Matrix *	Sample Date	Sample Time								
BOP6Y0	Water	7-6-98	1215	X	X	X	X	X	X	X	X
				<i>DAS 7/9/98</i>			<i>DAS 7/9/98</i>			<i>DAS 7/9/98</i>	
											<i>BOP714</i>
											<i>BOP713</i>
											<i>DAS 7/9/98</i>

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By <i>[Signature]</i>	Date/Time <i>7/9/98</i>	Received By <i>[Signature]</i>	Date/Time <i>7/9/98</i>
Relinquished By <i>Jedey</i>	Date/Time <i>7/10/98</i>	Received By <i>Joder</i>	Date/Time <i>7/10/98 1000</i>
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS:
 (1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)
note: Above indicated sample containers shipped to RECREA Council, PA. Other analytical shipped to Thomas Richmond CA DAS 7/9/98

Matrix * Legend:
 S - Soil
 SE - Sediment
 SO - Solid
 SL - 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 <i>Joder</i>	Title Sample Custodian	S.S 4235 7951 3838	Date/Time 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By		Date/Time



**Recra LabNet Philadelphia
Analytical Report**

Client: TNU HANFORD
RFW #: 9807L796
SDG/SAF #: H0165/B98-093

W.O. #: 10985-001-001-9999-00
Date Received: 07-10-98

SEMIVOLATILE

One (1) water sample was collected on 07-06-98.

The sample and its associated QC samples were extracted on 07-13-98 and analyzed according to criteria set forth in SW 846 Method 8270 for Semivolatile target compounds on 08-19,20-98.

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 temperature upon receipt has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis were met.
3. A non-target compound was detected in sample BOP6Y0.
4. All surrogate recoveries were within EPA QC limits.
5. All blank spike recoveries were within EPA QC limits.
6. The method blank contained the common laboratory contaminants di-n-Butylphthalate and bis(2-Ethylhexyl)phthalate at levels less than the CRQL.



for Chuck Stefanosky
Chuck Stefanosky
Laboratory Director
Lionville Analytical Laboratory

9-9-98
Date

mzmz/bna/07-796b.cn

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 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.



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.



Cust ID:	BOP6YO	SBLKEP	SBLKEP BS
RFW#:	001	98LE1181-MB1	98LE1181-MB1
2-Chloronaphthalene	10 U	10 U	10 U
2-Nitroaniline	26 U	25 U	25 U
Dimethylphthalate	10 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U
3-Nitroaniline	26 U	25 U	25 U
Acenaphthene	10 U	10 U	76 %
2,4-Dinitrophenol	26 U	25 U	25 U
4-Nitrophenol	26 U	25 U	76 %
Dibenzofuran	10 U	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U	76 %
Diethylphthalate	0.6 J	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U
4-Nitroaniline	26 U	25 U	25 U
4,6-Dinitro-2-methylphenol	26 U	25 U	25 U
N-Nitrosodiphenylamine (1)	10 U	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U
Pentachlorophenol	26 U	25 U	46 %
Phenanthrene	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U
Carbazole	10 U	10 U	10 U
Di-n-butylphthalate	1 JB	1 J	1 JB
Fluoranthene	10 U	10 U	10 U
Pyrene	10 U	10 U	81 %
Butylbenzylphthalate	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	2 JB	0.9 J	2 JB
Di-n-octyl phthalate	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U

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

005

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BOP6YO

Lab Name: Recra.LabNet Work Order: 19985001001

Client: TNU-HANFORD

Matrix: WATER Lab Sample ID: 9807L796-001

Sample wt/vol: 960 (g/mL) ML Lab File ID: A081914

Level: (low/med) LOW Date Received: 07/10/98

% Moisture: not dec. dec. Date Extracted: 07/13/98

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 08/19/98

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.500

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.24	3	JB

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD

DATE RECEIVED: 07/10/98

RFW LOT # :9807L796

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOP6YO	001	W	98LE1181	07/06/98	07/13/98	08/19/98

LAB QC:

SBLKEP	MB1	W	98LE1181	N/A	07/13/98	08/20/98
SBLKEP	MB1 BS	W	98LE1181	N/A	07/13/98	08/20/98

Collector Robert Falberg / <i>D.L. Barons</i>	Company Contact Scott Petersen	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Data Turnaround 15 Days
Project Designation 216-A 29 Ditch - Water	Sampling Location 200 East	SAF No. B98-093	Method of Shipment Hand deliver	
Ice Chest No.	Field Logbook No. <i>EL 1381</i>	Bill of Lading/Air Bill No.		
Shipped To <i>BPA 7-6-98 TMA</i>	Offsite Property No.	COA		
Waste Designation D002, D006, U133, and WT02.				

010

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	Cool 4C	Cool 4C	HNO3 to pH <2	HNO3 to pH <2
	Type of Container	P	aG	P	P	aG	aG	P	P
	No. of Container(s)	1	1	1	2	2	3	3	
	Special Handling and/or Storage Cool 4C	Volume 20ml	500ml	500ml	1000ml	1000ml	1000ml	1000ml	1000ml

SAMPLE ANALYSIS				Activity Scan	Mercury - 7470 - (CV)	See item (f) in Special Instructions	Gross Alpha, Gross Beta	Pesticides - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Water) (Cesium-137) (Total 60)	Strontium-89,90 - Total Sr
Sample No.	Matrix *	Sample Date	Sample Time								
B0P6Y0	Water	7-6-98	1215	X	X	X	X	X	X	X	X
											B0P714
											B0P713
											DAS 7/9/98
											DAS 7/9/98

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>P. Nielsen</i>	Date/Time <i>7/9/98 1400</i>	Received By <i>P. Nielsen</i>	Date/Time <i>7/9/98</i>	(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver) Note: Above indicated sample containers shipped to RECRA, Lincoln, PA. Other analytical shipped to thermo Richmond CA DAS 7/9/98				S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil AU - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other	
Relinquished By <i>Jedey</i>	Date/Time	Received By <i>Joder</i>	Date/Time <i>7/10/98 1000</i>						
Relinquished By	Date/Time	Received By	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time						
LABORATORY SECTION	Received By <i>Joder</i>	Title <i>Sample Custodian</i>	Disposed By <i>S.S. 4235 7951 3838</i>	Date/Time <i>7/10/98 1000</i>					
FINAL SAMPLE DISPOSITION	Disposal Method				Date/Time				

GLOSSARY OF PESTICIDE/PCB 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.

GLOSSARY OF PESTICIDE/PCB DATA

- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C** = This flag applies to a compound that has been confirmed by GC/MS.

Recra LabNet - Lionville Laboratory
PEST/PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD

DATE RECEIVED: 07/10/98

RFW LOT # :9807L796

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOP6YC	001	W	98LE1187	07/06/98	07/13/98	07/21/98
LAB QC:						
PBLKIL	MB1	W	98LE1187	N/A	07/13/98	07/21/98
PBLKIL	MB1 BS	W	98LE1187	N/A	07/13/98	07/21/98
PBLKIL	MB1 BSD	W	98LE1187	N/A	07/13/98	07/21/98

fw
08-07-98

Collector Robert Lahlberg / <i>D.L. Barons</i>	Company Contact Scott Petersen	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Data Turnaround 15 Days
Project Designation 216 A-29 Ditch - Water	Sampling Location 200 East	SAF No. B98-093		
Ice Chest No.	Field Logbook No. <i>EL 1381</i>	Method of Shipment Hand deliver		007
Shipped To <i>DAS 7-6-98</i> <i>TMA</i>	Offsite Property No.	Bill of Lading/Air Bill No.		
Waste Designation D002, D006, U133, and WT02			COA	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	HNO ₃ to pH <2	HNO ₃ to pH <2	HNO ₃ to pH <2	Cool 4C	Cool 4C	HNO ₃ to pH <2	HNO ₃ to pH <2
	Type of Container	P	aG	P	P	aG	aG	P	P
	No. of Container(s)	1	1	1	1	2	2	3	3
Special Handling and/or Storage Cool 4C	Volume	20ml	500ml	500ml	1000ml	1000ml	1000ml	1000ml	1000ml

SAMPLE ANALYSIS				Activity Scan	Mercury - 7470 - (CV)	See item (1) in Special Instructions	Gross Alpha, Gross Beta	Pesticides - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60)	Strontium-89,90 - Total Sr
Sample No	Matrix *	Sample Date	Sample Time								
BOP6Y0	Water	7-6-98	1215	X	X	X	X	X	X	X	X
				<i>DAS 7/9/98</i>			<i>DAS 7/9/98</i>			<i>DAS 7/9/98</i>	<i>DAS 7/9/98</i>
											<i>BOP714</i>
											<i>BOP713</i>
											<i>DAS 7/9/98</i>

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>Steve Nickerson</i>	Date/Time <i>7/9/98</i>	Received By <i>Fred Ex</i>	Date/Time <i>7/10/98</i>	(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver) Note: Above indicated sample containers shipped to RECREA, Livermore, PA. Other analytical shipped to Thermo Richmond CA <i>DAS 7/9/98</i>				S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other	
Relinquished By <i>Jedex</i>	Date/Time	Received By <i>Joder</i>	Date/Time <i>7/10/98 10:00</i>						
Relinquished By	Date/Time	Received By	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time						
LABORATORY SECTION	Received By <i>Joder</i>	Title <i>Sample Custodian</i>	<i>S.S</i>	4255 7951 3838	Date/Time <i>7/10/98 10:00</i>				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By		Date/Time					