

Thermo Nutech
W.O. No. N9-09-137-7214

RECEIVED
JAN 27 2000

Bechtel Hanford Inc.
SDG H0537

Case Narrative

EDMC

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0537 is composed of two solid (soil) samples designated under SAF No. B99-078 with a Project Designation of: 200 Area Source characterization-200-CW-1 OU.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. Results were faxed to BHI on November 3, 1999 (Technetium, Gamma Scan, Total Uranium and Tritium), November 12, 1999 (Americium-241, Neptunium-237, Isotopic Plutonium, Isotopic Thorium and Total Strontium) and November 15, 1999 (Nickel-63).

2.0 ANALYSIS NOTES

2.1 Gamma Scan Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses. Recounts were performed on sample B0WBR9, the Blank and the Duplicate.

2.3 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.4 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

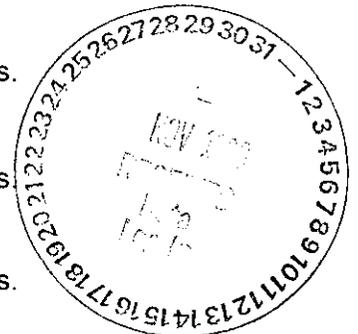
No problems were encountered during the course of the analyses. The RDP in results of the duplicate and original sample was 79%, greater than the allowable 3 sigma total of 68%.

2.7 Technetium-99 Analyses

No problems were encountered during the course of the analyses. A recount was taken on sample B0WBR9. Positive Tc99 activity greater than the sample MDA but less than the RDL was detected in the QC blank.

2.8 Total and Isotopic Uranium Analyses

Isotopic Uranium was to be ordered by BHI after reviewing data from the Total Uranium testing. No Isotopic Uranium analysis was requested. No problems were encountered during the course of the analyses.



2.9 Tritium Analyses

No problems were encountered during the course of the analyses.

2.10 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

SAMPLE SUMMARY

SDG 7214
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0537

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		CHAIN OF	
				SAMPLE ID	SAF NO	CUSTODY	COLLECTED
B0WBR9	200 B pond (B8758)>15'	SOLID		N909137-01	B99-078	B99-078-124	09/16/99 13:20
B0WBTO	200 B pond (B8758)>15'	SOLID		N909137-02	B99-078	B99-078-124	09/17/99 09:35
Method Blank		SOLID		N909137-04	B99-078		
Lab Control Sample		SOLID		N909137-03	B99-078		
Duplicate (N909137-01)	200 B pond (B8758)>15'	SOLID		N909137-05	B99-078		09/16/99 13:20

SAMPLE SUMMARY

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 11/15/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0537

SDG 7214
 Contact Kevin C. Johnson

QC SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0537

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7214	B99-078-124	B0WBR9	SOLID	94.5			09/21/99	5	N909137-01	7214-001
		B0WBTO	SOLID	95.4			09/21/99	4	N909137-02	7214-002
		Method Blank	SOLID						N909137-04	7214-004
		Lab Control Sample	SOLID						N909137-03	7214-003
		Duplicate (N909137-01)	SOLID	94.5			09/21/99	5	N909137-05	7214-005

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SAMPLE DELIVERY GROUP H0537

SDG 7214
 Contact Kevin C. Johnson

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0537

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Alpha Spectroscopy										
AM	SOLID	Americium 241 in Soil	6904-018	5.0	2			1	1	1/1
NP	SOLID	Neptunium in Soil	6904-018	5.0	2			1	1	1/1
PU	SOLID	Plutonium, Isotopic in Solids	6904-018	5.0	2			1	1	1/1
TH	SOLID	Thorium, Isotopic in Soil	6904-018	5.0	2			1	1	1/1
Beta Counting										
SR	SOLID	Total Strontium in Soil	6904-018	10.0	2			1	1	1/1
TC	SOLID	Technetium 99 in Soil	6904-018	10.0	2			1	1	1/1
Gamma Spectroscopy										
GAM	SOLID	Gamma Scan	6904-018	15.0	2			1	1	1/1
Kinetic Phosphorimetry										
U_T	SOLID	Uranium, Total in Soil	6904-018	9.0	2			1	1	1/1
Liquid Scintillation Counting										
H	SOLID	Tritium in Soil	6904-018	10.0	2			1	1	1/1
NI_L	SOLID	Nickel 63 in Soil	6904-018	10.0	2			1	1	1/1

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
 Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

SDG 7214
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SPB-207925
 Case no SDG H0537

WORK SUMMARY

CLIENT SAMPLE ID		LAB SAMPLE ID								
LOCATION	MATRIX	COLLECTED	FLANCHET	TEST	SUF-					
CUSTODY	SAF No	RECEIVED			FIX	ANALYZED	REVIEWED	BY	METHOD	
BOWBR9		N909137-01	7214-001	AM		11/10/99	11/12/99	NJV	Americium 241 in Soil	
200 B pond (B8758)>15'	SOLID	09/16/99	7214-001	GAM		10/26/99	11/03/99	NJV	Gamma Scan	
B99-078-124	B99-078	09/21/99	7214-001	H		10/27/99	11/03/99	NJV	Tritium in Soil	
			7214-001	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil	
			7214-001	NP		11/08/99	11/12/99	NJV	Neptunium in Soil	
			7214-001	PU		11/10/99	11/12/99	NJV	Plutonium, Isotopic in Solids	
			7214-001	SR		11/10/99	11/12/99	NJV	Total Strontium in Soil	
			7214-001	TC		10/28/99	11/03/99	NJV	Technetium 99 in Soil	
			7214-001	TH		11/02/99	11/12/99	NJV	Thorium, Isotopic in Soil	
			7214-001	U_T		10/18/99	11/03/99	NJV	Uranium, Total in Soil	
BOWBT0		N909137-02	7214-002	AM		11/10/99	11/12/99	NJV	Americium 241 in Soil	
200 B pond (B8758)>15'	SOLID	09/17/99	7214-002	GAM		10/27/99	11/03/99	NJV	Gamma Scan	
B99-078-124	B99-078	09/21/99	7214-002	H		10/27/99	11/03/99	NJV	Tritium in Soil	
			7214-002	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil	
			7214-002	NP		11/08/99	11/12/99	NJV	Neptunium in Soil	
			7214-002	PU		11/10/99	11/12/99	NJV	Plutonium, Isotopic in Solids	
			7214-002	SR		11/06/99	11/12/99	NJV	Total Strontium in Soil	
			7214-002	TC		10/26/99	11/03/99	NJV	Technetium 99 in Soil	
			7214-002	TH		11/02/99	11/12/99	NJV	Thorium, Isotopic in Soil	
			7214-002	U_T		10/18/99	11/03/99	NJV	Uranium, Total in Soil	
Method Blank		N909137-04	7214-004	AM		11/10/99	11/12/99	NJV	Americium 241 in Soil	
	SOLID		7214-004	GAM		10/27/99	11/03/99	NJV	Gamma Scan	
	B99-078		7214-004	H		10/28/99	11/03/99	NJV	Tritium in Soil	
			7214-004	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil	
			7214-004	NP		11/08/99	11/12/99	NJV	Neptunium in Soil	
			7214-004	PU		11/10/99	11/12/99	NJV	Plutonium, Isotopic in Solids	
			7214-004	SR		11/10/99	11/12/99	NJV	Total Strontium in Soil	
			7214-004	TC		10/27/99	11/03/99	NJV	Technetium 99 in Soil	
			7214-004	TH		11/02/99	11/12/99	NJV	Thorium, Isotopic in Soil	
			7214-004	U_T		10/18/99	11/03/99	NJV	Uranium, Total in Soil	

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

WORK SUMMARY, cont.

SDG 7214
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SPB-207925
 Case no SDG H0537

CLIENT SAMPLE ID		LAB SAMPLE ID								
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	SUF-					
CUSTODY	SAF No	RECEIVED			FIX	ANALYZED	REVIEWED	BY	METHOD	
Lab Control Sample		N909137-03	7214-003	AM		11/10/99	11/12/99	NJV	Americium 241 in Soil	
	SOLID		7214-003	GAM		10/27/99	11/03/99	NJV	Gamma Scan	
	B99-078		7214-003	H		10/27/99	11/03/99	NJV	Tritium in Soil	
			7214-003	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil	
			7214-003	NP		11/08/99	11/12/99	NJV	Neptunium in Soil	
			7214-003	PU		11/10/99	11/12/99	NJV	Plutonium, Isotopic in Solids	
			7214-003	SR		11/06/99	11/12/99	NJV	Total Strontium in Soil	
			7214-003	TC		10/25/99	11/03/99	NJV	Technetium 99 in Soil	
			7214-003	TH		11/02/99	11/12/99	NJV	Thorium, Isotopic in Soil	
			7214-003	U_T		10/18/99	11/03/99	NJV	Uranium, Total in Soil	
Duplicate (N909137-01)		N909137-05	7214-005	AM		11/10/99	11/12/99	NJV	Americium 241 in Soil	
200 B pond (B8758)>15'	SOLID	09/16/99	7214-005	GAM		10/27/99	11/03/99	NJV	Gamma Scan	
	B99-078	09/21/99	7214-005	H		10/28/99	11/03/99	NJV	Tritium in Soil	
			7214-005	NI_L		11/11/99	11/15/99	NJV	Nickel 63 in Soil	
			7214-005	NP		11/08/99	11/12/99	NJV	Neptunium in Soil	
			7214-005	PU		11/10/99	11/12/99	NJV	Plutonium, Isotopic in Solids	
			7214-005	SR		11/10/99	11/12/99	NJV	Total Strontium in Soil	
			7214-005	TC		10/25/99	11/03/99	NJV	Technetium 99 in Soil	
			7214-005	TH		11/02/99	11/12/99	NJV	Thorium, Isotopic in Soil	
			7214-005	U_T		10/18/99	11/03/99	NJV	Uranium, Total in Soil	

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

WORK SUMMARY, cont.

SDG 7214
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SFG H0537

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	B99-078	Americium 241 in Soil	AM/CMPLATE	2			1	1	1		5
GAM	B99-078	Gamma Scan	GAMMAHI	2			1	1	1		5
H	B99-078	Tritium in Soil	EPA906.0	2			1	1	1		5
NI_L	B99-078	Nickel 63 in Soil	NI63LSC	2			1	1	1		5
NP	B99-078	Neptunium in Soil	NP237PLATE	2			1	1	1		5
PU	B99-078	Plutonium, Isotopic in Solids	PUPLATE	2			1	1	1		5
SR	B99-078	Total Strontium in Soil	SRTOTAL	2			1	1	1		5
TC	B99-078	Technetium 99 in Soil	TC99TRLSC	2			1	1	1		5
TH	B99-078	Thorium, Isotopic in Soil	THPLATE	2			1	1	1		5
U_T	B99-078	Uranium, Total in Soil	UKPA	2			1	1	1		5
TOTALS				20			10	10	10		50

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0537

N909137-04

Method Blank

METHOD BLANK

SDG <u>7214</u>	Client/Case no <u>Hanford</u>	SDG <u>H0537</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SPB-207925</u>	
Lab sample id <u>N909137-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7214-004</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>B99-078</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.024	0.050	0.084	400	U	H
Technetium 99	14133-76-7	<u>1.50</u>	0.22	0.48	15	J	TC
Neptunium 237	13994-20-2	0.021	<u>0.028</u>	0.021			NP
Total Uranium (ug/g)	7440-61-1	-0.001	0.002	0.005	1.0	U	U_T
Plutonium 238	13981-16-3	-0.013	0.10	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0.025	0.076	0.16	1.0	U	PU
Nickel 63	13981-37-8	0.520	1.2	2.0	30	U	NI_L
Americium 241	14596-10-2	0.004	0.016	0.030	1.0	U	AM
Total Strontium	SR-RAD	-0.111	0.13	0.19	1.0	U	SR
Thorium 228	14274-82-9	-0.027	0.054	0.12	1.0	U	TH
Thorium 230	14269-63-7	-0.013	0.080	0.15	1.0	U	TH
Thorium 232	TH-232	0.013	0.027	0.051	1.0	U	TH
Potassium 40	13966-00-2	U		0.66		U	GAM
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Cesium 137	10045-97-3	U		0.044	0.10	U	GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.11</u>	0.10	U	GAM
Europium 155	14391-16-3	U		0.091	0.10	U	GAM
Radium 226	13982-63-3	U		0.076	0.10	U	GAM
Radium 228	15262-20-1	U		0.19	0.20	U	GAM
Thorium 228	14274-82-9	U		0.054		U	GAM
Thorium 232	TH-232	U		0.19		U	GAM
Americium 241	14596-10-2	U		0.098		U	GAM
Uranium 238	U-238	U		4.3		U	GAM
Uranium 235	15117-96-1	U		0.14		U	GAM

200 Area Source chrctztn-200-CW-1 OU

QC-BLANK 32094

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

N909137-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7214</u>	Client/Case no <u>Hanford</u>	<u>SDG H0537</u>
Contact <u>Kevin C. Johnson</u>	Case no <u>TRB-SPB-207925</u>	
Lab sample id <u>N909137-03</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7214-003</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-078</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	4.89	0.15	0.084	400	J	H	4.84	0.19	101	83-117	80-120
Technetium 99	52.0	1.8	0.47	15	B	TC	54.1	2.2	96	84-116	80-120
Neptunium 237	11.0	0.65	0.049			NP	11.9	0.48	92	88-112	
Total Uranium (ug/g)	34.8	4.1	0.049	1.0		U_T	41.2	1.6	84	80-120	80-120
Plutonium 238	9.48	0.88	0.053	1.0		PU	10.0	0.40	95	84-116	80-120
Plutonium 239/240	9.93	0.92	0.043	1.0		PU	10.6	0.42	94	84-116	80-120
Nickel 63	132	3.5	1.9	30		NI_L	134	5.4	99	84-116	
Americium 241	10.4	0.77	0.047	1.0		AM	10.5	0.42	99	85-115	80-120
Total Strontium	13.6	0.41	0.17	1.0		SR	12.4	0.50	110	82-118	
Thorium 230	22.5	1.1	0.16	1.0		TH	20.4	0.82	110	87-113	
Cobalt 60	1.36	0.066	0.029	0.050		GAM	1.49	0.060	91	78-122	80-120
Cesium 137	1.44	0.056	0.035	0.10		GAM	1.54	0.062	94	77-123	80-120

200 Area Source chrtztn-200-CW-1 OU

QC-LCS 32093

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>11/15/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0537

N909137-05

B0WBR9

DUPLICATE

SDG <u>7214</u>	Client/Case no <u>Hanford</u>	SDG <u>H0537</u>
Contact <u>Kevin C. Johnson</u>	Case no <u>TRE-SBR-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N909137-05</u>	Lab sample id <u>N909137-01</u>	Client sample id <u>B0WBR9</u>
Dept sample id <u>7214-005</u>	Dept sample id <u>7214-001</u>	Location/Matrix <u>200 B pond (B8758)>15' SOLID</u>
	Received <u>09/21/99</u>	Collected <u>09/16/99 13:20</u>
% solids <u>94.5</u>	% solids <u>94.5</u>	Custody/SAF No <u>B99-078-124</u> <u>B99-078</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	PROT
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST		pCi/g	(COUNT)	pCi/g	FIERS	%	TOT
Tritium	0.031	0.052	0.086	400	U	H	0.022	0.051	0.086	U	-	
Technetium 99	1.28	0.22	0.49	15	JB	TC	1.34	0.19	0.29	JB	5	39
Neptunium 237	-0.014	0.018	0.057		U	NP	0	0.024	0.067	U	-	
Total Uranium (ug/g)	0.406	0.045	0.005	1.0	J	U_T	0.358	0.041	0.005	J	13	31
Plutonium 238	0.016	0.049	0.10	1.0	U	PU	0	0.033	0.078	U	-	
Plutonium 239/240	0.057	0.066	0.091	1.0	U	PU	0.008	0.032	0.062	U	-	
Nickel 63	0.798	1.2	2.0	30	U	NI_L	0.698	1.2	2.1	U	-	
Americium 241	0.008	0.024	0.039	1.0	U	AM	-0.018	0.037	0.088	U	-	
Total Strontium	0.298	0.13	0.19	1.0	J	SR	0.285	0.11	0.15	J	4	90
Thorium 228	0.462	0.13	0.14	1.0	J	TH	0.658	0.14	0.10	J	35	52
Thorium 230	0.647	0.16	0.15	1.0	J	TH	0.279	0.13	0.15	J	79	68
Thorium 232	0.480	0.12	0.051	1.0	J	TH	0.439	0.11	0.053	J	9	54
Potassium 40	12.7	0.68	0.34			GAM	12.6	1.1	0.62		1	35
Cobalt 60	U		0.034	0.050	U	GAM	U	<u>0.067</u>	U		-	
Cesium 137	U		0.027	0.10	U	GAM	U	<u>0.049</u>	U		-	
Europium 152	U		0.074	0.10	U	GAM	U	<u>0.12</u>	U		-	
Europium 154	U		<u>0.11</u>	0.10	U	GAM	U	<u>0.19</u>	U		-	
Europium 155	U		<u>0.065</u>	0.10	U	GAM	U	<u>0.080</u>	U		-	
Radium 226	0.395	0.064	0.058	0.10		GAM	0.394	0.10	<u>0.11</u>		0	55
Radium 228	0.640	0.15	0.13	0.20		GAM	0.725	0.24	<u>0.23</u>		12	70
Thorium 228	0.500	0.037	0.035			GAM	0.535	0.058	0.059		7	38
Thorium 232	0.640	0.15	0.13			GAM	0.725	0.24	0.23		12	70
Americium 241	U		0.070		U	GAM	U	0.059	U		-	
Uranium 238	U		3.6		U	GAM	U	7.7	U		-	
Uranium 235	U		0.11		U	GAM	U	0.14	U		-	

200 Area Source chrctztn-200-CW-1 OU

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>11/15/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

N909137-05

B0WBR9

DUPLICATE, cont.

SDG <u>7214</u>		Client/Case no <u>Hanford</u>	SDG <u>H0537</u>
Contact <u>Kevin C. Johnson</u>		Case no <u>TRB-SPB-207925</u>	
DUPLICATE	ORIGINAL		
Lab sample id <u>N909137-05</u>	Lab sample id <u>N909137-01</u>	Client sample id <u>B0WBR9</u>	
Dept sample id <u>7214-005</u>	Dept sample id <u>7214-001</u>	Location/Matrix <u>200 B pond (B8758)>15'</u>	<u>SOLID</u>
	Received <u>09/21/99</u>	Collected <u>09/16/99 13:20</u>	
% solids <u>94.5</u>	% solids <u>94.5</u>	Custody/SAP No <u>B99-078-124</u>	<u>P99-078</u>

QC-DUP#1 32095

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>11/15/99</u>

DUPLICATES

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SUMMARY DATA SECTION

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0537

N909137-01

BOWBR9

DATA SHEET

SDG <u>7214</u>	Client/Case no <u>Hanford</u>	SDG <u>H0537</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N909137-01</u>	Client sample id <u>BOWBR9</u>	
Dept sample id <u>7214-001</u>	Location/Matrix <u>200 B pond (B8758)>15'</u> <u>SOLID</u>	
Received <u>09/21/99</u>	Collected <u>09/16/99 13:20</u>	
% solids <u>94.5</u>	Custody/SAF No <u>B99-078-124</u> <u>B99-078</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.022	0.051	0.086	400	U	H
Technetium 99	14133-76-7	1.34	0.19	0.29	15	JB	TC
Neptunium 237	13994-20-2	0	0.024	0.067		U	NP
Total Uranium (ug/g)	7440-61-1	0.358	0.041	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	0	0.033	0.078	1.0	U	PU
Plutonium 239/240	PU-239/240	0.008	0.032	0.062	1.0	U	PU
Nickel 63	13981-37-8	0.698	1.2	2.1	30	U	NI_L
Americium 241	14596-10-2	-0.018	0.037	0.088	1.0	U	AM
Total Strontium	SR-RAD	0.285	0.11	0.15	1.0	J	SR
Thorium 228	14274-82-9	0.658	0.14	0.10	1.0	J	TH
Thorium 230	14269-63-7	0.279	0.13	0.15	1.0	J	TH
Thorium 232	TH-232	0.439	0.11	0.053	1.0	J	TH
Potassium 40	13966-00-2	12.6	1.1	0.62			GAM
Cobalt 60	10198-40-0	U		0.067	0.050	U	GAM
Cesium 137	10045-97-3	U		0.049	0.10	U	GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.19	0.10	U	GAM
Europium 155	14391-16-3	U		0.080	0.10	U	GAM
Radium 226	13982-63-3	0.394	0.10	0.11	0.10		GAM
Radium 228	15262-20-1	0.725	0.24	0.23	0.20		GAM
Thorium 228	14274-82-9	0.535	0.058	0.059			GAM
Thorium 232	TH-232	0.725	0.24	0.23			GAM
Americium 241	14596-10-2	U		0.059		U	GAM
Uranium 238	U-238	U		7.7		U	GAM
Uranium 235	15117-96-1	U		0.14		U	GAM

200 Area Source chrctztn-200-CW-1 OU

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>11/15/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0537

N909137-02

BOWBTO

DATA SHEET

SDG <u>7214</u>	Client/Case no <u>Hanford</u>	SDG <u>H0537</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SRB-207925</u>	
Lab sample id <u>N909137-02</u>	Client sample id <u>BOWBTO</u>	
Dept sample id <u>7214-002</u>	Location/Matrix <u>200 B pond (B8758)>15'</u>	<u>SOLID</u>
Received <u>09/21/99</u>	Collected <u>09/17/99 09:35</u>	
% solids <u>95.4</u>	Custody/SAF No <u>B99-078-124</u>	<u>B99-078</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.018	0.050	0.084	400	U	H
Technetium 99	14133-76-7	1.33	0.20	0.43	15	JB	TC
Neptunium 237	13994-20-2	0.012	0.024	0.050		U	NP
Total Uranium (ug/g)	7440-61-1	0.325	0.037	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	0.010	0.020	0.047	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.005	0.020	0.047	1.0	U	PU
Nickel 63	13981-37-8	0.423	1.2	2.0	30	U	NI_L
Americium 241	14596-10-2	0.003	0.021	0.033	1.0	U	AM
Total Strontium	SR-RAD	0.063	0.11	0.15	1.0	U	SR
Thorium 228	14274-82-9	0.357	0.11	0.10	1.0	J	TH
Thorium 230	14269-63-7	0.276	0.12	0.14	1.0	J	TH
Thorium 232	TH-232	0.362	0.11	0.050	1.0	J	TH
Potassium 40	13966-00-2	12.1	1.1	0.50			GAM
Cobalt 60	10198-40-0	U		<u>0.064</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.045	0.10	U	GAM
Europium 152	14683-23-9	U		<u>0.13</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.18</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.11</u>	0.10	U	GAM
Radium 226	13982-63-3	0.402	0.10	0.096	0.10		GAM
Radium 228	15262-20-1	0.415	0.21	<u>0.21</u>	0.20		GAM
Thorium 228	14274-82-9	0.409	0.059	0.059			GAM
Thorium 232	TH-232	0.415	0.21	0.21			GAM
Americium 241	14596-10-2	U		0.13		U	GAM
Uranium 238	U-238	U		6.0		U	GAM
Uranium 235	15117-96-1	U		0.18		U	GAM

200 Area Source chrctztn-200-CW-1 OU

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>11/15/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Test AM Matrix SOLID
SDG 7214
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SRP-207925
Case no SDG H0537

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Americium 241
Preparation batch 6904-018					
BOWBR9	N909137-01	7214-001			U
BOWBT0	N909137-02	7214-002			U
BLK (QC ID=32094)	N909137-04	7214-004			U
LCS (QC ID=32093)	N909137-03	7214-003			ok
Duplicate (N909137-01)	N909137-05	7214-005			- U
Nominal values and limits from method					
200 Area Source chrctztn-200-CW-1 OU			RDLs (pCi/g)		1.0

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFT %	COUNT min	FWHM keV	DRIFT keV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 018															
BOWBR9	N909137-01			0.088	0.500			33		793			55	11/08/99	11/10 SS-013
BOWBT0	N909137-02			0.033	0.500			85		793			54	11/08/99	11/10 SS-014
BLK (QC ID=32094)	N909137-04			0.030	0.500			78		793				11/08/99	11/10 SS-016
LCS (QC ID=32093)	N909137-03			0.047	0.500			73		793				11/08/99	11/10 SS-015
Duplicate (N909137-01)	N909137-05			0.039	0.500			76		760			55	11/08/99	11/10 SS-056
(QC ID=32095)															
Nominal values and limits from method				1.0	0.500			20-105		700	100		180		

PROCEDURES	REFERENCE	AM/CMPLATE
EP-060		Soil Preparation, rev 0
EP-070		Soil Dissolution, rev 0
EP-940		Plutonium Purification, rev 0
EP-960		Americium-Curium Purification, rev 0
EP-008		Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA <u>0.047</u> ± <u>0.047</u>
FOR 5 SAMPLES	YIELD <u>69</u> ± <u>41</u>

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Test NP Matrix SOLID
SDG 7214
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SRR-207925
Case no SDG H0537

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Neptunium 237
Preparation batch 6904-018					
BOWBR9	N909137-01			7214-001	U
BOWBT0	N909137-02			7214-002	U
BLK (QC ID=32094)	N909137-04			7214-004	<u>0.021</u>
LCS (QC ID=32093)	N909137-03			7214-003	ok
Duplicate (N909137-01)	N909137-05			7214-005	- U

Nominal values and limits from method RDLs (pCi/g)
200 Area Source chrctztn-200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 018																
BOWBR9	N909137-01			0.067	0.500			43		200			53	11/03/99	11/08	BETA
BOWBT0	N909137-02			0.050	0.500			62		200			52	11/03/99	11/08	BETA
BLK (QC ID=32094)	N909137-04			0.021	0.500			30		200				11/03/99	11/08	BETA
LCS (QC ID=32093)	N909137-03			0.049	0.500			39		200				11/03/99	11/08	BETA
Duplicate (N909137-01)	N909137-05			0.057	0.500			44		200			53	11/03/99	11/08	BETA
	(QC ID=32095)															

Nominal values and limits from method 0.500 20-105 100

PROCEDURES REFERENCE NP237PLATE
EP-060 Soil Preparation, rev 0
EP-070 Soil Dissolution, rev 0
EP-930 Neptunium Purification, rev 0

AVERAGES ± 2 SD MDA 0.049 ± 0.034
FOR 5 SAMPLES YIELD 44 ± 23

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Test PU Matrix SOLID
SDG 7214
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SRB-207925
Case no SDG H0537

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	Plutonium 238	Plutonium 239/240
Preparation batch 6904-018					
BOWBR9	N909137-01		7214-001	U	U
BOWBT0	N909137-02		7214-002	U	U
BLK (QC ID=32094)	N909137-04		7214-004	U	U
LCS (QC ID=32093)	N909137-03		7214-003	ok	ok
Duplicate (N909137-01)	N909137-05		7214-005	- U	- U

Nominal values and limits from method RDLs (pCi/g) 1.0 1.0
200 Area Source chrctztn-200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 018															
BOWBR9	N909137-01			0.078	0.500			35	797			55	11/09/99	11/10	SS-006
BOWBT0	N909137-02			0.047	0.500			60	797			54	11/09/99	11/10	SS-008
BLK (QC ID=32094)	N909137-04			0.19	0.500			24	795				11/09/99	11/10	SS-009
LCS (QC ID=32093)	N909137-03			0.053	0.500			53	760				11/09/99	11/10	SS-055
Duplicate (N909137-01)	N909137-05			0.10	0.500			38	795			55	11/09/99	11/10	SS-011
(QC ID=32095)															

Nominal values and limits from method 1.0 0.500 20-105 10 100 180

PROCEDURES	REFERENCE	PUPLATE
EP-060		Soil Preparation, rev 0
EP-070		Soil Dissolution, rev 0
EP-940		Plutonium Purification, rev 0
EP-008		Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD MDA 0.094 ± 0.12
FOR 5 SAMPLES YIELD 42 ± 29

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Test TH Matrix SOLID
SDG 7214
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SRB-207925
Case no SDG H0537

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6904-018							
BOWBR9	N909137-01	7214-001			0.658 J	0.279 J	0.439 J
BOWBT0	N909137-02	7214-002			0.357 J	0.276 J	0.362 J
BLK (QC ID=32094)	N909137-04	7214-004			U	U	U
LCS (QC ID=32093)	N909137-03	7214-003				ok	
Duplicate (N909137-01)	N909137-05	7214-005			ok J	<u>CUT</u> J	ok J
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0
200 Area Source chrctztn-200-CW-1 OU							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR	
Preparation batch 6904-018 2σ prep error 5.0 % Reference Lab Notebook 6904 pg. 018																	
BOWBR9	N909137-01			0.15	0.250			87		791			47	11/01/99	11/02	SS-027	
BOWBT0	N909137-02			0.14	0.250			87		791			46	11/01/99	11/02	SS-029	
BLK (QC ID=32094)	N909137-04			0.15	0.250			87		783				11/01/99	11/02	SS-032	
LCS (QC ID=32093)	N909137-03			0.16	0.250			86		783				11/01/99	11/02	SS-031	
Duplicate (N909137-01)	N909137-05			0.15	0.250			88		783				47	11/01/99	11/02	SS-034
(QC ID=32095)																	
Nominal values and limits from method				1.0	0.250			20-105		200			180				

PROCEDURES	REFERENCE	THPLATE
EP-000		Data Entry and Document Preparation, rev 0
EP-001		Q.C. Preparation, rev 0
EP-003		Tracing, rev 0
EP-008		Heavy Elements Electroplating, rev 0
EP-070		Soil Dissolution, rev 0
RP-901		Thorium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD	MDA	0.15	±	0.014
FOR 5 SAMPLES	YIELD	87	±	1

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Test SR Matrix SOLID
SDG 7214
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SRB-207925
Case no SDG H0537

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 6904-018					
BOWBR9	N909137-01			7214-001	0.285 J
BOWBT0	N909137-02			7214-002	U
BLK (QC ID=32094)	N909137-04			7214-004	U
LCS (QC ID=32093)	N909137-03			7214-003	ok
Duplicate (N909137-01)	N909137-05			7214-005	ok J
Nominal values and limits from method		RDLs (pCi/g)		1.0	
200 Area Source chrctztn-200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX pCi/g	MDA g	ALIQ g	PREP FAC	DILU TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 018																	
BOWBR9	N909137-01			0.15	1.00				88	200			55	11/05/99	11/10	GRB-219	
BOWBT0	N909137-02			0.15	1.00				92	400			50	11/05/99	11/06	GRB-218	
BLK (QC ID=32094)	N909137-04			0.19	1.00				74	400				11/05/99	11/10	GRB-220	
LCS (QC ID=32093)	N909137-03			0.17	1.00				81	400				11/05/99	11/06	GRB-219	
Duplicate (N909137-01)	N909137-05			0.19	1.00				88	200			55	11/05/99	11/10	GRB-223	
(QC ID=32095)																	
Nominal values and limits from method				1.0	1.00						100			180			

PROCEDURES REFERENCE SRTOTAL
 RP-500 Strontium - Initial Separation, rev 0
 RP-519 Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD MDA 0.17 ± 0.040
 FOR 5 SAMPLES YIELD 85 ± 14

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 11/15/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Test TC Matrix SOLID
SDG 7214
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0537

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	Planchet	Technetium 99
Preparation batch 6904-018					
BOWBR9	N909137-01	7214-001			1.34 J
BOWBT0	N909137-02	7214-002			1.33 J
BLK (QC ID=32094)	N909137-04	7214-004			<u>1.50</u> J
LCS (QC ID=32093)	N909137-03	7214-003			ok
Duplicate (N909137-01)	N909137-05	7214-005			ok J

Nominal values and limits from method RDLs (pCi/g) 15
200 Area Source chrctztn-200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 018																
BOWBR9	N909137-01			0.29	1.01			80		200			42	10/21/99	10/28	GRB-224
BOWBT0	N909137-02			0.43	<u>1.00</u>			81		101			39	10/21/99	10/26	GRB-217
BLK (QC ID=32094)	N909137-04			0.48	1.01			71		101				10/21/99	10/27	GRB-230
LCS (QC ID=32093)	N909137-03			0.47	1.01			73		101				10/21/99	10/25	GRB-220
Duplicate (N909137-01)	N909137-05			0.49	1.01			68		101			39	10/21/99	10/25	GRB-222
	(QC ID=32095)															

Nominal values and limits from method 15 1.01 20-105 50 180

PROCEDURES	REFERENCE	TC99TRLSC
EP-060	Soil Preparation, rev 0	
EP-020	Sample Leach For Technetium-99, rev 0	
EP-540	Technetium-99 Purification, rev 0	

AVERAGES ± 2 SD	MDA <u>0.43</u> ± <u>0.17</u>
FOR 5 SAMPLES	YIELD <u>75</u> ± <u>11</u>

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/15/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0537

Test GAM Matrix SOLID
SDG 7214
Contact Kevin C. Johnson

METHOD SUMMARY
GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SRB-207925
Case no SDG H0537

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6904-018					
BOWBR9	N909137-01		7214-001	U	U
BOWBT0	N909137-02		7214-002	U	U
BLK (QC ID=32094)	N909137-04		7214-004	U	U
LCS (QC ID=32093)	N909137-03		7214-003	ok	ok
Duplicate (N909137-01)	N909137-05		7214-005	- U	- U
Nominal values and limits from method					
200 Area Source chrcztzn-200-CW-1 OU			RDLs (pCi/g)	0.050	0.10

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	MAX MDA pCi/g	AIJQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	PWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR	
Preparation batch 6904-018 2σ prep error 15.0 % Reference Lab Notebook 6904 pg. 018																
BOWBR9	N909137-01		0.16	172					489			40	10/08/99	10/26	JR,01,00	
BOWBT0	N909137-02		0.13	163					454			40	10/08/99	10/27	JR,03,00	
BLK (QC ID=32094)	N909137-04		0.082	167					402				10/08/99	10/27	JR,03,00	
LCS (QC ID=32093)	N909137-03		0.029	167					454				10/08/99	10/27	JR,04,00	
Duplicate (N909137-01)	N909137-05		0.084	172					402			41	10/08/99	10/27	JR,04,00	
(QC ID=32095)																
Nominal values and limits from method																
			0.050	167					100	180						

PROCEDURES REFERENCE GAMMAHI
EP-060 Soil Preparation, rev 0
EP-100 Ge(Li) Preparation for Environmental Samples,
rev 0

AVERAGES ± 2 SD MDA 0.097 ± 0.10
FOR 5 SAMPLES YIELD _____ + _____

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TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0537

Test U T Matrix SOLID
 SDG 7214
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0537

METHOD SUMMARY
 URANIUM, TOTAL IN SOIL
 KINETIC PHOSPHORIMETRY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Uranium
Preparation batch 6904-018					
BOWBR9	N909137-01			7214-001	0.358 J
BOWBT0	N909137-02			7214-002	0.325 J
BLK (QC ID=32094)	N909137-04			7214-004	U
LCS (QC ID=32093)	N909137-03			7214-003	ok
Duplicate (N909137-01)	N909137-05			7214-005	ok J
Nominal values and limits from method		RDLs (ug/g)		1.0	
200 Area Source chrctztn-200-CW-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA ug/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR	
Preparation batch 6904-018		2σ prep error 9.0 %		Reference Lab Notebook 6904 pg. 018												
BOWBR9	N909137-01			0.005	0.0500								32	10/18/99	10/18 KPA-001	
BOWBT0	N909137-02			0.005	0.0500								31	10/18/99	10/18 KPA-001	
BLK (QC ID=32094)	N909137-04			0.005	0.0500									10/18/99	10/18 KPA-001	
LCS (QC ID=32093)	N909137-03			0.049	0.0500									10/18/99	10/18 KPA-001	
Duplicate (N909137-01)	N909137-05			0.005	0.0500								32	10/18/99	10/18 KPA-001	
(QC ID=32095)																
Nominal values and limits from method				1.0	0.0500									180		

PROCEDURES	REFERENCE	UKPA
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-044	Preparation of Total Uranium by Kinetic Phosphorimetry, rev 1
	EP-928	Total Uranium by Kinetic Phosphorimetry, rev 0

AVERAGES ± 2 SD MDA 0.014 ± 0.039
 FOR 5 SAMPLES YIELD _____ ± _____

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TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0537

Test H Matrix SOLID
 SDG 7214
 Contact Kevin C. Johnson

METHOD SUMMARY
 TRITIUM IN SOIL
 LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract TRB-SRR-207925
 Case no SDG H0537

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Tritium
Preparation batch 6904-018				
BOWBR9	N909137-01		7214-001	U
BOWBT0	N909137-02		7214-002	U
BLK (QC ID=32094)	N909137-04		7214-004	U
LCS (QC ID=32093)	N909137-03		7214-003	ok J
Duplicate (N909137-01)	N909137-05		7214-005	- U

Nominal values and limits from method RDLs (pCi/g) 400
 200 Area Source chrcztzn-200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HOLD	ANAL- YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 018														
BOWBR9	N909137-01		0.086	<u>20.0</u>			100		120		41	10/27/99	10/27	LSC-005
BOWBT0	N909137-02		0.084	20.6			100		120		40	10/27/99	10/27	LSC-005
BLK (QC ID=32094)	N909137-04		0.084	20.3			100		120			10/27/99	10/28	LSC-005
LCS (QC ID=32093)	N909137-03		0.084	20.3			100		120			10/27/99	10/27	LSC-005
Duplicate (N909137-01)	N909137-05		0.086	20.3			100		120		42	10/27/99	10/28	LSC-005
	(QC ID=32095)													

Nominal values and limits from method 400 20.3 25 180

PROCEDURES	REFERENCE	EPA906.0
	EP-060	Soil Preparation, rev 0
	EP-211	Tritium in Solid Samples by Azeotropic Distillation, rev 0

AVERAGES ± 2 SD	MDA	<u>0.085</u> ± <u>0.002</u>
FOR 5 SAMPLES	YIELD	<u>100</u> ± <u>0</u>

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0537

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
 SDG 7214
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SPB-207925
 Case no SDG H0537

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Nickel 63
Preparation batch 6904-018				
BOWBR9	N909137-01		7214-001	U
BOWBT0	N909137-02		7214-002	U
BLK (QC ID=32094)	N909137-04		7214-004	U
LCS (QC ID=32093)	N909137-03		7214-003	ok
Duplicate (N909137-01)	N909137-05		7214-005	- U

Nominal values and limits from method RDLs (pCi/g) 30
 200 Area Source chrctztn-200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EPF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 6904-018 2σ prep error 10.0 % Reference Lab Notebook 6904 pg. 018															
BOWBR9	N909137-01		2.1	0.500				88	100				56	11/10/99	11/11 LSC-005
BOWBT0	N909137-02		2.0	0.500				89	100				55	11/10/99	11/11 LSC-005
BLK (QC ID=32094)	N909137-04		2.0	0.500				92	100					11/10/99	11/11 LSC-005
LCS (QC ID=32093)	N909137-03		1.9	0.500				95	100					11/10/99	11/11 LSC-005
Duplicate (N909137-01)	N909137-05		2.0	0.500				93	100				56	11/10/99	11/11 LSC-005
	(QC ID=32095)														

Nominal values and limits from method 30 0.500 10 180

PROCEDURES REFERENCE NI63LSC
 EP-060 Soil Preparation, rev 0
 EP-431 Nickel-63 Purification, rev 0

AVERAGES ± 2 SD MDA 2.0 ± 0.14
 FOR 5 SAMPLES YIELD 91 ± 6

METHOD SUMMARIES

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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.

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SDG 7214
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
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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.

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REPORT GUIDE

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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.

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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).

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GUIDE, cont.

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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.

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GUIDE, cont.

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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.

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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.

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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.

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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.

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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

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SDG 7214
Contact Kevin C. Johnson

GUIDE, cont.

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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.

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Contact Kevjn C. Johnson

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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'

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GUIDE, cont.

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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.

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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

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0537

SDG 7214
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0537

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/15/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-124	Page 1 of 1
Collector Bowers/Trice		Company Contact Chris Cearlock		Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078		
Ice Chest No. CHI 009		Field Logbook No. EL-1511		Method of Shipment Fed Ex		
Shipped To TMA/RECRA B7D TMA		Offsite Property No. A990261		Bill of Lading/Air Bill No. 4235 7952 9594		
COA B20CW167/C						

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
Special Handling and/or Storage	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
BOWBT9	Soil										
BOWBV0	Soil										
BOWBR9	Soil	9-16-99	1320			X				BOWCR1	

CHAIN OF POSSESSION		Sign/Print Names			SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By Doug Bowers		Date/Time 9-16-99/1515			Received By BOEIB		Date/Time 9-16-99/1515		See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium. Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241) Strontium-89,90 -- Total Sr Total Uranium (Uranium) Isotopic Plutonium Isotopic Thorium (Thorium-232) Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196 COLLECTOR UNAVAILABLE TO SIGN	
Relinquished By Ref IB		Date/Time 9-20-99 1000			Received By Chice		Date/Time 9-20-99 1000			
Relinquished By C. Trice		Date/Time 9-20-99 1400			Received By FEDEX		Date/Time 9-20-99 1400			
Relinquished By FedEx		Date/Time 9-21-99 10:00			Received By TNU M. Goldenberg		Date/Time 9-21-99			
LABORATORY SECTION		Received By			Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method			Disposed By				Date/Time	

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-078-124		Page 1 of 1							
Collector Bowers/Trice		Company Contact Chris Cearlock		Telephone No. 372-9574		Project Coordinator Trent, SJ		Price Code 8N Data Turnaround 45 Days							
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078											
Ice Chest No. CH1 009		Field Logbook No. EL-1511		Method of Shipment Fed Ex											
Shipped To TMA/RECRA D2B9-17-99 TMA		Offsite Property No. A990261		Bill of Lading/Air Bill No. 4235 7952 9594 COA B20CW1 671C											
POSSIBLE SAMPLE HAZARDS/REMARKS				Preservation	Cool 4C	Cool 4C	None	Cool 4C							
				Type of Container	aG	aG	aG	aG							
Special Handling and/or Storage				No. of Container(s)	1	1	1	1							
				Volume	60mL	250mL	250mL	500mL							
SAMPLE ANALYSIS				VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.								
Sample No.	Matrix *	Sample Date	Sample Time												
BOWBT9	Soil														
BOWBVO	Soil														
BOWBTO	Soil	9-17-99	0935			X								Bowers/	
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *							
Relinquished By <i>Darryl Bowers</i> Date/Time <i>9-17-99/1145</i>				Received By <i>Darryl Bowers</i> Date/Time <i>9-17-99/1145</i>				See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on {Americium-241}; Strontium-89,90 - Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241 (2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7195 COLLECTOR UNAVAILABLE TO SIGN COC				Soil Water Vapor Other Solid Other Liquid			
Relinquished By <i>Ref IB</i> Date/Time <i>9-20-99 1000</i>				Received By <i>Chris</i> Date/Time <i>9-20-99 1000</i>											
Relinquished By <i>C. Trice</i> Date/Time <i>9-20-99 1400</i>				Received By <i>FEDEX</i> Date/Time <i>9-20-99 1400</i>											
Relinquished By <i>FedEx</i> Date/Time <i>9-21-99 10:00</i>				Received By <i>TNU M. Goldenberg</i> Date/Time <i>9-21-99 10:00</i>											
LABORATORY SECTION	Received By	Title						Date/Time							
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By						Date/Time							

Recra LabNet Philadelphia

**WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS**

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

Other: *As Nitrate Nitrite* Method: *EPA 353.2*

Other: *Ammonia* Method: *EPA 350.3*

Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate } *EPA 300.0*

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.
2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
 - a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
 - b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
 - c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
 - d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
 - e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
 - f. Code of Federal Regulations.

L-WI-034/D-6/99

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOWBR9	% Solids	95.2	%	0.01	1.0
		Chloride by IC	1.5	MG/KG	1.3	1.0
		Fluoride by IC	2.6	u MG/KG	2.6	1.0
		Nitrite by IC	1.3	u MG/KG	1.3	1.0
		Nitrate by IC	2.1	MG/KG	1.3	1.0
		Cyanide, Total	0.52	u MG/KG	0.52	1.0
		Phosphate by IC	1.3	u MG/KG	1.3	1.0
		Chromium VI	0.42	u MG/KG	0.42	1.0
		Sulfate by IC	34.2	MG/KG	1.3	1.0
		Nitrate Nitrite	0.35	MG/KG	0.21	1.0
		Ammonia, as N	1.3	u MG/KG	1.3	1.0
		pH	8.9	SOIL PH	0.01	1.0
		Sulfide	3.9	MG/KG	1.1	1.0
-002	BOWBTO	% Solids	81.7	%	0.01	1.0
		Chloride by IC	2.0	MG/KG	1.5	1.0
		Fluoride by IC	3.1	u MG/KG	3.1	1.0
		Nitrite by IC	1.5	u MG/KG	1.5	1.0
		Nitrate by IC	1.5	u MG/KG	1.5	1.0
		Cyanide, Total	0.61	u MG/KG	0.61	1.0
		Phosphate by IC	1.5	u MG/KG	1.5	1.0
		Chromium VI	0.49	u MG/KG	0.49	1.0
		Sulfate by IC	21.2	MG/KG	1.5	1.0
		Nitrate Nitrite	0.24	u MG/KG	0.24	1.0
		Ammonia, as N	1.5	u MG/KG	1.5	1.0
		pH	9.7	SOIL PH	0.01	1.0
		Sulfide	4.6	MG/KG	1.2	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/22/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
*****	*****	*****	*****	*****	*****	*****
BLANK10	99LIC083-MB1	Chloride by IC	1.2	u MG/KG	1.2	1.0
		Fluoride by IC	2.5	u MG/KG	2.5	1.0
		Nitrite by IC	1.2	u MG/KG	1.2	1.0
		Nitrate by IC	1.2	u MG/KG	1.2	1.0
		Phosphate by IC	1.2	u MG/KG	1.2	1.0
BLANK10	99LC110B-MB1	Cyanide, Total	0.50	u MG/KG	0.50	1.0
BLANK10	99LV1067-MB1	Chromium VI	0.40	u MG/KG	0.40	1.0
BLANK10	99LIC083-MB1	Sulfate by IC	1.2	u MG/KG	1.2	1.0
BLANK10	99LN3D47-MB1	Nitrate Nitrite	0.20	u MG/KG	0.20	1.0
BLANK10	99LANA55-MB1	Nitrate Nitrite	0.20	u MG/KG	0.20	1.0
BLANK10	99LAM038-MB1	Ammonia, as N	1.2	u MG/KG	1.2	1.0
BLANK10	99LSD050-MB1	Sulfide	1.0	u MG/KG	1.0	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B0WB99	Chloride by IC	27.5	1.5	26.3	98.9	1.0
		Chloride by IC MSD	28.1	1.5	26.3	101.1	1.0
		Fluoride by IC	58.6	0.18	52.5	111.3	1.0
		Fluoride by IC MSD	57.1	0.18	52.5	108.3	1.0
		Nitrite by IC	27	1.3 u	26	103.0	1.0
		Nitrite by IC MSD	27	1.3 u	26	102.0	1.0
		Nitrate by IC	28	2.1	26	98.3	1.0
		Nitrate by IC MSD	28	2.1	26	97.4	1.0
		Cyanide, Total	4.8	0.52u	5.3	91.3	1.0
		Phosphate by IC	26.6	1.3 u	26.3	101.3	1.0
		Phosphate by IC MSD	26.8	1.3 u	26.3	101.9	1.0
		Sulfate by IC	89.5	34.2	52.5	105.2	2.0
		Sulfate by IC MSD	90.2	34.2	52.5	106.6	2.0
		Nitrate Nitrite	5.1	0.35	4.8	98.8	1.0
		Ammonia, as N	52.7	1.3 u	52.0	101.2	1.0
-002	B0WBTO	Soluble Chromium VI	4.9	0.49u	4.9	102.7	1.0
		Insoluble Chromium VI	1350	0.49u	1180	115.2	100
		Sulfide	423	4.6	536	78.1	1.0
		Sulfide MSD	423	4.6	536	78.1	1.0
BLANK10	99LIC083-MB1	Chloride by IC	23.6	1.2 u	25.0	94.5	1.0
		Fluoride by IC	52.4	2.5 u	50.0	104.8	1.0
		Nitrite by IC	24	1.2 u	25	97.8	1.0
		Nitrate by IC	24	1.2 u	25	95.8	1.0
		Phosphate by IC	25.1	1.2 u	25.0	100.5	1.0
BLANK10	99LVI067-MB1	Soluble Chromium VI	4.0	0.40u	4.0	99.8	1.0
		Insoluble Chromium VI	1150	0.40u	1160	98.8	100
BLANK10	99LICA83-MB1	Sulfate by IC	23.5	1.2 u	25.0	93.9	1.0
BLANK10	99LN3D47-MB1	Nitrate Nitrite	5.0	0.20u	5.0	101.0	1.0
		Nitrate Nitrite MSD	5.1	0.20u	5.0	102.6	1.0
BLANK10	99LANA55-MB1	Nitrate Nitrite	4.9	0.20u	5.0	98.4	1.0
		Nitrate Nitrite MSD	5.0	0.20u	5.0	100.8	1.0
BLANK10	99LAM038-MB1	Ammonia, as N	48.6	1.2 u	50.0	97.2	1.0
		Ammonia, as N MSD	51.0	1.2 u	50.0	102.0	1.0
BLANK10	99LSD050-MB1	Sulfide	9.3	1.0 u	9.9	93.9	1.0
		Sulfide MSD	9.5	1.0 u	9.9	96.0	1.0

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 SPIKE#2		%DIFF
			%RECOV	%RECOV	
-001	BOWBR9	Chloride by IC	98.9	101.1	2.2
		Fluoride by IC	111.3	108.3	2.7
		Nitrite by IC	103.0	102.0	1.0
		Nitrate by IC	98.3	97.4	0.94
		Phosphate by IC	101.3	101.9	0.57
		Sulfate by IC	105.2	106.6	1.4
-002	BOWBTO	Sulfide	78.1	78.1	0.039
BLANK10	99LN3D47-MB1	Nitrate Nitrite	101.0	102.6	1.6
BLANK10	99LANA55-MB1	Nitrate Nitrite	98.4	100.8	2.4
BLANK10	99LAMO38-MB1	Ammonia, as N	97.2	102.0	4.8
BLANK10	99LSD050-MB1	Sulfide	93.9	96.0	2.1

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	BOWBR9	Chloride by IC	1.5	1.6	3.0	1.0
		Fluoride by IC	2.6 u	2.6 u	NC	1.0
		Nitrite by IC	1.3 u	1.3 u	NC	1.0
		Nitrate by IC	2.1	2.2	3.7	1.0
		Cyanide, Total	0.52u	0.52u	NC	1.0
		Phosphate by IC	1.3 u	1.3 u	NC	1.0
		Sulfate by IC	34.2	35.4	3.3	1.0
		Nitrate Nitrite	0.35	0.28	21.1	1.0
		Ammonia, as N	1.3 u	1.3 u	NC	1.0
		pH	8.9	8.9	0.1	1.0
-002REP	BOWETO	% Solids	81.7	82.0	0.31	1.0
		Chromium VI	0.49u	0.49u	NC	1.0
		Sulfide	4.6	1.2 u	NC	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
*****	*****	*****	*****	*****	*****	*****
LCS10	99LC110B-LC1	Cyanide, Total LCS	2.3	2.0	MG/KG	116.0
LCS20	99LC110B-LC2	Cyanide, Total LCS	10	10	MG/KG	100.1

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBR9						
% SOLIDS	001	S	99L&S125	09/16/99	09/22/99	09/23/99
CHLORIDE BY IC	001	S	99LIC083	09/16/99	10/04/99	10/04/99
CHLORIDE BY IC	001 REP	S	99LIC083	09/16/99	10/04/99	10/04/99
CHLORIDE BY IC	001 MS	S	99LIC083	09/16/99	10/04/99	10/04/99
CHLORIDE BY IC	001 MSD	S	99LIC083	09/16/99	10/04/99	10/04/99
FLUORIDE BY IC	001	S	99LIC083	09/16/99	10/04/99	10/04/99
FLUORIDE BY IC	001 REP	S	99LIC083	09/16/99	10/04/99	10/04/99
FLUORIDE BY IC	001 MS	S	99LIC083	09/16/99	10/04/99	10/04/99
FLUORIDE BY IC	001 MSD	S	99LIC083	09/16/99	10/04/99	10/04/99
NITRITE BY IC	001	S	99LIC083	09/16/99	10/04/99	10/04/99
NITRITE BY IC	001 REP	S	99LIC083	09/16/99	10/04/99	10/04/99
NITRITE BY IC	001 MS	S	99LIC083	09/16/99	10/04/99	10/04/99
NITRITE BY IC	001 MSD	S	99LIC083	09/16/99	10/04/99	10/04/99
NITRATE BY IC	001	S	99LIC083	09/16/99	10/04/99	10/04/99
NITRATE BY IC	001 REP	S	99LIC083	09/16/99	10/04/99	10/04/99
NITRATE BY IC	001 MS	S	99LIC083	09/16/99	10/04/99	10/04/99
NITRATE BY IC	001 MSD	S	99LIC083	09/16/99	10/04/99	10/04/99
TOTAL CYANIDE	001	S	99LC110B	09/16/99	09/30/99	10/04/99
TOTAL CYANIDE	001 REP	S	99LC110B	09/16/99	09/30/99	10/04/99
TOTAL CYANIDE	001 MS	S	99LC110B	09/16/99	09/30/99	10/04/99
PHOSPHATE BY IC	001	S	99LIC083	09/16/99	10/04/99	10/04/99
PHOSPHATE BY IC	001 REP	S	99LIC083	09/16/99	10/04/99	10/04/99
PHOSPHATE BY IC	001 MS	S	99LIC083	09/16/99	10/04/99	10/04/99
PHOSPHATE BY IC	001 MSD	S	99LIC083	09/16/99	10/04/99	10/04/99
CHROMIUM VI	001	S	99LVI067	09/16/99	09/29/99	09/29/99
SULFATE BY IC	001	S	99LICA83	09/16/99	10/04/99	10/04/99
SULFATE BY IC	001 REP	S	99LICA83	09/16/99	10/04/99	10/04/99
SULFATE BY IC	001 MS	S	99LICA83	09/16/99	10/04/99	10/04/99
SULFATE BY IC	001 MSD	S	99LICA83	09/16/99	10/04/99	10/04/99
NITRATE NITRITE	001	S	99LN3D47	09/16/99	09/30/99	10/01/99
NITRATE NITRITE	001 REP	S	99LANA55	09/16/99	11/17/99	11/18/99
NITRATE NITRITE	001 MS	S	99LANA55	09/16/99	11/17/99	11/18/99
AMMONIA	001	S	99LAM038	09/16/99	10/12/99	10/12/99
AMMONIA	001 REP	S	99LAM038	09/16/99	10/12/99	10/12/99
AMMONIA	001 MS	S	99LAM038	09/16/99	10/12/99	10/12/99

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
PH	001	S	99LPH105	09/16/99	10/01/99	10/01/99
PH	001 REP	S	99LPH105	09/16/99	10/01/99	10/01/99
SULFIDE	001	S	99LSD050	09/16/99	09/28/99	09/28/99
BOWBTO						
% SOLIDS	002	S	99L%S125	09/17/99	09/22/99	09/23/99
% SOLIDS	002 REP	S	99L%S125	09/17/99	09/22/99	09/23/99
CHLORIDE BY IC	002	S	99LIC083	09/17/99	10/04/99	10/04/99
FLUORIDE BY IC	002	S	99LIC083	09/17/99	10/04/99	10/04/99
NITRITE BY IC	002	S	99LIC083	09/17/99	10/04/99	10/04/99
NITRATE BY IC	002	S	99LIC083	09/17/99	10/04/99	10/04/99
TOTAL CYANIDE	002	S	99LC110B	09/17/99	09/30/99	10/04/99
PHOSPHATE BY IC	002	S	99LIC083	09/17/99	10/04/99	10/04/99
CHROMIUM VI	002	S	99LVI067	09/17/99	09/29/99	09/29/99
CHROMIUM VI	002 REP	S	99LVI067	09/17/99	09/29/99	09/29/99
CHROMIUM VI	002 MS	S	99LVI067	09/17/99	09/29/99	09/29/99
CHROMIUM VI	002 MSD	S	99LVI067	09/17/99	09/29/99	09/29/99
SULFATE BY IC	002	S	99LICA83	09/17/99	10/04/99	10/04/99
NITRATE NITRITE	002	S	99LN3D47	09/17/99	09/30/99	10/01/99
AMMONIA	002	S	99LAM038	09/17/99	10/12/99	10/12/99
PH	002	S	99LPH107	09/17/99	10/06/99	10/06/99
SULFIDE	002	S	99LSD050	09/17/99	09/28/99	09/28/99
SULFIDE	002 REP	S	99LSD050	09/17/99	09/28/99	09/28/99
SULFIDE	002 MS	S	99LSD050	09/17/99	09/28/99	09/28/99
SULFIDE	002 MSD	S	99LSD050	09/17/99	09/28/99	09/28/99

LAB QC:

CHLORIDE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
CHLORIDE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
FLUORIDE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
FLUORIDE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
NITRITE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
NITRITE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
NITRATE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
NITRATE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
TOTAL CYANIDE	LC1 L	S	99LC110B	N/A	09/30/99	10/04/99

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
TOTAL CYANIDE	LC2 L	S	99LC110B	N/A	09/30/99	10/04/99
TOTAL CYANIDE	MB1	S	99LC110B	N/A	09/30/99	10/04/99
PHOSPHATE BY IC	MB1	S	99LIC083	N/A	10/04/99	10/04/99
PHOSPHATE BY IC	MB1 BS	S	99LIC083	N/A	10/04/99	10/04/99
CHROMIUM VI	MB1	S	99LVI067	N/A	09/29/99	09/29/99
CHROMIUM VI	MB1 BS	S	99LVI067	N/A	09/29/99	09/29/99
CHROMIUM VI	MB1 BSD	S	99LVI067	N/A	09/29/99	09/29/99
SULFATE BY IC	MB1	S	99LICA83	N/A	10/04/99	10/04/99
SULFATE BY IC	MB1 BS	S	99LICA83	N/A	10/04/99	10/04/99
NITRATE NITRITE	MB1	S	99LN3D47	N/A	09/30/99	10/01/99
NITRATE NITRITE	MB1 BS	S	99LN3D47	N/A	09/30/99	10/01/99
NITRATE NITRITE	MB1 BSD	S	99LN3D47	N/A	09/30/99	10/01/99
NITRATE NITRITE	MB1	S	99LANA55	N/A	11/17/99	11/18/99
NITRATE NITRITE	MB1 BS	S	99LANA55	N/A	11/17/99	11/18/99
NITRATE NITRITE	MB1 BSD	S	99LANA55	N/A	11/17/99	11/18/99
AMMONIA	MB1	S	99LAM038	N/A	10/12/99	10/12/99
AMMONIA	MB1 BS	S	99LAM038	N/A	10/12/99	10/12/99
AMMONIA	MB1 BSD	S	99LAM038	N/A	10/12/99	10/12/99
SULFIDE	MB1	S	99LSD050	N/A	09/28/99	09/28/99
SULFIDE	MB1 BS	S	99LSD050	N/A	09/28/99	09/28/99
SULFIDE	MB1 BSD	S	99LSD050	N/A	09/28/99	09/28/99



9909L152

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

⑧ perone metals wet lab

Client <u>TNU Hamford</u> <u>B99-078</u>	Refrigerator # <u>16</u>
Est. Final Proj. Sampling Date _____	#/Type Container Liquid _____ Solid <u>1ag</u> <u>1ag</u> <u>1</u> <u>1ag</u>
Project # <u>10485-001-001-9999-00</u>	Volume Liquid _____ Solid <u>60</u> <u>250</u> <u>500</u>
Project Contact/Phone # _____	Preservatives _____
RECRA Project Manager <u>OJ</u>	ANALYSES REQUESTED →
QC <u>spec</u> Del <u>Std</u> TAT <u>30 day</u>	ORGANIC VOA <u>✓</u> BNA _____ PEST <u>✓</u> PCB _____ Herb <u>✓</u>
Date Rec'd <u>9.21.99</u> Date Due <u>10/21/99</u>	INORG Metal _____ CN _____
Account # _____	

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 (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only																	
			MS	MSD				0024H	05CSC	0025H	OPRO	OPCB	AS	9/21/99	ICRG	MetO	ICATO	IN3U2	ISFD	IN33N	IPH	ICEL	ICFL	ICAD3	ICP24
			001	B0WBR9				S	9/16/99	1320	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓
002	B0WBT0	L	9/17/99	0935	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

Special Instructions: <u>Ref # B99-078</u> COMPOSITE WASTE	DATE/REVISIONS:	RECRA LabNet Use Only
	1. <u>Run matrix QC</u> <u>met ② = As, Ba, Cd, Cr, Pb, Se, Ag.</u> 3. <u>Be, Cu, Ni, V, Zn, Hg</u> <u>9/23/99</u> 4. <u>tests added per client COC</u> 5. _____ 6. _____	Samples were: 1) Shipped <input checked="" type="checkbox"/> or Hand Delivered _____ Airbill # <u>*</u> 2) Ambient or <u>Chilled</u> 3) Received in Good Condition <input checked="" type="checkbox"/> or N 4) Labels Indicate Properly Preserved <input checked="" type="checkbox"/> or N 5) Received Within Holding Times <input checked="" type="checkbox"/> or N COC Tape was: 1) Present on Outer Package <input checked="" type="checkbox"/> or N 2) Unbroken on Outer Package <input checked="" type="checkbox"/> or N 3) Present on Sample <input checked="" type="checkbox"/> or N 4) Unbroken on Sample <input checked="" type="checkbox"/> or N COC Record Present Upon Sample Rec't <input checked="" type="checkbox"/> or N Cooler Temp. <u>2.5</u> °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
<u>GeoEx</u>	<u>D. J. ...</u>	<u>9/21/99</u>	<u>0945</u>		ORIGINAL		
					REWRITTEN		

Discrepancies Between Samples Labels and COC Record?
 NOTES: * 423579529609

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-124	Page 1 of 1
Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days	
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond (B8758) >15'	SAF No. B99-078				
Ice Chest No. ERC 99-018	Field Logbook No. EL-1511	Method of Shipment Fed Ex				
Shipped To TMA/RECRA B70 AECRA	Offsite Property No. A990260	Bill of Lading/Air Bill No. 4235 7952 9609				
						COA B20CW1671C

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
Special Handling and/or Storage	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions						
Sample No.	Matrix *	Sample Date	Sample Time								
BOWBT9	Soil										
BOWBV0	Soil										
BOWBR9	Soil	9-16-99	1320	X	X			X			BowCR1

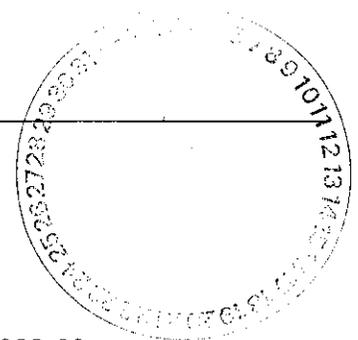
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time	See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . . . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7195 COLLECTOR UNAVAILABLE TO SIGN COA				Soil Water Vapor Other Solid Other Liquid <i>Temp. 2.5"</i> 4235 7952 9609	
<i>Danny Bowers</i>	3-16-99/1515	<i>R.F. 10</i>	9-16-99/1515	<i>Trice</i>	9-20-99 1000						
<i>Ref 1B</i>	9-20-99 1000	<i>Trice</i>	9-20-99 1000	<i>Trice</i>	9-20-99 1400						
<i>Trice</i>	9-20-99 1400	<i>FEDEX</i>	9-20-99 1400	<i>Trice</i>	9-21-99/0945						
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time						
<i>Trice</i>	9-21-99/0945	<i>D. Trice</i>	9-21-99/0945	<i>D. Trice</i>	9-21-99/0945						
LABORATORY SECTION	Received By	Title								Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By								Date/Time	

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-078-124	Page 1 of 1
Collector Bowers/Trice		Company Contact Chris Cearlock		Telephone No. 372-9574		Project Coordinator TRENT, SJ	
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078		Price Code 8N Data Turnaround 45 Days	
Ice Chest No. ERC 99-018		Field Logbook No. EL-1511		Method of Shipment Fed Ex			
Shipped To TMA/RECA RECAA		Offsite Property No. A990260		Bill of Lading/Air Bill No. 4235 7952 9609			
				COA B20CW1 671C			

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
	Special Handling and/or Storage	Volume	60mL	250mL	250mL	500mL					
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) [1- Propanol, Ethanol]	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
BOWBT9	Soil										
BOWBVO	Soil										
2. BOWBTO	Soil	9-17-99	0935	X	X		X				BowCR/

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>Daisy Bowers</i> Date/Time <i>9-17-99/1445</i>		Received By <i>Ref 1B</i> Date/Time <i>9-17-99/1445</i>				See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . . . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196 COLLECTOR UNAVAILABLE TO SIGN COC				Soil Water Vapor Other Solid Other Liquid	
Relinquished By <i>Ref 1B</i> Date/Time <i>9-20-99 1000</i>		Received By <i>Chris</i> Date/Time <i>9-20-99 1000</i>									
Relinquished By <i>Chris</i> Date/Time <i>9-20-99 1400</i>		Received By <i>FEDEX</i> Date/Time <i>9-20-99 1900</i>									
Relinquished By <i>Fed Ex</i> Date/Time <i>9-21-99/0945</i>		Received By <i>D. Smith</i> Date/Time <i>9-21-99/0945</i>									
LABORATORY SECTION	Received By	Title				Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time					

015



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-078
RFW# : 9909L152
SDG/SAF# : H0537/B99-078

W.O.# : 10985-001-001-9999-00
Date Received: 09-21-99

REVISION

METALS CASE NARRATIVE

This package has been revised to include the addition of Antimony and Thallium.

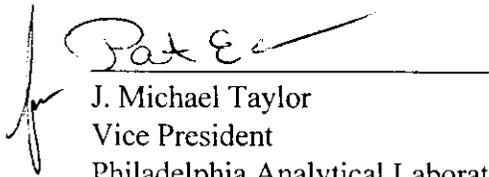
1. This narrative covers the analyses of 2 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) 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. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy 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 015 pages.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at the following concentration:

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
B0WBR9	Antimony	100	99.8

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory
mld/m09-152r

11-11-99
Date



METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9909L152

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> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Antimony	<u> </u> 6010B <u> </u> 7041 ⁵	<u> </u> 200.7	<u> </u> 204.2		<u> </u> 99
Arsenic	<u> </u> 6010B <u> </u> 7060A ⁵	<u> </u> 200.7	<u> </u> 206.2	<u> </u> 3113B	<u> </u> 99
Barium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Beryllium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Bismuth	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Boron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Cadmium	<u> </u> 6010B <u> </u> 7131A ⁵	<u> </u> 200.7	<u> </u> 213.2		<u> </u> 99
Calcium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Chromium	<u> </u> 6010B <u> </u> 7191 ⁵	<u> </u> 200.7	<u> </u> 218.2		<u> </u> SS17
Cobalt	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Copper	<u> </u> 6010B <u> </u> 7211 ⁵	<u> </u> 200.7	<u> </u> 220.2		<u> </u> 99
Iron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Lead	<u> </u> 6010B <u> </u> 7421 ⁵	<u> </u> 200.7	<u> </u> 239.2	<u> </u> 3113B	<u> </u> 99
Lithium	<u> </u> 6010B <u> </u> 7430 ⁴	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Magnesium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Manganese	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Mercury	<u> </u> 7470A ³ <u> </u> 7471A ³	<u> </u> 245.1 ²	<u> </u> 245.5 ²		<u> </u> 99
Molybdenum	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Nickel	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Potassium	<u> </u> 6010B <u> </u> 7610 ⁴	<u> </u> 200.7	<u> </u> 258.1 ⁴		<u> </u> 99
Rare Earths	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Selenium	<u> </u> 6010B <u> </u> 7740 ⁵	<u> </u> 200.7	<u> </u> 270.2	<u> </u> 3113B	<u> </u> 99
Silicon	<u> </u> 6010B ¹	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silica	<u> </u> 6010B	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silver	<u> </u> 6010B <u> </u> 7761 ⁵	<u> </u> 200.7	<u> </u> 272.2		<u> </u> 99
Sodium	<u> </u> 6010B <u> </u> 7770 ⁴	<u> </u> 200.7	<u> </u> 273.1 ⁴		<u> </u> 99
Strontium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Thallium	<u> </u> 6010B <u> </u> 7841 ⁵	<u> </u> 200.7	<u> </u> 279.2	<u> </u> 200.9	<u> </u> 99
Tin	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Titanium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Uranium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Vanadium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Zinc	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Zirconium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 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

Recre LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/09/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	B0WBR9	Silver, Total	0.1	u MG/KG	0.1	1.0
		Arsenic, Total	2.8	MG/KG	0.32	1.0
		Barium, Total	73.1	MG/KG	0.03	1.0
		Beryllium, Total	0.18	MG/KG	0.01	1.0
		Cadmium, Total	0.34	MG/KG	0.03	1.0
		Chromium, Total	7.6	MG/KG	0.08	1.0
		Copper, Total	10.4	MG/KG	0.11	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Nickel, Total	6.7	MG/KG	0.11	1.0
		Lead, Total	5.8	MG/KG	0.20	1.0
		Antimony, Total	0.24	u MG/KG	0.24	1.0
		Selenium, Total	0.35	u MG/KG	0.35	1.0
		Thallium, Total	0.51	u MG/KG	0.51	1.0
		Vanadium, Total	32.1	MG/KG	0.06	1.0
		Zinc, Total	37.7	MG/KG	0.08	1.0
-002	B0WBTO	Silver, Total	0.10	u MG/KG	0.10	1.0
		Arsenic, Total	2.2	MG/KG	0.34	1.0
		Barium, Total	72.2	MG/KG	0.03	1.0
		Beryllium, Total	0.13	MG/KG	0.01	1.0
		Cadmium, Total	0.12	MG/KG	0.03	1.0
		Chromium, Total	7.5	MG/KG	0.08	1.0
		Copper, Total	10.2	MG/KG	0.12	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Nickel, Total	9.9	MG/KG	0.12	1.0
		Lead, Total	3.6	MG/KG	0.21	1.0
		Antimony, Total	0.26	u MG/KG	0.26	1.0
		Selenium, Total	0.38	u MG/KG	0.38	1.0
		Thallium, Total	0.54	u MG/KG	0.54	1.0
		Vanadium, Total	35.9	MG/KG	0.06	1.0
		Zinc, Total	30.1	MG/KG	0.08	1.0

005

Recre LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/09/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
BLANK1	99L0674-MB1	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Barium, Total	0.05	MG/KG	0.03	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.10	MG/KG	0.08	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Nickel, Total	0.12 u	MG/KG	0.12	1.0
		Lead, Total	0.21 u	MG/KG	0.21	1.0
		Antimony, Total	0.25 u	MG/KG	0.25	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Thallium, Total	0.53 u	MG/KG	0.53	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.08 u	MG/KG	0.08	1.0
BLANK1	99C0290-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

006

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/09/99

CLIENT: TNU-MANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	BOWBR9	Silver, Total	4.8	0.1 u	5.1	94.1	1.0
		Arsenic, Total	192	2.8	202	93.7	1.0
		Barium, Total	286	73.1	202	105.6	1.0
		Beryllium, Total	4.9	0.18	5.1	92.6	1.0
		Cadmium, Total	4.7	0.34	5.1	85.6	1.0
		Chromium, Total	27.7	7.6	20.2	99.5	1.0
		Copper, Total	34.5	10.4	25.2	95.6	1.0
		Mercury, Total	0.18	0.02u	0.17	104.1	1.0
		Nickel, Total	53.3	6.7	50.5	92.3	1.0
		Lead, Total	50.8	5.8	50.5	89.1	1.0
		Antimony, Total	26.9	0.24u	50.5	53.3	1.0
		Selenium, Total	186	0.35u	202	92.0	1.0
		Thallium, Total	193	0.51u	202	95.4	1.0
		Vanadium, Total	85.0	32.1	50.5	104.8	1.0
		Zinc, Total	84.0	37.7	50.5	91.7	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/09/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	BOWBR9	Silver, Total	0.1 u	0.10u	NC	1.0
		Arsenic, Total	2.8	2.6	7.4	1.0
		Barium, Total	73.1	82.8	12.4	1.0
		Beryllium, Total	0.18	0.17	5.8	1.0
		Cadmium, Total	0.34	0.06	138.3	1.0
		Chromium, Total	7.6	7.1	6.8	1.0
		Copper, Total	10.4	9.6	8.0	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Nickel, Total	6.7	6.8	1.5	1.0
		Lead, Total	5.8	3.8	41.7	1.0
		Antimony, Total	0.24u	0.26u	NC	1.0
		Selenium, Total	0.35u	0.38u	NC	1.0
		Thallium, Total	0.51u	0.55u	NC	1.0
		Vanadium, Total	32.1	31.2	2.8	1.0
		Zinc, Total	37.7	34.7	8.3	1.0

008

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/09/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L152

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

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	99L0674-LC1	Silver, LCS	48.8	50.0	MG/KG	97.6
		Arsenic, LCS	952	1000	MG/KG	95.2
		Barium, LCS	500	500	MG/KG	100.0
		Beryllium, LCS	24.3	25.0	MG/KG	97.2
		Cadmium, LCS	24.2	25.0	MG/KG	96.8
		Chromium, LCS	50.8	50.0	MG/KG	101.6
		Copper, LCS	126	125	MG/KG	100.7
		Nickel, LCS	195	200	MG/KG	97.4
		Lead, LCS	242	250	MG/KG	96.8
		Antimony, LCS	292	300	MG/KG	97.2
		Selenium, LCS	921	1000	MG/KG	92.1
		Thallium, LCS	974	1000	MG/KG	97.4
		Vanadium, LCS	259	250	MG/KG	103.4
		Zinc, LCS	95.2	100	MG/KG	95.2
LCS1	99C0290-LC1	Mercury, LCS	1.0	1.0	MG/KG	102.5

009

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBR9						
SILVER, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
SILVER, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
SILVER, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
ARSENIC, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
ARSENIC, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
ARSENIC, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
BARIUM, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
BARIUM, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
BARIUM, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
BERYLLIUM, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
BERYLLIUM, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
BERYLLIUM, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
CADMIUM, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
CADMIUM, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
CADMIUM, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
CHROMIUM, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
CHROMIUM, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
CHROMIUM, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
COPPER, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
COPPER, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
COPPER, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
MERCURY, TOTAL	001	S	99C0290	09/16/99	10/06/99	10/07/99
MERCURY, TOTAL	001 REP	S	99C0290	09/16/99	10/06/99	10/07/99
MERCURY, TOTAL	001 MS	S	99C0290	09/16/99	10/06/99	10/07/99
NICKEL, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
NICKEL, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
NICKEL, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
LEAD, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
LEAD, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
LEAD, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
ANTIMONY, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
ANTIMONY, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
ANTIMONY, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
SELENIUM, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
SELENIUM, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
THALLIUM, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
THALLIUM, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
THALLIUM, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
VANADIUM, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
VANADIUM, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
VANADIUM, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99
ZINC, TOTAL	001	S	99L0674	09/16/99	10/04/99	10/15/99
ZINC, TOTAL	001 REP	S	99L0674	09/16/99	10/04/99	10/15/99
ZINC, TOTAL	001 MS	S	99L0674	09/16/99	10/04/99	10/15/99

BOWBTO

SILVER, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
ARSENIC, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
BARIUM, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
BERYLLIUM, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
CADMIUM, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
CHROMIUM, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
COPPER, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
MERCURY, TOTAL	002	S	99C0290	09/17/99	10/06/99	10/07/99
NICKEL, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
LEAD, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
ANTIMONY, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
SELENIUM, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
THALLIUM, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
VANADIUM, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99
ZINC, TOTAL	002	S	99L0674	09/17/99	10/04/99	10/15/99

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
SILVER, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
ARSENIC LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
ARSENIC, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
BARIUM LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
BARIUM, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
BERYLLIUM LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BERYLLIUM, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
CADMIUM LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
CADMIUM, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
CHROMIUM LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
CHROMIUM, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
COPPER LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
COPPER, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
MERCURY LABORATORY	LC1 BS	S	99C0290	N/A	10/06/99	10/07/99
MERCURY, TOTAL	MB1	S	99C0290	N/A	10/06/99	10/07/99
NICKEL LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
NICKEL, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
LEAD LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
LEAD, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
ANTIMONY LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
ANTIMONY, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
SELENIUM LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
SELENIUM, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
THALLIUM LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
THALLIUM, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
VANADIUM LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
VANADIUM, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99
ZINC LABORATORY	LC1 BS	S	99L0674	N/A	10/04/99	10/15/99
ZINC, TOTAL	MB1	S	99L0674	N/A	10/04/99	10/15/99



9909L152

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

8) ~~performed~~ metals wet lab

Client <u>TNU Hanford</u> <u>B99-078</u>	Refrigerator # <u>16</u>
Est. Final Proj. Sampling Date _____	#/Type Container Liquid _____ Solid <u>1ag</u> <u>1ag</u> <u>1</u> <u>1ag</u>
Project # <u>10485-001-001-9999-00</u>	Volume Liquid _____ Solid <u>60</u> <u>250</u> <u>500</u>
Project Contact/Phone # _____	Preservatives _____
RECRA Project Manager <u>OJ</u>	ANALYSES REQUESTED
QC <u>Spec</u> Del <u>Std</u> TAT <u>30 days</u>	ORGANIC: VOA <u>TL</u> , BNA, Pest, PCB, Herb <u>TPH</u>
Date Rec'd <u>9.21.99</u> Date Due <u>10/21/99</u>	INORG: Metal, CN
Account # _____	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 (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only														
			MS	MSD				0024H	05CSC	0025H	OPRO	OPCB	AS	12/21/99	CR6	met②	ICWTO	IN302	ISFD	IN43N	1PH	ICCL
	001	BOWBR9			S	9/16/99	1320	X	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓
	002	BOWBT0			L	9/17/99	0935	X	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓

11/3/99
SB and TL added to all metals samples per client

Special Instructions: sa# B99-078

COMPOSITE WASTE

DATE/REVISIONS:

- Run matrix QC
- met② = As, Pb, Cd, Cr, Pb, Se, Ag
- Be, Cu, Ni, V, Zn, Hg
- 9/23/99 tests added per client COC
- _____
- _____

RECRA LabNet Use Only

Samples were:
1) Shipped or Hand Delivered _____
Airbill # *

2) Ambient or Chilled
3) Received in Good Condition or N
4) Labels Indicate Properly Preserved or N
5) Received Within Holding Times or N

COC Tape was:
1) Present on Outer Package or N
2) Unbroken on Outer Package or N
3) Present on Sample or N
4) Unbroken on Sample or N
COC Record Present Upon Sample Rec't or N
Cooler Temp. 2.5 °C

Relinquished by	Received by	Date	Time
<u>Yco/Ex</u>	<u>D. J. ...</u>	<u>9/21/99</u>	<u>0945</u>

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:
* 423579529609

013

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-124	Page 1 of 1
Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days	
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond (B8758) >15'	Field Logbook No. EL-1511	Method of Shipment Fed Ex	SAF No. B99-078		
Ice Chest No. ERC 99-018	Offsite Property No. A990260	Bill of Lading/Air Bill No. 4235 7952 9609	COA B20CW167/C			
Shipped To TMA/RECRA B7D RECRA						

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
Special Handling and/or Storage	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions							
Sample No.	Matrix *	Sample Date	Sample Time								
BOWBT9 500	Soil										
BOWBV0 9-16-99	Soil										
BowBR9	Soil	9-16-99	1370	X	X						BowCR1

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *
Relinquished By Doug Bowers	Date/Time 9-16-99/1515	Received By R.C.F. 10	Date/Time 9-16-99/1515	See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . . . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.				Soil
Relinquished By Ref 13	Date/Time 9-20-99 1000	Received By C. Trice	Date/Time 9-20-99 1000	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241				Water
Relinquished By C. Trice	Date/Time 9-20-99 1400	Received By FEDEX	Date/Time 9-20-99 1400	(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196				Vapor
Relinquished By Fed Ex	Date/Time 9-21-99/0945	Received By D. J. Trice	Date/Time 9-21-99/0945	COLLECTOR UNAVAILABLE TO SIGN COC				Other Solid
LABORATORY SECTION	Received By	Title		Date/Time				Other Liquid
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By		Date/Time				4235 7952 9609

014

demp 2.5

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-124	Page 1 of 1
Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days	
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond (B8758) >15'	SAF No. B99-078				
Ice Chest No. ERC 99-018	Field Logbook No. EL-1511	Method of Shipment Fed Ex				
Shipped To FMA/DEGRA RECAA D2B9-17-99	Offsite Property No. A990260	Bill of Lading/Air Bill No. 4235 7952 9609 COA B20CW1 671C				

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
Special Handling and/or Storage	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						

SAMPLE ANALYSIS	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.						
-----------------	---	--	---------------------------------------	---------------------------------------	--	--	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time								
BOWBT9	Soil										
BOWBVO	Soil										
2. BOWBTO	Soil	9-17-99	0935	X	X			X			BowCR1

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>Doug Bowers</i> Date/Time <i>9-17-99/1445</i>		Received By <i>Ref 1B</i> Date/Time <i>9-17-99/1445</i>		See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . . . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196 COLLECTOR UNAVAILABLE TO SIGN WOC				Soil Water Vapor Other Solid Other Liquid	
Relinquished By <i>Ref 1B</i> Date/Time <i>9-20-99 1000</i>		Received By <i>Chris</i> Date/Time <i>9-20-99 1000</i>							
Relinquished By <i>Chris</i> Date/Time <i>9-20-99 1400</i>		Received By <i>FEDEX</i> Date/Time <i>9-20-99 1400</i>							
Relinquished By <i>Fed Ex</i> Date/Time <i>9-21-99/0945</i>		Received By <i>[Signature]</i> Date/Time <i>9-21-99/0945</i>							
LABORATORY SECTION	Received By	Title		Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time			

015



**Recra LabNet Philadelphia
Analytical Report**

Client: TNU-HANFORD B99-078
RFW#: 9909L152
SDG/SAF#: H0537/B99-078

W.O.#: 10985-001-001-9999-00
Date Received: 09-21-99

PCB

The set of samples consisted of two (2) soil samples collected on 09-16,17-99.

The samples and their associated QC samples were extracted on 09-28-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 10-02,03-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

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 has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received a sulfuric acid and sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.


J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-20-99
Date

pefr:\group\data\pest\09L-152.pcb

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 8 pages.

001

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

PCBs by GC

Report Date: 10/16/99 14:04

RFW Batch Number: 9909L152

Client: TNU-HANFORD B99-078

Work Order: 10985001001 Page: 1

Sample Information	Cust ID:	BOWBR9	BOWBR9	BOWBR9	BOWBTO	PBLKVJ	PBLKVJ BS
	RFW#:	001	001 MS	001 MSD	002	99LE1173-MB1	99LE1173-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	110 %	105 %	100 %	95 %	110 %	108 %
	Decachlorobiphenyl	108 %	100 %	95 %	99 %	103 %	104 %
		-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----
Aroclor-1016		35 U	35 U	35 U	41 U	33 U	33 U
Aroclor-1221		70 U	70 U	70 U	81 U	67 U	67 U
Aroclor-1232		35 U	35 U	35 U	41 U	33 U	33 U
Aroclor-1242		35 U	35 U	35 U	41 U	33 U	33 U
Aroclor-1248		35 U	35 U	35 U	41 U	33 U	33 U
Aroclor-1254		35 U	82 %	78 %	41 U	33 U	87 %
Aroclor-1260		35 U	35 U	35 U	41 U	33 U	33 U

004

M
10-18-99

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

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBR9	001	S	99LE1173	09/16/99	09/28/99	10/02/99
BOWBR9	001 MS	S	99LE1173	09/16/99	09/28/99	10/02/99
BOWBR9	001 MSD	S	99LE1173	09/16/99	09/28/99	10/03/99
BOWBTO	002	S	99LE1173	09/17/99	09/28/99	10/03/99

LAB QC:

PBLKVJ	MB1	S	99LE1173	N/A	09/28/99	10/02/99
PBLKVJ	MB1 BS	S	99LE1173	N/A	09/28/99	10/02/99

9/20-18 m



9909L152

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

⑧ perrone wet lab metals

Client <u>TNU Hanford</u> <u>B99-078</u>	Refrigerator # <u>16</u>																								
Est. Final Proj. Sampling Date _____	#/Type Container Liquid _____																								
Project # <u>10485-001-001-9999-00</u>	Solid <u>1ag</u> <u>1ag</u> <u>1ag</u>																								
Project Contact/Phone # _____	Volume Liquid _____																								
RECRA Project Manager <u>OJ</u>	Solid <u>60</u> <u>250</u> <u>500</u>																								
QC <u>spec</u> Del <u>Std</u> TAT <u>30 day</u>	Preservatives _____																								
Date Rec'd <u>9.21.99</u> Date Due <u>10/21/99</u>	ANALYSES REQUESTED																								
Account # _____	<table border="1"> <tr> <th colspan="6">ORGANIC</th> <th colspan="2">INORG</th> </tr> <tr> <td>VOA</td> <td>BNA</td> <td>Pest</td> <td>PCB</td> <td>Herb</td> <td>Metals</td> <td>CN</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td></td> </tr> </table>	ORGANIC						INORG		VOA	BNA	Pest	PCB	Herb	Metals	CN		<input checked="" type="checkbox"/>							
ORGANIC						INORG																			
VOA	BNA	Pest	PCB	Herb	Metals	CN																			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																			

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 OC Chosen (S)	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only																		
							MS	MSD	0024H	05CSC	0025H	OPRO	OPCB	to 9/21/99	ICRG	9Met	ICNTO	IN302	ISFD	INH34	IPH	ICEL	IC22a	ICW3	ICW2
	001	BOWBR9	S		9/16/99	1320	X	X	X		X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓			
	002	BOWBT0	L		9/17/99	0935	X	X	X		X	X		✓	✓	✓	✓	✓	✓	✓	✓	✓			

Special Instructions: <u>Ref # B99-078</u>	DATE/REVISIONS: 1. <u>Run matrix QC</u> <u>met ⑧ = As, Ba, Cd, Cr, Pb, Se, Ag.</u> 2. <u>Be, Cu, Ni, V, Zn, Hg</u> 3. <u>9/23/99</u> 4. <u>tests added per client COC</u> 5. _____ 6. _____	RECRA LabNet Use Only Samples were: 1) Shipped <input checked="" type="checkbox"/> or Hand Delivered _____ 2) Ambient or <u>Chilled</u> 3) Received in Good Condition <input checked="" type="checkbox"/> or N 4) Labels Indicate Properly Preserved <input checked="" type="checkbox"/> or N 5) Received Within Holding Times <input checked="" type="checkbox"/> or N COC Tape was: 1) Present on Outer Package <input checked="" type="checkbox"/> or N 2) Unbroken on Outer Package <input checked="" type="checkbox"/> or N 3) Present on Sample <input checked="" type="checkbox"/> or N 4) Unbroken on Sample <input checked="" type="checkbox"/> or N COC Record Present Upon Sample Rec't <input checked="" type="checkbox"/> or N Cooler Temp. <u>2.5</u> °C
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Relinquished by <u>GeoEx</u>	Received by <u>D. J. ...</u>	Date <u>9/21/99</u>	Time <u>0945</u>	Relinquished by	Received by ORIGINAL	Date	Time	Discrepancies Between Samples Labels and COC Record? Y <input checked="" type="checkbox"/> or N	NOTES: <u>* 423579529609</u>
					REWRITTEN				

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-124	Page 1 of 1
Collector Bowers/Trice		Company Contact Chris Cearlock		Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078		
Ice Chest No. ERC 99-018		Field Logbook No. EL-1511		Method of Shipment Fed Ex		
Shipped To TMA/RECRA-870 AECRA		Offsite Property No. A990260		Bill of Lading/Air Bill No. 4235 7952 9609		
				COA B20CW167/C		

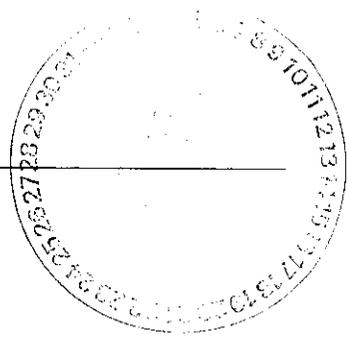
POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
Special Handling and/or Storage	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions						
Sample No.	Matrix *	Sample Date	Sample Time								
BOWBT9	Soil										
BOWBVO	Soil										
BOWBR9	Soil	9-16-99	1320	X	X		X			Bow CRA	

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By <i>Doris Bowers</i>		Date/Time <i>9-16-99/1515</i>		Received By <i>R.C.F. / B</i>		Date/Time <i>9-16-99/1515</i>		See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . . . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 -(CV); Chromium Hex - 7195 COLLECTOR UNAVAILABLE TO SIGN COC				Soil Water Vapor Other Solid Other Liquid <i>Temp. 2.5"</i> 4235 7952 9609	
Relinquished By <i>Ref 1B</i>		Date/Time <i>9-20-99 1000</i>		Received By <i>Chice</i>		Date/Time <i>9-20-99 1000</i>							
Relinquished By <i>Chice</i>		Date/Time <i>9-20-99 1400</i>		Received By <i>FEDEX</i>		Date/Time <i>9-20-99 1400</i>							
Relinquished By <i>Geo Ex</i>		Date/Time <i>9-21-99/0945</i>		Received By <i>D. J. [Signature]</i>		Date/Time <i>9-21-99/0945</i>							
LABORATORY SECTION	Received By			Title			Date/Time						
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By			Date/Time						

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-124	Page 1 of 1
Collector Bowers/Trice		Company Contact Chris Cearlock		Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078		
Ice Chest No. ERC 99-018		Field Logbook No. EL-1511		Method of Shipment Fed Ex		
Shipped To MADEIRA DB 9-17-99 RCCA		Offsite Property No. A990260		Bill of Lading/Air Bill No. 4235 7952 9609 COA B20CW1 671C		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
Special Handling and/or Storage	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions						
Sample No.	Matrix *	Sample Date	Sample Time								
BOWBT9	Soil										
BOWBVO	Soil										
2. BOWBTO	Soil	9-17-99	0935	X	X						BowCR1

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>Doug Bowers</i> Date/Time <i>9-17-99/1455</i>		Received By <i>Ref 1B</i> Date/Time <i>9-17-99/1455</i>		See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196 COLLECTOR UNAVAILABLE TO SIGN COC				Soil Water Vapor Other Solid Other Liquid	
Relinquished By <i>Ref 1B</i> Date/Time <i>9-20-99 1000</i>		Received By <i>Chiu</i> Date/Time <i>9-20-99 1000</i>							
Relinquished By <i>Chiu</i> Date/Time <i>9-20-99 1400</i>		Received By <i>FEDEX</i> Date/Time <i>9-20-99 1400</i>							
Relinquished By <i>Fed Ex</i> Date/Time <i>9-21-99/0945</i>		Received By <i>D. Smith</i> Date/Time <i>9-21-99/0945</i>							
LABORATORY SECTION	Received By	Title						Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By				Date/Time	



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-078
RFW# : 9909L152
SDG/SAF#: H0537/B99-078

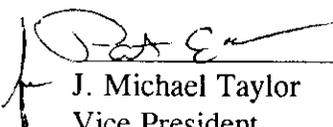
W.O #: 10985-001-001-9999-00
Date Received: 09-21-99

DIESEL RANGE ORGANICS

The set of samples consisted of two (2) soil samples collected on 09-16,17-99.

The samples and their associated QC samples were prepared on 09-30-99 and analyzed by methodology based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 10-08-99. The analysis met the intent of method WTPH-D.

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis were met.
3. All initial calibrations associated with this data set were within acceptance criteria.
4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.



J. Michael Taylor

Vice President
Philadelphia Analytical Laboratory

10-19-99
Date

R:\SHARE\LC\GCSCAN\09-152d.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.

GLOSSARY OF DIESEL 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 - Lionville Laboratory

DIESEL RANGE ORGANICS BY GC

Report Date: 10/12/99 13:34

RFW Batch Number: 9909L152

Client: TNU-HANFORD B99-078

Work Order: 10985-001-001-9999-00

Page: 1

	Cust ID:	BOWBR9	BOWBR9	BOWBR9	BOWBTO	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	99LE1190-MB1	99LE1190-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate:	p-Terphenyl	97 %	104 %	92 %	94 %	96 %	102 %
		=====fl=====	=====fl=====	=====fl=====	=====fl=====	=====fl=====	=====fl=====
Diesel Range Organics		4.2 U	95 %	92 %	4.7 U	4.0 U	94 %

003

*10/12/99
EPA/1999*

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.

Recra LabNet - Lionville Laboratory
DRO ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBR9	001	S	99LE1190	09/16/99	09/30/99	10/08/99
BOWBR9	001 MS	S	99LE1190	09/16/99	09/30/99	10/08/99
BOWBR9	001 MSD	S	99LE1190	09/16/99	09/30/99	10/08/99
BOWBTO	002	S	99LE1190	09/17/99	09/30/99	10/08/99

LAB QC:

BLK	MB1	S	99LE1190	N/A	09/30/99	10/08/99
BLK	MB1 BS	S	99LE1190	N/A	09/30/99	10/08/99





9909L152

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

⑧ perone wet lab metals

Client <u>TNU Hamford</u> <u>B99-078</u>	Refrigerator # <u>16</u>
Est. Final Proj. Sampling Date _____	#/Type Container Liquid _____ Solid <u>1ag</u> <u>1ag</u> <u>1ag</u>
Project # <u>10485-001-001-9999-00</u>	Volume Liquid _____ Solid <u>60</u> <u>250</u> <u>500</u>
Project Contact/Phone # _____	Preservatives _____
RECRA Project Manager <u>OJ</u>	ANALYSES REQUESTED
QC <u>spec</u> Del <u>std</u> TAT <u>30 days</u>	ORGANIC: VOA <u>✓</u> , BNA, PEST, PCB, Herb, <u>TRA</u>
Date Rec'd <u>9.21.99</u> Date Due <u>10/21/99</u>	INORG: Metal, CN
Account # _____	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 (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only																
			MS	MSD				0024H	05CSC	0025H	OPRO	OPCB	12/1/99	1CR6	9Met	1CMT0	10302	15FD	10H5N	1PH	10CL	10CF	10AD3	10P2
	001	BOWBR9			S	9/16/99	1320	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	002	BOWBT0			L	9/17/99	0935	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Special Instructions: Safe # B99-078

DATE/REVISIONS:

- Run matrix qc
- met ② = As, Ba, Cd, Cr, Pb, Se, Ag.
- Be, Cu, Ni, V, Zn, Hg
- 9/23/99 tests added per client coc
- _____
- _____

COMPOSITE WASTE

RECRA LabNet Use Only	
Samples were: 1) Shipped <input checked="" type="checkbox"/> or Hand Delivered _____	COC Tape was: 1) Present on Outer Package <input checked="" type="checkbox"/> or N
Airbill # <u>*</u>	2) Unbroken on Outer Package <input checked="" type="checkbox"/> or N
2) Ambient or <u>Chilled</u>	3) Present on Sample <input checked="" type="checkbox"/> or N
3) Received in Good Condition <input checked="" type="checkbox"/> or N	4) Unbroken on Sample <input checked="" type="checkbox"/> or N
4) Labels Indicate Properly Preserved <input checked="" type="checkbox"/> or N	COC Record Present Upon Sample Rec't <input checked="" type="checkbox"/> or N
5) Received Within Holding Times <input checked="" type="checkbox"/> or N	Cooler Temp. <u>2.5</u> °C

Relinquished by	Received by	Date	Time
<u>Ex</u>	<u>Dymia</u>	<u>9/21/99</u>	<u>0945</u>

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N

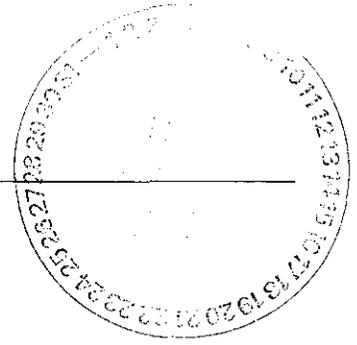
NOTES:
* 423579529609

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-078-124	Page 1 of 1
Collector Bowers/Trice		Company Contact Chris Cearlock		Telephone No. 372-9574		Project Coordinator TRENT, SJ	
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078		Price Code 8N Data Turnaround 45 Days	
Ice Chest No. ERC 99-018		Field Logbook No. EL-1511		Method of Shipment Fed Ex		100	
Shipped To FMA/REGRA RECAA DOB 9-17-99		Offsite Property No. A990260		Bill of Lading/Air Bill No. 4235 7952 9609		COA B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
Special Handling and/or Storage	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions						
Sample No.	Matrix *	Sample Date	Sample Time								
BOWBT9	Soil										
BOWBVO	Soil										
BOWBTO	Soil	9-17-99	0935	X	X						BowCR1

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>Doug Barron</i> Date/Time <i>9-17-99/1445</i>		Received By <i>Ref 1B</i> Date/Time <i>9-17-99/1445</i>		See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium. Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196				Soil Water Vapor Other Solid Other Liquid			
Relinquished By <i>Ref 1B</i> Date/Time <i>9-20-99 1000</i>		Received By <i>Chie</i> Date/Time <i>9-20-99 1000</i>									
Relinquished By <i>Chie</i> Date/Time <i>9-20-99 1400</i>		Received By <i>FED EX</i> Date/Time <i>9-20-99 1400</i>									
Relinquished By <i>Fed Ex</i> Date/Time <i>9-21-99/0945</i>		Received By <i>D. Smith</i> Date/Time <i>9-21-99/0945</i>									
LABORATORY SECTION		Received By				Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By				Date/Time	

**Recra LabNet Philadelphia
Analytical Report**



Client : TNU-HANFORD B99-078
RFW# : 9909L152
SDG/SAF #: H0537/B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 09-21-99

SEMIVOLATILE

Two (2) soil samples were collected on 09-16,17-99.

The samples and their associated QC samples were extracted on 09-30-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Methods 8270B for TCL Semivolatile target compounds on 10-04-99.

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 temperature upon receipt has 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. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. One (1) of eleven (11) blank spike recoveries was outside EPA QC limits.
7. These samples were spectrally searched for Butylated Hydroxytoluene; however, it was not identified in the samples.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

som\gorup\data\bna\tnu09152.doc

11-01-99
Date

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 11 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.



Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

Report Date: 10/25/99 18:22

RFW Batch Number: 9909L152

Client: TNU-HANFORD B99-078

Work Order: 10985001001

Page: 1a

Cust ID:	BOWBR9	BOWBR9	BOWBR9	BOWBTO	SBLKDP	SBLKDP BS
Sample RFW#:	001	001 MS	001 MSD	002	99LE1185-MB1	99LE1185-MB1
Information Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Nitrobenzene-d5	83 %	79 %	82 %	65 %	89 %	94 %
2-Fluorobiphenyl	84 %	79 %	81 %	61 %	88 %	91 %
Recovery Terphenyl-d14	92 %	92 %	97 %	77 %	98 %	103 %
Phenol-d5	89 %	83 %	86 %	68 %	90 %	95 %
2-Fluorophenol	88 %	81 %	84 %	66 %	88 %	92 %
2,4,6-Tribromophenol	89 %	88 %	89 %	66 %	84 %	96 %
=====f1=====f1=====f1=====f1=====f1=====f1=====						
Phenol	350 U	76 %	82 %	410 U	330 U	87 %
bis(2-Chloroethyl) ether	350 U	350 U	350 U	410 U	330 U	330 U
2-Chlorophenol	350 U	75 %	81 %	410 U	330 U	86 %
1,3-Dichlorobenzene	350 U	350 U	350 U	410 U	330 U	330 U
1,4-Dichlorobenzene	350 U	66 %	79 %	410 U	330 U	87 %
1,2-Dichlorobenzene	350 U	350 U	350 U	410 U	330 U	330 U
2-Methylphenol	350 U	350 U	350 U	410 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)	350 U	350 U	350 U	410 U	330 U	330 U
4-Methylphenol	350 U	350 U	350 U	410 U	330 U	330 U
N-Nitroso-di-n-propylamine	350 U	86 %	91 %	410 U	330 U	102 %
Hexachloroethane	350 U	350 U	350 U	410 U	330 U	330 U
Nitrobenzene	350 U	350 U	350 U	410 U	330 U	330 U
Isophorone	350 U	350 U	350 U	410 U	330 U	330 U
2-Nitrophenol	350 U	350 U	350 U	410 U	330 U	330 U
2,4-Dimethylphenol	350 U	350 U	350 U	410 U	330 U	330 U
bis(2-Chloroethoxy) methane	350 U	350 U	350 U	410 U	330 U	330 U
2,4-Dichlorophenol	350 U	350 U	350 U	410 U	330 U	330 U
1,2,4-Trichlorobenzene	350 U	72 %	82 %	410 U	330 U	93 %
Naphthalene	350 U	350 U	350 U	410 U	330 U	330 U
4-Chloroaniline	350 U	350 U	350 U	410 U	330 U	330 U
Hexachlorobutadiene	350 U	350 U	350 U	410 U	330 U	330 U
4-Chloro-3-methylphenol	350 U	80 %	84 %	410 U	330 U	88 %
2-Methylnaphthalene	350 U	350 U	350 U	410 U	330 U	330 U
Hexachlorocyclopentadiene	350 U	350 U	350 U	410 U	330 U	330 U
2,4,6-Trichlorophenol	350 U	350 U	350 U	410 U	330 U	330 U
2,4,5-Trichlorophenol	880 U	880 U	880 U	1000 U	840 U	840 U

*= Outside of EPA CLP QC limits.

Cust ID:	B0WBR9	B0WBR9	B0WBR9	B0WBTO	SBLKDP	SBLKDP BS
RFW#:	001	001 MS	001 MSD	002	99LE1185-MB1	99LE1185-MB1
2-Chloronaphthalene	350 U	350 U	350 U	410 U	330 U	330 U
2-Nitroaniline	880 U	880 U	880 U	1000 U	840 U	840 U
Dimethylphthalate	350 U	350 U	350 U	410 U	330 U	330 U
Acenaphthylene	350 U	350 U	350 U	410 U	330 U	330 U
2,6-Dinitrotoluene	350 U	350 U	350 U	410 U	330 U	330 U
3-Nitroaniline	880 U	880 U	880 U	1000 U	840 U	840 U
Acenaphthene	350 U	80 %	86 %	410 U	330 U	91 %
2,4-Dinitrophenol	880 U	880 U	880 U	1000 U	840 U	840 U
4-Nitrophenol	880 U	71 %	76 %	1000 U	840 U	89 %
Dibenzofuran	350 U	350 U	350 U	410 U	330 U	330 U
2,4-Dinitrotoluene	350 U	80 %	87 %	410 U	330 U	94 * %
Diethylphthalate	350 U	350 U	350 U	410 U	330 U	330 U
4-Chlorophenyl-phenylether	350 U	350 U	350 U	410 U	330 U	330 U
Fluorene	350 U	350 U	350 U	410 U	330 U	330 U
4-Nitroaniline	880 U	880 U	880 U	1000 U	840 U	840 U
4,6-Dinitro-2-methylphenol	880 U	880 U	880 U	1000 U	840 U	840 U
N-Nitrosodiphenylamine (1)	350 U	350 U	350 U	410 U	330 U	330 U
4-Bromophenyl-phenylether	350 U	350 U	350 U	410 U	330 U	330 U
Hexachlorobenzene	350 U	350 U	350 U	410 U	330 U	330 U
Pentachlorophenol	880 U	74 %	79 %	1000 U	840 U	92 %
Phenanthrene	350 U	350 U	350 U	410 U	330 U	330 U
Anthracene	350 U	350 U	350 U	410 U	330 U	330 U
Carbazole	350 U	350 U	350 U	410 U	330 U	330 U
Di-n-butylphthalate	350 U	350 U	350 U	410 U	330 U	330 U
Fluoranthene	350 U	350 U	350 U	410 U	330 U	330 U
Pyrene	350 U	91 %	96 %	410 U	330 U	98 %
Butylbenzylphthalate	350 U	350 U	350 U	410 U	330 U	330 U
3,3'-Dichlorobenzidine	350 U	350 U	350 U	410 U	330 U	330 U
Benzo(a)anthracene	350 U	350 U	350 U	410 U	330 U	330 U
Chrysene	350 U	350 U	350 U	410 U	330 U	330 U
bis(2-Ethylhexyl)phthalate	350 U	350 U	350 U	410 U	330 U	330 U
Di-n-octyl phthalate	350 U	350 U	350 U	410 U	330 U	330 U
Benzo(b)fluoranthene	350 U	350 U	350 U	410 U	330 U	330 U
Benzo(k)fluoranthene	350 U	350 U	350 U	410 U	330 U	330 U
Benzo(a)pyrene	350 U	350 U	350 U	410 U	330 U	330 U
Indeno(1,2,3-cd)pyrene	350 U	350 U	350 U	410 U	330 U	330 U
Dibenz(a,h)anthracene	350 U	350 U	350 U	410 U	330 U	330 U
Benzo(g,h,i)perylene	350 U	350 U	350 U	410 U	330 U	330 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.

BOWBR9

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9909L152-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D100413

Level: (low/med) LOW Date Received: 09/21/99

% Moisture: 5 decanted: (Y/N) Date Extracted: 09/30/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/04/99

Injection Volume: 2.0 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.49	100	JB
2.	ALDOL CONDENSATE	9.03	100	JAB

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BOWBTO

Lab Name: Recra,LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL

Lab Sample ID: 9909L152-002

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D100416

Level: (low/med) LOW

Date Received: 09/21/99

% Moisture: 18 decanted: (Y/N)

Date Extracted: 09/30/99

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 10/04/99

Injection Volume: 2.0 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH:

CONCENTRATION UNITS:

Number TICs found: 3

(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.48	100	JB
2.	ALDOL CONDENSATE	9.02	100	JAB
3.	ALDOL CONDENSATE	9.80	100	JA

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKDP

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 99LE1185-MB1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D100411

Level: (low/med) LOW Date Received: 09/30/99

% Moisture: decanted: (Y/N) Date Extracted: 09/30/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/04/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.49	100	J
2.	ALDOL CONDENSATE	9.03	80	JA

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBR9	001	S	99LE1185	09/16/99	09/30/99	10/04/99
BOWBR9	001 MS	S	99LE1185	09/16/99	09/30/99	10/04/99
BOWBR9	001 MSD	S	99LE1185	09/16/99	09/30/99	10/04/99
BOWBTO	002	S	99LE1185	09/17/99	09/30/99	10/04/99

LAB QC:

SBLKDP	MB1	S	99LE1185	N/A	09/30/99	10/04/99
SBLKDP	MB1 BS	S	99LE1185	N/A	09/30/99	10/04/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-078-124	Page 1 of 1
Collector Bowers/Trice		Company Contact Chris Cearlock		Telephone No. 372-9574		Project Coordinator TRENT, SJ	
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 B pond (B8758) >15'		SAF No. B99-078		Price Code 8N Data Turnaround 45 Days	
Ice Chest No. ERC 99-018		Field Logbook No. EL-1511		Method of Shipment Fed Ex			
Shipped To TMA/RECRA B7D RECRA		Offsite Property No. A990260		Bill of Lading/Air Bill No. 4235 7952 9609			
				COA B20CW167/C			

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
Special Handling and/or Storage	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - #260A (TCL); VOA - #260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - #270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions						
Sample No.	Matrix *	Sample Date	Sample Time								
BOWBT9	Soil										
BOWBVO	Soil										
BOWBR9	Soil	9-16-99	1320	X	X		X				BOWCRA

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By	Date/Time	Received By	Date/Time
Danny Bowers	9-16-99/1515	R.P.F. / B	9-16-99/1515
Raf IB	9-20-99 1000	Chris	9-20-99 1000
Case	9-20-99 1400	FEDEX	9-20-99 1400
Geo Ex	9-21-99/0945	D. Y. [Signature]	9-21-99/0945

SPECIAL INSTRUCTIONS
 See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . . . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241
 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7195

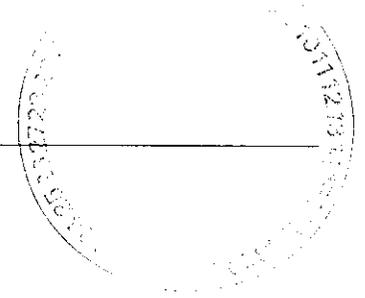
COLLECTOR UNAVAILABLE TO SIGN COA

Matrix *
 Soil
 Water
 Vapor
 Other Solid
 Other Liquid

4235 7952 9609

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

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-078-124	Page 1 of 1	
Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days			
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond (B8758) >15'	SAF No. B99-078						
Ice Chest No. ERC 99-018	Field Logbook No. EL-1511	Method of Shipment Fed Ex						
Shipped To TMA/REGRA RECAA	Offsite Property No. A990260	Bill of Lading/Air Bill No. 4235 7952 9609		COA B20CW/671C				
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage	Preservation	Cool 4C	Cool 4C	None	Cool 4C			
	Type of Container	aG	aG	aG	aG			
	No. of Container(s)	1	1	1	1			
	Volume	60mL	250mL	250mL	500mL			
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions			
Sample No.	Matrix *	Sample Date	Sample Time					
BOWBT9	Soil							
BOWBVO	Soil							
BOWBTO	Soil	9-17-99	0935	X	X	X	BowCR/	
CHAIN OF POSSESSION	Sign/Print Names				SPECIAL INSTRUCTIONS			Matrix *
Relinquished By Doug Bowers	Date/Time 9-17-99/1445	Received By Ref 1B	Date/Time 9-17-99/1445	See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Techn-99, Tritium, . . . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.			Soil	
Relinquished By Ref 1B	Date/Time 9-20-99 1000	Received By Chris	Date/Time 9-20-99 1000	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241			Water	
Relinquished By Chris	Date/Time 9-20-99 1400	Received By FEDEX	Date/Time 9-20-99 1900	(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196			Vapor	
Relinquished By Fed Ex	Date/Time 9-21-99/0945	Received By D. Smith	Date/Time 9-21-99/0945	COLLECTOR UNAVAILABLE TO SIGN			Other Solid	
LABORATORY SECTION	Received By	Title	Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time					



Chemical and Environmental Measurement Information

**Recra LabNet Philadelphia
Analytical Report**

Client: TNU HANFORD B99-078
RFW #: 9909L152
SDG/SAF#: H0537/B99-078

W.O. #: #: 10985-001-001-9999-00
Date Received: 09-21-99

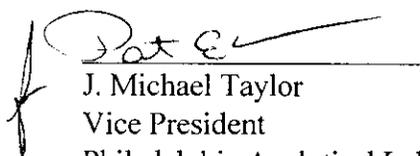
GC SCAN

The set of samples consisted of two (2) soil samples collected on 09-16,17-99.

The samples and their associated QC samples were prepared on 09-23-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and Butanol on 09-24-99.

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 required holding time for analysis was met.
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. The blank spike recovery was within advisory control limits of 50%-150%.
7. All matrix spike recoveries were within the advisory control limits of 50%-150%.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-15-99
Date

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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.

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 - Lionville Laboratory
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBR9	001	S	99LLC143	09/16/99	09/23/99	09/24/99
BOWBR9	001 MS	S	99LLC143	09/16/99	09/23/99	09/24/99
BOWBR9	001 MSD	S	99LLC143	09/16/99	09/23/99	09/24/99
BOWBTO	002	S	99LLC143	09/17/99	09/23/99	09/24/99

LAB QC:

BLK	MB1	S	99LLC143	N/A	09/23/99	09/24/99
BLK	MB1 BS	S	99LLC143	N/A	09/23/99	09/24/99

9/24/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-124	Page 1 of 1
Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code	8N	Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond (B8758) >15'	SAF No. B99-078				
Ice Chest No. ERC 99-018	Field Logbook No. EL-1511	Method of Shipment Fed Ex				
Shipped To TMA/RECA RECAA	Offsite Property No. A990260	Bill of Lading/Air Bill No. 4235 7952 9609				
			COA B20CW/671C			

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
	No. of Container(s)	1	1	1	1						
	Special Handling and/or Storage	Volume	60mL	250mL	250mL	500mL					

SAMPLE ANALYSIS				VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions						
-----------------	--	--	--	---	--	--------------------------------------	--------------------------------------	--	--	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time										
BOWBT9	Soil												
BOWBVO	Soil												
2. BOWBTO	Soil	9-17-99	0935	X	X		X					BOWCR/	

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . . . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.				Matrix * Soil Water Vapor Other Solid Other Liquid	
Relinquished By Doug Bowers	Date/Time 9-17-99/145	Received By Ref 1B	Date/Time 9-17-99/145	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196 COLLECTOR UNAVAILABLE TO SIGN COC					
Relinquished By Ref 1B	Date/Time 9-20-99 1000	Received By Chris	Date/Time 9-20-99 1000						
Relinquished By Chris	Date/Time 9-20-99 1400	Received By FEDEX	Date/Time 9-20-99 1900						
Relinquished By Fed Ex	Date/Time 9-21-99/0945	Received By D. Smith	Date/Time 9-21-99/0945						
LABORATORY SECTION	Received By	Title						Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By				Date/Time	



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-078
RFW# : 9909L152
SDG/SAF #: H0537/B99-078

W.O. #: 10985-001-001-9999-00
Date Received: 09-21-99

GC/MS VOLATILE

Two (2) soil samples were collected on 09-16,17-99.

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 09-29-99.

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. One (1) of eighteen (18) surrogate recoveries was outside EPA QC limits. The analysis of matrix spike duplicate fulfills the reanalysis requirements for sample B0WBTO MS.
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, Acetone at levels less than 2x the CRQL and the target compound 2-Butanone at a level less than the CRQL.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-01-99
Date

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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 09 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

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



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.



Cust ID:	BOWBR9	BOWBTO	BOWBTO	BOWBTO	VBLKTP	VBLKTP BS
RFW#:	001	002	002 MS	002 MSD	99LVN318-MB1	99LVN318-MB1

Chlorobenzene	6 U	6 U	115 %	103 %	5 U	104 %
Ethylbenzene	6 U	6 U	6 U	6 U	5 U	5 U
Styrene	6 U	6 U	6 U	6 U	5 U	5 U
Xylene (total)	6 U	6 U	6 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU

DATE RECEIVED: 09/21/99

RFW LOT # :9909L152

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWBR9	001	S	99LVN318	09/16/99	N/A	09/29/99
BOWBTO	002	S	99LVN318	09/17/99	N/A	09/29/99
BOWBTO	002 MS	S	99LVN318	09/17/99	N/A	09/29/99
BOWBTO	002 MSD	S	99LVN318	09/17/99	N/A	09/29/99

LAB QC:

VBLKTP	MB1	S	99LVN318	N/A	N/A	09/29/99
VBLKTP	MB1 BS	S	99LVN318	N/A	N/A	09/29/99

*all
10-2-99*



9909L152

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

⑧ Perrone wet Lab metals

Client <u>TNU Hanford</u> <u>B99-078</u>	Refrigerator # <u>16</u>
Est. Final Proj. Sampling Date _____	#/Type Container
Project # <u>10485-001-001-9999-00</u>	Liquid _____
Project Contact/Phone # _____	Solid <u>1ag</u> <u>1ag</u> <u>1ag</u>
RECRA Project Manager <u>OJ</u>	Volume
QC <u>spec</u> Del <u>Std</u> TAT <u>30 days</u>	Liquid _____
Date Rec'd <u>9/21/99</u> Date Due <u>10/21/99</u>	Solid <u>60</u> <u>250</u> <u>500</u>
Account # _____	Preservatives _____
	ANALYSES REQUESTED →
	ORGANIC
	VOA Volatile BNA Pest PCB Herb
	INORG Metal CN

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 (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only																	
			MS	MSD				0024H	05050	0025H	OPRO	OPCB	AS	9/21/99	ICRG	Meto	ICNTO	INBN2	ISFD	INHSN	IPH	100L	105L	10003	10003
			001	B0WBR9				S	9/16/99	1320	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
002	B0WBT0	L	9/17/99	0935	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Special Instructions:

Ref # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC
meto = As, Ba, Cd, Cr, Pb, Se, Ag.
2. Be, Cu, Ni, V, Zn, Hg
3. 9/23/99
4. tests added per client COC
- 5.
- 6.

RECRA LabNet Use Only

- | | |
|---|---|
| Samples were:
1) Shipped <input checked="" type="checkbox"/> or Hand Delivered _____ | COC Tape was:
1) Present on Outer Package <input checked="" type="checkbox"/> or N |
| Airbill # <u>*</u> | 2) Unbroken on Outer Package <input checked="" type="checkbox"/> or N |
| 2) Ambient or <input checked="" type="checkbox"/> chilled | 3) Present on Sample Condition <input checked="" type="checkbox"/> or N |
| 3) Received in Good Condition <input checked="" type="checkbox"/> or N | 4) Unbroken on Sample <input checked="" type="checkbox"/> or N |
| 4) Labels Indicate Properly Preserved <input checked="" type="checkbox"/> or N | COC Record Present Upon Sample Rec't <input checked="" type="checkbox"/> or N |
| 5) Received Within Holding Times <input checked="" type="checkbox"/> or N | Cooler Temp. <u>2.5</u> C |

Relinquished by	Received by	Date	Time
ProEx	D. J. ...	9/21/99	0945

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
* 423579529609

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-124	Page 1 of 1
Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days	
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 B pond (B8758) >15'	SAF No. B99-078				
Ice Chest No. ERC 99-018	Field Logbook No. EL-1511	Method of Shipment Fed Ex				
Shipped To TMA/RECA B70 AECRA	Offsite Property No. A990260	Bill of Lading/Air Bill No. 4235 7952 9609				
COA B20CW1671C						

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG	aG						
Special Handling and/or Storage	No. of Container(s)	1	1	1	1						
	Volume	60mL	250mL	250mL	500mL						
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions						
Sample No.	Matrix *	Sample Date	Sample Time								
B0WB T9	Soil										
B0WB V0	Soil	9-16-99									
B0WBR9	Soil	9-16-99	1320	X	X		X				BowCA1

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>Doug Bowers</i> Date/Time <i>9-16-99/1515</i>		Received By <i>RF 10</i> Date/Time <i>9-16-99/1515</i>		See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium. Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 - Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196 COLLECTOR UNAVAILABLE TO SIGN COA				Soil Water Vapor Other Solid Other Liquid <i>4235 7952 9609</i>	
Relinquished By <i>RF 1B</i> Date/Time <i>9-20-99 1000</i>		Received By <i>Chris</i> Date/Time <i>9-20-99 1000</i>							
Relinquished By <i>Chris</i> Date/Time <i>9-20-99 1400</i>		Received By <i>FEDEX</i> Date/Time <i>9-20-99 1400</i>							
Relinquished By <i>Geo Ex</i> Date/Time <i>9-21-99/0945</i>		Received By <i>D. J. ...</i> Date/Time <i>9-21-99/0945</i>							
LABORATORY SECTION	Received By	Title						Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By				Date/Time		

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-078-124	Page 1 of 1	50	
Collector Bowers/Trice		Company Contact Chris Cearlock		Telephone No. 372-9574		Project Coordinator TRENT, SJ		Price Code 8N	Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 B pond (B8758) >15'			SAF No. B99-078				
Ice Chest No. ERC 99-018		Field Logbook No. EL-1511			Method of Shipment Fed Ex				
Shipped To FMARECRA RECAA D2B 9-17-99		Offsite Property No. A990260			Bill of Lading/Air Bill No. 4235 7952 9609				
					COA B20CW1 6716				

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation				Cool 4C	Cool 4C	None	Cool 4C						
	Type of Container	aG	aG	aG										
Special Handling and/or Storage	No. of Container(s)	1	1	1	1									
	Volume	60mL	250mL	250mL	500mL									
SAMPLE ANALYSIS		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.									
Sample No.	Matrix *	Sample Date	Sample Time											
BOWBT9	Soil													
BOWBVO	Soil													
BOWBTO	Soil	9-17-99	0935	X	X			X						BowCR/

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By Doug Barron Date/Time 9-17-99/1445		Received By Ref 1B Date/Time 9-17-99/1445		See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, Ni-63, Tech-99, Tritium, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH. (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196 COLLECTOR UNAVAILABLE TO SIGN COC				Soil	
Relinquished By Ref 1B Date/Time 9-20-99 1000		Received By Chris Date/Time 9-20-99 1000						Water	
Relinquished By Chris Date/Time 9-20-99 1400		Received By FEDEX Date/Time 9-20-99 1400						Vapor	
Relinquished By Fed Ex Date/Time 9-21-99/0945		Received By D. Smith Date/Time 9-21-99/0945						Other Solid	
LABORATORY SECTION		Received By		Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time	