1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1223 was composed of two water samples designated under SAF No. B99-031 with a Project Designation of: 105F & 105DR LWTF Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on February 9, 2001.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

The activity from sample B118V7 (3.64×10^6 dpm of sample) swamped the added activity of the MS (2,198 dpm of MS). A tritium MS was not reported for this data package. No other problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

The LCS percent recovery (77%) was below the 3σ limits (87-113%) and the laboratory protocol limits (80-120%), but within BHI's limits of 70 to 130%. The C-14 MS percent recovery (83%) was slightly below the 3σ limits (86-114%), but within the laboratory protocol limits (80-120%). No other problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

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2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.7 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.8 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Program Manager

2/13/01

Date

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

SAMPLE SUMMARY

SDG 7618
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1223

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B118V7	105F FSB	WATER		R101133-01	B99-031	B99-031-04	01/23/01 09:00
B118V9	105F FSB	WATER		R101133-02	B99-031	B99-031-05	01/23/01 09:00
Method Blank		WATER		R101133-04	B99-031		
Lab Control Sample		WATER		R101133-03	B99-031		
Duplicate (R101133-01)	105F FSB	WATER		R101133-05	B99-031		01/23/01 09:00
Duplicate (R101133-02)	105F FSB	WATER		R101133-07	B99-031		01/23/01 09:00
Spike (R101133-02)	105F FSB	WATER		R101133-08	B99-031		01/23/01 09:00

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

QC SUMMARY

SDG 7618
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1223

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7618	B99-031-04	B118V7	WATER				01/25/01	2	R101133-01	7618-001
	B99-031-05	B118V9	WATER				01/25/01	2	R101133-02	7618-002
		Method Blank	WATER						R101133-04	7618-004
		Lab Control Sample	WATER						R101133-03	7618-003
		Duplicate (R101133-01)	WATER				01/25/01	2	R101133-05	7618-005
		Duplicate (R101133-02)	WATER				01/25/01	2	R101133-07	7618-007
		Spike (R101133-02)	WATER				01/25/01	2	R101133-08	7618-008

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

SDG 7618
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1223

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	WATER	Americium 241 in Water	6963-099	5.0	2			1	1	1/1		
PU	WATER	Plutonium, Isotopic in Water	6963-099	5.0	2			1	1	1/1		
U	WATER	Uranium, Isotopic in Water	6963-099	5.0	2			1	1	1/1		
Beta Counting												
SR	WATER	Total Strontium in Water	6963-099	10.0	2			1	1	1/1		
Gamma Scan												
GAM	WATER	Gamma Emitters	6963-099	15.0	2			1	1	1/1		
Liquid Scintillation Counting												
C	WATER	Carbon 14 in Water	6963-099	10.0	2			1	1	1/1	1/1	X
H	WATER	Tritium in Water	6963-099	10.0	2			1	1	1/1		
NI_L	WATER	Nickel-63 in Liquid	6963-099	10.0	2			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

WORK SUMMARY

SDG 7618
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1223

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B118V7			R101133-01	7618-001	AM		01/31/01	02/09/01	MCM	Americium 241 in Water
105F FSB		WATER	01/23/01	7618-001	C		01/29/01	02/09/01	MCM	Carbon 14 in Water
B99-031-04	B99-031		01/25/01	7618-001	GAM		01/26/01	02/09/01	MCM	Gamma Emitters
				7618-001	H		01/27/01	02/09/01	MCM	Tritium in Water
				7618-001	NI_L		01/29/01	02/09/01	MCM	Nickel-63 in Liquid
				7618-001	PU		01/31/01	02/09/01	MCM	Plutonium, Isotopic in Water
				7618-001	SR		01/29/01	02/09/01	MCM	Total Strontium in Water
				7618-001	U		01/30/01	02/09/01	MCM	Uranium, Isotopic in Water
B118V9			R101133-02	7618-002	AM		01/30/01	02/09/01	MCM	Americium 241 in Water
105F FSB		WATER	01/23/01	7618-002	C		01/29/01	02/09/01	MCM	Carbon 14 in Water
B99-031-05	B99-031		01/25/01	7618-002	GAM		01/26/01	02/09/01	MCM	Gamma Emitters
				7618-002	H		01/27/01	02/09/01	MCM	Tritium in Water
				7618-002	NI_L		01/29/01	02/09/01	MCM	Nickel-63 in Liquid
				7618-002	PU		01/31/01	02/09/01	MCM	Plutonium, Isotopic in Water
				7618-002	SR		01/29/01	02/09/01	MCM	Total Strontium in Water
				7618-002	U		01/30/01	02/09/01	MCM	Uranium, Isotopic in Water
Method Blank			R101133-04	7618-004	AM		01/31/01	02/09/01	MCM	Americium 241 in Water
		WATER		7618-004	C		01/29/01	02/09/01	MCM	Carbon 14 in Water
	B99-031			7618-004	GAM		01/26/01	02/09/01	MCM	Gamma Emitters
				7618-004	H		01/28/01	02/09/01	MCM	Tritium in Water
				7618-004	NI_L		01/29/01	02/09/01	MCM	Nickel-63 in Liquid
				7618-004	PU		02/01/01	02/09/01	MCM	Plutonium, Isotopic in Water
				7618-004	SR		01/29/01	02/09/01	MCM	Total Strontium in Water
				7618-004	U		01/30/01	02/09/01	MCM	Uranium, Isotopic in Water
Lab Control Sample			R101133-03	7618-003	AM		01/30/01	02/09/01	MCM	Americium 241 in Water
		WATER		7618-003	C		01/29/01	02/09/01	MCM	Carbon 14 in Water
	B99-031			7618-003	GAM		01/26/01	02/09/01	MCM	Gamma Emitters
				7618-003	H		01/27/01	02/09/01	MCM	Tritium in Water
				7618-003	NI_L		01/29/01	02/09/01	MCM	Nickel-63 in Liquid
				7618-003	PU		01/30/01	02/09/01	MCM	Plutonium, Isotopic in Water
				7618-003	SR		01/29/01	02/09/01	MCM	Total Strontium in Water
				7618-003	U		02/02/01	02/09/01	MCM	Uranium, Isotopic in Water

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

SDG 7618
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1223

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R101133-01)			R101133-05	7618-005	AM		01/30/01	02/09/01	MCM	Americium 241 in Water
105F FSB		WATER	01/23/01	7618-005	GAM		01/29/01	02/09/01	MCM	Gamma Emitters
	B99-031		01/25/01	7618-005	H		01/28/01	02/09/01	MCM	Tritium in Water
				7618-005	NI_L		01/29/01	02/09/01	MCM	Nickel-63 in Liquid
				7618-005	PU		01/30/01	02/09/01	MCM	Plutonium, Isotopic in Water
				7618-005	SR		01/29/01	02/09/01	MCM	Total Strontium in Water
				7618-005	U		02/06/01	02/09/01	MCM	Uranium, Isotopic in Water
Duplicate (R101133-02)			R101133-07	7618-007	C		01/29/01	02/09/01	MCM	Carbon 14 in Water
105F FSB		WATER	01/23/01							
	B99-031		01/25/01							
Spike (R101133-02)			R101133-08	7618-008	C		01/29/01	02/09/01	MCM	Carbon 14 in Water
105F FSB		WATER	01/23/01							
	B99-031		01/25/01							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	B99-031	Americium 241 in Water	AMCMISO_IE_PLATE_AEA	2			1	1	1		5
C	B99-031	Carbon 14 in Water	C14_CHEM_LSC	2			1	1	1	1	6
GAM	B99-031	Gamma Emitters	GAMMA_GS	2			1	1	1		5
H	B99-031	Tritium in Water	906.0_H3_LSC	2			1	1	1		5
NI_L	B99-031	Nickel-63 in Liquid	NI63_LSC	2			1	1	1		5
PU	B99-031	Plutonium, Isotopic in Water	PUISO_PLATE_AEA	2			1	1	1		5
SR	B99-031	Total Strontium in Water	SRTOT_SEP_PRECIP_GPC	2			1	1	1		5
U	B99-031	Uranium, Isotopic in Water	UISO_PLATE_AEA	2			1	1	1		5
TOTALS				16			8	8	8	1	41

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/09/01

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1223

R101133-04 Method Blank

METHOD BLANK

SDG	7618	Client/Case no	Hanford	SDG H1223	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R101133-04	Client sample id	Method Blank		
Dept sample id	7618-004	Material/Matrix		WATER	
		SAF No	B99-031		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	-2620	1000	1900	400	U	H
Carbon 14	14762-75-5	-1.64	27	45	200	U	C
Nickel 63	13981-37-8	-1.93	3.3	5.6	15	U	NI_L
Total Strontium	SR-RAD	-0.161	0.40	0.89	2.0	U	SR
Uranium 233	U-233/234	0	0.085	0.32	1.0	U	U
Uranium 235	15117-96-1	0	0.10	0.39	1.0	U	U
Uranium 238	U-238	0	0.085	0.32	1.0	U	U
Plutonium 238	13981-16-3	0.094	0.19	0.36	1.0	U	PU
Plutonium 239/240	PU-239/240	0.281	0.19	0.36	1.0	U	PU
Americium 241	14596-10-2	0.317	0.23	0.22	1.0	J	AM
Potassium 40	13966-00-2	U		110		U	GAM
Cobalt 60	10198-40-0	U		6.1	25	U	GAM
Barium 133	13981-41-4	U		6.1		U	GAM
Cesium 137	10045-97-3	U		5.3	15	U	GAM
Radium 226	13982-63-3	U		17		U	GAM
Radium 228	15262-20-1	U		25		U	GAM
Europium 152	14683-23-9	U		16	50	U	GAM
Europium 154	15585-10-1	U		17	50	U	GAM
Europium 155	14391-16-3	U		19	50	U	GAM
Thorium 228	14274-82-9	U		8.4		U	GAM
Thorium 232	TH-232	U		25		U	GAM
Uranium 235	15117-96-1	U		23		U	GAM
Uranium 238	U-238	U		660		U	GAM
Americium 241	14596-10-2	U		43		U	GAM

105F & 105DR LWTF Sampling

QC-BLANK 37403

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

R101133-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7618
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1223
Case no TRC-SBB-207925

Lab sample id R101133-03
Dept sample id 7618-003

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No B99-031

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	43700	2100	1900	400		H	49300	2000	89	84-116	80-120
Carbon 14	13100	140	56	200		C	17000	680	77	87-113	80-120
Nickel 63	556	12	6.4	15		NI_L	580	23	96	84-116	80-120
Total Strontium	74.8	2.9	0.82	2.0		SR	73.0	2.9	102	82-118	80-120
Uranium 233	31.2	1.2	0.55	1.0		U	31.0	1.2	101	89-111	80-120
Uranium 235	24.6	1.0	0.054	1.0		U	25.2	1.0	98	89-111	80-120
Uranium 238	33.6	1.3	0.52	1.0		U	33.7	1.3	100	89-111	80-120
Plutonium 238	44.5	4.0	0.28	1.0		PU	41.3	1.7	108	82-118	80-120
Plutonium 239/240	47.0	4.1	0.28	1.0		PU	44.0	1.8	107	83-117	80-120
Americium 241	34.2	4.0	0.46	1.0		AM	31.9	1.3	107	79-121	80-120
Cobalt 60	497	12	5.6	25		GAM	498	20	100	76-124	80-120
Cesium 137	525	11	6.8	15		GAM	502	20	105	76-124	80-120

105F & 105DR LWTF Sampling

QC-LCS 37402

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

R101133-05 B118V7

DUPLICATE

SDG	7618			Client/Case no	Hanford SDG H1223
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R101133-05	Lab sample id	R101133-01	Client sample id	B118V7
Dept sample id	7618-005	Dept sample id	7618-001	Location/Matrix	105F FSB WATER
		Received	01/25/01	Collected	01/23/01 09:00
				Custody/SAF No	B99-031-04 B99-031

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	1590000	16000	1000	400		H	1640000	17000	1100		3	21
Nickel 63	2630	54	17	15		NI_L	2910	59	15		10	22
Total Strontium	18000	31	0.45	2.0		SR	18200	28	0.33		1	21
Uranium 233	6.29	0.87	0.23	1.0		U	5.86	0.77	0.25		7	31
Uranium 235	0.579	0.23	0.22	1.0	J	U	0.682	0.25	0.19	J	16	82
Uranium 238	5.50	0.80	0.23	1.0		U	5.38	0.76	0.22		2	32
Plutonium 238	0.878	0.34	0.21	1.0	J	PU	0.538	0.27	0.26	J	48	93
Plutonium 239/240	17.6	1.9	0.21	1.0		PU	17.0	2.1	0.26		3	27
Americium 241	7.69	1.2	0.24	1.0		AM	6.66	1.1	0.29		14	36
Potassium 40	U		210		U	GAM	U		95	U	-	
Cobalt 60	39.0	9.8	8.9	25		GAM	39.6	11	10		2	65
Barium 133	U		16		U	GAM	U		10	U	-	
Cesium 137	1380	32	18	15		GAM	1410	24	12		2	32
Radium 226	U		23		U	GAM	U		19	U	-	
Radium 228	U		42		U	GAM	U		36	U	-	
Europium 152	232	40	46	50		GAM	209	30	34		10	47
Europium 154	U		35	50	U	GAM	U		30	U	-	
Europium 155	U		36	50	U	GAM	U		21	U	-	
Thorium 228	U		18		U	GAM	U		11	U	-	
Thorium 232	U		42		U	GAM	U		36	U	-	
Uranium 235	U		50		U	GAM	U		27	U	-	
Uranium 238	U		1200		U	GAM	U		1100	U	-	
Americium 241	U		50		U	GAM	U		14	U	-	

105F & 105DR LWTF Sampling

QC-DUP#1 37404

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

R101133-07

B118V9

DUPLICATE

SDG	7618			Client/Case no	Hanford SDG H1223
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R101133-07	Lab sample id	R101133-02	Client sample id	B118V9
Dept sample id	7618-007	Dept sample id	7618-002	Location/Matrix	105F FSB WATER
		Received	01/25/01	Collected	01/23/01 09:00
				Custody/SAF No	B99-031-05 B99-031

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Carbon 14	664	52	33	200		C	630	36	44		5	26	

105F & 105DR LWTF Sampling

QC-DUP#2 37510

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

R101133-08 B118V9

MATRIX SPIKE

SDG	7618			Client/Case no	Hanford SDG H1223
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R101133-08	Lab sample id	R101133-02	Client sample id	B118V9
Dept sample id	7618-008	Dept sample id	7618-002	Location/Matrix	105F FSB WATER
		Received	01/25/01	Collected	01/23/01 09:00
				Custody/SAF No	B99-031-05 B99-031

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	43100	440	120	200	X	C	51000	2000	630	36	83	86-114	60-140

105F & 105DR LWTF Sampling

QC-MS#2 37511

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

R101133-01 B118V7

DATA SHEET

SDG	7618	Client/Case no	Hanford	SDG_H1223	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R101133-01	Client sample id	B118V7		
Dept sample id	7618-001	Location/Matrix	105F FSB	WATER	
Received	01/25/01	Collected	01/23/01 09:00		
		Custody/SAF No	B99-031-04	B99-031	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	1640000	17000	1100	400		H
Carbon 14	14762-75-5	1080	32	32	200		C
Nickel 63	13981-37-8	2910	59	15	15		NI_L
Total Strontium	SR-RAD	18200	28	0.33	2.0		SR
Uranium 233	U-233/234	5.86	0.77	0.25	1.0		U
Uranium 235	15117-96-1	0.682	0.25	0.19	1.0	J	U
Uranium 238	U-238	5.38	0.76	0.22	1.0		U
Plutonium 238	13981-16-3	0.538	0.27	0.26	1.0	J	PU
Plutonium 239/240	PU-239/240	17.0	2.1	0.26	1.0		PU
Americium 241	14596-10-2	6.66	1.1	0.29	1.0		AM
Potassium 40	13966-00-2	U		95		U	GAM
Cobalt 60	10198-40-0	39.6	11	10	25		GAM
Barium 133	13981-41-4	U		10		U	GAM
Cesium 137	10045-97-3	1410	24	12	15		GAM
Radium 226	13982-63-3	U		19		U	GAM
Radium 228	15262-20-1	U		36		U	GAM
Europium 152	14683-23-9	209	30	34	50		GAM
Europium 154	15585-10-1	U		30	50	U	GAM
Europium 155	14391-16-3	U		21	50	U	GAM
Thorium 228	14274-82-9	U		11		U	GAM
Thorium 232	TH-232	U		36		U	GAM
Uranium 235	15117-96-1	U		27		U	GAM
Uranium 238	U-238	U		1100		U	GAM
Americium 241	14596-10-2	U		14		U	GAM

105F & 105DR LWTF Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/09/01

TMA / RICHMOND
SAMPLE DELIVERY GROUP H1223

R101133-02 B118V9

DATA SHEET

SDG	7618	Client/Case no	Hanford SDG H1223
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R101133-02	Client sample id	B118V9
Dept sample id	7618-002	Location/Matrix	105F FSB WATER
Received	01/25/01	Collected	01/23/01 09:00
		Custody/SAF No	B99-031-05 B99-031

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	1560000	16000	1000	400		H
Carbon 14	14762-75-5	630	36	44	200		C
Nickel 63	13981-37-8	2670	54	14	15		NI_L
Total Strontium	SR-RAD	18300	26	0.39	2.0		SR
Uranium 233	U-233/234	6.20	0.98	0.26	1.0		U
Uranium 235	15117-96-1	0.461	0.25	0.32	1.0	J	U
Uranium 238	U-238	6.37	1.0	0.26	1.0		U
Plutonium 238	13981-16-3	0.710	0.32	0.30	1.0	J	PU
Plutonium 239/240	PU-239/240	9.86	1.5	0.30	1.0		PU
Americium 241	14596-10-2	3.66	1.1	0.60	1.0		AM
Potassium 40	13966-00-2	U		180		U	GAM
Cobalt 60	10198-40-0	41.0	9.4	9.9	25		GAM
Barium 133	13981-41-4	U		12		U	GAM
Cesium 137	10045-97-3	1460	26	14	15		GAM
Radium 226	13982-63-3	U		21		U	GAM
Radium 228	15262-20-1	U		56		U	GAM
Europium 152	14683-23-9	206	32	39	50		GAM
Europium 154	15585-10-1	35.0	22	27	50	J	GAM
Europium 155	14391-16-3	U		29	50	U	GAM
Thorium 228	14274-82-9	U		14		U	GAM
Thorium 232	TH-232	U		56		U	GAM
Uranium 235	15117-96-1	U		40		U	GAM
Uranium 238	U-238	U		1100		U	GAM
Americium 241	14596-10-2	U		40		U	GAM

105F & 105DR LWTF Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

Test AM Matrix WATER
SDG 7618
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN WATER
ALPHA SPECTROSCOPY

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1223

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 6963-099					
B118V7	R101133-01			7618-001	6.66
B118V9	R101133-02			7618-002	3.66
BLK (QC ID=37403)	R101133-04			7618-004	0.317 J
LCS (QC ID=37402)	R101133-03			7618-003	ok
Duplicate (R101133-01)	R101133-05			7618-005	ok
Nominal values and limits from method 105F & 105DR LWTF Sampling				RDLs (pCi/L)	1.0

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-099 2σ prep error 5.0 % Reference Lab Notebook 6963 pg. 099																
B118V7	R101133-01			0.29	0.500			48		131			8	01/30/01	01/31	SS-038
B118V9	R101133-02			0.60	0.300			76		106			7	01/30/01	01/30	SS-019
BLK (QC ID=37403)	R101133-04			0.22	0.300			81		168				01/30/01	01/31	SS-027
LCS (QC ID=37402)	R101133-03			0.46	0.300			81		106				01/30/01	01/30	SS-021
Duplicate (R101133-01) (QC ID=37404)	R101133-05			0.24	0.500			83		105			7	01/30/01	01/30	SS-023
Nominal values and limits from method				1.0	0.300			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-040	Environmental Water Dissolution, rev 3
	CP-940	Plutonium Separation and Purification, rev 2
	CP-960	Americium-Curium Purification, Large Aliquot, rev 4
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES				
	MDA	0.36	±	0.33
	YIELD	74	±	29

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

Test	PU
Matrix	WATER
SDG	7618
Contact	Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN WATER

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRC-SBB-207925
Contract	SDG H1223

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 6963-099						
B118V7	R101133-01			7618-001	0.538 J	17.0
B118V9	R101133-02			7618-002	0.710 J	9.86
BLK (QC ID=37403)	R101133-04			7618-004	U	U
LCS (QC ID=37402)	R101133-03			7618-003	ok	ok
Duplicate (R101133-01)	R101133-05			7618-005	ok J	ok
Nominal values and limits from method				RDLs (pCi/L)	1.0	1.0
105F & 105DR LWTF Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-099	2σ prep error 5.0 %			Reference Lab Notebook 6963 pg. 099												
B118V7	R101133-01			0.26	0.500			51		131			8	01/30/01	01/31	SS-035
B118V9	R101133-02			0.30	0.300			80		131			8	01/30/01	01/31	SS-036
BLK (QC ID=37403)	R101133-04			0.36	0.300			53		157				01/30/01	02/01	SS-035
LCS (QC ID=37402)	R101133-03			0.28	0.300			94		109				01/30/01	01/30	SS-031
Duplicate (R101133-01) (QC ID=37404)	R101133-05			0.21	0.500			75		109			7	01/30/01	01/30	SS-035
Nominal values and limits from method				1.0	0.300			20-105		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-040	Environmental Water Dissolution, rev 3
	CP-940	Plutonium Separation and Purification, rev 2
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES				
MDA	0.28	±	0.11
YIELD	71	±	37

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	02/09/01

Test U Matrix WATER
SDG 7618
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

METHOD SUMMARY

URANIUM, ISOTOPIC IN WATER
ALPHA SPECTROSCOPY

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1223

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 6963-099											
B118V7	R101133-01			7618-001	5.86	0.682 J	5.38	109	21	13	5
B118V9	R101133-02			7618-002	6.20	0.461 J	6.37	97	22	7	4
BLK (QC ID=37402)	R101133-04			7618-004	U	U	U				
LCS (QC ID=37402)	R101133-03			7618-003	ok	ok	ok				
Duplicate (R101133-01)	R101133-05			7618-005	ok	ok J	ok	114	23	11	4
Nominal values and limits from method				RDLs (pCi/L)	1.0	1.0	1.0	100		4	
105F & 105DR LWTF Sampling								Averages 107		10	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-099	2σ prep error 5.0 %			Reference Lab Notebook 6963 pg. 099												
B118V7	R101133-01			0.25	0.500			104		109			7	01/26/01	01/30	SS-034
B118V9	R101133-02			0.32	0.300			109		109			7	01/26/01	01/30	SS-036
BLK (QC ID=37402)	R101133-04			0.39	0.300			86		109				01/26/01	01/30	SS-038
LCS (QC ID=37402)	R101133-03			0.55	0.300			90		729				01/26/01	02/02	SS-041
Duplicate (R101133-01) (QC ID=37402)	R101133-05			0.23	0.500			93		104			14	01/26/01	02/06	SS-044
Nominal values and limits from method				1.0	0.300			30-105		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-040	Environmental Water Dissolution, rev 3
	CP-910	Uranium Purification, rev 2
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.35 ± 0.26
YIELD 96 ± 19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

METHOD SUMMARY

TOTAL STRONTIUM IN WATER

BETA COUNTING

Test SR Matrix WATER
SDG 7618
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1223

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6963-099					
B118V7	R101133-01			7618-001	18200
B118V9	R101133-02			7618-002	18300
BLK (QC ID=37403)	R101133-04			7618-004	U
LCS (QC ID=37402)	R101133-03			7618-003	ok
Duplicate (R101133-01)	R101133-05			7618-005	ok
Nominal values and limits from method				RDLs (pCi/L)	2.0
105F & 105DR LWTF Sampling					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-099	2σ prep error 10.0 % Reference Lab Notebook 6963 pg. 099															
B118V7	R101133-01			0.33	0.500			94		100			6	01/29/01	01/29	GRB-203
B118V9	R101133-02			0.39	0.300			91		200			6	01/29/01	01/29	GRB-218
BLK (QC ID=37403)	R101133-04			0.89	0.300			90		100				01/29/01	01/29	GRB-230
LCS (QC ID=37402)	R101133-03			0.82	0.300			90		97				01/29/01	01/29	GRB-202
Duplicate (R101133-01) (QC ID=37404)	R101133-05			0.45	0.500			94		100			6	01/29/01	01/29	GRB-204
Nominal values and limits from method				2.0	0.300					100			180			

PROCEDURES REFERENCE SRTOT_SEP_PRECIP_GPC
CP-501 Strontium in Water Samples, rev 1

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.58 ± 0.52
YIELD 92 ± 4

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

Test	GAM
Matrix	WATER
SDG	7618
Contact	Melissa C. Mannion

METHOD SUMMARY

GAMMA EMITTERS

GAMMA SCAN

Client	Hanford
Contract	TRC-SBB-207925
Contract	SDG H1223

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6963-099						
B118V7	R101133-01			7618-001	39.6	1410
B118V9	R101133-02			7618-002	41.0	1460
BLK (QC ID=37403)	R101133-04			7618-004	U	U
LCS (QC ID=37402)	R101133-03			7618-003	ok	ok
Duplicate (R101133-01)	R101133-05			7618-005	ok	ok
Nominal values and limits from method				RDLs (pCi/L)	25	15
105F & 105DR LWTF Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-099	2σ prep error 15.0 %			Reference Lab Notebook 6963 pg. 099												
B118V7	R101133-01			12	0.500					1651			3	01/26/01	01/26	01,01,00
B118V9	R101133-02			14	0.500					1651			3	01/26/01	01/26	01,03,00
BLK (QC ID=37403)	R101133-04			5.3	0.500					1651				01/26/01	01/26	MB,05,00
LCS (QC ID=37402)	R101133-03			6.8	0.500					1651				01/26/01	01/26	01,04,00
Duplicate (R101133-01) (QC ID=37404)	R101133-05			18	0.500					1079			6	01/26/01	01/29	01,03,00
Nominal values and limits from method				15	0.500					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 2

AVERAGES ± 2 SD	MDA	11	± 10
FOR 5 SAMPLES	YIELD		±

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	02/09/01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

Test	C
Matrix	WATER
SDG	7618
Contact	Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN WATER

LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	TRC-SBB-207925
Contract	SDG H1223

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 6963-099						
B118V7	R101133-01			7618-001	1080	
B118V9	R101133-02			7618-002	630	
BLK (QC ID=37403)	R101133-04			7618-004	U	
LCS (QC ID=37402)	R101133-03			7618-003	LOW	
Duplicate (R101133-02)	R101133-07			7618-007	ok	
Spike (R101133-02)	R101133-08			7618-008	LOW	X
Nominal values and limits from method				RDLs (pCi/L)	200	
105F & 105DR LWTF Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-099	2σ prep error 10.0 %				Reference Lab Notebook 6963 pg. 099											
B118V7	R101133-01			32	0.0300			100		200			6	01/26/01	01/29	LSC-004
B118V9	R101133-02			44	0.0300			100		100			6	01/26/01	01/29	LSC-004
BLK (QC ID=37403)	R101133-04			45	0.0300			100		100				01/26/01	01/29	LSC-004
LCS (QC ID=37402)	R101133-03			56	0.0300			100		73				01/26/01	01/29	LSC-004
Duplicate (R101133-02) (QC ID=37510)	R101133-07			33	0.0300			100		200			6	01/26/01	01/29	LSC-004
Spike (R101133-02) (QC ID=37511)	R101133-08			120	0.0200			100		32			6	01/26/01	01/29	LSC-004
Nominal values and limits from method				200	0.0300					50			180			

PROCEDURES	REFERENCE	C14_CHEM_LSC
	CP-241	Carbon-14 in Aqueous Samples, rev 2

AVERAGES ± 2 SD FOR 6 SAMPLES				
MDA	55	±	66
YIELD	100	±	0

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	02/09/01

Test H Matrix WATER
SDG 7618
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

METHOD SUMMARY

TRITIUM IN WATER

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1223

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium
Preparation batch 6963-099					
B118V7	R101133-01			7618-001	1640000
B118V9	R101133-02			7618-002	1560000
BLK (QC ID=37403)	R101133-04			7618-004	U
LCS (QC ID=37402)	R101133-03			7618-003	ok
Duplicate (R101133-01)	R101133-05			7618-005	ok

Nominal values and limits from method RDLs (pCi/L) 400
105F & 105DR LWTF Sampling

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-099	2σ prep error 10.0 % Reference Lab Notebook 6963 pg. 099															
B118V7	R101133-01			1100	0.0100			100		4			4	01/26/01	01/27	LSC-007
B118V9	R101133-02			1000	0.0100			100		4			4	01/26/01	01/27	LSC-007
BLK (QC ID=37403)	R101133-04			1900	0.0100			10		100				01/26/01	01/28	LSC-007
LCS (QC ID=37402)	R101133-03			1900	0.0100			10		100				01/26/01	01/27	LSC-007
Duplicate (R101133-01) (QC ID=37404)	R101133-05			1000	0.0100			100		4			5	01/26/01	01/28	LSC-007
Nominal values and limits from method				400	0.0100					25			180			

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

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 1400 ± 950
YIELD 64 ± 99

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/01

Test NI_L Matrix WATER
SDG 7618
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1223

METHOD SUMMARY

NICKEL-63 IN LIQUID

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract IRC-SBB-207925
Contract SDG H1223

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63
Preparation batch 6963-099					
B118V7	R101133-01			7618-001	2910
B118V9	R101133-02			7618-002	2670
BLK (QC ID=37403)	R101133-04			7618-004	U
LCS (QC ID=37402)	R101133-03			7618-003	ok
Duplicate (R101133-01)	R101133-05			7618-005	ok
Nominal values and limits from method 105F & 105DR LWTF Sampling				RDLs (pCi/L)	15

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6963-099	2σ prep error 10.0 %			Reference Lab Notebook 6963 pg. 099												
B118V7	R101133-01			15	0.200			93		15			6	01/28/01	01/29	LSC-004
B118V9	R101133-02			14	0.200			96		16			6	01/28/01	01/29	LSC-004
BLK (QC ID=37403)	R101133-04			5.6	0.200			94		100				01/28/01	01/29	LSC-004
LCS (QC ID=37402)	R101133-03			6.4	0.200			94		75				01/28/01	01/29	LSC-004
Duplicate (R101133-01) (QC ID=37404)	R101133-05			17	0.200			65		24			6	01/28/01	01/29	LSC-004
Nominal values and limits from method				15	0.200					50			180			

PROCEDURES	REFERENCE	NI63_LSC
	RP-070	Sample Dissolution - HF Method, rev 0
	RP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 12 ± 10
YIELD 88 ± 26

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-04	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler — Telephone No.: 531-0703	Project Coordinator: TRENT, SJ	Price Code: 7K — Data Turnaround: 15 Days
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB H1223 (7618)	SAF No.: B99-031	Air Quality ☐
Ice Chest No.: ERC-96-044	Field Logbook No.: EFL1133-8 — COA: R105E4 J4X0	Method of Shipment: FED EX	
Shipped To: TMA/~~RERA~~ EBERLINC (1-23-01)	Offsite Property No.: AQ 101100	Bill of Lading/Air Bill No.: 4235 7954 1860	

POSSIBLE SAMPLE HAZARDS/REMARKS
≤ Background at 200cpm

Special Handling and/or Storage

Preservation	None	None	ZnAc+NaOH to pH >9 Cool	Cool 4C	HNO3 to pH <2	NaOH to pH >= 12 Cool 4C	Cool 4C	Cooled to 4C	HCl or H2SO4 to pH <2 Coo	HNO3 to pH <2
Type of Container	P	aG	P	P	P	P	aG	aG	aGs*	P
No. of Container(s)	1	1	1	1	1	1	1	2	3	1
Volume	~~60mL~~ 120mL (1-23-01)	250mL	500mL	1000mL	1000mL	~~1000mL~~	1000mL	1000mL	40mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Tritium - H3	Ignitability - 1010	Sulfides - 9030	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Total Cyanide - 9010	Semi-VOA - 8270A (ETF)	PCBs - 8082	VOA - 8260A (ETF)	See item (3) in Special Instructions.
B118V7	WATER	1-23-01	0900	X									X

Deleted 1-25-01

Samples stored in Ref.# 1-A at the 3728 Shipping Facility on 01/23/01.
Collector not available to relinquish samples on 01/24/01 for shipment.

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01 1314	~~Received By~~ Stored in Ref # 1A 3728	1-23-01 1315
Ref 1-A (Removed from)	01-24-01 1000	R. Fahlberg / R. Fahlberg	01-24-01 1000
R. Fahlberg / R. Fahlberg	01-24-01 1300	Fed Ex	01-24-01 1300
FED EXPRESS	1-25-01 10:00	E. Jeguirs	1-25-01 10:00

SPECIAL INSTRUCTIONS
* Close SDG upon receipt of samples.
** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

DET 1-23-01
~~(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040~~
~~(2) ICP Metals - 6010A (Supernate) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)~~
(3) Gamma Spectroscopy(Water) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Barium-133}; Isotopic Plutonium; Isotopic Uranium; ~~Isotopic Thorium;~~ Americium-241; Nickel-63; Strontium-89,90 -- Total Sr; Carbon-14; ~~Neptunium-237~~ DET 1-18-01

TICTO B118V8

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-05	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler — Telephone No.: 531-0703	Project Coordinator: TRENT, SJ	Price Code: 7K — Data Turnaround: 15 Days
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB 41223 (7618)	SAF No.: B99-031	Air Quality ☐
Ice Chest No.: ERC-96-044	Field Logbook No.: EFL1133-8 — COA: B105F4 J4X0	Method of Shipment: FED EX	
Shipped To: TMA/RECRA EBERLINE (10 1-23-01)	Offsite Property No.: A010160	Bill of Lading/Air Bill No.: 4235795 4 1860	

POSSIBLE SAMPLE HAZARDS/REMARKS: ≤ Background at 200cpm

Special Handling and/or Storage

SAMPLE ANALYSIS	VOA - 8260A (ETF)	Tritium - H3	Ignitability - 1010	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Total Cyanide - 9010	Sulfides - 9030	Semi-VOA - 8270A (ETF)	PCBs - 8082	See item (3) in Special Instructions.
Preservation	HCl or H2SO4 to pH <2 Coo	None	None	Cool 4C	HNO3 to pH <2	NaOH to pH >= 12 Cool 4C	ZnAc+NaOH to pH >9 Cool	Cool 4C	Cool 4C	HNO3 to pH <2
Type of Container	~~aGs*~~	P	aG	P	P	P	P	aG	aG	P
No. of Container(s)	~~1~~ 2	1	1	1	1	1	1	1	1	2
Volume	~~40mL~~ 40mL	~~60mL~~ 1000mL 1-24-01	120mL	500mL	500mL	~~500mL~~	500mL	1000mL	1000mL	1000mL

Deleted RT 1-23-01

Sample No.	Matrix *	Sample Date	Sample Time	VOA - 8260A (ETF)	Tritium - H3	Ignitability - 1010	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Total Cyanide - 9010	Sulfides - 9030	Semi-VOA - 8270A (ETF)	PCBs - 8082	See item (3) in Special Instructions.
B118V9	WATER	1-23-01	0900		X								X

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 01/23/01. Collector not available to relinquish samples on 01/24/01 for shipment.

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	Doug Bowers	1-23-01/1315	Received By: Stored in Ref 1A 3728	1-23-01/1315
Relinquished By: Removed from Ref 1A		01-24-01 1000	Received By: R. Fellows / R. Fahlberg	01-24-01 1000
Relinquished By: R. Fellows / R. Fahlberg		01-24-01 1300	Received By: Fed Ex	01-24-01 1300
Relinquished By: FED-EX PP2058		1-25-01 10:A	Received By: E. Aguirre	1-25-01 10:A
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

* Close SDG upon receipt of samples.

** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

RT 1-23-01

~~(1) Tc Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040~~

~~(2) ICP Metals - 6010A (Superfund) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (SV)~~

(3) Gamma Spectroscopy(Water) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Barium-133}; Isotopic Plutonium; Isotopic Uranium; ~~Isotopic Thorium~~; Americium-241; Nickel-63; Strontium-89,90 – Total Sr; Carbon-14; ~~Neptunium - 237~~ RT 1-18-01

TIE TO B118V8

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

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

BHI-EE-011 (10/99)

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: BECHTEL HANFORD INC. Date/Time received 1-25-01 10:[illegible] AM

CoC No. B99-031-05

Container I.D. No. _____ Requested TAT (Days) 15 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 2
7. Number of containers per sample: check (Or see CoC ✓)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by E. Segura Date: 1-25-01 Time: 10:[illegible] AM

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

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

MAR 2001 RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-031 H1223

DATE RECEIVED: 01/25/01 LVL LOT # :0101L837

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B118V7						
CHLORIDE BY IC	001	W	01LIC009	01/23/01	01/31/01	01/31/01
CHLORIDE BY IC	001 REP	W	01LIC009	01/23/01	01/31/01	01/31/01
CHLORIDE BY IC	001 MS	W	01LIC009	01/23/01	01/31/01	01/31/01
FLUORIDE BY IC	001	W	01LIC009	01/23/01	01/31/01	01/31/01
FLUORIDE BY IC	001 REP	W	01LIC009	01/23/01	01/31/01	01/31/01
FLUORIDE BY IC	001 MS	W	01LIC009	01/23/01	01/31/01	01/31/01
NITRITE BY IC	001	W	01LIC009	01/23/01	01/31/01	01/31/01
NITRITE BY IC	001 REP	W	01LIC009	01/23/01	01/31/01	01/31/01
NITRITE BY IC	001 MS	W	01LIC009	01/23/01	01/31/01	01/31/01
NITRATE BY IC	001	W	01LIC009	01/23/01	01/31/01	01/31/01
NITRATE BY IC	001 REP	W	01LIC009	01/23/01	01/31/01	01/31/01
NITRATE BY IC	001 MS	W	01LIC009	01/23/01	01/31/01	01/31/01
TOTAL CYANIDE	001	W	01LC010	01/23/01	02/01/01	02/01/01
TOTAL CYANIDE	001 REP	W	01LC010	01/23/01	02/01/01	02/01/01
SULFATE BY IC	001	W	01LIC009	01/23/01	01/31/01	01/31/01
SULFATE BY IC	001 REP	W	01LIC009	01/23/01	01/31/01	01/31/01
SULFATE BY IC	001 MS	W	01LIC009	01/23/01	01/31/01	01/31/01
IGNITABILITY	001	W	01LFP002	01/23/01	01/31/01	01/31/01
TOTAL ORGANIC CARBON	001	W	01LTC008	01/23/01	02/13/01	02/13/01
TOTAL ORGANIC CARBON	001 REP	W	01LTC008	01/23/01	02/13/01	02/13/01
TOTAL ORGANIC CARBON	001 MS	W	01LTC008	01/23/01	02/13/01	02/13/01
PH	001	W	01LPH007	01/23/01	01/26/01	01/26/01
PH	001 REP	W	01LPH007	01/23/01	01/26/01	01/26/01
SULFIDE	001	W	01LSDA05	01/23/01	01/26/01	01/26/01
SULFIDE	001 REP	W	01LSDA05	01/23/01	01/26/01	01/26/01
SULFIDE	001 MS	W	01LSDA05	01/23/01	01/26/01	01/26/01
SPECIFIC CONDUCTANCE	001	W	01LSP001	01/23/01	02/06/01	02/06/01
SPECIFIC CONDUCTANCE	001 REP	W	01LSP001	01/23/01	02/06/01	02/06/01
TOTAL DISSOLVED SOLI	001	W	01LSSA18	01/23/01	01/29/01	01/30/01
TOTAL DISSOLVED SOLI	001 REP	W	01LSSA18	01/23/01	01/29/01	01/30/01
TOTAL SUSPENDED SOLI	001	W	01LSSB18	01/23/01	01/29/01	01/30/01
TOTAL SUSPENDED SOLI	001 REP	W	01LSSB18	01/23/01	01/29/01	01/30/01
B118V9						
CHLORIDE BY IC	002	W	01LIC009	01/23/01	01/31/01	01/31/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-031 H1223

DATE RECEIVED: 01/25/01 LVL LOT # :0101L837

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
FLUORIDE BY IC	002	W	01LIC009	01/23/01	01/31/01	01/31/01
NITRITE BY IC	002	W	01LIC009	01/23/01	01/31/01	01/31/01
NITRATE BY IC	002	W	01LIC009	01/23/01	01/31/01	01/31/01
TOTAL CYANIDE	002	W	01LC010	01/23/01	02/01/01	02/01/01
SULFATE BY IC	002	W	01LIC009	01/23/01	01/31/01	01/31/01
IGNITABILITY	002	W	01LFP002	01/23/01	01/31/01	01/31/01
TOTAL ORGANIC CARBON	002	W	01LTC008	01/23/01	02/13/01	02/13/01
PH	002	W	01LPH007	01/23/01	01/26/01	01/26/01
SULFIDE	002	W	01LSDA05	01/23/01	01/26/01	01/26/01
SPECIFIC CONDUCTANCE	002	W	01LSP001	01/23/01	02/06/01	02/06/01
TOTAL DISSOLVED SOLI	002	W	01LSSA18	01/23/01	01/29/01	01/30/01
TOTAL SUSPENDED SOLI	002	W	01LSSB18	01/23/01	01/29/01	01/30/01

LAB QC:

CHLORIDE BY IC	MB1	W	01LIC009	N/A	01/31/01	01/31/01
CHLORIDE BY IC	MB1 BS	W	01LIC009	N/A	01/31/01	01/31/01
FLUORIDE BY IC	MB1	W	01LIC009	N/A	01/31/01	01/31/01
FLUORIDE BY IC	MB1 BS	W	01LIC009	N/A	01/31/01	01/31/01
NITRITE BY IC	MB1	W	01LIC009	N/A	01/31/01	01/31/01
NITRITE BY IC	MB1 BS	W	01LIC009	N/A	01/31/01	01/31/01
NITRATE BY IC	MB1	W	01LIC009	N/A	01/31/01	01/31/01
NITRATE BY IC	MB1 BS	W	01LIC009	N/A	01/31/01	01/31/01
TOTAL CYANIDE	LCS L	W	01LC010	N/A	02/01/01	02/01/01
TOTAL CYANIDE	LCS L	W	01LC010	N/A	02/01/01	02/01/01
TOTAL CYANIDE	MB1	W	01LC010	N/A	02/01/01	02/01/01
SULFATE BY IC	MB1	W	01LIC009	N/A	01/31/01	01/31/01
SULFATE BY IC	MB1 BS	W	01LIC009	N/A	01/31/01	01/31/01
TOTAL ORGANIC CARBON	MB1	W	01LTC008	N/A	02/13/01	02/13/01
TOTAL ORGANIC CARBON	MB1 BS	W	01LTC008	N/A	02/13/01	02/13/01
SULFIDE	MB1	W	01LSDA05	N/A	01/26/01	01/26/01
SULFIDE	MB1 BS	W	01LSDA05	N/A	01/26/01	01/26/01
SPECIFIC CONDUCTANCE	MB1	W	01LSP001	N/A	02/06/01	02/06/01
SPECIFIC CONDUCTANCE	MB1 BS	W	01LSP001	N/A	02/06/01	02/06/01
SPECIFIC CONDUCTANCE	MB1 BSD	W	01LSP001	N/A	02/06/01	02/06/01
TOTAL DISSOLVED SOLI	MB1	W	01LSSA18	N/A	01/29/01	01/30/01
TOTAL DISSOLVED SOLI	MB1 BS	W	01LSSA18	N/A	01/29/01	01/30/01
TOTAL DISSOLVED SOLI	MB1 BSD	W	01LSSA18	N/A	01/29/01	01/30/01

N 2/3/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-031 H1223

DATE RECEIVED: 01/25/01 LVL LOT # :0101L837

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
TOTAL SUSPENDED SOLI	MB1	W	01LSSB18	N/A	01/29/01	01/30/01
TOTAL SUSPENDED SOLI	MB1 BS	W	01LSSB18	N/A	01/29/01	01/30/01
TOTAL SUSPENDED SOLI	MB1 BSD	W	01LSSB18	N/A	01/29/01	01/30/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B99-031 H1223
LVL#: 0101L837

W.O.#: 10985-001-001-9999-00
Date Received: 01-25-01

INORGANIC NARRATIVE

As of 27 January 2001, Recra LabNet Philadelphia became Lionville Laboratory Incorporated. Some forms may still reference Recra LabNet Philadelphia.

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

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

3. Sample holding times as required by the method and/or contract were met with the exception of pH, Nitrate and Nitrite that were received past hold.

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

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries were within the 75-125% control limits. Matrix spike analysis was not performed for Total Cyanide as there was insufficient sample volume available.

8. The replicate analyses were within the 20% RPD control limit with the exception of Total Suspended Solids (TS) that was outside the control limit; TSS replicate results were less than 10 times the reporting limit.

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

J. Michael Taylor
President
Lionville Laboratory Incorporated

03-02-01
Date

njp\i01- 837

The results presented in this report relate to the analytical testing and conditions of the samples upon 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 16 pages.

Inorganic Data Summary Report
Physical Testing Observation

Client: TNU-HANFORD B99-031 H1223
LVL#: 0101L837

W.O.#: 10985-001-001-9999-00
Date Received: 01-25-01

Analyte:

Ignitability

Observation:

Samples B118V7 and B118V9 did not ignite.

The samples were heated to 220°F.

p-Xylene was used to determined the accuracy of the ignitability apparatus. The p-Xylene will ignite at 81°F +/- 1°F. For this test, the p-Xylene ignited at 80°F.

njp\i01-837 .pt2

LVLI
LONVILLE LABORATORY INC.

044

Lionville Laboratory, Inc.

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	EPA /600	SW846	OTHER
Acidity	___ 305.1		
___Alkalinity ___Bicarbonate ___Carbonate	___ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chromatography:			
___Bromide ✓Chloride ✓Fluoride	✓ 300.0	___ 9056	
✓Nitrate ✓Nitrite ___Phosphate	✓ 300.0	___ 9056	
✓Sulfate ___Formate ___Acetate ___Oxalate	✓ 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chlorination	___ 335.2	✓ 9010B	
Cyanide, Total	___ 335.2	✓ 9010B ✓ 9014	___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable		___	___ 412 (a) ___ 4500CN-I (b)
COD	___ 410.4(mod)		___ 5220C (b)
Color	___ 110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	___ 340.2		___ 4500-FC
Hardness, Calcium	___ 215.2		
Hardness, Total	___ 130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	___ 425.1		
___Nitrate-Nitrite ___Nitrate ___Nitrite	___ 353.2		
Ammonia	___ 350.3		
Total ___Kjeldahl ___ Organic Nitrogen	___ 351.3		
Total ✓ Organic ___ Inorganic Carbon	✓ 415.1	___ 9060	
Oil & Grease	___ 413.1	___ 9070	
✓ pH ____ pH; paper	___ 150.1	✓ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	___ 418.1		
Phenol	___ 420.1 ___ 420.2	___ 9065 ___ 9066	
___Ortho ___Total Phosphate	___ 365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	___ 160.5		
Sulfide	___ 376.1	✓ 9030B/9034 (acid soluble)	
Reactive ___Cyanide ___Sulfide		___ Section 7.3 (__9014__9030B)	
Silica	___ 370.1		
Sulfite	___ 377.1		
Sulfate	___ 375.4	___ 9038	
Specific Conductance	✓ 120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach		✓ 1312	
Total ✓Dissolved ✓Suspended ___Solids	160 ✓.1	✓.2 ___.3	
Total Organic Halides	___ 450.1	___ 9020B	
Turbidity	___ 180.1		
Volatile Solids:			
__Total __Dissolved __Suspended	___ 160.4		

Other: Ignitability **Method:** SW 1010

L-WI-034/A-01/01

05

~~02~~ 3/2/

Lionville Laboratory, Inc.

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.

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/14/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B118V7	Chloride by IC	67.3	MG/L	5.0	20.0
		Fluoride by IC	1.1	MG/L	1.0	2.0
		Nitrite by IC	5.00 u	MG/L	5.00	20.0
		Nitrate by IC	0.68	MG/L	0.50	2.0
		Cyanide, Total	5.00 u	UG/L	5.00	1.0
		Sulfate by IC	98.6	MG/L	5.0	20.0
		Total Organic Carbon	69.1	MG/L	5.0	10.0
		pH	8.1	PH UNIT	0.01	1.0
		Sulfide	1.0 u	MG/L	1.0	1.0
		Specific Conductance	702	UMHOS/C	1.0	1.0
		Total Dissolved Solids	544	MG/L	5.00	1.0
		Total Suspended Solids	25.0	MG/L	5.00	1.0
-002	B118V9	Chloride by IC	71.3	MG/L	5.0	20.0
		Fluoride by IC	1.1	MG/L	1.0	2.0
		Nitrite by IC	5.00 u	MG/L	5.00	20.0
		Nitrate by IC	0.73	MG/L	0.50	2.0
		Cyanide, Total	5.00 u	UG/L	5.00	1.0
		Sulfate by IC	103	MG/L	5.0	20.0
		Total Organic Carbon	69.5	MG/L	5.0	10.0
		pH	8.1	PH UNIT	0.01	1.0
		Sulfide	1.0 u	MG/L	1.0	1.0
		Specific Conductance	699	UMHOS/C	1.0	1.0
		Total Dissolved Solids	532	MG/L	5.00	1.0
		Total Suspended Solids	35.0	MG/L	5.00	1.0

07
04
2/13/2010

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/14/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LIC009-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK1	01LC010-MB1	Cyanide, Total	5.00 u	UG/L	5.00	1.0
BLANK10	01LTC008-MB1	Total Organic Carbon	0.50 u	MG/L	0.50	1.0
BLANK10	01LSDA05-MB1	Sulfide	1.0 u	MG/L	1.0	1.0
BLANK10	01LSP001-MB1	Specific Conductance	1.0 u	UMHOS/C	1.0	1.0
BLANK10	01LSSA18-MB1	Total Dissolved Solids	5.00 u	MG/L	5.00	1.0
BLANK10	01LSSB18-MB1	Total Suspended Solids	5.00 u	MG/L	5.00	1.0

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65

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 02/14/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B118V7	Chloride by IC	160	67.3	100	93.0	20.0
		Fluoride by IC	24.2	1.1	20.0	115.6	2.0
		Nitrite by IC	98.7	5.00u	100	98.7	20.0
		Nitrate by IC	11.8	0.68	10.0	110.8	2.0
		Sulfate by IC	196	98.6	100	97.7	20.0
		Total Organic Carbon	119	69.1	50.0	100.2	10.0
		Sulfide	9.5	0.50	9.0	100.6	1.0
BLANK10	01LIC009-MB1	Chloride by IC	5.0	0.25u	5.0	100.3	1.0
		Fluoride by IC	11.0	0.50u	10.0	110.3	1.0
		Nitrite by IC	5.21	0.25u	5.00	104.2	1.0
		Nitrate by IC	4.95	0.25u	5.00	99.0	1.0
		Sulfate by IC	5.0	0.25u	5.0	100.5	1.0
BLANK10	01LTC008-MB1	Total Organic Carbon	5.2	0.50u	5.0	104.3	1.0
BLANK10	01LSDA05-MB1	Sulfide	9.4	1.0 u	9.4	100.2	1.0
BLANK10	01LSP001-MB1	Specific Conductance	1410	1.0 u	1410	99.5	1.0
		Spec Conductance MSD	732	1.0 u	717	102.0	1.0
BLANK10	01LSSA18-MB1	Total Dissolved Solids	102	5.00u	100	102.0	1.0
		Total Dissolved Solids	103	5.00u	100	103.0	1.0
BLANK10	01LSSB18-MB1	Total Suspended Solids	95.0	5.00u	100	95.0	1.0
		Total Suspended Solids	106	5.00u	100	106.0	1.0

Lionville Lababoratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 02/14/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	01LSP001-MB1	Specific Conductance	99.5	102.0	2.5
BLANK10	01LSSA18-MB1	Total Dissolved Solids	102.0	103.0	0.98
BLANK10	01LSSB18-MB1	Total Suspended Solids	95.0	106.0	10.9

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 02/14/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B118V7	Chloride by IC	67.3	65.1	3.4	20.0
		Fluoride by IC	1.1	1.1	2.2	2.0
		Nitrite by IC	5.00u	5.00u	NC	20.0
		Nitrate by IC	0.68	0.67	1.5	2.0
		Cyanide, Total	5.00u	5.00u	NC	1.0
		Sulfate by IC	98.6	96.1	2.5	20.0
		Total Organic Carbon	69.1	68.6	0.68	10.0
		pH	8.1	8.1	0.2	1.0
		Sulfide	1.0 u	1.0 u	NC	1.0
		Specific Conductance	702	682	2.9	1.0
		Total Dissolved Solids	544	534	1.9	1.0
		Total Suspended Solids	25.0	19.0	27.3	1.0

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 02/14/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	01LC010-LCS1	Cyanide, Total LCS	20.5	20.0	UG/L	102.4
LCSS2	01LC010-LCS2	Cyanide, Total LCS	94.7	100	UG/L	94.7

RECRA LabNet Use Only

01010837

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client TNU HANFORD SAF # B99-031

Est. Final Proj. Sampling Date

Project # 10985-001-001-999900

Project Contact/Phone #

RECRA Project Manager OJ

QC Spec Del Std TAT 15 day

Date Rec'd 1-25-01 Date Due 2-9-01

Account #

		A-C	DE	FG					H	I	J		K		L	
Refrigerator #		1	6	6					6	6	6		6		6	
#/Type Container	Liquid	3AG	2AG	2AG					1PL	1PL	1PL		1PL		1PL	
	Solid															
Volume	Liquid	40	950	950					1LT	1LT	1LT		500		250	
	Solid															
Preservatives		HCL NaOH	—	—					NaOH	NaOH	—		NaOH		—	
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN	Inorg					

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624N	0625X	0PCB					RCRA TO	ICNTO	Inorg①		ISFD		ETFI
								RECRA LabNet Use Only													
S - Soil	001	B118V7	✓	✓	W	1-23-01	0900	3	2	2					1	1	1		1		1
SE - Sediment	002	1 9			1	1	1	1	1	1					1	1	1		1		1
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																					

[redacted]

O624N - VOA ETF:
Ethyl Cyanide Only
Spectral Search for: 2-pentanone and 1-butanol

Special Instructions: SAF B99-031

Inorg① = ICCL, ICFl, ICNO3, ICNO2, ICSO4, ITDS, ITSS, IOCT, ISPCD, IPH

O625X - BNA ETF:
3 and/or 4 methylphenol
Benzyl Alcohol
1,4-Dichlorobenzene
Spectral search for: tetrahydrofuran

DATE/REVISIONS:

002 1. Letters H, I, J Rec'd 500ml
1 2. Bottle Sizes.
002 3. Letter L Rec'd in 125 Plastic
1 4. For Bottle Size -
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See Below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved TOC TC 1-25-01 (Y) or (N)
5) Received Within Holding Times (Y) or (N) TOC NO3 pH TC 1-25-01

COC Tape was: 1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 3.6 °C 3.6

Relinquished by	Received by	Date	Time
Ed Ep	[signature]	1-25-01	1230 1830 1850

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

4235 7954 1849

1 1850

01012837

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-04	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler — Telephone No.: 531-0703	Project Coordinator: TRENT, SJ	Price Code: 7K — Data Turnaround: 15 Days — Air Quality ☐
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	
Ice Chest No.: ERC 96 036	Field Logbook No.: EFL1133-8 — COA: R105F4J4X0	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: 42357954-1849	

POSSIBLE SAMPLE HAZARDS/REMARKS
≤ Background at 200cpm

Special I: Samples stored in Ref.# 1A at the 3728 Shipping Facility on 01/23/01. Collector not available to relinquish samples on 01/24/01 for shipment..

Preservation	None	H None	E ZnAc+NaOH to pH >9 Cool	F Cool 4C	D HNO3 to pH <2	E NaOH to pH >= 12 Cool 4C	B Cool 4C	E Cooled to 4C	A-D HCl or H2SO4 to pH <2 Coo	HNO3 to pH <2
Type of Container	P	aG	P	P	P	P	aG	aG	aGs*	
No. of Container(s)	1	1	1	1	1	1	2	2	3	1
Volume	250mL	250mL	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Tritium - H3	Ignitability - 1010	Sulfides - 9030	See item (1) in Special Instructions. H	See item (2) in Special Instructions. F	Total Cyanide - 9010	Semi-VOA - 8270A (ETF) EF	PCBs - 8082 GH	VOA - 8260A (ETF) A-D	See item (3) in Special Instructions.
B118V7	WATER	1-23-01	0900		X	X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01 1315	Ref 1A 3728	1-23-01 1315
Relinquished By: Removed from Ref 1A	01-24-01 1000	R. Fallon / R. Fehlberg	01-24-01 1000
R. Fallon / R. Fehlberg	01-24-01 1300	Fed Ex	01-24-01 1300
Fed Ex	1-25-01 1230	[illegible]	1-25-01 1230
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
* Close SDG upon receipt of samples.
** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Sulfate}; TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)
~~(3) Gamma Spectroscopy (Water) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Addition {Barium-133}; Isotopic Plutonium, Isotopic Uranium, Isotopic Thorium, Americium-241, Nickel-63, Strontium-89,90 — Total Sr, Carbon-14, Neptunium~~ 1-18-01

TIE TO B118V8

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-05	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler — Telephone No.: 531-0703	Project Coordinator: TRENT, SJ	Price Code: 7K — Data Turnaround: 15 Days
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	Air Quality ☐
Ice Chest No.: ERC-96-036	Field Logbook No.: EFL1133-8 — COA: R105F4 J4X0	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: 42357954-1849	

POSSIBLE SAMPLE HAZARDS/REMARKS

≤ Background at 200cpm

Samples stored in Ref.# 18 at the 3728 Shipping Facility on 01/23/01. Collector not available to relinquish samples on 01/24/01 for shipment.

Spe

Preservation	HCl or H2SO4 to pH <2 Coo	None	None	Cool 4C	HNO3 to pH <2	NaOH to pH >= 12 Cool 4C	ZnAc+NaOH to pH >9 Cool	Cool 4C	Cooled to 4C	HNO3 to pH <2
Type of Container	aGs*	P*	aG	P	P	P	P	aG	aG	P
No. of Container(s)	1	1	1	1	1	1	1	1	1	2
Volume	40mL	60mL	120mL	500mL	500mL	500mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	VOA - 8260A (ETF)	Tritium - H3	Ignitability - 1010	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Total Cyanide - 9010	Sulfides - 9030	Semi-VOA - 8270A (ETF)	PCBs - 8082	See item (3) in Special Instructions.
B118V9	WATER	1-23-01	0900	X		X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01/1315	A.F. 1A 3728	1-23-01/1315
Ref 18	01-24-01 1000	R. Fellers / R. Fellers	01/24/01 1000
R. Fellers / R. Fellers	01-24-01	Fed Ex	01/24/01 1300
Fed Ex	1-25-01 1230	Uttermadez	1-25-01 1230
		TC 1-25-01	

SPECIAL INSTRUCTIONS

* Close SDG upon receipt of samples.

** While a 15 day turnaround is optional, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)

~~(3) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Strontium-89,90 - Total Sr; Carbon-14; Neptunium-237~~ BS 1-23-01 1-18-01

TIE TO B118V8

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

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

BHI-EE-011 (10/99)

MAR 2001 RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-031 H1223

DATE RECEIVED: 01/25/01 LVL LOT # :0101L837

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B118V7						
SILVER, TOTAL	001	W	01L0035	01/23/01	01/31/01	02/08/01
SILVER, TOTAL	001 REP	W	01L0035	01/23/01	01/31/01	02/08/01
SILVER, TOTAL	001 MS	W	01L0035	01/23/01	01/31/01	02/08/01
ARSENIC, TOTAL	001	W	01L0035	01/23/01	01/31/01	02/08/01
ARSENIC, TOTAL	001 REP	W	01L0035	01/23/01	01/31/01	02/08/01
ARSENIC, TOTAL	001 MS	W	01L0035	01/23/01	01/31/01	02/08/01
BARIUM, TOTAL	001	W	01L0035	01/23/01	01/31/01	02/08/01
BARIUM, TOTAL	001 REP	W	01L0035	01/23/01	01/31/01	02/08/01
BARIUM, TOTAL	001 MS	W	01L0035	01/23/01	01/31/01	02/08/01
CADMIUM, TOTAL	001	W	01L0035	01/23/01	01/31/01	02/08/01
CADMIUM, TOTAL	001 REP	W	01L0035	01/23/01	01/31/01	02/08/01
CADMIUM, TOTAL	001 MS	W	01L0035	01/23/01	01/31/01	02/08/01
CHROMIUM, TOTAL	001	W	01L0035	01/23/01	01/31/01	02/08/01
CHROMIUM, TOTAL	001 REP	W	01L0035	01/23/01	01/31/01	02/08/01
CHROMIUM, TOTAL	001 MS	W	01L0035	01/23/01	01/31/01	02/08/01
MERCURY, TOTAL	001	W	01C0037	01/23/01	01/30/01	01/30/01
MERCURY, TOTAL	001 REP	W	01C0037	01/23/01	01/30/01	01/30/01
MERCURY, TOTAL	001 MS	W	01C0037	01/23/01	01/30/01	01/30/01
LEAD, TOTAL	001	W	01L0035	01/23/01	01/31/01	02/08/01
LEAD, TOTAL	001 REP	W	01L0035	01/23/01	01/31/01	02/08/01
LEAD, TOTAL	001 MS	W	01L0035	01/23/01	01/31/01	02/08/01
SELENIUM, TOTAL	001	W	01L0035	01/23/01	01/31/01	02/08/01
SELENIUM, TOTAL	001 REP	W	01L0035	01/23/01	01/31/01	02/08/01
SELENIUM, TOTAL	001 MS	W	01L0035	01/23/01	01/31/01	02/08/01
B118V9						
SILVER, TOTAL	002	W	01L0035	01/23/01	01/31/01	02/08/01
ARSENIC, TOTAL	002	W	01L0035	01/23/01	01/31/01	02/08/01
BARIUM, TOTAL	002	W	01L0035	01/23/01	01/31/01	02/08/01
CADMIUM, TOTAL	002	W	01L0035	01/23/01	01/31/01	02/08/01
CHROMIUM, TOTAL	002	W	01L0035	01/23/01	01/31/01	02/08/01
MERCURY, TOTAL	002	W	01C0037	01/23/01	01/30/01	01/30/01
LEAD, TOTAL	002	W	01L0035	01/23/01	01/31/01	02/08/01
SELENIUM, TOTAL	002	W	01L0035	01/23/01	01/31/01	02/08/01

LAB QC:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-031 H1223

DATE RECEIVED: 01/25/01 LVL LOT # :0101L837

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILVER LABORATORY	LC1 BS	W	01L0035	N/A	01/31/01	02/08/01
SILVER, TOTAL	MB1	W	01L0035	N/A	01/31/01	02/08/01
ARSENIC LABORATORY	LC1 BS	W	01L0035	N/A	01/31/01	02/08/01
ARSENIC, TOTAL	MB1	W	01L0035	N/A	01/31/01	02/08/01
BARIUM LABORATORY	LC1 BS	W	01L0035	N/A	01/31/01	02/08/01
BARIUM, TOTAL	MB1	W	01L0035	N/A	01/31/01	02/08/01
CADMIUM LABORATORY	LC1 BS	W	01L0035	N/A	01/31/01	02/08/01
CADMIUM, TOTAL	MB1	W	01L0035	N/A	01/31/01	02/08/01
CHROMIUM LABORATORY	LC1 BS	W	01L0035	N/A	01/31/01	02/08/01
CHROMIUM, TOTAL	MB1	W	01L0035	N/A	01/31/01	02/08/01
MERCURY LABORATORY	LC1 BS	W	01C0037	N/A	01/30/01	01/30/01
MERCURY, TOTAL	MB1	W	01C0037	N/A	01/30/01	01/30/01
MERCURY, TCLP LEACHA	MB2	W	01C0037	N/A	01/30/01	01/30/01
LEAD LABORATORY	LC1 BS	W	01L0035	N/A	01/31/01	02/08/01
LEAD, TOTAL	MB1	W	01L0035	N/A	01/31/01	02/08/01
SELENIUM LABORATORY	LC1 BS	W	01L0035	N/A	01/31/01	02/08/01
SELENIUM, TOTAL	MB1	W	01L0035	N/A	01/31/01	02/08/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B99-031
LVL#: 0101L837
SDG/SAF#: H1223/B99-031

W.O.#: 10985-001-001-9999-00
Date Received: 01-25-01

METALS CASE NARRATIVE

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

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

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

4. All cooler temperatures have been recorded on the Chain of Custody.

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

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

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

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

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

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

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

14. As of January 27, 2001, Recra LabNet Philadelphia became Lionville Laboratory Incorporated. Some forms may still reference Recra LabNet Philadelphia.

J. Michael Taylor
President
Lionville Laboratory Incorporated
jjw/m01-837

02-26-01
Date

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0101L837

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: X3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	X6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	X6010B		__200.7				__99
Beryllium	__6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	X6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	X6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	__6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	X6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	X7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	__6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	X6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	X6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	__6010B		__200.7				__99
Zinc	__6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-11/99

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/21/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B118V7	Silver, Total	1.1	u	UG/L	1.1	1.0
		Arsenic, Total	9.4		UG/L	2.4	1.0
		Barium, Total	49.2		UG/L	0.20	1.0
		Cadmium, Total	0.74		UG/L	0.30	1.0
		Chromium, Total	9.9		UG/L	0.60	1.0
		Mercury, Total	1.3		UG/L	0.10	1.0
		Lead, Total	36.5		UG/L	2.1	1.0
		Selenium, Total	3.3	u	UG/L	3.3	1.0
-002	B118V9	Silver, Total	1.1	u	UG/L	1.1	1.0
		Arsenic, Total	9.4		UG/L	2.4	1.0
		Barium, Total	49.2		UG/L	0.20	1.0
		Cadmium, Total	0.78		UG/L	0.30	1.0
		Chromium, Total	10.0		UG/L	0.60	1.0
		Mercury, Total	1.2		UG/L	0.10	1.0
		Lead, Total	35.1		UG/L	2.1	1.0
		Selenium, Total	3.3	u	UG/L	3.3	1.0

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/21/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0035-MB1	Silver, Total	1.1	u	UG/L	1.1	1.0
		Arsenic, Total	2.4	u	UG/L	2.4	1.0
		Barium, Total	0.20	u	UG/L	0.20	1.0
		Cadmium, Total	0.30	u	UG/L	0.30	1.0
		Chromium, Total	0.60	u	UG/L	0.60	1.0
		Lead, Total	2.1	u	UG/L	2.1	1.0
		Selenium, Total	3.3	u	UG/L	3.3	1.0
BLANK1	01C0037-MB1	Mercury, Total	0.10	u	UG/L	0.10	1.0
BLANK2	01C0037-MB2	Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 02/21/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B118V7	Silver, Total	50.2	1.1 u	50.0	100.4	1.0
		Arsenic, Total	2030	9.4	2000	100.9	1.0
		Barium, Total	2010	49.2	2000	97.8	1.0
		Cadmium, Total	49.7	0.74	50.0	98.0	1.0
		Chromium, Total	208	9.9	200	98.8	1.0
		Mercury, Total	2.2	1.3	1.0	89.8	1.0
		Lead, Total	526	36.5	500	97.9	1.0
		Selenium, Total	2020	3.3 u	2000	100.9	1.0

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 02/21/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B118V7	Silver, Total	1.1 u	1.1 u	NC	1.0
		Arsenic, Total	9.4	8.3	12.4	1.0
		Barium, Total	49.2	48.1	2.2	1.0
		Cadmium, Total	0.74	0.56	27.7	1.0
		Chromium, Total	9.9	9.4	5.2	1.0
		Mercury, Total	1.3	1.1	21.3	1.0
		Lead, Total	36.5	35.1	3.9	1.0
		Selenium, Total	3.3 u	3.3 u	NC	1.0

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 02/21/01

CLIENT: TNUHANFORD B99-031 H1223 LVL LOT #: 0101L837

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0035-LC1	Silver, LCS	511	500	UG/L	102.3
		Arsenic, LCS	10200	10000	UG/L	102.3
		Barium, LCS	5040	5000	UG/L	100.8
		Cadmium, LCS	263	250	UG/L	105.2
		Chromium, LCS	518	500	UG/L	103.7
		Lead, LCS	2590	2500	UG/L	103.6
		Selenium, LCS	10200	10000	UG/L	102.4
LCS1	01C0037-LC1	Mercury, LCS	5.2	5.0	UG/L	103.5

RECRA LabNet Use Only

01010837

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU HANFORD SAF # B99-031

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-999900

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: Spec Del: Std TAT: 15 day

Date Rec'd: 1-25-01 Date Due: 2-9-01

Account #:

		A-C	DE	FG					H	I	J		K		L
Refrigerator #		1	6	6					6	6	6		6		6
#/Type Container	Liquid	3AG	2AG	2AG					1PL	1PL	1PL		1PL		1PL
	Solid														
Volume	Liquid	40	950	950					1LT	1LT	1LT		500		250
	Solid														
Preservatives		NEC #2SO4	—	—					HNO3	HNO3	—		NaOH		—
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: Metal	CN	IC Anions		Alkalinity		
RECRA LabNet Use Only		0624N	0625X	0PCB					RCRA TO	ICNTO	IONI		TSTD		TOTH Plastic

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624N	0625X	0PCB					RCRA TO	ICNTO	IONI		TSTD		TOTH Plastic
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	001	B118V7	✓	✓	W	1-23-01	0900	3	2	2					1	1	1		1		1
	002	1 9			1	1	1	1	1	1					1	1	1		1		1

O624N - VOA ETF:
Ethyl Cyanide Only
Spectral Search for: 2-pentanone and 1-butanol

Special Instructions: SAF B99-031

Inorg(1) - ICCL, ICFl, ICNO3, ICNO2, ICSO4, ITDS, ITSS, IOCT, ISPCD, IPH

O625X - BNA ETF:
3 and/or 4 methylphenol
Benzyl Alcohol
1,4-Dichlorobenzene
Spectral search for: tetrahydrofuran

DATE/REVISIONS:

002 1. Letters H, I, J Rec'd 500ml
1 2. Bottle Sizes.
002 3. Letter L Rec'd in 125 Plastic
1 4. For Bottle Size -
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See Below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or (N) TOC
5) Received Within Holding Times (Y) or (N) NO2 NO3

COC Tape was: 1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 3.6 °C
3.6

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	1-25-01	1230 1230 1250

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 1849

1 1850

0101L837

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-04	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler — Telephone No.: 531-0703	Project Coordinator: TRENT, SJ	Price Code: 7K — Data Turnaround: 15 Days — Air Quality ☐
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	
Ice Chest No.: ERC 96 036	Field Logbook No.: EFL1133-8 — COA: R105F4J4X0	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: 42357954-1849	

POSSIBLE SAMPLE HAZARDS/REMARKS
≤ Background at 200cpm

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 01/23/01.
Special I: Collector not available to relinquish samples on 01/24/01 for shipment..

Preservation	None	H: None	G: ZnAc+NaOH to pH >9 Cool	F: Cool 4C	D: HNO3 to pH <2	E: NaOH to pH >= 12 Cool 4C	B: Cool 4C	C: Cooled to 4C	A-D: HCl or H2SO4 to pH <2 Coo	HNO3 to pH <2
Type of Container	P	aG	P	P	P	P	aG	aG	aGs*	
No. of Container(s)		1	1	1	1	1	2	2	3	
Volume	500mL	250mL	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL	1000mL

SAMPLE ANALYSIS

	Tritium - H3	Ignitability - 1010	Sulfides - 9030	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Total Cyanide - 9010	Semi-VOA - 8270A (ETF)	PCBs - 8082	VOA - 8260A (ETF)	See item (3) in Special Instructions.
				H	F		EF	6H	A-D	

Sample No.	Matrix *	Sample Date	Sample Time										
B118V7	WATER	1-23-01	0900		X	X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01 1315	Ref 1A 3728	1-23-01 1315
Removed from Ref 1A	01-24-01 1000	R. Fellows / R. Fellows	01-24-01 1000
R. Fellows / R. Fellows	01-24-01 1300	Fed Ex	01-24-01 1300
Fed Ex	1-25-01 1230	[illegible]	1-25-01 1230

SPECIAL INSTRUCTIONS
* Close SDG upon receipt of samples.
** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)
~~(3) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Antimony (Bismuth-133); Isotopic Plutonium, Isotopic Uranium, Isotopic Thorium, Americium-241, Nickel-63, Strontium-89,90 - Total Sr, Carbon-14, Neptunium-237~~ A10
RF 1-23-01 1-18-01
TIE TO B118V8

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-05	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler	Telephone No.: 531-0703	Project Coordinator: TRENT, SJ
Price Code: 7K	Data Turnaround: 15 Days	Air Quality ☐	
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	
Ice Chest No.: ERC-96-036	Field Logbook No.: EFL1133-8	COA: R105F4 J4X0	Method of Shipment: FED EX
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: H2357954-1849	

POSSIBLE SAMPLE HAZARDS/REMARKS
≤ Background at 200cpm

Samples stored in Ref.# 18 at the 3728 Shipping Facility on 01/23/01. Collector not available to relinquish samples on 01/24/01 for shipment.

Spe

Preservation	HCl or H2SO4 to pH <2 Coo	None	None	Cool 4C	HNO3 to pH <2	NaOH to pH >= 12 Cool 4C	ZnAc+NaOH to pH >9 Cool	Cool 4C	Cooled to 4C	HNO3 to pH <2
Type of Container	aGs*	P	aG	P	P	P	P	aG	aG	P
No. of Container(s)	1	1	1	1	1	1	1	1	1	2
Volume	40mL	60mL	120mL	500mL	500mL	500mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	VOA - 8260A (ETF)	Tritium - H3	Ignitability - 1010	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Total Cyanide - 9010	Sulfides - 9030	Semi-VOA - 8270A (ETF)	PCBs - 8082	See item (3) in Special Instructions.
B118V9	WATER	1-23-01	0900	X		X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01 1315	A.F. 1A 3728	1-23-01 1315
Ref 1A	01-24-01 1000	R. Fell / R. Fellows	01/24/01 1000
R. Fell / R. Fellows	01-24-01 1300	Fed Ex	01/24/01 1300
Fed Ex	1-25-01 1230	Uthmade Z	1-25-01 1230
		TC 1-25-01	

SPECIAL INSTRUCTIONS
* Close SDG upon receipt of samples.
** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Sulfate}; TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7470 - (CV)
~~(3) Gamma Spectroscopy(Water) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add on {Barium-133}; Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Strontium-89,90 - Total Sr; Carbon-14; Neptunium-237~~ 1-18-01
RT 1-23-01

TIE TO B118V8

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

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

BHI-EE-011 (10/99)

Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-031 H1223

DATE RECEIVED: 01/25/01 RFW LOT # :0101L837

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B118V7	001	W	01LE0099	01/23/01	01/29/01	02/08/01
B118V7	001 MS	W	01LE0099	01/23/01	01/29/01	02/08/01
B118V7	001 MSD	W	01LE0099	01/23/01	01/29/01	02/08/01
B118V9	002	W	01LE0099	01/23/01	01/29/01	02/08/01

LAB QC:

PBLKNN	MB1	W	01LE0099	N/A	01/29/01	02/08/01
PBLKNN	MB1 BS	W	01LE0099	N/A	01/29/01	02/08/01

MAR 2001
RECEIVED

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD B99-031
LVL#: 0101L837
SDG/SAF#: H1223/B99-031

W.O.#: 10985-001-001-9999-00
Date Received: 01-25-01

PCB

The set of samples consisted of two (2) water samples collected on 01-23-01.

The samples and their associated QC samples were extracted on 01-29-01 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 02-08-01. The extraction procedure was based on method 3520 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. All cooler temperatures have 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 cleanup.

4. The method blank was below the reporting limits for all target compounds.

5. Three (3) of twelve (12) surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).

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.

10. As of January 27, 2001, Recra Labnet Philadelphia became Lionville Laboratory Incorporated. Some forms may still reference Recra Labnet Philadelphia.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

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

J. Michael Taylor
President
Lionville Laboratory Incorporated

02-14-9
Date

pef\r:\group\data\pest\01L-837.pcb

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.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 02/12/01 18:00

RFW Batch Number: **0101L837** Client: **TNUHANFORD B99-031 H1223** Work Order: 10985001001 Page: 1

9

	Cust ID:	B118V7	B118V7	B118V7	B118V9	PBLKNN	PBLKNN BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	01LE0099-MB1	01LE0099-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate:	Tetrachloro-m-xylene	105 %	122 %	98 %	152 * %	142 * %	138 * %
	Decachlorobiphenyl	87 %	69 %	67 %	92 %	113 %	97 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		1.0 U	2.2 U	2.2 U	1.0 U	1.0 U	1.0 U
Aroclor-1221		2.0 U	4.3 U	4.3 U	2.0 U	2.0 U	2.0 U
Aroclor-1232		1.0 U	2.2 U	2.2 U	1.0 U	1.0 U	1.0 U
Aroclor-1242		1.0 U	2.2 U	2.2 U	1.0 U	1.0 U	1.0 U
Aroclor-1248		1.0 U	2.2 U	2.2 U	1.0 U	1.0 U	1.0 U
Aroclor-1254		1.0 U	56 %	58 %	1.0 U	1.0 U	66 %
Aroclor-1260		1.0 U	2.2 U	2.2 U	1.0 U	1.0 U	1.0 U

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 Use Only

01010837

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TWU HANFORD SAF # B99-031

Est. Final Proj. Sampling Date

Project # 110985-001-001-9999-00

Project Contact/Phone #

RECRA Project Manager OJ

QC Spec Del Std TAT 15 day

Date Rec'd 1-25-01 Date Due 2-9-01

Account #

		A-C	DE	FG					H	I	J		K		L
Refrigerator #		1	6	6					6	6	6		6		6
#/Type Container	Liquid	3AG	2AG	2AG					1PL	1PL	1PL		1PL		1PL
	Solid														
Volume	Liquid	40	950	950					1LT	1LT	1LT		500		250
	Solid														
Preservatives		HCL 4°C	—	—					HNO3	HNO3	—		NaOH HNO3		—
ANALYSES REQUESTED →		ORGANIC							INORG						
		VOA	BNA	Pest/PCB	Herb				Metal	CN	Inorg (1)		Polychlorinated		
		RECRA LabNet Use Only													
		0624N	0625X	0PCB					RCRATO	ICNTO	Inorg (1)		ISFD		2,4,6-TCP

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624N	0625X	0PCB	RCRATO	ICNTO	Inorg (1)	ISFD	2,4,6-TCP
001	B118V7	✓	✓	W	1-23-01	0900	3	2	2	1	1	1	1	1
002	1 9			1	1	1	1	1	1	1	1	1	1	1
	[redacted]													

O624N - VOA ETF:
Ethyl Cyanide Only
Spectral Search for: 2-pentanone and 1-butanol

Special Instructions: SAF B99-031

Inorg (1) - ICCL, ICFl, ICNO3, ICNO2, ICSO4, ITDS, ITSS, IOCT, ISPCD, IPH

O625X - BNA ETF:
3 and/or 4 methylphenol
Benzyl Alcohol
1,4-Dichlorobenzene
Spectral search for: tetrahydrofuran

DATE/REVISIONS:

002 1. Letters H, I, J Rec'd 500ml
1 2. Bottle Sizes.
002 3. Letter L Rec'd in 125 Plastic
1 4. For Bottle Size -
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
Airbill # See Below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or (N) TOC
5) Received Within Holding Times (Y) or (N) NO2 NO3

COC Tape was: 1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 3.6 °C

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 4235 7954 1849

Relinquished by	Received by	Date	Time
[signature]	[signature]	1-25-01	1030 1030 1350

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

1 1850

0101L837

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-04	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler — Telephone No.: 531-0703	Project Coordinator: TRENT, SJ	Price Code: 7K — Data Turnaround: 15 Days ∞
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	Air Quality ☐
Ice Chest No.: ERC 96 036	Field Logbook No.: EFL1133-8 — COA: R105F4J4X0	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: 42357954-1849	

RJ 1-23-01

POSSIBLE SAMPLE HAZARDS/REMARKS

≤ Background at 200cpm

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 01/23/01.

Special I: Collector not available to relinquish samples on 01/24/01 for shipment..

Preservation	None	None	ZnAc+NaOH to pH >9 Cool	Cool 4C	HNO3 to pH <2	NaOH to pH >= 12 Cool 4C	Cool 4C	Cooled to 4C	HCl or H2SO4 to pH <2 Coo	HNO3 to pH <2
	H	G	F	D	E	B	E	AD		
Type of Container	P	sG	P	P	P	P	sG	sG	sGs*	P
No. of Container(s)	1	1	1	1	1	1	2	2	3	1
Volume	250mL	250mL	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL	100mL
SAMPLE ANALYSIS	Tritium - H3	Ignitability - 1010	Sulfides - 9030	See item (1) in Special Instructions. H	See item (2) in Special Instructions. F	Total Cyanide - 9010	Semi-VOA - 8270A (ETF) EF	PCBs - 8082 GH	VOA - 8260A (ETF) A-D	See item (3) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time									
B118V7	WATER	1-23-01	0900		X	X	X	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By: Doug Bowers	Doug Bowers	1-23-01 1315	Received By: R.of 1A 3728	1-23-01 1315
Relinquished By: Remarc of Fed Ex	Ref 1A	01-24-01 1000	Received By: R. Fahlberg / R. Fahlberg	01-24-01 1000
Relinquished By: R. Fahlberg / R. Fahlberg		01-24-01 1300	Received By: Fed Ex	01-24-01 1300
Relinquished By: Fed Ex		1-25-01 1230	Received By: [illegible]	1-25-01 1231
Relinquished By		Date/Time	Received By	Date/Time
Relinquished By		Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

* Close SDG upon receipt of samples.

** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)

~~(3) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Strontium-89,90 — Total Sr; Carbon-14; Neptunium-237~~ RJ 1-20

BT 1-23-01 1-18-01

TIE TO B118V8

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-05	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler — Telephone No.: 531-0703	Project Coordinator: TRENT, SJ	Price Code: 7K — Data Turnaround: 15 Days
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	Air Quality ☐
Ice Chest No.: ERC-96-036	Field Logbook No.: EFL1133-8 — COA: R105F4 J4X0	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: 42357954-1849	

POSSIBLE SAMPLE HAZARDS/REMARKS
≤ Background at 200cpm

Samples stored in Ref.# 118 at the 3728 Shipping Facility on 01/23/01. Collector not available to relinquish samples on 01/24/01 for shipment.

Preservation	HCl or H2SO4 to pH <2 Cool	None	None	Cool 4C	HNO3 to pH <2	NaOH to pH >= 12 Cool 4C	ZnAc+NaOH to pH >9 Cool	Cool 4C	Cooled to 4C	HNO3 to pH <2
Type of Container	aGs*	P	aG	P	P	P	P	aG	aG	P
No. of Container(s)	1	1	1	1	1	1	1	1	1	2
Volume	40mL	60mL	120mL	500mL	500mL	500mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	VOA - 8260A (ETF)	Tritium - H3	Ignitability - 1010	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Total Cyanide - 9010	Sulfides - 9030	Semi-VOA - 8270A (ETF)	PCBs - 8082	See item (3) in Special Instructions.
B118V9	WATER	1-23-01	0900	X		X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01/1315	A.F. 1A 3728	1-23-01/1315
Renee Atwin	01-24-01 1000	R. Fallers	01/24/01 1000
R. Fallers / R. Fallers	01-24-01 1300	Fed Ex	01/24/01 1300
Fed Ex	1-25-01 1230	Uthmadez	1-25-01 1230
		TK 1-25-01	

SPECIAL INSTRUCTIONS

* Close SDG upon receipt of samples.

** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)

~~(3) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Strontium-89,90 — Total Sr; Carbon-14; Neptunium-237~~ RS 1-23-01 1-18-01

TIE TO B118V8

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 1-25-01 1230

SDG#: 0101L837

Work Order Number: _____ SAF# B99-031

Shipping Container ID: ERC-96-036 Chain of Custody # _____

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

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

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

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

Sample Custodian/Laboratory: [signature] Date: 1-25-01

Telephoned to: _____ On _____ By _____

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-031 H1223

DATE RECEIVED: 01/25/01 LVL LOT # :0101L837

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B118V7	001	W	01LE0098	01/23/01	01/29/01	02/15/01
B118V7	001 MS	W	01LE0098	01/23/01	01/29/01	02/15/01
B118V7	001 MSD	W	01LE0098	01/23/01	01/29/01	02/15/01
B118V9	002	W	01LE0098	01/23/01	01/29/01	02/15/01
LAB QC:						
SBLKPU	MB1	W	01LE0098	N/A	01/29/01	02/15/01
SBLKPU	MB1 BS	W	01LE0098	N/A	01/29/01	02/15/01

MAR 2001 RECEIVED

01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B99-031
RFW #: 0101L837
SDG/SAF #: H1223/B99-031

W.O. #: 10985-001-001-9999-00
Date Received: 01-25-2001

SEMIVOLATILE

Two (2) water samples were collected on 01-23-2001.

The samples and their associated QC samples were extracted on 01-29-2001 and analyzed according to criteria set forth in Lionville laboratory OPs based on SW 846 Method 8270C for client specified Semivolatile target compounds on 02-15-2001.

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. Samples were extracted and analyzed within required holding times.

3. Nine (9) of thirty-six (36) surrogate recoveries were outside EPA QC limits. The surrogate recovery criteria were not met for samples B118V9, B118V7 MS and the method blank spike 01LE0098-MB1 BS. The spike recoveries indicated that the surrogate compounds were improperly spiked. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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

   Three (3) of eleven (11) blank spike recoveries were outside EPA QC limits.

   The target compounds are not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.)

5. Internal standard area and retention time criteria were met.

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

7. As of January 27, 2001, Recra LabNet Philadelphia became Lionville Laboratory Incorporated. Some Forms may still reference Recra LabNet Philadelphia.

Stephen D. Wesson
Laboratory Manager
Lionville Laboratory Incorporated

03-16-01
Date

som\gorup\data\bna\tnu-hanford-0101-837.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 1 pages.

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

Lionville Laboratory Sample Discrepancy Report (SDR) SDR #: 01MS103

Initiator: S Layman Batch: 0101L837 Parameter: ~~TOC~~ BNA
Date: 2-16-01 Samples: Matrix: water
Client: TNU Hunted Method: SW846/MCAWW/CLP/ Prep Batch: 01LE009P

1. Reason for SDR

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

b. General Discrepancy

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

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

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

Blank spike - surrogates, spikes Fail low MS-2BN surr, 3 BN spikes low
MSD - all spikes OK, 002 - 2 BN surrogates low

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description: narrate QC issues.

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
✓ ~~Re-extract~~ GT 3/13/01 narrate 002 GT 3/13/01
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

4. Project Manager Instructions...signature/date: [signature] 2/20/01

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

5. Final Action...signature/date: GT 3/13/01 Other Explanation:

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

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

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

L-WI-006/E-01/01

GLOSSARY OF BNA DATA

DATA QUALIFIERS

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

mmz\10-94\gloss.bna

GLOSSARY OF BNA DATA

ABBREVIATIONS

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

mmz\10-94\gloss.bna

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

Report Date: 03/16/01 09:12

RFW Batch Number: **0101L837** Client: **TNUHANFORD B99-031 H1223** Work Order: 10985001001 Page: 1a

	Cust ID:	B118V7	B118V7	B118V7	B118V9	SBLKPU	SBLKPU BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	01LE0098-MB1	01LE0098-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate Recovery	Phenol-d5	68 %	33 %	49 %	31 %	94 %	13 %
	2-Fluorophenol	62 %	30 %	44 %	28 %	99 %	14 * %
	2,4,6-Tribromophenol	100 %	48 %	76 %	53 %	120 %	19 %
	Nitrobenzene-d5	70 %	31 * %	48 %	30 * %	96 %	14 * %
	2-Fluorobiphenyl	56 %	25 * %	38 * %	23 * %	73 %	9 * %
	p-Terphenyl-d14	58 %	40 %	58 %	35 %	121 %	18 * %
		fl	fl	fl	fl	fl	fl
1,4-Dichlorobenzene		10 U	19 * %	37 %	10 U	10 U	32 * %
Benzyl alcohol		10 U	22 U	22 U	10 U	10 U	10 U
3 and/or 4-Methylphenol		10 U	22 U	22 U	10 U	10 U	10 U
2-Methylphenol		10 U	22 U	22 U	10 U	10 U	10 U
Naphthalene		10 U	22 U	22 U	10 U	10 U	10 U
Hexachloroethane		10 U	22 U	22 U	10 U	10 U	10 U
Di-n-Octyl phthalate		10 U	22 U	22 U	10 U	10 U	10 U
N-Nitrosodimethylamine		10 U	22 U	22 U	10 U	10 U	10 U
Acetophenone		10 U	22 U	22 U	10 U	10 U	10 U
Tributylphosphate		10 U	22 U	22 U	10 U	10 U	10 U

*= Outside of EPA CLP QC limits.

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 0985-01-01

Case No.: TNUHANFORD B99-031 H1223 RFW Lot No.: 0101L837-001

MATRIX Spike - Sample No.: B118V7 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	MS CONCENTRATION UG/L	MS % REC #	QC LIMITS REC
Phenol	162	0	47.8	30	12 -110
2-Chlorophenol	162	0	48.6	30	27 -123
1,4-Dichlorobenzene	108	0	20.2	19 *	36 - 97
N-Nitroso-di-n-propylamine	108	0	34.4	32 *	41 -116
1,2,4-Trichlorobenzene	108	0	21.9	20 *	39 - 98
4-Chloro-3-methylphenol	162	0	63.5	39	23 - 97
Acenaphthene	108	0	27.6	26 *	46 -118
4-Nitrophenol	162	0	71.5	44	10 - 80
2,4-Dinitrotoluene	108	0	40.7	38	24 - 96
Pentachlorophenol	162	0	65.3	40	9 -103
Pyrene	108	0	37.2	34	26 -127

COMPOUND	SPIKE ADDED UG/L	MSD CONCENTRATION UG/L	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Phenol	162	87.4	54	57 *	42	12 -110
2-Chlorophenol	162	88.7	55	59 *	40	27 -123
1,4-Dichlorobenzene	108	39.9	37	64 *	28	36 - 97
N-Nitroso-di-n-propylamine	108	63.0	58	57 *	38	41 -116
1,2,4-Trichlorobenzene	108	43.9	41	70 *	28	39 - 98
4-Chloro-3-methylphenol	162	130	80	69 *	42	23 - 97
Acenaphthene	108	56.9	53	69 *	31	46 -118
4-Nitrophenol	162	148	91 *	70 *	50	10 - 80
2,4-Dinitrotoluene	108	82.0	76	66 *	38	24 - 96
Pentachlorophenol	162	134	82	68 *	50	9 -103
Pyrene	108	72.6	67	66 *	31	26 -127

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

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

COMMENTS:

3C

WATER SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: ONE

Case No.: LAB RFW Lot No.: 01LE0098-MB1

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

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	BS CONCENTRATION UG/L	BS % REC	#	QC LIMITS REC
Phenol	75.0	0	48.3	64		12 -110
2-Chlorophenol	75.0	0	50.8	68		27 -123
1,4-Dichlorobenzene	50.0	0	16.1	32	*	36 - 97
N-Nitroso-di-n-propylamine	50.0	0	38.6	77		41 -116
1,2,4-Trichlorobenzene	50.0	0	17.1	34	*	39 - 98
4-Chloro-3-methylphenol	75.0	0	59.0	79		23 - 97
Acenaphthene	50.0	0	26.4	53		46 -118
4-Nitrophenol	75.0	0	74.3	99	*	10 - 80
2,4-Dinitrotoluene	50.0	0	42.5	85		24 - 96
Pentachlorophenol	75.0	0	61.6	82		9 -103
Pyrene	50.0	0	34.6	69		26 -127

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

Spike Recovery: 3 out of 11 outside limits

COMMENTS:

RECRA LabNet Use Only

0101C837

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TMC HANFORD SAF # B99-031

Est. Final Proj. Sampling Date

Project # 10985-001-001-999900

Project Contact/Phone #

RECRA Project Manager: OJ

QC: Std Del: Std TAT: 15 day

Date Rec'd: 1-25-01 Date Due: 2-9-01

Account #

		A-C	DE	FG					H	I	J		K		L
Refrigerator #		1	6	6					6	6	6		6		6
#/Type Container	Liquid	2AG	2AG	2AG					1PL	1PL	1PL		1PL		1PL
	Solid														
Volume	Liquid	40	950	950					1LT	1LT	1LT		500		250
	Solid														
Preservatives		NaOH	—	—					HNO3	HNO3	—		NaOH		—

ANALYSES REQUESTED →

	ORGANIC							INORG				
	VOA	BNA	Pest/PCB	Herb				Metal	CN	IC ANIONS		
RECRA LabNet Use Only	OLC24N	OLC25X	OPCB					RCRATO	ICNTO	ICIONS	ISFD	ICFI

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; P - Paint

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OLC24N	OLC25X	OPCB					RCRATO	ICNTO	ICIONS	ISFD	ICFI
001	B118V7	✓	✓	W	1-23-01	0900	3	2	2					1	1	1	1	1
002	1 9			1	1	1	1	1	1					1	1	1	1	1
	[redacted]																	

O624N - VOA ETF:
Ethyl Cyanide Only
Spectral Search for: 2-pentanone and 1-butanol

Special Instructions: SAF B99-031

Inorg① - ICCL, ICFI, ICNO3, ICNO2, ICSO4, ITDS, ITSS, IOCT, ISPCD, IPH

O625X - BNA ETF:
3 and/or 4 methylphenol
Benzyl Alcohol
1,4-Dichlorobenzene
Spectral search for: tetrahydrofuran

DATE/REVISIONS:

002 1. Letters H, I, J Rec'd 500ml
1 2. Bottle Sizes.
002 3. Letter L Rec'd in 125 Plastic
1 4. For Bottle Size -
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	1-25-01	1830

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
Airbill # See Below
2) Ambient or Chilled
3) Received In Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 3.6 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 4235 7954 1849
1 1850

0101L837

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-04	Page 1 of 1
Collector: Doug Bowers	Company Contact: Jason Adler; Telephone No.: 531-0703	Project Coordinator: TRENT, SJ	Price Code: 7K; Data Turnaround: 15 Days; Air Quality ☐
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	
Ice Chest No.: ERC 96 036	Field Logbook No.: EFL1133-8; COA: R105F4J4X0	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: 42357954-1849	

A 1-23-01

POSSIBLE SAMPLE HAZARDS/REMARKS

≤ Background at 200cpm

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 01/23/01.

Special I: Collector not available to relinquish samples on 01/24/01 for shipment..

Preservation	None	None	ZnAc+NaOH to pH >9 Cool	Cool 4C	HNO3 to pH <2	NaOH to pH >= 12 Cool 4C	Cool 4C	Cooled to 4C	HCl or H2SO4 to pH <2 Coo	HNO3 to pH <2
Type of Container	P	aG	P	P	P	P	aG	aG	aGs*	
No. of Container(s)	1	1	1	1	1	1	2	2	3	1
Volume	500mL	250mL	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	Ignitability - 1010	Sulfides - 9030	See item (1) in Special Instructions. H	See item (2) in Special Instructions. F	Total Cyanide - 9010	Semi-VOA - 8270A (ETF) EF	PCBs - 8082 6A	VOA - 8260A (ETF) A-D	See item (3) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time									
B118V7	WATER	1-23-01	0900		X	X	X	X	X	X	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01 1315	Ref 1A 3728	1-23-01 1315
Ref 1A	01-24-01 1000	R. Fahlberg / R. Fahlberg	01-24-01 1000
R. Fahlberg / R. Fahlberg	01-24-01 1300	Fed Ex	01-24-01 1300
Fed Ex	1-25-01 1230	[illegible]	1-25-01 1230

SPECIAL INSTRUCTIONS

* Close SDG upon receipt of samples.

** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)

~~(3) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium, Isotopic Uranium, Isotopic Thorium, Americium-241, Nickel-63, Strontium-89,90 - Total Sr, Carbon-14, Neptunium-237~~ A 1-23-01

1-18-01

TIE TO B118V8

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-05	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler	Telephone No.: 531-0703	Project Coordinator: TRENT, SJ
Price Code: 7K	Data Turnaround: 15 Days	Air Quality ☐	
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	
Ice Chest No.: ERC-96-036	Field Logbook No.: EFL1133-8	COA: R105F4 J4X0	Method of Shipment: FED EX
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: 42357954-1849	

POSSIBLE SAMPLE HAZARDS/REMARKS

≤ Background at 200cpm

Samples stored in Ref.# 1B at the 3728
Shipping Facility on 01/23/01.
Collector not available to relinquish samples on 01/24/01 for shipment.

Preservation	HCl or H2SO4 to pH <2 Cool	None	None	Cool 4C	HNO3 to pH <2	NaOH to pH >= 12 Cool 4C	ZnAc+NaOH to pH >9 Cool	Cool 4C	Cooled to 4C	HNO3 to pH <2
Type of Container	aGs*	P	aG	P	P	P	P	aG	aG	P
No. of Container(s)	1	1	1	1	1	1	1	1	1	2
Volume	40mL	40mL	120mL	500mL	500mL	500mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	VOA - 8260A (ETF)	Tritium - H3	Ignitability - 1010	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Total Cyanide - 9010	Sulfides - 9030	Semi-VOA - 8270A (ETF)	PCBs - 8082	See item (3) in Special Instructions.
B118V9	WATER	1-23-01	0900	X		X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01 / 1315	Ref 1A 3728	1-23-01 / 1315
Remove from Ref 1A	01-24-01 1000	R. Fuller / R. Fuller	01/24/01 1000
R. Fuller / R. Fuller	01-24-01 1300	Fed Ex	01/24/01 1300
Fed Ex	1-25-01 1230	Uthmadez	1-25-01 1230
		TU 1-25-01	

SPECIAL INSTRUCTIONS

* Close SDG upon receipt of samples.
** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)
~~(3) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241; Nickel-63; Strontium-89,90 - Total Sr; Carbon-14; Neptunium-237~~ 1-18-01
RF 1-23-01

TIE TO B118V8

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

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

BHI-EE-011 (10/99)

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B99-031 H1223

DATE RECEIVED: 01/25/01 LVL LOT # :0101L837

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B118V7	001	W	01LVN023	01/23/01	N/A	01/29/01
B118V7	001 MS	W	01LVN023	01/23/01	N/A	01/29/01
B118V7	001 MSD	W	01LVN023	01/23/01	N/A	01/29/01
B118V9	002	W	01LVN023	01/23/01	N/A	01/29/01

LAB QC:

VBLKLX	MB1	W	01LVN023	N/A	N/A	01/29/01
VBLKLX	MB1 BS	W	01LVN023	N/A	N/A	01/29/01

MAR 2001
RECEIVED

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B99-031
LVL#: 0101L837
SDG/SAF #: H1223/B99-031

W.O. #: 10985-001-001-9999-00
Date Received: 01-25-01

GC/MS VOLATILE

The set of samples consisted of two (2) water samples collected on 01-23-01.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville laboratory OPs based on SW 846 Method 8260A for client specified Volatile target compounds on 01-29-01.

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

1. All cooler temperatures upon receipt have been recorded on the chain-of-custody.
2. The samples were analyzed within required holding time.
3. All surrogate recoveries were within EPA QC limits.
4. All matrix spike recoveries were within 50-150%.
5. All blank spike recoveries were within 50-150%.
6. The method blanks contained the common laboratory contaminant Methylene Chloride and Acetone at levels less than 2x and less than the CRQL, respectively.
7. All internal standard area and retention time criteria were met.
8. These samples were spectrally searched for 2-Pentanone and Tetrahydrofuran; however, they were not identified in the samples.
9. As of January 27, 2001, Recra LabNet Philadelphia became Lionville Laboratory Incorporated. Some Forms may still reference Recra LabNet Philadelphia.
10. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

by J. Michael Taylor
President
Lionville laboratory Incorporated

02-28-01
Date

pef\group\data\voa\tnu-hanford-01-837doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

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

mmz\10-94\gloss.voa

GLOSSARY OF VOA DATA

ABBREVIATIONS

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

mmz\10-94\gloss.voa

Lionville Laboratory, Inc.

Volatiles by GC/MS, Appendix IX List

Report Date: 02/14/01 11:36

RFW Batch Number: **0101L837** Client: **TNUHANFORD B99-031 H1223** Work Order: 10985001001 Page: 1a

	Cust ID:	B118V7		B118V7		B118V7		B118V9		VBLKLX		VBLKLX BS	
Sample Information	RFW#:	001		001 MS		001 MSD		002		01LVN023-MB1		01LVN023-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Surrogate Recovery	Toluene-d8	100	%	101	%	99	%	98	%	96	%	94	%
	Bromofluorobenzene	87	%	105	%	102	%	85	%	88	%	107	%
	1,2-Dichloroethane-d4	100	%	96	%	98	%	101	%	100	%	101	%
			fl		fl		fl		fl		fl		fl
Propionitrile (Ethyl Cyanide)		50	U	91	%	94	%	50	U	50	U	89	%
N-Butanol		250	U	73	%	94	%	250	U	250	U	83	%
1,2-Dichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U	10	U
Toluene		5	U	5	U	5	U	5	U	5	U	5	U
Chlorobenzene		5	U	5	U	5	U	5	U	5	U	5	U
Tetrachloroethene		5	U	5	U	5	U	5	U	5	U	5	U
Xylene (total)		5	U	5	U	5	U	5	U	5	U	5	U
Cis-1,2-dichloroethene		5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethene (trans)		5	U	5	U	5	U	5	U	5	U	5	U
Carbon Tetrachloride		5	U	5	U	5	U	5	U	5	U	5	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U	10	U
Acetone		10	JB	9	JB	11	B	9	JB	5	J	5	JB
Chloroform		5	U	5	U	5	U	5	U	5	U	5	U
Benzene		5	U	5	U	5	U	5	U	5	U	5	U
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U	10	U
Methylene Chloride		10	B	7	B	12	B	9	B	9		12	B
Carbon Disulfide		5	U	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	5	U	5	U	5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U	5	U	5	U
Trichloroethene		5	U	5	U	5	U	5	U	5	U	5	U

*= Outside of EPA CLP QC limits.

RECRA LabNet Use Only

0101C837

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client TNU HANFORD SAF # B99-031

Est. Final Proj. Sampling Date

Project # 10985-001-001-999900

Project Contact/Phone #

RECRA Project Manager OJ

QC Spec Del Std TAT 15 day

Date Rec'd 1-25-01 Date Due 2-9-01

Account #

		A-C	DE	FG					H	I	J		K		L	M
Refrigerator #		1	6	6					6	6	6		6		6	
#/Type Container	Liquid	3AG	2AG	2AG					1PL	1PL	1PL		1PL		1PL	
	Solid															
Volume	Liquid	40	950	950					1LT	1LT	1LT		500		250	
	Solid															
Preservatives		NaOH	—	—					HNO3	HNO3	—		NaOH		—	
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN	IC Anions		Sulfide			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only											
								OC624N	OC625X	OPCB				PCRATO	ICNTO	INORG (1)		ISFD		I-24HR ETF
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish	001	B118V7	✓	✓	W	1-23-01	0900	3	2	2				1	1	1		1		1
	002	1 9			1	1	1	1	1	1				1	1	1		1		1

[redacted]

O624N - VOA ETF:
Ethyl Cyanide Only
Spectral Search for: 2-pentanone and 1-butanol

Special Instructions: SAF B99-031

Inorg(1) - ICCL, ICFl, ICNO3, ICNO2, ICSO4, ITDS, ITSS, IOCT, ISPCD, IPH

O625X - BNA ETF:
3 and/or 4 methylphenol
Benzyl Alcohol
1,4-Dichlorobenzene
Spectral search for: tetrahydrofuran

DATE/REVISIONS:

002 1. Letters H, I, J Rec'd 500ml
1 2. Bottle Sizes.
002 3. Letter L Rec'd in 125 PLASTIC
1 4. For Bottle Size -
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped 1 or Hand Delivered ___ Airbill # See Below
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved TOC Y or N
5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 3.6 °C

Relinquished by	Received by	Date	Time
[signature]	[signature]	1-25-01	1230

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

4235 7954 1849

1 1850

0101L837

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-04	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler — Telephone No.: 531-0703	Project Coordinator: TRENT, SJ	Price Code: 7K — Data Turnaround: 15 Days
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	Air Quality ☐
Ice Chest No.: ERC 96 036	Field Logbook No.: EFL1133-8 — COA: R105F4J4X0	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: 42357954-1849	

A 01-23-01

POSSIBLE SAMPLE HAZARDS/REMARKS

≤ Background at 200cpm

Special I: Samples stored in Ref.# 1A at the 3728 Shipping Facility on 01/23/01. Collector not available to relinquish samples on 01/24/01 for shipment..

Preservation	None	H: None	G: ZnAc+NaOH to pH >9 Cool	F: Cool 4C	D: HNO3 to pH <2	E: NaOH to pH >= 12 Cool 4C	B: Cool 4C	C: Cooled to 4C	A: HCl or H2SO4 to pH <2 Coo	HNO3 to pH <2
Type of Container	P	aG	P	P	P	P	aG	aG	aGs*	
No. of Container(s)	4	1	1	1	1	1	2	2	3	2
Volume	500mL	250mL	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	Ignitability - 1010	Sulfides - 9030	See item (1) in Special Instructions. H	See item (2) in Special Instructions. F	Total Cyanide - 9010	Semi-VOA - 8270A (ETF) EF	PCBs - 8082 6A	VOA - 8260A (ETF) A-D	See item (3) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
B118V7	WATER	1-23-01	0900		X	X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01 1345	Ref 1A 3728	1-23-01 1345
Ref 1A	01-24-01 1000	R. Fahlberg / R. Fahlberg	01-24-01 1000
R. Fahlberg / R. Fahlberg	01-24-01 1300	Fed Ex	01-24-01 1300
Fed Ex	1-25-01 1230	[illegible]	1-25-01 1230

SPECIAL INSTRUCTIONS

* Close SDG upon receipt of samples.

** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)

~~(3) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Field on (Barium-133); Isotopic Plutonium, Isotopic Uranium, Isotopic Thorium, Americium-241, Nickel-63, Strontium-89/90 — Total Sr, Carbon-14, Neptunium~~

BT 1-23-01 1-18-01

TIE TO B118V8

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-05	Page 1 of 1

Collector: Doug Bowers	Company Contact: Jason Adler	Telephone No.: 531-0703	Project Coordinator: TRENT, SJ
Price Code: 7K	Data Turnaround: 15 Days ∞	Air Quality ☐	
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105F FSB	SAF No.: B99-031	
Ice Chest No.: ERC-96-036	Field Logbook No.: EFL1133-8	COA: R105F4 J4X0	Method of Shipment: FED EX
Shipped To: TMA/RECRA	Offsite Property No.: A010194	Bill of Lading/Air Bill No.: H2357954-1849	

POSSIBLE SAMPLE HAZARDS/REMARKS

≤ Background at 200cpm

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 01/23/01. Collector not available to relinquish samples on 01/24/01 for shipment.

Preservation	HCl or H2SO4 to pH <2 Coo	None	None	Cool 4C	HNO3 to pH <2	NaOH to pH >= 12 Cool 4C	ZnAc+NaOH to pH >9 Cool	Cool 4C	Cooled to 4C	HNO3 to pH <2
Type of Container	aGs*	P	aG	P	P	P	P	aG	aG	P
No. of Container(s)	1	1	1	1	1	1	1	1	1	2
Volume	40mL	500mL	120mL	500mL	500mL	500mL	500mL	1000mL	1000mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	VOA - 8260A (ETF)	Tritium - H3	Ignitability - 1010	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Total Cyanide - 9010	Sulfides - 9030	Semi-VOA - 8270A (ETF)	PCBs - 8082	See item (3) in Special Instructions.
B118V9	WATER	1-23-01	0900	X		X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-23-01 1315	Ref 1A 3728	1-23-01 1315
Ref 1A	01-24-01 1000	R. Fellows / R. Fellows	01/24/01 1000
R. Fellows / R. Fellows	01-24-01 1300	Fed Ex	01/24/01 1300
Fed Ex	1-25-01 1230	Uttemade Z	1-25-01 1230
		TC 1-25-01	

SPECIAL INSTRUCTIONS

* Close SDG upon receipt of samples.

** While a 15 day turnaround is optimal, the ERC acknowledges that laboratory capacity may not accomodate this turnaround time. The absolute minimum turnaround time is 15 days.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Sulfate); TDS - 160.1; TSS - 160.2; TOC - 415.1; Conductivity - 120.1; pH (Water) - 9040

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7470 - (CV)

~~(3) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add on (Barium-133); Isotopic Plutonium; Isotopic Uranium; Isotopic Thorium; Americium-241, Nickel-63, Strontium-89/90 – Total Sr, Carbon-14, Neptunium-237~~

RF 1-23-01 1-18-01

TIE TO B118V8

Matrix *

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 1-25-01 1230

SDG#: 0101L837

Work Order Number: _____ SAF# B99-031

Shipping Container ID: ERC-96-036 Chain of Custody # _____

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

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

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

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

Sample Custodian/Laboratory: [signature] Date: 1-25-01

Telephoned to: _____ On _____ By _____