H1627

0056760

RECEIVED
MAR 26 2002
EDMC

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1627 was composed of one water sample designated under SAF No. B01-114 with a Project Designation of: PFP Well Installation Sampling and Analysis – Water.

The sample was 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 January 30, 2002.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.5 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.6 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.7 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 — 2/5/02

Melissa C. Mannion
Program Manager

Date

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

SDG 7176
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1627

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B13F24	200 West	WATER		R112014-01	B01-114	B01-114-28	11/30/01 09:30
Method Blank		WATER		R112014-03	B01-114		
Lab Control Sample		WATER		R112014-02	B01-114		
Duplicate (R112014-01)	200 West	WATER		R112014-04	B01-114		11/30/01 09:30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

SDG 7176
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1627

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
7176	B01-114-28	B13F24	WATER		6.0 L		12/04/01	4	R112014-01	7176-001
		Method Blank	WATER						R112014-03	7176-003
		Lab Control Sample	WATER						R112014-02	7176-002
		Duplicate (R112014-01)	WATER		6.0 L		12/04/01	4	R112014-04	7176-004

Lab id TMANC
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Form DVD-QS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

SDG 7176
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1627

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	7018-078	5.0	1			1	1	1/1		
NP	WATER	Neptunium in Water	7018-078	5.0	1			1	1	1/1		
PU	WATER	Plutonium, Isotopic in Water	7018-078	5.0	1			1	1	1/1		
U	WATER	Uranium, Isotopic in Water	7018-078	5.0	1			1	1	1/1		
Beta Counting												
SR	WATER	Total Strontium in Water	7018-078	10.0	1			1	1	1/1		
Gas Proportional Counting												
93A	WATER	Gross Alpha in Water	7018-078	20.0	1			1	1	1/1		
93B	WATER	Gross Beta in Water	7018-078	15.0	1			1	1	1/1		
Gamma Scan												
GAM	WATER	Gamma Emitters	7018-078	15.0	1			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

SDG 7176
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1627

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B13F24			R112014-01	7176-001	93A/93		01/23/02	01/30/02	MCM	Gross Alpha in Water
200 West		WATER	11/30/01	7176-001	93B/93		01/23/02	01/30/02	MCM	Gross Beta in Water
B01-114-28	B01-114		12/04/01	7176-001	AM		01/29/02	01/30/02	MCM	Americium 241 in Water
				7176-001	GAM		01/22/02	01/30/02	MCM	Gamma Emitters
				7176-001	NP		01/17/02	01/30/02	MCM	Neptunium in Water
				7176-001	PU		01/29/02	01/30/02	MCM	Plutonium, Isotopic in Water
				7176-001	SR		01/16/02	01/30/02	MCM	Total Strontium in Water
				7176-001	U		01/16/02	01/30/02	MCM	Uranium, Isotopic in Water
Method Blank			R112014-03	7176-003	93A/93		01/23/02	01/30/02	MCM	Gross Alpha in Water
		WATER		7176-003	93B/93		01/23/02	01/30/02	MCM	Gross Beta in Water
	B01-114			7176-003	AM		01/29/02	01/30/02	MCM	Americium 241 in Water
				7176-003	GAM		01/22/02	01/30/02	MCM	Gamma Emitters
				7176-003	NP		01/17/02	01/30/02	MCM	Neptunium in Water
				7176-003	PU		01/29/02	01/30/02	MCM	Plutonium, Isotopic in Water
				7176-003	SR		01/16/02	01/30/02	MCM	Total Strontium in Water
				7176-003	U		01/16/02	01/30/02	MCM	Uranium, Isotopic in Water
Lab Control Sample			R112014-02	7176-002	93A/93		01/24/02	01/30/02	MCM	Gross Alpha in Water
		WATER		7176-002	93B/93		01/24/02	01/30/02	MCM	Gross Beta in Water
	B01-114			7176-002	AM		01/30/02	01/30/02	MCM	Americium 241 in Water
				7176-002	GAM		01/22/02	01/30/02	MCM	Gamma Emitters
				7176-002	NP		01/17/02	01/30/02	MCM	Neptunium in Water
				7176-002	PU		01/30/02	01/30/02	MCM	Plutonium, Isotopic in Water
				7176-002	SR		01/16/02	01/30/02	MCM	Total Strontium in Water
				7176-002	U		01/18/02	01/30/02	MCM	Uranium, Isotopic in Water
Duplicate (R112014-01)			R112014-04	7176-004	93A/93		01/23/02	01/30/02	MCM	Gross Alpha in Water
200 West		WATER	11/30/01	7176-004	93B/93		01/23/02	01/30/02	MCM	Gross Beta in Water
	B01-114		12/04/01	7176-004	AM		01/29/02	01/30/02	MCM	Americium 241 in Water
				7176-004	GAM		01/23/02	01/30/02	MCM	Gamma Emitters
				7176-004	NP		01/17/02	01/30/02	MCM	Neptunium in Water
				7176-004	PU		01/29/02	01/30/02	MCM	Plutonium, Isotopic in Water
				7176-004	SR		01/16/02	01/30/02	MCM	Total Strontium in Water
				7176-004	U		01/19/02	01/30/02	MCM	Uranium, Isotopic in Water

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

SDG 7176
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1627

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	B01-114	Gross Alpha in Water	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	B01-114	Gross Beta in Water	900.0_ALPHABETA_GPC	1			1	1	1	4
AM	B01-114	Americium 241 in Water	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
GAM	B01-114	Gamma Emitters	GAMMA_GS	1			1	1	1	4
NP	B01-114	Neptunium in Water	NP237_LLE_PLATE_AEA	1			1	1	1	4
PU	B01-114	Plutonium, Isotopic in Water	PUISO_PLATE_AEA	1			1	1	1	4
SR	B01-114	Total Strontium in Water	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
U	B01-114	Uranium, Isotopic in Water	UISO_PLATE_AEA	1			1	1	1	4
TOTALS				8			8	8	8	32

Lab id TMANC
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Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

R112014-03 **Method Blank**

METHOD BLANK

SDG	7176	Client/Case no	Hanford	SDG	H1627
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R112014-03	Client sample id	Method Blank		
Dept sample id	7176-003	Material/Matrix		WATER	
		SAF No	B01-114		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.288	0.55	1.3	3.0	U	93A
Gross Beta	12587-47-2	-0.429	1.7	3.0	4.0	U	93B
Total Strontium	SR-RAD	-0.218	0.27	0.40	2.0	U	SR
Uranium 233/234	U-233/234	-0.029	0.008	0.032	1.0	U	U
Uranium 235	15117-96-1	-0.015	0.010	0.039	1.0	U	U
Uranium 238	U-238	-0.008	0.008	0.032	1.0	U	U
Neptunium 237	13994-20-2	-0.011	0.023	0.087	1.0	U	NP
Plutonium 238	13981-16-3	-0.027	0.054	0.20	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.027	0.054	0.20	1.0	U	PU
Americium 241	14596-10-2	-0.068	0.068	0.26	1.0	U	AM
Potassium 40	13966-00-2	U		190		U	GAM
Cobalt 60	10198-40-0	U		9.6	25	U	GAM
Ruthenium 106	13967-48-1	U		73		U	GAM
Antimony 125	14234-35-6	U		19		U	GAM
Cesium 137	10045-97-3	U		9.6	15	U	GAM
Radium 226	13982-63-3	U		17		U	GAM
Radium 228	15262-20-1	U		42		U	GAM
Europium 152	14683-23-9	U		23	50	U	GAM
Europium 154	15585-10-1	U		24	50	U	GAM
Europium 155	14391-16-3	U		28	50	U	GAM
Thorium 228	14274-82-9	U		12		U	GAM
Thorium 232	TH-232	U		42		U	GAM
Uranium 235	15117-96-1	U		40		U	GAM
Uranium 238	U-238	U		1200		U	GAM
Americium 241	14596-10-2	U		60		U	GAM

PFP Well Installation Smpl. & Anal.

QC-BLANK 40844

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

R112014-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7176
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1627
Case no No. 630

Lab sample id R112014-02
Dept sample id 7176-002

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No B01-114

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	108	7.5	1.6	3.0		93A	100	4.0	108	65-135	70-130
Gross Beta	108	5.7	4.3	4.0		93B	108	4.3	100	75-125	70-130
Total Strontium	45.2	1.2	0.34	2.0		SR	43.4	1.7	104	83-117	80-120
Uranium 233/234	22.9	2.2	1.0	1.0		U	23.2	0.93	99	83-117	80-120
Uranium 235	16.7	1.8	0.24	1.0		U	18.9	0.76	88	83-117	80-120
Uranium 238	25.2	2.3	0.98	1.0		U	25.2	1.0	100	83-117	80-120
Neptunium 237	50.6	1.8	0.082	1.0		NP	49.7	2.0	102	89-111	80-120
Plutonium 238	27.7	2.8	0.26	1.0		PU	30.8	1.2	90	84-116	80-120
Plutonium 239/240	30.3	3.1	0.26	1.0		PU	33.0	1.3	92	83-117	80-120
Americium 241	21.4	3.4	0.58	1.0		AM	23.8	0.95	90	77-123	80-120
Cobalt 60	426	26	11	25		GAM	406	16	105	74-126	80-120
Cesium 137	488	23	15	15		GAM	478	19	102	75-125	80-120

PFP Well Installation Smpl. & Anal.

QC-LCS 40843

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

R112014-04 B13F24

DUPLICATE

SDG 7176		Client/Case no Hanford	SDG H1627
Contact Melissa C. Mannion		Case no No. 630	
DUPLICATE	ORIGINAL		
Lab sample id R112014-04	Lab sample id R112014-01	Client sample id B13F24	
Dept sample id 7176-004	Dept sample id 7176-001	Location/Matrix 200 West	WATER
	Received 12/04/01	Collected/Volume 11/30/01 09:30	6.0 L
		Custody/SAF No B01-114-28	B01-114

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
Gross Alpha	-0.414	0.45	1.2	3.0	U	93A	0.035	0.75	1.4	U	-	
Gross Beta	-0.271	2.1	3.6	4.0	U	93B	0.071	1.6	2.8	U	-	
Total Strontium	-0.147	0.26	0.37	2.0	U	SR	0.047	0.30	0.43	U	-	
Uranium 233/234	0.177	0.18	0.23	1.0	U	U	-0.015	0.020	0.047	U	-	
Uranium 235	0.107	0.14	0.27	1.0	U	U	0.012	0.024	0.046	U	-	
Uranium 238	0	0.059	0.23	1.0	U	U	-0.005	0.020	0.047	U	-	
Neptunium 237	0.011	0.046	0.11	1.0	U	NP	-0.033	0.067	0.21	U	-	
Plutonium 238	0.069	0.069	0.26	1.0	U	PU	0	0.043	0.16	U	-	
Plutonium 239/240	0	0.069	0.26	1.0	U	PU	-0.021	0.043	0.16	U	-	
Americium 241	-0.057	0.058	0.22	1.0	U	AM	-0.037	0.074	0.28	U	-	
Potassium 40	U		110		U	GAM	U		130	U	-	
Cobalt 60	U		8.1	25	U	GAM	U		14	U	-	
Ruthenium 106	U		71		U	GAM	U		97	U	-	
Antimony 125	U		18		U	GAM	U		21	U	-	
Cesium 137	U		8.2	15	U	GAM	U		11	U	-	
Radium 226	U		14		U	GAM	U		19	U	-	
Radium 228	U		45		U	GAM	U		43	U	-	
Europium 152	U		17	50	U	GAM	U		23	U	-	
Europium 154	U		28	50	U	GAM	U		38	U	-	
Europium 155	U		17	50	U	GAM	U		14	U	-	
Thorium 228	U		11		U	GAM	U		12	U	-	
Thorium 232	U		45		U	GAM	U		43	U	-	
Uranium 235	U		28		U	GAM	U		26	U	-	
Uranium 238	U		1100		U	GAM	U		1300	U	-	
Americium 241	U		24		U	GAM	U		9.3	U	-	

PFP Well Installation Smpl. & Anal.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/30/02

DUPLICATE, cont.

SDG 7176		Client/Case no Hanford	SDG H1627
Contact Melissa C. Mannion		Case no No. 630	
DUPLICATE	ORIGINAL		
Lab sample id R112014-04	Lab sample id R112014-01	Client sample id B13F24	
Dept sample id 7176-004	Dept sample id 7176-001	Location/Matrix 200 West	WATER
	Received 12/04/01	Collected/Volume 11/30/01 09:30	6.0 L
		Custody/SAF No B01-114-28	B01-114

QC-DUP#1 40845

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

R112014-01 **B13F24**

DATA SHEET

SDG	7176	Client/Case no	Hanford SDG H1627
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R112014-01	Client sample id	B13F24
Dept sample id	7176-001	Location/Matrix	200 West WATER
Received	12/04/01	Collected/Volume	11/30/01 09:30 6.0 L
		Custody/SAF No	B01-114-28 B01-114

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.035	0.75	1.4	3.0	U	93A
Gross Beta	12587-47-2	0.071	1.6	2.8	4.0	U	93B
Total Strontium	SR-RAD	0.047	0.30	0.43	2.0	U	SR
Uranium 233/234	U-233/234	-0.015	0.020	0.047	1.0	U	U
Uranium 235	15117-96-1	0.012	0.024	0.046	1.0	U	U
Uranium 238	U-238	-0.005	0.020	0.047	1.0	U	U
Neptunium 237	13994-20-2	-0.033	0.067	0.21	1.0	U	NP
Plutonium 238	13981-16-3	0	0.043	0.16	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.021	0.043	0.16	1.0	U	PU
Americium 241	14596-10-2	-0.037	0.074	0.28	1.0	U	AM
Potassium 40	13966-00-2	U		130		U	GAM
Cobalt 60	10198-40-0	U		14	25	U	GAM
Ruthenium 106	13967-48-1	U		97		U	GAM
Antimony 125	14234-35-6	U		21		U	GAM
Cesium 137	10045-97-3	U		11	15	U	GAM
Radium 226	13982-63-3	U		19		U	GAM
Radium 228	15262-20-1	U		43		U	GAM
Europium 152	14683-23-9	U		23	50	U	GAM
Europium 154	15585-10-1	U		38	50	U	GAM
Europium 155	14391-16-3	U		14	50	U	GAM
Thorium 228	14274-82-9	U		12		U	GAM
Thorium 232	TH-232	U		43		U	GAM
Uranium 235	15117-96-1	U		26		U	GAM
Uranium 238	U-238	U		1300		U	GAM
Americium 241	14596-10-2	U		9.3		U	GAM

PFP Well Installation Smpl. & Anal.

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

Test AM Matrix WATER
SDG 7176
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN WATER
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1627

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241	
Preparation batch 7018-078						
B13F24	R112014-01			7176-001	U	
BLK (QC ID=40844)	R112014-03			7176-003	U	
LCS (QC ID=40843)	R112014-02			7176-002	ok	
Duplicate (R112014-01)	R112014-04			7176-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	1.0	
PFP Well Installation Smpl. & Anal.						

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 7018-078	2σ prep error 5.0 %			Reference Lab Notebook 7018 pg. 078												
B13F24	R112014-01			0.28	0.400			51		158			60	01/29/02	01/29	SS-032
BLK (QC ID=40844)	R112014-03			0.26	0.400			57		159				01/29/02	01/29	SS-049
LCS (QC ID=40843)	R112014-02			0.58	0.400			35		107				01/29/02	01/30	SS-050
Duplicate (R112014-01) (QC ID=40845)	R112014-04			0.22	0.400			62		159			60	01/29/02	01/29	SS-050
Nominal values and limits from method				1.0	0.400			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-040	Environmental Water Dissolution, rev 4
	CP-940	Plutonium Separation and Purification, rev 3
	CP-960	Americium-Curium Purification, Large Aliquot, rev 4
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.34	±	0.33
	YIELD	51	±	23

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

Test NP Matrix WATER
SDG 7176
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN WATER
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1627

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237	
Preparation batch 7018-078						
B13F24	R112014-01			7176-001	U	
BLK (QC ID=40844)	R112014-03			7176-003	U	
LCS (QC ID=40843)	R112014-02			7176-002	ok	
Duplicate (R112014-01)	R112014-04			7176-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	1.0	
PFP Well Installation Smpl. & Anal.						

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 7018-078	2σ prep error 5.0 %			Reference Lab Notebook 7018 pg. 078												
B13F24	R112014-01			0.21	0.200			50		737			48	01/16/02	01/17	SS-031
BLK (QC ID=40844)	R112014-03			0.087	0.200			70		738				01/16/02	01/17	SS-033
LCS (QC ID=40843)	R112014-02			0.082	0.200			75		738				01/16/02	01/17	SS-032
Duplicate (R112014-01) (QC ID=40845)	R112014-04			0.11	0.200			70		743			48	01/16/02	01/17	SS-042
Nominal values and limits from method				1.0	0.200			20-105		100			180			

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
	CP-040	Environmental Water Dissolution, rev 4
	CP-934	Neptunium from Solids and Water by Extraction Chromatography, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	0.12	±	0.12
YIELD	66	±	22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

Test PU Matrix WATER
SDG 7176
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN WATER
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1627

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 7018-078								
B13F24	R112014-01			7176-001	U		U	
BLK (QC ID=40844)	R112014-03			7176-003	U		U	
LCS (QC ID=40843)	R112014-02			7176-002	ok		ok	
Duplicate (R112014-01)	R112014-04			7176-004	-	U	-	U
Nominal values and limits from method				RDLs (pCi/L)	1.0		1.0	
PFP Well Installation Smpl. & Anal.								

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 7018-078	2σ prep error 5.0 %			Reference Lab Notebook 7018 pg. 078												
B13F24	R112014-01			0.16	0.400			92		148			60	01/29/02	01/29	SS-032
BLK (QC ID=40844)	R112014-03			0.20	0.400			71		149				01/29/02	01/29	SS-050
LCS (QC ID=40843)	R112014-02			0.26	0.400			79		106				01/29/02	01/30	SS-047
Duplicate (R112014-01) (QC ID=40845)	R112014-04			0.26	0.400			83		101			60	01/29/02	01/29	SS-047
Nominal values and limits from method				1.0	0.400			20-105		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-040	Environmental Water Dissolution, rev 4
	CP-940	Plutonium Separation and Purification, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.22	±	0.098
	YIELD	81	±	17

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

Test U Matrix WATER
SDG 7176
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, ISOTOPIC IN WATER
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1627

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234		2: Uranium 235		3: Uranium 238		RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 7018-078														
B13F24	R112014-01			7176-001	U		U		U					
BLK (QC ID=40844)	R112014-03			7176-003	U		U		U					
LCS (QC ID=40843)	R112014-02			7176-002	ok		ok		ok					
Duplicate (R112014-01)	R112014-04			7176-004	-	U	-	U	-	U				
Nominal values and limits from method				RDLs (pCi/L)	1.0		1.0		1.0		100		4	
PFP Well Installation Smpl. & Anal.											Averages			

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 7018-078 2σ prep error 5.0 % Reference Lab Notebook 7018 pg. 078																
B13F24	R112014-01			0.047	0.400			79		737			47	01/16/02	01/16	SS-043
BLK (QC ID=40844)	R112014-03			0.039	0.400			95		736				01/16/02	01/16	SS-047
LCS (QC ID=40843)	R112014-02			1.0	0.400			102		1134				01/16/02	01/18	SS-051
Duplicate (R112014-01) (QC ID=40845)	R112014-04			0.27	0.400			99		104			50	01/16/02	01/19	SS-031
Nominal values and limits from method				1.0	0.400			30-105		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-040	Environmental Water Dissolution, rev 4
	CP-910	Uranium Purification, rev 2
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.34 ± 0.91
YIELD 94 ± 20

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

Test SR Matrix WATER
SDG 7176
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN WATER
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1627

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 7018-078						
B13F24	R112014-01			7176-001	U	
BLK (QC ID=40844)	R112014-03			7176-003	U	
LCS (QC ID=40843)	R112014-02			7176-002	ok	
Duplicate (R112014-01)	R112014-04			7176-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	2.0	
PFP Well Installation Smpl. & Anal.						

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 7018-078	2σ prep error 10.0 % Reference Lab Notebook 7018 pg. 078															
B13F24	R112014-01			0.43	0.500			91		327			47	01/16/02	01/16	GRB-223
BLK (QC ID=40844)	R112014-03			0.40	0.500			91		370				01/16/02	01/16	GRB-232
LCS (QC ID=40843)	R112014-02			0.34	0.500			91		200				01/16/02	01/16	GRB-229
Duplicate (R112014-01) (QC ID=40845)	R112014-04			0.37	0.500			86		400			47	01/16/02	01/16	GRB-203
Nominal values and limits from method				2.0	0.500					100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-501	Strontium in Water Samples, rev 2

AVERAGES ± 2 SD	MDA	0.38	± 0.077
FOR 4 SAMPLES	YIELD	90	± 5

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

Test 93A Matrix WATER
SDG 7176
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1627

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 7018-078						
B13F24	R112014-01	93		7176-001	U	
BLK (QC ID=40844)	R112014-03	93		7176-003	U	
LCS (QC ID=40843)	R112014-02	93		7176-002	ok	
Duplicate (R112014-01)	R112014-04	93		7176-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	3.0	

PFP Well Installation Smpl. & Anal.

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7018-078	2σ prep error 20.0 %							Reference Lab Notebook 7018 pg. 078								
B13F24	R112014-01	93		1.4	0.200			4		100			54	01/22/02	01/23	GRB-109
BLK (QC ID=40844)	R112014-03	93		1.3	0.200			19		100				01/22/02	01/23	GRB-111
LCS (QC ID=40843)	R112014-02	93		1.6	0.200			22		100				01/22/02	01/24	GRB-114
Duplicate (R112014-01) (QC ID=40845)	R112014-04	93		1.2	0.200			5		100			54	01/22/02	01/23	GRB-112
Nominal values and limits from method				3.0	0.200			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-170	Soil Preparation for Direct Gross Alpha and Gross Beta Counting, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	1.4	±	0.34
	RESIDUE	12	±	19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

Test 938 Matrix WATER
SDG 7176
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN WATER
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H1627

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta	
Preparation batch 7018-078						
B13F24	R112014-01	93		7176-001	U	
BLK (QC ID=40844)	R112014-03	93		7176-003	U	
LCS (QC ID=40843)	R112014-02	93		7176-002	ok	
Duplicate (R112014-01)	R112014-04	93		7176-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	4.0	
PFP Well Installation Smpl. & Anal.						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7018-078	2σ prep error 15.0 %				Reference Lab Notebook 7018 pg. 078											
B13F24	R112014-01	93		2.8	0.200			4		100			54	01/22/02	01/23	GRB-109
BLK (QC ID=40844)	R112014-03	93		3.0	0.200			19		100				01/22/02	01/23	GRB-111
LCS (QC ID=40843)	R112014-02	93		4.3	0.200			22		100				01/22/02	01/24	GRB-114
Duplicate (R112014-01) (QC ID=40845)	R112014-04	93		3.6	0.200			5		100			54	01/22/02	01/23	GRB-112
Nominal values and limits from method				4.0	0.200			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-170	Soil Preparation for Direct Gross Alpha and Gross Beta Counting, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 3.4 ± 1.4
RESIDUE 12 ± 19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/30/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1627

Test GAM Matrix WATER
SDG 7176
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA EMITTERS

GAMMA SCAN

Client Hanford
Contract No. 630
Contract SDG H1627

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 7018-078								
B13F24	R112014-01			7176-001	U		U	
BLK (QC ID=40844)	R112014-03			7176-003	U		U	
LCS (QC ID=40843)	R112014-02			7176-002	ok		ok	
Duplicate (R112014-01)	R112014-04			7176-004	-	U	-	U
Nominal values and limits from method PFP Well Installation Smpl. & Anal.				RDLs (pCi/L)	25		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 7018-078 2σ prep error 15.0 % Reference Lab Notebook 7018 pg. 078																
B13F24	R112014-01			35	0.500					701			53	01/21/02	01/22	01,01,00
BLK (QC ID=40844)	R112014-03			46	0.500					701				01/21/02	01/22	MB,05,00
LCS (QC ID=40843)	R112014-02			15	0.500					311				01/21/02	01/22	01,04,00
Duplicate (R112014-01) (QC ID=40845)	R112014-04			39	0.500					310			54	01/21/02	01/23	01,04,00
Nominal values and limits from method				15	0.500					100			180			

PROCEDURES REFERENCE GAMMA_GS
CP-100 Ge(Li) Preparation for Commercial Samples, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 34 ± 27
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 01/30/02

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-114-28	Page 1 of 1

Collector: Renee Nielson / R. Fahlberg	Company Contact: Virginia Rohay	Telephone No.: 372-9100	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: PFP Well Installation Sampling and Analysis - Water	Sampling Location: 200 West H1627 (7176)	SAF No.: B01-114	
Ice Chest No.: ERC 99-035	Field Logbook No.: EL-1562	COA: T20ZP1D722	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A020083	Bill of Lading/Air Bill No.: 4235 7954 - 9449	

POSSIBLE SAMPLE HAZARDS/REMARKS

SAMPLES STORED IN REF.#2B AT THE 3728 SHIPPING FACILITY ON 11 30 01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 12/3/01 FOR SHIPMENT. RT 12.3.01

Preservation	H2SO4 to pH <2 Cool 4C	Cool 4C	H2SO4 to pH <2 Cool 4C	HNO3 to pH <2	Cool 4C	HCL to pH <2 Cool 4C	HCL to pH <2 Cool 4C	HNO3 to pH <2		
Type of Container	aG	P	P	P	aG	aG	aGs*	P		
No. of Container(s)	1	1	1	1	2	2	3	6		
Volume	500mL	500mL	500mL	500mL	1000mL	1000mL	40mL	1000mL		
SAMPLE ANALYSIS	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	NO2/NO3 - 353.2	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Oil & Grease - 413.1	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (4) in Special Instructions.		
			RT 11.30.01							

Sample No.	Matrix *	Sample Date	Sample Time										
B13F24	WATER	11.30.01	0930								X		

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By: R. Fahlberg / R. Fahlberg	11.30.01 1100	Received By: Stored in Ref 2-B	11.30.01 1100
Relinquished By: Removed from Ref 2B 3728	12.3.01 0900	Received By: R. Thorne	12.3.01 0900
Relinquished By: R. Thorne ERC	12.3.01 0900	Received By: EDQ	12-3-01
Relinquished By: FED. EXPRESS	12-04-01 9:30	Received By: E. Maestas / E. MAESTAS	12/4/01 9:30
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

The BRC acknowledges that the holding time for Nitrate by EPA Method 300.0 will not be met. The laboratory is to analyze pH within 24 hours of sample receipt. If a limited quantity of material is received, analyze in the order listed on the FSR.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040
(2) ICP Metals - 6010A (PAs) (Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium, Zinc); ICP Metals - 6010A (Add-on) (Phosphorus)
(3) Semi-VOA - 8270A (TCL); Semi-VOA - 8270A (Add-On) (Tributyl phosphate)
(4) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125, Ruthenium-106); Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89,90 -- Total Sr; Isotopic Uranium

RT 12.3.01

Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 12-3-01

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)

From: Melissa Mannion

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc. Date/Time received 12-04-01 9:30

CoC No. B01-114-28

Container I.D. No. ERC99-035 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1 SAMPLES
7. Number of containers per sample: (6X EACH) (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____
13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by Eric R. Maestas Date: 12-04-01 Time: 9:30 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 _____

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-114 H1627

JAN 2002
RECEIVED

RFW LOT # : 0212L505

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B13F24	001	W	01LVG085	11/30/01	12/04/01	N/A	12/10/01
B13F24	001 MS	W	01LVG085	11/30/01	12/04/01	N/A	12/10/01
B13F24	001 MSD	W	01LVG085	11/30/01	12/04/01	N/A	12/10/01
LAB QC:							
VBLKCV	MB1	W	01LVG085	N/A	N/A	N/A	12/10/01
VBLKCV	MB1 BS	W	01LVG085	N/A	N/A	N/A	12/10/01

12-19-01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-114
LVL #: 0112L505
SDG/SAF #: H1627/B01-114

W.O. #: 11343-606-001-9999-00
Date Received: 12-04-2001

GC/MS VOLATILE

One (1) water sample was collected on 11-30-2001.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for client specified Volatile target compounds on 12-10-2001.

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

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

2. The analysis holding time was met.

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

4. All surrogate recoveries were within EPA QC limits.

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

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

7. The method blank contained the common laboratory contaminant Acetone at a level less than the CRQL.

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

9. Manual integrations are performed according to OP L-QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

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

for J. Michael Taylor
President
Lionville Laboratory Incorporated

01-14-02
Date

som\group\data\voa\tnu-hanford\0112-505.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

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.

VLI
LIONVILLE LABORATORY INC.

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.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - **Missed Peak**: manually added peak not found by automatic quan program.

PA - **Peak Assignment**: quan report was changed to reflect correct peak assignment.

RI - **Routine Integration**: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - **Split Peak**: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - **Coelution/Background**: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - **Proper Integration**: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

VLI
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Lionville Laboratory, Inc.

Volatiles By GC/MS, Special List

Report Date: 12/18/01 19:57

RFW Batch Number: **0112L505** Client: **TNUHANFORD B01-114 H1627** Work Order: 11343606001 Page: 1a

	Cust ID:	B13F24		B13F24		B13F24		VBLKCV		VBLKCV BS	
Sample Information	RFW#:	001		001 MS		001 MSD		01LVG085-MB1		01LVG085-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	ug/L		ug/L		ug/L		ug/L		ug/L	
	Toluene-d8	98	%	97	%	99	%	103	%	95	%
Surrogate	Bromofluorobenzene	97	%	97	%	98	%	99	%	96	%
Recovery	1,2-Dichloroethane-d4	96	%	98	%	98	%	97	%	89	%
Chloromethane		10	U	10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U
Methylene Chloride		5	U	5	U	5	U	5	U	5	U
Acetone		1	JB	2	JB	1	JB	4	J	5	JB
Carbon Disulfide		2	J	3	J	4	J	5	U	5	U
1,1-Dichloroethene		5	U	90	%	91	%	5	U	87	%
1,1-Dichloroethane		5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U	5	U	5	U	5	U
Chloroform		5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethane		5	U	5	U	5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U	10	U	2	J
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U	5	U
Carbon Tetrachloride		5	U	5	U	5	U	5	U	5	U
Bromodichloromethane		5	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane		5	U	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U
Trichloroethene		5	U	89	%	89	%	5	U	93	%
Dibromochloromethane		5	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U	5	U
Benzene		1	J	93	%	91	%	5	U	91	%
Trans-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U
Bromoform		5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		5	U	5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U	5	U	5	U	5	U
Toluene		5	U	99	%	101	%	5	U	95	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0112L505** Client: **TNUHANFORD B01-114 H1627** Work Order: 11343606001 Page: 1b

Cust ID:	B13F24	B13F24	B13F24	VBLKCV	VBLKCV BS
RFW#:	001	001 MS	001 MSD	01LVG085-MB1	01LVG085-MB1
Chlorobenzene	5 U	94 %	96 %	5 U	93 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U
N-butylbenzene	5 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B13F24

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-114 H1627

Matrix: WATER

Lab Sample ID: 0112L505-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: q121013

Level: (low/med) LOW

Date Received: 12/04/01

% Moisture: not dec. _____

Date Analyzed: 12/10/01

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	16.697	6	J
2.	SILOXANE	19.666	10	J

1E

VOLATILE ORGANICS ANALYSIS SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKCV

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-114 H1627

Matrix: WATER

Lab Sample ID: 01LVG085-MB1

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: q121005

Level: (low/med) LOW

Date Received: 12/10/01

% Moisture: not dec. _____

Date Analyzed: 12/10/01

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0

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

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

FORM 1 VOA-TIC 12/88 Rev.

Lionville Laboratory Use Only

01121505

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: INU-HANFORD SAF B01-114

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 12-4-01 Date Due: 1-3-02

		A-C	D	E		F	G	H	I		J	K				
Refrigerator #		1	2			2	2		2		2	2				
#/Type Container	Liquid	3AG	2AG			1AG	2AG		1PL		1PL	1PL				
	Solid															
Volume	Liquid	40	1L			500	1L		500		500	500				
	Solid															
Preservatives		HCL	—			H2SO4	HCL		HNO3							
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb	TIC TOC	Oil Grease		Metal	CN	T.C Anions	NO2/NO3				
		Lionville Laboratory Use Only														
		0624X	0625X			ITIC IOCT	IOGGR		MET①		INORG①	IN3N2				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected														
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	B13F24	✓	✓	W	11-30-01	0930	X	X			X	X		X		X	X			

Special Instructions: SAF # B01-114

DATE/REVISIONS:

MET① 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, Zn, P

INORG① 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IPH

3.

4.

5.

6.

Relinquished by	Received by	Date	Time
FEDEX	Carl Wenzel	12-4-01	0945

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

NOTES:

4235 7954 9438

Lionville Laboratory 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) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or (N) pH

Tamper Resistant Seal 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. 1.8 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-114-28	Page 1 of 1
Collector: Renee Nielson / R. Fahlberg	Company Contact: Virginia Rohay; Telephone No.: 372-9100	Project Coordinator: TRENT, SJ	Price Code: 7N; Data Turnaround: 45 Days
Project Designation: PFP Well Installation Sampling and Analysis - Water	Sampling Location: 200 West	SAF No.: B01-114	Air Quality ☐
Ice Chest No.: ERC-02-010	Field Logbook No.: EL-1562; COA: T20ZP1D722	Method of Shipment: Federal Express	
Shipped To: TMA (RECRA)	Offsite Property No.: A020845	Bill of Lading/Air Bill No.: 4235 7954 - 9438	

POSSIBLE SAMPLE HAZARDS/REMARKS

SAMPLES STORED IN REF.# 2B AT THE 3728 SHIPPING FACILITY ON 11/30/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 12/3/01 FOR SHIPMENT. RT 12.3.01

Preservation	H2SO4 to pH <2 Cool 4C	Cool 4C	H2SO4 to pH <2 Cool 4C	HNO3 to pH <2	Cool 4C	HCL to pH <2 Cool 4C	HCl to pH <2 Cool 4C	HNO3 to pH <2		
Type of Container	aG	P	P	P	aG	aG	aGs*	P		
No. of Container(s)	1	1	1	1	2	2	3	6		
Volume	500mL	500mL	500mL	500mL	1000mL	1000mL	40mL	1000mL		
SAMPLE ANALYSIS	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	NO2/NO3 - 353.2	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Oil & Grease - 413.1	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (4) in Special Instructions.		

Sample No.	Matrix *	Sample Date	Sample Time										
B13F24	WATER	11.30.01	0930	X	X	X	X	X	X	X			

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

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	11:30.01 1100	Sfonadin / Ra f 2.B	11.30.01 1100
Relinquished By / Removed from Ref. 2B 3728	Date/Time 12.3.01 0900	Received By / R. Thorer	Date/Time 12.3.01 0900
Relinquished By / R. Thorer ERC	Date/Time 12.3.01 0900	Received By / FEDEX	Date/Time
Relinquished By / FEDEX	Date/Time 12.4.01 0945	Received By / Carla Henry	Date/Time 12.4.01 0945
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

The ERC acknowledges that the holding time for Nitrate by EPA Method 300.0 will not be met. The laboratory is to analyze pH within 24 hours of sample receipt. *If a limited quantity of material is received, analyze in the order listed on the FSR.*

(1) IC Anions - 300.0 {Chloride, *Fluoride, Nitrate, Nitrite*, Phosphate, Sulfate}; pH (Water) - 9040
(2) ICP Metals - 6010A (TAL) {Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium, Zinc}; ICP Metals - 6010A (Add-on) {Phosphorus}
(3) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(4) Gross Alpha, Gross Beta, Gamma Spectroscopy {Cesium-137, Cobalt-60}; Gamma Spec - Add-On {Antimony-125, Ruthenium-106}; Americium-241; Neptunium-237; Isotopic Plutonium; Strontium-89/90 - Total Sr; Isotopic Uranium~~ RT 12.3.01

Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 12.3.01

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)

JAN 2002
RECEIVED

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-114 H1627

DATE RECEIVED: 12/04/01 LVL LOT # :0112L505

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13F24	001	W	01LE1458	11/30/01	12/05/01	12/20/01
B13F24	001 MS	W	01LE1458	11/30/01	12/05/01	12/20/01
B13F24	001 MSD	W	01LE1458	11/30/01	12/05/01	12/20/01
LAB QC:						
SBLKLQ	MB1	W	01LE1458	N/A	12/05/01	12/19/01
SBLKLQ	MB1 BS	W	01LE1458	N/A	12/05/01	12/19/01
SBLKLQ	MB1 BSD	W	01LE1458	N/A	12/05/01	12/19/01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-114
LVL #: 0112L505
SDG/SAF #: H1627/B01-114

W.O. #: 11343-606-001-9999-00
Date Received: 12-04-2001

SEMIVOLATILE

One (1) water sample was collected on 11-30-2001.

The sample and its associated QC samples were extracted on 12-05-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL and Tributylphosphate Semivolatile target compounds on 12-19,20-2001.

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. The sample was extracted and analyzed within required holding time.
3. A non-target compound was detected in the method blank.
4. All surrogate recoveries were within EPA QC limits.
5. Three (3) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.
6. Two (2) of twenty-two (22) blank spike recoveries were outside EPA QC limits.
7. Internal standard area and retention time criteria were met.
8. 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

01-18-02
Date

som\gorup\data\bna\tnu-hanford-0112-505.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 2 pages.

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 01MS349

Initiator: Cam Goodfield Batch: 01121505 Parameter: 0625X
Date: 12-21-01 Samples: MS & BS Matrix: H2O
Client: TNU Method: SW846/MCAWW/CLP/ Prep Batch: 01LE1458

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)

Low recovery for 1-4 Dichlorobenzene in MS + BS, also low rec. of 1,2,4 Trichlorobenzene in BS. Recoveries in MSD and BSD are fine.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description: Narrate

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

4. Project Manager Instructions...signature/date: Arlene Johnson 12/22/01

✓ 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: [illegible] 1/16/02 Other Explanation:

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

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

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

QA-105-A-0801

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.

VLI
LONVILLE LABORATORY INC

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.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

MP - Missed Peak: manually added peak not found by automatic quantitation program.

PA - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

Report Date: 12/21/01 14:15

RFW Batch Number: **0112L505** Client: **TNUHANFORD B01-114 H1627** Work Order: 11343606001 Page: 1a

	Cust ID:	B13F24	B13F24	B13F24	SBLKLQ	SBLKLQ BS	SBLKLQ BSD
Sample Information	RFW#:	001	001 MS	001 MSD	01LE1458-MB1	01LE1458-MB1	01LE1458-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	Nitrobenzene-d5	66 %	67 %	78 %	79 %	81 %	87 %
	2-Fluorobiphenyl	55 %	51 %	73 %	74 %	70 %	73 %
	p-Terphenyl-d14	106 %	101 %	117 %	112 %	124 %	117 %
	Phenol-d5	54 %	61 %	59 %	57 %	70 %	73 %
	2-Fluorophenol	53 %	65 %	66 %	63 %	71 %	76 %
	2,4,6-Tribromophenol	73 %	80 %	89 %	73 %	84 %	84 %
Phenol		10 U	62 %	59 %	10 U	71 %	72 %
bis(2-Chloroethyl)ether		10 U	20 U	21 U	10 U	10 U	10 U
2-Chlorophenol		10 U	63 %	64 %	10 U	72 %	74 %
1,3-Dichlorobenzene		10 U	20 U	21 U	10 U	10 U	10 U
1,4-Dichlorobenzene		10 U	32 * %	48 %	10 U	30 * %	39 %
1,2-Dichlorobenzene		10 U	20 U	21 U	10 U	10 U	10 U
2-Methylphenol		10 U	20 U	21 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)		10 U	20 U	21 U	10 U	10 U	10 U
3- and/or 4-Methylphenol		10 U	20 U	21 U	10 U	10 U	10 U
N-Nitroso-Di-n-propylamine		10 U	50 %	57 %	10 U	59 %	63 %
Hexachloroethane		10 U	20 U	21 U	10 U	10 U	10 U
Nitrobenzene		10 U	20 U	21 U	10 U	10 U	10 U
Isophorone		10 U	20 U	21 U	10 U	10 U	10 U
2-Nitrophenol		10 U	20 U	21 U	10 U	10 U	10 U
2,4-Dimethylphenol		10 U	20 U	21 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane		10 U	20 U	21 U	10 U	10 U	10 U
2,4-Dichlorophenol		10 U	20 U	21 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		10 U	41 %	61 %	10 U	35 * %	46 %
Naphthalene		10 U	20 U	21 U	10 U	10 U	10 U
4-Chloroaniline		10 U	20 U	21 U	10 U	10 U	10 U
Hexachlorobutadiene		10 U	20 U	21 U	10 U	10 U	10 U
4-Chloro-3-methylphenol		10 U	68 %	36 %	10 U	66 %	72 %
2-Methylnaphthalene		10 U	20 U	21 U	10 U	10 U	10 U
Hexachlorocyclopentadiene		10 U	20 U	21 U	10 U	10 U	10 U
2,4,6-Trichlorophenol		10 U	20 U	21 U	10 U	10 U	10 U
2,4,5-Trichlorophenol		26 U	50 U	53 U	25 U	25 U	25 U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0112L505 Client: TNUHANFORD B01-114 H1627 Work Order: 11343606001 Page: 1b

Cust ID:	B13F24		B13F24		B13F24		SBLKLQ		SBLKLQ BS		SBLKLQ BSD	
RFW#:	001		001 MS		001 MSD		01LE1458-MB1		01LE1458-MB1		01LE1458-MB1	
2-Chloronaphthalene	10	U	20	U	21	U	10	U	10	U	10	U
2-Nitroaniline	26	U	50	U	53	U	25	U	25	U	25	U
Dimethylphthalate	10	U	20	U	21	U	10	U	10	U	10	U
Acenaphthylene	10	U	20	U	21	U	10	U	10	U	10	U
2,6-Dinitrotoluene	10	U	20	U	21	U	10	U	10	U	10	U
3-Nitroaniline	26	U	50	U	53	U	25	U	25	U	25	U
Acenaphthene	10	U	55	%	70	%	10	U	60	%	71	%
2,4-Dinitrophenol	26	U	50	U	53	U	25	U	25	U	25	U
4-Nitrophenol	26	U	88 *	%	98 *	%	25	U	13	%	74	%
Dibenzofuran	10	U	20	U	21	U	10	U	10	U	10	U
2,4-Dinitrotoluene	10	U	72	%	81	%	10	U	76	%	85	%
Diethylphthalate	10	U	20	U	21	U	10	U	10	U	10	U
4-Chlorophenyl-phenylether	10	U	20	U	21	U	10	U	10	U	10	U
Fluorene	10	U	20	U	21	U	10	U	10	U	10	U
4-Nitroaniline	26	U	50	U	53	U	25	U	25	U	25	U
4,6-Dinitro-2-methylphenol	26	U	50	U	53	U	25	U	25	U	25	U
N-Nitrosodiphenylamine (1)	10	U	20	U	21	U	10	U	10	U	10	U
4-Bromophenyl-phenylether	10	U	20	U	21	U	10	U	10	U	10	U
Hexachlorobenzene	10	U	20	U	21	U	10	U	10	U	10	U
Pentachlorophenol	26	U	82	%	84	%	25	U	53	%	87	%
Phenanthrene	10	U	20	U	21	U	10	U	10	U	10	U
Anthracene	10	U	20	U	21	U	10	U	10	U	10	U
Carbazole	10	U	20	U	21	U	10	U	10	U	10	U
Di-n-Butylphthalate	10	U	20	U	21	U	10	U	10	U	10	U
Fluoranthene	10	U	20	U	21	U	10	U	10	U	10	U
Pyrene	10	U	92	%	106	%	10	U	118	%	108	%
Butylbenzylphthalate	10	U	20	U	21	U	10	U	10	U	10	U
3,3'-Dichlorobenzidine	10	U	20	U	21	U	10	U	10	U	10	U
Benzo(a)anthracene	10	U	20	U	21	U	10	U	10	U	10	U
Chrysene	10	U	20	U	21	U	10	U	10	U	10	U
bis(2-Ethylhexyl)phthalate	0.6	J	20	U	21	U	10	U	10	U	10	U
Di-n-Octyl phthalate	10	U	20	U	21	U	10	U	10	U	10	U
Benzo(b)fluoranthene	10	U	20	U	21	U	10	U	10	U	10	U
Benzo(k)fluoranthene	10	U	20	U	21	U	10	U	10	U	10	U
Benzo(a)pyrene	10	U	20	U	21	U	10	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	10	U	20	U	21	U	10	U	10	U	10	U
Dibenzo(a,h)anthracene	10	U	20	U	21	U	10	U	10	U	10	U
Benzo(g,h,i)perylene	10	U	20	U	21	U	10	U	10	U	10	U
Tributylphosphate	10	U	20	U	21	U	10	U	10	U	10	U

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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B13F24

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-114 H1627

Matrix: (soil/water) WATER

Lab Sample ID: 0112L505-001

Sample wt/vol: 980 (g/mL) ML

Lab File ID: D122005

Level: (low/med) LOW

Date Received: 12/04/01

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 12/05/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 12/20/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 0

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

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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKLQ

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-114 H1627

Matrix: (soil/water) WATER

Lab Sample ID: 01LE1458-MB1

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: D121906

Level: (low/med) LOW

Date Received: 12/05/01

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 12/05/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 12/19/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.394	4	J

Lionville Laboratory Use Only

0112L505

Custody Transfer Record/Lab Work Request

Page 1 of 1

VLI

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: INU-HANFORD SAF B01-114

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 12-4-01 Date Due: 1-3-02

		A-C	D	E		F	G	H	I		J	K				
Refrigerator #		1	2			2	2		2		2	2				
#/Type Container	Liquid	3AG	2AG			1AG	2AG		1PL		1PL	1PL				
	Solid															
Volume	Liquid	40	1L			500	1L		500		500	500				
	Solid															
Preservatives		HCL	—			H2SO4	HCL		HNO3							
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb	TIC TOC	oil Grease		Metal	CN	T.C Anions	NO2/NO3				
Lionville Laboratory Use Only		0624X	0625X			ITIC IOCT	IOGGR		MET(1)		INORG(1)	IN3N2				

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624X	0625X			ITIC IOCT	IOGGR		MET(1)		INORG(1)	IN3N2				
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	B13F24	✓	✓	W	11-30-01	0930	X	X			X	X		X		X	X				

Special Instructions: SAF # B01-114

DATE/REVISIONS:

MET(1) 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, Zn, P

INORG(1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IPH

3.

4.

5.

6.

Relinquished by	Received by	Date	Time
FEDEX	Carl Hunnf	12-4-01	0945

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

NOTES:

4235 7954 9438

Lionville Laboratory 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) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or (N) pH

Tamper Resistant Seal 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. 1.8 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-114-28	Page 1 of 1

Collector: Renee Nielson / R. Fahlberg	Company Contact: Virginia Rohay	Telephone No.: 372-9100	Project Coordinator: TRENT, SJ
Project Designation: PFP Well Installation Sampling and Analysis - Water	Sampling Location: 200 West		SAF No.: B01-114
Ice Chest No.: ERC-02-010	Field Logbook No.: EL-1562	COA: T20ZP1D722	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A020045		Bill of Lading/Air Bill No.: 4235 7954 - 9438

Price Code: 7N
Air Quality ☐
Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

SAMPLES STORED IN REF.# 2B AT THE 3728 SHIPPING FACILITY ON 11/30/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 12/3/01 FOR SHIPMENT. RT 12.3.01

Preservation	H2SO4 to pH <2 Cool 4C	Cool 4C	H2SO4 to pH <2 Cool 4C	HNO3 to pH <2	Cool 4C	HCL to pH <2 Cool 4C	HCl to pH <2 Cool 4C	HNO3 to pH <2		
Type of Container	aG	P	P	P	aG	aG	aGs*	P		
No. of Container(s)	1	1	1	1	2	2	3	6		
Volume	500mL	500mL	500mL	500mL	1000mL	1000mL	40mL	1000mL		
SAMPLE ANALYSIS	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	NO2/NO3 - 353.2	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Oil & Grease - 413.1	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (4) in Special Instructions.		

Sample No.	Matrix *	Sample Date	Sample Time										
B13F24	WATER	11.30.01	0930	X	X	X	X	X	X	X			

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By: R. Fahlberg / R. Fahlberg	Date/Time: 1100	Received By: Stonecin	Date/Time: 1100
Relinquished By: Removed from R. Fahlberg 2B 3728	Date/Time: 0900 12.3.01	Received By: R. Thorer	Date/Time: 0900 12.3.01
Relinquished By: R. Thorer ERC	Date/Time: 0900 12.3.01	Received By: FEDEX	Date/Time:
Relinquished By: FEDEX	Date/Time: 12-4-01 0945	Received By: Carb Henry	Date/Time: 12-4-01 0945
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

The ERC acknowledges that the holding time for Nitrate by EPA Method 300.0 will not be met. The laboratory is to analyze pH within 24 hours of sample receipt. If a limited quantity of material is received, analyze in the order listed on the FSR.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; pH (Water) - 9040
(2) ICP Metals - 6010A (TAL) {Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium, Zinc}; ICP Metals - 6010A (Add-on) {Phosphorus}
(3) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(4) Gross Alpha, Gross Beta, Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on {Antimony-125, Ruthenium-106}, Americium-241, Neptunium-237, Isotopic Plutonium, Strontium-89,90 -- Total Sr, Isotopic Uranium~~ RT 12.3.01

Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 12.3.01

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
Ve=Vegetation
X=Other

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

BHI-EE-011 (10/99)

JAN 2002
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-114 H1627

DATE RECEIVED: 12/04/01 LVL LOT # :0112L505

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13F24						
CALCIUM, TOTAL	001	W	01L0846	11/30/01	12/29/01	12/31/01
CALCIUM, TOTAL	001 REP	W	01L0846	11/30/01	12/29/01	12/31/01
CALCIUM, TOTAL	001 MS	W	01L0846	11/30/01	12/29/01	12/31/01
CADMIUM, TOTAL	001	W	01L0846	11/30/01	12/29/01	12/31/01
CADMIUM, TOTAL	001 REP	W	01L0846	11/30/01	12/29/01	12/31/01
CADMIUM, TOTAL	001 MS	W	01L0846	11/30/01	12/29/01	12/31/01
CHROMIUM, TOTAL	001	W	01L0846	11/30/01	12/29/01	12/31/01
CHROMIUM, TOTAL	001 REP	W	01L0846	11/30/01	12/29/01	12/31/01
CHROMIUM, TOTAL	001 MS	W	01L0846	11/30/01	12/29/01	12/31/01
IRON, TOTAL	001	W	01L0846	11/30/01	12/29/01	12/31/01
IRON, TOTAL	001 REP	W	01L0846	11/30/01	12/29/01	12/31/01
IRON, TOTAL	001 MS	W	01L0846	11/30/01	12/29/01	12/31/01
MAGNESIUM, TOTAL	001	W	01L0846	11/30/01	12/29/01	12/31/01
MAGNESIUM, TOTAL	001 REP	W	01L0846	11/30/01	12/29/01	12/31/01
MAGNESIUM, TOTAL	001 MS	W	01L0846	11/30/01	12/29/01	12/31/01
SODIUM, TOTAL	001	W	01L0846	11/30/01	12/29/01	12/31/01
SODIUM, TOTAL	001 REP	W	01L0846	11/30/01	12/29/01	12/31/01
SODIUM, TOTAL	001 MS	W	01L0846	11/30/01	12/29/01	12/31/01
NICKEL, TOTAL	001	W	01L0846	11/30/01	12/29/01	12/31/01
NICKEL, TOTAL	001 REP	W	01L0846	11/30/01	12/29/01	12/31/01
NICKEL, TOTAL	001 MS	W	01L0846	11/30/01	12/29/01	12/31/01
PHOSPHORUS, TOTAL	001	W	01L0846	11/30/01	12/29/01	12/31/01
PHOSPHORUS, TOTAL	001 REP	W	01L0846	11/30/01	12/29/01	12/31/01
PHOSPHORUS, TOTAL	001 MS	W	01L0846	11/30/01	12/29/01	12/31/01
ZINC, TOTAL	001	W	01L0846	11/30/01	12/29/01	12/31/01
ZINC, TOTAL	001 REP	W	01L0846	11/30/01	12/29/01	12/31/01
ZINC, TOTAL	001 MS	W	01L0846	11/30/01	12/29/01	12/31/01

LAB QC:

CALCIUM LABORATORY	LC1 BS	W	01L0846	N/A	12/29/01	12/31/01
CALCIUM, TOTAL	MB1	W	01L0846	N/A	12/29/01	12/31/01
CADMIUM LABORATORY	LC1 BS	W	01L0846	N/A	12/29/01	12/31/01
CADMIUM, TOTAL	MB1	W	01L0846	N/A	12/29/01	12/31/01
CHROMIUM LABORATORY	LC1 BS	W	01L0846	N/A	12/29/01	12/31/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-114 H1627

DATE RECEIVED: 12/04/01 LVL LOT # :0112L505

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM, TOTAL	MB1	W	01L0846	N/A	12/29/01	12/31/01
IRON LABORATORY	LC1 BS	W	01L0846	N/A	12/29/01	12/31/01
IRON, TOTAL	MB1	W	01L0846	N/A	12/29/01	12/31/01
MAGNESIUM LABORATORY	LC1 BS	W	01L0846	N/A	12/29/01	12/31/01
MAGNESIUM, TOTAL	MB1	W	01L0846	N/A	12/29/01	12/31/01
SODIUM LABORATORY	LC1 BS	W	01L0846	N/A	12/29/01	12/31/01
SODIUM, TOTAL	MB1	W	01L0846	N/A	12/29/01	12/31/01
NICKEL LABORATORY	LC1 BS	W	01L0846	N/A	12/29/01	12/31/01
NICKEL, TOTAL	MB1	W	01L0846	N/A	12/29/01	12/31/01
PHOSPHORUS LCS	LC1 BS	W	01L0846	N/A	12/29/01	12/31/01
PHOSPHORUS, TOTAL	MB1	W	01L0846	N/A	12/29/01	12/31/01
ZINC LABORATORY	LC1 BS	W	01L0846	N/A	12/29/01	12/31/01
ZINC, TOTAL	MB1	W	01L0846	N/A	12/29/01	12/31/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-114
LVL#: 0112L505
SDG/SAF#: H1627/B01-114

W.O.#: 11343-606-001-9999-00
Date Received: 12-04-01

METALS CASE NARRATIVE

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

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

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

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

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

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

7. The preparation/method blanks for 2 analytes were outside 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.

   a). The MB results for Sodium and Zinc were greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and all samples read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

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.

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

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.

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.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

01-04-02
Date

gmb/m12-505

LVLI
LIONVILLE LABORATORY INC.

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0112L505

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: ✓3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	__6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	__6010B		__200.7				__99
Beryllium	__6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	✓6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	__6010B	__7211 [5]	__200.7	__220.2			__99
Iron	✓6010B		__200.7				__99
Lead	__6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	✓6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	__7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	__6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	__6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	✓6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2__200.9			__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	__6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other: Phosphorous Method: 6010B

L-WI-033/M-03/01

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 Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/03/02

CLIENT: TNUHANFORD B01-114 H1627 LVL LOT #: 0112L505

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13F24	Calcium, Total	74.0		UG/L	8.9	1.0
		Cadmium, Total	0.30	u	UG/L	0.30	1.0
		Chromium, Total	0.60	u	UG/L	0.60	1.0
		Iron, Total	17.3	u	UG/L	17.3	1.0
		Magnesium, Total	22.5		UG/L	4.1	1.0
		Sodium, Total	52.2		UG/L	3.6	1.0
		Nickel, Total	1.0	u	UG/L	1.0	1.0
		Phosphorus, Total	20.0	u	UG/L	20.0	1.0
		Zinc, Total	20.9		UG/L	0.30	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/03/02

CLIENT: TNUHANFORD B01-114 H1627 LVL LOT #: 0112L50S

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0846-MB1	Calcium, Total	9.4		UG/L	8.9	1.0
		Cadmium, Total	0.46		UG/L	0.30	1.0
		Chromium, Total	0.60	u	UG/L	0.60	1.0
		Iron, Total	17.3	u	UG/L	17.3	1.0
		Magnesium, Total	4.1		UG/L	4.1	1.0
		Sodium, Total	19.0		UG/L	3.6	1.0
		Nickel, Total	1.0	u	UG/L	1.0	1.0
		Phosphorus, Total	20.0	u	UG/L	20.0	1.0
		Zinc, Total	0.97		UG/L	0.30	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/03/02

CLIENT: TNUHANFORD B01-114 H1627 LVL LOT #: 0112L505

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B13F24	Calcium, Total	25900	74.0	25000	103.5	1.0
		Cadmium, Total	51.6	0.30u	50.0	103.2	1.0
		Chromium, Total	205	0.60u	200	102.6	1.0
		Iron, Total	1020	17.3 u	1000	102.4	1.0
		Magnesium, Total	25400	22.5	25000	101.3	1.0
		Sodium, Total	24500	52.2	25000	97.7	1.0
		Nickel, Total	515	1.0 u	500	103.0	1.0
		Phosphorus, Total	5050	20.0 u	5000	101.0	1.0
		Zinc, Total	539	20.9	500	103.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/03/02

CLIENT: TNUHANFORD B01-114 H1627 LVL LOT #: 0112L505

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B13F24	Calcium, Total	74.0	48.1	42.4	1.0
		Cadmium, Total	0.30u	0.30u	NC	1.0
		Chromium, Total	0.60u	0.60u	NC	1.0
		Iron, Total	17.3 u	17.3 u	NC	1.0
		Magnesium, Total	22.5	10.7	71.1	1.0
		Sodium, Total	52.2	47.3	9.8	1.0
		Nickel, Total	1.0 u	1.0 u	NC	1.0
		Phosphorus, Total	20.0 u	20.0 u	NC	1.0
		Zinc, Total	20.9	20.5	1.9	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/03/02

CLIENT: TNUHANFORD B01-114 H1627 LVL LOT #: 0112L505

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0846-LC1	Calcium, LCS	24700	25000	UG/L	98.8
		Cadmium, LCS	256	250	UG/L	102.3
		Chromium, LCS	509	500	UG/L	101.9
		Iron, LCS	5050	5000	UG/L	100.9
		Magnesium, LCS	25400	25000	UG/L	101.6
		Sodium, LCS	24800	25000	UG/L	99.3
		Nickel, LCS	2060	2000	UG/L	102.9
		Phosphorus, LCS	4990	5000	UG/L	99.7
		Zinc, LCS	1030	1000	UG/L	103.2

Lionville Laboratory Use Only

01121505

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI HONSHOLT LABORATORY INC

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-HANFORD SAF B01-114

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 12-4-01 Date Due: 1-3-02

		A	C	D	E	F	G	H	I	J	K
Refrigerator #		1	2			2	2		2	2	2
#/Type Container	Liquid	3AG	2AG			1AG	2AG		1PL	1PL	1PL
	Solid										
Volume	Liquid	40	1L			500	1L		500	500	500
	Solid										
Preservatives		HCL	—			H2SO4	HCL		HNO3		
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb	T.I.C TOC	OIL GREASE		INORG: Metal	CN	T.C Anions NO2/NO3
Lionville Laboratory Use Only		0624 X	0625 X			ITIC TOCT	IOGGR		MET(1) ~~Post Digest~~		INORG(1) INNO2

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	0624	0625			ITIC TOCT	IOGGR		MET(1)		INORG(1)	INNO2				
001	B13F24	✓	✓	W	11-30-01	0930	X	X			X	X		X		X	X				

Special Instructions: SAF # B01-114

DATE/REVISIONS:
MET(1) 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, Zn, P
INORG(1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IPH
3.
4.
5.
6.

Lionville Laboratory 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) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N

Tamper Resistant Seal 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. 1.8 °C

Relinquished by	Received by	Date	Time
FEDEX	[illegible]	12-4-01	0945

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
4235 7954 9438

pH

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-114-28	Page 1 of 1

Collector: Renee Nielson / R. Fahlberg	Company Contact: Virginia Rohay	Telephone No.: 372-9100	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: PFP Well Installation Sampling and Analysis - Water	Sampling Location: 200 West	SAF No.: B01-114	
Ice Chest No.: ERC-02-010	Field Logbook No.: EL-1562	COA: T20ZP1D722	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A020045	Bill of Lading/Air Bill No.: 4235 7954 - 9438	

POSSIBLE SAMPLE HAZARDS/REMARKS

SAMPLES STORED IN REF.# 2B AT THE 3728 SHIPPING FACILITY ON 11/30/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 12/3/01 FOR SHIPMENT. RT 12.3.01

Preservation	H2SO4 to pH <2 Cool 4C	Cool 4C	H2SO4 to pH <2 Cool 4C	HNO3 to pH <2	Cool 4C	HCL to pH <2 Cool 4C	HCl to pH <2 Cool 4C	HNO3 to pH <2		
Type of Container	aG	P	P	P	aG	aG	aGs*	P		
No. of Container(s)	1	1	1	1	2	2	3	6		
Volume	500mL	500mL	500mL	500mL	1000mL	1000mL	40mL	1000mL		
SAMPLE ANALYSIS	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	NO2/NO3 - 353.2	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Oil & Grease - 413.1	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (4) in Special Instructions.		

Sample No.	Matrix*	Sample Date	Sample Time										
B13F24	WATER	11.30.01	0930	X	X	X	X	X	X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	11.30.01 1100	Sfoneadin	1100
Removed from Rad. ZB 3728	12.3.01 0900	R. Thorer	12.3.01 0900
R. Thorer ERC	12.3.01 0900	FEDEX	
FEDEX	12.4.01 0945	Carla Henry	12.4.01 0945

SPECIAL INSTRUCTIONS

The ERC acknowledges that the holding time for Nitrate by EPA Method 300.0 will not be met. The laboratory is to analyze pH within 24 hours of sample receipt. If a limited quantity of material is received, analyze in the order listed on the FSR.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; pH (Water) - 9040
(2) ICP Metals - 6010A (TAL) {Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium, Zinc}; ICP Metals - 6010A (Add-on) {Phosphorus}
(3) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(4) Gross Alpha, Gross Beta, Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-On (Antimony-126, Ruthenium-106), Americium-241, Neptunium-237, Isotopic Plutonium, Strontium-89,90 - Total Sr, Isotopic Uranium~~ RT 12.3.01

Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 12.3.01

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)

JAN 2002
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-114 H1627

DATE RECEIVED: 12/04/01 LVL LOT # :0112L508

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13F24						
CHLORIDE BY IC	001	W	01LICB83	11/30/01	12/11/01	12/11/01
CHLORIDE BY IC	001 REP	W	01LICB83	11/30/01	12/11/01	12/11/01
CHLORIDE BY IC	001 MS	W	01LICB83	11/30/01	12/11/01	12/11/01
FLUORIDE BY IC	001	W	01LICB83	11/30/01	12/11/01	12/11/01
FLUORIDE BY IC	001 REP	W	01LICB83	11/30/01	12/11/01	12/11/01
FLUORIDE BY IC	001 MS	W	01LICB83	11/30/01	12/11/01	12/11/01
NITRITE BY IC	001	W	01LICB83	11/30/01	12/11/01	12/11/01
NITRITE BY IC	001 REP	W	01LICB83	11/30/01	12/11/01	12/11/01
NITRITE BY IC	001 MS	W	01LICB83	11/30/01	12/11/01	12/11/01
NITRATE BY IC	001	W	01LICB83	11/30/01	12/11/01	12/11/01
NITRATE BY IC	001 REP	W	01LICB83	11/30/01	12/11/01	12/11/01
NITRATE BY IC	001 MS	W	01LICB83	11/30/01	12/11/01	12/11/01
PHOSPHATE BY IC	001	W	01LICB83	11/30/01	12/11/01	12/11/01
PHOSPHATE BY IC	001 REP	W	01LICB83	11/30/01	12/11/01	12/11/01
PHOSPHATE BY IC	001 MS	W	01LICB83	11/30/01	12/11/01	12/11/01
SULFATE BY IC	001	W	01LICB83	11/30/01	12/11/01	12/11/01
SULFATE BY IC	001 REP	W	01LICB83	11/30/01	12/11/01	12/11/01
SULFATE BY IC	001 MS	W	01LICB83	11/30/01	12/11/01	12/11/01
NITRATE NITRITE	001	W	01LN3A65	11/30/01	12/07/01	12/07/01
NITRATE NITRITE	001 REP	W	01LN3A65	11/30/01	12/07/01	12/07/01
NITRATE NITRITE	001 MS	W	01LN3A65	11/30/01	12/07/01	12/07/01
TOTAL ORGANIC CARBON	001	W	01LTC060	11/30/01	12/17/01	12/17/01
TOTAL ORGANIC CARBON	001 REP	W	01LTC060	11/30/01	12/17/01	12/17/01
TOTAL ORGANIC CARBON	001 MS	W	01LTC060	11/30/01	12/17/01	12/17/01
OIL & GREASE BY GRAV	001	W	01LOG043	11/30/01	12/12/01	12/13/01
OIL AND GREASE BY GR	001 REP	W	01LOG043	11/30/01	12/12/01	12/13/01
PH	001	W	01LPH082	11/30/01	12/05/01	12/05/01
PH	001 REP	W	01LPH082	11/30/01	12/05/01	12/05/01
TOTAL INORGANIC CARB	001	W	01LTCB60	11/30/01	12/17/01	12/17/01

LAB QC:

CHLORIDE BY IC	MB1	W	01LICB83	N/A	12/11/01	12/11/01
CHLORIDE BY IC	MB1 BS	W	01LICB83	N/A	12/11/01	12/11/01
FLUORIDE BY IC	MB1	W	01LICB83	N/A	12/11/01	12/11/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-114 H1627

DATE RECEIVED: 12/04/01 LVL LOT # :0112L505

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
FLUORIDE BY IC	MB1 BS	W	01LICB83	N/A	12/11/01	12/11/01
NITRITE BY IC	MB1	W	01LICB83	N/A	12/11/01	12/11/01
NITRITE BY IC	MB1 BS	W	01LICB83	N/A	12/11/01	12/11/01
NITRATE BY IC	MB1	W	01LICB83	N/A	12/11/01	12/11/01
NITRATE BY IC	MB1 BS	W	01LICB83	N/A	12/11/01	12/11/01
PHOSPHATE BY IC	MB1	W	01LICB83	N/A	12/11/01	12/11/01
PHOSPHATE BY IC	MB1 BS	W	01LICB83	N/A	12/11/01	12/11/01
SULFATE BY IC	MB1	W	01LICB83	N/A	12/11/01	12/11/01
SULFATE BY IC	MB1 BS	W	01LICB83	N/A	12/11/01	12/11/01
NITRATE NITRITE	MB1	W	01LN3A65	N/A	12/03/01	12/03/01
NITRATE NITRITE	MB1 BS	W	01LN3A65	N/A	12/03/01	12/03/01
TOTAL ORGANIC CARBON	MB1	W	01LTC060	N/A	12/17/01	12/17/01
TOTAL ORGANIC CARBON	MB1 BS	W	01LTC060	N/A	12/17/01	12/17/01
OIL & GREASE BY GRAV	MB1	W	01LOG043	N/A	12/12/01	12/13/01
OIL AND GREASE BY GR	MB1 BS	W	01LOG043	N/A	12/12/01	12/13/01
OIL AND GREASE BY GR	MB1 BSD	W	01LOG043	N/A	12/12/01	12/13/01
TOTAL INORGANIC CARB	MB1	W	01LTCB60	N/A	12/17/01	12/17/01
TOTAL INORGANIC CARB	MB1 BS	W	01LTCB60	N/A	12/17/01	12/17/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-114 H1627
LVL#: 0112L505

W.O.#: 11343-606-001-9999-00
Date Received: 12-04-01

INORGANIC NARRATIVE

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

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

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

4. The cooler temperature was 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.

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

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

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

12-20-01
Date

njp\i12-505

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 12 pages.

Lionville Laboratory Incorporated

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: **Method:**

Lionville Laboratory Incorporated

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 Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/20/01

CLIENT: TNUHANFORD B01-114 H1627 LVL LOT #: 0112L505

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13F24	Chloride by IC	0.35	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
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
		Nitrate Nitrite	0.020u	MG/L	0.020	1.0
		Total Organic Carbon	0.50 u	MG/L	0.50	1.0
		Oil & Grease Gravimetri	0.95	MG/L	0.95	1.0
		pH	5.8	PH UNIT	0.01	1.0
		Total Inorganic Carbon	0.50 u	MG/L	0.50	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/20/01

CLIENT: TNUHANFORD B01-114 H1627 LVL LOT #: 0112L505

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LICB83-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
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	01LN3A65-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	01LTC060-MB1	Total Organic Carbon	0.50 u	MG/L	0.50	1.0
BLANK10	01LOG043-MB1	Oil & Grease Gravimetri	1.0 u	MG/L	1.0	1.0
BLANK10	01LTCB60-MB1	Total Inorganic Carbon	0.50 u	MG/L	0.50	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/20/01

CLIENT: TNUHANFORD B01-114 H1627 LVL LOT #: 0112L505

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B13F24	Chloride by IC	5.1	0.35	5.0	94.4	1.0
		Fluoride by IC	10.6	0.50u	10.0	106.1	1.0
		Nitrite by IC	4.95	0.25u	5.00	99.1	1.0
		Nitrate by IC	4.92	0.25u	5.00	98.4	1.0
		Phosphate by IC	4.9	0.25u	5.0	97.2	1.0
		Sulfate by IC	4.9	0.25u	5.0	98.4	1.0
		Nitrate Nitrite	0.50	0.02u	0.50	100.8	1.0
		Total Organic Carbon	5.2	0.50u	5.0	103.5	1.0
BLANK10	01LICB83-MB1	Chloride by IC	4.7	0.25u	5.0	94.5	1.0
		Fluoride by IC	10.8	0.50u	10.0	107.7	1.0
		Nitrite by IC	4.76	0.25u	5.00	95.3	1.0
		Nitrate by IC	4.79	0.25u	5.00	95.9	1.0
		Phosphate by IC	5.3	0.25u	5.0	106.1	1.0
		Sulfate by IC	4.8	0.25u	5.0	96.2	1.0
BLANK10	01LN3A65-MB1	Nitrate Nitrite	0.48	0.02u	0.50	96.8	1.0
BLANK10	01LTC060-MB1	Total Organic Carbon	5.0	0.50u	5.0	99.7	1.0
BLANK10	01LOG043-MB1	Oil & Grease Gravimetr	58.6	1.0 u	54.7	107.1	1.0
		Oil & Grease - Grav M	58.9	1.0 u	51.3	114.8	1.0
BLANK10	01LTCB60-MB1	Total Inorganic Carbon	5.0	0.50u	5.0	99.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/20/01

CLIENT: TNUHANFORD B01-114 H1627 LVL LOT #: 0112L505

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B13F24	Chloride by IC	0.35	0.25u	NC	1.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	0.25u	0.25u	NC	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	0.25u	0.25u	NC	1.0
		Nitrate Nitrite	0.02u	0.02u	NC	1.0
		Total Organic Carbon	0.50u	0.50u	NC	1.0
		Oil & Grease Gravimetri	0.95	1.0	9.6	1.0
		pH	5.8	5.8	0.7	1.0

Lionville Laboratory Use Only

0112L505

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-HANFORD SAF B01-114

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 12-4-01 Date Due: 1-3-02

		A-C	D	E		F	G	H	I		J	K
Refrigerator #		1	2			2	2		2		2	2
#/Type Container	Liquid	3AG	2AG			1AG	2AG		1PL		1PL	1PL
	Solid											
Volume	Liquid	40	1L			500	1L		500		500	500
	Solid											
Preservatives		HCL	—			H2SO4	HCL		HNO3			
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb	T.I.C. TOC	Oil & Grease		INORG: Metal	CN	T.C. Anions	NO2/NO3
Lionville Laboratory Use Only		0624X	0625X			ITIC IOCT	IOGGR		MET(1) ~~SPOT~~		INORG(1)	IN3N2

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	0624X	0625X			ITIC IOCT	IOGGR		MET(1) ~~SPOT~~		INORG(1)	IN3N2				
001	B13F24	✓	✓	W	11-30-01	0930	X	X			X	X		X		X	X				

Special Instructions: SAF # B01-114

DATE/REVISIONS:

MET(1) 1. Cd, Ca, Cr, Fe, Mg, Ni, Na, Zn, P

INORG(1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4, IPH

3.

4.

5.

6.

Relinquished by	Received by	Date	Time
FEDEX	Carl Wyrwas	12-4-01	0945

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

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

NOTES:

4235 7954 9438

Lionville Laboratory 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) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or (N)

Tamper Resistant Seal 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. 1.8 °C

pH, NO2, NO3, PO4

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-114-28	Page 1 of 1

Collector: Renee Nielson / R. Fahlberg	Company Contact: Virginia Rohay	Telephone No.: 372-9100	Project Coordinator: TRENT, SJ
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: PFP Well Installation Sampling and Analysis - Water	Sampling Location: 200 West	SAF No.: B01-114	
Ice Chest No.: ERC-02-010	Field Logbook No.: EL-1562	COA: T20ZP1D722	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A020045	Bill of Lading/Air Bill No.: 4235 7954 - 9438	

POSSIBLE SAMPLE HAZARDS/REMARKS

SAMPLES STORED IN REF.# 2B AT THE 3728 SHIPPING FACILITY ON 11/30/01. COLLECTOR NOT AVAILABLE TO RELINQUISH SAMPLES ON 12/3/01 FOR SHIPMENT. RT 12.3.01

Preservation	H2SO4 to pH <2 Cool 4C	Cool 4C	H2SO4 to pH <2 Cool 4C	HNO3 to pH <2	Cool 4C	HCL to pH <2 Cool 4C	HCl to pH <2 Cool 4C	HNO3 to pH <2		
Type of Container	sG	P	P	P	sG	sG	sGs*	P		
No. of Container(s)	1	1	1	1	2	2	3	6		
Volume	500mL	500mL	500mL	500mL	1000mL	1000mL	40mL	1000mL		
SAMPLE ANALYSIS	TIC - 415.1M; TOC - 415.1	See item (1) in Special Instructions.	NO2/NO3 - 353.2	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Oil & Grease - 413.1	VOA - 8260A (TCL); VOA - 8260A (Add-On) (n-Butylbenzene)	See item (4) in Special Instructions. RT 11.30.01		

Sample No.	Matrix *	Sample Date	Sample Time										
B13F24	WATER	11.30.01	0930	X	X	X	X	X	X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R. Fahlberg	Date/Time: 1100 11.30.01	Received By: Storedin / Rae Z. B	Date/Time: 1100 11.30.01
Relinquished By: Removed from / Rae ZB 3728	Date/Time: 0900 12.3.01	Received By: R. Thorer	Date/Time: 0900 12.3.01
Relinquished By: R. Thorer ERC	Date/Time: 0900 12.3.01	Received By: FEDEX	Date/Time:
Relinquished By: FEDEX	Date/Time: 12-4-01 0945	Received By: Carb Henry	Date/Time: 12-4-01 0945
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

The ERC acknowledges that the holding time for Nitrate by EPA Method 300.0 will not be met. The laboratory is to analyze pH within 24 hours of sample receipt. If a limited quantity of material is received, analyze in the order listed on the FSR.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; pH (Water) - 9040
(2) ICP Metals - 6010A (TAL) {Cadmium, Calcium, Chromium, Iron, Magnesium, Nickel, Sodium, Zinc}; ICP Metals - 6010A (Add-on) {Phosphorus}
(3) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(4) Gross Alpha, Gross Beta, Gamma Spectroscopy {Cesium-137, Cobalt-60}; Gamma Spec - Add-on {Antimony-125, Ruthenium-106}, Americium-241, Neptunium-237, Isotopic Plutonium, Strontium-89,90 + Total Sr, Isotopic Uranium~~ RT 12.3.01

Samples did not originate in radiological controlled area. No total activity associated with sample/samples. RT 12.3.01

Matrix *
S=Soil
SS=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: 12-4-01 0945

SDG#: 0112L505

Work Order Number: _____ SAF# B01-114

Shipping Container ID: ERC-02-010 Chain of Custody # B01-114-28

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: 14
7. Sample holding times exceeded? Yes [ ] No [✓]

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

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

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

Sample Custodian/Laboratory: Carla Hemsley Date: 12-4-01

Telephoned to: _____ On _____ By _____