H1524

0056824

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1524 was composed of one solid (soil) sample designated under SAF No. B01-058 with a Project Designation of: 200-TW-1 & 2 – Soil Sampling. SDG H1524 (7099) was batched with SDG H1519 (7094) except for the C-14 analyses.

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 December 10, 2001.

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2.0 ANALYSIS NOTES

2.1 Tritium Analyses

The matrix spike was associated with SDG H1519 (7094). The matrix spike recovery was 92%. No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.5 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.8 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.9 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.10 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.11 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.12 Gamma Spectroscopy Analyses

The RPD between sample B12MJ2 and its sample duplicate for Ra-226 was 140%, greater than the 3σ limit of 72%. No other problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Program Manager

12/20/01

Date

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

SDG 7099
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1524

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B12MJ2	B-7A/200 E	SOLID		R110011-01	B01-058	B01-058-232	09/26/01 12:55
Method Blank		SOLID		R109170-06	B01-058		
Method Blank		SOLID		R110011-04	B01-058		
Lab Control Sample		SOLID		R109170-05	B01-058		
Lab Control Sample		SOLID		R110011-03	B01-058		
Duplicate (R110011-01)	B-7A/200 E	SOLID		R110011-02	B01-058		09/26/01 12:55

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

SDG 7099
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1524

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
7094		Method Blank	SOLID						R109170-06	7094-006
		Lab Control Sample	SOLID						R109170-05	7094-005
7099	B01-058-232	B12MJ2	SOLID	80.3	1082 g		09/27/01	1	R110011-01	7099-001
		Method Blank	SOLID						R110011-04	7099-004
		Lab Control Sample	SOLID						R110011-03	7099-003
		Duplicate (R110011-01)	SOLID	80.3	1082 g		09/27/01	1	R110011-02	7099-002

Lab id TMANC
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Form DVD-QS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

SDG 7099
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1524

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	7008-181	5.0	1			1	1	1/1		
NP	SOLID	Neptunium in Soil	7008-181	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7008-181	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	7008-181	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	7008-181	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7008-181	10.0	1			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	7008-181	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7008-181	15.0	1			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	7008-181	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	7012-006	10.0	1			1	1	1/1		
H	SOLID	Tritium in Soil	7008-181	10.0	1			1	1	1/1		
NI_L	SOLID	Nickel 63 in Soil	7008-181	10.0	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
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

SDG 7099
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1524

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B12MJ2			R110011-01	7099-001	AM		11/17/01	12/10/01	MCM	Americium 241 in Soil
B-7A/200 E		SOLID	09/26/01	7099-001	C		11/14/01	12/10/01	MCM	Carbon 14 in Soil
B01-058-232	B01-058		09/27/01	7099-001	GAM		11/12/01	12/10/01	MCM	Gamma Scan
				7099-001	H		11/07/01	12/10/01	MCM	Tritium in Soil
				7099-001	NI_L		11/05/01	12/10/01	MCM	Nickel 63 in Soil
				7099-001	NP		11/09/01	12/10/01	MCM	Neptunium in Soil
				7099-001	PU		11/20/01	12/10/01	MCM	Plutonium, Isotopic in Solids
				7099-001	SR		11/05/01	12/10/01	MCM	Total Strontium in Soil
				7099-001	TC		11/26/01	12/10/01	MCM	Technetium 99 in Soil
				7099-001	TH		11/13/01	12/10/01	MCM	Thorium, Isotopic in Soil
				7099-001	U		11/09/01	12/10/01	MCM	Uranium, Isotopic in Soil
				7099-001	U_T		11/21/01	12/10/01	MCM	Uranium, Total in Soil
Method Blank			R109170-06	7094-006	AM		11/17/01	12/09/01	MCM	Americium 241 in Soil
		SOLID		7094-006	GAM		11/13/01	12/09/01	MCM	Gamma Scan
	B01-058			7094-006	H		11/07/01	12/09/01	MCM	Tritium in Soil
				7094-006	NI_L		11/05/01	12/09/01	MCM	Nickel 63 in Soil
				7094-006	NP		11/09/01	12/09/01	MCM	Neptunium in Soil
				7094-006	PU		11/19/01	12/09/01	MCM	Plutonium, Isotopic in Solids
				7094-006	SR		11/05/01	12/09/01	MCM	Total Strontium in Soil
				7094-006	TC		11/27/01	12/09/01	MCM	Technetium 99 in Soil
				7094-006	TH		11/13/01	12/09/01	MCM	Thorium, Isotopic in Soil
				7094-006	U		11/08/01	12/09/01	MCM	Uranium, Isotopic in Soil
				7094-006	U_T		11/21/01	12/09/01	MCM	Uranium, Total in Soil
Method Blank			R110011-04	7099-004	C		11/14/01	12/10/01	MCM	Carbon 14 in Soil
		SOLID								
	B01-058									

Lab id TMANC
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

SDG 7099
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1524

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			R109170-05	7094-005	AM		11/17/01	12/09/01	MCM	Americium 241 in Soil
		SOLID		7094-005	GAM		11/12/01	12/09/01	MCM	Gamma Scan
	B01-058			7094-005	H		11/07/01	12/09/01	MCM	Tritium in Soil
				7094-005	NI_L		11/05/01	12/09/01	MCM	Nickel 63 in Soil
				7094-005	NP		11/09/01	12/09/01	MCM	Neptunium in Soil
				7094-005	PU		11/19/01	12/09/01	MCM	Plutonium, Isotopic in Solids
				7094-005	SR		11/05/01	12/09/01	MCM	Total Strontium in Soil
				7094-005	TC		11/29/01	12/09/01	MCM	Technetium 99 in Soil
				7094-005	TH		11/07/01	12/09/01	MCM	Thorium, Isotopic in Soil
				7094-005	U		11/07/01	12/09/01	MCM	Uranium, Isotopic in Soil
				7094-005	U_T		11/21/01	12/09/01	MCM	Uranium, Total in Soil
Lab Control Sample			R110011-03	7099-003	C		11/14/01	12/10/01	MCM	Carbon 14 in Soil
		SOLID								
	B01-058									
Duplicate (R110011-01)			R110011-02	7099-002	AM		11/17/01	12/10/01	MCM	Americium 241 in Soil
B-7A/200 E		SOLID	09/26/01	7099-002	C		11/14/01	12/10/01	MCM	Carbon 14 in Soil
	B01-058		09/27/01	7099-002	GAM		11/12/01	12/10/01	MCM	Gamma Scan
				7099-002	H		11/07/01	12/10/01	MCM	Tritium in Soil
				7099-002	NI_L		11/05/01	12/10/01	MCM	Nickel 63 in Soil
				7099-002	NP		11/15/01	12/10/01	MCM	Neptunium in Soil
				7099-002	PU		11/20/01	12/10/01	MCM	Plutonium, Isotopic in Solids
				7099-002	SR		11/05/01	12/10/01	MCM	Total Strontium in Soil
				7099-002	TC		11/27/01	12/10/01	MCM	Technetium 99 in Soil
				7099-002	TH		11/08/01	12/10/01	MCM	Thorium, Isotopic in Soil
				7099-002	U		11/08/01	12/10/01	MCM	Uranium, Isotopic in Soil
				7099-002	U_T		11/21/01	12/10/01	MCM	Uranium, Total in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

SDG 7099
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1524

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B01-058	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
C	B01-058	Carbon 14 in Soil	C14_COX_LSC	1			1	1	1	4
GAM	B01-058	Gamma Scan	GAMMA_GS	1			1	1	1	4
H	B01-058	Tritium in Soil	906.0_H3_LSC	1			1	1	1	4
NI_L	B01-058	Nickel 63 in Soil	NI63_LSC	1			1	1	1	4
NP	B01-058	Neptunium in Soil	NP237_LLE_PLATE_AEA	1			1	1	1	4
PU	B01-058	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	B01-058	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TC	B01-058	Technetium 99 in Soil	TC99_TR_SEP_LSC	1			1	1	1	4
TH	B01-058	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1			1	1	1	4
U	B01-058	Uranium, Isotopic in Soil	UISO_PLATE_AEA	1			1	1	1	4
U_T	B01-058	Uranium, Total in Soil	UTOT_KPA	1			1	1	1	4
TOTALS				12			12	12	12	48

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

R109170-06 **Method Blank**

METHOD BLANK

SDG	7099	Client/Case no	Hanford	SDG	H1524
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109170-06	Client sample id	Method Blank		
Dept sample id	7094-006	Material/Matrix		SOLID	
		SAF No	B01-058		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.040	0.13	0.23	400	U	H
Carbon 14	14762-75-5	N.A.			50		C
Nickel 63	13981-37-8	-1.59	1.3	2.2	30	U	NI_L
Total Strontium	SR-RAD	0.008	0.15	0.30	1.0	U	SR
Americium 241	14596-10-2	0.025	0.10	0.19	1.0	U	AM
Technetium 99	14133-76-7	-0.025	0.11	0.36	15	U	TC
Thorium 228	14274-82-9	-0.062	0.25	0.55		U	TH
Thorium 230	14269-63-7	-0.093	0.25	0.47	1.0	U	TH
Thorium 232	TH-232	0.093	0.12	0.24	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0	0.001	0.003	0.10	U	U_T
Uranium 233	U-233/234	-0.021	0.084	0.20	1.0	U	U
Uranium 235	15117-96-1	0.025	0.10	0.19	1.0	U	U
Uranium 238	U-238	0.063	0.084	0.16	1.0	U	U
Neptunium 237	13994-20-2	0	0.092	0.14	1.0	U	NP
Plutonium 238	13981-16-3	0	0.053	0.20	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.053	0.20	1.0	U	PU
Potassium 40	13966-00-2	U		0.079		U	GAM
Cobalt 60	10198-40-0	U		0.007	0.050	U	GAM
Cesium 137	10045-97-3	U		0.006	0.10	U	GAM
Radium 226	13982-63-3	U		0.013	0.10	U	GAM
Radium 228	15262-20-1	U		0.030	0.20	U	GAM
Europium 152	14683-23-9	U		0.015	0.10	U	GAM
Europium 154	15585-10-1	U		0.019	0.10	U	GAM
Europium 155	14391-16-3	U		0.013	0.10	U	GAM
Thorium 228	14274-82-9	U		0.008		U	GAM
Thorium 232	TH-232	U		0.030		U	GAM
Uranium 235	15117-96-1	U		0.019		U	GAM
Uranium 238	U-238	U		0.73		U	GAM
Americium 241	14596-10-2	U		0.017		U	GAM

200-TW-1 & 2 - Soil Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/10/01

B L A N K , c o n t .

SDG	7099	Client/Case no	Hanford SDG H1524
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109170-06	Client sample id	Method Blank
Dept sample id	7094-006	Material/Matrix	SOLID
		SAF No	B01-058

QC-BLANK 40061

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/10/01

M E T H O D B L A N K

SDG	7099	Client/Case no	Hanford SDG H1524
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R110011-04	Client sample id	Method Blank
Dept sample id	7099-004	Material/Matrix	SOLID
		SAF No	B01-058

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-2.36	3.2	5.5	50	U	C

200-TW-1 & 2 - Soil Sampling

QC-BLANK 40246

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

R109170-05 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7099 Client/Case no Hanford SDG H1524
Contact Melissa C. Mannion Case no No. 630

Lab sample id R109170-05 Client sample id Lab Control Sample
Dept sample id 7094-005 Material/Matrix SOLID
SAF No B01-058

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	23.9	0.50	0.22	400	J	H	24.6	0.98	97	84-116	80-120
Carbon 14	N.A.			50		C					80-120
Nickel 63	258	5.5	2.7	30		NI_L	264	11	98	84-116	80-120
Total Strontium	23.7	0.91	0.28	1.0		SR	22.9	0.92	104	82-118	80-120
Americium 241	21.6	2.1	0.19	1.0		AM	21.0	0.84	103	82-118	80-120
Technetium 99	133	2.6	0.37	15		TC	131	5.2	102	83-117	80-120
Thorium 230	44.8	2.1	0.34	1.0		TH	44.8	1.8	100	88-112	80-120
Total Uranium (ug/g)	18.7	2.2	0.026	0.10		U_T	18.1	0.72	103	76-124	80-120
Uranium 233	18.8	1.8	0.88	1.0		U	19.1	0.76	98	83-117	80-120
Uranium 235	15.2	1.6	0.20	1.0		U	15.7	0.63	97	82-118	80-120
Uranium 238	20.7	1.9	0.83	1.0		U	21.0	0.84	99	83-117	80-120
Neptunium 237	23.9	1.9	0.11	1.0		NP	23.8	0.95	100	85-115	80-120
Plutonium 238	29.3	3.3	0.28	1.0		PU	27.2	1.1	108	79-121	80-120
Plutonium 239/240	32.4	3.6	0.28	1.0		PU	29.0	1.2	112	79-121	80-120
Cobalt 60	0.288	0.013	0.006	0.050		GAM	0.276	0.011	104	75-125	80-120
Cesium 137	0.341	0.012	0.009	0.10		GAM	0.318	0.013	107	74-126	80-120

200-TW-1 & 2 - Soil Sampling

QC-LCS 40060

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

R110011-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG	7099	Client/Case no	Hanford SDG H1524
Contact	Melissa C. Mannion	Case no	No. 630
Lab sample id	R110011-03	Client sample id	Lab Control Sample
Dept sample id	7099-003	Material/Matrix	SOLID
		SAF No	B01-058

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	10300	100	15	50		C	11300	450	91	85-115	80-120

200-TW-1 & 2 - Soil Sampling

QC-LCS 40245

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-LCS
Version	3.06
Report date	12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

R110011-02 B12MJ2

DUPLICATE

SDG	7099			Client/Case no	Hanford SDG H1524
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R110011-02	Lab sample id	R110011-01	Client sample id	B12MJ2
Dept sample id	7099-002	Dept sample id	7099-001	Location/Matrix	B-7A/200 E SOLID
		Received	09/27/01	Collected/Weight	09/26/01 12:55 1082 g
% solids	80.3	% solids	80.3	Custody/SAF No	B01-058-232 B01-058

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Tritium	0.056	0.058	0.096	400	U	H	0.053	0.058	0.096	U	-		
Carbon 14	-0.912	2.9	4.9	50	U	C	-0.746	2.7	4.6	U	-		
Nickel 63	-0.841	1.4	2.4	30	U	NI_L	-0.639	1.5	2.5	U	-		
Total Strontium	-0.055	0.12	0.27	1.0	U	SR	0.025	0.15	0.30	U	-		
Americium 241	-0.022	0.089	0.21	1.0	U	AM	-0.026	0.16	0.38	U	-		
Technetium 99	0.660	0.23	0.58	15	J	TC	0.591	0.23	0.66	U	11	81	
Thorium 228	0.754	0.35	0.47			TH	1.28	0.52	0.56		52	93	
Thorium 230	0.519	0.35	0.39	1.0	J	TH	0.936	0.44	0.48	J	57	116	
Thorium 232	1.04	0.35	0.22	1.0		TH	0.720	0.36	0.28	J	36	86	
Total Uranium (ug/g)	1.72	0.20	0.026	0.10		U_T	1.80	0.21	0.026		5	31	
Uranium 233	0.704	0.29	0.18	1.0	J	U	0.407	0.22	0.21	J	53	99	
Uranium 235	0.085	0.11	0.22	1.0	U	U	0.052	0.10	0.20	U	-		
Uranium 238	0.704	0.24	0.18	1.0	J	U	0.686	0.26	0.16	J	3	77	
Neptunium 237	0.015	0.015	0.028	1.0	U	NP	0.027	0.054	0.082	U	-		
Plutonium 238	0	0.009	0.034	1.0	U	PU	0.061	0.081	0.16	U	-		
Plutonium 239/240	0.004	0.009	0.034	1.0	U	PU	0.020	0.040	0.15	U	-		
Potassium 40	16.8	0.98	0.39			GAM	15.5	1.1	0.47		8	35	
Cobalt 60	U		0.037	0.050	U	GAM	U		0.063	U	-		
Cesium 137	U		0.033	0.10	U	GAM	U		0.053	U	-		
Radium 226	U		0.12	0.10	U	GAM	0.682	0.11	0.10		140	72	
Radium 228	1.02	0.16	0.14	0.20		GAM	1.07	0.25	0.23		5	53	
Europium 152	U		0.077	0.10	U	GAM	U		0.11	U	-		
Europium 154	U		0.13	0.10	U	GAM	U		0.21	U	-		
Europium 155	U		0.14	0.10	U	GAM	U		0.099	U	-		
Thorium 228	1.18	0.070	0.065			GAM	0.840	0.058	0.049		34	35	
Thorium 232	1.02	0.16	0.14			GAM	1.07	0.25	0.23		5	53	
Uranium 235	U		0.12		U	GAM	U		0.14	U	-		
Uranium 238	U		4.3		U	GAM	U		6.9	U	-		

200-TW-1 & 2 - Soil Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/10/01

DUPLICATE, cont.

SDG	7099			Client/Case no	Hanford SDG H1524
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R110011-02	Lab sample id	R110011-01	Client sample id	B12MJ2
Dept sample id	7099-002	Dept sample id	7099-001	Location/Matrix	B-7A/200 E SOLID
		Received	09/27/01	Collected/Weight	09/26/01 12:55 1082 g
% solids	80.3	% solids	80.3	Custody/SAF No	B01-058-232 B01-058

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Americium 241	U		0.048		U	GAM	U		0.066	U	-	

200-TW-1 & 2 - Soil Sampling

QC-DUP#1 40079

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

R110011-01 B12MJ2

DATA SHEET

SDG	7099	Client/Case no	Hanford SDG_H1524
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R110011-01	Client sample id	B12MJ2
Dept sample id	7099-001	Location/Matrix	B-7A/200 E SOLID
Received	09/27/01	Collected/Weight	09/26/01 12:55 1082 g
% solids	80.3	Custody/SAF No	B01-058-232 B01-058

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.053	0.058	0.096	400	U	H
Carbon 14	14762-75-5	-0.746	2.7	4.6	50	U	C
Nickel 63	13981-37-8	-0.639	1.5	2.5	30	U	NI_L
Total Strontium	SR-RAD	0.025	0.15	0.30	1.0	U	SR
Americium 241	14596-10-2	-0.026	0.16	0.38	1.0	U	AM
Technetium 99	14133-76-7	0.591	0.23	0.66	15	U	TC
Thorium 228	14274-82-9	1.28	0.52	0.56			TH
Thorium 230	14269-63-7	0.936	0.44	0.48	1.0	J	TH
Thorium 232	TH-232	0.720	0.36	0.28	1.0	J	TH
Total Uranium (ug/g)	7440-61-1	1.80	0.21	0.026	0.10		U_T
Uranium 233	U-233/234	0.407	0.22	0.21	1.0	J	U
Uranium 235	15117-96-1	0.052	0.10	0.20	1.0	U	U
Uranium 238	U-238	0.686	0.26	0.16	1.0	J	U
Neptunium 237	13994-20-2	0.027	0.054	0.082	1.0	U	NP
Plutonium 238	13981-16-3	0.061	0.081	0.16	1.0	U	PU
Plutonium 239/240	PU-239/240	0.020	0.040	0.15	1.0	U	PU
Potassium 40	13966-00-2	15.5	1.1	0.47			GAM
Cobalt 60	10198-40-0	U		0.063	0.050	U	GAM
Cesium 137	10045-97-3	U		0.053	0.10	U	GAM
Radium 226	13982-63-3	0.682	0.11	0.10	0.10		GAM
Radium 228	15262-20-1	1.07	0.25	0.23	0.20		GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.21	0.10	U	GAM
Europium 155	14391-16-3	U		0.099	0.10	U	GAM
Thorium 228	14274-82-9	0.840	0.058	0.049			GAM
Thorium 232	TH-232	1.07	0.25	0.23			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		6.9		U	GAM

200-TW-1 & 2 - Soil Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/10/01

D A T A S H E E T , c o n t

SDG	7099	Client/Case no	Hanford	SDG H1524	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R110011-01	Client sample id	B12MJ2		
Dept sample id	7099-001	Location/Matrix	B-7A/200 E	SOLID	
Received	09/27/01	Collected/Weight	09/26/01 12:55	1082 g	
% solids	80.3	Custody/SAF No	B01-058-232	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	U		0.066		U	GAM

200-TW-1 & 2 - Soil Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test AM Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241	
Preparation batch 7008-181						
B12MJ2	R110011-01			7099-001	U	
BLK (QC ID=40061)	R109170-06			7094-006	U	
LCS (QC ID=40060)	R109170-05			7094-005	ok	
Duplicate (R110011-01)	R110011-02			7099-002	-	U
Nominal values and limits from method				*RDLs (pCi/g)*	1.0	
200-TW-1 & 2 - Soil Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181	*2σ prep error 5.0 %*							Reference Lab Notebook 7008 pg. 181								
B12MJ2	R110011-01			0.38	0.500			58		206			52	11/17/01	11/17	SS-021
BLK (QC ID=40061)	R109170-06			0.19	0.500			76		117				11/17/01	11/17	SS-050
LCS (QC ID=40060)	R109170-05			0.19	0.500			83		117				11/17/01	11/17	SS-049
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.21	0.500			70		206			52	11/17/01	11/17	SS-022
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, 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	0.24	±	0.18
	YIELD	72	±	21

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test NP Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237	
Preparation batch 7008-181						
B12MJ2	R110011-01			7099-001	U	
BLK (QC ID=40061)	R109170-06			7094-006	U	
LCS (QC ID=40060)	R109170-05			7094-005	ok	
Duplicate (R110011-01)	R110011-02			7099-002	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
200-TW-1 & 2 - Soil Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181 2σ prep error 5.0 % Reference Lab Notebook 7008 pg. 181																
B12MJ2	R110011-01			0.082	0.500			68		122			44	11/07/01	11/09	SS-050
BLK (QC ID=40061)	R109170-06			0.14	0.500			40		121				11/07/01	11/09	SS-048
LCS (QC ID=40060)	R109170-05			0.11	0.500			52		121				11/07/01	11/09	SS-047
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.028	0.500			59		2022			50	11/07/01	11/15	SS-033
Nominal values and limits from method				1.0	0.500			20-105		100			180			

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-934	Neptunium from Solids and Water by Extraction Chromatography, rev 2

AVERAGES ± 2 SD	MDA	0.090	±	0.095
FOR 4 SAMPLES	YIELD	55	±	24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test PU Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 7008-181								
B12MJ2	R110011-01			7099-001	U		U	
BLK (QC ID=40061)	R109170-06			7094-006	U		U	
LCS (QC ID=40060)	R109170-05			7094-005	ok		ok	
Duplicate (R110011-01)	R110011-02			7099-002	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
200-TW-1 & 2 - Soil Sampling								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181 2σ prep error 5.0 % Reference Lab Notebook 7008 pg. 181																
B12MJ2	R110011-01			0.16	0.500			91		127			55	11/17/01	11/20	SS-032
BLK (QC ID=40061)	R109170-06			0.20	0.500			78		113				11/17/01	11/19	SS-047
LCS (QC ID=40060)	R109170-05			0.28	0.500			54		112				11/17/01	11/19	SS-045
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.034	0.500			83		623			55	11/17/01	11/20	SS-043
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	
	PUISO_PLATE_AEA	
	CP-060	Soil Preparation, rev 3
	CP-940	Plutonium Separation and Purification, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.17 ± 0.21
YIELD 76 ± 32

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test TH Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 7008-181							
B12MJ2	R110011-01			7099-001	1.28	0.936 J	0.720 J
BLK (QC ID=40061)	R109170-06			7094-006	U	U	U
LCS (QC ID=40060)	R109170-05			7094-005		ok	
Duplicate (R110011-01)	R110011-02			7099-002	ok	ok J	ok
Nominal values and limits from method				RDLs (pCi/g)		1.0	1.0
200-TW-1 & 2 - Soil Sampling							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181 2σ prep error 5.0 % Reference Lab Notebook 7008 pg. 181																
B12MJ2	R110011-01			0.48	0.250			92		189			48	11/05/01	11/13	SS-019
BLK (QC ID=40061)	R109170-06			0.47	0.250			73		263				11/05/01	11/13	SS-024
LCS (QC ID=40060)	R109170-05			0.34	0.250			77		617				11/05/01	11/07	SS-024
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.39	0.250			86		237			43	11/05/01	11/08	SS-024
Nominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-905	Thorium in Water and Dissolved Solid Sample Using TRU and AG 1x8 Resin, rev 1
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.42 ± 0.13
YIELD 82 ± 17

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test U Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 7008-181											
B12MJ2	R110011-01			7099-001	0.407 J	U	0.686 J	59	39	8	15
BLK (QC ID=40061)	R109170-06			7094-006	U	U	U				
LCS (QC ID=40060)	R109170-05			7094-005	ok	ok	ok				
Duplicate (R110011-01)	R110011-02			7099-002	ok J	- U	ok J	100	53	12	16
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
200-TW-1 & 2 - Soil Sampling								Averages 80		10	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181 2σ prep error 5.0 % Reference Lab Notebook 7008 pg. 181																
B12MJ2	R110011-01			0.21	0.500			94		151			44	11/07/01	11/09	SS-021
BLK (QC ID=40061)	R109170-06			0.20	0.500			89		162				11/07/01	11/08	SS-021
LCS (QC ID=40060)	R109170-05			0.88	0.500			91		153				11/07/01	11/07	SS-021
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.22	0.500			87		114			43	11/07/01	11/08	SS-047
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-911	Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.38 ± 0.67
YIELD 90 ± 6

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test SR Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 7008-181						
B12MJ2	R110011-01			7099-001	U	
BLK (QC ID=40061)	R109170-06			7094-006	U	
LCS (QC ID=40060)	R109170-05			7094-005	ok	
Duplicate (R110011-01)	R110011-02			7099-002	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181 2σ prep error 10.0 % Reference Lab Notebook 7008 pg. 181																
B12MJ2	R110011-01			0.30	1.00			85		100			40	11/05/01	11/05	GRB-229
BLK (QC ID=40061)	R109170-06			0.30	1.00			82		100				11/05/01	11/05	GRB-223
LCS (QC ID=40060)	R109170-05			0.28	1.00			82		100				11/05/01	11/05	GRB-231
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.27	1.00			88		100			40	11/05/01	11/05	GRB-230
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-502	Strontium in Solids, rev 4
	CP-519	Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.29 ± 0.030
YIELD 84 ± 6

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test TC Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 7008-181						
B12MJ2	R110011-01			7099-001	U	
BLK (QC ID=40061)	R109170-06			7094-006	U	
LCS (QC ID=40060)	R109170-05			7094-005	ok	
Duplicate (R110011-01)	R110011-02			7099-002	ok	J
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	15	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181 2σ prep error 10.0 % Reference Lab Notebook 7008 pg. 181																
B12MJ2	R110011-01			0.66	1.02			80		50			61	11/20/01	11/26	GRB-232
BLK (QC ID=40061)	R109170-06			0.36	1.00			96		100				11/20/01	11/27	GRB-222
LCS (QC ID=40060)	R109170-05			0.37	1.00			93		100				11/20/01	11/29	GRB-222
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.58	1.02			87		50			62	11/20/01	11/27	GRB-217
Nominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-060	Soil Preparation, rev 3
	CP-021	Preparation of Tc-99m Tracer, rev 1
	CP-002	Q.C. Preparation, rev 3
	CP-003	Tracing, rev 3
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.49	±	0.30
	YIELD	89	±	14

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test GAM Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 7008-181								
B12MJ2	R110011-01			7099-001	U		U	
BLK (QC ID=40061)	R109170-06			7094-006	U		U	
LCS (QC ID=40060)	R109170-05			7094-005	ok		ok	
Duplicate (R110011-01)	R110011-02			7099-002	-	U	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	0.050		0.10	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181 2σ prep error 15.0 % Reference Lab Notebook 7008 pg. 181																
B12MJ2	R110011-01			0.063	716					109			47	11/12/01	11/12	02,01,00
BLK (QC ID=40061)	R109170-06			0.007	829					209				11/12/01	11/13	01,04,00
LCS (QC ID=40060)	R109170-05			0.006	829					944				11/12/01	11/12	MB,05,00
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.037	716					101			47	11/12/01	11/12	MB,07,00
Nominal values and limits from method				0.050	829					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 3
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.028 ± 0.055
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test U T Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 7008-181					
B12MJ2	R110011-01			7099-001	1.80
BLK (QC ID=40061)	R109170-06			7094-006	U
LCS (QC ID=40060)	R109170-05			7094-005	ok
Duplicate (R110011-01)	R110011-02			7099-002	ok
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (ug/g)	0.10

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181 2σ prep error 9.0 % Reference Lab Notebook 7008 pg. 181																
B12MJ2	R110011-01			0.026	0.100								56	11/21/01	11/21	KPA-001
BLK (QC ID=40061)	R109170-06			0.003	0.100									11/21/01	11/21	KPA-001
LCS (QC ID=40060)	R109170-05			0.026	0.100									11/21/01	11/21	KPA-001
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.026	0.100								56	11/21/01	11/21	KPA-001
Nominal values and limits from method				0.10	0.100								180			

PROCEDURES	REFERENCE	UTOT_KPA
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 3
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.020 ± 0.023
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test C Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 7012-006						
B12MJ2	R110011-01			7099-001	U	
BLK (QC ID=40246)	R110011-04			7099-004	U	
LCS (QC ID=40245)	R110011-03			7099-003	ok	
Duplicate (R110011-01)	R110011-02			7099-002	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	50	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7012-006 2σ prep error 10.0 % Reference Lab Notebook 7012 pg. 006																
B12MJ2	R110011-01			4.6	0.230			100		100			49	11/14/01	11/14	LSC-006
BLK (QC ID=40246)	R110011-04			5.5	0.200			100		100				11/14/01	11/14	LSC-006
LCS (QC ID=40245)	R110011-03			15	0.200			100		12				11/14/01	11/14	LSC-006
Duplicate (R110011-01) (QC ID=40079)	R110011-02			4.9	0.219			100		100			49	11/14/01	11/14	LSC-006
Nominal values and limits from method				50	0.200					50			180			

PROCEDURES	REFERENCE	
	C14_COX_LSC	
	CP-060	Soil Preparation, rev 3
	CP-251	Tritium/Carbon-14 Oxidation, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 7.5 ± 10
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test H	Matrix SOLID
SDG 7099	
Contact Melissa C. Mannion	

METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford	
Contract No. 630	
Contract SDG H1524	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 7008-181						
B12MJ2	R110011-01			7099-001	U	
BLK (QC ID=40061)	R109170-06			7094-006	U	
LCS (QC ID=40060)	R109170-05			7094-005	ok	J
Duplicate (R110011-01)	R110011-02			7099-002	-	U
Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling				RDLs (pCi/g)	400	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181 2σ prep error 10.0 % Reference Lab Notebook 7008 pg. 181																
B12MJ2	R110011-01			0.096	20.3			77		120			42	11/06/01	11/07	LSC-007
BLK (QC ID=40061)	R109170-06			0.23	20.0			33		120				11/06/01	11/07	LSC-007
LCS (QC ID=40060)	R109170-05			0.22	20.0			33		120				11/06/01	11/07	LSC-007
Duplicate (R110011-01) (QC ID=40079)	R110011-02			0.096	20.3			77		120			42	11/06/01	11/07	LSC-007
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES	REFERENCE	906.0_H3_LSC
	CP-060	Soil Preparation, rev 3
	CP-216	Tritium in Solid Samples by Azeotropic Distillation, rev 4

AVERAGES ± 2 SD	MDA	0.16	± 0.15
FOR 4 SAMPLES	YIELD	55	± 51

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	12/10/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1524

Test NI_L Matrix SOLID
SDG 7099
Contact Melissa C. Mannion

METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1524

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation batch 7008-181						
B12MJ2	R110011-01			7099-001	U	
BLK (QC ID=40061)	R109170-06			7094-006	U	
LCS (QC ID=40060)	R109170-05			7094-005	ok	
Duplicate (R110011-01)	R110011-02			7099-002	-	U
Nominal values and limits from method				RDLs (pCi/g)	30	
200-TW-1 & 2 - Soil Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7008-181	2σ prep error 10.0 % Reference Lab Notebook 7008 pg. 181															
B12MJ2	R110011-01			2.5	0.500			84		100			40	11/03/01	11/05	LSC-004
BLK (QC ID=40061)	R109170-06			2.2	0.500			93		100				11/03/01	11/05	LSC-004
LCS (QC ID=40060)	R109170-05			2.7	0.500			95		66				11/03/01	11/05	LSC-004
Duplicate (R110011-01) (QC ID=40079)	R110011-02			2.4	0.500			86		100			40	11/03/01	11/05	LSC-004
Nominal values and limits from method				30	0.500			30-105		50			180			

PROCEDURES	REFERENCE	
	NI63_LSC	
	CP-060	Soil Preparation, rev 3
	CP-431	Nickel-63 Purification, rev 4

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	2.4	±	0.42
YIELD	90	±	11

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/10/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-232	Page 1 of 1
Collector: Thomas G./Watson D. Fahlberg	Company Contact: Todd, M.E. / Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N / Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E H1524 (7099)	SAF No.: B01-058	Air Quality ☐
Ice Chest No.: EBC99 0607	Field Logbook No.: EL-1518-1 / COA: B20TW2674C	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA 09/15/01	Offsite Property No.: AQ10385	Bill of Lading/Air Bill No.: 4235 1954 - 7711	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 9/26/01.
Collector not available to relinquish samples on 9/27/01 for shipment.
PJ 9.27.01

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	60mL	500mL	120mL	1000mL	120mL	500mL	1000mL				
SAMPLE ANALYSIS	Chromium Hex - 7196	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.				
Sample No.	Matrix *	Sample Date	Sample Time								
B12MJ2	SOIL	9.26.01	1255					X			

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: R. Fahlberg	1630	Received By/Stored In: R. Fahlberg 9.26.01	1630
Relinquished By/Removed From: R. Fahlberg 3728	0830 9.27.01	Received By/Stored In: R. Thorson	0830 9.27.01
Relinquished By/Removed From: R. Thorson ERC 9.27.01	0830	Received By/Stored In: [signature]	9-27-01
Relinquished By/Removed From: Ted Ex 9-28-01	9:30	Received By/Stored In: [signature] JR Cover	9:30 9-28-01
Relinquished By/Removed From:	Date/Time	Received By/Stored In:	Date/Time
Relinquished By/Removed From:	Date/Time	Received By/Stored In:	Date/Time

SPECIAL INSTRUCTIONS

(1) ~~ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}~~
~~(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045~~
~~(3) Semi-VOA - 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D~~
(4) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

Activity < D
Tiete B12MK8

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

LABORATORY SECTION	Received By	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 Date/Time received 9-28-01 9:30

CoC No. B01-058-232

Container I.D. No. FRC99-067 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

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

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by [signature] Date: 9-28-01 Time: 9:30

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

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

MAXIM
TECHNOLOGIES INC

5 December 2001

Ms. Joan Kessner
Analytical Services Program Manager
Bechtel Hanford, Inc.
3190 George Washington Way
Sigma I Building, MSIN H9-03
Richland, WA 99352

Dear Ms. Kessner:

Enclosed are the data sheets for the analyses we recently submitted via email on 11/20/01. The EDD was titled TNTSDG5.

If you have any questions, please call me at 314-426-0880.

Sincerely,

David E. Germeroth

DEC 2001
RECEIVED

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-73	Page 1 of 1
Collector: Thomas G./Watson D. Fahlberg	Company Contact: Todd, M.R.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Air Quality ☐	Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	
Ice Chest No.: ERC 99-067	Field Logbook No.: EL-1518-1	COA: B20TW2674C	Method of Shipment: Fed EX	
Shipped To: Maxim Technologies, Inc.	Offsite Property No.: A010385		Bill of Lading/Air Bill No.: 4235 7954 7711	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None									
Type of Container	Moisture Resistant	Split Spoon Liner									
No. of Container(s)	1	1									
Volume	200g	1000g									
SAMPLE ANALYSIS	Moisture Content - D2216	Particle Size (Dry Sieve) - D422 Hydrometer 11/5/01									

Sample No.	Matrix *	Sample Date	Sample Time										
B12BR9	SOIL	9/26/01	1255	X	X							B110003-002	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R Fahlberg / R Fahlberg	9-26-01 1630	R Fahlberg	9-26-01 1630
R Thorson	9-27-01 0830	RT	9.27.01
Removed from Ice Chest / R Thorson	9-27-01 0830	R Thorson	9.27.01 0830
R Thorson / ERC	9.27.01 0830	FedEx	9-27-01
Fed Ex	9-28-01 9:30	JR Cover	9-28-01 9:30
JR Cover	10-3-01 16:00	Fed Ex	10-3-01

SPECIAL INSTRUCTIONS

Activity < D.
Tie to B12MK8

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 9/27/01.
Collector not available to relinquish samples on 9/27/01 for shipment.
RT 9.27.01

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

RHLFF-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-72	Page 1 of 1

Collector: Thomas G./Watson D. / Fahlberg	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	
Ice Chest No.: SEEOSPC	Field Logbook No.: EL-1518-1	COA: B20TW2674C	Method of Shipment: Fed EX SDG# H1519
Shipped To: Maxim Technologies, Inc.	Offsite Property No.: A810384	Bill of Lading/Air Bill No.: SEEOSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None										
Type of Container	Moisture Resistant	Split Spoon Liner										
No. of Container(s)	1	1										
Volume	200g	1000g										
SAMPLE ANALYSIS	Moisture Content - D2216	Particle Size (Dry Sieve) - D422										
Sample No. / Matrix* / Sample Date / Sample Time												
B12BR8 / SOIL / 9-21-01 / 1440	X	X										

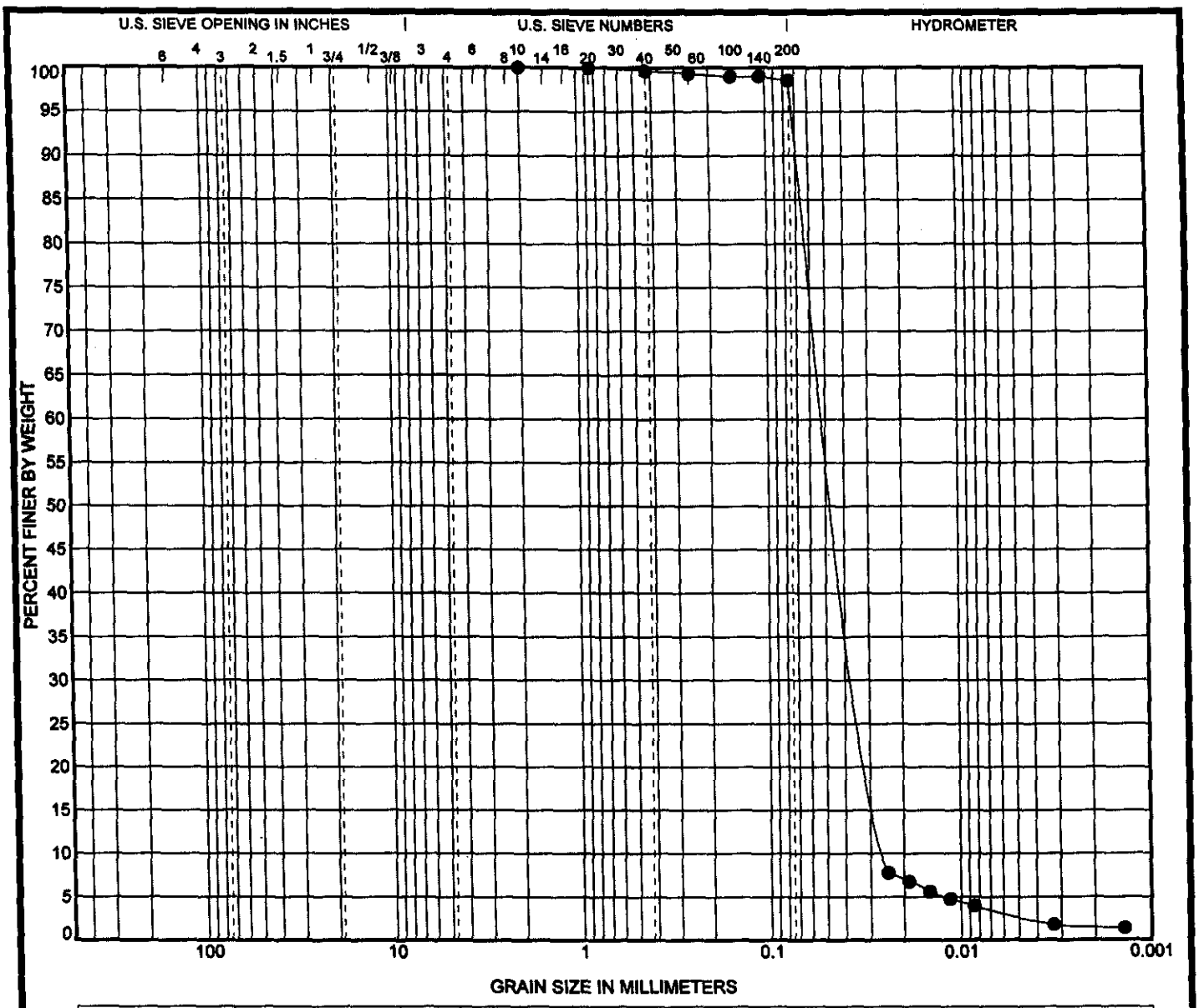
TIRTO
REMKS
0110003-01

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By: R. Fahlberg / R. Fahlberg 9-21-01 Date/Time 1630	Received By: STORED IN Date/Time 1630	
Relinquished By: Removed from Ref. 1A 3728 9-26-01 Date/Time 0700	Received By: R. Thorne Date/Time 0700 9-26-01	Samples stored in Ref.# 1A at the 3728 Shipping Facility on 9/21/01. Collector not available to relinquish samples on 9/26/01 for shipment. RT 9-26-01
Relinquished By: R. Thorne ERC 9-26-01 Date/Time 0700	Received By: FEDEX Date/Time 9-26-01	
Relinquished By: Fed Ex 9-27-01 Date/Time 9:21	Received By: J R Corno / J R Corno 9-27-01 Date/Time	
Relinquished By: J R Corno / J R Corno 10-3-01 Date/Time 16:09	Received By: Fed Ex 10-3-01 Date/Time	
Relinquished By: Date/Time	Received By: Date/Time	

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

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

BHI-EE-011 (10/99)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● 0110003-002	0.0	Soil				0.88	1.87
B12BR9							

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 0110003-002	0.0	2	0.046	0.032	0.025	0.0	1.5	95.8	2.8

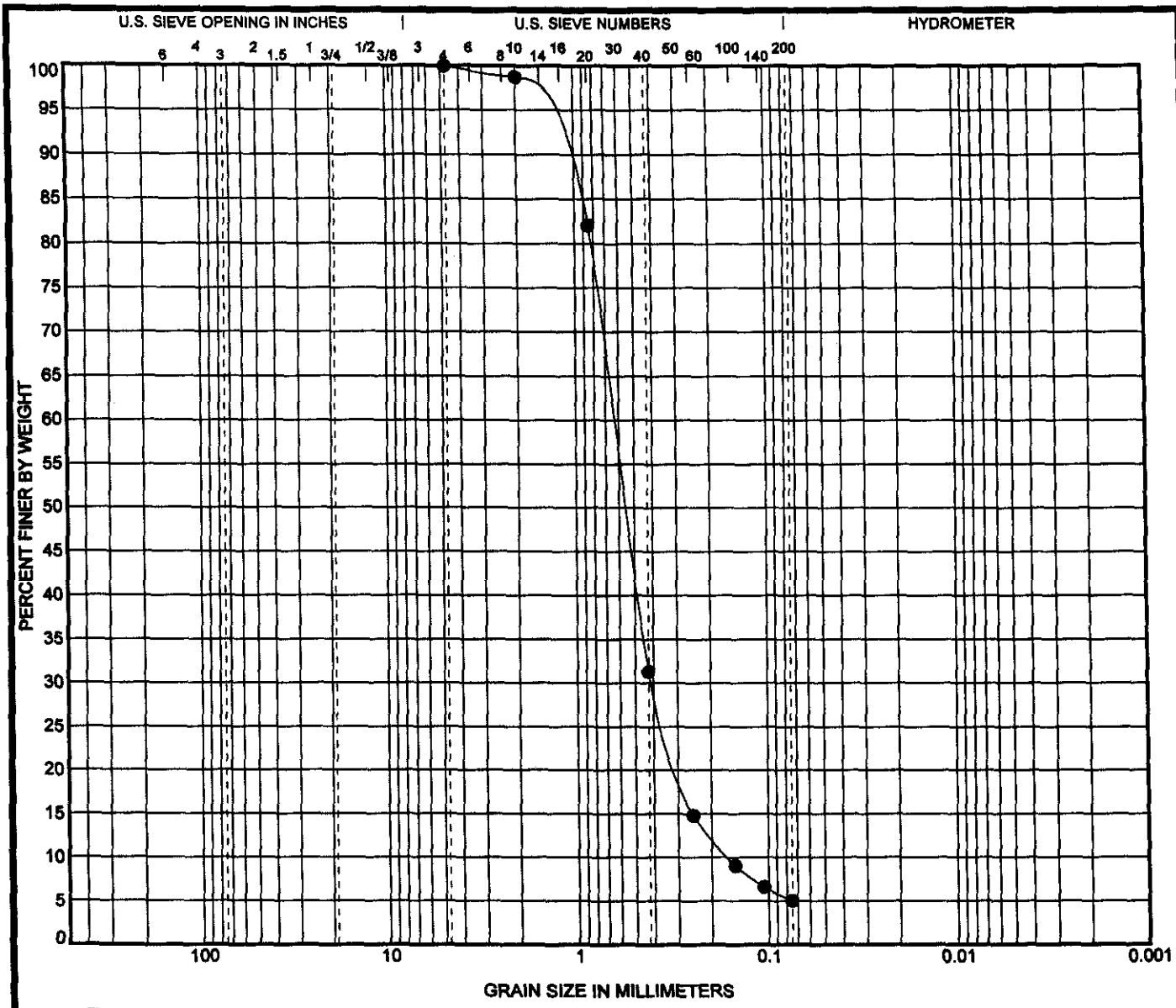
MAXIM Technologies Inc.
Maxim Technologies, Inc.
1908 Innerbelt Business Center Drive
St. Louis, Missouri 63114
Telephone: 314-426-0860
Fax: 314-426-4212

GRAIN SIZE DISTRIBUTION

Project: Eberline Services

Location:

Number: 9905093



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	0110003-001	0.0	Soil				1.62	3.85
	B12BR8							

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	0110003-001	0.0	4.75	0.629	0.408	0.163	0.0	94.9	5.0	

Maxim Technologies, Inc.
1908 Innerbelt Business Center Drive
St. Louis, Missouri 63114
Telephone: 314-426-0880
Fax: 314-426-4212

GRAIN SIZE DISTRIBUTION

Project: Eberline Services

Location:

Number: 9905093

US_GRAIN_SIZE_BECHTEL.GPJ US_LAB.GDT 11/12/01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-058
LVL #: 0109L971
SDG/SAF #: H1524/B01-058

W.O. #: 11343-606-001-9999-00
Date Received: 09-28-2001

GC/MS VOLATILE

One (1) soil sample was collected on 09-26-2001.

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 TCL Volatile target compounds on 10-06-2001.

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 sample was analyzed within required holding time.

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

4. All surrogate recoveries were within EPA QC limits.

5. Matrix spike analyses were inadvertently not analyzed. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

6. The method blank contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than 3x the CRQL.

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

10/23/01
Date

som\group\data\voa\tnu-hanford\0109-971.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 10 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 01NT242

Initiator: T. Keppel Batch: 01091971 Parameter: 0624H
Date: 10-19-01 Samples: 001 Matrix: Soil
Client: TMU-Hanford 200-UOS Method: SW846/MCAWW/CLP/ Prep Batch: _____

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)

- No MS/MSD Run on Sample
- Sample is now out of hold

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

narrate

4. Project Manager Instructions...signature/date: [signature] 10/20/01

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

5. Final Action...signature/date: [signature] 10/22/01 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
2	X Initiator Tina Keppel	__	__ Metals: Beegle
	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
1	X Project Mgr: Stone/Johnson/Haslett		__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	2	__ MS: Rychlak/Layman
__	X QA (file): Alberts	__	__ Log-in: Keppel
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

QA-105-A-0601

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.

VLI
LIONVILLE LABORATORY INC.

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.

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List
Report Date: 10/22/01 09:38

RFW Batch Number: **0109L971** Client: **TNUHANFORD B01-058 H1524** Work Order: 11343606001 Page: 1a

	Cust ID:	**B12MJ2**		**VBLKUB**	
Sample Information	RFW#:	**001**		**01LVH422-MB1**	
	Matrix:	SOIL		SOIL	
	D.F.:	1.11		1.00	
	Units:	ug/Kg		ug/Kg	
Surrogate Recovery	Toluene-d8	104	%	92	%
	Bromofluorobenzene	82	%	79	%
	1,2-Dichloroethane-d4	75	%	73	%
Chloromethane		14	U	10	U
Bromomethane		14	U	10	U
Vinyl Chloride		14	U	10	U
Chloroethane		14	U	10	U
Methylene Chloride		17	B	12	
Acetone		13	JB	9	J
Carbon Disulfide		7	U	5	U
1,1-Dichloroethene		7	U	5	U
1,1-Dichloroethane		7	U	5	U
1,2-Dichloroethene (total)		7	U	5	U
Chloroform		7	U	5	U
1,2-Dichloroethane		7	U	5	U
2-Butanone		14	U	10	U
1,1,1-Trichloroethane		7	U	5	U
Carbon Tetrachloride		7	U	5	U
Bromodichloromethane		7	U	5	U
1,2-Dichloropropane		7	U	5	U
cis-1,3-Dichloropropene		7	U	5	U
Trichloroethene		7	U	5	U
Dibromochloromethane		7	U	5	U
1,1,2-Trichloroethane		7	U	5	U
Benzene		7	U	5	U
Trans-1,3-Dichloropropene		7	U	5	U
Bromoform		7	U	5	U
4-Methyl-2-pentanone		14	U	10	U
2-Hexanone		14	U	10	U
Tetrachloroethene		7	U	5	U
1,1,2,2-Tetrachloroethane		7	U	5	U
Toluene		7	U	5	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0109L971 Client: TNUHANFORD B01-058 B1524 Work Order: 11343606001 Page: 1b

Cust ID:	B12MJ2		VBLKUB	
RFW#:	001		01LVH422-MB1	
Chlorobenzene	7	U	5	U
Ethylbenzene	7	U	5	U
Styrene	7	U	5	U
Xylene (total)	7	U	5	U

*= Outside of EPA CLP QC limits.

Lionville Laboratory Use Only
01091971

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TNU-Hanford 301-058
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

Date Rec'd: 9-28-01 Date Due: 10-28-01

		A	B			B			C		D	E	F			
Refrigerator #		1	6						6							
#/Type Container	Liquid															
	Solid	1pg	1pg						1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	500						500		60	60	1L			
Preservatives		—	—						—		—	—	—			
ANALYSES REQUESTED		ORGANIC: TCL VOA	ORGANIC: BNA (S)	ORGANIC: Pest/PCB	ORGANIC: Herb				INORG: ICP Metal (1)	INORG: CN	Hex Chrome	Merc.	TC Anions (2)			
Lionville Laboratory Use Only		0624H	0625X			ODRO			MCL		ICAL	MHG TO	IWARG(1)			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H	0625X			ODRO			MCL		ICAL	MHG TO	IWARG(1)			
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	B12MJ2	✓	✓	S	9/28/01	1255	X	X			X			X		X	X	X			

Special Instructions:

DATE/REVISIONS:
MCL 1. Cd, Cr, Cu, Ni, Ag, Pb
IWARG(1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
3. INH3N, INN2, ICNTO, ICCY, IPH
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. 2.7 °C

Relinquished by	Received by	Date	Time
Hex Ex	[signature]	9/28/01	09:15

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL RECEIVED		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 7744

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-232	Page 1 of 1
Collector: Thomas G./Watson D. Fahlberg	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Air Quality ☐	Date Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	
Ice Chest No.: ERC 99.874	Field Logbook No.: EL-1518-1	COA: B20TW2674C	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA 09/15/01	Offsite Property No.: A010441		Bill of Lading/Air Bill No.: 4255 7454 7744	

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 9/26/01.
Collector not available to relinquish samples on 9/27/01 for shipment.
RT 9.27.01

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	500mL	120mL	1000mL	120mL	500mL	1000mL			
SAMPLE ANALYSIS	Chromium Hex - 7196	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time									
B12MJ2	SOIL	9.26.01	1255	X	X	X	X	X	X			

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: R. Fahlberg R. Fahlberg 9-26-01	1630	Received By/Stored In: Ref. 1-C 9-26-01	1630
Relinquished By/Removed From: Ref. 1C 3728 9.27.01	0850	Received By/Stored In: R. Thorne 9.27.01	0850
Relinquished By/Removed From: R. Thorne ERC 9.27.01	0850	Received By/Stored In: ERC	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
~~(4) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium-H3; Isotopic Uranium~~ Cancelled

Activity < D.
Tic to Blanks

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

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

(10/99)

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-058
LVL #: 0109L971
SDG/SAF #: H1524/B01-058

W.O. #: 11343-606-001-9999-00
Date Received: 09-28-2001

SEMIVOLATILE

One (1) soil sample was collected on 09-26-2001.

The sample and its associated QC samples were extracted on 10-01-2001 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 10-08-2001.

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 sample.
4. All surrogate recoveries were within EPA QC limits.
5. All blank spike recoveries were within EPA QC limits.
6. All matrix spike recoveries were within 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

10/23/01
Date

som\gorup\data\bna\tnu-hanford-0109-971.doc

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208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

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

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

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.

LONVILLE LABORATORY INC

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:

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Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

RFW Batch Number: **0109L971** Client: **TNUHANFORD B01-058 H1524** Work Order: 11343606001 Report Date: 10/18/01 14:05 Page: 1a

	Cust ID:	B12MJ2		B12MJ2		B12MJ2		SBLKGV		SBLKGV BS	
Sample Information	RFW#:	001		001 MS		001 MSD		01LE1167-MB1		01LE1167-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	79	%	75	%	74	%	81	%	85	%
	2-Fluorobiphenyl	79	%	77	%	76	%	82	%	86	%
	p-Terphenyl-d14	93	%	97	%	97	%	104	%	103	%
	Phenol-d5	71	%	65	%	65	%	71	%	74	%
	2-Fluorophenol	71	%	70	%	68	%	78	%	81	%
	2,4,6-Tribromophenol	69	%	73	%	72	%	76	%	81	%
Phenol		430	U	62	%	59	%	330	U	69	%
bis(2-Chloroethyl)ether		430	U	430	U	430	U	330	U	330	U
2-Chlorophenol		430	U	69	%	65	%	330	U	79	%
1,3-Dichlorobenzene		430	U	430	U	430	U	330	U	330	U
1,4-Dichlorobenzene		430	U	66	%	63	%	330	U	75	%
1,2-Dichlorobenzene		430	U	430	U	430	U	330	U	330	U
2-Methylphenol		430	U	430	U	430	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		430	U	430	U	430	U	330	U	330	U
4-Methylphenol		430	U	430	U	430	U	330	U	330	U
N-Nitroso-Di-n-propylamine		430	U	69	%	67	%	330	U	76	%
Hexachloroethane		430	U	430	U	430	U	330	U	330	U
Nitrobenzene		430	U	430	U	430	U	330	U	330	U
Isophorone		430	U	430	U	430	U	330	U	330	U
2-Nitrophenol		430	U	430	U	430	U	330	U	330	U
2,4-Dimethylphenol		430	U	430	U	430	U	330	U	330	U
bis(2-Chloroethoxy)methane		430	U	430	U	430	U	330	U	330	U
2,4-Dichlorophenol		430	U	430	U	430	U	330	U	330	U
1,2,4-Trichlorobenzene		430	U	71	%	66	%	330	U	81	%
Naphthalene		430	U	430	U	430	U	330	U	330	U
4-Chloroaniline		430	U	430	U	430	U	330	U	330	U
Hexachlorobutadiene		430	U	430	U	430	U	330	U	330	U
4-Chloro-3-methylphenol		430	U	67	%	65	%	330	U	74	%
2-Methylnaphthalene		430	U	430	U	430	U	330	U	330	U
Hexachlorocyclopentadiene		430	U	430	U	430	U	330	U	330	U
2,4,6-Trichlorophenol		430	U	430	U	430	U	330	U	330	U
2,4,5-Trichlorophenol		1100	U	1100	U	1100	U	830	U	830	U

*= Outside of EPA CLP QC limits.

Cust ID:	B12MJ2		B12MJ2		B12MJ2		SBLKGV		SBLKGV BS	
RFW#:	001		001 MS		001 MSD		01LE1167-MB1		01LE1167-MB1	
2-Chloronaphthalene	430	U	430	U	430	U	330	U	330	U
2-Nitroaniline	1100	U	1100	U	1100	U	830	U	830	U
Dimethylphthalate	430	U	430	U	430	U	330	U	330	U
Acenaphthylene	430	U	430	U	430	U	330	U	330	U
2,6-Dinitrotoluene	430	U	430	U	430	U	330	U	330	U
3-Nitroaniline	1100	U	1100	U	1100	U	830	U	830	U
Acenaphthene	430	U	74	%	71	%	330	U	85	%
2,4-Dinitrophenol	1100	U	1100	U	1100	U	830	U	830	U
4-Nitrophenol	1100	U	59	%	60	%	830	U	61	%
Dibenzofuran	430	U	430	U	430	U	330	U	330	U
2,4-Dinitrotoluene	430	U	75	%	74	%	330	U	86	%
Diethylphthalate	430	U	430	U	430	U	330	U	330	U
4-Chlorophenyl-phenylether	430	U	430	U	430	U	330	U	330	U
Fluorene	430	U	430	U	430	U	330	U	330	U
4-Nitroaniline	1100	U	1100	U	1100	U	830	U	830	U
4,6-Dinitro-2-methylphenol	1100	U	1100	U	1100	U	830	U	830	U
N-Nitrosodiphenylamine (1)	430	U	430	U	430	U	330	U	330	U
4-Bromophenyl-phenylether	430	U	430	U	430	U	330	U	330	U
Hexachlorobenzene	430	U	430	U	430	U	330	U	330	U
Pentachlorophenol	1100	U	57	%	51	%	830	U	70	%
Phenanthrene	430	U	430	U	430	U	330	U	330	U
Anthracene	430	U	430	U	430	U	330	U	330	U
Carbazole	430	U	430	U	430	U	330	U	330	U
Di-n-Butylphthalate	430	U	430	U	430	U	330	U	330	U
Fluoranthene	430	U	430	U	430	U	330	U	330	U
Pyrene	430	U	89	%	88	%	330	U	95	%
Butylbenzylphthalate	430	U	430	U	430	U	330	U	330	U
3,3'-Dichlorobenzidine	430	U	430	U	430	U	330	U	330	U
Benzo(a)anthracene	430	U	430	U	430	U	330	U	330	U
Chrysene	430	U	430	U	430	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	430	U	430	U	430	U	330	U	330	U
Di-n-Octyl phthalate	430	U	430	U	430	U	330	U	330	U
Benzo(b)fluoranthene	430	U	430	U	430	U	330	U	330	U
Benzo(k)fluoranthene	430	U	430	U	430	U	330	U	330	U
Benzo(a)pyrene	430	U	430	U	430	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	430	U	430	U	430	U	330	U	330	U
Dibenzo(a,h)anthracene	430	U	430	U	430	U	330	U	330	U
Benzo(g,h,i)perylene	430	U	430	U	430	U	330	U	330	U
Tributylphosphate	430	U	430	U	430	U	330	U	330	U

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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B12MJ2

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

Client: TNUHANFORD B01-058 H1524

Matrix: (soil/water) SOIL

Lab Sample ID: 0109L971-001

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

Lab File ID: D100812

Level: (low/med) LOW

Date Received: 09/28/01

% Moisture: 22 decanted: (Y/N)__

Date Extracted: 10/01/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 10/08/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: _____

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.354	600	JB

8

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKGV

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

Client: TNUHANFORD B01-058 H1524

Matrix: (soil/water) SOIL

Lab Sample ID: 01LE1167-MB1

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

Lab File ID: D100810

Level: (low/med) LOW

Date Received: 10/01/01

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

Date Extracted: 10/01/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 10/08/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: _____

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.354	500	J

Lionville Laboratory Use Only
01091971

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TNU-Hanford B01-058
Est. Final Proj. Sampling Date:
Project #: 11343-606-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OS
QC: SPEC Del: STD TAT: 30

Date Rec'd: 9-28-01 Date Due: 10-28-01

		A	B			B			C		D	E	F			
Refrigerator #		1	6						6							
#/Type Container	Liquid															
	Solid	1pg	1pg			1pg			1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	500			1			500		60	60	1L			
Preservatives		—	—						—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		TCL VOA	BNA (5)	Pest/PCB	Herb				ICP Metal (5)	CN	Hex Chrome	Merc.	TC Anions (2)			
		Lionville Laboratory Use Only														
		0624H	0625X			0DRO			MCL		ICCL	MHGTO	IANIONO			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H	0625X			0DRO			MCL		ICCL	MHGTO	IANIONO			
S - Soil	001	B1AMJ2	✓	✓	S	9/26/01	1255	X	X			X			X		X	X	X			
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																						

Special Instructions:

DATE/REVISIONS:

MCL 1. Cd, Cr, Cu, Ni, Ag, Pb
IANIONO 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
3. INH3N, INO2N, ICNTO, ICET, IPH
4.
5.
6.

Relinquished by	Received by	Date	Time
Hex Ex	[signature]	9/28/01	09:15

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	[signature]	GINA	
	RE WRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 7744

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. 2.7 °C

Beehtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-232	Page 1 of 1

Collector: Thomas G./Watson D. Fahlberg	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	
Ice Chest No.: ERC 99-674	Field Logbook No.: EL-1518-1	COA: B20TW2674C	Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA 05W 08/15/01	Offsite Property No.: A010441		Bill of Lading/Air Bill No.: 4255745477 44

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 9/26/01. Collector not available to relinquish samples on 9/27/01 for shipment. RT 9.27.01

Preservation			Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None			
Type of Container			sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)			1	1	1	1	1	1	1			
Volume			60mL	500mL	120mL	1000mL	120mL	500mL	1000mL			
SAMPLE ANALYSIS			Chromium Hex - 7196	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.			
Sample No.	Matrix *	Sample Date	Sample Time									
B12MJ2	SOIL	9.26.01	1255	X	X	X	X	X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Fahlberg / R. Fahlberg	9-26-01 1630	Ref 1-C	9-26-01 1630
Ref 1C 3728	9.27.01 0830	R. Thorp	9.27.01 0830
R. Thorp ERC	9.27.01 0830	ERC	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium, Isotopic Thorium {Thorium-232}, Americium-241, Carbon-14, Neptunium-237, Nickel-63, Strontium-89,90 – Total Sr, Technetium-99, Total Uranium, Tritium - H3, Isotopic Uranium~~ 09/26/01

Activity < D.
Tie to BIEMKS

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

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

(10/99)

LIONVILLE LABORATORY INC.

Analytical Report

Client: THU-HANFORD B01-058
LVL#: 0109L971
SDG/SAF#: H1524/B01-058

W.O #: 11343-606-001-9999-00
Date Received: 09-28-01

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 09-26-01.

The sample and its associated QC samples were extracted on 10-03-01 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 10-05,06,09-01.

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

2. The sample was extracted and analyzed within required holding times.

3. All surrogate recoveries were within acceptance criteria.

4. The blank spike was within acceptance criteria.

5. All matrix spikes were within acceptance criteria.

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

7. All continuing calibration checks analyzed prior to samples were within acceptance criteria.

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.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

10/15/01
Date

R:\SHARE\GCPEST\narr temp\inu971dro.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.

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

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

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

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

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

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

Lionville Laboratory, Inc.

DIESEL RANGE ORGANICS BY GC

Report Date: 10/09/01 08:50

RFW Batch Number: **0109L971** Client: ***TNU-HANFORD B01-058*** Work Order: 11343606001 Page: 1

	Cust ID:	B12MJ2	B12MJ2	B12MJ2	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	01LE1186-MB1	01LE1186-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	p-Terphenyl	112 %	108 %	118 %	71 %	83 %
Diesel Range Organics		12.0 U	90 %	98 %	12.0 U	81 %
Motor Oil		12.0 U	12.0 U	12.0 U	12.0 U	12.0 U

TGr 10/10/01

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

Lionville Laboratory Use Only
01091971

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory, Inc.

Client: TNU-Hanford 301-058
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
Date Rec'd: 9-28-01 Date Due: 10-28-01

		A	B			B			C		D	E	F			
Refrigerator #		1	6						6							
#/Type Container	Liquid															
	Solid	1pg	1pg			1pg			1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	200						500		60	60	1L			
Preservatives		—	—						—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		TCL VOA	BNA (CS)	Pest/PCB	Herb				ICP Metal (1)	CN	Hex Chrome	Merc.	Tc Anions (2)			
		Lionville Laboratory Use Only														
		06244	0625X			0DRO			MCL		ICAL	MHKTO	IWARG(1)			

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	B12MJ2	✓	✓	S	9/24/01	1255	X	X			X			X		X	X	X		

Special Instructions:

DATE/REVISIONS:

MCL 1. Cd, Cr, Cu, Ni, Ag, Pb
IWARG(1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
3. INH3N, IN3N2, ICCNO, ICCT, IPH
4.
5.
6.

Relinquished by	Received by	Date	Time
Hex Ex	[signature]	9/28/01	09:15

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL RC WRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 7744

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. 2.7 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-232	Page 1 of 1

Collector: Thomas G./Watson D. Fahlberg	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058
Ice Chest No.: ERC 99-074	Field Logbook No.: EL-1518-1	COA: B20TW2674C	Method of Shipment: Fed EX
Shipped To: ~~TMA~~/RECRA 09/15/01	Offsite Property No.: A010441		Bill of Lading/Air Bill No.: 4255745477 44

Price Code: 8N

Air Quality ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 9/26/01. Collector not available to relinquish samples on 9/27/01 for shipment. RT 9.27.01

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	500mL	120mL	1000mL	120mL	500mL	1000mL			
SAMPLE ANALYSIS	Chromium Hex - 7196	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.			
Sample No.	Matrix *	Sample Date	Sample Time								
B12MJ2	SOIL	9.26.01	1255	X	X	X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Fahlberg / R. Fahlberg 9-26-01	1630	Ref 1-C 9-26-01	1630
Ref 1C 3728 9.27.01	0830	R. Thorp / R. Thorp 9.27.01	0830
R. Thorp / R. Thorp ERC 9.27.01	0830	ERC / ERC	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
~~(4) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241, Carbon-14, Neptunium-237, Nickel-63, Strontium-89,90 – Total Sr, Technetium-99, Total Uranium, Tritium +H2, Isotopic Uranium~~ 10/15/01

Activity < D.
Tie to Bienks

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

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

(10/99)

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-058
LVL#: 0109L971
SDG/SAF#: H1524/B01-058

W.O.#: 11343-606-001-9999-00
Date Received: 09-28-01

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 solid 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. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

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

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

11. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

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

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

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

10-23-01
Date

gmb/m09-971

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#: 01092971

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

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

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

Q QUALIFIERS

E = The reported value is estimated because of the presence of interference.

M = Duplicate injection precision not met.

N = Spiked sample recovery not within control limits.

S = The reported value was determined by the Method of Standard Additions (MSA).

W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.

* = Duplicate analysis not within control limits.

+ = Correlation coefficient for the MSA is less than 0.995.

ABBREVIATIONS

PB = Method or Preparation Blank.
S = Matrix Spike.
T = Matrix Spike Duplicate.
R or D = Sample Replicate

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.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/23/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12MJ2	Silver, Total	1.2	u	MG/KG	1.2	1.0
		Cadmium, Total	0.81	u	MG/KG	0.81	1.0
		Chromium, Total	44.2		MG/KG	0.61	1.0
		Copper, Total	29.5		MG/KG	1.0	1.0
		Mercury, Total	0.04		MG/KG	0.02	1.0
		Nickel, Total	36.4		MG/KG	1.4	1.0
		Lead, Total	11.3		MG/KG	2.9	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/23/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0686-MB1	Silver, Total	0.96 u	MG/KG	0.96	1.0
		Cadmium, Total	0.63 u	MG/KG	0.63	1.0
		Chromium, Total	0.48 u	MG/KG	0.48	1.0
		Copper, Total	0.80 u	MG/KG	0.80	1.0
		Nickel, Total	1.1 u	MG/KG	1.1	1.0
		Lead, Total	2.3 u	MG/KG	2.3	1.0
BLANK1	01C0323-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/23/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12MJ2	Silver, Total	7.4	1.2 u	6.4	115.6	1.0
		Cadmium, Total	6.5	0.81u	6.4	101.6	1.0
		Chromium, Total	63.9	44.2	25.6	77.0	1.0
		Copper, Total	55.4	29.5	32.0	80.9	1.0
		Mercury, Total	0.26	0.04	0.20	113.0	1.0
		Nickel, Total	90.7	36.4	63.9	85.0	1.0
		Lead, Total	75.5	11.3	63.9	100.5	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/23/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12MJ2	Silver, Total	1.2 u	1.2 u	NC	1.0
		Cadmium, Total	0.81u	0.81u	NC	1.0
		Chromium, Total	44.2	40.7	8.2	1.0
		Copper, Total	29.5	26.0	12.6	1.0
		Mercury, Total	0.04	0.03	18.8	1.0
		Nickel, Total	36.4	33.4	8.6	1.0
		Lead, Total	11.3	18.1	46.3	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/23/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0686-LC1	Silver, LCS	43.5	50.0	MG/KG	87.0
		Cadmium, LCS	23.3	25.0	MG/KG	93.2
		Chromium, LCS	48.7	50.0	MG/KG	97.4
		Copper, LCS	119	125	MG/KG	95.0
		Nickel, LCS	195	200	MG/KG	97.6
		Lead, LCS	241	250	MG/KG	96.5
LCS1	01C0323-LC1	Mercury, LCS	2.5	2.5	MG/KG	100

onville Laboratory Use Only
01091971

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

VLI LIONVILLE LABORATORY, INC.

Client: TNU-Hanford 301-058
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

Date Rec'd: 9-28-01 Date Due: 10-28-01

		A	B			B			C		D	E	F			
Refrigerator #		1	6						6							
#/Type Container	Liquid															
	Solid	1pg	1pg			1pg			1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	500						500		60	60	1L			
Preservatives		—	—						—		—	—	—			
ANALYSES REQUESTED →		ORGANIC							INORG							
		TCL VOA	BNA (35)	Pest/ PCB	Herb				ICP Metal (1)	CN	Hex Chrome	Merc.	IC Anions (2)			
		Lionville Laboratory Use Only														
		06244	0625X			ODRO			MCL		ICPL6	MHG70	IWORG(1)			

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	TCL VOA	BNA (35)	Pest/ PCB	Herb	ODRO	ICP Metal (1)	CN	Hex Chrome	Merc.	IC Anions (2)
001	B1amJ2	✓	✓	S	9/26/01	1255	X	X			X	X		X	X	X

Special Instructions:

DATE/REVISIONS:
MCL 1. Cd, Cr, Cu, Ni, Ag, Pb
IWORG(1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
3. INH3N, INO2N, ICANO, ICCT, IPH
4.
5.
6.

Relinquished by	Received by	Date	Time
Alex Cox	D. Amin	9/28/01	09:15

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL RE WRITTEN		

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

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. 2.7 °C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-232	Page 1 of 1

Collector: Thomas G./Watson D. Fahlberg	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058
Ice Chest No.: ERC 99-874	Field Logbook No.: EL-1518-1	COA: B20TW2674C	Method of Shipment: Fed EX
Shipped To: TMA/RECRA DSW 09/15/01	Offsite Property No.: A010441		Bill of Lading/Air Bill No.: 4255 7454 7744

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 9/26/01.
Collector not available to relinquish samples on 9/27/01 for shipment.
RT 9.27.01

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	60mL	500mL	120mL	1000mL	120mL	500mL	1000mL				
SAMPLE ANALYSIS	Chromium Hex. - 7196	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.				
Sample No.	Matrix *	Sample Date	Sample Time								
B12MJ2	SOIL	9.26.01	1255	X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1630	Received By/Stored In	Date/Time 1630
R. Fahlberg	R. Fahlberg 9-26-01	Ref. 1-C	9-26-01
Relinquished By/Removed From	Date/Time 0850	Received By/Stored In	Date/Time 0850
Ref. 1C 3728	9.27.01	R. Thorp	9.27.01
Relinquished By/Removed From	Date/Time 0850	Received By/Stored In	Date/Time
R. Thorp ERC	9.27.01	ERC	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~ 10/15/01 DSW

Activity < D.
Tie to BIEMKS

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

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

(10/99)

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-058 H1524
LVL#: 0109L971

W.O.#: 11343-606-001-9999-00
Date Received: 09-28-01

INORGANIC NARRATIVE

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

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

3. Sample holding times as required by the method and/or contract were met with the exception of Total Cyanide.

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. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.

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

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

9. Results for solid samples are reported on a dry weight basis and Total Organic Carbon samples are dried prior to analysis.

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 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

10-25-01
Date

njp\i09-971

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 15 pages.

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

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity __ by coupon __ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		✓ 9010B/9014	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		✓ 9060	✓ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: Chloride, Fluoride, Nitrate **Method:** EPA 300.0 (mod.)

Other: Nitrite, Phosphate, Sulfate **Method**

Nitrate Nitrite EPA 353.2 (mod.)

Ammonia EPA 351.3

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity __ by coupon __ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		✓ 9010B/9014	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		✓ 9060	✓ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: Chloride, Fluoride, Nitrate, **Method:**

Other: Nitrite, Phosphate, Sulf **Method**

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
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 10/24/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12MJ2	% Solids	78.2	%	0.01	1.0
		Chloride by IC	24.8	MG/KG	3.2	2.0
		Fluoride by IC	101	MG/KG	6.4	2.0
		Nitrite by IC	3.20 u	MG/KG	3.20	2.0
		Nitrate by IC	263	MG/KG	16.0	10.0
		Cyanide, Total	0.58 u	MG/KG	0.58	1.0
		Phosphate by IC	17.8	MG/KG	3.2	2.0
		Chromium VI	3.8	MG/KG	0.51	1.0
		Sulfate by IC	121	MG/KG	3.2	2.0
		Nitrate Nitrite	62.2	MG/KG	5.0	20.0
		Ammonia, as N	2.7 u	MG/KG	2.7	1.0
		Total Organic Carbon	273	MG/KG	164	1.0
		pH	10.2	SOIL PH	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/24/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LICA65-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	1.25	u	MG/KG	1.25	1.0
		Nitrate by IC	1.25	u	MG/KG	1.25	1.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK1	01LC094-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	01LVI083-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	01LN3A54-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	01LAM046-MB1	Ammonia, as N	2.5	u	MG/KG	2.5	1.0
BLANK10	01LTZ033-MB1	Total Organic Carbon	20.0	u	MG/KG	20.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/24/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12MJ2	Chloride by IC	102	24.8	64.0	120.0	2.0
		Fluoride by IC	435	101	320	104.4	5.0
		Nitrite by IC	60.2	3.20u	64.0	94.2	2.0
		Nitrate by IC	613	263	320	109.4	10.0
		Cyanide, Total	5.25	0.58u	5.82	90.2	1.0
		Phosphate by IC	85.5	17.8	64.0	105.8	2.0
		Soluble Chromium VI	8.9	3.8	5.1	99.6	1.0
		Insoluble Chromium VI	1940	3.8	1730	111.8	100
		Sulfate by IC	280	121	160	99.3	5.0
		Nitrate Nitrite	190	62.2	125	102.4	20.0
		Ammonia, as N	121	2.7 u	118	102.5	1.0
		Total Organic Carbon	3460	273	3330	95.5	1.0
BLANK10	01LICA65-MB1	Chloride by IC	24.6	1.2 u	25.0	98.4	1.0
		Fluoride by IC	54.5	2.5 u	50.0	109.0	1.0
		Nitrite by IC	24.1	1.25u	25.0	96.4	1.0
		Nitrate by IC	25.7	1.25u	25.0	102.8	1.0
		Phosphate by IC	27.1	1.2 u	25.0	108.3	1.0
		Sulfate by IC	24.7	1.2 u	25.0	98.7	1.0
BLANK10	01LVI083-MB1	Soluble Chromium VI	3.9	0.40u	4.0	98.6	1.0
		Insoluble Chromium VI	1030	0.40u	1030	100	100
BLANK10	01LN3A54-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.8	1.0
BLANK10	01LAM046-MB1	Ammonia, as N	103	2.5 u	100	103.0	1.0
		Ammonia, as N NSD	102	2.5 u	100	102.0	1.0
BLANK10	01LTZ033-MB1	Total Organic Carbon	402	20.0 u	400	100.4	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 10/24/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	01LAM046-MB1	Ammonia, as N	103.0	102.0	0.98

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/24/01

CLIENT: TNUHANFORD B01-058 H1524 LVL LOT #: 0109L971

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12MJ2	% Solids	78.2	78.4	0.28	1.0
		Chloride by IC	24.8	27.6	10.6	2.0
		Fluoride by IC	101	112	10.0	2.0
		Nitrite by IC	3.20u	3.20u	NC	2.0
		Nitrate by IC	263	268	2.2	10.0
		Cyanide, Total	0.58u	0.55u	NC	1.0
		Phosphate by IC	17.8	18.1	1.8	2.0
		Chromium VI	3.8	4.2	8.3	1.0
		Sulfate by IC	121	124	2.0	2.0
		Nitrate Nitrite	62.2	61.7	0.77	20.0
		Ammonia, as N	2.7 u	3.0 u	NC	1.0
		Total Organic Carbon	273	316	14.6	1.0
		pH	10.2	10.2	0.3	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/24/01

CLIENT: TNUHANFORD B01-058 H1524 *LVL LOT #: 0109L971*

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCSS1	01LC094-LCS1	Cyanide, Total LCS	1.81	2.0	MG/KG	90.5
LCSS2	01LC094-LCS2	Cyanide, Total LCS	9.38	10.0	MG/KG	93.8

Lionville Laboratory Use Only
01094971

Custody Transfer Record/Lab Work Request

LVLI 13

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B01-058
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
Date Rec'd: 9.28.01 Date Due: 10-28-01

		A	B			B			C		D	E	F			
Refrigerator #		1	6						6							
#/Type Container	Liquid															
	Solid	1pg	1pg			1pg			1pg		1pg	1pg	1pg			
Volume	Liquid															
	Solid	120	500						500		60	60	1L			
Preservatives		—	—						—		—	—	—			
ANALYSES REQUESTED		ORGANIC							INORG							
		Tot VOA	BNA (SV)	Pest/PCB	Herb				ICP Metal (1)	CN	Hex Chrome	Merc.	TC Anions (2)			
		Lionville Laboratory Use Only														
		06244	0625X			0DRO			MEI		ICPG	MHG70	INORG(1)			

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														
001	B12MJ2	✓	✓	S	9/26/01	1255	X	X			X			X		X	X	X		

Special Instructions:

DATE/REVISIONS:
MEI 1. Cd, Cr, Cu, Ni, Ag, Pb
INORG(1) 2. ICCL, ICFL, ICNO3, ICNO2, ICPO4, ICSO4,
3. INH3N, IN3N2, ICNTO, ICCT, IPH
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. 2.7 °C

Relinquished by	Received by	Date	Time
Hex Exp	D. Johnson	9/28/01	09:15

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL RE-WRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 7744

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-232	Page 1 of 1

Collector: Thomas G./Watson D. Fahlberg	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	
Ice Chest No.: ERC 99-674	Field Logbook No.: EL-1518-1	COA: B20TW2674C	Method of Shipment: Fed EX
Shipped To: TMA/RECRA 09/15/01	Offsite Property No.: A010441		Bill of Lading/Air Bill No.: 4255 7454 7744

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 9/26/01.
Collector not available to relinquish samples on 9/27/01 for shipment.
RT 9.27.01

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container	aG	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	60mL	500mL	120mL	1000mL	120mL	500mL	1000mL				
SAMPLE ANALYSIS	Chromium Hex - 7196	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.				
Sample No.	Matrix *	Sample Date	Sample Time								
B12MJ2	SOIL	9.26.01	1255	X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1630	Received By/Stored In	Date/Time 1630
R. Fahlberg	R. Fahlberg 9-26-01	Ref. 1-C	9-26-01
Relinquished By/Removed From	Date/Time 0830	Received By/Stored In	Date/Time 0830
Ref. 1C 3728	9.27.01	R. Thorer	9.27.01
Relinquished By/Removed From	Date/Time 0830	Received By/Stored In	Date/Time
R. Thorer ERC	9.27.01	ERC	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~ 10/15/01

Activity < D.
Tie to Biemks

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

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

(10/99)

Figure 1. Sample Check-in List

Date/Time Received: 9.28.01 09:15

SDG#: 01091971

Work Order Number: _____ SAF# B01-058

Shipping Container ID: ERC 99-074 Chain of Custody # B01-058-232

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 2.7°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 6
7. Sample holding times exceeded? Yes [ ] No [✓]

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

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

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

Sample Custodian/Laboratory: _____ Date: _____

Telephoned to: _____ On _____ By _____