H1085

0054352

Thermo Retec
W.O. No. R0-10-070-7524

Bechtel Hanford Inc.
SDG H1085

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1085 was composed of four solid (soil) samples designated under SAF No. B00-029 with a Project Designation of: 100 F Area – Quick Turn.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on November 4, and 8, 2000.

2.0 ANALYSIS NOTES

2.1 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.2 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.3 Total Strontium 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 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.7 Gamma Spectroscope Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Program Manager

11/10/00
Date

RECEIVED
JAN 2 2 2001
EDMC

NOV 2000
RECEIVED

SDG 7524
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

SAMPLE SUMMARY

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1085

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B10F55	116-F-14 Retention Basin	SOLID		R010070-01	B00-029	B00-029-043	10/03/00 12:58
B10F56	116-F-14 Retention Basin	SOLID		R010070-02	B00-029	B00-029-043	10/03/00 13:17
B10F57	116-F-14 Retention Basin	SOLID		R010070-03	B00-029	B00-029-043	10/03/00 13:33
B10F58	116-F-14 Retention Basin	SOLID		R010070-04	B00-029	B00-029-043	10/03/00 13:15
Method Blank		SOLID		R010070-06	B00-029		
Lab Control Sample		SOLID		R010070-05	B00-029		
Duplicate (R010070-02)	116-F-14 Retention Basin	SOLID		R010070-07	B00-029		10/03/00 13:17

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

QC SUMMARY

SDG 7524
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1085

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
7524	B00-029-043	B10F55	SOLID	97.8			10/10/00	7	R010070-01	7524-001
		B10F56	SOLID	95.4			10/10/00	7	R010070-02	7524-002
		B10F57	SOLID	97.9			10/10/00	7	R010070-03	7524-003
		B10F58	SOLID	98.6			10/10/00	7	R010070-04	7524-004
		Method Blank	SOLID						R010070-06	7524-006
		Lab Control Sample	SOLID						R010070-05	7524-005
		Duplicate (R010070-02)	SOLID	95.4			10/10/00	7	R010070-07	7524-007

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

SDG 7524
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1085

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
PU	SOLID	Plutonium, Isotopic in Solids	6955-181	5.0	4			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6955-181	5.0	4			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6955-181	10.0	4			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	6955-181	10.0	4			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6955-181	15.0	4			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	6955-181	10.0	4			1	1	1/1		
NI_L	SOLID	Nickel 63 in Soil	6955-181	10.0	4			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

WORK SUMMARY

SDG 7524
Contact Melissa C. Mannion

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1085

CLIENT SAMPLE ID / LOCATION / CUSTODY	MATRIX / SAF No	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B10F55		R010070-01	7524-001	C		10/27/00	11/04/00	MCM	Carbon 14 in Soil
116-F-14 Retention Basin	SOLID	10/03/00	7524-001	GAM		10/17/00	11/04/00	MCM	Gamma Scan
B00-029-043	B00-029	10/10/00	7524-001	NI_L		10/24/00	11/04/00	MCM	Nickel 63 in Soil
			7524-001	PU		10/29/00	11/04/00	MCM	Plutonium, Isotopic in Solids
			7524-001	SR		10/20/00	11/04/00	MCM	Total Strontium in Soil
			7524-001	TC		10/20/00	11/04/00	MCM	Technetium 99 in Soil
			7524-001	U		10/26/00	11/04/00	MCM	Uranium, Isotopic in Soil
B10F56		R010070-02	7524-002	C		10/27/00	11/04/00	MCM	Carbon 14 in Soil
116-F-14 Retention Basin	SOLID	10/03/00	7524-002	GAM		10/17/00	11/04/00	MCM	Gamma Scan
B00-029-043	B00-029	10/10/00	7524-002	NI_L		10/24/00	11/04/00	MCM	Nickel 63 in Soil
			7524-002	PU		11/02/00	11/08/00	MCM	Plutonium, Isotopic in Solids
			7524-002	SR		10/20/00	11/04/00	MCM	Total Strontium in Soil
			7524-002	TC		10/25/00	11/04/00	MCM	Technetium 99 in Soil
			7524-002	U		10/26/00	11/04/00	MCM	Uranium, Isotopic in Soil
B10F57		R010070-03	7524-003	C		10/27/00	11/04/00	MCM	Carbon 14 in Soil
116-F-14 Retention Basin	SOLID	10/03/00	7524-003	GAM		10/17/00	11/04/00	MCM	Gamma Scan
B00-029-043	B00-029	10/10/00	7524-003	NI_L		10/25/00	11/04/00	MCM	Nickel 63 in Soil
			7524-003	PU		10/30/00	11/04/00	MCM	Plutonium, Isotopic in Solids
			7524-003	SR		10/20/00	11/04/00	MCM	Total Strontium in Soil
			7524-003	TC		10/24/00	11/04/00	MCM	Technetium 99 in Soil
			7524-003	U		10/28/00	11/04/00	MCM	Uranium, Isotopic in Soil
B10F58		R010070-04	7524-004	C		10/27/00	11/04/00	MCM	Carbon 14 in Soil
116-F-14 Retention Basin	SOLID	10/03/00	7524-004	GAM		10/17/00	11/04/00	MCM	Gamma Scan
B00-029-043	B00-029	10/10/00	7524-004	NI_L		10/25/00	11/04/00	MCM	Nickel 63 in Soil
			7524-004	PU		10/30/00	11/04/00	MCM	Plutonium, Isotopic in Solids
			7524-004	SR		10/20/00	11/04/00	MCM	Total Strontium in Soil
			7524-004	TC		10/20/00	11/04/00	MCM	Technetium 99 in Soil
			7524-004	U		10/28/00	11/04/00	MCM	Uranium, Isotopic in Soil
Method Blank		R010070-06	7524-006	C		10/27/00	11/04/00	MCM	Carbon 14 in Soil
	SOLID		7524-006	GAM		10/17/00	11/04/00	MCM	Gamma Scan
	B00-029		7524-006	NI_L		10/25/00	11/04/00	MCM	Nickel 63 in Soil
			7524-006	PU		10/30/00	11/04/00	MCM	Plutonium, Isotopic in Solids
			7524-006	SR		10/20/00	11/04/00	MCM	Total Strontium in Soil
			7524-006	TC		10/24/00	11/04/00	MCM	Technetium 99 in Soil
			7524-006	U		10/28/00	11/04/00	MCM	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

SDG 7524
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRC-SBB-207925
Case no SDG H1085

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			R010070-05	7524-005	C		10/27/00	11/04/00	MCM	Carbon 14 in Soil
		SOLID		7524-005	GAM		10/17/00	11/04/00	MCM	Gamma Scan
	B00-029			7524-005	NI_L		10/25/00	11/04/00	MCM	Nickel 63 in Soil
				7524-005	PU		10/30/00	11/04/00	MCM	Plutonium, Isotopic in Solids
				7524-005	SR		10/20/00	11/04/00	MCM	Total Strontium in Soil
				7524-005	TC		10/20/00	11/04/00	MCM	Technetium 99 in Soil
				7524-005	U		10/28/00	11/04/00	MCM	Uranium, Isotopic in Soil
Duplicate (R010070-02)			R010070-07	7524-007	C		10/27/00	11/04/00	MCM	Carbon 14 in Soil
116-F-14 Retention Basin		SOLID	10/03/00	7524-007	GAM		10/17/00	11/04/00	MCM	Gamma Scan
	B00-029		10/10/00	7524-007	NI_L		10/25/00	11/04/00	MCM	Nickel 63 in Soil
				7524-007	PU		10/30/00	11/08/00	MCM	Plutonium, Isotopic in Solids
				7524-007	SR		10/20/00	11/04/00	MCM	Total Strontium in Soil
				7524-007	TC		10/20/00	11/04/00	MCM	Technetium 99 in Soil
				7524-007	U		10/28/00	11/04/00	MCM	Uranium, Isotopic in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
C	B00-029	Carbon 14 in Soil	C14_COX_LSC	4			1	1	1	7
GAM	B00-029	Gamma Scan	GAMMA_GS	4			1	1	1	7
NI_L	B00-029	Nickel 63 in Soil	NI63_LSC	4			1	1	1	7
PU	B00-029	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	4			1	1	1	7
SR	B00-029	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	4			1	1	1	7
TC	B00-029	Technetium 99 in Soil	TC99_TR_SEP_LSC	4			1	1	1	7
U	B00-029	Uranium, Isotopic in Soil	UISO_PLATE_AEA	4			1	1	1	7
TOTALS				28			7	7	7	49

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/08/00

TMA / RICHMOND
SAMPLE DELIVERY GROUP H1085

R010070-06

Method Blank

METHOD BLANK

SDG	7524	Client/Case no	Hanford	SDG H1085	
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925		
Lab sample id	R010070-06	Client sample id	Method Blank		
Dept sample id	7524-006	Material/Matrix		SOLID	
		SAF No	B00-029		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-2.54	3.0	5.2	50	U	C
Nickel 63	13981-37-8	0.431	0.94	2.0	30	U	NI_L
Total Strontium	SR-RAD	0.024	0.086	0.15	1.0	U	SR
Technetium 99	14133-76-7	-0.256	0.24	0.58	15	U	TC
Uranium 233	U-233/234	0	0.034	0.13	1.0	U	U
Uranium 235	15117-96-1	0	0.041	0.16	1.0	U	U
Uranium 238	U-238	0	0.034	0.13	1.0	U	U
Plutonium 238	13981-16-3	0.022	0.016	0.015	1.0	J	PU
Plutonium 239/240	PU-239/240	0.010	0.012	0.015	1.0	U	PU
Potassium 40	13966-00-2	U		2.8		U	GAM
Cobalt 60	10198-40-0	U		0.094	0.050	U	GAM
Cesium 137	10045-97-3	U		0.089	0.10	U	GAM
Radium 226	13982-63-3	U		0.26	0.10	U	GAM
Radium 228	15262-20-1	U		0.47	0.20	U	GAM
Europium 152	14683-23-9	U		0.21	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.16	0.10	U	GAM
Thorium 228	14274-82-9	U		0.11		U	GAM
Thorium 232	TH-232	U		0.47		U	GAM
Uranium 235	15117-96-1	U		0.28		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.071		U	GAM

100 F Area - Quick Turn

QC-BLANK 36185

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

R010070-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7524
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1085
Case no TRC-SBB-207925

Lab sample id R010070-05
Dept sample id 7524-005

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B00-029

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	10400	210	31	50		C	11300	450	92	85-115	80-120
Nickel 63	132	3.3	2.1	30		NI_L	133	5.3	99	84-116	80-120
Total Strontium	11.8	0.67	0.28	1.0		SR	11.0	0.44	107	81-119	80-120
Technetium 99	55.2	2.1	0.87	15		TC	54.6	2.2	101	83-117	80-120
Uranium 233	8.80	1.0	0.52	1.0		U	9.28	0.37	95	81-119	80-120
Uranium 235	7.97	0.98	0.13	1.0		U	7.54	0.30	106	78-122	80-120
Uranium 238	10.4	1.2	0.49	1.0		U	10.1	0.40	103	80-120	80-120
Plutonium 238	9.75	0.51	0.023	1.0		PU	9.94	0.40	98	88-112	80-120
Plutonium 239/240	10.5	0.55	0.018	1.0		PU	10.6	0.42	99	88-112	80-120
Cobalt 60	1.23	0.13	0.072	0.050		GAM	1.25	0.050	98	72-128	80-120
Cesium 137	1.36	0.11	0.073	0.10		GAM	1.37	0.055	99	74-126	80-120

100 F Area - Quick Turn

QC-LCS 36184

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

R010070-07

B10F56

DUPLICATE

SDG	7524			Client/Case no	Hanford SDG H1085
Contact	Melissa C. Mannion			Case no	TRC-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	R010070-07	Lab sample id	R010070-02	Client sample id	B10F56
Dept sample id	7524-007	Dept sample id	7524-002	Location/Matrix	116-F-14 Retention Basin SOLID
		Received	10/10/00	Collected	10/03/00 13:17
% solids	95.4	% solids	95.4	Custody/SAF No	B00-029-043 B00-029

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
Carbon 14	38.7	3.7	4.9	50	J	C	42.5	3.7	4.9	J	9	29
Nickel 63	2990	30	4.5	30		NI_L	3020	30	4.4		1	21
Total Strontium	4.93	0.26	0.14	1.0		SR	5.23	0.27	0.14		6	24
Technetium 99	-0.105	0.33	0.97	15	U	TC	0.060	0.24	0.67	U	-	
Uranium 233	1.44	0.32	0.12	1.0		U	1.36	0.31	0.12		6	49
Uranium 235	0.020	0.040	0.15	1.0	U	U	0.077	0.077	0.15	U	-	
Uranium 238	1.13	0.28	0.12	1.0		U	1.09	0.27	0.12		4	54
Plutonium 238	0.224	0.045	0.019	1.0	JB	PU	0.283	0.056	0.042	J	23	44
Plutonium 239/240	8.65	0.49	0.019	1.0		PU	9.60	0.56	0.035		10	16
Potassium 40	U		11		U	GAM	U		5.7	U	-	
Cobalt 60	60.8	1.8	1.4	0.050		GAM	58.5	0.88	0.65		4	32
Cesium 137	9.61	1.4	2.0	0.10		GAM	9.31	0.67	0.90		3	40
Radium 226	U		3.5	0.10	U	GAM	U		1.5	U	-	
Radium 228	U		8.0	0.20	U	GAM	U		3.7	U	-	
Europium 152	1620	8.0	6.1	0.10		GAM	1570	4.0	3.1		3	32
Europium 154	158	5.9	5.5	0.10		GAM	156	2.7	2.4		1	32
Europium 155	U		5.0	0.10	U	GAM	U		21	U	-	
Thorium 228	U		2.3		U	GAM	U		1.1	U	-	
Thorium 232	U		8.0		U	GAM	U		3.7	U	-	
Uranium 235	U		6.5		U	GAM	U		3.1	U	-	
Uranium 238	U		270		U	GAM	U		140	U	-	
Americium 241	U		4.4		U	GAM	U		2.1	U	-	

100 F Area - Quick Turn

QC-DUP#2 36186

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	11/08/00

R010070-01

B10F55

TMA / RICHMOND

SAMPLE DELIVERY GROUP H1085

DATA SHEET

SDG	7524	Client/Case no	Hanford SDG H1085
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R010070-01	Client sample id	B10F55
Dept sample id	7524-001	Location/Matrix	116-F-14 Retention Basin SOLID
Received	10/10/00	Collected	10/03/00 12:58
% solids	97.8	Custody/SAF No	B00-029-043 B00-029

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.068	3.2	5.4	50	U	C
Nickel 63	13981-37-8	5.77	0.75	1.1	30	J	NI_L
Total Strontium	SR-RAD	0.089	0.13	0.17	1.0	U	SR
Technetium 99	14133-76-7	0.185	0.27	0.73	15	U	TC
Uranium 233	U-233/234	0.489	0.25	0.19	1.0	J	U
Uranium 235	15117-96-1	0.089	0.12	0.23	1.0	U	U
Uranium 238	U-238	0.685	0.25	0.19	1.0	J	U
Plutonium 238	13981-16-3	0.002	0.007	0.017	1.0	U	PU
Plutonium 239/240	PU-239/240	0.021	0.014	0.013	1.0	J	PU
Potassium 40	13966-00-2	10.8	1.4	0.69			GAM
Cobalt 60	10198-40-0	U		0.20	0.050	U	GAM
Cesium 137	10045-97-3	0.366	0.097	0.11	0.10		GAM
Radium 226	13982-63-3	0.387	0.17	0.18	0.10		GAM
Radium 228	15262-20-1	0.768	0.43	0.44	0.20		GAM
Europium 152	14683-23-9	2.03	0.20	0.20	0.10		GAM
Europium 154	15585-10-1	U		0.35	0.10	U	GAM
Europium 155	14391-16-3	U		0.22	0.10	U	GAM
Thorium 228	14274-82-9	0.391	0.078	0.099			GAM
Thorium 232	TH-232	0.768	0.43	0.44			GAM
Uranium 235	15117-96-1	U		0.32		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.22		U	GAM

100 F Area - Quick Turn

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/00

TMA/RICHMOND
SAMPLE DELIVERY GROUP H1085

R010070-02 B10F56

DATA SHEET

SDG	7524	Client/Case no	Hanford SDG H1085
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R010070-02	Client sample id	B10F56
Dept sample id	7524-002	Location/Matrix	116-F-14 Retention Basin SOLID
Received	10/10/00	Collected	10/03/00 13:17
% solids	95.4	Custody/SAF No	B00-029-043 B00-029

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	42.5	3.7	4.9	50	J	C
Nickel 63	13981-37-8	3020	30	4.4	30		NI_L
Total Strontium	SR-RAD	5.23	0.27	0.14	1.0		SR
Technetium 99	14133-76-7	0.060	0.24	0.67	15	U	TC
Uranium 233	U-233/234	1.36	0.31	0.12	1.0		U
Uranium 235	15117-96-1	0.077	0.077	0.15	1.0	U	U
Uranium 238	U-238	1.09	0.27	0.12	1.0		U
Plutonium 238	13981-16-3	0.283	0.056	0.042	1.0	J	PU
Plutonium 239/240	PU-239/240	9.60	0.56	0.035	1.0		PU
Potassium 40	13966-00-2	U		5.7		U	GAM
Cobalt 60	10198-40-0	58.5	0.88	0.65	0.050		GAM
Cesium 137	10045-97-3	9.31	0.67	0.90	0.10		GAM
Radium 226	13982-63-3	U		1.5	0.10	U	GAM
Radium 228	15262-20-1	U		3.7	0.20	U	GAM
Europium 152	14683-23-9	1570	4.0	3.1	0.10		GAM
Europium 154	15585-10-1	156	2.7	2.4	0.10		GAM
Europium 155	14391-16-3	U		21	0.10	U	GAM
Thorium 228	14274-82-9	U		1.1		U	GAM
Thorium 232	TH-232	U		3.7		U	GAM
Uranium 235	15117-96-1	U		3.1		U	GAM
Uranium 238	U-238	U		140		U	GAM
Americium 241	14596-10-2	U		2.1		U	GAM

100 F Area - Quick Turn

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/00

TMA/RICHMOND
SAMPLE DELIVERY GROUP H1085

R010070-03 B10F57

DATA SHEET

SDG	7524	Client/Case no	Hanford SDG H1085
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R010070-03	Client sample id	B10F57
Dept sample id	7524-003	Location/Matrix	116-F-14 Retention Basin SOLID
Received	10/10/00	Collected	10/03/00 13:33
% solids	97.9	Custody/SAF No	B00-029-043 B00-029

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	1.86	3.0	5.0	50	U	C
Nickel 63	13981-37-8	3.71	0.70	1.1	30	J	NI_L
Total Strontium	SR-RAD	3.99	0.23	0.13	1.0		SR
Technetium 99	14133-76-7	-0.141	0.36	1.1	15	U	TC
Uranium 233	U-233/234	0.525	0.18	0.11	1.0	J	U
Uranium 235	15117-96-1	0.035	0.035	0.14	1.0	U	U
Uranium 238	U-238	0.335	0.15	0.11	1.0	J	U
Plutonium 238	13981-16-3	0.019	0.034	0.061	1.0	U	PU
Plutonium 239/240	PU-239/240	0.011	0.017	0.030	1.0	U	PU
Potassium 40	13966-00-2	12.4	2.8	0.55			GAM
Cobalt 60	10198-40-0	U		0.072	0.050	U	GAM
Cesium 137	10045-97-3	U		0.15	0.10	U	GAM
Radium 226	13982-63-3	0.421	0.15	0.14	0.10		GAM
Radium 228	15262-20-1	0.681	0.31	0.31	0.20		GAM
Europium 152	14683-23-9	0.190	0.11	0.16	0.10		GAM
Europium 154	15585-10-1	U		0.23	0.10	U	GAM
Europium 155	14391-16-3	U		0.14	0.10	U	GAM
Thorium 228	14274-82-9	0.649	0.14	0.12			GAM
Thorium 232	TH-232	0.681	0.31	0.31			GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		8.5		U	GAM
Americium 241	14596-10-2	U		0.072		U	GAM

100 F Area - Quick Turn

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/00

TMA/RICHMOND
SAMPLE DELIVERY GROUP H1085

R010070-04 B10F58

DATA SHEET

SDG	7524	Client/Case no	Hanford SDG H1085
Contact	Melissa C. Mannion	Contract	TRC-SBB-207925
Lab sample id	R010070-04	Client sample id	B10F58
Dept sample id	7524-004	Location/Matrix	116-F-14 Retention Basin SOLID
Received	10/10/00	Collected	10/03/00 13:15
% solids	98.6	Custody/SAF No	B00-029-043 B00-029

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	1.99	2.8	4.6	50	U	C
Nickel 63	13981-37-8	-0.103	0.67	1.1	30	U	NI_L
Total Strontium	SR-RAD	-0.010	0.12	0.16	1.0	U	SR
Technetium 99	14133-76-7	-0.020	0.23	0.70	15	U	TC
Uranium 233	U-233/234	0.429	0.16	0.10	1.0	J	U
Uranium 235	15117-96-1	0.016	0.032	0.12	1.0	U	U
Uranium 238	U-238	0.496	0.17	0.10	1.0	J	U
Plutonium 238	13981-16-3	0.007	0.015	0.025	1.0	U	PU
Plutonium 239/240	PU-239/240	0.017	0.015	0.025	1.0	U	PU
Potassium 40	13966-00-2	12.7	2.0	1.2			GAM
Cobalt 60	10198-40-0	U		0.12	0.050	U	GAM
Cesium 137	10045-97-3	U		0.10	0.10	U	GAM
Radium 226	13982-63-3	0.336	0.20	0.24	0.10		GAM
Radium 228	15262-20-1	0.748	0.43	0.38	0.20		GAM
Europium 152	14683-23-9	U		0.25	0.10	U	GAM
Europium 154	15585-10-1	U		0.28	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Thorium 228	14274-82-9	0.458	0.14	0.17			GAM
Thorium 232	TH-232	0.748	0.43	0.38			GAM
Uranium 235	15117-96-1	U		0.38		U	GAM
Uranium 238	U-238	U		16		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM

100 F Area - Quick Turn

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/00

Test PU Matrix SOLID
SDG 7524
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1085

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 6955-181						
B10F55	R010070-01			7524-001	U	0.021 J
B10F56	R010070-02			7524-002	0.283 J	9.60
B10F57	R010070-03			7524-003	U	U
B10F58	R010070-04			7524-004	U	U
BLK (QC ID=36185)	R010070-06			7524-006	0.022 J	U
LCS (QC ID=36184)	R010070-05			7524-005	ok	ok
Duplicate (R010070-02)	R010070-07			7524-007	ok J	ok
Nominal values and limits from method 100 F Area - Quick Turn				RDLs (pCi/g)	1.0	1.0

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 6955-181	2σ prep error 5.0 %				Reference Lab Notebook 6955 pg. 181											
B10F55	R010070-01			0.017	0.500			93		1461			26	10/23/00	10/29	SS-046
B10F56	R010070-02			0.042	0.500			88		1129			30	10/23/00	11/02	SS-032
B10F57	R010070-03			0.061	0.500			87		1317			27	10/23/00	10/30	SS-041
B10F58	R010070-04			0.025	0.500			96		1317			27	10/23/00	10/30	SS-042
BLK (QC ID=36185)	R010070-06			0.015	0.500			89		1321				10/23/00	10/30	SS-044
LCS (QC ID=36184)	R010070-05			0.023	0.500			97		1321				10/23/00	10/30	SS-043
Duplicate (R010070-02) (QC ID=36186)	R010070-07			0.019	0.500			90		1321			27	10/23/00	10/30	SS-045
Nominal values and limits from method				1.0	0.500			20-105		50	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-060	Soil Preparation, rev 2
	CP-940	Plutonium Separation and Purification, rev 2
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 0.029 ± 0.034
YIELD 91 ± 8

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/00

Test U Matrix SOLID
SDG 7524
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1085

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 6955-181											
B10F55	R010070-01			7524-001	0.489 J	U	0.685 J	71	45	13	18
B10F56	R010070-02			7524-002	1.36	U	1.09	125	42	7	7
B10F57	R010070-03			7524-003	0.525 J	U	0.335 J	157	88	10	11
B10F58	R010070-04			7524-004	0.429 J	U	0.496 J	86	44	3	7
BLK (QC ID=36185)	R010070-06			7524-006	U	U	U				
LCS (QC ID=36184)	R010070-05			7524-005	ok	ok	ok				
Duplicate (R010070-02)	R010070-07			7524-007	ok	- U	ok	127	42	2	4
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
100 F Area - Quick Turn								Averages 113		7	

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 6955-181	2σ prep error 5.0 %				Reference Lab Notebook 6955 pg. 181											
B10F55	R010070-01			0.23	0.500			72		193			23	10/21/00	10/26	SS-022
B10F56	R010070-02			0.15	0.500			91		193			23	10/21/00	10/26	SS-023
B10F57	R010070-03			0.14	0.500			93		177			25	10/21/00	10/28	SS-027
B10F58	R010070-04			0.12	0.500			94		177			25	10/21/00	10/28	SS-029
BLK (QC ID=36185)	R010070-06			0.16	0.500			73		178				10/21/00	10/28	SS-032
LCS (QC ID=36184)	R010070-05			0.52	0.500			88		178				10/21/00	10/28	SS-031
Duplicate (R010070-02) (QC ID=36186)	R010070-07			0.15	0.500			80		178			25	10/21/00	10/28	SS-033
Nominal values and limits from method				1.0	0.500			20-105		150	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	CP-911	Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 2
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 0.21 ± 0.28
YIELD 84 ± 19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

Test	SR
Matrix	SOLID
SDG	7524
Contact	Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client	Hanford
Contract	TRC-SBB-207925
Contract	SDG H1085

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6955-181					
B10F55	R010070-01			7524-001	U
B10F56	R010070-02			7524-002	5.23
B10F57	R010070-03			7524-003	3.99
B10F58	R010070-04			7524-004	U
BLK (QC ID=36185)	R010070-06			7524-006	U
LCS (QC ID=36184)	R010070-05			7524-005	ok
Duplicate (R010070-02)	R010070-07			7524-007	ok
Nominal values and limits from method 100 F Area - Quick Turn				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 6955-181 2σ prep error 10.0 % Reference Lab Notebook 6955 pg. 181																
B10F55	R010070-01			0.17	1.00			95		400			17	10/20/00	10/20	GRB-217
B10F56	R010070-02			0.14	1.00			96		200			17	10/20/00	10/20	GRB-218
B10F57	R010070-03			0.13	1.00			98		192			17	10/20/00	10/20	GRB-232
B10F58	R010070-04			0.16	1.00			97		400			17	10/20/00	10/20	GRB-220
BLK (QC ID=36185)	R010070-06			0.15	1.00			89		200				10/20/00	10/20	GRB-220
LCS (QC ID=36184)	R010070-05			0.28	1.00			90		400				10/20/00	10/20	GRB-221
Duplicate (R010070-02) (QC ID=36186)	R010070-07			0.14	1.00			94		192			17	10/20/00	10/20	GRB-231
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 2
	CP-519	Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 2

AVERAGES ± 2 SD FOR 7 SAMPLES	MDA	0.17	± 0.10
	YIELD	94	± 7

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

Test TC Matrix SOLID
SDG 7524
Contact Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1085

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 6955-181						
B10F55	R010070-01			7524-001	U	
B10F56	R010070-02			7524-002	U	
B10F57	R010070-03			7524-003	U	
B10F58	R010070-04			7524-004	U	
BLK (QC ID=36185)	R010070-06			7524-006	U	
LCS (QC ID=36184)	R010070-05			7524-005	ok	
Duplicate (R010070-02)	R010070-07			7524-007	-	U
Nominal values and limits from method				RDLs (pCi/g)	15	
100 F Area - Quick Turn						

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 6955-181	2σ prep error 10.0 % Reference Lab Notebook 6955 pg. 181															
B10F55	R010070-01			0.73	1.04			46		101			17	10/17/00	10/20	GRB-217
B10F56	R010070-02			0.67	1.01			50		101			22	10/17/00	10/25	GRB-230
B10F57	R010070-03			1.1	1.01			32		101			21	10/17/00	10/24	GRB-221
B10F58	R010070-04			0.70	1.00			48		101			17	10/17/00	10/20	GRB-220
BLK (QC ID=36185)	R010070-06			0.58	1.00			42		200				10/17/00	10/24	GRB-232
LCS (QC ID=36184)	R010070-05			0.87	1.00			41		101				10/17/00	10/20	GRB-232
Duplicate (R010070-02) (QC ID=36186)	R010070-07			0.97	1.01			36		101			17	10/17/00	10/20	GRB-203
Nominal values and limits from method				15	1.00			20-105		50			180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

Test	TC
Matrix	SOLID
SDG	7524
Contact	Melissa C. Mannion

METHOD SUMMARY, cont.

TECHNETIUM 99 IN SOIL

BETA COUNTING

Client	Hanford
Contract	TRC-SBB-207925
Contract	SDG H1085

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-060	Soil Preparation, rev 2
	CP-021	Preparation of Tc-99m Tracer, rev 0
	CP-002	Q.C. Preparation, rev 2
	CP-003	Tracing, rev 2
	CP-542	Technetium-99 Purification (Soil) by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 7 SAMPLES				
MDA	0.80	±	0.37
YIELD	42	±	13

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	11/08/00

Test GAM Matrix SOLID
SDG 7524
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1085

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6955-181						
B10F55	R010070-01			7524-001	U	0.366
B10F56	R010070-02			7524-002	58.5	9.31
B10F57	R010070-03			7524-003	U	U
B10F58	R010070-04			7524-004	U	U
BLK (QC ID=36185)	R010070-06			7524-006	U	U
LCS (QC ID=36184)	R010070-05			7524-005	ok	ok
Duplicate (R010070-02)	R010070-07			7524-007	ok	ok
Nominal values and limits from method 100 F Area - Quick Turn				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 6955-181	2σ prep error 15.0 % Reference Lab Notebook 6955 pg. 181															
B10F55	R010070-01			0.26	205					186			14	10/17/00	10/17	JR,03,00
B10F56	R010070-02			4.9	185					178			14	10/17/00	10/17	JR,04,00
B10F57	R010070-03			0.17	200					186			14	10/17/00	10/17	JR,07,00
B10F58	R010070-04			0.25	195					104			14	10/17/00	10/17	JR,03,00
BLK (QC ID=36185)	R010070-06			0.21	184					104				10/17/00	10/17	JR,07,00
LCS (QC ID=36184)	R010070-05			0.072	184					104				10/17/00	10/17	JR,04,00
Duplicate (R010070-02) (QC ID=36186)	R010070-07			7.5	185					109			14	10/17/00	10/17	JR,03,00
Nominal values and limits from method				0.050	184					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 2
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 2

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 1.9 ± 6.1
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/00

Test C Matrix SOLID
SDG 7524
Contact Melissa C. Mannion

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

METHOD SUMMARY

CARBON 14 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRC-SBB-207925
Contract SDG H1085

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 6955-181						
B10F55	R010070-01			7524-001	U	
B10F56	R010070-02			7524-002	42.5	J
B10F57	R010070-03			7524-003	U	
B10F58	R010070-04			7524-004	U	
BLK (QC ID=36185)	R010070-06			7524-006	U	
LCS (QC ID=36184)	R010070-05			7524-005	ok	
Duplicate (R010070-02)	R010070-07			7524-007	ok	J
Nominal values and limits from method 100 F Area - Quick Turn				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 6955-181	2σ prep error 10.0 % Reference Lab Notebook 6955 pg. 181															
B10F55	R010070-01			5.4	0.212			100		100			24	10/17/00	10/27	LSC-004
B10F56	R010070-02			4.9	0.210			100		100			24	10/17/00	10/27	LSC-004
B10F57	R010070-03			5.0	0.210			100		100			24	10/17/00	10/27	LSC-004
B10F58	R010070-04			4.6	0.228			100		100			24	10/17/00	10/27	LSC-004
BLK (QC ID=36185)	R010070-06			5.2	0.200			100		100				10/17/00	10/27	LSC-004
LCS (QC ID=36184)	R010070-05			31	0.200			100		3				10/17/00	10/27	LSC-004
Duplicate (R010070-02) (QC ID=36186)	R010070-07			4.9	0.210			100		100			24	10/17/00	10/27	LSC-004
Nominal values and limits from method				50	0.200					25			180			

PROCEDURES	REFERENCE	C14_COX_LSC
	CP-060	Soil Preparation, rev 2
	CP-251	Tritium/Carbon-14 Oxidation, rev 2

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 8.7 ± 20
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H1085

Test	NI_L Matrix SOLID
SDG	7524
Contact	Melissa C. Mannion

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	TRC-SBB-207925
Contract	SDG H1085

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation batch 6955-181						
B10F55	R010070-01			7524-001	5.77	J
B10F56	R010070-02			7524-002	3020	
B10F57	R010070-03			7524-003	3.71	J
B10F58	R010070-04			7524-004	U	
BLK (QC ID=36185)	R010070-06			7524-006	U	
LCS (QC ID=36184)	R010070-05			7524-005	ok	
Duplicate (R010070-02)	R010070-07			7524-007	ok	

Nominal values and limits from method RDLs (pCi/g) 30

100 F Area - Quick Turn

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 6955-181 2σ prep error 10.0 % Reference Lab Notebook 6955 pg. 181																
B10F55	R010070-01			1.1	0.500			82		400			21	10/20/00	10/24	LSC-007
B10F56	R010070-02			4.4	0.500			87		25			21	10/20/00	10/24	LSC-007
B10F57	R010070-03			1.1	0.500			84		400			22	10/20/00	10/25	LSC-007
B10F58	R010070-04			1.1	0.500			83		375			22	10/20/00	10/25	LSC-007
BLK (QC ID=36185)	R010070-06			2.0	0.500			92		100				10/20/00	10/25	LSC-007
LCS (QC ID=36184)	R010070-05			2.1	0.500			90		100				10/20/00	10/25	LSC-007
Duplicate (R010070-02) (QC ID=36186)	R010070-07			4.5	0.500			77		28			22	10/20/00	10/25	LSC-007
Nominal values and limits from method				30	0.500			30-105		10			180			

PROCEDURES	REFERENCE	NI63_LSC
	CP-060	Soil Preparation, rev 2
	RP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 7 SAMPLES				
	MDA	2.3	±	3.0
	YIELD	85	±	10

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	11/08/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-029-043	Page 1 of ~~1~~ 2 RT 10/9/00

Collector: R. Nielson	Company Contact: Mike Stankovich; Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 2E; Data Turnaround: 15 days
Project Designation: 100 F Area - Quick Turn	Sampling Location: 116-F-14 Retention Basin H1085 (7524)	SAF No.: B00-029	Air Quality ☐
Ice Chest No.: ERC 99-068 (1 of 1)	Field Logbook No.: EL-1535; COA: R16F142600	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA TMA	Offsite Property No.: RSR# ~~10658~~ 10658 RT 10/9/00	Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Samples # B10F56 was re-labeled (B10F96) and sent to RCF for GEA analysis. Pages 2 of 2 represent custody transfer to RCF. The sample was picked up from RCF and the original label (B10F56) was placed back onto the sample jar for delivery to TMA for offsite analysis.

SAMPLE ANALYSIS													
Preservation				Cool 4C	None	None	None	None					
Type of Container				aG	aG	aG	aG	P					
No. of Container(s)				1	1	1	1	1					
Volume				60mL	60mL	60mL	60mL	500mL					
				Chromium Hex - 7196	See item (1) in Special Instructions.	Isotopic Uranium; Isotopic Plutonium; ~~Americium-241~~ RJN 10/3/00	Nickel-63; Strontium-89,90 -- Total Sr; Carbon-14; Technetium-99	See item (2) in Special Instructions.					
Sample No.	Matrix *	Sample Date	Sample Time										
B10F55	SOIL	10/3/00	1258			X	X	X					
B10F56	SOIL	10/3/00	1317			X	X	X					
B10F57	SOIL	10/3/00	1333			X	X	X					
B10F58	SOIL	10/3/00	1345			X	X	X					

CHAIN OF POSSESSION

Relinquished By (Sign/Print Names)	Date/Time	Received By (Sign/Print Names)	Date/Time
R. Nielson	10/3/00 1622	RJN 10/3/00 Stored in Ref # 1A	10/3/00 1622
RT 10/4/00 Removed from BOC 1A 3728	10/4/00 0600	R. Thoren	10/4/00 0600
R. Thoren	10/4/00 0800	Stored in ~~FED EX~~ Ref 1A 3728	10/4/00 0800
RT 10/9/00 Removed from Ref 1A 3728	10/4/00 0830	R. Thoren	10/4/00 0830
R. Thoren	10/9/00 0830	FED EX	10/9/00
FED EX 12658	10-10/00 10 AM	L. Segura	10/10/00 10 AM

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Chromium, Lead); Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Total Activity ~~B10H9~~ B10F96 RT 10/4/00

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10/3/00. Collector not available to relinquish samples on 10/4/00 for shipment. RT 10/4/00

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-029-44	Page 2 of 2

Collector: Fahlberg / Nielson	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Price Code	Data Turnaround: 24 Hours	Air Quality ☐	
Project Designation: 100 F Area - Quick Turn	Sampling Location: 100F / 116 F 14	SAF No.: B00-029	
Ice Chest No.: ERC 97-079	Field Logbook No.: EL 1535	COA: R16F142600	Method of Shipment: Government Vehicle
Shipped To: Radiological Counting Facility	Offsite Property No.: NA	Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None											
Type of Container	Marinelli											
No. of Container(s)	1											
Volume	500mL											
SAMPLE ANALYSIS	See item (1) in Special Instructions. Rad Screen			RCF								
Sample No.	Matrix *	Sample Date	Sample Time									
B10F96	SOIL	10/3/00	1317	X		8510						

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	R. Fahlberg / R. Fahlberg	10-4-00 1300	J Duffey / J Duffey	10-4-00 1300
Relinquished By	J Duffey / J Duffey	10-5-00 1300	[illegible]	10-5-00 1300
Relinquished By	[illegible]	10-5-00 1345	R. Thoren / R. Thoren	10-5-00 1345
Relinquished By			Received By	
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

(1) GAMMA ENERGY ANALYSIS (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Potassium-40)

Not Received

Matrix *

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

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

BHI-EE-011 (10/99)

ThermoRetec
Richmond Laboratory

Analytical Services

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: BECHTEL HANFORD INC Date/Time received 10-10-00 10:AM

CoC No. B00-029-043

Container I.D. No. ERC99-068 Requested TAT (Days) 15 P.O. Received Yes [ ] No [✓]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 4 x3
7. Number of containers per sample: 3 SAMPLE (EACH) (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by E. Segura Date: 10-10-00 Time: 10:AM

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

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-029 H1085

DATE RECEIVED: 10/10/00 RFW LOT # :0010L919

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10F55						
% SOLIDS	001	S	00L%S164	10/03/00	10/17/00	10/18/00
% SOLIDS	001 REP	S	00L%S164	10/03/00	10/17/00	10/18/00
CHROMIUM VI	001	S	00LVIA60	10/03/00	10/25/00	10/25/00
CHROMIUM VI	001 REP	S	00LVIA60	10/03/00	10/25/00	10/25/00
CHROMIUM VI	001 MS	S	00LVIA60	10/03/00	10/25/00	10/25/00
CHROMIUM VI	001 MSD	S	00LVIA60	10/03/00	10/25/00	10/25/00
B10F56						
% SOLIDS	002	S	00L%S164	10/03/00	10/17/00	10/18/00
CHROMIUM VI	002	S	00LVIA60	10/03/00	10/25/00	10/25/00
B10F57						
% SOLIDS	003	S	00L%S164	10/03/00	10/17/00	10/18/00
CHROMIUM VI	003	S	00LVIA60	10/03/00	10/25/00	10/25/00
B10F58						
% SOLIDS	004	S	00L%S164	10/03/00	10/17/00	10/18/00
CHROMIUM VI	004	S	00LVIA60	10/03/00	10/25/00	10/25/00
LAB QC:						
CHROMIUM VI	MB1	S	00LVIA60	N/A	10/25/00	10/25/00
CHROMIUM VI	MB1 BS	S	00LVIA60	N/A	10/25/00	10/25/00
CHROMIUM VI	MB1 BSD	S	00LVIA60	N/A	10/25/00	10/25/00

DEC 2000 RECEIVED

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B00-029
RFW# : 0010L919
SDG# : H1085
SAF# : B00-029

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

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

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

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blank for Chromium VI was within method criteria.

6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.

7. The matrix spike (MS) recovery for Insoluble Chromium VI was within the 75-125% control limits, however MS recovery for Soluble Chromium VI was below the control limits.

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

9. Results for solid samples are reported on a dry weight basis.

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

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

11-27-00
Date

njp\110-919

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 • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Recra LabNet Philadelphia

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	__ 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: **Method:**

Other: **Method**

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

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

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/27/00

CLIENT: TNUHANFORD B00-029 H1085

RECRA LOT #: 0010L919

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B10F55	% Solids	97.6	%	0.01	1.0
		Chromium VI	3.4	MG/KG	0.41	1.0
-002	B10F56	% Solids	97.6	%	0.01	1.0
		Chromium VI	6.2	MG/KG	0.41	1.0
-003	B10F57	% Solids	98.4	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-004	B10F58	% Solids	98.8	%	0.01	1.0
		Chromium VI	0.48	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/27/00

CLIENT: TNUHANFORD B00-029 H1085 RECRA LOT #: 0010L919

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	00LVIA60-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/27/00

CLIENT: TNUHANFORD B00-029 H1085

RECRA LOT #: 0010L919

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B10F55	Soluble Chromium VI	8.6	3.4	4.1	127.7	1.0
		Insoluble Chromium VI	1110	3.4	1250	87.9	100
BLANK10	00LVIA60-MB1	Soluble Chromium VI	3.8	0.40u	4.0	95.2	1.0
		Insoluble Chromium VI	1110	0.40u	1160	95.9	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/27/00

CLIENT: TNUHANFORD B00-029 H1085 RECRA LOT #: 0010L919

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B10F55	% Solids	97.6	98.3	0.74	1.0
		Chromium VI	3.4	3.6	4.2	1.0

RECRA LabNet Use Only
0010L919

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU-Hanford B00-029
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: DJ
QC: Spec Del: Std TAT: 15 day
Date Rec'd: 10-10-00 Date Due: 10-25-00
Account #:

		A	B
Refrigerator #		N	N
#/Type Container	Liquid		
	Solid	1Pt	1Pt
Volume	Liquid		
	Solid	60	60
Preservatives		-	-

ANALYSES REQUESTED →

ORGANIC				INORG	
VOA	BNA	Pest/PCB	Herb	Metal	CN

RECRA LabNet Use Only

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only: As Cr Pb Hg	ICP/9
001	B10F55			S	10-3-00	1258	✓	✓
002	56					1317	✓	✓
003	57					1333	✓	✓
004	58					1345	✓	✓

Special Instructions: Saf B00-029

Run Matrix QC

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 7.3 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
822771885374

Relinquished by	Received by	Date	Time
FedEx	TKoppel	10-10-00	0920

Relinquished by	Received by	Date	Time
COMPOSITE	ORIGINAL		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-029-043	Page 1 of 1

Collector: R. Nielson	Company Contact: Mike Stankovich; Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 2E; Data Turnaround: 15 days
Project Designation: 100 F Area - Quick Turn	Sampling Location: 116-F-14 Retention Basin	SAF No.: B00-029	Air Quality ☐
Ice Chest No.: ERC 99-067 (1 OF 1)	Field Logbook No.: EL-1535; COA: R16F142600	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: RSR # 104090 RT 10/9/00	Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Chromium Hex - 7196	See item (1) in Special Instructions.	Isotopic Uranium; Isotopic Plutonium; ~~Americium-241~~ RJN 10/3/00	Nickel-63; Strontium-89,90 -- Total Sr; Carbon-14; Technetium-99	See item (2) in Special Instructions.					
				Preservation	Cool 4C	None	None	None	None				
				Type of Container	aG	aG	aG	aG	P				
				No. of Container(s)	1	1	1	1	1				
				Volume	60mL	60mL	60mL	60mL	500mL				
B10F55	SOIL	10/3/00	1258		X	X							
B10F56	SOIL	10/3/00	1317		X	X							
B10F57	SOIL	10/3/00	1333		X	X							
B10F58	SOIL	10/3/00	1345		X	X							

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson	10/3/00 1622	Stored in RJN 10/3/00 Ref# 1A	10/3/00 1622
Removed from Ref 1A 3728	10/4/00 0800	R Thoren	10/4/00 0800
R Thoren	10/4/00 0800	Stored in Ref 1A 3728 ~~FED EX~~	10/4/00 0800
Removed from Ref 1A 3728	10/9/00 0830	R Thoren	10/9/00 0830
R Thoren	10/9/00 0830	FEDEX	
FedEx	10-10-00 0920	Thoppel	10-10-00 0920

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Chromium, Lead); Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Total Activity ~~B10H4~~ B10F96 RT 10/9/00

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10/3/00. Collector not available to relinquish samples on 10/4/00 for shipment. RT 10/4/00

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

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

BHI-EE-011 (10/99)

DEC 2000
RECEIVED

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-029 H1085

DATE RECEIVED: 10/10/00 RFW LOT # :0010L919

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B10F55						
ARSENIC, TOTAL	001	S	99L1658	10/03/00	10/28/00	10/30/00
ARSENIC, TOTAL	001 REP	S	99L1658	10/03/00	10/28/00	10/30/00
ARSENIC, TOTAL	001 MS	S	99L1658	10/03/00	10/28/00	10/30/00
CHROMIUM, TOTAL	001	S	99L1658	10/03/00	10/28/00	10/30/00
CHROMIUM, TOTAL	001 REP	S	99L1658	10/03/00	10/28/00	10/30/00
CHROMIUM, TOTAL	001 MS	S	99L1658	10/03/00	10/28/00	10/30/00
MERCURY, TOTAL	001	S	00C0350	10/03/00	10/23/00	10/24/00
MERCURY, TOTAL	001 REP	S	00C0350	10/03/00	10/23/00	10/24/00
MERCURY, TOTAL	001 MS	S	00C0350	10/03/00	10/23/00	10/24/00
LEAD, TOTAL	001	S	99L1658	10/03/00	10/28/00	10/30/00
LEAD, TOTAL	001 REP	S	99L1658	10/03/00	10/28/00	10/30/00
LEAD, TOTAL	001 MS	S	99L1658	10/03/00	10/28/00	10/30/00
B10F56						
ARSENIC, TOTAL	002	S	99L1658	10/03/00	10/28/00	10/30/00
CHROMIUM, TOTAL	002	S	99L1658	10/03/00	10/28/00	10/30/00
MERCURY, TOTAL	002	S	00C0350	10/03/00	10/23/00	10/24/00
LEAD, TOTAL	002	S	99L1658	10/03/00	10/28/00	10/30/00
B10F57						
ARSENIC, TOTAL	003	S	99L1658	10/03/00	10/28/00	10/30/00
CHROMIUM, TOTAL	003	S	99L1658	10/03/00	10/28/00	10/30/00
MERCURY, TOTAL	003	S	00C0350	10/03/00	10/23/00	10/24/00
LEAD, TOTAL	003	S	99L1658	10/03/00	10/28/00	10/30/00
B10F58						
ARSENIC, TOTAL	004	S	99L1658	10/03/00	10/28/00	10/30/00
CHROMIUM, TOTAL	004	S	99L1658	10/03/00	10/28/00	10/30/00
MERCURY, TOTAL	004	S	00C0350	10/03/00	10/23/00	10/24/00
LEAD, TOTAL	004	S	99L1658	10/03/00	10/28/00	10/30/00

LAB QC:

ARSENIC LABORATORY	LC1 BS	S	99L1658	N/A	10/28/00	10/30/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-029 H1085

DATE RECEIVED: 10/10/00 RFW LOT # :0010L919

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	MB1	S	99L1658	N/A	10/28/00	10/30/00
CHROMIUM LABORATORY	LC1 BS	S	99L1658	N/A	10/28/00	10/30/00
CHROMIUM, TOTAL	MB1	S	99L1658	N/A	10/28/00	10/30/00
MERCURY LABORATORY	LC1 BS	S	00C0350	N/A	10/23/00	10/24/00
MERCURY, TOTAL	MB1	S	00C0350	N/A	10/23/00	10/24/00
LEAD LABORATORY	LC1 BS	S	99L1658	N/A	10/28/00	10/30/00
LEAD, TOTAL	MB1	S	99L1658	N/A	10/28/00	10/30/00

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B00-029
RFW#: 0010L919
SDG/SAF#: H1085/B00-029

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

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. Sample B10F56 was reported with a twenty five fold dilution for Mercury due to the high concentration of this analyte.

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

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

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

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

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), 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 form 7.

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

11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

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

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

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

J. Michael Taylor
VP, Laboratory General Manager
Lionville Laboratory

Date 11-30-00

gmb/m10-919

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0010L919

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.

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/30/00

CLIENT: TNUHANFORD B00-029 H1085

RECRA LOT #: 0010L919

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B10F55	Arsenic, Total	2.0	MG/KG	0.31	1.0
		Chromium, Total	13.5	MG/KG	0.08	1.0
		Mercury, Total	0.22	MG/KG	0.02	1.0
		Lead, Total	3.7	MG/KG	0.19	1.0
-002	B10F56	Arsenic, Total	3.1	MG/KG	0.31	1.0
		Chromium, Total	860	MG/KG	0.08	1.0
		Mercury, Total	23.1	MG/KG	0.41	25.0
		Lead, Total	36.4	MG/KG	0.19	1.0
-003	B10F57	Arsenic, Total	2.3	MG/KG	0.32	1.0
		Chromium, Total	9.9	MG/KG	0.08	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.9	MG/KG	0.20	1.0
-004	B10F58	Arsenic, Total	2.1	MG/KG	0.32	1.0
		Chromium, Total	9.7	MG/KG	0.08	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Lead, Total	2.3	MG/KG	0.20	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/30/00

CLIENT: TNUHANFORD B00-029 H1085 RECRA LOT #: 0010L919

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1658-MB1	Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Chromium, Total	0.09 u	MG/KG	0.09	1.0
		Lead, Total	0.21 u	MG/KG	0.21	1.0
BLANK1	00C0350-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/30/00

CLIENT: TNUHANFORD B00-029 H1085

RECRA LOT #: 0010L919

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B10F55	Arsenic, Total	178	2.0	181	97.0	1.0
		Chromium, Total	30.9	13.5	18.1	96.1	1.0
		Mercury, Total	0.40	0.22	0.16	112.7	1.0
		Lead, Total	47.5	3.7	45.3	96.7	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/30/00

CLIENT: TNUHANFORD B00-029 H1085 RECRA LOT #: 0010L919

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B10F55	Arsenic, Total	2.0	2.3	14.0	1.0
		Chromium, Total	13.5	13.4	0.74	1.0
		Mercury, Total	0.22	0.21	2.4	1.0
		Lead, Total	3.7	4.4	17.3	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/30/00

CLIENT: TNUHANFORD B00-029 H1085 RECRA LOT #: 0010L919

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1658-LC1	Arsenic, LCS	969	1000	MG/KG	96.9
		Chromium, LCS	50.7	50.0	MG/KG	101.4
		Lead, LCS	247	250	MG/KG	98.8
LCS1	00C0350-LC1	Mercury, LCS	0.76	0.7	MG/KG	106.6

RECRA LabNet Use Only
00101919

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU-Hanford B00-029
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: Std TAT: 15 day
Date Rec'd: 10-10-00 Date Due: 10-25-00
Account #:

		A	B
Refrigerator #		4	4
#/Type Container	Liquid		
	Solid	1Pkg	1Pkg
Volume	Liquid		
	Solid	600	600
Preservatives		-	-

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

RECRA LabNet Use Only: As, Cr, Pb, Hg; ICRL9

MATRIX CODES:
S - Soil
SE - Sediment
SG - 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	MS	MSD	Matrix	Date Collected	Time Collected	Metal	ICRL9
001	B10E55			S	10-3-00	1258	✓	✓
002	56					1317	✓	✓
003	57					1333	✓	✓
004	58					1345	✓	✓

Special Instructions: Saf B00-029

Run Matrix QC

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

RECRA LabNet Use Only

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

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 7.3 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
822771885374

Relinquished by	Received by	Date	Time
FedEx	TKoppel	10-10-00	0920

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-029-043	Page 1 of 1
Collector: R. Nielson	Company Contact: Mike Stankovich; Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 2E; Data Turnaround: 15 days
Project Designation: 100 F Area - Quick Turn	Sampling Location: 116-F-14 Retention Basin	SAF No.: B00-029	Air Quality ☐
Ice Chest No.: ERC 99-067 (1 OF 1)	Field Logbook No.: EL-1535; COA: R16F142600	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: RSR # 1065944 RT 10/4/00	Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None	None	None	None					
Type of Container	sG	sG	sG	sG	P					
No. of Container(s)	1	1	1	1	1					
Volume	60mL	60mL	60mL	60mL	500mL					
SAMPLE ANALYSIS	Chromium Hex - 7196	See item (1) in Special Instructions.	Isotopic Uranium; Isotopic Plutonium; ~~Americium-241~~ RJN 10/3/00	Nickel-63; Strontium-89,90 – Total Sr; Carbon-14; Technetium-99	See item (2) in Special Instructions.					

Sample No.	Matrix *	Sample Date	Sample Time									
B10F55	SOIL	10/3/00	1258	X	X							
B10F56	SOIL	10/3/00	1317	X	X							
B10F57	SOIL	10/3/00	1333	X	X							
B10F58	SOIL	10/3/00	1345	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson / R. Nielson	10/3/00 1622	RJN 10/3/00	Stored in Ref # 1A 10/3/00 1622
Removed from Ref 1A 3728 10/4/00	0800	R Thoren 10/4/00	0800
R Thoren 10/4/00	0800	Stored in ~~FED EX~~ Ref 1A 3728 10/4/00	0800
Removed from Ref 1A 3728 10/9/00	0830	R Thoren 10/9/00	0830
R Thoren 10/9/00	0830	FED EX	
FEDEX	10-10-00 0920	Thoppel	10-10-00 0920

RT 10/4/00

RT 10/9/00

RT 10/9/00

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Chromium, Lead); Mercury - 7471 - (CV)
(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Total Activity ~~B10H9~~ B10F96 RT 10/9/00

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10/3/00.
Collector not available to relinquish samples on 10/4/00 for shipment. RT 10/4/00

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

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

BHI-EE-011 (10/99)

3-A