H0195-TN

0050110

Thermo Nutech
W.O. No. N8-08-057-7490

Bechtel Hanford Inc.
SDG H0195

Case Narrative

1.0 GENERAL

Thermo Nutech Sample Delivery Group H0195 is comprised of eleven soil samples designated under SAF No. B98-022 with a Project Designation of : 100 D Areas - Full Protocol.

The sample was received as stated on the Chain-of-Custody documents.

DEC 1998
RECEIVED
EDMC

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analyses

No problems were encountered with the analyses.

2.2 Strontium-90 Analyses

No problems were encountered with the analyses. The MDA of the blank sample was greater than the RDL.

2.3 Isotopic Plutonium Analyses

The MDA's or both the LCS and blank were greater than the RDL. All sample MDA's were less than the RDL.

2.4 Americium-241 Analyses

The yields for samples B0PK18, B0PK21, and B0PK27 were less than the lower method limit of 20% and their respective MDA's were greater than the RDL. The MDA for sample B0PK23 was 35% and the MDA was slightly greater than the RDL. Positive Am241 activity was detected in some of the samples.

2.5 Gamma Scan Analyses

Most of the nuclide MDA's were greater than their respective RDL's. Positive Co60 and Cs137 activities were detected in all but one sample (B0PK22).

OCT 1998
RECEIVED
Data
Log In

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

SAMPLE SUMMARY

SDG 7490
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0PK17	116-D-7	SOLID		N808057-01	B98-022	B98-022-16	08/10/98 07:45
B0PK18	116-D-7	SOLID		N808057-02	B98-022	B98-022-16	08/10/98 07:30
B0PK19	116-D-7	SOLID		N808057-03	B98-022	B98-022-16	08/10/98 09:00
B0PK20	116-D-7	SOLID		N808057-04	B98-022	B98-022-16	08/10/98 07:10
B0PK21	116-D-7	SOLID		N808057-05	B98-022	B98-022-17	08/10/98 09:30
B0PK22	116-D-7	SOLID		N808057-06	B98-022	B98-022-17	08/10/98 06:15
B0PK23	116-D-7	SOLID		N808057-07	B98-022	B98-022-17	08/10/98 08:05
B0PK24	116-D-7	SOLID		N808057-08	B98-022	B98-022-17	08/10/98 09:10
B0PK25	116-D-7	SOLID		N808057-09	B98-022	B98-022-18	08/10/98 08:30
B0PK26	116-D-7	SOLID		N808057-10	B98-022	B98-022-18	08/10/98 06:40
B0PK27	116-D-7	SOLID		N808057-11	B98-022	B98-022-18	08/10/98 06:40
Method Blank		SOLID		N808057-13	B98-022		
Lab Control Sample		SOLID		N808057-12	B98-022		
Duplicate (N808057-01)	116-D-7	SOLID		N808057-14	B98-022		08/10/98 07:45

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

QC SUMMARY

SDG 7490
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

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
7490	B98-022-16	B0PK17	SOLID				08/13/98	3	N808057-01	7490-001
		B0PK18	SOLID				08/13/98	3	N808057-02	7490-002
		B0PK19	SOLID				08/13/98	3	N808057-03	7490-003
		B0PK20	SOLID				08/13/98	3	N808057-04	7490-004
	B98-022-17	B0PK21	SOLID				08/13/98	3	N808057-05	7490-005
		B0PK22	SOLID				08/13/98	3	N808057-06	7490-006
		B0PK23	SOLID				08/13/98	3	N808057-07	7490-007
		B0PK24	SOLID				08/13/98	3	N808057-08	7490-008
	B98-022-18	B0PK25	SOLID				08/13/98	3	N808057-09	7490-009
		B0PK26	SOLID				08/13/98	3	N808057-10	7490-010
		B0PK27	SOLID				08/13/98	3	N808057-11	7490-011
		Method Blank	SOLID						N808057-13	7490-013
		Lab Control Sample	SOLID						N808057-12	7490-012
		Duplicate (N808057-01)	SOLID				08/13/98	3	N808057-14	7490-014

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

SDG 7490
Contact N. Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

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	2785-112	5.0	11			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Soil	2785-112	5.0	11			1	1	1/1		
Beta Counting												
SR	SOLID	Strontium, Total in Soil	2785-112	10.0	11			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	2785-112	15.0	11			1	1	1/1		
Liquid Scintillation Counting												
NI_L	SOLID	Nickel 63 in Soil	2785-112	10.0	11			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 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

WORK SUMMARY

SDG 7490
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0PK17			N808057-01	7490-001	AM		08/27/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-001	GAM		08/24/98	08/31/98	NJV	Gamma Scan
B98-022-16	B98-022		08/13/98	7490-001	NI_L		08/27/98	09/04/98	NJV	Nickel 63 in Soil
				7490-001	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-001	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
B0PK18			N808057-02	7490-002	AM		08/27/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-002	GAM		08/24/98	08/31/98	NJV	Gamma Scan
B98-022-16	B98-022		08/13/98	7490-002	NI_L		08/27/98	09/04/98	NJV	Nickel 63 in Soil
				7490-002	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-002	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
B0PK19			N808057-03	7490-003	AM		08/27/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-003	GAM		08/24/98	08/31/98	NJV	Gamma Scan
B98-022-16	B98-022		08/13/98	7490-003	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-003	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-003	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
B0PK20			N808057-04	7490-004	AM		09/02/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-004	GAM		08/24/98	08/31/98	NJV	Gamma Scan
B98-022-16	B98-022		08/13/98	7490-004	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-004	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-004	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
B0PK21			N808057-05	7490-005	AM		08/27/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-005	GAM		08/25/98	08/31/98	NJV	Gamma Scan
B98-022-17	B98-022		08/13/98	7490-005	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-005	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-005	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
B0PK22			N808057-06	7490-006	AM		08/27/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-006	GAM		08/25/98	08/31/98	NJV	Gamma Scan
B98-022-17	B98-022		08/13/98	7490-006	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-006	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-006	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

SDG 7490
Contact N. Joseph Verville

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0PK23			N808057-07	7490-007	AM		08/27/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-007	GAM		08/25/98	08/31/98	NJV	Gamma Scan
B98-022-17	B98-022		08/13/98	7490-007	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-007	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-007	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
B0PK24			N808057-08	7490-008	AM		09/02/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-008	GAM		08/25/98	08/31/98	NJV	Gamma Scan
B98-022-17	B98-022	-	08/13/98	7490-008	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-008	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-008	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
B0PK25			N808057-09	7490-009	AM		09/02/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-009	GAM		08/26/98	08/31/98	NJV	Gamma Scan
B98-022-18	B98-022		08/13/98	7490-009	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-009	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-009	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
B0PK26			N808057-10	7490-010	AM		09/02/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-010	GAM		08/25/98	08/31/98	NJV	Gamma Scan
B98-022-18	B98-022		08/13/98	7490-010	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-010	PU		08/26/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-010	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
B0PK27			N808057-11	7490-011	AM		09/01/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-011	GAM		08/25/98	08/31/98	NJV	Gamma Scan
B98-022-18	B98-022		08/13/98	7490-011	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-011	PU		08/26/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-011	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
Method Blank			N808057-13	7490-013	AM		08/27/98	09/04/98	NJV	Americium 241 in Soil
		SOLID		7490-013	GAM		08/25/98	08/31/98	NJV	Gamma Scan
	B98-022			7490-013	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-013	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-013	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

SDG 7490
Contact N. Joseph Verville

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			N808057-12	7490-012	AM		09/01/98	09/04/98	NJV	Americium 241 in Soil
		SOLID		7490-012	GAM		08/25/98	08/31/98	NJV	Gamma Scan
	B98-022			7490-012	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-012	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-012	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil
Duplicate (N808057-01)			N808057-14	7490-014	AM		09/02/98	09/04/98	NJV	Americium 241 in Soil
116-D-7		SOLID	08/10/98	7490-014	GAM		08/26/98	08/31/98	NJV	Gamma Scan
	B98-022		08/13/98	7490-014	NI_L		08/28/98	09/04/98	NJV	Nickel 63 in Soil
				7490-014	PU		08/25/98	08/31/98	NJV	Plutonium, Isotopic in Soil
				7490-014	SR		08/25/98	08/31/98	NJV	Strontium, Total in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B98-022	Americium 241 in Soil	AM/CMPLATE	11			1	1	1	14
GAM	B98-022	Gamma Scan	GAMMAHI	11			1	1	1	14
NI_L	B98-022	Nickel 63 in Soil	NI63LSC	11			1	1	1	14
PU	B98-022	Plutonium, Isotopic in Soil	PUPLATE	11			1	1	1	14
SR	B98-022	Strontium, Total in Soil	SR8990	11			1	1	1	14
TOTALS				55			5	5	5	70

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-13

METHOD BLANK

Method Blank

SDG 7490 Client/Case no Hanford SDG H0195
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N808057-13 Client sample id Method Blank
Dept sample id 7490-013 Material/Matrix SOLID
SAF No B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.074	0.15	0.28	0.050	U	PU
Plutonium 239/240	15117-48-3	-0.037	0.074	0.28	0.050	U	PU
Americium 241	14596-10-2	0.012	0.011	0.016	0.050	U	AM
Total Strontium	SR-89/90	-1.3	1.5	1.8	1.0	U	SR
Nickel 63	13981-37-8	4.3	2.9	4.6	20	U	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		0.047		U	GAM
Cobalt 60	10198-40-0	U		0.004	0.050	U	GAM
Cesium 137	10045-97-3	U		0.004	0.050	U	GAM
Europium 152	14683-23-9	U		0.011	0.10	U	GAM
Europium 154	15585-10-1	U		0.011	0.10	U	GAM
Europium 155	14391-16-3	U		0.010	0.10	U	GAM
Americium 241	14596-10-2	U		0.010		U	GAM
Uranium 238	U-238	U		0.48		U	GAM

100 D Areas - Full Protocol

QC-BLANK 28896

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 09/04/98

N808057-12

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

LAB CONTROL SAMPLE

Lab Control Sample

SDG 7490
Contact N. Joseph Verville

Client/Case no Hanford SDG H0195
Case no TRB-SBB-207925

Lab sample id N808057-12
Dept sample id 7490-012

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B98-022

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
Plutonium 238	94	9.1	0.27	0.050		PU	88.5	3.5	106	82-118	80-120
Plutonium 239/240	55	5.6	0.34	0.050		PU	53.0	2.1	104	81-119	80-120
Americium 241	4.8	0.29	0.010	0.050		AM	5.28	0.21	91	88-112	80-120
Total Strontium	100	3.9	2.0	1.0		SR	98.8	4.0	101	82-118	
Nickel 63	140	7.1	4.4	20		NI_L	135	5.4	104	81-119	
GAMMA SCAN ANALYTES	U										
Cobalt 60	0.26	0.022	0.012	0.050		GAM	0.277	0.011	94	75-125	80-120
Cesium 137	0.37	0.022	0.016	0.050		GAM	0.352	0.014	105	74-126	80-120

100 D Areas - Full Protocol

QC-LCS 28895

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-14

DUPLICATE

B0PK17

SDG 7490
Contact N. Joseph Verville

Client/Case no Hanford SDG H0195
Case no TRB-SBB-207925

DUPLICATE
Lab sample id N808057-14
Dept sample id 7490-014

ORIGINAL
Lab sample id N808057-01
Dept sample id 7490-001
Received 08/13/98

Client sample id B0PK17
Location/Matrix 116-D-7 SOLID
Collected 08/10/98 07:45
Custody/SAF No B98-022-16 B98-022

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
Plutonium 238	0.019	0.023	0.036	0.050	U	PU	0.010	0.010	0.039	U	-		
Plutonium 239/240	0.56	0.10	0.036	0.050		PU	0.46	0.11	0.039		20	45	
Americium 241	0.15	0.044	0.029	0.050		AM	0.19	0.059	0.038		24	66	
Total Strontium	1.3	0.17	0.17	1.0		SR	1.2	0.19	0.20		8	38	
Nickel 63	410	15	6.8	20		NI_L	480	19	10		16	23	
GAMMA SCAN ANALYTES	U						U						
Potassium 40	U		0.82		U	GAM	U		1.2	U	-		
Cobalt 60	18	0.13	0.084	0.050		GAM	19	0.21	0.14		5	32	
Cesium 137	43	0.15	0.11	0.050		GAM	41	0.23	0.20		5	32	
Europium 152	220	0.60	0.43	0.10		GAM	230	0.80	0.69		4	32	
Europium 154	32	0.35	0.29	0.10		GAM	31	0.58	0.52		3	32	
Europium 155	1.1	0.33	0.46	0.10		GAM	1.3	0.42	0.61		17	74	
Radium 226	0.61	0.13	0.19	0.10		GAM	0.51	0.25	0.36		18	82	
Radium 228	0.52	0.29	0.42	0.20		GAM	0.89	0.60	0.83		52	146	
Thorium 228	0.59	0.085	0.14			GAM	0.55	0.15	0.24		7	55	
Thorium 232	0.52	0.29	0.42			GAM	0.89	0.60	0.83		52	146	
Americium 241	U		0.35		U	GAM	U		0.63	U	-		
Uranium 238	U		16		U	GAM	U		27	U	-		

100 D Areas - Full Protocol

QC-DUP#1 28897

Lab id TMANC
Protocol Hanford
Version Ver 1.1
Form DVD-DUP
Version 3.06
Report date 09/04/98

N808057-01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

DATA SHEET

B0PK17

SDG 7490 Client/Case no Hanford SDG H0195
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N808057-01 Client sample id B0PK17
Dept sample id 7490-001 Location/Matrix 116-D-7 SOLID
Received 08/13/98 Collected 08/10/98 07:45
Custody/SAF No B98-022-16 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.010	0.010	0.039	0.050	U	PU
Plutonium 239/240	15117-48-3	0.46	0.11	0.039	0.050		PU
Americium 241	14596-10-2	0.19	0.059	0.038	0.050		AM
Total Strontium	SR-89/90	1.2	0.19	0.20	1.0		SR
Nickel 63	13981-37-8	480	19	10	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		1.2		U	GAM
Cobalt 60	10198-40-0	19	0.21	0.14	0.050		GAM
Cesium 137	10045-97-3	41	0.23	0.20	0.050		GAM
Europium 152	14683-23-9	230	0.80	0.69	0.10		GAM
Europium 154	15585-10-1	31	0.58	0.52	0.10		GAM
Europium 155	14391-16-3	1.3	0.42	0.61	0.10		GAM
Radium 226	13982-63-3	0.51	0.25	0.36	0.10		GAM
Radium 228	15262-20-1	0.89	0.60	0.83	0.20		GAM
Thorium 228	14274-82-9	0.55	0.15	0.24			GAM
Thorium 232	7440-29-1	0.89	0.60	0.83			GAM
Americium 241	14596-10-2	U		0.63		U	GAM
Uranium 238	U-238	U		27		U	GAM

100 D Areas - Full Protocol

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-02

DATA SHEET

B0PK18

SDG	7490	Client/Case no	Hanford SDG H0195
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808057-02	Client sample id	B0PK18
Dept sample id	7490-002	Location/Matrix	116-D-7 SOLID
Received	08/13/98	Collected	08/10/98 07:30
		Custody/SAF No	B98-022-16 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.007	0.013	0.025	0.050	U	PU
Plutonium 239/240	15117-48-3	0.39	0.080	0.025	0.050		PU
Americium 241	14596-10-2	0.13	0.051	0.032	0.050		AM
Total Strontium	SR-89/90	1.0	0.16	0.17	1.0		SR
Nickel 63	13981-37-8	170	10	7.5	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	13	0.38	0.27			GAM
Cobalt 60	10198-40-0	6.8	0.073	0.039	0.050		GAM
Cesium 137	10045-97-3	9.2	0.068	0.053	0.050		GAM
Europium 152	14683-23-9	47	0.20	0.13	0.10		GAM
Europium 154	15585-10-1	7.9	0.18	0.15	0.10		GAM
Europium 155	14391-16-3	0.23	0.12	0.18	0.10		GAM
Radium 226	13982-63-3	0.33	0.078	0.10	0.10		GAM
Radium 228	15262-20-1	0.57	0.17	0.23	0.20		GAM
Thorium 228	14274-82-9	0.55	0.049	0.073			GAM
Thorium 232	7440-29-1	0.57	0.17	0.23			GAM
Americium 241	14596-10-2	U		0.17		U	GAM
Uranium 238	U-238	U		8.0		U	GAM

100 D Areas - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-03

DATA SHEET

B0PK19

SDG	7490	Client/Case no	Hanford SDG H0195
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808057-03	Client sample id	B0PK19
Dept sample id	7490-003	Location/Matrix	116-D-7 SOLID
Received	08/13/98	Collected	08/10/98 09:00
		Custody/SAF No	B98-022-16 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.016	0.022	0.042	0.050	U	PU
Plutonium 239/240	15117-48-3	0.27	0.081	0.042	0.050		PU
Americium 241	14596-10-2	0.051	0.061	0.097	0.050	U	AM
Total Strontium	SR-89/90	0.84	0.15	0.17	1.0	J	SR
Nickel 63	13981-37-8	160	9.1	6.3	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	11	0.55	0.34			GAM
Cobalt 60	10198-40-0	4.3	0.10	0.067	0.050		GAM
Cesium 137	10045-97-3	29	0.20	0.14	0.050		GAM
Europium 152	14683-23-9	55	0.44	0.38	0.10		GAM
Europium 154	15585-10-1	7.2	0.31	0.26	0.10		GAM
Europium 155	14391-16-3	U		0.29	0.10	U	GAM
Radium 226	13982-63-3	0.43	0.14	0.18	0.10		GAM
Radium 228	15262-20-1	0.59	0.34	0.43	0.20		GAM
Thorium 232	7440-29-1	0.59	0.34	0.43			GAM
Americium 241	14596-10-2	U		0.14		U	GAM
Uranium 238	U-238	U		16		U	GAM

100 D Areas - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-04

DATA SHEET

B0PK20

SDG 7490 Client/Case no Hanford SDG H0195

Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N808057-04 Client sample id B0PK20

Dept sample id 7490-004 Location/Matrix 116-D-7 SOLID

Received 08/13/98 Collected 08/10/98 07:10

Custody/SAF No B98-022-16 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	-0.005	0.010	0.039	0.050	U	PU
Plutonium 239/240	15117-48-3	0.11	0.053	0.039	0.050		PU
Americium 241	14596-10-2	0.025	0.013	0.013	0.050	J	AM
Total Strontium	SR-89/90	0.63	0.17	0.19	1.0	J	SR
Nickel 63	13981-37-8	140	12	11	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	8.4	0.26	0.15			GAM
Cobalt 60	10198-40-0	1.8	0.039	0.022	0.050		GAM
Cesium 137	10045-97-3	18	0.080	0.040	0.050		GAM
Europium 152	14683-23-9	3.4	0.071	0.086	0.10		GAM
Europium 154	15585-10-1	0.43	0.065	0.072	0.10		GAM
Europium 155	14391-16-3	U		0.077	0.10	U	GAM
Radium 226	13982-63-3	0.50	0.047	0.059	0.10		GAM
Radium 228	15262-20-1	0.50	0.091	0.11	0.20		GAM
Thorium 228	14274-82-9	0.77	0.036	0.049			GAM
Thorium 232	7440-29-1	0.50	0.091	0.11			GAM
Americium 241	14596-10-2	U		0.10		U	GAM
Uranium 238	U-238	U		3.4		U	GAM

100 D Areas - Full Protocol

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-05

DATA SHEET

B0PK21

SDG	7490	Client/Case no	Hanford SDG H0195
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808057-05	Client sample id	B0PK21
Dept sample id	7490-005	Location/Matrix	116-D-7 SOLID
Received	08/13/98	Collected	08/10/98 09:30
		Custody/SAF No	B98-022-17 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.031	0.018	0.023	0.050	J	PU
Plutonium 239/240	15117-48-3	0.65	0.078	0.019	0.050		PU
Americium 241	14596-10-2	0.23	0.12	0.11	0.050		AM
Total Strontium	SR-89/90	1.8	0.18	0.16	1.0		SR
Nickel 63	13981-37-8	180	12	9.1	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	12	0.55	0.36			GAM
Cobalt 60	10198-40-0	4.9	0.11	0.075	0.050		GAM
Cesium 137	10045-97-3	16	0.19	0.16	0.050		GAM
Europium 152	14683-23-9	79	0.49	0.40	0.10		GAM
Europium 154	15585-10-1	10	0.35	0.30	0.10		GAM
Europium 155	14391-16-3	2.6	0.35	0.40	0.10		GAM
Radium 226	13982-63-3	0.41	0.16	0.21	0.10		GAM
Americium 241	14596-10-2	U		0.15		U	GAM
Uranium 238	U-238	U		19		U	GAM

100 D Areas - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-06

DATA SHEET

B0PK22

SDG	7490	Client/Case no	Hanford SDG H0195
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808057-06	Client sample id	B0PK22
Dept sample id	7490-006	Location/Matrix	116-D-7 SOLID
Received	08/13/98	Collected	08/10/98 06:15
		Custody/SAF No	B98-022-17 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.003	0.006	0.012	0.050	U	PU
Plutonium 239/240	15117-48-3	0.003	0.006	0.012	0.050	U	PU
Americium 241	14596-10-2	0.013	0.015	0.028	0.050	U	AM
Total Strontium	SR-89/90	0.016	0.15	0.20	1.0	U	SR
Nickel 63	13981-37-8	2.2	2.8	4.7	20	U	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	5.5	0.30	0.16			GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	U		0.012	0.050	U	GAM
Europium 152	14683-23-9	U		0.034	0.10	U	GAM
Europium 154	15585-10-1	U		0.050	0.10	U	GAM
Europium 155	14391-16-3	U		0.036	0.10	U	GAM
Radium 226	13982-63-3	0.18	0.027	0.025	0.10		GAM
Radium 228	15262-20-1	0.18	0.051	0.055	0.20	J	GAM
Thorium 228	14274-82-9	0.16	0.014	0.016			GAM
Thorium 232	7440-29-1	0.18	0.051	0.055			GAM
Americium 241	14596-10-2	U		0.052		U	GAM
Uranium 238	U-238	U		1.8		U	GAM

100 D Areas - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-07

DATA SHEET

B0PK23

SDG 7490 Client/Case no Hanford SDG H0195
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N808057-07 Client sample id B0PK23
Dept sample id 7490-007 Location/Matrix 116-D-7 SOLID
Received 08/13/98 Collected 08/10/98 08:05
Custody/SAF No B98-022-17 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.049	0.033	0.041	0.050	J	PU
Plutonium 239/240	15117-48-3	1.8	0.22	0.040	0.050		PU
Americium 241	14596-10-2	0.43	0.11	0.055	0.050		AM
Total Strontium	SR-89/90	2.0	0.19	0.17	1.0		SR
Nickel 63	13981-37-8	1300	26	7.5	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		0.96		U	GAM
Cobalt 60	10198-40-0	40	0.18	0.11	0.050		GAM
Cesium 134	13967-70-9	0.16	0.13	0.19		U	GAM
Cesium 137	10045-97-3	45	0.16	0.14	0.050		GAM
Europium 152	14683-23-9	370	0.70	0.54	0.10		GAM
Europium 154	15585-10-1	53	0.47	0.39	0.10		GAM
Europium 155	14391-16-3	2.0	0.32	0.49	0.10		GAM
Radium 226	13982-63-3	0.70	0.16	0.24	0.10		GAM
Thorium 228	14274-82-9	0.59	0.13	0.20			GAM
Americium 241	14596-10-2	U		0.44		U	GAM
Uranium 238	U-238	U		21		U	GAM

100 D Areas - Full Protocol

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-08

DATA SHEET

B0PK24

SDG	7490	Client/Case no	Hanford SDG H0195
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808057-08	Client sample id	B0PK24
Dept sample id	7490-008	Location/Matrix	116-D-7 SOLID
Received	08/13/98	Collected	08/10/98 09:10
		Custody/SAF No	B98-022-17 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.007	0.009	0.018	0.050	U	PU
Plutonium 239/240	15117-48-3	0.36	0.062	0.023	0.050		PU
Americium 241	14596-10-2	0.084	0.031	0.019	0.050		AM
Total Strontium	SR-89/90	2.1	0.22	0.20	1.0		SR
Nickel 63	13981-37-8	110	6.6	4.6	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	11	0.59	0.38			GAM
Cobalt 60	10198-40-0	4.8	0.11	0.068	0.050		GAM
Cesium 137	10045-97-3	16	0.20	0.16	0.050		GAM
Europium 152	14683-23-9	61	0.46	0.37	0.10		GAM
Europium 154	15585-10-1	7.6	0.34	0.29	0.10		GAM
Europium 155	14391-16-3	1.7	0.62	0.55	0.10		GAM
Radium 226	13982-63-3	0.51	0.17	0.21	0.10		GAM
Radium 228	15262-20-1	0.63	0.36	0.48	0.20		GAM
Thorium 232	7440-29-1	0.63	0.36	0.48			GAM
Americium 241	14596-10-2	U		0.15		U	GAM
Uranium 238	U-238	U		19		U	GAM

100 D Areas - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-09

DATA SHEET

B0PK25

SDG 7490 Client/Case no Hanford SDG H0195
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N808057-09 Client sample id B0PK25
Dept sample id 7490-009 Location/Matrix 116-D-7 SOLID
Received 08/13/98 Collected 08/10/98 08:30
Custody/SAF No B98-022-18 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.015	0.013	0.017	0.050	U	PU
Plutonium 239/240	15117-48-3	0.54	0.080	0.024	0.050		PU
Americium 241	14596-10-2	0.24	0.052	0.021	0.050		AM
Total Strontium	SR-89/90	0.73	0.17	0.21	1.0	J	SR
Nickel 63	13981-37-8	380	15	8.3	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	15	0.72	0.58			GAM
Cobalt 60	10198-40-0	16	0.18	0.11	0.050		GAM
Cesium 137	10045-97-3	21	0.21	0.20	0.050		GAM
Europium 152	14683-23-9	140	0.60	0.51	0.10		GAM
Europium 154	15585-10-1	18	0.44	0.40	0.10		GAM
Europium 155	14391-16-3	0.53	0.28	0.44	0.10		GAM
Radium 226	13982-63-3	0.56	0.17	0.25	0.10		GAM
Radium 228	15262-20-1	0.54	0.42	0.62	0.20	U	GAM
Thorium 228	14274-82-9	0.57	0.12	0.18			GAM
Thorium 232	7440-29-1	0.54	0.42	0.62		U	GAM
Americium 241	14596-10-2	U		0.49		U	GAM
Uranium 238	U-238	U		22		U	GAM

100 D Areas - Full Protocol

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-10

B0PK26

DATA SHEET

SDG 7490 Client/Case no Hanford SDG H0195
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N808057-10 Client sample id B0PK26
Dept sample id 7490-010 Location/Matrix 116-D-7 SOLID
Received 08/13/98 Collected 08/10/98 06:40
Custody/SAF No B98-022-18 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.003	0.006	0.024	0.050	U	PU
Plutonium 239/240	15117-48-3	0.096	0.039	0.024	0.050		PU
Americium 241	14596-10-2	0.029	0.023	0.022	0.050	J	AM
Total Strontium	SR-89/90	0.96	0.20	0.20	1.0	J	SR
Nickel 63	13981-37-8	140	9.1	7.0	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	8.7	0.28	0.15			GAM
Cobalt 60	10198-40-0	1.5	0.037	0.022	0.050		GAM
Cesium 137	10045-97-3	15	0.080	0.035	0.050		GAM
Europium 152	14683-23-9	4.7	0.081	0.083	0.10		GAM
Europium 154	15585-10-1	0.59	0.074	0.074	0.10		GAM
Europium 155	14391-16-3	U		0.089	0.10	U	GAM
Radium 226	13982-63-3	0.49	0.045	0.054	0.10		GAM
Radium 228	15262-20-1	0.55	0.10	0.12	0.20		GAM
Thorium 228	14274-82-9	0.48	0.028	0.040			GAM
Thorium 232	7440-29-1	0.55	0.10	0.12			GAM
Americium 241	14596-10-2	U		0.093		U	GAM
Uranium 238	U-238	U		3.2		U	GAM

100 D Areas - Full Protocol

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

N808057-11

DATA SHEET

B0PK27

SDG	7490	Client/Case no	Hanford SDG H0195
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808057-11	Client sample id	B0PK27
Dept sample id	7490-011	Location/Matrix	116-D-7 SOLID
Received	08/13/98	Collected	08/10/98 06:40
		Custody/SAF No	B98-022-18 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0	0.008	0.031	0.050	U	PU
Plutonium 239/240	15117-48-3	0.092	0.041	0.031	0.050		PU
Americium 241	14596-10-2	0.007	0.057	0.11	0.050	U	AM
Total Strontium	SR-89/90	1.1	0.19	0.19	1.0		SR
Nickel 63	13981-37-8	73	5.3	4.3	20		NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	9.4	0.40	0.21			GAM
Cobalt 60	10198-40-0	1.8	0.057	0.031	0.050		GAM
Cesium 137	10045-97-3	15	0.12	0.062	0.050		GAM
Europium 152	14683-23-9	6.1	0.15	0.15	0.10		GAM
Europium 154	15585-10-1	0.90	0.12	0.11	0.10		GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.48	0.076	0.087	0.10		GAM
Radium 228	15262-20-1	0.54	0.16	0.19	0.20		GAM
Thorium 228	14274-82-9	0.61	0.067	0.078			GAM
Thorium 232	7440-29-1	0.54	0.16	0.19			GAM
Americium 241	14596-10-2	U		0.064		U	GAM
Uranium 238	U-238	U		6.3		U	GAM

100 D Areas - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test AM	Matrix SOLID
SDG 7490	
Contact N. Joseph Verville	

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0195	

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 2785-112	2σ prep error 5.0 %			Reference Lab			Notebook #2785 pg. 112									
B0PK17	N808057-01			0.038	1.00			50		570			17	08/27/98	08/27	SS-043
B0PK18	N808057-02			0.032	1.00			48		570			17	08/27/98	08/27	SS-044
B0PK19	N808057-03			0.097	1.00			19		570			17	08/27/98	08/27	SS-045
B0PK20	N808057-04			0.013	1.00			53		1444			23	09/01/98	09/02	SS-001
B0PK21	N808057-05			0.11	1.00			17		569			17	08/27/98	08/27	SS-048
B0PK22	N808057-06			0.028	1.00			79		569			17	08/27/98	08/27	SS-049
B0PK23	N808057-07			0.055	1.00			35		569			17	08/27/98	08/27	SS-050
B0PK24	N808057-08			0.019	1.00			33		1444			23	09/01/98	09/02	SS-002
B0PK25	N808057-09			0.021	1.00			30		1444			23	09/01/98	09/02	SS-003
B0PK26	N808057-10			0.022	1.00			28		1444			23	09/01/98	09/02	SS-004
B0PK27	N808057-11			0.11	1.00			17		963			22	09/01/98	09/01	SS-009
BLK (QC ID=28896)	N808057-13			0.016	1.00			81		1100				08/27/98	08/27	SS-036
LCS (QC ID=28895)	N808057-12			0.010	1.00			92		963				09/01/98	09/01	SS-010
Duplicate (N808057-01) (QC ID=28897)	N808057-14			0.029	1.00			80		640			23	09/01/98	09/02	SS-009
Nominal values and limits from method				0.050	1.00			20-105		700	100		180			

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

AVERAGES ± 2 SD				
FOR 14 SAMPLES	MDA	0.043	±	0.072
	YIELD	47	±	52

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test	AM
Matrix	SOLID
SDG	7490
Contact	N. Joseph Verville

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG H0195

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 2785-112					
B0PK17	N808057-01			7490-001	0.19
B0PK18	N808057-02			7490-002	0.13
B0PK19	N808057-03			7490-003	0.051 U
B0PK20	N808057-04			7490-004	0.025 J
B0PK21	N808057-05			7490-005	0.23
B0PK22	N808057-06			7490-006	U
B0PK23	N808057-07			7490-007	0.43
B0PK24	N808057-08			7490-008	0.084
B0PK25	N808057-09			7490-009	0.24
B0PK26	N808057-10			7490-010	0.029 J
B0PK27	N808057-11			7490-011	U
BLK (QC ID=28896)	N808057-13			7490-013	U
LCS (QC ID=28895)	N808057-12			7490-012	ok
Duplicate (N808057-01)	N808057-14			7490-014	ok

Nominal values and limits from method RDLs (pCi/g) 0.050

100 D Areas - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test PU Matrix SOLID
SDG 7490
Contact N. Joseph Verville

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 2785-112						
B0PK17	N808057-01			7490-001	U	0.46
B0PK18	N808057-02			7490-002	U	0.39
B0PK19	N808057-03			7490-003	U	0.27
B0PK20	N808057-04			7490-004	U	0.11
B0PK21	N808057-05			7490-005	0.031 J	0.65
B0PK22	N808057-06			7490-006	U	U
B0PK23	N808057-07			7490-007	0.049 J	1.8
B0PK24	N808057-08			7490-008	U	0.36
B0PK25	N808057-09			7490-009	U	0.54
B0PK26	N808057-10			7490-010	U	0.096
B0PK27	N808057-11			7490-011	U	0.092
BLK (QC ID=28896)	N808057-13			7490-013	0.074 U	U
LCS (QC ID=28895)	N808057-12			7490-012	ok	ok
Duplicate (N808057-01)	N808057-14			7490-014	- U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.050
100 D Areas - Full Protocol						

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test PU Matrix SOLID
SDG 7490
Contact N. Joseph Verville

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-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 2785-112			2σ prep error 5.0 %		Reference Lab		Notebook #2785 pg. 112									
B0PK17	N808057-01			0.039	1.00			33		730			15	08/24/98	08/25	SS-001
B0PK18	N808057-02			0.025	1.00			50		730			15	08/24/98	08/25	SS-002
B0PK19	N808057-03			0.042	1.00			30		730			15	08/24/98	08/25	SS-003
B0PK20	N808057-04			0.039	1.00			31		730			15	08/24/98	08/25	SS-004
B0PK21	N808057-05			0.023	1.00			66		1047			15	08/24/98	08/25	SS-009
B0PK22	N808057-06			0.012	1.00			72		1047			15	08/24/98	08/25	SS-010
B0PK23	N808057-07			0.041	1.00			35		1047			15	08/24/98	08/25	SS-011
B0PK24	N808057-08			0.023	1.00			47		1047			15	08/24/98	08/25	SS-012
B0PK25	N808057-09			0.024	1.00			51		1047			15	08/24/98	08/25	SS-013
B0PK26	N808057-10			0.024	1.00			61		643			16	08/24/98	08/26	SS-001
B0PK27	N808057-11			0.031	1.00			47		643			16	08/24/98	08/26	SS-002
BLK (QC ID=28896)	N808057-13			0.28	0.100			42		763				08/24/98	08/25	SS-055
LCS (QC ID=28895)	N808057-12			0.34	0.100			32		1047				08/24/98	08/25	SS-016
Duplicate (N808057-01) (QC ID=28897)	N808057-14			0.036	1.00			41		763			15	08/24/98	08/25	SS-058
Nominal values and limits from method				0.050	0.100			20-105		10	100		180			

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

AVERAGES ± 2 SD FOR 14 SAMPLES
MDA 0.070 ± 0.21
YIELD 46 ± 27

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test SR	Matrix SOLID
SDG 7490	
Contact N. Joseph Verville	

METHOD SUMMARY

STRONTIUM, TOTAL IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0195	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 2785-112						
B0PK17	N808057-01			7490-001	1.2	
B0PK18	N808057-02			7490-002	1.0	
B0PK19	N808057-03			7490-003	0.84	J
B0PK20	N808057-04			7490-004	0.63	J
B0PK21	N808057-05			7490-005	1.8	
B0PK22	N808057-06			7490-006	U	
B0PK23	N808057-07			7490-007	2.0	
B0PK24	N808057-08			7490-008	2.1	
B0PK25	N808057-09			7490-009	0.73	J
B0PK26	N808057-10			7490-010	0.96	J
B0PK27	N808057-11			7490-011	1.1	
BLK (QC ID=28896)	N808057-13			7490-013	U	
LCS (QC ID=28895)	N808057-12			7490-012	ok	
Duplicate (N808057-01)	N808057-14			7490-014	ok	

Nominal values and limits from method RDLs (pCi/g) 1.0

100 D Areas - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test SR	Matrix SOLID
SDG 7490	
Contact N. Joseph Verville	

METHOD SUMMARY

STRONTIUM, TOTAL IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0195	

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 2785-112	2σ prep error 10.0 %			Reference Lab			Notebook #2785 pg. 112									
B0PK17	N808057-01			0.20	1.00			85		200			15	08/25/98	08/25	GRB-202
B0PK18	N808057-02			0.17	1.00			93		400			15	08/25/98	08/25	GRB-202
B0PK19	N808057-03			0.17	1.00			92		400			15	08/25/98	08/25	GRB-203
B0PK20	N808057-04			0.19	1.00			88		400			15	08/25/98	08/25	GRB-204
B0PK21	N808057-05			0.16	1.00			97		400			15	08/25/98	08/25	GRB-205
B0PK22	N808057-06			0.20	1.00			81		400			15	08/25/98	08/25	GRB-206
B0PK23	N808057-07			0.17	1.00			95		400			15	08/25/98	08/25	GRB-207
B0PK24	N808057-08			0.20	1.00			86		400			15	08/25/98	08/25	GRB-208
B0PK25	N808057-09			0.21	1.00			90		200			15	08/25/98	08/25	GRB-218
B0PK26	N808057-10			0.20	1.00			87		400			15	08/25/98	08/25	GRB-218
B0PK27	N808057-11			0.19	1.00			93		400			15	08/25/98	08/25	GRB-219
BLK (QC ID=28896)	N808057-13			1.8	0.100			86		400				08/25/98	08/25	GRB-217
LCS (QC ID=28895)	N808057-12			2.0	0.100			82		400				08/25/98	08/25	GRB-220
Duplicate (N808057-01) (QC ID=28897)	N808057-14			0.17	1.00			94		200			15	08/25/98	08/25	GRB-228
Nominal values and limits from method				1.0	0.100			20-105		150			180			

PROCEDURES	REFERENCE	SR8990
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-500	Strontium-89,90 - Purification, rev 0

AVERAGES ± 2 SD	MDA	0.43	±	1.2
FOR 14 SAMPLES	YIELD	89	±	10

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test GAM Matrix SOLID
SDG 7490
Contact N. Joseph Verville

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 2785-112						
B0PK17	N808057-01			7490-001	19	41
B0PK18	N808057-02			7490-002	6.8	9.2
B0PK19	N808057-03			7490-003	4.3	29
B0PK20	N808057-04			7490-004	1.8	18
B0PK21	N808057-05			7490-005	4.9	16
B0PK22	N808057-06			7490-006	U	U
B0PK23	N808057-07			7490-007	40	45
B0PK24	N808057-08			7490-008	4.8	16
B0PK25	N808057-09			7490-009	16	21
B0PK26	N808057-10			7490-010	1.5	15
B0PK27	N808057-11			7490-011	1.8	15
BLK (QC ID=28896)	N808057-13			7490-013	U	U
LCS (QC ID=28895)	N808057-12			7490-012	ok	ok
Duplicate (N808057-01)	N808057-14			7490-014	ok	ok
Nominal values and limits from method 100 D Areas - Full Protocol				RDLs (pCi/g)	0.050	0.050

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test GAM Matrix SOLID
SDG 7490
Contact N. Joseph Verville

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

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 2785-112	2σ prep error 15.0 %			Reference Lab	Notebook #2785 pg. 112											
B0PK17	N808057-01			0.79	838					411			14	08/24/98	08/24	02,03,00
B0PK18	N808057-02			0.25	844					418			14	08/24/98	08/24	02,04,00
B0PK19	N808057-03			0.47	868					416			14	08/24/98	08/24	02,01,00
B0PK20	N808057-04			0.071	880					1013			14	08/24/98	08/24	02,03,00
B0PK21	N808057-05			0.56	850					437			15	08/24/98	08/25	02,01,00
B0PK22	N808057-06			0.038	850					441			15	08/24/98	08/25	02,03,00
B0PK23	N808057-07			0.66	854					414			15	08/24/98	08/25	02,04,00
B0PK24	N808057-08			0.55	824					354			15	08/24/98	08/25	02,01,00
B0PK25	N808057-09			0.58	892					419			16	08/24/98	08/26	02,03,00
B0PK26	N808057-10			0.087	868					355			15	08/24/98	08/25	02,04,00
B0PK27	N808057-11			0.17	853					490			15	08/24/98	08/25	02,01,00
BLK (QC ID=28896)	N808057-13			0.007	750					491				08/24/98	08/25	01,04,00
LCS (QC ID=28895)	N808057-12			0.016	750					491				08/24/98	08/25	01,03,00
Duplicate (N808057-01) (QC ID=28897)	N808057-14			0.52	832					411			16	08/24/98	08/26	02,04,00
Nominal values and limits from method				0.050	750					100			180			

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

AVERAGES ± 2 SD FOR 14 SAMPLES
MDA 0.34 ± 0.55
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test	NI L
Matrix	SOLID
SDG	7490
Contact	N. Joseph Verville

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG H0195

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63
Preparation batch 2785-112					
B0PK17	N808057-01			7490-001	480
B0PK18	N808057-02			7490-002	170
B0PK19	N808057-03			7490-003	160
B0PK20	N808057-04			7490-004	140
B0PK21	N808057-05			7490-005	180
B0PK22	N808057-06			7490-006	U
B0PK23	N808057-07			7490-007	1300
B0PK24	N808057-08			7490-008	110
B0PK25	N808057-09			7490-009	380
B0PK26	N808057-10			7490-010	140
B0PK27	N808057-11			7490-011	73
BLK (QC ID=28896)	N808057-13			7490-013	U
LCS (QC ID=28895)	N808057-12			7490-012	ok
Duplicate (N808057-01)	N808057-14			7490-014	ok

Nominal values and limits from method RDLs (pCi/g) 20

100 D Areas - Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

Test NI L Matrix SOLID
SDG 7490
Contact N. Joseph Verville

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

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 2785-112	2σ prep error 10.0 %			Reference Lab	Notebook #2785 pg. 112											
B0PK17	N808057-01			10	0.500					25			17	08/27/98	08/27	LSC-004
B0PK18	N808057-02			7.5	0.500					25			17	08/27/98	08/27	LSC-004
B0PK19	N808057-03			6.3	0.500					25			18	08/27/98	08/28	LSC-004
B0PK20	N808057-04			11	0.500					25			18	08/27/98	08/28	LSC-004
B0PK21	N808057-05			9.1	0.500					25			18	08/27/98	08/28	LSC-004
B0PK22	N808057-06			4.7	0.500					25			18	08/27/98	08/28	LSC-004
B0PK23	N808057-07			7.5	0.500					25			18	08/27/98	08/28	LSC-004
B0PK24	N808057-08			4.6	0.500					25			18	08/27/98	08/28	LSC-004
B0PK25	N808057-09			8.3	0.500					25			18	08/27/98	08/28	LSC-004
B0PK26	N808057-10			7.0	0.500					25			18	08/27/98	08/28	LSC-004
B0PK27	N808057-11			4.3	0.500					25			18	08/27/98	08/28	LSC-004
BLK (QC ID=28896)	N808057-13			4.6	0.500					25				08/27/98	08/28	LSC-004
LCS (QC ID=28895)	N808057-12			4.4	0.500					25				08/27/98	08/28	LSC-004
Duplicate (N808057-01) (QC ID=28897)	N808057-14			6.8	0.500					25			18	08/27/98	08/28	LSC-004
Nominal values and limits from method				20	0.500					10			180			

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

AVERAGES ± 2 SD FOR 14 SAMPLES
MDA 6.9 ± 4.4
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0195

SDG 7490
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

SDG 7490
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

SDG 7490
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0195

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/04/98

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-022-18	Page 1 of 1

Collector ID Jacques/Rick Kerkow MT Stankovich	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KOERNER, CC	Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 116-D-7		SAF No. B98-022	
Ice Chest No.	Field Logbook No. EL-1339-3		Method of Shipment Hand Delivered - Gov. Vehicle	
Shipped To RJN ~~TMA/RECRA~~ 8/12/98 Thermo Nutech Richmond Laboratory	Offsite Property No. A9806036		Bill of Lading/Air Bill No.	
Waste Designation Client determined no waste codes associated with this project.			COA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; Isotopic Uranium	Nickel-63	Strontium-89,90 -- Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions.		
Sample No. / Matrix * / Sample Date / Sample Time										
✓ B0PK25 / Soil / 8-10-98 / 0830	X	X	X	X				X	3981	A1
✓ B0PK26 / Soil / 8-10-98 / 0640	X	X	X	X				X	3978	C7
✓ B0PK27 / Soil / 8-10-98 / 0640	X	X	X	X				X	3978	C7

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: S. Stankovich	Date/Time: 1515 8-10-98	Received By: Renee Nielsen R. Nielsen	Date/Time: 1515 8/10/98
Relinquished By: Renee Nielsen R Nielsen	Date/Time: 1130 8/10/98	Received By: Fed Ex	Date/Time:
Relinquished By:	Date/Time:	Received By: C-SRV/BALANCE	Date/Time: 8/13/98 / 1030
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS
COA - R116D7 2F00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

S	=	Soil
SE	=	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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-022-16	Page 1 of 1

Collector ID Jacques/Rick Kerkow / MTS Stankovich	**Company Contact** Mike Stankovich	**Telephone No.** 531-7620	**Project Coordinator** KOERNER, CC	**Data Turnaround** 15 Days
Project Designation 100 D Areas - Full Protocol	**Sampling Location** 116-D-7		**SAF No.** B98-022	
Ice Chest No.	**Field Logbook No.** EL-1339-3		**Method of Shipment** Hand Delivered - Gov. Vehicle	
Shipped To RN ~~TMA/RECRA~~ 8/12/98 Thermo Nutech Richmond Laboratory	**Offsite Property No.** A98 0176		**Bill of Lading/Air Bill No.**	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None	
Type of Container	aG	aG	aG	aG	aG	aG	aG	P	
No. of Container(s)	1	1	1	1	1	1	1	2	
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL	
SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; ~~Isotopic Uranium~~	Nickel-63	Strontium-89,90 – Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions.	

Sample No.	Matrix *	Sample Date	Sample Time										
✓ B0PK17	Soil	8-10-98	745	X	X	X	X				X	3980	B4
✓ B0PK18	Soil	8-10-98	0730	X	X	X	X				X	3983	C9
✓ B0PK19	Soil	8-10-98	0900	X	X	X	X				X	3975	A2
✓ B0PK20	Soil	8-10-98	0710	X	X	X	X				X	3979	C8

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
MTS Stankovich	1515 8-10-98	Renee Nielson R. Nielson	1515 8/10/98
Renee Nielson R. Nielson	1130 8/12/98	Fed-Ex	
		C. SANGARAMAN	8/13/98 1031

SPECIAL INSTRUCTIONS

COA - R116D7 2F00

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-238}

Matrix *

S	=	Soil
SE	=	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

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-022-17	Page 1 of 1

Collector ID Jacques/Rick Kerkow / MT Stankovich	**Company Contact** Mike Stankovich	**Telephone No.** 531-7620	**Project Coordinator** KOERNER, CC	**Data Turnaround** 15 Days
Project Designation 100 D Areas - Full Protocol	**Sampling Location** 116-D-7		**SAF No.** B98-022	
Ice Chest No.	**Field Logbook No.** EL-1339-3		**Method of Shipment** Hand Delivered - Gov. Vehicle	
Shipped To RJN Thermo NuTech ~~TMA/RECRA~~ 8/12/98 Richmond Laboratory	**Offsite Property No.** A-18-C-131		**Bill of Lading/Air Bill No.**	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; [redacted]	Nickel-63	Strontium-89,90 -- Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions		

Sample No.	Matrix *	Sample Date	Sample Time										
✓ B0PK21	Soil	8-10-98	0930	X	X	X	X				X	3982	B6
B0PK22	Soil	8-10-98	0615	X	X	X	X				X	NA	E
✓ B0PK23	Soil	8-10-98	0805	X	X	X	X				X	3976	B5
✓ B0PK24	Soil	8-10-98	0910	✓	✓	✓	✓				✓	3977	A3

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Stankovich	Date/Time 1515 8-10-98	Received By Renee Nielson R. Nielson	Date/Time 1515 8/10/98
Relinquished By Renee Nielson R. Nielson	Date/Time 1130 8/12/98	Received By Fed Ex	Date/Time
Relinquished By	Date/Time	Received By K-SANG AL ANG	Date/Time 8/13/98/1030
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

COA - R116D7 2F00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

S	=	Soil
SE	=	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

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 8/13/98/ 1030 S.G.#: _____

Work Order Number: N8-08-056-057 SAF #: _____

Shipping Container ID: ERC-96-052 Chain of Custody # B98-022-17, B98-022-18

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature _____
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 7 (14 poly bottles, 2 glass jar, 7 vials)
7. Sample holding times exceeded? Yes [ ] No [ ]

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

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

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

Sample Custodian/Laboratory: [signature] / TNU Date: 8/13/98

Telephoned To: _____ On _____ By _____

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 8/13/98/1030 S.G.#: _____

Work Order Number: J8-056 & 057 SAF #: _____

Shipping Container ID: ERC-96-064 Chain of Custody # B98-022-16

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature _____
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 4 (8 plastic bottles, ~~12 Glass Jars~~, 4 Vials)
7. Sample holding times exceeded? Yes [ ] No [ ]

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

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

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

Sample Custodian/Laboratory [signature] /TNU Date: 8/13/98

Telephoned To: _____ On _____ By _____

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
BHI - Hanford		A980036 / MTF-A-24

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ERC Engineering Support	Field & Analytical Support	Field Sampling

The following items are to be shipped from: [X] Contractor [ ] Vendor

Routing: Federal Express [ ] Contractor [ ] Vendor

Shipped to: Thermo NUtech Richmond Laboratory
2030 Wright Ave
Richmond, CA 94804-0040
(510) 235-2633
Attn: Larry Johnson

Off-site Custodian:

Full Title:

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1	Sample #: BOPK21, BOPK22, BOPK23, BOPK24, BOPK25, BOPK26, BOPK27 Cooler ID: ERC-96-052 Gross Weight: 75 lbs Polycooler with environmental samples packed with vermiculite	N/A
1	Sample #: BOPK17, BOPK18, BOPK19, BOPK20 Cooler ID: ERC-96-064 Gross Weight: 50 lbs Polycooler with environmental samples packed with packing peanuts	N/A

[ ] Classified [X] Unclassified [ ] Shipped Under DOE Contract [ ] Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

Project work at 100D Area, site 116-D-7.

Cooler ERC-96-052 (75 lbs) Bill of Lading # 4235 7951 5808

Cooler ERC-96-064 (50 lbs) Bill of Lading # 4235 7951 5819

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No	Date
N/A		

Location of Property (Area & Bldg.)	Contact	Phone
300 Area/3728 Bldg.	Renee Nielson	(509) 376-8054

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
8/12/98	R116D72600	

Originated By	Date	Authorized By	Date
Renee Nielson	8/12/98		8/8

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Yellow – Retain Green – Property Control Custodian (Issuing Office) Pink – Originator

54-3000-479 (09/89)

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

OCT 1998
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B98-022
RFW# : 9808L335
SDG/SAF# : H0195/B98-022

W.O.# : 10985-001-001-9999-00
Date Received: 08-14-98

METALS CASE NARRATIVE

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

2. Samples were prepared and analyzed in accordance with methods checked on the attached glossary. The sample matrix created difficulties in maintaining calibration criteria. Please refer to statement 5.

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 control limits except the ending CCV for both analytes. Both CCVs went out high with recoveries above 130% (CR at 138.8% and PB at 148.9%). These samples were run over a two day period in three separate files. In each case, the CCV recoveries trended upward as the samples were analyzed. The instrument was calibrated for an HSL list and while most analytes were detected, none were extremely high. In all files, the CCV recovery was in the range of 130% to 170% for every analyte. Other files were completed between these runs and the instrument maintained its calibration throughout the file. It appears that the sample matrix caused the high CCV recoveries. A comparision of the sample results between the files gives similar numbers.

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

7. All preparation/method blanks were within method criteria. Refer to the Inorganics Method Blank Data Summary.

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

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

10. The matrix spike (MS) recoveries for 2 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

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

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
BOPK17	Chromium	1200	109.1

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

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

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-1-95
Date

mld/m08-335

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within thi
Recra Lot#: 98081335

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

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

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__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:**_____

L-WI-033/M-03/98

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.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0PK17	Chromium, Total	226	MG/KG	0.08	1.0
		Mercury, Total	0.38	MG/KG	0.01	1.0
		Lead, Total	8.0	MG/KG	0.19	1.0
-002	B0PK18	Chromium, Total	90.9	MG/KG	0.08	1.0
		Mercury, Total	0.19	MG/KG	0.01	1.0
		Lead, Total	6.2	MG/KG	0.19	1.0
-003	B0PK19	Chromium, Total	153	MG/KG	0.07	1.0
		Mercury, Total	0.23	MG/KG	0.02	1.0
		Lead, Total	10.3	MG/KG	0.17	1.0
-004	B0PK20	Chromium, Total	152	MG/KG	0.08	1.0
		Mercury, Total	0.24	MG/KG	0.02	1.0
		Lead, Total	4.9	MG/KG	0.18	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/11/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	98L1143-MB1	Chromium, Total	0.21	MG/KG	0.08	1.0
		Lead, Total	0.19 u	MG/KG	0.19	1.0
BLANK1	98C0420-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022

RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0PK17	Chromium, Total	283	226	19.5	294.9*	1.0
		Mercury, Total	0.85	0.38	0.17	279.6	1.0
		Lead, Total	64.8	8.0	48.7	116.6	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0PK17	Chromium, Total	226	258	13.6	1.0
		Mercury, Total	0.38	0.73	62.7	1.0
		Lead, Total	8.0	7.8	2.5	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	98L1143-LC1	Chromium, LCS	48.6	50.0	MG/KG	97.2
		Lead, LCS	242	250	MG/KG	96.8
LCS1	98C0420-LC1	Mercury, LCS	1.0	1.2	MG/KG	88.6

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-022

DATE RECEIVED: 08/14/98 RFW LOT # :9808L335

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0PK17						
CHROMIUM, TOTAL	001	S	98L1143	08/10/98	08/20/98	08/27/98
CHROMIUM, TOTAL	001 REP	S	98L1143	08/10/98	08/20/98	08/27/98
CHROMIUM, TOTAL	001 MS	S	98L1143	08/10/98	08/20/98	08/27/98
MERCURY, TOTAL	001	S	98C0420	08/10/98	08/26/98	08/27/98
MERCURY, TOTAL	001 REP	S	98C0420	08/10/98	08/26/98	08/27/98
MERCURY, TOTAL	001 MS	S	98C0420	08/10/98	08/26/98	08/27/98
LEAD, TOTAL	001	S	98L1143	08/10/98	08/20/98	08/27/98
LEAD, TOTAL	001 REP	S	98L1143	08/10/98	08/20/98	08/27/98
LEAD, TOTAL	001 MS	S	98L1143	08/10/98	08/20/98	08/27/98
B0PK18						
CHROMIUM, TOTAL	002	S	98L1143	08/10/98	08/20/98	08/27/98
MERCURY, TOTAL	002	S	98C0420	08/10/98	08/26/98	08/27/98
LEAD, TOTAL	002	S	98L1143	08/10/98	08/20/98	08/27/98
B0PK19						
CHROMIUM, TOTAL	003	S	98L1143	08/10/98	08/20/98	08/27/98
MERCURY, TOTAL	003	S	98C0420	08/10/98	08/26/98	08/27/98
LEAD, TOTAL	003	S	98L1143	08/10/98	08/20/98	08/27/98
B0PK20						
CHROMIUM, TOTAL	004	S	98L1143	08/10/98	08/20/98	08/27/98
MERCURY, TOTAL	004	S	98C0420	08/10/98	08/26/98	08/27/98
LEAD, TOTAL	004	S	98L1143	08/10/98	08/20/98	08/27/98

LAB QC:

CHROMIUM LABORATORY	LC1 BS	S	98L1143	N/A	08/20/98	08/26/98
CHROMIUM, TOTAL	MB1	S	98L1143	N/A	08/20/98	08/26/98
MERCURY LABORATORY	LC1 BS	S	98C0420	N/A	08/26/98	08/27/98
MERCURY, TOTAL	MB1	S	98C0420	N/A	08/26/98	08/27/98
LEAD LABORATORY	LC1 BS	S	98L1143	N/A	08/20/98	08/26/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-022

DATE RECEIVED: 08/14/98 RFW LOT # :9808L335

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	MB1	S	98L1143	N/A	08/20/98	08/26/98

RECRA LabNet Use Only
9808L335

Custody Transfer Record/Lab Work Request

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford B98-022
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: MS
QC: SPEC Del: STD TAT: 15 Days
Date Rec'd: 8/14/98 Date Due: 8/29/98
Account #:

Refrigerator #										3		3						
#/Type Container	Liquid																	
	Solid									2g		1g						
Volume	Liquid																	
	Solid								120/250			120						
Preservatives																		
ANALYSES REQUESTED →		ORGANIC								INORG								
		VOA	BNA	Pest/PCB	Herb					Metal	CN							
		RECRA LabNet Use Only																
										*		ICP6						

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	BOPK17			S	8/10/98	0745						✓		✓					
002	18					0820						✓		✓					
003	19					0900						✓		✓					
004	20					0710						✓		✓					

Special Instructions:
* Analyst must pick a sample and run matrix QC *

DATE/REVISIONS:
1 SAF # B98-022
2
3 * Hg, Cr, Pb (Cr + Pb by trace)
4
5
6

RECRA LabNet Use Only

Samples were: 1) Shipped X or Hand Delivered
Airbill # See *
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'd (Y) or N
Cooler Temp: 5.8

Relinquished by	Received by	Date	Time
Fed ex	L. Sandy	8/14/98	3:00

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES
* 4725795158 2n

012

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-022-16	Page 1 of 1

Collector ID Jacques/Rick Kerkow / MT Stankovich	**Company Contact** Mike Stankovich	**Telephone No.** 531-7620	**Project Coordinator** KOERNER, CC	**Data Turnaround** 15 Days
Project Designation 100 D Areas - Full Protocol	**Sampling Location** 116-D-7		**SAF No.** B98-022	
Ice Chest No.	**Field Logbook No.** EL-1339-3		**Method of Shipment** Hand Delivered - Gov. Vehicle	
Shipped To ~~TMA/RECRA~~ Location 1 Bldg 2715	**Offsite Property No.** A98L437		**Bill of Lading/Air Bill No.**	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; [redacted]	Nickel-63	Strontium-89,90 -- Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Superfrace) (Chromium, Lead)	See item (1) in Special Instructions		

Sample No.	Matrix *	Sample Date	Sample Time	[redacted]									
B0PK17	Soil	8-10-98	0740					X	X	X		3980	BY
B0PK18	Soil	8-10-98	0730					✓	✓	✓		3983	CQ
B0PK19	Soil	8-10-98	0900					X	X	✓		3975	AZ
B0PK20	Soil	8-10-98	0710					X	X	X		3974	CB

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

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	8-10-98 1515	Renee Nielson R. Nielson	8/10/98 1515
Renee Nielson R. Nielson	8/12/98 1130	Fed Ex	
Fed Ex		L. Langley	8/14/98 3:00

SPECIAL INSTRUCTIONS

COA - R116D7 2F00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

S	-	Soil
SE	-	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

013

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

OCT 1998
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B98-022
RFW# : 9808L318;335
SDG# : H0195
SAF# : B98-022

W.O. # : 10985-001-001-9999-00
Date Received: 08-13,14-98

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 11 soil samples.

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

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

4. The cooler temperatures were 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. The duplicate LCS 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.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-23-98
Date

njp:i08-318,335

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 21 pages.

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

WET CHEMISTRY
METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	ASTM	SW846	OTHER
%Ash	__ D2216-80		
%Moisture	__ D2216-80		__ ILMO4.0 (e)
%Solids			✓ ILMO4.0 (e)
%Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Corrosivity __by coupon __by pH		__ 1110 (mod)__ 9045	
Cyanide, Total		__ 9010	__ ILMO4.0 (e)
Cyanide, Reactive		__ Sec 7.3	
Density			__ b
Halides, Extractable Organic			__ EPA 600/4/84-008 (mod)
Halides, Total			__ EPA 600/4/84-008 (mod)
EP-Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Carbon, Total Organic (by LOI)			__ c
Oil and 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 (mod)
pH, Soil		__ 9045B	
Sulfide, Reactive		__ Sec 7.3	
Specific Gravity	__ D1429-76C		
Sulfur, Total		__ 9056	
TCLP		__ 1311	
TCLV		__ 1311	
Synthetic Precipitation Leach		__ 1312	
Chlorine, Total		__ 9056	
Paint Filter		__ 9095	

Other: Chromium VI Method: SW3060B/7196A

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., (1989).

b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)

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 08/24/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L318

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0PK21	% Solids	100	%	0.01	1.0
		Chromium VI	0.80 u	MG/KG	0.80	1.0
-002	B0PK22	% Solids	100	%	0.01	1.0
		Chromium VI	0.80 u	MG/KG	0.80	1.0
-003	B0PK23	% Solids	99.9	%	0.01	1.0
		Chromium VI	8.5	MG/KG	0.80	1.0
-004	B0PK24	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.80 u	MG/KG	0.80	1.0
-005	B0PK25	% Solids	100	%	0.01	1.0
		Chromium VI	1.3	MG/KG	0.80	1.0
-006	B0PK26	% Solids	100	%	0.01	1.0
		Chromium VI	1.4	MG/KG	0.80	1.0
-007	B0PK27	% Solids	100	%	0.01	1.0
		Chromium VI	3.0	MG/KG	0.80	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/24/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0PK17	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.80 u	MG/KG	0.80	1.0
-002	B0PK18	% Solids	99.6	%	0.01	1.0
		Chromium VI	3.8	MG/KG	0.80	1.0
-003	B0PK19	% Solids	99.9	%	0.01	1.0
		Chromium VI	2.9	MG/KG	0.80	1.0
-004	B0PK20	% Solids	99.8	%	0.01	1.0
		Chromium VI	18.0	MG/KG	0.80	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/24/98

CLIENT: TNU-HANFORD B98-022

RECRA LOT #: 9808L318

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	98LVI054-MB1	Chromium VI	0.80 u	MG/KG	0.80	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/24/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	98LVI054-MB1	Chromium VI	0.80 u	MG/KG	0.80	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 08/24/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L318

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-007	B0PK27	Chromium VI	44.2	3.0	40.0	102.9	1.0
BLANK10	98LVI054-MB1	Chromium VI	39.0	0.80u	40.0	97.5	1.0
		Chromium VI MSD	40.5	0.80u	40.0	101.3	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 08/24/98

CLIENT: TNU-HANFORD B98-022

RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	B0PK20	Chromium VI	1250	18.0	1030	119.9	20.0
BLANK10	98LVI054-MB1	Chromium VI	39.0	0.80u	40.0	97.5	1.0
		Chromium VI MSD	40.5	0.80u	40.0	101.3	1.0

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 08/24/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L318

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	98LVI054-MB1	Chromium VI	97.5	101.3	3.8

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 08/24/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	98LVI054-MB1	Chromium VI	97.5	101.3	3.8

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 08/24/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L318

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-007REP	B0PK27	Chromium VI	3.0	3.2	5.0	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 08/24/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-004REP	B0PK20	Chromium VI	18.0	18.0	0.00	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-022

DATE RECEIVED: 08/13/98 RFW LOT # :9808L318

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0PK21						
% SOLIDS	001	S	98L%S169	08/10/98	08/17/98	08/18/98
CHROMIUM VI	001	S	98LVI054	08/10/98	08/18/98	08/18/98
B0PK22						
% SOLIDS	002	S	98L%S169	08/10/98	08/17/98	08/18/98
CHROMIUM VI	002	S	98LVI054	08/10/98	08/18/98	08/18/98
B0PK23						
% SOLIDS	003	S	98L%S169	08/10/98	08/17/98	08/18/98
CHROMIUM VI	003	S	98LVI054	08/10/98	08/18/98	08/18/98
B0PK24						
% SOLIDS	004	S	98L%S169	08/10/98	08/17/98	08/18/98
CHROMIUM VI	004	S	98LVI054	08/10/98	08/18/98	08/18/98
B0PK25						
% SOLIDS	005	S	98L%S169	08/10/98	08/17/98	08/18/98
CHROMIUM VI	005	S	98LVI054	08/10/98	08/18/98	08/18/98
B0PK26						
% SOLIDS	006	S	98L%S169	08/10/98	08/17/98	08/18/98
CHROMIUM VI	006	S	98LVI054	08/10/98	08/18/98	08/18/98
B0PK27						
% SOLIDS	007	S	98L%S169	08/10/98	08/17/98	08/18/98
CHROMIUM VI	007	S	98LVI054	08/10/98	08/18/98	08/18/98
CHROMIUM VI	007 REP	S	98LVI054	08/10/98	08/18/98	08/18/98
CHROMIUM VI	007 MS	S	98LVI054	08/10/98	08/18/98	08/18/98

LAB QC:

CHROMIUM VI	MB1	S	98LVI054	N/A	08/18/98	08/18/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-022

DATE RECEIVED: 08/13/98 RFW LOT # :9808L318

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	MB1 BS	S	98LVI054	N/A	08/18/98	08/18/98
CHROMIUM VI	MB1 BSD	S	98LVI054	N/A	08/18/98	08/18/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-022

DATE RECEIVED: 08/14/98 RFW LOT # :9808L335

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0PK17						
% SOLIDS	001	S	98L%S170	08/10/98	08/18/98	08/19/98
CHROMIUM VI	001	S	98LVI054	08/10/98	08/18/98	08/18/98
B0PK18						
% SOLIDS	002	S	98L%S170	08/10/98	08/18/98	08/19/98
CHROMIUM VI	002	S	98LVI054	08/10/98	08/18/98	08/18/98
B0PK19						
% SOLIDS	003	S	98L%S170	08/10/98	08/18/98	08/19/98
CHROMIUM VI	003	S	98LVI054	08/10/98	08/18/98	08/18/98
B0PK20						
% SOLIDS	004	S	98L%S170	08/10/98	08/18/98	08/19/98
CHROMIUM VI	004	S	98LVI054	08/10/98	08/18/98	08/18/98
CHROMIUM VI	004 REP	S	98LVI054	08/10/98	08/18/98	08/18/98
CHROMIUM VI	004 MS	S	98LVI054	08/10/98	08/18/98	08/18/98

LAB QC:

CHROMIUM VI	MB1	S	98LVI054	N/A	08/18/98	08/18/98
CHROMIUM VI	MB1 BS	S	98LVI054	N/A	08/18/98	08/18/98
CHROMIUM VI	MB1 BSD	S	98LVI054	N/A	08/18/98	08/18/98

RECRA LabNet Use Only

9808L318

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU Hanford B98-022

Est. Final Proj. Sampling Date

Project #: 10985-001-021-9999-02

Project Contact/Phone #

RECRA Project Manager: MS

QC: SPEC Del: STD TAT: 15 day

Date Rec'd: 8/13/98 Date Due: 8/28/98

Account #

Refrigerator #																
#/Type Container	Liquid									3		3				
	Solid									1g		2g				
Volume	Liquid															
	Solid									250		120				
Preservatives																
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		RECRA LabNet Use Only														
									*		ICR6					

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	BØPK21			S	8/10/98	0930							✓		✓					
2	2					0815							✓		✓					
3	3					0805							✓		✓					
4	4					0910							✓		✓					
5	5					0830							✓		✓					
6	6					0640							✓		✓					
7	7					0640							✓		✓					

Special Instructions:

SAF# - B98-022

DATE/REVISIONS:

1. * Hg, CR, Pb,
2. (CR+Pb by trace ICP)
3.
4. → Analysts must pick a
5. sample and run matrix
6. QC

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered

Airbill # *

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 Receipt Y or N

Cooler Temp 3.4 C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Dedep	Jodu	8/13/98	0930				

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES

*A235715158216

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-022-17	Page 1 of 1

Collector ID Jacques/Rick Kerkow	**Company Contact** Mike Stankovich	**Telephone No.** 531-7620	**Project Coordinator** KOERNER, CC	**Date Turnaround** 15 Days
Project Designation 100 D Areas - Full Protocol	**Sampling Location** 116-D-7		**SAF No.** B98-022	
Ice Chest No.	**Field Logbook No.** EL-1339-3		**Method of Shipment** Hand Delivered - Gov. Vehicle	
Shipped To TMA/RECRA	**Offsite Property No.**		**Bill of Lading/Air Bill No.**	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

3/18

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium, Isotopic Uranium	Nickel-63	Strontium-89,90 -- Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions		

Sample No.	Matrix *	Sample Date	Sample Time										
B0PK21	Soil	8-10-98	0930					X	X	X		3982	156
B0PK22	Soil	8-10-98	0615					X	X	X		NA	15
B0PK23	Soil	8-10-98	0805					X	X	X		3976	135
B0PK24	Soil	8-10-98	0910					X	X	X		3977	43

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	8-10-98 1515	Renee Nielson R. Nielson	8/10/98 1515
Renee Nielson R. Nielson	8/12/98 1130	Fed Ex	
Fedex		Jeder	8/18/98 0930

SPECIAL INSTRUCTIONS

COA - R116D7 2F00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

4235 7951 5820

Matrix *

S	-	Soil
SE	-	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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-022-18	Page 1 of 1

Collector ID Jacques/Rick Kerkow MT Stankovich	**Company Contact** Mike Stankovich	**Telephone No.** 531-7620	**Project Coordinator** KOERNER, CC	**Data Turnaround** 15 Days
Project Designation 100 D Areas - Full Protocol	**Sampling Location** 116-D-7		**SAF No.** B98-022	
Ice Chest No.	**Field Logbook No.** EL-1339-3		**Method of Shipment** Hand Delivered - Gov. Vehicle	
Shipped To TMA/RECRA	**Offsite Property No.**		**Bill of Lading/Air Bill No.**	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; [redacted]	Nickel-63	Strontium-89,90 -- Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions		
Sample No. / **Matrix *** / **Sample Date** / **Sample Time**	[redacted]									
B0PK25 / Soil / 8-10-98 / 0830					X	X	X		3981	A1
B0PK26 / Soil / 8-10-98 / 0640					X	X	X		3978	C7
B0PK27 / Soil / 8-10-98 / 0640					X	X	X		3978	C7

CHAIN OF POSSESSION	**Sign/Print Names**		
Relinquished By MT Stankovich	**Date/Time** 8-10-98 1515	**Received By** Renee Nelson R. Nelson	**Date/Time** 8/10/98 1515
Relinquished By Renee Nelson R. Nelson	**Date/Time** 8/12/98 1130	**Received By** Fed Ex	**Date/Time**
Relinquished By Fedex	**Date/Time**	**Received By** Fedex	**Date/Time** 8/13/98 0930
Relinquished By	**Date/Time**	**Received By**	**Date/Time**

SPECIAL INSTRUCTIONS
COA - R116D7 2F00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

S	=	Soil
SE	=	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

RECRA LabNet Use Only
9808L335

Custody Transfer Record/Lab Work Request

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford B98-022
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: MS
QC: SPEC Del: STD TAT: 15 Days
Date Rec'd: 8/14/98 Date Due: 8/29/98
Account #:

Refrigerator #																	
										3		3					
#/Type Container	Liquid																
	Solid									2qt		1qt					
Volume	Liquid																
	Solid								120/250			120					
Preservatives																	
ANALYSES REQUESTED →		ORGANIC								INORG							
		VOA	BNA	Pest/PCB	Herb					Metal	CN						
		RECRA LabNet Use Only															
										*		ICP6					

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	BOPK17			S	8/10/98	0745							✓		✓				
002	18					0820							✓		✓				
003	19					0900							✓		✓				
004	20					0710							✓		✓				

Special Instructions:
* Analyst must pick a sample and run matrix QC *

DATE/REVISIONS:
1 SAF # B98-022
2
3 * Hg, Cr, Pb. (Cr+Pb by trace)
4
5
6

Relinquished by	Received by	Date	Time
Fed ex	L. Landye	8/14/98	3:00

Relinquished by	Received by	Date	Time

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

RECRA LabNet Use Only

Samples were: 1) Shipped (X) or Hand Delivered
Airbill # See *
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: 0°

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-022-16	Page 1 of 1

Collector ID Jacques/Rick Kerkow / MT Stankovich	**Company Contact** Mike Stankovich	**Telephone No.** 531-7620	**Project Coordinator** KOERNER, CC
Project Designation 100 D Areas - Full Protocol	**Sampling Location** 116-D-7		**SAF No.** B98-022
Ice Chest No.	**Field Logbook No.** EL-1339-3		**Method of Shipment** Hand Delivered - Gov. Vehicle
Shipped To TMA/RECRA Location 1 Purchase	**Offsite Property No.** A9804 37		**Bill of Lading/Air Bill No.**
Waste Designation Client determined no waste codes associated with this project.			**COA**

Data Turnaround 15 Days

120 021

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; ~~Isotopic Uranium~~	Nickel-63	Strontium-89,90 -- Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions		
Sample No. / **Matrix *** / **Sample Date** / **Sample Time**										
B0PK17 / Soil / 8-10-98 / 0740					X	X	X		3980	BY
B0PK18 / Soil / 8-10-98 / 0730					✓	✓	✓		3983	C9
B0PK19 / Soil / 8-10-98 / 0900					X	X	X		3975	A2
B0PK20 / Soil / 8-10-98 / 0710					X	X	X		3974	C8

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Stankovich / MT Stankovich	Date/Time: 1515 8-10-98	Received By: Renee Nickson / R. Nickson	Date/Time: 8/10/98 1515
Relinquished By: Renee Nickson / R. Nickson	Date/Time: 8/12/98 1130	Received By: Fed Ex	Date/Time
Relinquished By: Fed Ex	Date/Time	Received By: L. Lansday	Date/Time: 8/14/98 8:00
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
COA - R116D7 2F00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

S	Soil
SE	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

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

OCT 1998
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B98-022
RFW# : 9808L318
SDG/SAF# : H0195/B98-022

W.O.# : 10985-001-001-9999-00
Date Received: 08-13-98

METALS CASE NARRATIVE

1. This narrative covers the analyses of 7 soil samples.

2. Samples were prepared and analyzed in accordance with methods checked on the attached glossary. The sample matrix created difficulties in maintaining calibration criteria. Please refer to statement 5.

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 control limits except the ending CCV for both analytes. Only the last two samples are impacted. Both CCVs went out high with recoveries above 130% (CR at 138.8% and PB at 148.9%). These samples were run over a two day period in three separate files. In each case, the CCV recoveries trended upward as the samples were analyzed. The instrument was calibrated for an HSL list and while most analytes were detected, none were extremely high. In all files, the CCV recovery was in the range of 130% to 170% for every analyte. Other files were completed between these runs and the instrument maintained its calibration throughout the file. It appears that the sample matrix caused the high CCV recoveries. A comparision of the sample results between the files gives similar numbers.

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

7. All preparation/method blanks were within method criteria. Refer to the Inorganics Method Blank Data Summary.

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

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

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

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

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
BOPK21	Chromium	800	92.4

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

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

for Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-1-98
Date

mld/m08-318

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9808L318

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

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

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__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:**_____

L-WI-033/M-03/98

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.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L318

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0PK21	Chromium, Total	131	MG/KG	0.08	1.0
		Mercury, Total	0.22	MG/KG	0.02	1.0
		Lead, Total	4.3	MG/KG	0.18	1.0
-002	B0PK22	Chromium, Total	0.17	MG/KG	0.08	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	1.2	MG/KG	0.18	1.0
-003	B0PK23	Chromium, Total	339	MG/KG	0.07	1.0
		Mercury, Total	2.4	MG/KG	0.03	2.0
		Lead, Total	7.8	MG/KG	0.17	1.0
-004	B0PK24	Chromium, Total	144	MG/KG	0.07	1.0
		Mercury, Total	0.30	MG/KG	0.02	1.0
		Lead, Total	4.4	MG/KG	0.16	1.0
-005	B0PK25	Chromium, Total	117	MG/KG	0.06	1.0
		Mercury, Total	1.8	MG/KG	0.03	2.0
		Lead, Total	7.7	MG/KG	0.15	1.0
-006	B0PK26	Chromium, Total	117	MG/KG	0.06	1.0
		Mercury, Total	0.36	MG/KG	0.01	1.0
		Lead, Total	3.9	MG/KG	0.15	1.0
-007	B0PK27	Chromium, Total	142	MG/KG	0.07	1.0
		Mercury, Total	0.25	MG/KG	0.01	1.0
		Lead, Total	4.1	MG/KG	0.17	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/11/98

CLIENT: TNU-HANFORD B98-022 RECRA LOT #: 9808L318

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	98L1143-MB1	Chromium, Total	0.21	MG/KG	0.08	1.0
		Lead, Total	0.19 u	MG/KG	0.19	1.0
BLANK1	98C0420-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022

RECRA LOT #: 9808L318

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0PK21	Chromium, Total	154	131	18.7	125.1*	1.0
		Mercury, Total	0.41	0.22	0.17	110.8	1.0
		Lead, Total	48.4	4.3	46.8	94.2	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 09/11/98

CLIENT: TMU-HANFORD B98-022 RECRA LOT #: 9808L318

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0PK21	Chromium, Total	131	135	2.8	1.0
		Mercury, Total	0.22	0.18	18.6	1.0
		Lead, Total	4.3	4.0	7.2	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022

RECRA LOT #: 9806L318

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	98L1143-LC1	Chromium, LCS	48.6	50.0	MG/KG	97.2
		Lead, LCS	242	250	MG/KG	96.8
LCS1	98C0420-LC1	Mercury, LCS	1.0	1.2	MG/KG	88.6

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-022

DATE RECEIVED: 08/13/98 RFW LOT # :9808L318

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0PK21						
CHROMIUM, TOTAL	001	S	98L1143	08/10/98	08/20/98	08/26/98
CHROMIUM, TOTAL	001 REP	S	98L1143	08/10/98	08/20/98	08/26/98
CHROMIUM, TOTAL	001 MS	S	98L1143	08/10/98	08/20/98	08/26/98
MERCURY, TOTAL	001	S	98C0420	08/10/98	08/26/98	08/27/98
MERCURY, TOTAL	001 REP	S	98C0420	08/10/98	08/26/98	08/27/98
MERCURY, TOTAL	001 MS	S	98C0420	08/10/98	08/26/98	08/27/98
LEAD, TOTAL	001	S	98L1143	08/10/98	08/20/98	08/26/98
LEAD, TOTAL	001 REP	S	98L1143	08/10/98	08/20/98	08/26/98
LEAD, TOTAL	001 MS	S	98L1143	08/10/98	08/20/98	08/26/98
B0PK22						
CHROMIUM, TOTAL	002	S	98L1143	08/10/98	08/20/98	08/26/98
MERCURY, TOTAL	002	S	98C0420	08/10/98	08/26/98	08/27/98
LEAD, TOTAL	002	S	98L1143	08/10/98	08/20/98	08/26/98
B0PK23						
CHROMIUM, TOTAL	003	S	98L1143	08/10/98	08/20/98	08/26/98
MERCURY, TOTAL	003	S	98C0420	08/10/98	08/26/98	08/28/98
LEAD, TOTAL	003	S	98L1143	08/10/98	08/20/98	08/26/98
B0PK24						
CHROMIUM, TOTAL	004	S	98L1143	08/10/98	08/20/98	08/26/98
MERCURY, TOTAL	004	S	98C0420	08/10/98	08/26/98	08/27/98
LEAD, TOTAL	004	S	98L1143	08/10/98	08/20/98	08/26/98
B0PK25						
CHROMIUM, TOTAL	005	S	98L1143	08/10/98	08/20/98	08/27/98
MERCURY, TOTAL	005	S	98C0420	08/10/98	08/26/98	08/28/98
LEAD, TOTAL	005	S	98L1143	08/10/98	08/20/98	08/27/98
B0PK26						
CHROMIUM, TOTAL	006	S	98L1143	08/10/98	08/20/98	08/27/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-022

DATE RECEIVED: 08/13/98 RFW LOT # :9808L318

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	006	S	98C0420	08/10/98	08/26/98	08/27/98
LEAD, TOTAL	006	S	98L1143	08/10/98	08/20/98	08/27/98
B0PK27						
CHROMIUM, TOTAL	007	S	98L1143	08/10/98	08/20/98	08/27/98
MERCURY, TOTAL	007	S	98C0420	08/10/98	08/26/98	08/27/98
LEAD, TOTAL	007	S	98L1143	08/10/98	08/20/98	08/27/98

LAB QC:

CHROMIUM LABORATORY	LC1 BS	S	98L1143	N/A	08/20/98	08/26/98
CHROMIUM, TOTAL	MB1	S	98L1143	N/A	08/20/98	08/26/98
MERCURY LABORATORY	LC1 BS	S	98C0420	N/A	08/26/98	08/27/98
MERCURY, TOTAL	MB1	S	98C0420	N/A	08/26/98	08/27/98
LEAD LABORATORY	LC1 BS	S	98L1143	N/A	08/20/98	08/26/98
LEAD, TOTAL	MB1	S	98L1143	N/A	08/20/98	08/26/98

RECRA LabNet Use Only

9808L318

Custody Transfer Record/Lab Work Request

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford B98-022
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: MS
QC: SPEC Del: STD TAT: 15 day
Date Rec'd: 8/13/98 Date Due: 8/28/98
Account #:

Refrigerator #										3		3					
#/Type Container	Liquid																
	Solid									1g		2g					
Volume	Liquid																
	Solid									250		120					
Preservatives																	
ANALYSES REQUESTED →		ORGANIC								INORG							
		VOA	BNA	Pest/PCB	Herb					Metal	CN						
		RECRA LabNet Use Only															
										*		ICP6					

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	BOPK21			S	8/10/98	0930								✓		✓					
2	2					0615								✓		✓					
3	3					0805								✓		✓					
4	4					0910								✓		✓					
5	5					0830								✓		✓					
6	6					0640								✓		✓					
7	7					0640								✓		✓					

Special Instructions:
SAF # - B98-022

DATE/REVISIONS:
1 * Hg, CR, Pb,
2 (CR + Pb by trace ICP)
3
4 → Analysts must pick a
5 sample and run matrix
6 QC

RECRA LabNet Use Only

Samples were: 1) Shipped or Hand Delivered ✓
Airbill # *
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 Receipt Y or N
Cooler Temp 3.4

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES
*1235 7151580

Relinquished by	Received by	Date	Time
Dedeep	Jordan	8/13/98	0930

Relinquished by	Received by	Date	Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-022-17

013

Collector ID Jacques/Rick Kerkow	**Company Contact** Mike Stankovich	**Telephone No.** 531-7620	**Project Coordinator** KOERNER, CC
Project Designation 100 D Areas - Full Protocol	**Sampling Location** 116-D-7		**SAF No.** B98-022
Ice Chest No.	**Field Logbook No.** EL-1339-3		**Method of Shipment** Hand Delivered - Gov. Vehicle
Shipped To TMA/RECRA	**Offsite Property No.** A9301/37		**Bill of Lading/Air Bill No.**
Waste Designation Client determined no waste codes associated with this project.			**COA**

Data Turnaround 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

2,18

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; Isotopic Uranium	Nickel-63	Strontium-89,90 – Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions		
Sample No. / **Matrix *** / **Sample Date** / **Sample Time**										
B0PK21 / Soil / 8-10-98 / 0930					X	X	X		3982	136
B0PK22 / Soil / 8-10-98 / 0015					X	X	X		NA	15
B0PK23 / Soil / 8-10-98 / 0805					X	X	X		3976	135
B0PK24 / Soil / 8-10-98 / 0910					X	X	X		3977	49

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	8-10-98 1515	R Nielson	8/10/98 1515
R Nielson	8/12/98 1130	Fed Ex	
Fed Ex		Jeller	8/13/98 0930

SPECIAL INSTRUCTIONS

COA - R116D7 2F00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

4235 7951 5820

Matrix *

S	=	Soil
SE	=	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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-022-18	Page 1 of 1

Collector ID Jacques/Rick Kerkow MT Stankovich	**Company Contact** Mike Stankovich	**Telephone No.** 531-7620	**Project Coordinator** KOERNER, CC	**Data Turnaround** 15 Days
Project Designation 100 D Areas - Full Protocol	**Sampling Location** 116-D-7		**SAF No.** B98-022	
Ice Chest No.	**Field Logbook No.** EL-1339-3		**Method of Shipment** Hand Delivered - Gov. Vehicle	
Shipped To TMA/RECRA [illegible]	**Offsite Property No.** AC9[illegible]		**Bill of Lading/Air Bill No.**	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	2		
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; [redacted]	Nickel-63	Strontium-89,90 -- Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions		
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**								
B0PK25	Soil	8-10-98	0830					X	X	X		3981	A1
B0PK26	Soil	8-10-98	0640					X	X	X		3978	C-7
B0PK27	Soil	8-10-98	0640					X	X	X		3978	C-7

CHAIN OF POSSESSION	**Sign/Print Names**		
Relinquished By [signature]	**Date/Time** 1515 8-10-98	**Received By** Renee Nelson R. Nelson	**Date/Time** 1515 8/10/98
Relinquished By Renee Nelson R. Nelson	**Date/Time** 1130 8/12/98	**Received By** Fed Ex	**Date/Time**
Relinquished By Fed Ex	**Date/Time**	**Received By** [signature]	**Date/Time** 8/13/98 0930
Relinquished By	**Date/Time**	**Received By**	**Date/Time**

SPECIAL INSTRUCTIONS

COA - R116D7 2F00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

S	=	Soil
SE	=	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