RECEIVED
JAN 18 2000
EDMC

H0517-TMA/RCRA

0052400

Thermo Nutech
W.O. No. N9-09-038-7197

Bechtel Hanford Inc.
SDG H0517

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0517 is composed of ten solid (soil) samples designated under SAF No. B99-078 with a Project Designation of: 200 Area Source characterization-200-CW-1 OU.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. The Gamma Scan results were reported to BHI via fax on October 19, 1999 while the Total Strontium data was faxed to BHI on November 8, 1999.

2.0 ANALYSIS NOTES

2.1 Gamma Scan Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses. The MDA of sample B0W9K5 was greater than the RDL however the sample activity was much greater than the MDA or RDL.

NOV 1999
RECEIVED
Data
Log In

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

SAMPLE SUMMARY

SDG 7197
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
BOW9K0	GP-12	SOLID		N909038-01	B99-078	B99-078-107	09/01/99 07:10
BOW9K1	GP-12	SOLID		N909038-02	B99-078	B99-078-107	09/01/99 07:10
BOW9K2	GP-12	SOLID		N909038-03	B99-078	B99-078-107	09/01/99 07:35
BOW9K3	GP-12	SOLID		N909038-04	B99-078	B99-078-107	09/01/99 07:56
BOW9K4	GP-12	SOLID		N909038-05	B99-078	B99-078-107	09/01/99 08:03
BOW9K5	GP-12	SOLID		N909038-06	B99-078	B99-078-107	09/01/99 08:21
BOW9K6	GP-12	SOLID		N909038-07	B99-078	B99-078-107	09/01/99 08:25
BOW9K7	GP-12	SOLID		N909038-08	B99-078	B99-078-107	09/01/99 08:32
BOW9K8	GP-12	SOLID		N909038-09	B99-078	B99-078-107	09/01/99 08:45
BOW9L9	GP-12	SOLID		N909038-10	B99-078	B99-078-107	09/01/99 08:55
Method Blank		SOLID		N909038-12	B99-078		
Method Blank		SOLID		N909038-15	B99-078		
Lab Control Sample		SOLID		N909038-11	B99-078		
Lab Control Sample		SOLID		N909038-14	B99-078		
Duplicate (N909038-01)	GP-12	SOLID		N909038-16	B99-078		09/01/99 07:10
Duplicate (N909038-02)	GP-12	SOLID		N909038-13	B99-078		09/01/99 07:10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

QC SUMMARY

SDG 7197
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS RECEIVED	DAYS COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7197	B99-078-107	BOW9K0	SOLID	91.2			09/03/99	2	N909038-01	7197-001
		BOW9K1	SOLID	90.9			09/03/99	2	N909038-02	7197-002
		BOW9K2	SOLID	88.8			09/03/99	2	N909038-03	7197-003
		BOW9K3	SOLID	80.6			09/03/99	2	N909038-04	7197-004
		BOW9K4	SOLID	84.5			09/03/99	2	N909038-05	7197-005
		BOW9K5	SOLID	96.7			09/03/99	2	N909038-06	7197-006
		BOW9K6	SOLID	94.9			09/03/99	2	N909038-07	7197-007
		BOW9K7	SOLID	92.0			09/03/99	2	N909038-08	7197-008
		BOW9K8	SOLID	92.3			09/03/99	2	N909038-09	7197-009
		BOW9L9	SOLID	94.0			09/03/99	2	N909038-10	7197-010
		Method Blank	SOLID						N909038-12	7197-012
		Method Blank	SOLID						N909038-15	7197-015
		Lab Control Sample	SOLID						N909038-11	7197-011
		Lab Control Sample	SOLID						N909038-14	7197-014
		Duplicate (N909038-01)	SOLID				09/03/99	2	N909038-16	7197-016
		Duplicate (N909038-02)	SOLID	90.9			09/03/99	2	N909038-13	7197-013

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

PREP BATCH SUMMARY

SDG 7197
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Beta Counting												
SR	SOLID	Total Strontium in Soil	6893-153	10.0	10			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6893-153	15.0	10			1	1	1/1		

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

WORK SUMMARY

SDG 7197
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
BOW9K0			N909038-01	7197-001	GAM		10/14/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-001	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							
BOW9K1			N909038-02	7197-002	GAM		10/15/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-002	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							
BOW9K2			N909038-03	7197-003	GAM		10/15/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-003	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							
BOW9K3			N909038-04	7197-004	GAM		10/15/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-004	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							
BOW9K4			N909038-05	7197-005	GAM		10/16/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-005	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							
BOW9K5			N909038-06	7197-006	GAM		10/15/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-006	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							
BOW9K6			N909038-07	7197-007	GAM		10/15/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-007	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							
BOW9K7			N909038-08	7197-008	GAM		10/15/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-008	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							
BOW9K8			N909038-09	7197-009	GAM		10/15/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-009	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							
BOW9L9			N909038-10	7197-010	GAM		10/15/99	10/19/99	NJV	Gamma Scan
GP-12		SOLID	09/01/99	7197-010	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
B99-078-107	B99-078		09/03/99							

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/08/99

SDG 7197
Contact Kevin C. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Method Blank	B99-078	SOLID	N909038-12	7197-012	GAM		10/15/99	10/19/99	NJV	Gamma Scan
Method Blank	B99-078	SOLID	N909038-15	7197-015	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
Lab Control Sample	B99-078	SOLID	N909038-11	7197-011	GAM		10/15/99	10/19/99	NJV	Gamma Scan
Lab Control Sample	B99-078	SOLID	N909038-14	7197-014	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
Duplicate (N909038-01) GP-12	B99-078	SOLID	N909038-16 09/01/99 09/03/99	7197-016	SR		11/01/99	11/08/99	NJV	Total Strontium in Soil
Duplicate (N909038-02) GP-12	B99-078	SOLID	N909038-13 09/01/99 09/03/99	7197-013	GAM		10/15/99	10/19/99	NJV	Gamma Scan

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
GAM	B99-078	Gamma Scan	GAMMAHI	10			1	1	1	13
SR	B99-078	Total Strontium in Soil	SRTOTAL	10			1	1	1	13
TOTALS				20			2	2	2	26

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-12

Method Blank

METHOD BLANK

SDG 7197	Client/Case no Hanford	SDG-H0517	
Contact Kevin C. Johnson	Contract TRB-SBB-207925		
Lab sample id N909038-12	Client sample id Method Blank		
Dept sample id 7197-012	Material/Matrix	SOLID	
	SAF No B99-078		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Potassium 40	13966-00-2	U		0.31		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.009	0.10	U	GAM
Europium 152	14683-23-9	U		0.031	0.10	U	GAM
Europium 154	15585-10-1	U		0.026	0.10	U	GAM
Europium 155	14391-16-3	U		0.041	0.10	U	GAM
Radium 226	13982-63-3	U		0.020	0.10	U	GAM
Radium 228	15262-20-1	U		0.045	0.20	U	GAM
Thorium 228	14274-82-9	U		0.019		U	GAM
Thorium 232	TH-232	U		0.045		U	GAM
Americium 241	14596-10-2	U		0.071		U	GAM
Uranium 238	U-238	U		1.3		U	GAM
Uranium 235	15117-96-1	U		0.055		U	GAM

200 Area Source chrctztn-200-CW-1 OU

QC-BLANK 31894

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-15

Method Blank

METHOD BLANK

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-15	Client sample id	Method Blank
Dept sample id	7197-015	Material/Matrix	SOLID
		SAF No	B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.102	0.39	0.40	1.0	U	SR

200 Area Source chrctztn-200-CW-1 OU

QC-BLANK 32151

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-11

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7197 | Client/Case no Hanford | SDG-H0517

Contact Kevin C. Johnson | Case no TRB-SBB-207925

Lab sample id N909038-11 | Client sample id Lab Control Sample

Dept sample id 7197-011 | Material/Matrix SOLID

SAF No B99-078

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
Cobalt 60	0.381	0.035	0.019	0.050		GAM	0.371	0.015	103	72-128	80-120
Cesium 137	0.444	0.031	0.020	0.10		GAM	0.403	0.016	110	72-128	80-120

200 Area Source chrctztn-200-CW-1 OU

QC-LCS 31893

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-14

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7197
Contact Kevin C. Johnson

Client/Case no Hanford SDG-H0517
Case no TRB-SBB-207925

Lab sample id N909038-14
Dept sample id 7197-014

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-078

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
Total Strontium	13.8	1.0	0.78	1.0		SR	12.2	0.49	113	78-122	

200 Area Source chrctztn-200-CW-1 OU

QC-LCS 32150

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-16 BOW9K0

DUPLICATE

SDG 7197		Client/Case no Hanford	SDG-H0517
Contact Kevin C. Johnson		Case no TRB-SBB-207925	
DUPLICATE	ORIGINAL		
Lab sample id N909038-16	Lab sample id N909038-01	Client sample id BOW9K0	
Dept sample id 7197-016	Dept sample id 7197-001	Location/Matrix GP-12	SOLID
	Received 09/03/99	Collected 09/01/99 07:10	
	% solids 91.2	Custody/SAF No B99-078-107	B99-078

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Total Strontium	0.084	0.49	0.32	1.0	U	SR	0.064	0.15	0.20	U	-	

200 Area Source chrctztn-200-CW-1 OU

QC-DUP#1 32152

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-13 BOW9K1

DUPLICATE

SDG 7197 Client/Case no Hanford SDG-H0517

Contact Kevin C. Johnson Case no TRB-SBB-207925

DUPLICATE		ORIGINAL			
Lab sample id	N909038-13	Lab sample id	N909038-02	Client sample id	BOW9K1
Dept sample id	7197-013	Dept sample id	7197-002	Location/Matrix	GP-12 SOLID
		Received	09/03/99	Collected	09/01/99 07:10
% solids	90.9	% solids	90.9	Custody/SAF No	B99-078-107 B99-078

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Potassium 40	15.7	1.9	0.29			GAM	15.1	0.73	0.35		4	38
Cobalt 60	U		0.025	0.050	U	GAM	U		0.037	U	-	
Cesium 137	33.2	0.19	0.061	0.10		GAM	31.7	0.23	0.081		5	32
Europium 152	U		0.17	0.10	U	GAM	U		0.24	U	-	
Europium 154	U		0.086	0.10	U	GAM	U		0.13	U	-	
Europium 155	U		0.11	0.10	U	GAM	U		0.18	U	-	
Radium 226	U		0.11	0.10	U	GAM	0.700	0.11	0.14		146	70
Radium 228	U		0.18	0.20	U	GAM	1.05	0.16	0.15		142	71
Thorium 228	0.407	0.26	0.068			GAM	0.985	0.072	0.10		83	68
Thorium 232	U		0.18		U	GAM	1.05	0.16	0.15		142	71
Americium 241	U		0.055		U	GAM	U		0.26	U	-	
Uranium 238	U		3.0		U	GAM	U		4.5	U	-	
Uranium 235	U		0.18		U	GAM	U		0.29	U	-	

200 Area Source chrctztn-200-CW-1 OU

QC-DUP#2 31895

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-01 BOW9K0

DATA SHEET

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-01	Client sample id	BOW9K0
Dept sample id	7197-001	Location/Matrix	GP-12 SOLID
Received	09/03/99	Collected	09/01/99 07:10
% solids	91.2	Custody/SAF No	B99-078-107 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.064	0.15	0.20	1.0	U	SR
Potassium 40	13966-00-2	U		0.61		U	GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	15.3	0.18	0.020	0.10		GAM
Europium 152	14683-23-9	U		0.074	0.10	U	GAM
Europium 154	15585-10-1	U		0.039	0.10	U	GAM
Europium 155	14391-16-3	U		0.075	0.10	U	GAM
Radium 226	13982-63-3	U		0.042	0.10	U	GAM
Radium 228	15262-20-1	U		0.079	0.20	U	GAM
Thorium 228	14274-82-9	U		0.32		U	GAM
Thorium 232	TH-232	U		0.079		U	GAM
Americium 241	14596-10-2	U		0.14		U	GAM
Uranium 238	U-238	U		1.4		U	GAM
Uranium 235	15117-96-1	U		0.099		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-02 BOW9K1

DATA SHEET

SDG	7197	Client/Case no	Hanford	SDG-H0517	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909038-02	Client sample id	BOW9K1		
Dept sample id	7197-002	Location/Matrix	GP-12	SOLID	
Received	09/03/99	Collected	09/01/99 07:10		
% solids	90.9	Custody/SAF No	B99-078-107	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.265	0.10	0.15	1.0	J	SR
Potassium 40	13966-00-2	15.1	0.73	0.35			GAM
Cobalt 60	10198-40-0	U		0.037	0.050	U	GAM
Cesium 137	10045-97-3	31.7	0.23	0.081	0.10		GAM
Europium 152	14683-23-9	U		0.24	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Radium 226	13982-63-3	0.700	0.11	0.14	0.10		GAM
Radium 228	15262-20-1	1.05	0.16	0.15	0.20		GAM
Thorium 228	14274-82-9	0.985	0.072	0.10			GAM
Thorium 232	TH-232	1.05	0.16	0.15			GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Uranium 238	U-238	U		4.5		U	GAM
Uranium 235	15117-96-1	U		0.29		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-03 BOW9K2

DATA SHEET

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-03	Client sample id	BOW9K2
Dept sample id	7197-003	Location/Matrix	GP-12 SOLID
Received	09/03/99	Collected	09/01/99 07:35
% solids	88.8	Custody/SAF No	B99-078-107 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	2.73	0.22	0.16	1.0		SR
Potassium 40	13966-00-2	15.2	0.92	0.38			GAM
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Cesium 137	10045-97-3	850	1.6	0.37	0.10		GAM
Europium 152	14683-23-9	U		1.4	0.10	U	GAM
Europium 154	15585-10-1	0.362	0.21	0.21	0.10		GAM
Europium 155	14391-16-3	U		0.89	0.10	U	GAM
Radium 226	13982-63-3	0.686	0.36	0.52	0.10		GAM
Radium 228	15262-20-1	0.994	0.36	0.40	0.20		GAM
Thorium 228	14274-82-9	0.954	0.40	0.62			GAM
Thorium 232	TH-232	0.994	0.36	0.40			GAM
Americium 241	14596-10-2	U		1.0		U	GAM
Uranium 238	U-238	U		10		U	GAM
Uranium 235	15117-96-1	U		1.4		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-04

BOW9K3

DATA SHEET

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-04	Client sample id	BOW9K3
Dept sample id	7197-004	Location/Matrix	GP-12 SOLID
Received	09/03/99	Collected	09/01/99 07:56
% solids	80.6	Custody/SAF No	B99-078-107 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	2.42	0.21	0.16	1.0		SR
Potassium 40	13966-00-2	17.4	0.59	0.23			GAM
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	0.069	0.018	0.021	0.10	J	GAM
Europium 152	14683-23-9	U		0.060	0.10	U	GAM
Europium 154	15585-10-1	U		0.082	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.747	0.055	0.050	0.10		GAM
Radium 228	15262-20-1	1.02	0.12	0.12	0.20		GAM
Thorium 228	14274-82-9	0.920	0.036	0.031			GAM
Thorium 232	TH-232	1.02	0.12	0.12			GAM
Americium 241	14596-10-2	U		0.082		U	GAM
Uranium 238	U-238	U		3.2		U	GAM
Uranium 235	15117-96-1	U		0.094		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-05 BOW9K4

DATA SHEET

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-05	Client sample id	BOW9K4
Dept sample id	7197-005	Location/Matrix	GP-12 SOLID
Received	09/03/99	Collected	09/01/99 08:03
% solids	84.5	Custody/SAF No	B99-078-107 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	2.28	0.20	0.15	1.0		SR
Potassium 40	13966-00-2	18.8	0.76	0.30			GAM
Cobalt 60	10198-40-0	U		0.038	0.050	U	GAM
Cesium 137	10045-97-3	0.098	0.037	0.041	0.10	J	GAM
Europium 152	14683-23-9	U		0.087	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.879	0.076	0.072	0.10		GAM
Radium 228	15262-20-1	1.12	0.17	0.16	0.20		GAM
Thorium 228	14274-82-9	1.08	0.050	0.050			GAM
Thorium 232	TH-232	1.12	0.17	0.16			GAM
Americium 241	14596-10-2	U		0.32		U	GAM
Uranium 238	U-238	U		4.5		U	GAM
Uranium 235	15117-96-1	U		0.16		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-06 BOW9K5

DATA SHEET

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-06	Client sample id	BOW9K5
Dept sample id	7197-006	Location/Matrix	GP-12 SOLID
Received	09/03/99	Collected	09/01/99 08:21
% solids	96.7	Custody/SAF No	B99-078-107 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	49.7	2.8	1.4	1.0		SR
Potassium 40	13966-00-2	10.2	0.61	0.29			GAM
Cobalt 60	10198-40-0	U		0.032	0.050	U	GAM
Cesium 137	10045-97-3	U		0.030	0.10	U	GAM
Europium 152	14683-23-9	U		0.077	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	0.329	0.058	0.061	0.10		GAM
Radium 228	15262-20-1	0.532	0.12	0.12	0.20		GAM
Thorium 228	14274-82-9	0.506	0.036	0.038			GAM
Thorium 232	TH-232	0.532	0.12	0.12			GAM
Americium 241	14596-10-2	U		0.17		U	GAM
Uranium 238	U-238	U		4.2		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-07 BOW9K6

DATA SHEET

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-07	Client sample id	BOW9K6
Dept sample id	7197-007	Location/Matrix	GP-12 SOLID
Received	09/03/99	Collected	09/01/99 08:25
% solids	94.9	Custody/SAF No	B99-078-107 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	7.10	0.40	0.20	1.0		SR
Potassium 40	13966-00-2	11.0	0.38	0.15			GAM
Cobalt 60	10198-40-0	U		0.015	0.050	U	GAM
Cesium 137	10045-97-3	1.26	0.035	0.020	0.10		GAM
Europium 152	14683-23-9	U		0.049	0.10	U	GAM
Europium 154	15585-10-1	U		0.059	0.10	U	GAM
Europium 155	14391-16-3	U		0.049	0.10	U	GAM
Radium 226	13982-63-3	0.390	0.036	0.034	0.10		GAM
Radium 228	15262-20-1	0.486	0.077	0.077	0.20		GAM
Thorium 228	14274-82-9	0.501	0.024	0.024			GAM
Thorium 232	TH-232	0.486	0.077	0.077			GAM
Americium 241	14596-10-2	U		0.060		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Uranium 235	15117-96-1	U		0.071		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-08 BOW9K7

DATA SHEET

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-08	Client sample id	BOW9K7
Dept sample id	7197-008	Location/Matrix	GP-12 SOLID
Received	09/03/99	Collected	09/01/99 08:32
% solids	92.0	Custody/SAF No	B99-078-107 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	7.15	0.35	0.17	1.0		SR
Potassium 40	13966-00-2	12.5	0.54	0.21			GAM
Cobalt 60	10198-40-0	U		0.024	0.050	U	GAM
Cesium 137	10045-97-3	3.07	0.069	0.035	0.10		GAM
Europium 152	14683-23-9	U		0.082	0.10	U	GAM
Europium 154	15585-10-1	U		0.083	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.519	0.064	0.061	0.10		GAM
Radium 228	15262-20-1	0.673	0.10	0.099	0.20		GAM
Thorium 228	14274-82-9	0.612	0.040	0.046			GAM
Thorium 232	TH-232	0.673	0.10	0.099			GAM
Americium 241	14596-10-2	U		0.27		U	GAM
Uranium 238	U-238	U		3.2		U	GAM
Uranium 235	15117-96-1	U		0.13		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-09 BOW9K8

DATA SHEET

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-09	Client sample id	BOW9K8
Dept sample id	7197-009	Location/Matrix	GP-12 SOLID
Received	09/03/99	Collected	09/01/99 08:45
% solids	92.3	Custody/SAF No	B99-078-107 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	15.4	0.79	0.30	1.0		SR
Potassium 40	13966-00-2	11.5	0.71	0.35			GAM
Cobalt 60	10198-40-0	U		0.041	0.050	U	GAM
Cesium 137	10045-97-3	0.188	0.038	0.041	0.10		GAM
Europium 152	14683-23-9	U		0.082	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	0.473	0.064	0.063	0.10		GAM
Radium 228	15262-20-1	0.581	0.14	0.15	0.20		GAM
Thorium 228	14274-82-9	0.604	0.041	0.042			GAM
Thorium 232	TH-232	0.581	0.14	0.15			GAM
Americium 241	14596-10-2	U		0.15		U	GAM
Uranium 238	U-238	U		4.7		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0517

N909038-10 BOW9L9

DATA SHEET

SDG	7197	Client/Case no	Hanford SDG-H0517
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909038-10	Client sample id	BOW9L9
Dept sample id	7197-010	Location/Matrix	GP-12 SOLID
Received	09/03/99	Collected	09/01/99 08:55
% solids	94.0	Custody/SAF No	B99-078-107 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	10.4	0.55	0.23	1.0		SR
Potassium 40	13966-00-2	11.8	0.42	0.18			GAM
Cobalt 60	10198-40-0	U		0.017	0.050	U	GAM
Cesium 137	10045-97-3	0.346	0.023	0.021	0.10		GAM
Europium 152	14683-23-9	U		0.044	0.10	U	GAM
Europium 154	15585-10-1	U		0.062	0.10	U	GAM
Europium 155	14391-16-3	U		0.054	0.10	U	GAM
Radium 226	13982-63-3	0.450	0.037	0.033	0.10		GAM
Radium 228	15262-20-1	0.555	0.078	0.077	0.20		GAM
Thorium 228	14274-82-9	0.558	0.026	0.024			GAM
Thorium 232	TH-232	0.555	0.078	0.077			GAM
Americium 241	14596-10-2	U		0.065		U	GAM
Uranium 238	U-238	U		2.2		U	GAM
Uranium 235	15117-96-1	U		0.072		U	GAM

200 Area Source chrctztn-200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Test SR Matrix SOLID
SDG 7197
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6893-153					
BOW9K0	N909038-01			7197-001	U
BOW9K1	N909038-02			7197-002	0.265 J
BOW9K2	N909038-03			7197-003	2.73
BOW9K3	N909038-04			7197-004	2.42
BOW9K4	N909038-05			7197-005	2.28
BOW9K5	N909038-06			7197-006	49.7
BOW9K6	N909038-07			7197-007	7.10
BOW9K7	N909038-08			7197-008	7.15
BOW9K8	N909038-09			7197-009	15.4
BOW9L9	N909038-10			7197-010	10.4
BLK (QC ID=32151)	N909038-15			7197-015	U
LCS (QC ID=32150)	N909038-14			7197-014	ok
Duplicate (N909038-01)	N909038-16			7197-016	- U

Nominal values and limits from method RDLs (pCi/g) 1.0
200 Area Source chrctztn-200-CW-1 OU

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Test SR Matrix SOLID
SDG 7197
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 6893-153 2σ prep error 10.0 % Reference Lab Notebook 6893 pg.153																
BOW9K0	N909038-01			0.20	1.04			86		400			61	11/01/99	11/01	GRB-231
BOW9K1	N909038-02			0.15	1.03			85		200			61	11/01/99	11/01	GRB-224
BOW9K2	N909038-03			0.16	1.01			83		200			61	11/01/99	11/01	GRB-227
BOW9K3	N909038-04			0.16	1.04			79		200			61	11/01/99	11/01	GRB-228
BOW9K4	N909038-05			0.15	1.03			89		200			61	11/01/99	11/01	GRB-228
BOW9K5	N909038-06			1.4	1.00			88		400			61	11/01/99	11/01	GRB-214
BOW9K6	N909038-07			0.20	1.03			89		167			61	11/01/99	11/01	GRB-223
BOW9K7	N909038-08			0.17	1.01			85		200			61	11/01/99	11/01	GRB-229
BOW9K8	N909038-09			0.30	1.00			88		400			61	11/01/99	11/01	GRB-208
BOW9L9	N909038-10			0.23	1.04			87		167			61	11/01/99	11/01	GRB-221
BLK (QC ID=32151)	N909038-15			0.40	1.02			78		200				11/01/99	11/01	GRB-214
LCS (QC ID=32150)	N909038-14			0.78	1.02			76		129				11/01/99	11/01	GRB-229
Duplicate (N909038-01) (QC ID=32152)	N909038-16			0.32	1.04			85		400			61	11/01/99	11/01	GRB-216
Nominal values and limits from method				1.0	1.02					100			180			

PROCEDURES	REFERENCE	SRTOTAL
	RP-500	Strontium - Initial Separation, rev 0
	RP-519	Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD	MDA	0.36	± 0.72
FOR 13 SAMPLES	YIELD	84	± 9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

Test GAM Matrix SOLID
SDG 7197
Contact Kevin C. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6893-153						
BOW9K0	N909038-01			7197-001	U	15.3
BOW9K1	N909038-02			7197-002	U	31.7
BOW9K2	N909038-03			7197-003	U	850
BOW9K3	N909038-04			7197-004	U	0.069 J
BOW9K4	N909038-05			7197-005	U	0.098 J
BOW9K5	N909038-06			7197-006	U	U
BOW9K6	N909038-07			7197-007	U	1.26
BOW9K7	N909038-08			7197-008	U	3.07
BOW9K8	N909038-09			7197-009	U	0.188
BOW9L9	N909038-10			7197-010	U	0.346
BLK (QC ID=31894)	N909038-12			7197-012	U	U
LCS (QC ID=31893)	N909038-11			7197-011	ok	ok
Duplicate (N909038-02)	N909038-13			7197-013	- U	ok
Nominal values and limits from method 200 Area Source chrctztn-200-CW-1 OU				RDLs (pCi/g)	0.050	0.10

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0517

Test GAM Matrix SOLID
SDG 7197
Contact Kevin C. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 6893-153	2σ prep error 15.0 %	Reference Lab Notebook 6893 pg.153														
BOW9K0	N909038-01			0.029	698					521			43	09/20/99	10/14	MB,08,00
BOW9K1	N909038-02			0.093	674					279			44	09/20/99	10/15	02,03,00
BOW9K2	N909038-03			0.17	633					73			44	09/20/99	10/15	02,04,00
BOW9K3	N909038-04			0.073	616					202			44	09/20/99	10/15	02,04,00
BOW9K4	N909038-05			0.11	648					202			45	09/20/99	10/16	MB,05,00
BOW9K5	N909038-06			0.081	732					223			44	09/20/99	10/15	02,03,00
BOW9K6	N909038-07			0.048	814					223			44	09/20/99	10/15	02,04,00
BOW9K7	N909038-08			0.071	742					223			44	09/20/99	10/15	MB,05,00
BOW9K8	N909038-09			0.086	715					208			44	09/20/99	10/15	02,03,00
BOW9L9	N909038-10			0.050	765					208			44	09/20/99	10/15	02,04,00
BLK (QC ID=31894)	N909038-12			0.021	703					208				09/20/99	10/15	MB,08,00
LCS (QC ID=31893)	N909038-11			0.019	703					208				09/20/99	10/15	MB,05,00
Duplicate (N909038-02) (QC ID=31895)	N909038-13			0.061	674					207			44	09/20/99	10/15	MB,07,00
Nominal values and limits from method				0.050	703					100			180			

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

AVERAGES ± 2 SD	MDA	0.070 ± 0.082
FOR 13 SAMPLES	YIELD	±

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/99

SDG 7197
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

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 7197
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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 11/08/99

SDG 7197
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0517

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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/08/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-107	Page 1 of 2

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 50 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-12	SAF No.: B99-078	110517
Ice Chest No.: BRC96-065	Field Logbook No.: EL-1511	Method of Shipment: ~~gov vehicle~~ RJN 9/2/99 Federal Express	
Shipped To: TMA/REGRA 0789-1-99	Offsite Property No.: AA90241	Bill of Lading/Air Bill No.: 423579528999	
		COA: B20CW167C	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
Special Handling and/or Storage	No. of Container(s)	1	1									
	Volume	500mL	1000mL									
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time									
B0W9K0	Soil	9-1-99	0710		X		3'-4'			Bow5L8		
B0W9K1	Soil	9-1-99	0710		X		3-4'			Bow5L8		
B0W9K2	Soil	9-1-99	0735		X		7'-8'			Bow8B7		
B0W9K3	Soil	9-1-99	0756		X		9.5'-10.5'			Bow5L8		
B0W9K4	Soil	9-1-99	0803		X		12'-13'			Bow5L8		

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers	Doug Bowers	9-1-99/1200
Received By: B.F.I.B		9-1-99/1200
Relinquished By: RCF IB		9/2/99 0900
Received By: K. Nielson / R. Nielson		0900 9/2/99
Relinquished By: K. Nielson / R. Nielson		9/2/99 1330
Received By: Federal Express		9/2/99
Relinquished By: FedEx		9-3-99 11:00
Received By: TNV M. Goldenberg		11:00 9-3-99

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Sampler unavailable to relinquish samples. RJN 9/2/99

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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	B99-078-107	Page 2 of ~~1~~ 2 BTD 9-1-99

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N SDG HO517
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-12		SAF No.: B99-078	Data Turnaround: 45 Days
Ice Chest No.: ERC96-065	Field Logbook No.: EL-1511		Method of Shipment: ~~gov vehicle~~ RJN 9/2/99 Federal Express	
Shipped To: TMA/~~RECRA~~ BTD 9-1-99	Offsite Property No.: A990241		Bill of Lading/Air Bill No.: 423579528999	
			COA: B20CW167C	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
	No. of Container(s)	1	1									
Special Handling and/or Storage	Volume	500mL	1000mL									
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time										
B0W9K5	Soil	9-1-99	0821		X		13'-14'			B0W5M1			
B0W9K6	Soil	9-1-99	0825		X		14'-15'			B0W5L8			
B0W9K7	Soil	9-1-99	0832		X		17'-18'						
B0W9K8	Soil	9-1-99	0845		X		22'-23'						
~~B0W9K9~~ BTD 9-1-99 B0W9L9	Soil	9-1-99	0855		X		24'-25'						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers Doug Bowers	Date/Time: 9-1-99/1200	Received By: B of 1B	Date/Time: 9-1-99/1200
Relinquished By: Ref #1B	Date/Time: 9/2/99 0900	Received By: R. Nielson	Date/Time: 9/2/99 0900
Relinquished By: R. Nielson	Date/Time: 9/2/99 1330	Received By: Federal Express	Date/Time: 9/2/99
Relinquished By: FedEx	Date/Time: 9-3-99 11:00	Received By: TNV M. Goldenberg	Date/Time: 9-3-99 11:00

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Sampler unavailable to relinquish samples. 9/2/99 RJN

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 9-3-99 11:00

CoC No. B99-078-107

Container I.D. No. ERC96-065 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

INSPECTION

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

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by M. Goldenberg Date: 9-3-99 Time: 11:00

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

SDR # B00-014
Revision #: 0
Date Initiated: 10/11/99

SAMPLE DISPOSITION RECORD

SAF: B99-078
OU: 200-CW-1
Project ID: 200-CW-1
Task ID: 1
Sampling Event: 200 Area Source Characterization 200-CW-1 OU

Laboratory: TMA/RECRA

Task Manager: M.E. Todd

Sampling Information:
Number of Samples: 1
ID Numbers: B0W9K1
Matrix: Soil
Collection Date: 09/01/99

Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Addition of Analyses

Description: Perform Total Radioactive Strontium Analysis

Disposition:

Description: The 200-CW-1 Characterization project requested that the laboratory perform a total radioactive strontium analysis on the listed sample.

Justification: Total radioactive strontium data was determined to be needed subsequent to collection of the listed sample.

Approval Signatures:

S. J. Trent 10/26/99
Project Coordinator (Print/Sign Name) Date

M. E. Todd
Task Manager (Print/Sign Name) Date

SDR # B00-010
Revision #: 0
Date Initiated: 10/11/99

SAMPLE DISPOSITION RECORD

SAF: B99-078
OU: 200-CW-1
Project ID: 200-CW-1
Task ID: 1
Sampling Event: 200 Area Source Characterization 200-CW-1 OU

Laboratory: TMA/RECRA

Task Manager: M.E. Todd

Sampling Information:
Number of Samples: 33
ID Numbers: See Attachment
Matrix: Soil
Collection Date: 08/31/99 - 09/07/99

Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Addition of Analyses

Description: Perform Total Radioactive Strontium Analysis

Disposition:

Description: The 200-CW-1 Characterization project requested that the laboratory perform a total radioactive strontium analysis on the listed samples.

Justification: Total radioactive strontium data was determined to be needed subsequent to collection of the listed samples.

Approval Signatures:

S. J. Trent 10/11/99
Project Coordinator (Print/Sign Name) Date

M. E. Todd
Task Manager (Print/Sign Name) Date

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

OCT 1999
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L008
SDG# : H0517
SAF# : B99-078

W.O. # : 10985-001-001-9999-00
Date Received: 09-03-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 10 soil samples.

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

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

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

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

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

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

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

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

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-30-99
Date

njp\i09-008

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 12 pages.

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

Recra LabNet Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

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

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

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

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

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

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

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

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

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

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

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

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 09/15/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0W9K0	% Solids	92.7	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
-002	B0W9K1	% Solids	92.3	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
-003	B0W9K2	% Solids	90.1	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
-004	B0W9K3	% Solids	82.8	%	0.01	1.0
		Chromium VI	0.48 u	MG/KG	0.48	1.0
-005	B0W9K4	% Solids	85.5	%	0.01	1.0
		Chromium VI	0.47 u	MG/KG	0.47	1.0
-006	B0W9K5	% Solids	97.2	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-007	B0W9K6	% Solids	94.1	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-008	B0W9K7	% Solids	94.4	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-009	B0W9K8	% Solids	94.6	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-010	B0W9L9	% Solids	94.8	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/15/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVIA63-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 09/15/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0W9K0	Soluble Chromium VI	4.3	0.18	4.3	96.1	1.0
		Insoluble Chromium VI	1360	0.18	1180	115.9	100
BLANK10	99LVIA63-MB1	Soluble Chromium VI	3.9	0.40u	4.0	97.8	1.0
		Insoluble Chromium VI	1080	0.40u	1160	92.7	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 09/15/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0W9K0	Chromium VI	0.43u	0.43u	NC	1.0
-010REP	B0W9L9	% Solids	94.8	95.3	0.57	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L008

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W9K0						
% SOLIDS	001	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	001	S	99LVIA63	09/01/99	09/09/99	09/09/99
CHROMIUM VI	001 REP	S	99LVIA63	09/01/99	09/09/99	09/09/99
CHROMIUM VI	001 MS	S	99LVIA63	09/01/99	09/09/99	09/09/99
CHROMIUM VI	001 MSD	S	99LVIA63	09/01/99	09/09/99	09/09/99
B0W9K1						
% SOLIDS	002	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	002	S	99LVIA63	09/01/99	09/09/99	09/09/99
B0W9K2						
% SOLIDS	003	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	003	S	99LVIA63	09/01/99	09/09/99	09/09/99
B0W9K3						
% SOLIDS	004	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	004	S	99LVIA63	09/01/99	09/09/99	09/09/99
B0W9K4						
% SOLIDS	005	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	005	S	99LVIA63	09/01/99	09/09/99	09/09/99
B0W9K5						
% SOLIDS	006	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	006	S	99LVIA63	09/01/99	09/09/99	09/09/99
B0W9K6						
% SOLIDS	007	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	007	S	99LVIA63	09/01/99	09/09/99	09/09/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L008

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W9K7						
% SOLIDS	008	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	008	S	99LVIA63	09/01/99	09/09/99	09/09/99
B0W9K8						
% SOLIDS	009	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	009	S	99LVIA63	09/01/99	09/09/99	09/09/99
B0W9L9						
% SOLIDS	010	S	99L%S125	09/01/99	09/10/99	09/10/99
% SOLIDS	010 REP	S	99L%S125	09/01/99	09/10/99	09/10/99
CHROMIUM VI	010	S	99LVIA63	09/01/99	09/09/99	09/09/99
LAB QC:						
CHROMIUM VI	MB1	S	99LVIA63	N/A	09/09/99	09/09/99
CHROMIUM VI	MB1 BS	S	99LVIA63	N/A	09/09/99	09/09/99
CHROMIUM VI	MB1 BSD	S	99LVIA63	N/A	09/09/99	09/09/99

RECRA LabNet Use Only
9909L008

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

010

all

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - HANFORD B99-078
Est. Final Proj. Sampling Date:
Project #: 01985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: O. Johnson
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 9-3-99 Date Due: 10-3-99
Account #:

Refrigerator #											6	6				
#/Type Container	Liquid															
	Solid						1AG				1AG					
Volume	Liquid															
	Solid										500ml					
Preservatives											—					
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: Metal	CN						

RECRA LabNet Use Only

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Met①	ICR6
001	BOW9K0			S	9-1-99	0710	1	✓
002	1					0710	1	
003	2					0735	1	
004	3					0756	1	
005	4					0803	1	
006	5					0821	1	
007	6					0825	1	
008	7					0832	1	
009	8					0845	1	
010	BOW 9L9					0855	1	

Special Instructions:

Saf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:
1. Met① = As, Ba, Be, Cd, Cr, Cu,
2. Pb, Ni, Se, Ag, V, Zn, Hg
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
4235 7952 9013
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. 4° °C

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

Relinquished by	Received by	Date	Time
Fed Ex	V. Hendy	9-3-99	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

1109C008

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-107	Page 1 of 52 B70 9-1-99

Collector Bowers/Porter/Nielson	**Company Contact** Chris Cearlock **Telephone No.** 372-9574	**Project Coordinator** TRENT, SJ	**Price Code** 8N **Data Turnaround** 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU	**Sampling Location** GP-12	**SAF No.** B99-078	
Ice Chest No. ERC96-036	**Field Logbook No.** EL-1511	**Method of Shipment** ~~gov vehicle~~ RJN 9/2/99 Federal Express	
Shipped To TMA/RECRA B70 9-1-99	**Offsite Property No.** AR10240	**Bill of Lading/Air Bill No.** 423579529013	
		COA B20CW1 67C	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
Special Handling and/or Storage	**No. of Container(s)**	1	1									
	Volume	500mL	1000mL									
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time									
001 ✓ B0W9K0	Soil	9-1-99	0710	X		3'-4'					Bow5-8	
002 ✓ B0W9K1	Soil	9-1-99	0710	X		3'-4'					Bow5-8	
003 ✓ B0W9K2	Soil	9-1-99	0735	X		7'-8'					Bow5B7	
004 ✓ B0W9K3	Soil	9-1-99	0756	X		9.5'-10.5'					Bow5-8	
005 ✓ B0W9K4	Soil	9-1-99	0803	X		12'-13'					Bow5-8	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	Doug Bowers	9-1-99 1200
Received By	Ref 1B	9-1-99 1200
Relinquished By	Ref #1B	9/2/99 0900
Received By	R. Nielson	9/2/99 0900
Relinquished By	R Nielson	9/2/99 1330
Received By	FedEx	
Relinquished By	FedEx	9.3.99 0930
Received By	V Hernandez	9.3.99 0930

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Sampler unavailable to relinquish samples. RJN 9/2/99

Temp 3

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

7707C000

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-107	Page 2 of 2

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-12	SAF No.: B99-078	
Ice Chest No.: ERC96-036	Field Logbook No.: EL-1511	Method of Shipment: ~~gov vehicle~~ RLN 9/2/99 Federal Express	
Shipped To: ~~TMA/RECRA~~ 9-1-99	Offsite Property No.: AR10240	Bill of Lading/Air Bill No.: 423579529013	
		COA: B20CW167C	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	None								
	Type of Container	aG	aG								
Special Handling and/or Storage	No. of Container(s) / Volume	1 / 500mL	1 / 1000mL								
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.								

Sample No.	Matrix *	Sample Date	Sample Time									
006 ✓ B0W9K5	Soil	9-1-99	0831	X			13'-14'			Bows M1		
007 ✓ B0W9K6	Soil	9-1-99	0835	X			14'-15'			Bows L8		
008 ✓ B0W9K7	Soil	9-1-99	0837	X			17'-18'			↓		
009 ✓ B0W9K8	Soil	9-1-99	0845	X			22'-23'					
010 ✓ ~~B0W9K9~~ Bows L9	Soil	9-1-99	0855	X			24-25'					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: 9-1-99/1200	Received By: Ref 1B — Date/Time: 9-1-99/1200		
Relinquished By: Ref 1B 9/2/99 0900 — Date/Time	Received By: R. Nielson 9-2-99 0900 — Date/Time		
Relinquished By: R. Nielson/R. Nielson 9/2/99 0900 — Date/Time	Received By: Fed Ex — Date/Time		
Relinquished By: Fed Ex — Date/Time: 9-3-99 0930	Received By: — Date/Time: 9-3-99 0930		

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Sampler unavailable to relinquish samples. RLN 9/2/99

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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 1999
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L008
SDG/SAF# : B99-078/H0517

W.O.# : 10985-001-001-9999-00
Date Received: 09-03-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 10 soil samples.

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

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

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

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

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

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

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

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

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

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

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 22 pages.

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

Pat Ec

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-1-95
Date

mld/m09-008

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9909L008

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:_____

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 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0W9K0	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	2.7	MG/KG	0.34	1.0
		Barium, Total	70.3	MG/KG	0.03	1.0
		Beryllium, Total	0.32	MG/KG	0.01	1.0
		Cadmium, Total	0.19	MG/KG	0.03	1.0
		Chromium, Total	11.0	MG/KG	0.08	1.0
		Copper, Total	12.7	MG/KG	0.12	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Nickel, Total	10.7	MG/KG	0.12	1.0
		Lead, Total	4.7	MG/KG	0.22	1.0
		Selenium, Total	0.46	MG/KG	0.38	1.0
		Vanadium, Total	39.1	MG/KG	0.06	1.0
		Zinc, Total	49.9	MG/KG	0.08	1.0
-002	B0W9K1	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	3.3	MG/KG	0.35	1.0
		Barium, Total	75.1	MG/KG	0.03	1.0
		Beryllium, Total	0.36	MG/KG	0.01	1.0
		Cadmium, Total	0.17	MG/KG	0.03	1.0
		Chromium, Total	12.0	MG/KG	0.08	1.0
		Copper, Total	14.2	MG/KG	0.13	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Nickel, Total	11.7	MG/KG	0.13	1.0
		Lead, Total	5.0	MG/KG	0.22	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Vanadium, Total	40.0	MG/KG	0.06	1.0
		Zinc, Total	44.3	MG/KG	0.08	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B0W9K2	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	2.8	MG/KG	0.36	1.0
		Barium, Total	87.0	MG/KG	0.03	1.0
		Beryllium, Total	0.35	MG/KG	0.01	1.0
		Cadmium, Total	0.10	MG/KG	0.03	1.0
		Chromium, Total	13.7	MG/KG	0.09	1.0
		Copper, Total	21.0	MG/KG	0.13	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Nickel, Total	11.4	MG/KG	0.13	1.0
		Lead, Total	6.2	MG/KG	0.23	1.0
		Selenium, Total	0.46	MG/KG	0.40	1.0
		Vanadium, Total	41.3	MG/KG	0.06	1.0
		Zinc, Total	42.7	MG/KG	0.09	1.0
-004	B0W9K3	Silver, Total	0.12 u	MG/KG	0.12	1.0
		Arsenic, Total	2.9	MG/KG	0.38	1.0
		Barium, Total	127	MG/KG	0.03	1.0
		Beryllium, Total	0.37	MG/KG	0.01	1.0
		Cadmium, Total	0.06	MG/KG	0.03	1.0
		Chromium, Total	13.1	MG/KG	0.09	1.0
		Copper, Total	15.9	MG/KG	0.14	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Nickel, Total	12.0	MG/KG	0.14	1.0
		Lead, Total	6.8	MG/KG	0.24	1.0
		Selenium, Total	0.43 u	MG/KG	0.43	1.0
		Vanadium, Total	30.0	MG/KG	0.07	1.0
		Zinc, Total	38.5	MG/KG	0.09	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	B0W9K4	Silver, Total	0.1 u	MG/KG	0.1	1.0
		Arsenic, Total	5.5	MG/KG	0.33	1.0
		Barium, Total	107	MG/KG	0.03	1.0
		Beryllium, Total	0.51	MG/KG	0.01	1.0
		Cadmium, Total	0.08	MG/KG	0.03	1.0
		Chromium, Total	13.1	MG/KG	0.08	1.0
		Copper, Total	18.3	MG/KG	0.12	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Nickel, Total	13.5	MG/KG	0.12	1.0
		Lead, Total	10.3	MG/KG	0.21	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Vanadium, Total	37.2	MG/KG	0.06	1.0
		Zinc, Total	46.9	MG/KG	0.08	1.0
-006	B0W9K5	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.5	MG/KG	0.28	1.0
		Barium, Total	66.0	MG/KG	0.03	1.0
		Beryllium, Total	0.34	MG/KG	0.008	1.0
		Cadmium, Total	0.11	MG/KG	0.03	1.0
		Chromium, Total	3.7	MG/KG	0.07	1.0
		Copper, Total	13.0	MG/KG	0.10	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	8.5	MG/KG	0.10	1.0
		Lead, Total	2.4	MG/KG	0.18	1.0
		Selenium, Total	0.56	MG/KG	0.31	1.0
		Vanadium, Total	54.5	MG/KG	0.05	1.0
		Zinc, Total	41.3	MG/KG	0.07	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	B0W9K6	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	2.8	MG/KG	0.29	1.0
		Barium, Total	64.0	MG/KG	0.03	1.0
		Beryllium, Total	0.39	MG/KG	0.009	1.0
		Cadmium, Total	0.07	MG/KG	0.03	1.0
		Chromium, Total	6.7	MG/KG	0.07	1.0
		Copper, Total	16.4	MG/KG	0.11	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	7.6	MG/KG	0.11	1.0
		Lead, Total	4.9	MG/KG	0.19	1.0
		Selenium, Total	0.64	MG/KG	0.33	1.0
		Vanadium, Total	36.2	MG/KG	0.05	1.0
		Zinc, Total	37.3	MG/KG	0.07	1.0
-008	B0W9K7	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	3.1	MG/KG	0.34	1.0
		Barium, Total	73.7	MG/KG	0.03	1.0
		Beryllium, Total	0.33	MG/KG	0.01	1.0
		Cadmium, Total	0.09	MG/KG	0.03	1.0
		Chromium, Total	7.1	MG/KG	0.08	1.0
		Copper, Total	14.4	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	9.3	MG/KG	0.12	1.0
		Lead, Total	4.2	MG/KG	0.22	1.0
		Selenium, Total	0.56	MG/KG	0.38	1.0
		Vanadium, Total	53.3	MG/KG	0.06	1.0
		Zinc, Total	43.3	MG/KG	0.08	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	B0W9K8	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	3.6	MG/KG	0.27	1.0
		Barium, Total	68.2	MG/KG	0.02	1.0
		Beryllium, Total	0.33	MG/KG	0.008	1.0
		Cadmium, Total	0.03	MG/KG	0.02	1.0
		Chromium, Total	6.2	MG/KG	0.07	1.0
		Copper, Total	15.1	MG/KG	0.1	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Nickel, Total	8.3	MG/KG	0.1	1.0
		Lead, Total	4.2	MG/KG	0.17	1.0
		Selenium, Total	0.44	MG/KG	0.30	1.0
		Vanadium, Total	41.4	MG/KG	0.05	1.0
		Zinc, Total	38.6	MG/KG	0.07	1.0
-010	B0W9L9	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.7	MG/KG	0.25	1.0
		Barium, Total	58.6	MG/KG	0.02	1.0
		Beryllium, Total	0.33	MG/KG	0.008	1.0
		Cadmium, Total	0.02 u	MG/KG	0.02	1.0
		Chromium, Total	5.9	MG/KG	0.06	1.0
		Copper, Total	13.2	MG/KG	0.09	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Nickel, Total	7.8	MG/KG	0.09	1.0
		Lead, Total	4.3	MG/KG	0.16	1.0
		Selenium, Total	0.44	MG/KG	0.28	1.0
		Vanadium, Total	42.3	MG/KG	0.05	1.0
		Zinc, Total	36.4	MG/KG	0.06	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0654-MB1	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Barium, Total	0.04	MG/KG	0.03	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.08 u	MG/KG	0.08	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Nickel, Total	0.12 u	MG/KG	0.12	1.0
		Lead, Total	0.21 u	MG/KG	0.21	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.08 u	MG/KG	0.08	1.0
BLANK1	99C0278-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0W9K0	Silver, Total	4.7	0.10u	5.3	88.7	1.0
		Arsenic, Total	197	2.7	212	92.0	1.0
		Barium, Total	268	70.3	212	93.6	1.0
		Beryllium, Total	5.1	0.32	5.3	90.1	1.0
		Cadmium, Total	5.0	0.19	5.3	90.7	1.0
		Chromium, Total	31.6	11.0	21.2	97.2	1.0
		Copper, Total	37.8	12.7	26.4	95.1	1.0
		Mercury, Total	0.19	0.02	0.15	109.1	1.0
		Nickel, Total	58.6	10.7	52.9	90.5	1.0
		Lead, Total	52.9	4.7	52.9	91.1	1.0
		Selenium, Total	190	0.46	212	89.8	1.0
		Vanadium, Total	93.8	39.1	52.9	103.4	1.0
		Zinc, Total	98.2	49.9	52.9	91.3	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	B0W9K0	Silver, Total	0.10u	0.10u	NC	1.0
		Arsenic, Total	2.7	2.8	3.6	1.0
		Barium, Total	70.3	72.9	3.6	1.0
		Beryllium, Total	0.32	0.30	7.8	1.0
		Cadmium, Total	0.19	0.20	5.2	1.0
		Chromium, Total	11.0	12.5	12.8	1.0
		Copper, Total	12.7	14.2	11.2	1.0
		Mercury, Total	0.02	0.02	5.4	1.0
		Nickel, Total	10.7	11.9	10.6	1.0
		Lead, Total	4.7	5.3	12.0	1.0
		Selenium, Total	0.46	0.39u	~~NC~~ 200	1.0
		Vanadium, Total	39.1	41.0	4.7	1.0
		Zinc, Total	49.9	51.2	2.6	1.0

Correction MD 11/1/99

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L008

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0654-LC1	Silver, LCS	49.0	50.0	MG/KG	98.0
		Arsenic, LCS	960	1000	MG/KG	96.0
		Barium, LCS	493	500	MG/KG	98.6
		Beryllium, LCS	24.3	25.0	MG/KG	97.2
		Cadmium, LCS	24.3	25.0	MG/KG	97.2
		Chromium, LCS	49.7	50.0	MG/KG	99.4
		Copper, LCS	123	125	MG/KG	98.6
		Nickel, LCS	195	200	MG/KG	97.6
		Lead, LCS	242	250	MG/KG	97.0
		Selenium, LCS	937	1000	MG/KG	93.7
		Vanadium, LCS	252	250	MG/KG	100.7
		Zinc, LCS	96.0	100	MG/KG	96.0
LCS1	99C0278-LC1	Mercury, LCS	1.1	1.0	MG/KG	109.5

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L008

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W9K0						
SILVER, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
SILVER, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
SILVER, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
MERCURY, TOTAL	001	S	99C0278	09/01/99	09/24/99	09/27/99
MERCURY, TOTAL	001 REP	S	99C0278	09/01/99	09/24/99	09/27/99
MERCURY, TOTAL	001 MS	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
NICKEL, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
NICKEL, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L008

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	001	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	001 REP	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	001 MS	S	99L0654	09/01/99	09/24/99	09/29/99
B0W9K1						
SILVER, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
MERCURY, TOTAL	002	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	002	S	99L0654	09/01/99	09/24/99	09/29/99
B0W9K2						
SILVER, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
MERCURY, TOTAL	003	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	003	S	99L0654	09/01/99	09/24/99	09/29/99
B0W9K3						
SILVER, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L008

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
MERCURY, TOTAL	004	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	004	S	99L0654	09/01/99	09/24/99	09/29/99
B0W9K4						
SILVER, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
MERCURY, TOTAL	005	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	005	S	99L0654	09/01/99	09/24/99	09/29/99
B0W9K5						
SILVER, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L008

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	006	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	006	S	99L0654	09/01/99	09/24/99	09/29/99
B0W9K6						
SILVER, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
MERCURY, TOTAL	007	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	007	S	99L0654	09/01/99	09/24/99	09/29/99
B0W9K7						
SILVER, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
MERCURY, TOTAL	008	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	008	S	99L0654	09/01/99	09/24/99	09/29/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L008

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W9K8						
SILVER, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
MERCURY, TOTAL	009	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	009	S	99L0654	09/01/99	09/24/99	09/29/99
B0W9L9						
SILVER, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
ARSENIC, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
BARIUM, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
BERYLLIUM, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
CADMIUM, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
CHROMIUM, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
COPPER, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
MERCURY, TOTAL	010	S	99C0278	09/01/99	09/24/99	09/27/99
NICKEL, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
LEAD, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
SELENIUM, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
VANADIUM, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99
ZINC, TOTAL	010	S	99L0654	09/01/99	09/24/99	09/29/99

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
SILVER, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
ARSENIC LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L008

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
BARIUM LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
BARIUM, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
BERYLLIUM LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
BERYLLIUM, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
CADMIUM LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
CADMIUM, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
CHROMIUM LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
CHROMIUM, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
COPPER LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
COPPER, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
MERCURY LABORATORY	LC1 BS	S	99C0278	N/A	09/24/99	09/27/99
MERCURY, TOTAL	MB1	S	99C0278	N/A	09/24/99	09/27/99
NICKEL LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
NICKEL, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
LEAD LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
LEAD, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
SELENIUM LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
SELENIUM, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
VANADIUM LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
VANADIUM, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99
ZINC LABORATORY	LC1 BS	S	99L0654	N/A	09/24/99	09/29/99
ZINC, TOTAL	MB1	S	99L0654	N/A	09/24/99	09/29/99

RECRA LabNet Use Only

9909L008 all

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client DOE-HANFORD B99-078

Est. Final Proj. Sampling Date

Project # 01985-001-001-9999-00

Project Contact/Phone #

RECRA Project Manager O. Johnson

QC Spec Del Std TAT 30 day

Date Rec'd 9-3-99 Date Due 10-3-99

Account #

Refrigerator #																			
#/Type Container	Liquid														6	6			
	Solid						1AG								1AG	1			
Volume	Liquid														500ml	1			
	Solid																		
Preservatives															—				
ANALYSES REQUESTED →		ORGANIC								INORG									
		VOA	BNA	Pest/PCB	Herb					Metal	CN								

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only: MetHD	12RC
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish	001	BOW9K0			S	9-1-99	0710	1	✓
	002	1					0710	1	
	003	2					0735	1	
	004	3					0756	1	
	005	4					0803	1	
	006	5					0821	1	
	007	6					0825	1	
	008	7					0832	1	
	009	8					0845	1	
	010	BOW9L9					0855	1	

Special Instructions:

Saf # B99-078

COMPOSITE WASTE

020

DATE/REVISIONS:

1. Met(1) = As, Ba, Be, Cd, Cr, Cu,
2. Pb, Ni, Se, Ag, V, Zn, Hg.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped / or Hand Delivered

4235 7952 9813

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. 4° °C

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

NOTES:

Relinquished by	Received by	Date	Time
Fed Ex	V. Hung	9-3-99	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-107	Page 1 of 2

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-12	SAF No.: B99-078	
Ice Chest No.: ER-C96-036	Field Logbook No.: EL-1511	Method of Shipment: ~~gov vehicle~~ RJN 9/2/99 Federal Express	
Shipped To: TMA/RECRA 0730 9-1-99	Offsite Property No.: ACM0240	Bill of Lading/Air Bill No.: 423579529013	
		COA: B20 CW1 67 IC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None									
Type of Container	aG	aG									
No. of Container(s) / Volume	1 / 500mL	1 / 1000mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time									
001 ✓ B0W9K0	Soil	9-1-99	0710	X		3'-4'					Bow548	
002 ✓ B0W9K1	Soil	9-1-99	0710	X		3'-4'					Bow548	
003 ✓ B0W9K2	Soil	9-1-99	0735	X		7'-8'					Bow487	
004 ✓ B0W9K3	Soil	9-1-99	0756	X		9.5-10.5'					Bow548	
005 ✓ B0W9K4	Soil	9-1-99	0803	X		12'-13'					Bow548	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By / Date/Time	Received By / Date/Time
Doug Bowers 9.1.99/1200	RF #1B 9.1.99/1200
RF #1B 9/2/99 0900	K Nielson R. Nielson 9/2/99 0900
K Nielson R Nielson 9/2/99 1330	Fed Ex
Fed Ex 9.3.99 0930	V Hernandez 9.3.99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Sampler unavailable to relinquish samples. RJN 9/2/99

Temp 3

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

Title — Date/Time

LABORATORY SECTION — Received By — Date/Time

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

021

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-107	Page 2 of 2

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-12	SAF No.: B99-078	
Ice Chest No.: ERC96-036	Field Logbook No.: EL-1511	Method of Shipment: ~~gov vehicle~~ RSN 9/1/99 Federal Express	
Shipped To: TMA/RECRA DTD 9-1-99	Offsite Property No.: AR10240	Bill of Lading/Air Bill No.: 423579529013	
		COA: B20CW167C	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
Special Handling and/or Storage	No. of Container(s) / Volume	1 / 500mL	1 / 1000mL									
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time										
006 ✓ B0W9K5	Soil	9-1-99	0821	X			13'-14'			B0W5M1			
007 ✓ B0W9K6	Soil	9-1-99	0825	X			14'-15'			B0W5L8			
008 ✓ B0W9K7	Soil	9-1-99	0832	X			17'-18'			↓			
009 ✓ B0W9K8	Soil	9-1-99	0845	X			22'-23'						
010 ✓ 9-1-99 ~~B0W9K9~~ B0W9L9	Soil	9-1-99	0855	X			24'-25'			↓			

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers	Doug Bowers	9-1-99 1200
Received By: Ref IB	Ref IB	9-1-99 1700
Relinquished By: Ref IB	Ref IB	9-2-99 0700
Received By: K.M. Nielson / R. Nielson	K.M. Nielson / R. Nielson	9-2-99 (1900)
Relinquished By: K.M. Nielson / R. Nielson	K.M. Nielson / R. Nielson	9-2-99 (1900)
Received By: Fed Ex	Fed Ex	
Relinquished By: Fed Ex	Fed Ex	9-3-99 0930
Received By: V. Henry	V. Henry	9-3-99 0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Sampler unavailable to relinquish Samples RSN 9/1/99

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

220