H1452

0057397

Date: 5 January 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-TW-1&2 - Soil Sampling
Subject: Radiochemistry - Data Package No. H1452-ES (SDG No. H1452)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1452-ES prepared by Eberline Services (ES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B12C63	8/2/01	Soil	C	See note 1
B12C64	8/2/01	Soil	C	See note 1
B12C88	8/5/01	Soil	C	See note 1
B12DB8	8/3/01	Soil	C	See note 1
B12DB9	8/3/01	Soil	C	See note 1
B12DC0	8/5/01	Soil	C	See note 1

1-Tritium; carbon-14; nickel-63; total strontium; americium-241; technetium-99; isotopic uranium, plutonium and thorium; neptunium-237; gamma spectroscopy; total uranium.

Data validation was conducted in accordance with the BHI validation statement of work and the *200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan*, DOE/RL-2000-38, Rev. 0, February 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

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DATA QUALITY PARAMETERS

- **Holding Times**

  Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

  All holding times were acceptable.

- **Method Blanks**

  Laboratory Blanks

  Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

  All blank results were acceptable although the target required quantitation limits (TRQLs) were exceeded for 17 of the 29 analytes.

  Field Blank

  No field blanks were submitted for analysis.

- **Accuracy**

  Accuracy is evaluated from laboratory control sample (LCS) or samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30%, tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of a matrix spike analysis, all carbon-14 and total uranium results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the TRQL and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the TRQL, the RPD control limit is less than or equal to two times the TRQL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicate

One set of field duplicates (B12C88-A/B12DC0-A) was submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against 200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan, DOE/RL-2000-38, Rev. 0, February 2001 TRQLs to ensure that laboratory detection levels meet the required criteria. Sixty-two of one hundred seventy four analytes were reported above their TRQL. Under the BHI statement of work, no qualification is required. All other reported laboratory MDAs were at or below the analyte-specific TRQL.

- **Completeness**

Data package No. H1452-ES was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a matrix spike analysis, all carbon-14 and total uranium results were qualified as estimates and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Sixty-two of one hundred seventy four analytes were reported above their TRQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-2000-38, Rev. 0, *200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan*, February 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1452	REVIEWER: TLI	DATE: 1/5/02	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Total uranium Carbon-14	J	All	No matrix spike

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																	
Laboratory: Eberline Services																	
Case	SDG: H1452																
Sample Number		B12C63		B12C64		B12C88		B12D88		B12D89		B12DC0					
Remarks												Duplicate					
Sample Date		08/02/01		08/02/01		08/05/01		08/03/01		08/03/01		08/05/01					
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Tritium	400	-0.043	U	-0.009	U	15.3		0.043	U	2.21		14.2					
Carbon-14	50	3.02	UJ	2.83	UJ	3.66	UJ	-0.564	UJ	0.160	UJ	0.629	UJ				
Nickel-63	30	-45.4	U*	3.01	U*	-3.05	U	2.91	U*	-15.6	U*	-0.298	U				
Total Strontium	1	1390		2050		0.129	U*	288		50.9		0.164	U*				
Americium-241	1	43.9		24.1		1.37		7.43		6.72		0.562					
Technetium-99	15	0.200	U	0.007	U	0.128	U	-0.209	U	-0.070	U	0.037	U				
Thorium-228		6.44	U	1.41	U	-0.989	U	-1.74	U	-0.171	U	-0.258	U				
Thorium-230		-6.44	U	-3.26	U	0.329	U	0	U	-0.854	U	-0.321	U				
Thorium-232	1	9.65	U*	0.930	U*	0	U*	2.06	U*	0.525	U*	0.193	U				
Total Uranium (ug/g)	1	11.3	J	32.5	J	7.74	J	19.1	J	14.8	J	8.09	J				
Uranium-233	1	8.15	U*	9.00		2.72		8.52	U*	5.16		2.73					
Uranium-235	1	0	U*	0	U*	0.137	U	0	U*	0.480	U*	0.602	U*				
Uranium-238	1	5.82	U*	5.63	U*	2.83		7.31	U*	6.35		2.48					
Neptunium-237	1	3.61	U*	0	U*	0.568	U	0	U*	-0.543	U*	-0.284	U*				
Plutonium-238	1	7.85		3.36		0.657		3.66	U*	3.48		0.324	U				
Plutonium-239/240	1	106		159		0.776		64.6		4.64		0.883					
Potassium-40		U	U	273		34.2		19.3		U	U	32.9					
Cobalt 60	0.05	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*				
Cesium 137	0.1	226000		226000		31600		17900		95700		25800					
Radium-226	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*				
Radium-228	0.2	U	U*	U	U*	U	U*	U	U*	U	U*	2.59					
Europium 152	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*				
Europium 154	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*				
Europium 155	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*				
Thorium-228		U	U	U	U	U	U	U	U	U	U	U	U				
Thorium-232		U	U	U	U	U	U	U	U	U	U	2.59					
Uranium-238		U	U	U	U	U	U	U	U	U	U	U	U				
Uranium-235		U	U	U	U	U	U	U	U	U	U	U	U				
Americium-241 (gamma)		U	U	U	U	U	U	U	U	U	U	U	U				

* - TRQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-01 B12C63

DATA SHEET

SDG	7050	Client/Case no	Hanford SDG H1452
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R108047-01	Client sample id	B12C63
Dept sample id	7050-001	Location/Matrix	B-38/200 E SOLID
Received	08/09/01	Collected/Weight	08/02/01 02:10 307.1 g
% solids	95.7	Custody/SAF No	B01-058-140 B01-058

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-0.043	0.54	0.92	400	U	H
Carbon 14	14762-75-5	3.02	3.1	5.0	50	U J	C
Nickel 63	13981-37-8	-45.4	52	91	30	U	NI_L
Total Strontium	SR-RAD	1390	45	19	1.0		SR
Americium 241	14596-10-2	43.9	18	11	1.0		AM
Technetium 99	14133-76-7	0.200	0.67	2.1	15	U	TC
Thorium 228	14274-82-9	6.44	9.7	20		U	TH
Thorium 230	14269-63-7	-6.44	6.5	15	1.0	U	TH
Thorium 232	TH-232	9.65	6.5	12	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	11.3	1.2	0.028	0.10	~~B~~ J	U_T
Uranium 233	U-233/234	8.15	7.0	8.9	1.0	U	U
Uranium 235	15117-96-1	0	2.8	11	1.0	U	U
Uranium 238	U-238	5.82	4.7	8.9	1.0	U	U
Neptunium 237	13994-20-2	3.61	7.2	11	1.0	U	NP
Plutonium 238	13981-16-3	7.85	2.5	2.1	1.0		PU
Plutonium 239/240	PU-239/240	106	9.2	1.9	1.0		PU
Potassium 40	13966-00-2	U		87		U	GAM
Cobalt 60	10198-40-0	U		4.8	0.050	U	GAM
Cesium 137	10045-97-3	226000	200	28	0.10		GAM
Radium 226	13982-63-3	U		62	0.10	U	GAM
Radium 228	15262-20-1	U		45	0.20	U	GAM
Europium 152	14683-23-9	U		180	0.10	U	GAM
Europium 154	15585-10-1	U		15	0.10	U	GAM
Europium 155	14391-16-3	U		86	0.10	U	GAM
Thorium 228	14274-82-9	U		77		U	GAM
Thorium 232	TH-232	U		45		U	GAM
Uranium 235	15117-96-1	U		150		U	GAM
Uranium 238	U-238	U		710		U	GAM

200-TW-1 & 2 - Soil Sampling

R 11/5/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

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SAMPLE DELIVERY GROUP H1452

R108047-01 B12C63

DATA SHEET, cont

SDG	7050	Client/Case no	Hanford	SDG H1452	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-01	Client sample id	B12C63		
Dept sample id	7050-001	Location/Matrix	B-38/200 E	SOLID	
Received	08/09/01	Collected/Weight	08/02/01 02:10	307.1 g	
% solids	95.7	Custody/SAF No	B01-058-140	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	U		47		U	GAM

200-TW-1 & 2 - Soil Sampling

11/5/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-02 B12C64

DATA SHEET

SDG	7050	Client/Case no	Hanford		SDG H1452
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-02	Client sample id	B12C64		
Dept sample id	7050-002	Location/Matrix	B-38/200 E		SOLID
Received	08/09/01	Collected/Weight	08/02/01 06:20	302.9 g	
% solids	95.5	Custody/SAF No	B01-058-141	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.009	0.57	0.97	400	U	H
Carbon 14	14762-75-5	2.83	3.1	5.1	50	U J	C
Nickel 63	13981-37-8	3.01	56	94	30	U	NI_L
Total Strontium	SR-RAD	2050	46	15	1.0		SR
Americium 241	14596-10-2	24.1	4.3	1.7	1.0		AM
Technetium 99	14133-76-7	0.007	0.47	1.6	15	U	TC
Thorium 228	14274-82-9	1.41	3.3	5.6		U	TH
Thorium 230	14269-63-7	-3.26	3.7	7.7	1.0	U	TH
Thorium 232	TH-232	0.930	1.9	2.9	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	32.5	3.7	0.28	0.10	J	U_T
Uranium 233	U-233/234	9.00	6.8	8.6	1.0		U
Uranium 235	15117-96-1	0	2.7	10	1.0	U	U
Uranium 238	U-238	5.63	4.5	8.6	1.0	U	U
Neptunium 237	13994-20-2	0	1.3	3.1	1.0	U	NP
Plutonium 238	13981-16-3	3.36	1.8	1.7	1.0		PU
Plutonium 239/240	PU-239/240	159	13	1.7	1.0		PU
Potassium 40	13966-00-2	273	70	55			GAM
Cobalt 60	10198-40-0	U		12	0.050	U	GAM
Cesium 137	10045-97-3	226000	300	62	0.10		GAM
Radium 226	13982-63-3	U		86	0.10	U	GAM
Radium 228	15262-20-1	U		54	0.20	U	GAM
Europium 152	14683-23-9	U		250	0.10	U	GAM
Europium 154	15585-10-1	U		23	0.10	U	GAM
Europium 155	14391-16-3	U		120	0.10	U	GAM
Thorium 228	14274-82-9	U		110		U	GAM
Thorium 232	TH-232	U		54		U	GAM
Uranium 235	15117-96-1	U		210		U	GAM
Uranium 238	U-238	U		950		U	GAM

200-TW-1 & 2 - Soil Sampling

pu 1/5/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

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SAMPLE DELIVERY GROUP H1452

R108047-02 B12C64

DATA SHEET, cont

SDG	7050	Client/Case no	Hanford	SDG H1452	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-02	Client sample id	B12C64		
Dept sample id	7050-002	Location/Matrix	B-38/200 E	SOLID	
Received	08/09/01	Collected/Weight	08/02/01 06:20	302.9 g	
% solids	95.5	Custody/SAF No	B01-058-141	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	U		66		U	GAM

200-TW-1 & 2 - Soil Sampling

1/5/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-03 B12C88

DATA SHEET

SDG	7050	Client/Case no	Hanford	SDG H1452	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-03	Client sample id	B12C88		
Dept sample id	7050-003	Location/Matrix	B-38/200 E	SOLID	
Received	08/09/01	Collected/Weight	08/05/01 23:10	218.3 g	
% solids	96.6	Custody/SAF No	B01-058-165	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	15.3	0.35	0.19	400		H
Carbon 14	14762-75-5	3.66	3.2	5.3	50	U	C
Nickel 63	13981-37-8	-3.05	5.5	9.5	30	U	NI_L
Total Strontium	SR-RAD	0.129	1.5	2.0	1.0	U	SR
Americium 241	14596-10-2	1.37	0.33	0.18	1.0		AM
Technetium 99	14133-76-7	0.128	0.20	0.60	15	U	TC
Thorium 228	14274-82-9	-0.989	1.3	4.1		U	TH
Thorium 230	14269-63-7	0.329	1.3	2.5	1.0	U	TH
Thorium 232	TH-232	0	0.66	2.5	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	7.74	0.88	0.028	0.10	J	U_T
Uranium 233	U-233/234	2.72	1.1	0.87	1.0		U
Uranium 235	15117-96-1	0.137	0.27	1.0	1.0	U	U
Uranium 238	U-238	2.83	1.1	0.87	1.0		U
Neptunium 237	13994-20-2	0.568	0.57	0.92	1.0	U	NP
Plutonium 238	13981-16-3	0.657	0.24	0.19	1.0		PU
Plutonium 239/240	PU-239/240	0.776	0.28	0.19	1.0		PU
Potassium 40	13966-00-2	34.2	7.8	6.5			GAM
Cobalt 60	10198-40-0	U		0.77	0.050	U	GAM
Cesium 137	10045-97-3	31600	40	9.2	0.10		GAM
Radium 226	13982-63-3	U		12	0.10	U	GAM
Radium 228	15262-20-1	U		4.6	0.20	U	GAM
Europium 152	14683-23-9	U		36	0.10	U	GAM
Europium 154	15585-10-1	U		2.5	0.10	U	GAM
Europium 155	14391-16-3	U		17	0.10	U	GAM
Thorium 228	14274-82-9	U		15		U	GAM
Thorium 232	TH-232	U		4.6		U	GAM
Uranium 235	15117-96-1	U		30		U	GAM
Uranium 238	U-238	U		120		U	GAM

200-TW-1 & 2 - Soil Sampling

1/5/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

DATA SHEET, cont

SDG	7050	Client/Case no	Hanford	SDG H1452	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-03	Client sample id	B12C88		
Dept sample id	7050-003	Location/Matrix	B-38/200 E	SOLID	
Received	08/09/01	Collected/Weight	08/05/01 23:10	218.3 g	
% solids	96.6	Custody/SAF No	B01-058-165	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	U		7.9		U	GAM

200-TW-1 & 2 - Soil Sampling

11/5/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-04 B12DB8

DATA SHEET

SDG	7050	Client/Case no	Hanford SDG H1452
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R108047-04	Client sample id	B12DB8
Dept sample id	7050-004	Location/Matrix	B-38/200 E SOLID
Received	08/09/01	Collected/Weight	08/03/01 01:20 271.5 g
% solids	96.2	Custody/SAF No	B01-058-203 B01-058

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.043	0.55	0.93	400	U	H
Carbon 14	14762-75-5	-0.564	2.9	4.9	50	U J	C
Nickel 63	13981-37-8	2.91	54	91	30	U	NI_L
Total Strontium	SR-RAD	288	25	21	1.0		SR
Americium 241	14596-10-2	7.43	3.1	2.6	1.0		AM
Technetium 99	14133-76-7	-0.209	0.46	1.3	15	U	TC
Thorium 228	14274-82-9	-1.74	4.1	7.9		U	TH
Thorium 230	14269-63-7	0	4.6	8.2	1.0	U	TH
Thorium 232	TH-232	2.06	2.4	2.8	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	19.1	2.2	0.28	0.10	J	U_T
Uranium 233	U-233/234	8.52	7.3	9.3	1.0	U	U
Uranium 235	15117-96-1	0	2.9	11	1.0	U	U
Uranium 238	U-238	7.31	4.9	9.3	1.0	U	U
Neptunium 237	13994-20-2	0	8.4	32	1.0	U	NP
Plutonium 238	13981-16-3	3.66	4.9	9.3	1.0	U	PU
Plutonium 239/240	PU-239/240	64.6	18	9.3	1.0		PU
Potassium 40	13966-00-2	19.3	3.5	3.2			GAM
Cobalt 60	10198-40-0	U		0.35	0.050	U	GAM
Cesium 137	10045-97-3	17900	10	2.0	0.10		GAM
Radium 226	13982-63-3	U		4.4	0.10	U	GAM
Radium 228	15262-20-1	U		1.7	0.20	U	GAM
Europium 152	14683-23-9	U		12	0.10	U	GAM
Europium 154	15585-10-1	U		1.1	0.10	U	GAM
Europium 155	14391-16-3	U		5.1	0.10	U	GAM
Thorium 228	14274-82-9	U		4.9		U	GAM
Thorium 232	TH-232	U		1.7		U	GAM
Uranium 235	15117-96-1	U		10		U	GAM
Uranium 238	U-238	U		49		U	GAM

200-TW-1 & 2 - Soil Sampling

1/5/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

DATA SHEET, cont

SDG	7050	Client/Case no	Hanford	SDG H1452	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-04	Client sample id	B12DB8		
Dept sample id	7050-004	Location/Matrix	B-38/200 E	SOLID	
Received	08/09/01	Collected/Weight	08/03/01 01:20	271.5 g	
% solids	96.2	Custody/SAF No	B01-058-203	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	U		2.7		U	GAM

200-TW-1 & 2 - Soil Sampling

1/5/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-05 B12DB9

DATA SHEET

SDG	7050	Client/Case no	Hanford		SDG H1452
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-05	Client sample id	B12DB9		
Dept sample id	7050-005	Location/Matrix	B-38/200 E		SOLID
Received	08/09/01	Collected/Weight	08/03/01 05:00	248.5 g	
% solids	95.9	Custody/SAF No	B01-058-204	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	2.21	0.29	0.38	400		H
Carbon 14	14762-75-5	0.160	3.0	5.0	50	U J	C
Nickel 63	13981-37-8	-15.6	18	31	30	U	NI_L
Total Strontium	SR-RAD	50.9	6.5	6.3	1.0		SR
Americium 241	14596-10-2	6.72	1.6	1.4	1.0		AM
Technetium 99	14133-76-7	-0.070	0.16	0.55	15	U	TC
Thorium 228	14274-82-9	-0.171	1.2	2.2		U	TH
Thorium 230	14269-63-7	-0.854	1.5	2.9	1.0	U	TH
Thorium 232	TH-232	0.525	0.70	1.1	1.0	U J	TH
Total Uranium (ug/g)	7440-61-1	14.8	1.7	0.093	0.10		U_T
Uranium 233	U-233/234	5.16	3.2	3.0	1.0		U
Uranium 235	15117-96-1	0.480	0.96	3.7	1.0	U	U
Uranium 238	U-238	6.35	3.2	3.0	1.0		U
Neptunium 237	13994-20-2	-0.543	1.1	4.2	1.0	U	NP
Plutonium 238	13981-16-3	3.48	1.2	1.2	1.0		PU
Plutonium 239/240	PU-239/240	4.64	1.3	1.3	1.0		PU
Potassium 40	13966-00-2	U		93		U	GAM
Cobalt 60	10198-40-0	U		5.2	0.050	U	GAM
Cesium 137	10045-97-3	95700	290	69	0.10		GAM
Radium 226	13982-63-3	U		85	0.10	U	GAM
Radium 228	15262-20-1	U		40	0.20	U	GAM
Europium 152	14683-23-9	U		220	0.10	U	GAM
Europium 154	15585-10-1	U		22	0.10	U	GAM
Europium 155	14391-16-3	U		100	0.10	U	GAM
Thorium 228	14274-82-9	U		110		U	GAM
Thorium 232	TH-232	U		40		U	GAM
Uranium 235	15117-96-1	U		190		U	GAM
Uranium 238	U-238	U		1100		U	GAM

200-TW-1 & 2 - Soil Sampling

1/5/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-05 B12DB9

DATA SHEET, cont

SDG	7050	Client/Case no	Hanford	SDG H1452	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-05	Client sample id	B12DB9		
Dept sample id	7050-005	Location/Matrix	B-38/200 E	SOLID	
Received	08/09/01	Collected/Weight	08/03/01 05:00	248.5 g	
% solids	95.9	Custody/SAF No	B01-058-204	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	U		55		U	GAM

200-TW-1 & 2 - Soil Sampling

1/5/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-06 B12DC0

DATA SHEET

SDG	7050	Client/Case no	Hanford	SDG H1452	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-06	Client sample id	B12DC0		
Dept sample id	7050-006	Location/Matrix	B-38/200 E	SOLID	
Received	08/09/01	Collected/Weight	08/05/01 23:10	357.4 g	
% solids	96.7	Custody/SAF No	B01-058-205	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	14.2	0.34	0.19	400	~~U~~	H
Carbon 14	14762-75-5	0.629	2.8	4.7	50	U J	C
Nickel 63	13981-37-8	-0.298	5.5	9.3	30	U	NI_L
Total Strontium	SR-RAD	0.164	1.5	3.0	1.0	U	SR
Americium 241	14596-10-2	0.562	0.25	0.24	1.0	~~U~~	AM
Technetium 99	14133-76-7	0.037	0.17	0.54	15	U	TC
Thorium 228	14274-82-9	-0.258	0.90	1.7		U	TH
Thorium 230	14269-63-7	-0.321	0.64	1.2	1.0	U	TH
Thorium 232	TH-232	0.193	0.51	0.86	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	8.09	0.92	0.028	0.10	J	U_T
Uranium 233	U-233/234	2.73	1.3	0.95	1.0		U
Uranium 235	15117-96-1	0.602	0.60	1.2	1.0	U	U
Uranium 238	U-238	2.48	1.0	0.95	1.0		U
Neptunium 237	13994-20-2	-0.284	0.57	2.2	1.0	U	NP
Plutonium 238	13981-16-3	0.324	0.29	0.39	1.0	U	PU
Plutonium 239/240	PU-239/240	0.883	0.35	0.33	1.0	~~U~~	PU
Potassium 40	13966-00-2	32.9	4.5	3.9			GAM
Cobalt 60	10198-40-0	U		0.43	0.050	U	GAM
Cesium 137	10045-97-3	25800	20	3.1	0.10		GAM
Radium 226	13982-63-3	U		6.7	0.10	U	GAM
Radium 228	15262-20-1	2.59	2.0	2.5	0.20		GAM
Europium 152	14683-23-9	U		17	0.10	U	GAM
Europium 154	15585-10-1	U		1.3	0.10	U	GAM
Europium 155	14391-16-3	U		9.5	0.10	U	GAM
Thorium 228	14274-82-9	U		8.9		U	GAM
Thorium 232	TH-232	2.59	2.0	2.5			GAM
Uranium 235	15117-96-1	U		17		U	GAM
Uranium 238	U-238	U		65		U	GAM

200-TW-1 & 2 - Soil Sampling

1/9/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

DATA SHEET, cont

SDG	7050	Client/Case no	Hanford		SDG H1452
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108047-06	Client sample id	B12DC0		
Dept sample id	7050-006	Location/Matrix	B-38/200 E		SOLID
Received	08/09/01	Collected/Weight	08/05/01 23:10	357.4 g	
% solids	96.7	Custody/SAF No	B01-058-205	B01-058	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	U		5.1		U	GAM

200-TW-1 & 2 - Soil Sampling

2/5/02

000022

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/30/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1452 was composed of six solid (soil) samples designated under SAF No. B01-058 with a Project Designation of: 200-TW-1 & -2 - Soil Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on October 18 and 30, 2001.

2.0 ANALYSIS NOTES

2.1 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.5 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

Sample B12C64 was reworked in chemistry due to a low yield (15%). The data from the reworked sample is reported herein (rework yield 94%). No other problems were encountered during the course of the analyses.

2.7 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.8 Neptunium-237 Analyses

The Np-237 LCS percent recovery (83%) was below the 3σ limits (87 to 113%), but within the laboratory protocol limits (80 to 120%). No other problems were encountered during the course of the analyses.

2.9 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.10 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.11 Tritium Analyses

No problems were encountered during the course of the analyses.

2.12 Total Uranium Analyses

There was contamination in the method blank (0.03 pC/g). The activity was below the RDL (0.1 pC/g) for total uranium. No other problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Program Manager

11/9/01

Date

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-205	Page 1 of 1
Collector: Thomas G./Watson D. / Nielson	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-38/200 E	H1452 (7050)	SAF No.: B01-058	Air Quality ☐
Ice Chest No.: ERC 99.065	Field Logbook No.: EL-1518 - 1	COA: B20TW2674C	Method of Shipment: ~~Fed EX~~ RIN 8/3/01 Govt. Vehicle	
Shipped To: Sal 7-19-01 TMA/EBERLINE ~~Severn Trent Incorporated~~ Richland	Offsite Property No.: RSR 106555		Bill of Lading/Air Bill No.: NA SDG H1452	

POSSIBLE SAMPLE HAZARDS/REMARKS

Maximum Dose .6 MR B & γ on bottle

Samples stored in Ref. #3A at the 3728 Shipping Facility on 8/6/01. Collector not available to relinquish samples on 8/8/01 for shipment. RT 8.8.01

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	60mL	250mL	120mL	250mL	60mL			
	Chromium Hex - 7196	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	Activity Scan			
					Sal 7-19-01					TICTO

Sample No.	Matrix *	Sample Date	Sample Time									
B12DC0	SOIL	8-5-01	2310	X					X	X		B12BV0

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas/Greg Thomas	0630 8-6-01	Ref 3A	0630 8/6/01
Ref 3A	0600 8.8.01	R. Thorn	0600 8.8.01
R. Thorn	0600 8.8.01	FED EX	8-9-01
Fed Ex	10:15 8-9-01	Nielson SR Corso	10:15 8-9-01

SPECIAL INSTRUCTIONS

~~(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045~~ Sal 7-19-01
~~(2) Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH Diesel Range - WTPH-D~~
~~(3) ICP Metals - 6010TR (Client List) (Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc)~~
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

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

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

BHI-EE-011 (10/99)

000026

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-204	Page 1 of 1
Collector: Thomas G./Watson D. / Nielson	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631 H1452	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-38/200 E	Depth 29-31.5 (7050)	SAF No.: B01-058	Air Quality ☐
Ice Chest No.: ERC 99.065	Field Logbook No.: EL-1518	COA: B20TW2674C	Method of Shipment: ~~Fed-Ex~~ RJN 8/3/01 Hand deliver govt. vehicle	
Shipped To: Sal 7-19-01 TMA/EBERline ~~Severn Trent Incorporated~~ - Richland	Offsite Property No.: RSR 106555		Bill of Lading/Air Bill No.: NA SDG H1452	

POSSIBLE SAMPLE HAZARDS/REMARKS

Maximum Dose 1.3B / 1.6 γ on bottles

Samples stored in Ref.# 3C at the 3728 Shipping Facility on 8/3/01. Collector not available to relinquish samples on 8/8/01 for shipment. RT 8.8.01

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	60mL	250mL	120mL	250mL	60mL			
SAMPLE ANALYSIS	Chromium Hex - 7196	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	Activity Scan			

Sample No.	Matrix *	Sample Date	Sample Time									TIE TO
B12DB9	SOIL	8/3/01	0500	X					X	X		B12BT9

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas / Greg Thomas	0800 8/3/01	Ref 3C	0800 8/3/01
Ref 3C	0600 8.8.01	R.F. Thorn	0600 8.8.01
R.F. Thorn	0600 8.8.01	FEDEX	8-9-01
Fed Ex	10:15 8-9-01	Alfonso J. Alfonso	10:15 8-9-01

SPECIAL INSTRUCTIONS

~~(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045~~ Sal 7-19-01
~~(2) Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH Diesel Range - WTPH-D~~
~~(3) ICP Metals - 6010TR (Client List) (Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc)~~
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 – Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

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

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

BHI-EE-011 (10/99)

000027

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-203	Page 1 of 1

Collector: Thomas G./Watson D. / Nielson	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631 H1452	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-38/200 E Depth 22.5 - 25 (7050)	SAF No.: B01-058	
Ice Chest No.: ERC 99.065	Field Logbook No.: EL-1518	COA: B20TW2674C	Method of Shipment: ~~Fed Ex~~ RN 8/2/01 Hand deliver. Govt Vehicle
Shipped To: Sol 7-19-01 TMA/EBERME ~~Severn Trent Incorporated~~ Richland RF 8-7-01	Offsite Property No.: RSR 106555	Bill of Lading/Air Bill No.: SDG H1452	

POSSIBLE SAMPLE HAZARDS/REMARKS

Maximum Dose 3.0 mR β & 2.6 mR γ on bottle

Samples stored in Ref. 3C at the 3728 Shipping Facility on 8/3/01. Collector not available to relinquish samples on 8/8/01 for shipment. RT 8-8-01

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None RF 8.7.01		
Type of Container	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1		
Volume	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
	Chromium Hex - 7196	See Item (1) in Special Instructions.	VOA - 8260A (TCL)	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan		

Sample No.	Matrix *	Sample Date	Sample Time										
B12D88	SOIL	8/03/01	0120	X					X	X			B12B78

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas Greg Thomas	0800 08/3/01	Ref 3C	0800 8/3/01
Ref 3C	0600 8.8.01	R J Thomas	0600 8.8.01
R J Thomas	0600 8.8.01	FEDEX	8-9-01
Fed Ex	8-9-01 10:15	JR Corso JR Corso	10:15 8-9-01

SPECIAL INSTRUCTIONS

(1) ~~IC-Anions - 300.0 (Chloride, Fluoride, Nitrogen-in-Nitrate, Nitrogen-in-Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045~~ Sol 7-19-01
(2) ~~Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D~~
(3) ~~ICP Metals - 6010B (Short List) (Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc)~~
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

RF 8.7.01

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

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

BHI-EE-011 (10/99)

000038

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-165	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631 H1452	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-38/200 E	(7050)	SAF No.: B01-058	Air Quality ☐
Ice Chest No.: ERC99.065	Field Logbook No.: EL-1518 - 1	COA: B20TW2674C	Method of Shipment: Fed EX	SDG H1452
Shipped To: DSA 7/18/01 ~~TMA/RECRA~~ Eberline	Offsite Property No.: RSR 106555		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS
Maximum Dose on bottle .8mR B/.5mR γ

Samples stored in Ref.# 3A at the 3728 Shipping Facility on 8/6/01. Collector not available to relinquish samples on 8/8/01 for shipment. RT 8.8.01

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See item (2) in Special Instructions.	VOA - 8260A (TCL) DSA 7/18/01	See item (3) in Special Instructions.	See item (4) in Special Instructions.			
										TIETO

Sample No.	Matrix *	Sample Date	Sample Time									
B12C88	SOIL	8/5/01	2310							X		B12B10

000029

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: Greg Thomas/Greg Thomas	Date/Time: 0630 8/6/01	Received By/Stored In: Ref 3A	Date/Time: 0630 8/6/01
Relinquished By/Removed From: Ref 3A	Date/Time: 0600 8.8.01	Received By/Stored In: R Thomas	Date/Time: 0600 8.8.01
Relinquished By/Removed From: R Thomas	Date/Time: 0600 8.8.01	Received By/Stored In: FED EX	Date/Time: 8-8-01
Relinquished By/Removed From: Fed Ex	Date/Time: 8-9-01 10:15	Received By/Stored In: JR Corso	Date/Time: 10:15 8-9-01
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

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

DSA 7/18/01

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

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

HI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-141	Page 1 of 1

Collector: Thomas G./Watson D. /Nielson	Company Contact: Todd, M.E. — Telephone No.: (509) 372-9631 H1452	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-38/200 E — Depth 18 - 20.5 (7050)	SAF No.: B01-058	Air Quality ☐
Ice Chest No.: ERC99-065	Field Logbook No.: EL-1518 — COA: B20TW2674C	Method of Shipment: ~~Fed Ex~~ RJN 7/31/01 Hand deliver - Govt. vehicle	
Shipped To: DSA 7/18/01 Tma EBERline ~~Severn Trent Incorporated~~ RICHLANDET 8-7-01	Offsite Property No.: RSR106555	Bill of Lading/Air Bill No.: WKL SDG H1452	

POSSIBLE SAMPLE HAZARDS/REMARKS

Maximum Dose 3.0 MR β/3.5 MR γ on bottles

Samples stored in Ref. #3B at the 3728 Shipping Facility on 8/3/01. Collector not available to relinquish samples on 8/8/01 for shipment. RT 8801

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None RT 8-7-01		
Type of Container	8-7-01	aG	aG	aG	aG	aG	aG		
No. of Container(s)		1	1	1	1	1	1		
Volume	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	Chromium Hex 7196	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions. DSA 7/18/01	See item (4) in Special Instructions.	Activity Scan		TICTO

Sample No.	Matrix *	Sample Date	Sample Time									
B12C64	SOIL	8/2/01	0620	X					X	X		B12BT3

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas/Greg Thomas	0815 8/3/01	Ref 3B	0815 8/3/01
Ref 3B	0600 8-8-01	RJ Thorn	0600 8-8-01
RJ Thorn	0600 8-8-01	FED EX	8-8-01
Fed Ex	8-9-01 10:15	JR Corso JR Corso	10:15 8-9-01

SPECIAL INSTRUCTIONS

~~(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045~~
~~(2) Semi VOA - 8270A (Add-On) (Tributyl phosphate); TPH Diesel Range - WTPH-D~~
~~(3) ICP Metals - 6010TR (Client List) (Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc)~~
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

DSA 7/18/01

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

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

BHI-EE-011 (10/99)

000030

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-140	Page 1 of 1

Collector: Thomas G./Watson D. /Nielson	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631 H1452 (7050)	Project Coordinator: TRENT, SJ
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-38/200 E Depth 14.5-15.5		SAF No.: B01-058
Ice Chest No.: ERC 99-065	Field Logbook No.: EL-1518	COA: B20TW2674C	Method of Shipment: ~~Fed EX~~ RJN 7/31/01 Hand deliver - Govt. Vehicle
Shipped To: DSA 7/18/01 TMA/EBERLINE ~~Severn Trent Incorporated~~ ~~Richland~~ RT 8.7.01	Offsite Property No.: RSR 106555		Bill of Lading/Air Bill No.: WA SDG H1452

Price Code: 8N

Air Quality ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

3MR B on outside jar
2MR γ on outside jar
No alpha

AT 8/02/01
Direct 110K cpm on outside jar

Samples stored in Ref.#38 at the 3728 Shipping Facility on 8/3/01.
Collector not available to relinquish samples on 8/8/01 for shipment. RT 8.8.01

Preservation	Cool 4C	Cool 4C	Cool 4C	None	None	None			
Type of Container	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1			
Volume	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
	Chromium Hex - 7196	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions. RJN 9/11/01	See item (3) in Special Instructions.	See item (4) in Special Instructions.	Activity Scan		

Sample No.	Matrix *	Sample Date	Sample Time									
B12C63	SOIL	8/2/01	0210	X					X	X		B12BT2

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas/Greg Thomas	0810 8/2/01	TW1 & 2 Site Trailer Ref	0810 8/2/01
TW1 & 2 Site Trailer Ref	0320 8/3/01	Greg Thomas/Greg Thomas RT 8/3/01	0320 8/3/01
Greg Thomas/Greg Thomas	0815 8/3/01	Ref 3B	0815 8/3/01
Ref 3B	0600 8.8.01	R Thor	0600 8.8.01
R Thor	0600 8.8.01	FEDEX	8-9-01
Fed Ex	8-9-01 10:15	JRCorso JRCorso	10:15 8-9-01

SPECIAL INSTRUCTIONS

~~(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045~~
~~(2) Semi-VOA - 8270A (Add On) (Tributyl phosphate); TPH Diesel Range - WTPH-D~~
~~(3) ICP Metals - 6010TR (Clean List) (Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc)~~
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

DSA 7/18/01

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

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

BHI-EE-011 (10/99)

000031

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200 TW 1+2			DATA PACKAGE: H1452		
VALIDATOR: TY		LAB: EB		DATE: 12/27/01	
CASE:			SDG: H1452		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	total uranium
Total Uranium	Radium-226	Tritium Ni-63	C14	NP 237	
SAMPLES/MATRIX					
B12C63	B12C64	B12C88	B12D88	B12D89	B12DC0
					Soil

1. Completeness ..... ☒ N/A

Technical verification forms present? ..... Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Appendix A – Radiochemical Data Validation Checklist

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E) ..... ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A
Method blank results acceptable? ..... Yes No N/A
Analytes detected in method blank? ..... Yes No N/A
Field blank(s) analyzed? ..... Yes No N/A
Field blank results acceptable? ..... Yes No N/A
Analytes detected in field blank(s)? ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A
Comments: 0 total uranium detects – No qualifiers

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A
LCS/BSS recoveries acceptable? ..... Yes No N/A
LCS/BSS traceable? (Levels D,E) ..... Yes No N/A
LCS/BSS expired? (Levels D,E) ..... Yes No N/A
LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A
Comments: NP 237 8390 control QC limits ok

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☐ N/A

Chemical carrier added? ..... Yes No N/A
Chemical recovery acceptable? ..... Yes No N/A
Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Appendix A – Radiochemical Data Validation Checklist

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

9. Matrix Spikes (Levels C, D, E) ..... ☐ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: total uranium - no MS July
CCU - no MS J

Appendix A – Radiochemical Data Validation Checklist

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

11. Field QC Samples (Levels C, D E) ..... ☒ N/A

Field duplicate sample(s) analyzed? ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split sample(s) analyzed? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: _____

12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses? Yes No N/A

Results supported in raw data?(Levels D, E) Yes No N/A

Results Acceptable? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

MDA's meet required detection limits? Yes No N/A

Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: 63 of 174 over TDL

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-08 Method Blank

METHOD BLANK

SDG 7050 Client/Case no Hanford SDG H1452
Contact Melissa C. Mannion Contract No. 630

Lab sample id R108047-08 Client sample id Method Blank
Dept sample id 7050-008 Material/Matrix SOLID
SAF No B01-058

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-1.87	1.7	2.9	400	U	H
Carbon 14	14762-75-5	1.82	3.2	5.2	50	U	C
Nickel 63	13981-37-8	-33.5	53	92	30	U	NI_L
Total Strontium	SR-RAD	-9.31	13	30	1.0	U	SR
Americium 241	14596-10-2	-0.583	1.6	2.4	1.0	U	AM
Technetium 99	14133-76-7	0.575	0.64	1.9	15	U	TC
Thorium 228	14274-82-9	0	25	52		U	TH
Thorium 230	14269-63-7	-8.41	17	40	1.0	U	TH
Thorium 232	TH-232	0	8.4	32	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0.030	0.013	0.028	0.10	J	U_T
Uranium 233	U-233/234	1.12	2.2	8.5	1.0	U	U
Uranium 235	15117-96-1	0	2.7	10	1.0	U	U
Uranium 238	U-238	2.23	2.2	8.5	1.0	U	U
Neptunium 237	13994-20-2	0	3.6	5.5	1.0	U	NP
Plutonium 238	13981-16-3	-1.36	2.7	10	1.0	U	PU
Plutonium 239/240	PU-239/240	0	2.7	10	1.0	U	PU
Potassium 40	13966-00-2	U		6.3		U	GAM
Cobalt 60	10198-40-0	U		0.88	0.050	U	GAM
Cesium 137	10045-97-3	U		0.89	0.10	U	GAM
Radium 226	13982-63-3	U		1.3	0.10	U	GAM
Radium 228	15262-20-1	U		3.0	0.20	U	GAM
Europium 152	14683-23-9	U		2.2	0.10	U	GAM
Europium 154	15585-10-1	U		2.7	0.10	U	GAM
Europium 155	14391-16-3	U		2.1	0.10	U	GAM
Thorium 228	14274-82-9	U		1.2		U	GAM
Thorium 232	TH-232	U		3.0		U	GAM
Uranium 235	15117-96-1	U		3.2		U	GAM
Uranium 238	U-238	U		100		U	GAM
Americium 241	14596-10-2	U		2.2		U	GAM

200-TW-1 & 2 - Soil Sampling

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7050
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1452
Case no No. 630

Lab sample id R108047-07
Dept sample id 7050-007

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-058

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	226	5.2	2.9	400	J	H	228	9.1	99	84-116	80-120
Carbon 14	10500	110	15	50		C	11300	450	93	85-115	80-120
Nickel 63	11200	220	91	30		NI_L	11600	460	97	84-116	80-120
Total Strontium	2440	85	24	1.0		SR	2190	88	111	81-119	80-120
Americium 241	918	50	2.9	1.0		AM	955	38	96	88-112	80-120
Technetium 99	429	12	2.0	15		TC	393	16	109	82-118	80-120
Thorium 230	931	150	26	1.0		TH	1020	41	91	76-124	80-120
Total Uranium (ug/g)	149	17	0.28	0.10		U_T	144	5.8	104	77-123	80-120
Uranium 233	887	30	14	1.0		U	929	37	95	89-111	80-120
Uranium 235	718	26	1.1	1.0		U	755	30	95	89-111	80-120
Uranium 238	1000	32	13	1.0		U	1010	40	99	89-111	80-120
Neptunium 237	883	67	11	1.0		NP	1060	42	83	87-113	80-120
Plutonium 238	1170	51	3.6	1.0		PU	1240	50	94	89-111	80-120
Plutonium 239/240	1340	57	3.6	1.0		PU	1320	53	102	88-112	80-120
Cobalt 60	21.8	1.5	0.97	0.050		GAM	25.1	1.0	87	78-122	80-120
Cesium 137	24.5	1.3	1.1	0.10		GAM	28.6	1.1	86	79-121	80-120

200-TW-1 & 2 - Soil Sampling

QC-LCS 39475

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-09 B12C88

DUPLICATE

SDG	7050			Client/Case no	Hanford SDG H1452
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R108047-09	Lab sample id	R108047-03	Client sample id	B12C88
Dept sample id	7050-009	Dept sample id	7050-003	Location/Matrix	B-38/200 E SOLID
		Received	08/09/01	Collected/Weight	08/05/01 23:10 218.3 g
% solids	96.6	% solids	96.6	Custody/SAF No	B01-058-165 B01-058

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	14.8	0.35	0.20	400	J	H	15.3	0.35	0.19	J	3	22
Carbon 14	2.10	3.1	5.2	50	U	C	3.66	3.2	5.3	U	-	
Nickel 63	-0.890	5.4	9.3	30	U	NI_L	-3.05	5.5	9.5	U	-	
Total Strontium	0.947	1.5	2.5	1.0	U	SR	0.129	1.5	2.0	U	-	
Americium 241	1.44	0.36	0.15	1.0		AM	1.37	0.33	0.18		5	53
Technetium 99	0.026	0.23	0.65	15	U	TC	0.128	0.20	0.60	U	-	
Thorium 228	0	1.4	3.1		U	TH	-0.989	1.3	4.1	U	-	
Thorium 230	-0.692	0.92	2.2	1.0	U	TH	0.329	1.3	2.5	U	-	
Thorium 232	0.461	0.92	1.8	1.0	U	TH	0	0.66	2.5	U	-	
Total Uranium (ug/g)	7.95	0.91	0.028	0.10		U_T	7.74	0.88	0.028		3	31
Uranium 233	2.52	1.1	0.84	1.0		U	2.72	1.1	0.87		8	90
Uranium 235	0	0.27	1.0	1.0	U	U	0.137	0.27	1.0	U	-	
Uranium 238	3.40	1.3	0.84	1.0		U	2.83	1.1	0.87		18	83
Neptunium 237	0.210	0.84	1.6	1.0	U	NP	0.568	0.57	0.92	U	-	
Plutonium 238	0.538	0.54	1.0	1.0	U	PU	0.657	0.24	0.19	J	20	149
Plutonium 239/240	0.941	0.81	1.0	1.0	U	PU	0.776	0.28	0.19	J	19	150
Potassium 40	40.1	9.8	7.2			GAM	34.2	7.8	6.5		16	60
Cobalt 60	U		1.0	0.050	U	GAM	U		0.77	U	-	
Cesium 137	31800	50	11	0.10		GAM	31600	40	9.2		1	32
Radium 226	U		15	0.10	U	GAM	U		12	U	-	
Radium 228	U		5.5	0.20	U	GAM	U		4.6	U	-	
Europium 152	U		40	0.10	U	GAM	U		36	U	-	
Europium 154	U		3.2	0.10	U	GAM	U		2.5	U	-	
Europium 155	U		22	0.10	U	GAM	U		17	U	-	
Thorium 228	U		20		U	GAM	U		15	U	-	
Thorium 232	U		5.5		U	GAM	U		4.6	U	-	
Uranium 235	U		38		U	GAM	U		30	U	-	
Uranium 238	U		160		U	GAM	U		120	U	-	

200-TW-1 & 2 - Soil Sampling

Lab id	TNANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-09 B12C88

DUPLICATE, cont.

SDG	7050			Client/Case no	Hanford SDG H1452
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R108047-09	Lab sample id	R108047-03	Client sample id	B12C88
Dept sample id	7050-009	Dept sample id	7050-003	Location/Matrix	B-38/200 E SOLID
		Received	08/09/01	Collected/Weight	08/05/01 23:10 218.3 g
% solids	96.6	% solids	96.6	Custody/SAF No	B01-058-165 B01-058

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Americium 241	U		12		U	GAM	U		7.9	U	-		

200-TW-1 & 2 - Soil Sampling

QC-DUP#3 39477

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 10/30/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1452

R108047-10 B12C88

MATRIX SPIKE

SDG	7050			Client/Case no	Hanford SDG H1452
Contact	Melissa C. Mannion			Case no	No. 630
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R108047-10	Lab sample id	R108047-03	Client sample id	B12C88
Dept sample id	7050-010	Dept sample id	7050-003	Location/Matrix	B-38/200 E SOLID
		Received	08/09/01	Collected/Weight	08/05/01 23:10 218.3 g
% solids	96.6	% solids	96.6	Custody/SAF No	B01-058-165 B01-058

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	100	1.0	0.23	400	JX	H	97.2	3.9	15.3	0.35	87	83-117	60-140

200-TW-1 & 2 - Soil Sampling

QC-MS#3 39478

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 10/30/01

SDR # B02-044
Revision #: 0
Date Initiated: 08/9/01

SAMPLE DISPOSITION RECORD

SAF: B01-058
OU: 200-TW-1/2
Project ID: 200 TW 1&2
Task ID: 1
Sampling Event: 200-TW-1 & 2 - Soil

Laboratory: TMA/RECRA; Severn Trent, Incorporated

Task Manager: M. E. Todd

Sampling Information:
Number of Samples: 4
ID Numbers: B12C88, B12C88-A, B12DC0, B12DC0-A
Matrix: SOIL
Collection Date: 08/05/01

Issue Background:
Class: ☒ Project Data Use ☐ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction
Type: Other
Description: Change of Quality Control Sample Type

Disposition:
Description: Sample B12C88 was originally collected as a laboratory comparison (split) sample associated with sample B12DC0. However, both samples were collected from a sample interval that contained elevated radiological contamination. The elevated radiological contamination limited the laboratories that could accept the samples for analysis (see SDR B01-101). Sample B12C88 and B12DC0 were subsequently subdivided into B12C88, B12C88-A, B12DC0, and B12DC0-A to facilitate shipping of the samples to laboratories that could accept the samples. As a result, the samples were not analyzed at different laboratories. Because the samples were collected from the same sample interval, sample B12C88 and B12C88-A effectively became field duplicates of samples B12DC0 and B12DC0-A.

Justification: Because the listed samples were analyzed at the same laboratories, sample B12C88 and B12C88-A could not be considered split samples of B12DC0 and B12DC0-A, respectively. However, the samples were collected from the same interval, B12C88 and B12C88-A can be considered field duplicates of B12DC0 and B12DC0-A, respectively.

Approval Signatures:

S. J. Trent 1/9/02
Project Coordinator (Print/Sign Name) Date

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

BHI-EE-109 (02/99)

SDR # B02-043
Revision #: 0
Date Initiated: 08/9/01

SAMPLE DISPOSITION RECORD

SAF: B01-058
OU: 200-TW-1/2
Project ID: 200 TW 1&2
Task ID: 1
Sampling Event: 200-TW-1 & 2 - Soil

Laboratory: TMA/RECRA

Task Manager: M. E. Todd

Sampling Information:
Number of Samples: 3
ID Numbers: B12DC0-A, B12DB9-A, B12DB8-A
Matrix: SOIL
Collection Date: 08/03/01 – 08/05/01

Issue Background:

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

Type: Clarification of Direction

Description: Modification of Analytes to Report From the 6010A Metals Analysis

Disposition:

Description: The chain of custody for the listed samples requested metals analysis by method 6010A and report all "client list" metals. However, for these samples the Groundwater/Vadose Zone project requested that only cadmium, chromium, copper, nickel, silver, and lead be reported.

Justification: Metals data reported under the 6010A – Client List analysis are not needed for these samples.

Approval Signatures:

S. J. Trent 1/9/02
Project Coordinator (Print/Sign Name) Date

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

BHI-EE-109 (02/99)