0057396

H1481

RECEIVED
JUN 10 2002
EDMC

Date: 10 February 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-TW-1&2 - Soil Sampling
Subject: Radiochemistry - Data Package No. H1481-ES (SDG No. H1481)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1481-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
B12C89	8/23/01	Soil	C	See note 1
B12DC1	8/24/01	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

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 18 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".

Due to a tracer recovery of 106%, the americium-241 result in sample B12C89 was quailified as an estimate 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.

  Due to the duplicate not being prepared with the sample, the neptunium-237 result in sample B12DC1 was qualified as an estimate and flagged "J".

  All other duplicate results were acceptable.

  Field Duplicate

  No field duplicates were submitted for analysis.

- **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. Twenty-five of fifty-eight 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. H1481-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". Due to the duplicate not being prepared with the sample, the neptunium-237 result in sample B12DC1 was qualified as an estimate and flagged "J". Due to a tracer recovery of 106%, the americium-241 result in sample B12C89 was quailified as an estimate 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.

Twenty-five of fifty-eight 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: H1481	REVIEWER: TLI	DATE: 2/10/02	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Neptunium-237	J	B12DC1	Duplicate not prepared with the sample
Americium-241(aspec)	J	B12C89	Tracer recovery
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: H1481																
Sample Number		B12C89		B12DC1													
Remarks																	
Sample Date		08/23/01		08/24/01													
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Tritium	400	11.6	U	3.65	U												
Carbon-14	50	1.40	UJ	0.361	UJ												
Nickel-63	30	-175	U*	-136	U*												
Total Strontium	1	940000		2340000													
Americium-241	1	5690	J	2620													
Technetium-99	15	32.9		4.27													
Thorium-228		0	U	6.24	U												
Thorium-230		-11.2	U	68.1	U												
Thorium-232	1	5.61	U*	-6.19	U*												
Total Uranium (ug/g)	1	51.3	J	147	J												
Uranium-233	1	-40.0	U*	19.5	U*												
Uranium-235	1	0	U*	0	U*												
Uranium-238	1	60.0	U*	19.5	U*												
Neptunium-237	1	24.3	U*	-17.9	UJ*												
Plutonium-238	1	481	U*	755	U*												
Plutonium-239/240	1	153000		77300													
Potassium-40		236		244													
Cobalt 60	0.05	U	U*	U	U*												
Cesium 137	0.1	102000		153000													
Radium-226	0.1	U	U*	U	U*												
Radium-228	0.2	U	U*	U	U*												
Europium 152	0.1	U	U*	U	U*												
Europium 154	0.1	200		U	U*												
Europium 155	0.1	U	U*	U	U*												
Thorium-228 (gamma)		U	U	U	U												
Thorium-232 (gamma)		U	U	U	U												
Uranium-238 (gamma)		U	U	U	U												
Uranium-235 (gamma)		U	U	U	U												
Americium-241 (gamma)		4920		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 H1481

R108152-01 B12C89

DATA SHEET

SDG	7070	Client/Case no	Hanford SDG H1481
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R108152-01	Client sample id	B12C89
Dept sample id	7070-001	Location/Matrix	B-7A/200 E SOLID
Received	08/29/01	Collected/Weight	08/23/01 01:30 463.0 g
% solids	88.3	Custody/SAF No	B01-058-166 B01-058

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	11.6	8.2	13	400	U	H
Carbon 14	14762-75-5	1.40	2.1	3.6	50	U J	C
Nickel 63	13981-37-8	-175	540	920	30	U	NI_L
Total Strontium	SR-RAD	940000	6200	330	1.0		SR
Americium 241	14596-10-2	5690	1600	870	1.0	J	AM
Technetium 99	14133-76-7	32.9	3.6	4.0	15		TC
Thorium 228	14274-82-9	0	23	54		U	TH
Thorium 230	14269-63-7	-11.2	56	99	1.0	U	TH
Thorium 232	TH-232	5.61	11	43	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	51.3	5.4	0.28	0.10	J	U_T
Uranium 233	U-233/234	-40.0	40	150	1.0	U	U
Uranium 235	15117-96-1	0	48	190	1.0	U	U
Uranium 238	U-238	60.0	80	150	1.0	U	U
Neptunium 237	13994-20-2	24.3	97	190	1.0	U	NP
Plutonium 238	13981-16-3	481	480	920	1.0	U	PU
Plutonium 239/240	PU-239/240	153000	14000	920	1.0		PU
Potassium 40	13966-00-2	236	51	47			GAM
Cobalt 60	10198-40-0	U		6.1	0.050	U	GAM
Cesium 137	10045-97-3	102000	100	31	0.10		GAM
Radium 226	13982-63-3	U		49	0.10	U	GAM
Radium 228	15262-20-1	U		31	0.20	U	GAM
Europium 152	14683-23-9	U		110	0.10	U	GAM
Europium 154	15585-10-1	200	25	21	0.10		GAM
Europium 155	14391-16-3	U		200	0.10	U	GAM
Thorium 228	14274-82-9	U		48		U	GAM
Thorium 232	TH-232	U		31		U	GAM
Uranium 235	15117-96-1	U		130		U	GAM
Uranium 238	U-238	U		1200		U	GAM

200-TW-1 & 2 - Soil Sampling

2/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-01 B12C89

DATA SHEET, cont

SDG	7070	Client/Case no	Hanford	SDG H1481	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108152-01	Client sample id	B12C89		
Dept sample id	7070-001	Location/Matrix	B-7A/200 E	SOLID	
Received	08/29/01	Collected/Weight	08/23/01 01:30	463.0 g	
% solids	88.3	Custody/SAF No	B01-058-166	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	4920	53	70			GAM

200-TW-1 & 2 - Soil Sampling

2/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-02 B12DC1

DATA SHEET

SDG	7070	Client/Case no	Hanford SDG H1481
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R108152-02	Client sample id	B12DC1
Dept sample id	7070-002	Location/Matrix	B-7A/200 E SOLID
Received	08/29/01	Collected/Weight	08/24/01 02:00 555.4 g
% solids	89.8	Custody/SAF No	B01-058-206 B01-058

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	3.65	8.1	14	400	U	H
Carbon 14	14762-75-5	0.361	2.3	3.8	50	U J	C
Nickel 63	13981-37-8	-136	540	930	30	U	NI_L
Total Strontium	SR-RAD	2340000	9700	310	1.0		SR
Americium 241	14596-10-2	2620	1300	1000	1.0		AM
Technetium 99	14133-76-7	4.27	1.8	4.0	15	~~J~~	TC
Thorium 228	14274-82-9	6.24	12	48		U	TH
Thorium 230	14269-63-7	68.1	62	76	1.0	U	TH
Thorium 232	TH-232	-6.19	12	47	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	147	16	0.28	0.10	~~B~~ J	U_T
Uranium 233	U-233/234	19.5	78	150	1.0	U	U
Uranium 235	15117-96-1	0	47	180	1.0	U	U
Uranium 238	U-238	19.5	39	150	1.0	U	U
Neptunium 237	13994-20-2	-17.9	36	140	1.0	U J	NP
Plutonium 238	13981-16-3	755	650	820	1.0	U	PU
Plutonium 239/240	PU-239/240	77300	7700	820	1.0		PU
Potassium 40	13966-00-2	244	66	61			GAM
Cobalt 60	10198-40-0	U		12	0.050	U	GAM
Cesium 137	10045-97-3	153000	200	38	0.10		GAM
Radium 226	13982-63-3	U		93	0.10	U	GAM
Radium 228	15262-20-1	U		62	0.20	U	GAM
Europium 152	14683-23-9	U		210	0.10	U	GAM
Europium 154	15585-10-1	U		44	0.10	U	GAM
Europium 155	14391-16-3	U		180	0.10	U	GAM
Thorium 228	14274-82-9	U		94		U	GAM
Thorium 232	TH-232	U		62		U	GAM
Uranium 235	15117-96-1	U		260		U	GAM
Uranium 238	U-238	U		1800		U	GAM

200-TW-1 & 2 - Soil Sampling

pc 2/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/19/01

DATA SHEET, cont

SDG	7070	Client/Case no	Hanford	SDG H1481	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108152-02	Client sample id	B12DC1		
Dept sample id	7070-002	Location/Matrix	B-7A/200 E	SOLID	
Received	08/29/01	Collected/Weight	08/24/01 02:00	555.4 g	
% solids	89.8	Custody/SAF No	B01-058-206	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		1600		U	GAM

200-TW-1 & 2 - Soil Sampling

2/10/02

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/19/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1481 was composed of two solid (soil) samples designated under SAF No. B01-058 with a Project Designation of: 200-TW-1 & -2 – Soil Sampling. Due to the high activities of strontium, Cs-137, Am-241, and plutonium in the samples the sample aliquots had to be reduced substantially to prevent contamination in the laboratory and cross contamination of samples.

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 November 7, 10 and 19, 2001.

2.0 ANALYSIS NOTES

2.1 Isotopic Plutonium Analyses

Due to low yields (less than 20%) the Pu samples were reanalyzed with new QC samples. No other 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

There was Pu-239 on the Am-241 planchets. The samples were reworked in chemistry but the yields for the reworked samples were below 20%. Due to the low yields the Am-241 samples were reanalyzed with new QC samples. The results from the reanalysis are reported herein. No other 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

No 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

Due to a low yield (less than 20%) Np-237 sample B12C89 was reanalyzed with new QC samples. No other problems were encountered during the course of the analyses.

2.9 Carbon-14 Analyses

The C14 LCS percent recovery (78%) was below the 3σ limits (87 to 113%) and the laboratory protocol limits (80 to 120%), but within BHI's limits (70 to 130%). No other 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 Total Uranium Analyses

There was contamination in the method blank (0.42 μg/g). The activity was above the RDL (0.1 μg/g) for total uranium, but less than 5-times the MDA (0.28 μg/g). No other problems were encountered during the course of the analyses.

2.12 Tritium Analyses

The H3 matrix spike had a percent recovery (79%) below the 3σ limits (87 to 113%) and was slightly below the laboratory protocol limits (80 to 120%), but within BHI's limits (60 to 140%). 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

11/21/01

Date

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-058-000

ctor omas G./Watson D.	Company Contact Todd, M.E.	Telephone No. (509) 372-9631	Project Coordinator TRENT, SJ
Price Code 8N	Data Turnaround 45 Days	Air Quality ☐	
ct Designation 0-TW-1 & 2 - Soil Sampling	Sampling Location B-7A/200 E H1481 (7070)		SAF No. B01-058
Chest No. King SN 08/98 840008	Field Logbook No. EL-1518-1	COA B20TW2444K ~~B20TW2674C~~ ET	Method of Shipment Fed EX
ped To TMA RT 8.28.01 ~~Transported by~~ St Louis	Offsite Property No. PSP ~~104563~~ 107150 RTP 8.29.01 8/24/01		Bill of Lading/Air Bill No. N/A

SSIBLE SAMPLE HAZARDS/REMARKS
ndologed Field Instruments Reading 35mR B
mR γ on bottles. Possible ca

Samples stored in Ref.# Site Trailer at the 3728 Shipping Facility on 8/24/01. Collector not available to relinquish samples on 8/24/01 for shipment. ET 8.28.01

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	sG	FG	sG	sG	sG	sG	sG	FG		
No. of Container(s)	1	8.28.01	1	1	1	1	1	8.28.01		
Volume	60mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	Mercury - 7470 - (CV)	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								
12DC1	SOIL	8/24/01	0200		X			X	X	B12	MKO

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas/Greg Thomas	0600 8/24/01	200TW1&2 Site Trailer	0600 8/24/01
200TW1&2 Site Trailer	0415 8/28/01	R. Thorer	0415 8.28.01
R. Thorer	0450 8.28.01	FEDEX	8-28-01
Fed Ex	9:30 8-29-01	SR Lopez JR Cox	9:30 8-29-01

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 - 6010B (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-230, 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
SD=Sediment
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

From: Melissa Mannion

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B01-058-166	Page 1 of 1
lector Thomas G./Watson D.	Company Contact Todd, M.E.	Telephone No. (509) 372-9631	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days
ject: Designation 200-TW-1 & 2 - Soil Sampling	Sampling Location B-7A/200 E	H1481 (7070)	SAF No. B01-058	Air Quality ☐	
Chest No. Liking SN09/98040008	Field Logbook No. EL-1518-1	COA B20TW2A44C ~~B20TW2674C~~ AT	Method of Shipment Fed EX		
ipped To TMA/~~RBCRA~~ DSW 08/15/01	Offsite Property No. RSR 107150	8/23/01	Bill of Lading/Air Bill No. N/A		

POSSIBLE SAMPLE HAZARDS/REMARKS

Radiological Field Instruments Readings on bottles ranged from 1.5MR B/<.5MR 2 to 3.0MR B/1.3MR 2. Possible OR

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL			
SAMPLE ANALYSIS	Chromium Hex - 7196 DSW 08/15/01	Mercury - 7470 - (CV)	VOA - 8260A (TCL)	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time									Tie to
B12C69	SOIL	8-23-01	0130							X		~~B12C69-A~~ B12MJ8

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Greg Thomas/Greg Thomas	8/23/01 0815	Stored in 200 TW 1&2 Site Trailer	8/23/01 0815
200 TW1&2 Site Trailer	8-28-01 0415	R.T. RThoren	8-28-01 0415
R.T. RThoren	8-28-01 0450	FEDEX	8-28-01
Fed Ex	8-29-01 9:30	JR Corso JR Corso	8-29-01 9:30

SPECIAL INSTRUCTIONS

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

DSW 08/15/01

Samples stored in Ref.# Site Trailer at the 3728 Shipping Facility on 8/28/01. Collector not available to relinquish samples on 8/28/01 for shipment. RT 8-28-01

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

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

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-PW-1+2 – Soil			DATA PACKAGE: H1481		
VALIDATOR: TLI		LAB: ES		DATE: 1/28/02	
CASE:			SDG: H1481		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	C14	NP237	
SAMPLES/MATRIX B12C87 B12DC1					
					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

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: _____

Appendix A – Radiochemical Data Validation Checklist

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:

~~IIII~~ ~~IIII~~ ~~IIII~~ III – 18 our in MB

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:

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: ~~Am 241 - 106% - 88 J~~

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: Am 241 - 106% - 88 J

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: No total U or C14 MS - J all

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: NP-237 DCI not run w/day J

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: ~~25~~ 25 of 58 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-04 Method Blank

METHOD BLANK

SDG 7070 Client/Case no Hanford SDG H1481
Contact Melissa C. Mannion Contract No. 630

Lab sample id R108152-04 Client sample id Method Blank
Dept sample id 7070-004 Material/Matrix SOLID
SAF No B01-058

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	15.8	32	53	400	U	H
Carbon 14	14762-75-5	0.369	2.3	3.9	50	U	C
Nickel 63	13981-37-8	-161	520	900	30	U	NI_L
Total Strontium	SR-RAD	-6.47	120	250	1.0	U	SR
Technetium 99	14133-76-7	-1.62	1.2	3.0	15	U	TC
Thorium 228	14274-82-9	11.0	11	42		U	TH
Thorium 230	14269-63-7	11.0	55	93	1.0	U	TH
Thorium 232	TH-232	-5.48	11	42	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0.420	0.13	0.28	0.10		U_T
Uranium 233	U-233/234	26.3	35	67	1.0	U	U
Uranium 235	15117-96-1	10.6	21	81	1.0	U	U
Uranium 238	U-238	8.78	18	67	1.0	U	U
Neptunium 237	13994-20-2	48.0	48	72	1.0	U	NP
Potassium 40	13966-00-2	U		2.7		U	GAM
Cobalt 60	10198-40-0	U		0.33	0.050	U	GAM
Cesium 137	10045-97-3	U		0.23	0.10	U	GAM
Radium 226	13982-63-3	U		0.60	0.10	U	GAM
Radium 228	15262-20-1	U		1.0	0.20	U	GAM
Europium 152	14683-23-9	U		0.50	0.10	U	GAM
Europium 154	15585-10-1	U		0.76	0.10	U	GAM
Europium 155	14391-16-3	U		0.25	0.10	U	GAM
Thorium 228	14274-82-9	U		0.22		U	GAM
Thorium 232	TH-232	U		1.0		U	GAM
Uranium 235	15117-96-1	U		0.47		U	GAM
Uranium 238	U-238	U		31		U	GAM
Americium 241	14596-10-2	U		0.13		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 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-08 Method Blank

METHOD BLANK

SDG	7070	Client/Case no	Hanford SDG H1481
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R108152-08	Client sample id	Method Blank
Dept sample id	7070-008	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
Plutonium 238	13981-16-3	359	720	1100	1.0	U	PU
Plutonium 239/240	PU-239/240	0	240	920	1.0	U	PU

200-TW-1 & 2 - Soil Sampling

QC-BLANK #40130

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-11 Method Blank

METHOD BLANK

SDG	7070	Client/Case no	Hanford	SDG H1481	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R108152-11	Client sample id	Method Blank		
Dept sample id	7070-011	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
Neptunium 237	13994-20-2	145	290	440	1.0	U	NP

200-TW-1 & 2 - Soil Sampling

QC-BLANK 40179

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-14 Method Blank

METHOD BLANK

SDG	7070	Client/Case no	Hanford SDG H1481
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R108152-14	Client sample id	Method Blank
Dept sample id	7070-014	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
Americium 241	14596-10-2	178	300	430	1.0	U	AM

200-TW-1 & 2 - Soil Sampling

QC-BLANK 40214

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-03 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7070
Contact Melissa C. Mennion

Client/Case no Hanford SDG H1481
Case no No. 630

Lab sample id R108152-03
Dept sample id 7070-003

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	4750	100	51	400		H	4930	200	96	84-116	80-120
Carbon 14	8780	180	23	50		C	11300	450	78	87-113	80-120
Nickel 63	126000	2300	930	30		NI_L	132000	5300	95	84-116	80-120
Total Strontium	23400	720	170	1.0		SR	23000	920	102	83-117	80-120
Technetium 99	1360	26	6.0	15		TC	1310	52	104	83-117	80-120
Thorium 230	12300	790	74	1.0		TH	11200	450	110	85-115	80-120
Total Uranium (ug/g)	1790	200	2.8	0.10		U_T	1810	72	99	78-122	80-120
Uranium 233	9000	990	520	1.0		U	9660	390	93	82-118	80-120
Uranium 235	8300	950	130	1.0		U	7850	310	106	79-121	80-120
Uranium 238	10200	1100	500	1.0		U	10500	420	97	82-118	80-120
Neptunium 237	10900	950	54	1.0		NP	11900	480	92	85-115	80-120
Cobalt 60	24.6	0.58	0.25	0.050		GAM	25.2	1.0	98	77-123	80-120
Cesium 137	30.2	0.51	0.28	0.10		GAM	29.0	1.2	104	76-124	80-120

200-TW-1 & 2 - Soil Sampling

QC-LCS 39876

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/19/01

000032

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7070
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1481
Case no No. 630

Lab sample id R108152-07
Dept sample id 7070-007

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No 801-058

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
Plutonium 238	139000	12000	1100	1.0		PU	136000	5400	102	84-116	80-120
Plutonium 239/240	151000	13000	860	1.0		PU	145000	5800	104	83-117	80-120

200-TW-1 & 2 - Soil Sampling

QC-LCS #40129

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-10

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7070
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1481
Case no No. 630

Lab sample id R108152-10
Dept sample id 7070-010

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
Neptunium 237	106000	8100	430	1.0		NP	106000	4200	100	85-115	80-120

200-TW-1 & 2 - Soil Sampling

QC-LCS 40178

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVO-LCS
Version 3.06
Report date 11/19/01

000034

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-13

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7070

Contact Melissa C. Mannion

Client/Case no Hanford SDG H1481

Case no No. 630

Lab sample id R108152-13

Dept sample id 7070-013

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
Americium 241	100000	12000	1500	1.0		AM	95400	3800	105	79-121	80-120

200-TW-1 & 2 - Soil Sampling

QC-LCS 40213

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-05 B12C89

DUPLICATE

SDG 7070		Client/Case no Hanford	SDG H1481
Contact Melissa C. Mannion		Case no No. 630	
DUPLICATE	ORIGINAL		
Lab sample id R108152-05	Lab sample id R108152-01	Client sample id B12C89	
Dept sample id 7070-005	Dept sample id 7070-001	Location/Matrix B-7A/200 E	SOLID
	Received 08/29/01	Collected/Weight 08/23/01 01:30	463.0 g
% solids 88.3	% solids 88.3	Custody/SAF No B01-058-166	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	13.8	11	18	400	U	H	11.6	8.2	13	U	-	
Carbon 14	0.228	2.3	3.8	50	U	C	1.40	2.1	3.6	U	-	
Nickel 63	-47.9	530	910	30	U	NI_L	-175	540	920	U	-	
Total Strontium	963000	6100	320	1.0		SR	940000	6200	330		2	21
Technetium 99	25.5	2.3	2.2	15		TC	32.9	3.6	4.0		25	31
Thorium 228	-31.0	62	140		U	TH	0	23	54	U	-	
Thorium 230	-23.1	62	110	1.0	U	TH	-11.2	56	99	U	-	
Thorium 232	7.69	15	59	1.0	U	TH	5.61	11	43	U	-	
Total Uranium (ug/g)	51.4	5.4	0.28	0.10	B	U_T	51.3	5.4	0.28	B	0	29
Uranium 233	11.7	23	45	1.0	U	U	-40.0	40	150	U	-	
Uranium 235	0	14	54	1.0	U	U	0	48	190	U	-	
Uranium 238	11.7	23	45	1.0	U	U	60.0	80	150	U	-	
Potassium 40	218	91	84			GAM	236	51	47		8	76
Cobalt 60	U		9.2	0.050	U	GAM	U		6.1	U	-	
Cesium 137	103000	200	47	0.10		GAM	102000	100	31		1	32
Radium 226	U		61	0.10	U	GAM	U		49	U	-	
Radium 228	U		48	0.20	U	GAM	U		31	U	-	
Europium 152	U		170	0.10	U	GAM	U		110	U	-	
Europium 154	182	39	36	0.10		GAM	200	25	21		9	48
Europium 155	U		220	0.10	U	GAM	U		200	U	-	
Thorium 228	U		73		U	GAM	U		48	U	-	
Thorium 232	U		48		U	GAM	U		31	U	-	
Uranium 235	U		190		U	GAM	U		130	U	-	
Uranium 238	U		1900		U	GAM	U		1200	U	-	
Americium 241	4920	81	110			GAM	4920	53	70		0	32

200-TW-1 & 2 - Soil Sampling

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-09 B12C89

DUPLICATE

SDG 7070		Client/Case no Hanford	SDG H1481
Contact Melissa C. Mannion		Case no No. 630	
DUPLICATE	ORIGINAL		
Lab sample id R108152-09	Lab sample id R108152-01	Client sample id B12C89	
Dept sample id 7070-009	Dept sample id 7070-001	Location/Matrix B-7A/200 E	SOLID
	Received 08/29/01	Collected/Weight 08/23/01 01:30	463.0 g
% solids 88.3	% solids 88.3	Custody/SAF No B01-058-166	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
Plutonium 238	777	670	850	1.0	U	PU	481	480	920	U	-		
Plutonium 239/240	158000	14000	850	1.0		PU	153000	14000	920		3	22	

200-TW-1 & 2 - Soil Sampling

QC-DUP#1A1 40131

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-12 B12C89

DUPLICATE

SDG	7070			Client/Case no	Hanford SDG H1481
Contact	Melissa C. Marnion			Case no	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R108152-12	Lab sample id	R108152-01	Client sample id	B12C89
Dept sample id	7070-012	Dept sample id	7070-001	Location/Matrix	B-7A/200 E SOLID
		Received	08/29/01	Collected/Weight	08/23/01 01:30 463.0 g
% solids	88.3	% solids	88.3	Custody/SAF No	B01-058-166 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
Neptunium 237	398	400	600	1.0	U	NP	24.3	97	190	U	-		

200-TW-1 & 2 - Soil Sampling

QC-DUP#1A1 40180

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-15

B12C89

DUPLICATE

SDG	7070			Client/Case no	Hanford SDG H1481
Contact	Melissa C. Mannion			Case no	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R108152-15	Lab sample id	R108152-01	Client sample id	B12C89
Dept sample id	7070-015	Dept sample id	7070-001	Location/Matrix	B-7A/200 E SOLID
		Received	08/29/01	Collected/Weight	08/23/01 01:30 463.0 g
% solids	88.3	% solids	88.3	Custody/SAF No	B01-058-166 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	6380	950	610	1.0		AM	5690	1600	870		11	47	

200-TW-1 & 2 - Soil Sampling

QC-DUP#1A1 40215

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1481

R108152-06 B12C89

MATRIX SPIKE

SDG	7070		Client/Case no	Hanford	SDG H1481
Contact	Melissa C. Mannion		Case no	No. 630	
MATRIX SPIKE		ORIGINAL			
Lab sample id	R108152-06	Lab sample id	R108152-01	Client sample id	B12C89
Dept sample id	7070-006	Dept sample id	7070-001	Location/Matrix	B-7A/200 E SOLID
		Received	08/29/01	Collected/Weight	08/23/01 01:30 463.0 g
		% solids	88.3	Custody/SAF No	B01-058-166 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	7560	76	17	400	X	H	9550	380	11.6	8.2	79	87-113	60-140

200-TW-1 & 2 - Soil Sampling

QC-MS#1 39879

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 11/19/01