



EBERLINE
SERVICES

July 17, 2006

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R6-05-142-7448, SDG H3419

Dear Mr. Trent:

Enclosed is the data report for two solid (soil) samples designated under SAF No. F06-005 received at Eberline Services on May 17, 2006. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM/njv

Enclosure: Data Package



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1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H3416 was composed of two solid (soil) samples designated under SAF No. F06-005 with a Project Designation of: 216-Z-9 Trench Slant Characterization Borehole-Soil.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analysis

The relative percent difference in the original and duplicate results was 90%, greater than the 3σ total limit of 62%, the DER was 4.4. No other problems were encountered during the course of the analyses.

2.3 Technetium-99 Analysis

No problems were encountered during the course of the analyses.

2.4 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

2.5 Neptunium-237 Analysis

No problems were encountered during the course of the analyses.

2.6 Gamma Spectroscopy

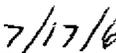
No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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



Melissa C. Mannion
Senior Program Manager



Date

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3419

SDG 7448
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG_H3419

S U M M A R Y D A T A S E C T I O N

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Prepared by

Melissa Mannion
Reviewed by

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 07/14/06

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H3419

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

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SUMMARY DATA SECTION

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H3419

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

REPORT GUIDES

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SUMMARY DATA SECTION

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
 Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H3419

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
BlHK62	C3427, Slant, I-23	SOLID		R605142-01	F06-005	F06-005-072	04/24/06 09:45
BlHK67	C3427SlantI-24,131.5-133	SOLID		R605142-02	F06-005	F06-005-080	04/27/06 08:40
QC-DUP#1 57301	C3427, Slant, I-23	SOLID		R605142-05	F06-005		04/24/06 09:45
Method Blank		SOLID		R605142-04	F06-005		
Lab Control Sample		SOLID		R605142-03	F06-005		

SAMPLE SUMMARY

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SUMMARY DATA SECTION

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
 Contact Melissa C. Marnion

QC SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H3419

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7448	F06-005-072	BLHK62	SOLID	80.6	279 g		05/17/06 23	R605142-01	7448-001
	F06-005-080	BLHK67	SOLID	83.4	117 g		05/17/06 20	R605142-02	7448-002
		QC-DUP#1 57301	SOLID	80.6	279 g		05/17/06 23	R605142-05	7448-005
		Method Blank	SOLID					R605142-04	7448-004
		Lab Control Sample	SOLID					R605142-03	7448-003

QC SUMMARY

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
 Contact Melissa C. Marnion

PREP BATCH SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H3419

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED			QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE BLANK		LCS
Alpha Spectroscopy									
NP	SOLID	Neptunium in Solids	7H93-017	5.0	2		1	1	1/1
TH	SOLID	Thorium, Isotopic in Solids	7H93-017	5.0	2		1	1	1/1
Beta Counting									
SR	SOLID	Total Strontium in Solids	7193-017	10.0	2		1	1	1/1
TC	SOLID	Technetium 99 in Solids	7193-017	10.0	2		1	1	1/1
Gamma Spectroscopy									
GAM	SOLID	Gamma Scan	7H93-017	15.0	2		1	1	1/1
Liquid Scintillation Counting									
H	SOLID	Tritium in Solids	7193-017	10.0	2		1	1	1/1

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

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SAMPLE DELIVERY GROUP H3419

SDG 744B
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Case no SDG H3419

WORK SUMMARY

CLIENT SAMPLE ID	MATRIX	LAB SAMPLE ID	COLLECTED	TEST	SUP-	ANALYZED	REVIEWED	BY	METHOD
LOCATION		RECEIVED	PLANCHET		FLX				
CUSTODY	SAF No								
B1HK62		R605142-01	7448-001	GAM		07/04/06	07/07/06	CSS	Gamma Scan
C3427, Slant, I-23	SOLID	04/24/06	7448-001	H		06/23/06	06/30/06	BW	Tritium in Solids
F06-005-072	F06-005	05/17/06	7448-001	NP		06/28/06	07/02/06	MWT	Neptunium in Solids
			7448-001	SR		06/26/06	07/07/06	BW	Total Strontium in Solids
			7448-001	TC		06/29/06	07/13/06	MWT	Technetium 99 in Solids
			7448-001	TH		06/24/06	06/29/06	BW	Thorium, Isotopic in Solids
B1HK67		R605142-02	7448-002	GAM		07/04/06	07/07/06	CSS	Gamma Scan
C3427SlantI-24, 131.5-133	SOLID	04/27/06	7448-002	H		06/23/06	06/30/06	BW	Tritium in Solids
F06-005-080	F06-005	05/17/06	7448-002	NP		06/28/06	07/02/06	MWT	Neptunium in Solids
			7448-002	SR		06/26/06	07/07/06	BW	Total Strontium in Solids
			7448-002	TC		06/29/06	07/13/06	MWT	Technetium 99 in Solids
			7448-002	TH		06/24/06	06/29/06	BW	Thorium, Isotopic in Solids
QC-DUP#1 57301		R605142-05	7448-005	GAM		07/06/06	07/07/06	CSS	Gamma Scan
C3427, Slant, I-23	SOLID	04/24/06	7448-005	H		06/23/06	06/30/06	BW	Tritium in Solids
	F06-005	05/17/06	7448-005	NP		06/28/06	07/02/06	MWT	Neptunium in Solids
			7448-005	SR		06/26/06	07/07/06	BW	Total Strontium in Solids
			7448-005	TC		06/29/06	07/13/06	MWT	Technetium 99 in Solids
			7448-005	TH		06/29/06	06/29/06	BW	Thorium, Isotopic in Solids
Method Blank		R605142-04	7448-004	GAM		07/05/06	07/07/06	CSS	Gamma Scan
	SOLID		7448-004	H		06/23/06	06/30/06	BW	Tritium in Solids
	F06-005		7448-004	NP		06/28/06	07/02/06	MWT	Neptunium in Solids
			7448-004	SR		06/26/06	07/07/06	BW	Total Strontium in Solids
			7448-004	TC		06/29/06	07/13/06	MWT	Technetium 99 in Solids
			7448-004	TH		06/24/06	06/29/06	BW	Thorium, Isotopic in Solids
Lab Control Sample		R605142-03	7448-003	GAM		07/05/06	07/07/06	CSS	Gamma Scan
	SOLID		7448-003	H		06/23/06	06/30/06	BW	Tritium in Solids
	F06-005		7448-003	NP		06/28/06	07/02/06	MWT	Neptunium in Solids
			7448-003	SR		06/26/06	07/07/06	BW	Total Strontium in Solids
			7448-003	TC		06/29/06	07/13/06	MWT	Technetium 99 in Solids
			7448-003	TH		06/24/06	06/29/06	BW	Thorium, Isotopic in Solids

WORK SUMMARY

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
 Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
 Contract No. 630
 Case no SDG H3419

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAP No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
GAM	F06-005	Gamma Scan	GAMMA_GS	2			1	1	1	5
H	F06-005	Tritium in Solids	TRITIUM_COX_LSC	2			1	1	1	5
NP	F06-005	Neptunium in Solids	NP237_LLE_PLATE_AEA	2			1	1	1	5
SR	F06-005	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	2			1	1	1	5
TC	F06-005	Technetium 99 in Solids	TC99_TR_SEP_GPC	2			1	1	1	5
TH	F06-005	Thorium, Isotopic in Solids	THISO_IE_PLATE_AEA	2			1	1	1	5
TOTALS				12			6	6	6	30

WORK SUMMARY

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3419

R605142-04

Method Blank

METHOD BLANK

SDG <u>7448</u>	Client/Case no <u>Hanford</u>	SDG <u>H3419</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R605142-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7448-004</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F06-Q05</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.466	1.7	2.9	400	U	H
Total Strontium	SR-RAD	0.014	0.088	0.18	1.0	U	SR
Technetium 99	14133-76-7	0.021	0.22	0.59	15	U	TC
Thorium 228	14274-82-9	0.117	0.16	0.30	1.0	U	TH
Thorium 230	14269-63-7	<u>0.427</u>	0.31	0.30	1.0		TH
Thorium 232	TH-232	-0.039	0.078	0.30	1.0	U	TH
Neptunium 237	13994-20-2	0	0.049	0.073	1.0	U	NP
Potassium 40	13966-00-2	U		1.1		U	GAM
Cobalt 60	10198-40-0	U		<u>0.11</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.077	0.10	U	GAM
Radium 226	13982-63-3	U		<u>0.16</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>0.36</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.15</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.33</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.12</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.086		U	GAM
Thorium 232	TH-232	U		0.36		U	GAM
Uranium 235	15117-96-1	U		0.21		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.067		U	GAM

216Z9 Trnch.Slant Charact.Brhle-Soil

QC-BLANK 57300

Lab id <u>EBRLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

R605142-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7448</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> SDG <u>H3419</u> Contract <u>No. 630</u>
Lab sample id <u>R605142-03</u> Dept sample id <u>7448-003</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>F06-005</u>

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	%	(TOTAL)	LIMITS
Tritium	875	9.7	2.9	400	H	913	37	96	84-116	80-120
Total Strontium	10.7	0.50	0.19	1.0	SR	9.77	0.39	110	81-119	80-120
Technetium 99	116	2.4	0.42	15	TC	120	4.8	97	84-116	80-120
Thorium 230	45.2	5.3	0.37	1.0	B TH	44.4	1.8	102	80-120	80-120
Neptunium 237	19.2	1.4	0.065	1.0	NP	21.8	0.87	88	87-113	80-120
Cobalt 60	5.68	0.39	<u>0.26</u>	0.050	GAM	5.56	0.22	102	74-126	80-120
Cesium 137	4.83	0.27	<u>0.20</u>	0.10	GAM	5.88	0.24	82	79-121	80-120

216Z9 Trnch.Slant Charact.Brhle-Scil

QC-LCS 57299

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

R605142-05

B1HK62

DUPLICATE

SDG <u>7448</u> Contact <u>Melissa C. Mannion</u> Duplicates Lab sample id <u>R605142-05</u> Dept sample id <u>7448-005</u> Client samp id <u>QC-DUP#1 57301</u> % solids <u>80.6</u>	Client/Case no <u>Hanford</u> SDG <u>H3419</u> Contract No. <u>630</u> ORIGINAL Lab sample id <u>R605142-01</u> Dept sample id <u>7448-001</u> Received <u>05/17/06</u> % solids <u>80.6</u>	Client sample id <u>B1HK62</u> Location/Matrix <u>C3427, Slant, I-23</u> SOLID Collected/Weight <u>04/24/06 09:45</u> <u>279 g</u> Custody/SAF No <u>F06-005-072</u> <u>F06-005</u>
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ANALYTE	DUPLICATE		MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL		MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	DER σ
	pCi/g	2σ ERR (COUNT)					pCi/g	2σ ERR (COUNT)					
Tritium	0.474	1.5	2.5	400	U	H	0.827	1.5	2.5	U	-	62	0.3
Total Strontium	0.579	0.13	0.16	1.0		SR	0.220	0.078	0.11	U	90	62	4.4
Technetium 99	0.130	0.23	0.60	15	U	TC	0.253	0.26	0.62	U	-	61	0.7
Thorium 228	2.03	0.52	0.24	1.0		TH	1.46	0.44	0.23		33	60	1.6
Thorium 230	0.673	0.31	0.23	1.0	B	TH	1.57	0.50	0.23	B	80	80	3.0
Thorium 232	1.59	0.44	0.23	1.0		TH	1.42	0.44	0.23		11	63	0.5
Neptunium 237	0	0.071	0.11	1.0	U	NP	0.020	0.040	0.061	U	-	61	0.5
Potassium 40	17.9	2.7	1.9			GAM	16.2	1.9	1.5		10	43	0.7
Cobalt 60	U		0.17	0.050	U	GAM	U		0.13	U	-	61	0.4
Cesium 137	U		0.11	0.10	U	GAM	U		0.091	U	-	61	0.3
Radium 226	1.14	0.26	0.25	0.10		GAM	0.907	0.24	0.23		23	61	1.1
Radium 228	1.75	0.67	0.65	0.20		GAM	1.37	0.51	0.51		24	87	0.8
Europium 152	U		0.23	0.10	U	GAM	U		0.20	U	-	61	0.2
Europium 154	U		0.53	0.10	U	GAM	U		0.40	U	-	61	0.4
Europium 155	U		0.21	0.10	U	GAM	U		0.19	U	-	61	0.1
Thorium 228	1.64	0.19	0.17			GAM	1.53	0.14	0.13		7	39	0.5
Thorium 232	1.75	0.67	0.65			GAM	1.37	0.51	0.51		24	87	0.8
Uranium 235	U		0.35		U	GAM	U		0.27	U	-	61	0.4
Uranium 238	U		17		U	GAM	U		14	U	-	61	0.3
Americium 241	0.851	0.11	0.13			GAM	0.777	0.086	0.10		9	41	0.7

21629 Trnch.Slant Charact.Brhle-Soil

QC-DUP#1 57301

DUPLICATES

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SUMMARY DATA SECTION

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Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3419

R605142-01

B1HK62

DATA SHEET

SDG <u>7448</u>	Client/Case no <u>Hanford</u>	SDG <u>H3419</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R605142-01</u>	Client sample id <u>B1HK62</u>	
Dept sample id <u>7448-001</u>	Location/Matrix <u>C3427, Slant, I-23</u>	<u>SOLID</u>
Received <u>05/17/06</u>	Collected/Weight <u>04/24/06 09:45</u>	<u>279 g</u>
% solids <u>80.6</u>	Custody/SAP No <u>F06-005-072</u>	<u>F06-005</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.827	1.5	2.5	400	U	H
Total Strontium	SR-RAD	0.220	0.078	0.11	1.0		SR
Technetium 99	14133-76-7	0.253	0.26	0.62	15	U	TC
Thorium 228	14274-82-9	1.46	0.44	0.23	1.0		TH
Thorium 230	14269-63-7	1.57	0.50	0.23	1.0	B	TH
Thorium 232	TH-232	1.42	0.44	0.23	1.0		TH
Neptunium 237	13994-20-2	0.020	0.040	0.061	1.0	U	NP
Potassium 40	13966-00-2	16.2	1.9	1.5			GAM
Cobalt 60	10198-40-0	U		<u>0.13</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>0.091</u>	0.10	U	GAM
Radium 226	13982-63-3	0.907	0.24	<u>0.23</u>	0.10		GAM
Radium 228	15262-20-1	1.37	0.51	<u>0.51</u>	0.20		GAM
Europium 152	14683-23-9	U		<u>0.20</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.40</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.19</u>	0.10	U	GAM
Thorium 228	14274-82-9	1.53	0.14	0.13			GAM
Thorium 232	TH-232	1.37	0.51	0.51			GAM
Uranium 235	15117-96-1	U		0.27		U	GAM
Uranium 238	U-238	U		14		U	GAM
Americium 241	14596-10-2	0.777	0.086	0.10			GAM

216Z9 Trnch.Slant Charact.Brhle-Soil

DATA SHEETS

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SUMMARY DATA SECTION

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Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>07/14/06</u>

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3419

R605142-02

B1HK67

DATA SHEET

SDG <u>7448</u>	Client/Case no <u>Hanford</u>	SDG <u>H3419</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R605142-02</u>	Client sample id <u>B1HK67</u>	
Dept sample id <u>7448-002</u>	Location/Matrix <u>C3427SlantI-24,131.5-133 SOLID</u>	
Received <u>05/17/06</u>	Collected/Weight <u>04/27/06 08:40 117 g</u>	
% solids <u>83.4</u>	Custody/SAF No <u>F06-005-080 F06-005</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.424	1.4	2.4	400	U	H
Total Strontium	SR-RAD	1.18	0.17	0.15	1.0		SR
Technetium 99	14133-76-7	0.196	0.23	0.55	15	U	TC
Thorium 228	14274-82-9	0.542	0.30	0.29	1.0		TH
Thorium 230	14269-63-7	2.70	0.64	0.23	1.0	B	TH
Thorium 232	TH-232	0.451	0.24	0.23	1.0		TH
Neptunium 237	13994-20-2	0.022	0.044	0.065	1.0	U	NP
Potassium 40	13966-00-2	2.22	0.97	0.90			GAM
Cobalt 60	10198-40-0	U		<u>0.067</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.062	0.10	U	GAM
Radium 226	13982-63-3	2.16	0.18	<u>0.16</u>	0.10		GAM
Radium 228	15262-20-1	U		<u>0.29</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.16</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.20</u>	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.291	0.11	0.080			GAM
Thorium 232	TH-232	U		0.29		U	GAM
Uranium 235	15117-96-1	U		0.36		U	GAM
Uranium 238	U-238	U		7.6		U	GAM
Americium 241	14596-10-2	6.29	0.11	0.080			GAM

21629 Trnch.Slant Charact.Brhle-Soil

DATA SHEETS

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

Test NP Matrix SOLID
 SDG 7448
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Contract SDG H3419

METHOD SUMMARY

NEPTUNIUM IN SOLIDS
 ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Neptunium
				237
Preparation batch 7H93-017				
B1HK62	R605142-01		7448-001	U
B1HK67	R605142-02		7448-002	U
QC-DUP#1 57301	R605142-05		7448-005	- U
Method Blank	R605142-04		7448-004	U
Lab Control Sample	R605142-03		7448-003	ok

Nominal values and limits from method RDLs (pCi/g) 1.0
 216Z9 Trnch.Slant Charact.Brhle-Soil

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7H93-017 2σ prep error 5.0 % Reference Lab Notebook 7193 pg. 17																
B1HK62	R605142-01		0.061	0.500				67		187			65	06/27/06	06/28	SS-055
B1HK67	R605142-02		0.065	0.500				64		187			62	06/27/06	06/28	SS-056
QC-DUP#1 57301	R605142-05		0.11	0.500				59		132			65	06/27/06	06/28	SS-032
Method Blank	R605142-04		0.073	0.500				62		187				06/27/06	06/28	SS-058
Lab Control Sample	R605142-03		0.065	0.500				64		187				06/27/06	06/28	SS-057

Nominal values and limits from method 1.0 0.500 20-105 100 180

PROCEDURES REFERENCE NP237_ILLE_PLATE_AEA
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5
 CP-930 Neptunium from Solids and Water by Extraction Chromatography, rev 1
 CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD MDA 0.075 ± 0.040
 FOR 5 SAMPLES YIELD 63 ± 6

METHOD SUMMARIES

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 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 07/14/06

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Test TH Matrix SOLID

SDG 7448

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Contract SDG H3419

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Thorium 230
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Preparation batch 7H93-017

BlHK62	R605142-01	7448-001	1.57
BlHK67	R605142-02	7448-002	2.70
QC-DUP#1 57301	R605142-05	7448-005	ok
Method Blank	R605142-04	7448-004	<u>0.427</u>
Lab Control Sample	R605142-03	7448-003	ok

Nominal values and limits from method RDLs (pCi/g) 1.0
21629 Trnch.Slant Charact.Brhle-Soil

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MAX MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT keV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
------------------	---------------	--------------	------------	-----------	--------	----------	------------	---------	-------	-----------	----------	-----------	-----------	----------------	------	----------

Preparation batch 7H93-017 2σ prep error 5.0 % Reference Lab Notebook 7193 pg. 17

BlHK62	R605142-01	0.23	0.250	95	160	61	06/23/06	06/24	SS-037
BlHK67	R605142-02	0.29	0.250	92	160	58	06/23/06	06/24	SS-038
QC-DUP#1 57301	R605142-05	0.24	0.250	90	201	66	06/23/06	06/29	SS-060
Method Blank	R605142-04	0.30	0.250	85	163		06/23/06	06/24	SS-042
Lab Control Sample	R605142-03	0.37	0.250	77	162		06/23/06	06/24	SS-040

Nominal values and limits from method 1.0 0.250 20-105 150 180

PROCEDURES	REFERENCE	THISO IE_PLATE_AEA
SPP-073	Soil Leaching 10-200 g Aliquot, rev 0	
CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1	
CP-008	Heavy Element Electroplating, rev 9	

AVERAGES ± 2 SD	MDA <u>0.29</u> ± <u>0.11</u>
FOR 5 SAMPLES	YIELD <u>88</u> ± <u>14</u>

METHOD SUMMARIES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

Test SR Matrix SOLID
 SDG 7448
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Contract SDG H3419

METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Total Strontium
Preparation batch 7193-017				
B1HK62	R605142-01		7448-001	0.220
B1HK67	R605142-02		7448-002	1.18
QC-DUP#1 57301	R605142-05		7448-005	<u>OUT</u>
Method Blank	R605142-04		7448-004	U
Lab Control Sample	R605142-03		7448-003	ok

Nominal values and limits from method RDLs (pCi/g) 1.0
 21629 Trnch.Slant Charact.Brhle-Soil

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 7193-017 2σ prep error 10.0 % Reference Lab Notebook 7193 pg. 17																
B1HK62	R605142-01		0.11	1.00				99		100			63	06/26/06	06/26	GRB-203
B1HK67	R605142-02		0.15	1.00				103		100			60	06/26/06	06/26	GRB-202
QC-DUP#1 57301	R605142-05		0.16	1.00				100		100			63	06/26/06	06/26	GRB-203
Method Blank	R605142-04		0.18	1.00				92		100				06/26/06	06/26	GRB-221
Lab Control Sample	R605142-03		0.19	1.00				95		100				06/26/06	06/26	GRB-225
Nominal values and limits from method			1.0	1.00				30-105		100			180			

PROCEDURES REFERENCE SRTOT_SEP_PRECIP_GPC
 SPP-073 Soil Leaching 10-200 g Aliquot, rev 0
 CP-383 Strontium in Dissolved Solid of < 5.0g Aliquot, rev 1

AVERAGES ± 2 SD MDA 0.16 ± 0.062
 FOR 5 SAMPLES YIELD 98 ± 9

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

Test TC Matrix SOLID
 SDG 7448
 Contact Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOLIDS

BETA COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H3419

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Technetium 99
Preparation batch 7193-017					
B1HK62	R605142-01			7448-001	U
B1HK67	R605142-02			7448-002	U
QC-DUP#1 57301	R605142-05			7448-005	- U
Method Blank	R605142-04			7448-004	U
Lab Control Sample	R605142-03			7448-003	ok

Nominal values and limits from method RDLs (pCi/g) 15
 216Z9 Trnch.Slant Charact.Brnhle-Soil

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP PAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 7193-017 2σ prep error 10.0 % Reference Lab Notebook 7193 pg. 17																
B1HK62	R605142-01			0.62	1.00			63		100		66	06/21/06	06/29	GRB-219	
B1HK67	R605142-02			0.55	1.00			63		100		63	06/21/06	06/29	GRB-220	
QC-DUP#1 57301	R605142-05			0.60	1.00			64		85		66	06/21/06	06/29	GRB-223	
Method Blank	R605142-04			0.59	1.00			64		85			06/21/06	06/29	GRB-222	
Lab Control Sample	R605142-03			0.42	1.00			94		85			06/21/06	06/29	GRB-221	

Nominal values and limits from method 15 1.00 20-105 50 180

PROCEDURES	REFERENCE	TC99_TR_SEP_GPC
SPP-062	Sample Aliquoting, rev 0	
CP-431	Technetium-99 Purification of Soil or Resin by Extraction Chromatography, rev 2	
CP-008	Heavy Element Electroplating, rev 9	

AVERAGES ± 2 SD	MDA <u>0.56</u> ± <u>0.16</u>
FOR 5 SAMPLES	YIELD <u>70</u> ± <u>27</u>

Lab id EBERLINE
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

Test GAM Matrix SOLID
 SDG 7448
 Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN
 GAMMA SPECTROSCOPY

Client Hanford
 Contract No. 630
 Contract SDG H3419

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Cobalt 60	Cesium 137
------------------	---------------	--------------	---------------	-----------	------------

Preparation batch 7H93-017

B1HK62	R605142-01	7448-001		U	U
B1HK67	R605142-02	7448-002		U	U
QC-DUP#1 57301	R605142-05	7448-005		- U	- U
Method Blank	R605142-04	7448-004		U	U
Lab Control Sample	R605142-03	7448-003		ok	ok

Nominal values and limits from method RDLs (pCi/g) 0.050 0.10
 216Z9 Trnch.Slant Charact.Brhle-Soil

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
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Preparation batch 7H93-017 2σ prep error 15.0 % Reference Lab Notebook 7193 pg. 17

B1HK62	R605142-01		<u>22</u>	54.7						671		71	06/17/06	07/04	PD,01,00
B1HK67	R605142-02		<u>13</u>	50.7						671		68	06/17/06	07/04	PD,07,00
QC-DUP#1 57301	R605142-05		<u>26</u>	54.7						449		73	06/17/06	07/06	PD,01,00
Method Blank	R605142-04		<u>19</u>	50.0						686			06/17/06	07/05	PD,01,00
Lab Control Sample	R605142-03		<u>0.26</u>	50.0						456			06/17/06	07/05	PD,01,00

Nominal values and limits from method 0.050 50.0 100 180

PROCEDURES REFERENCE GAMMA_CS
 SPP-100 Ge(Li) Preparation for Commercial Samples, rev 7

AVERAGES ± 2 SD MDA 16 ± 20
 FOR 5 SAMPLES YIELD _____ ± _____

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3419

Test H Matrix SOLID
 SDG 7448
 Contact Melissa C. Mannion

METHOD SUMMARY
 TRITIUM IN SOLIDS
 LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H3419

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Tritium
Preparation batch 7193-017				
B1HR62	R605142-01		7448-001	U
B1HR67	R605142-02		7448-002	U
QC-DUP#1 57301	R605142-05		7448-005	- U
Method Blank	R605142-04		7448-004	U
Lab Control Sample	R605142-03		7448-003	ok
Nominal values and limits from method				
21629 Trnch,Slant Charact.Brhle-Soil			RDLs (pCi/g)	400

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 7193-017 2σ prep error 10.0 % Reference Lab Notebook 7193 pg. 17																
B1HR62	R605142-01		2.5	0.350				100		150		60	06/23/06	06/23	LSC-004	
B1HR67	R605142-02		2.4	0.369				100		150		57	06/23/06	06/23	LSC-004	
QC-DUP#1 57301	R605142-05		2.5	0.350				100		150		60	06/23/06	06/23	LSC-004	
Method Blank	R605142-04		2.9	0.300				100		150			06/23/06	06/23	LSC-004	
Lab Control Sample	R605142-03		2.9	0.300				100		150			06/23/06	06/23	LSC-004	
Nominal values and limits from method																
			400	0.300						25			180			

PROCEDURES REFERENCE TRITIUM_COX_LSC
 CP-251 Tritium/Carbon-14 Oxidation, rev 8

AVERAGES ± 2 SD MDA 2.6 ± 0.48
 FOR 5 SAMPLES YIELD 100 ± 0

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H3419

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

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

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

REPORT GUIDES

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H3419

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

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

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG H3419

WORK SUMMARY

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

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448

Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford

Contract No. 630

Case no SDG H3419

DATA SHEET

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

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

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

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Form DVD-RG
Version 3.06
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3419

SDG 7448
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
 Contract No. 630
 Case no SDG H3419

DATA SHEET

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

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

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

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

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

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

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

P The RESULT is 'preliminary'.

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

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

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

The following values are underlined to indicate possible problems:

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

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DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

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

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

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

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 1. A fixed percentage specified in the protocol.

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DUPLICATE

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

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

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

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

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

- * The first, computed limits for the recovery reflect:

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

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

2. The error of ADDED.

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

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

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MATRIX SPIKE

for the recovery.

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

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

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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METHOD SUMMARY

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

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.
- * Aliquots are underlined if less than the nominal value specified for the method.
- * Preparation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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GUIDE, cont.

METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

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

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

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

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

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

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METHOD SUMMARY

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

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

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

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

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Fluor Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F06-005-072	PAGE 1 OF 1		
COLLECTOR Mokler/Pope/Pfister		COMPANY CONTACT TRENT, SJ		TELEPHONE NO. 373-5869	PROJECT COORDINATOR TRENT, SJ		PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days	
SAMPLING LOCATION C3427, Slant, I-23		PROJECT DESIGNATION 216-Z-9 Trench Slant Characterization Borehole - Soil H3419 (7448)			SAF NO. F06-005		AIR QUALITY <input type="checkbox"/>		
ICE CHEST NO. GRP-05-001		FIELD LOGBOOK NO. HNF-N-360-1		COA 121618E510	METHOD OF SHIPMENT FEDERAL EXPRESS				
SHIPPED TO Eberline Services		OFFSITE PROPERTY NO. SEE PTR # 17389			BILL OF LADING/AIR BILL NO. SEE PTR # 17389				
MATRIX* A=Air DL=Drum Lg=Drum DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION		None					
		TYPE OF CONTAINER		G/P					
		NO. OF CONTAINER(S)		1					
		VOLUME		250ml.					
		SPECIAL HANDLING AND/OR STORAGE		SAMPLE ANALYSIS		SEE ITEM (1) IN SPECIAL INSTRUCTIONS			
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B1HK62	SOIL	4/29/06	0945						
CHAIN OF POSSESSION				SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS			
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN		DATE/TIME	(1)Gamma Spec - Radium {Radium-226, Radium-228} Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232} Neptunium-237; Tritium - H3; 483 GRAMS DEPTH 128.5 - 130.5			
J. MOKLER		4/29/06-1040	D. T. REEF		4/29/06-1040				
D. T. REEF		4/27/06-1310	J. MOKLER		4/27/06-1310				
MO 745 FRIEZE		5-16-06/1025	D. TODAK / D		5-16-06/1025				
D. TODAK / D		5-16-06/1025	FED EX						
FED EX			FED EX		05/17/06 9:30				
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN		DATE/TIME				
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN		DATE/TIME				
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN		DATE/TIME				
LABORATORY SECTION		RECEIVED BY			TITLE	DATE/TIME			
FINAL SAMPLE DISPOSITION		DISPOSAL METHOD			DISPOSED BY	DATE/TIME			

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Fluor Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F06-005-080	PAGE 1 OF 1				
COLLECTOR Mokler/Pope/Pfister		COMPANY CONTACT TRENT, SJ		TELEPHONE NO. 373-5869		PROJECT COORDINATOR TRENT, SJ					
SAMPLING LOCATION C3427, Slant, I-24 131.5-133'		PROJECT DESIGNATION 216-Z-9 Trench Slant Characterization Borehole - Soil		SAF NO. F06-005		PRICE CODE BN DATA TURNAROUND 45 Days / 45 Days					
ICE CHEST NO. GRP-05-001		FIELD LOGBOOK NO. HNF-N-360-1		COA 121618ES10		METHOD OF SHIPMENT FEDERAL EXPRESS					
SHIPPED TO Eberline Services		OFFSITE PROPERTY NO. SEE PTR #17389				BILL OF LADING/AIR BILL NO. SEE PTR #17389					
MATRIX* A=Air DL=Drum L=Liquid DS=Drum S=Soil L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS 462g 263g = 257 263-122 = 141g SOIL		PRESERVATION None								
			TYPE OF CONTAINER G/P								
			NO. OF CONTAINER(S) 1								
			VOLUME 250ml 120ml								
	SPECIAL HANDLING AND/OR STORAGE		SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS								
SAMPLE NO.		MATRIX*		SAMPLE DATE		SAMPLE TIME					
B1HK67		SOIL		4/27/06		0840					
CHAIN OF POSSESSION				SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS			
RELINQUISHED BY/REMOVED FROM R. PFISTER/Pope		DATE/TIME 4/27/06 1005		RECEIVED BY/STORED IN 29 SITE FRIG		DATE/TIME 4/27/06 1005		(1)Gamma Spec - Radium {Radium-226, Radium-228} Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232} Neptunium-237; Tritium - H3; * SHIP WITH PREVIOUS INTERVALS TO PROVIDE QC VOLUME			
RELINQUISHED BY/REMOVED FROM 2-9 Site Fridge		DATE/TIME 5-16-06/0750		RECEIVED BY/STORED IN Kevin Hughes		DATE/TIME 5-16-06/0750					
RELINQUISHED BY/REMOVED FROM K. HUGHES		DATE/TIME 5-16-06/0840		RECEIVED BY/STORED IN MO 745 FRIDGE #3		DATE/TIME 5-16-06/0840					
RELINQUISHED BY/REMOVED FROM MO-745 FRIDGE		DATE/TIME 05-16-06/1025		RECEIVED BY/STORED IN D. T. DAK / D 3		DATE/TIME 5-16-06/1025					
RELINQUISHED BY/REMOVED FROM D. T. DAK /		DATE/TIME 5-16-06/1025		RECEIVED BY/STORED IN FEO EX		DATE/TIME					
RELINQUISHED BY/REMOVED FROM FEO EX		DATE/TIME		RECEIVED BY/STORED IN FEO EX		DATE/TIME 05/17/06 9:30					
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME					
LABORATORY SECTION		RECEIVED BY				TITLE				DATE/TIME	
FINAL SAMPLE DISPOSITION		DISPOSAL METHOD				DISPOSED BY				DATE/TIME	



RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: F. HANFORD City METLAND State WA
 Date/Time received 05/17/06 09:30 CoC No. 706-005-071,072,079,080
 Container I.D. No. GAP-85-001 Requested TAT (Days) 45 P.O. Received Yes [] No []

INSPECTION

1. Custody seals on shipping container intact? Yes No [] N/A []
2. Custody seals on shipping container dated & signed? Yes No [] N/A []
3. Custody seals on sample containers intact? Yes No [] N/A []
4. Custody seals on sample containers dated & signed? Yes No [] N/A []
5. Packing material is: Wet [] Dry
6. Number of samples in shipping container: 2 Sample Matrix S
7. Number of containers per sample: 3 (Or see CoC _____)
8. Samples are in correct container Yes No []
9. Paperwork agrees with samples? Yes No []
10. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels
11. Samples are: In good condition Leaking [] Broken Container [] Missing []
12. Samples are: Preserved [] Not preserved [] pH _____ Preservative _____
13. Describe any anomalies:

14. Was P.M. notified of any anomalies? Yes [] No [] Date _____
15. Inspected by [Signature] Date: 05/17/06 Time: 10:30

Customer Sample No.	cpm	mR/hr	Wipe	Customer Sample No.	cpm	mR/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____
 Alpha Meter Ser. No. _____ Calibration date _____
 Beta/Gamma Meter Ser. No. _____ Calibration date _____