



April 24, 2012

Mr. Scot Fitzgerald
CH2M Hill Plateau Remediation Company
P.O. Box 1600
Mail Stop – B6-06
Richland, WA 99352

Reference: **P.O. #33677**
Eberline Analytical S2-04-016-7661, SDG H4717

Dear Mr. Fitzgerald:

Enclosed is a data report for one solid (other solid) sample designated under SAF No. F11-031, received at Eberline Analytical on April 4, 2012. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Joseph Verville
Client Services Manager

NJV/mw

Enclosure: Case Narrative

1.0 GENERAL

CH2M Hill Plateau Remediation Company (CHPRC) Sample Delivery Group H4717 was composed of one solid (other solid) sample designated under SAF No. F11-031 with a Project Designation of: 200-PW-1 & 200-ZP-1 Spent GAC Canisters and Filters.

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

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses. The results for both the original and duplicate analyses were less than their respective MDA's therefore no RPD or statistical control limit is calculated.

2.2 Carbon-14 Analysis

No other problems were encountered during the course of the analyses. The results for both the original and duplicate analyses were less than their respective MDA's therefore no RPD or statistical control limit is calculated.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses. The results for both the original and duplicate analyses were less than their respective MDA's therefore no RPD or statistical control limit is calculated.

2.4 Technicium-99 Analysis

No problems were encountered during the course of the analyses. The results for both the original and duplicate analyses were less than their respective MDA's therefore no RPD or statistical control limit is calculated.

2.5 Selenium-79 Analysis

No problems were encountered during the course of the analyses. The results for both the original and duplicate analyses were less than their respective MDA's therefore no RPD or statistical control limit is calculated. Eberline analytical does not maintain a stock of Se-79 activity therefore no QC LCS analysis was performed.

2.6 Iodine-129 Analysis

No problems were encountered during the course of the analyses. The results for both the original and duplicate analyses were less than their respective MDA's therefore no RPD or statistical control limit is calculated.

2.7 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

2.8 Protactinium-231 Analysis

The original analytical batch results were rejected due to unacceptably low tracer yields. No problems were encountered during the course of the reanalyses. The results for both the original and duplicate analyses were less than their respective MDA's therefore no RPD or statistical control limit is calculated.

2.9 Total Uranium Analysis

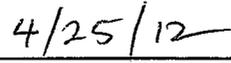
No problems were encountered during the course of the analyses.

3.0 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."



Joseph Verville
Client Services Manager



Date

APRIL 25, 2012
EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG_H4717

SUMMARY DATA SECTION

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Prepared by _____


Reviewed by _____

Lab id EBRLNE
Protocol F11-031
Version Ver 0.0
Form DVD-TOC
Version 3.06
Report date 04/24/12

APRIL 25, 2012

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

REPORT GUIDE

Client CHPRC
Contract No. 33677
Case no SDG H4717

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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Lab id EBRLNE
Protocol F11-031
Version Ver 0.0
Form DVD-RG
Version 3.06
Report date 04/24/12

APRIL 25, 2012

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

GUIDE, cont.

Client CHPRC
Contract No. 33677
Case no SDG_H4717

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

Page 2

Lab id EBRLNE
Protocol F11-031
Version Ver 0.0
Form DVD-RG
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Report date 04/24/12

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
 Contact Joseph Verville

LAB SAMPLE SUMMARY

Client CHPRC
 Contract No. 33677
 Case no SDG H4717

LAB	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S204016-01	B2KFT0	ZP-1 SPENT GAC;COMPOSITE	SOLID		F11-031	F11-031-022	03/28/12 10:00
S204016-02	Lab Control Sample		SOLID		F11-031		
S204016-03	Method Blank		SOLID		F11-031		
S204016-04	Duplicate (S204016-01)	ZP-1 SPENT GAC;COMPOSITE	SOLID		F11-031		03/28/12 10:00
S204016-05	Lab Control Sample		SOLID		F11-031		
S204016-06	Method Blank		SOLID		F11-031		
S204016-07	Duplicate (S204016-01)	ZP-1 SPENT GAC;COMPOSITE	SOLID		F11-031		03/28/12 10:00

LAB SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol F11-031
 Version Ver 0.0
 Form DVD-LS
 Version 3.06
 Report date 04/24/12

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG H4717

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7661	F11-031-022	B2KFT0	SOLID	100.0	143.9 g		04/04/12	7	S204016-01	7661-001
		Method Blank	SOLID						S204016-03	7661-003
		Method Blank	SOLID						S204016-06	7661-006
		Lab Control Sample	SOLID						S204016-02	7661-002
		Lab Control Sample	SOLID						S204016-05	7661-005
		Duplicate (S204016-01)	SOLID	100.0	143.9 g		04/04/12	7	S204016-04	7661-004
		Duplicate (S204016-01)	SOLID	100.0	143.9 g		04/04/12	7	S204016-07	7661-007

QC SUMMARY

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Lab id EBRLNE
Protocol F11-031
Version Ver 0.0
Form DVD-QS
Version 3.06
Report date 04/24/12

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

PREP BATCH SUMMARY

Client CHPRC
Contract No. 33677
Case no SDG H4717

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Alpha Spectroscopy										
PA	SOLID	Pa 231 in Solids	7320-132	14.8	1			1	1	1/1
TH	SOLID	Thorium, Isotopic in Solids	7320-132	8.0	1			1	1	1/1
Beta Counting										
TC	SOLID	Technetium 99 in Solids	7320-132	13.2	1			1	1	1/1
Gamma Spectroscopy										
I	SOLID	Iodine 129 in Solids	7320-132	19.4	1			1	1	1/1
Kinetic Phosphorimetry										
U_T	SOLID	Uranium, Total in Solids	7320-132		1			1	1	1/1
Liquid Scintillation Counting										
C	SOLID	Carbon 14 in Solids	7320-132	10.0	1			1	1	1/1
H	SOLID	Tritium in Solids	7320-132	10.0	1			1	1	1/1
NI_L	SOLID	Nickel 63 in Solids	7320-132	11.2	1			1	1	1/1
SE_L	SOLID	Selenium 79 in Solids	7320-132	11.2	1			1		1/1

Blank, LCS, Duplicate and Spike planchets are those in the same preparation batch as some Client sample.

Lab id EBRLINE
Protocol F11-031
Version Ver 0.0
Form DVD-PBS
Version 3.06
Report date 04/24/12

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG H4717

LAB WORK SUMMARY

Table with columns: LAB SAMPLE, CLIENT SAMPLE ID, COLLECTED, LOCATION, RECEIVED, CUSTODY, SAF No, MATRIX, PLANCHET, TEST, SUF-FIX, ANALYZED, REVIEWED, BY, METHOD. Rows include samples S204016-01 through S204016-05 with various test results and dates.

Lab id EBRLNE
Protocol F11-031
Version Ver 0.0
Form DVD-LWS
Version 3.06
Report date 04/24/12

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG H4717

WORK SUMMARY, cont.

LAB SAMPLE	CLIENT SAMPLE ID	COLLECTED	LOCATION	MATRIX	SUF-	RECEIVED	CUSTODY	SAF No	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
S204016-06	Method Blank			SOLID				7661-006		PA	AOR3	04/20/12	04/24/12	BW	Pa 231 in Solids
				F11-031											
S204016-07	Duplicate (S204016-01)							7661-007		PA		04/23/12	04/24/12	BW	Pa 231 in Solids
	03/28/12		ZP-1 SPENT GAC;COMPOSITE	SOLID											
	04/04/12			F11-031											

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
C	F11-031	Carbon 14 in Solids	C14_LSC	1			1	1	1		4
H	F11-031	Tritium in Solids	TRITIUM_COX_LSC	1			1	1	1		4
I	F11-031	Iodine 129 in Solids	I129_SEP_LEPS_GS	1			1	1	1		4
NI_L	F11-031	Nickel 63 in Solids	NI63_LSC	1			1	1	1		4
PA	F11-031	Pa 231 in Solids	PA231_IE_PLATE_AEA	1			1	1	1		4
SE_L	F11-031	Selenium 79 in Solids	SE79_SEP_IE_LSC	1			1		1		3
TC	F11-031	Technetium 99 in Solids	TC99_TR_SEP_GPC	1			1	1	1		4
TH	F11-031	Thorium, Isotopic in Solids	THISO_IE_PLATE_AEA	1			1	1	1		4
U_T	F11-031	Uranium, Total in Solids	UTOT_KPA	1			1	1	1		4
TOTALS				9			9	8	9		35

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLINE
Protocol F11-031
Version Ver 0.0
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Version 3.06
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EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP H4717

7661-003

Method Blank

METHOD BLANK

SDG <u>7661</u>	Client/Case no <u>CHPRC</u>	SDG <u>H4717</u>
Contact <u>Joseph Verville</u>	Contract No. <u>33677</u>	
Lab sample id <u>S204016-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7661-003</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F11-031</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	17.0	65	111	400	U	H
Carbon 14	14762-75-5	15.1	42	<u>71.0</u>	50.0	U	C
Nickel 63	13981-37-8	-0.746	1.8	3.15	30.0	U	NI_L
Selenium-79	15758-45-9	-0.470	1.6	2.70	10.0	U	SE_L
Technetium 99	14133-76-7	-0.057	0.21	0.360	15.0	U	TC
Iodine 129	15046-84-1	-0.375	0.58	0.639	2.00	U	I
Thorium 228	14274-82-9	0.074	0.098	0.177	1.00	U	TH
Thorium 230	14269-63-7	0.049	0.27	0.363	1.00	U	TH
Thorium 232	TH-232	-0.024	0.024	0.117	1.00	U	TH
Total Uranium (ug/g)	7440-61-1	0	0.005	0.012	1.00	U	U_T

QC-BLANK #81469

Lab id <u>EBRLNE</u>
Protocol <u>F11-031</u>
Version <u>Ver 0.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/24/12</u>

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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4717

7661-006

Method Blank

METHOD BLANK

SDG <u>7661</u>	Client/Case no <u>CHPRC</u>	SDG <u>H4717</u>
Contact <u>Joseph Verville</u>	Contract <u>No. 33677</u>	
Lab sample id <u>S204016-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7661-006</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F11-031</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Protactinium 231	14331-85-2	0.020	0.045	0.076	1.00	U	PA

QC-BLANK #81583

Lab id <u>EBRLNE</u>
Protocol <u>F11-031</u>
Version <u>Ver 0.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/24/12</u>

METHOD BLANKS

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SUMMARY DATA SECTION

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

7661-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7661</u>	Client/Case no <u>CHPRC</u>	<u>SDG H4717</u>
Contact <u>Joseph Verville</u>	Contract No. <u>33677</u>	
Lab sample id <u>S204016-02</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7661-002</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F11-031</u>	

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 LMDS (TOTAL)	PROTOCOL LIMITS
Tritium	11200	280	103	400		H	11200	450	100	83-117	80-120
Carbon 14	35700	720	<u>152</u>	50.0		C	36200	1400	99	84-116	80-120
Nickel 63	233	6.3	3.13	30.0		NI_L	258	10	90	83-117	80-120
Technetium 99	122	3.9	0.914	15.0		TC	106	4.2	115	76-124	80-120
Iodine 129	54.9	1.4	0.590	2.00		I	56.9	2.3	96	71-129	80-120
Thorium 230	19.8	2.2	0.613	1.00		TH	18.9	0.76	105	78-122	80-120
Total Uranium (ug/g)	37.0	4.1	0.116	1.00		U_T	36.2	1.4	102	82-118	80-120

QC-LCS #81468

Lab id <u>EBRLNE</u>
Protocol <u>F11-031</u>
Version <u>Ver 0.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>04/24/12</u>

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

7661-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7661</u>	Client/Case no <u>CHPRC</u>	<u>SDG H4717</u>
Contact <u>Joseph Verville</u>	Contract No. <u>33677</u>	
Lab sample id <u>S204016-05</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7661-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F11-031</u>	

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 LMES (TOTAL)	PROTOCOL LIMITS
Protactinium 231	5.06	0.62	0.135	1.00	PA	4.54	0.18	112	67-133	80-120

QC-LCS #81582

Lab id <u>EBRLNE</u>
Protocol <u>F11-031</u>
Version <u>Ver 0.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>04/24/12</u>

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

7661-004

B2KFT0

DUPLICATE

SDG <u>7661</u>	Client/Case no <u>CHPRC</u>	<u>SDG H4717</u>
Contact <u>Joseph Verville</u>	Contract No. <u>33677</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>S204016-04</u>	Lab sample id <u>S204016-01</u>	Client sample id <u>B2KFT0</u>
Dept sample id <u>7661-004</u>	Dept sample id <u>7661-001</u>	Location/Matrix <u>ZP-1 SPENT GAC;COMPOSITE SOLID</u>
	Received <u>04/04/12</u>	Collected/Weight <u>03/28/12 10:00 143.9 g</u>
% solids <u>100.0</u>	% solids <u>100.0</u>	Custody/SAF No <u>F11-031-022 F11-031</u>

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	DER σ
Tritium	-3.18	63	109	400	U	H	-14.9	65	114	U	-	0.3	
Carbon 14	-22.1	39	<u>67.2</u>	50.0	U	C	-12.4	40	<u>68.5</u>	U	-	0.3	
Nickel 63	-1.47	1.8	3.18	30.0	U	NI_L	0.407	2.4	4.08	U	-	1.2	
Selenium-79	1.50	1.7	2.73	10.0	U	SE_L	0.262	1.8	3.02	U	-	1.0	
Technetium 99	-0.050	0.31	0.774	15.0	U	TC	0.206	0.32	0.758	U	-	1.1	
Iodine 129	-0.216	0.52	0.595	2.00	U	I	-0.259	0.60	0.654	U	-	0.1	
Thorium 228	0.230	0.092	0.110	1.00		TH	0.276	0.11	0.132		18	87 0.6	
Thorium 230	0.107	0.26	0.281	1.00	U	TH	0.329	0.29	0.309		102	269 1.1	
Thorium 232	0.183	0.076	0.058	1.00		TH	0.174	0.073	0.070		5	90 0.2	
Total Uranium (ug/g)	1.18	0.13	0.012	1.00		U_T	1.13	0.12	0.012		4	23 0.6	

QC-DUP#1 81470

200-PW-1 & 200-ZP-1 Spent GAC Canisters and Filters

Lab id <u>EBRLNE</u>
Protocol <u>F11-031</u>
Version <u>Ver 0.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>04/24/12</u>

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

7661-007

B2KFT0

DUPLICATE

SDG <u>7661</u>	Client/Case no <u>CHPRC</u>	<u>SDG H4717</u>
Contact <u>Joseph Verville</u>	Contract No. <u>33677</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>S204016-07</u>	Lab sample id <u>S204016-01</u>	Client sample id <u>B2KFT0</u>
Dept sample id <u>7661-007</u>	Dept sample id <u>7661-001</u>	Location/Matrix <u>ZP-1 SPENT GAC;COMPOSITE SOLID</u>
	Received <u>04/04/12</u>	Collected/Weight <u>03/28/12 10:00 143.9 g</u>
% solids <u>100.0</u>	% solids <u>100.0</u>	Custody/SAF No <u>F11-031-022 F11-031</u>

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	DER σ
Protactinium 231	0.026	0.051	0.098	1.00	U	PA	0.016	0.063	0.151	U	-		0.2

QC-DUP#1 81584

200-PW-1 & 200-ZP-1 Spent GAC Canisters and Filters

DUPLICATES

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SUMMARY DATA SECTION

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Report date <u>04/24/12</u>

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EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP H4717

7661-001

B2KFT0

DATA SHEET

SDG <u>7661</u>	Client/Case no <u>CHPRC</u>	SDG <u>H4717</u>
Contact <u>Joseph Verville</u>	Contract <u>No. 33677</u>	
Lab sample id <u>S204016-01</u>	Client sample id <u>B2KFT0</u>	
Dept sample id <u>7661-001</u>	Location/Matrix <u>ZP-1 SPENT GAC;COMPOSITE SOLID</u>	
Received <u>04/04/12</u>	Collected/Weight <u>03/28/12 10:00 143.9 g</u>	
% solids <u>100.0</u>	Custody/SAF No <u>F11-031-022 F11-031</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-14.9	65	114	400	U	H
Carbon 14	14762-75-5	-12.4	40	<u>68.5</u>	50.0	U	C
Nickel 63	13981-37-8	0.407	2.4	4.08	30.0	U	NI_L
Selenium-79	15758-45-9	0.262	1.8	3.02	10.0	U	SE_L
Technetium 99	14133-76-7	0.206	0.32	0.758	15.0	U	TC
Iodine 129	15046-84-1	-0.259	0.60	0.654	2.00	U	I
Thorium 228	14274-82-9	0.276	0.11	0.132	1.00		TH
Thorium 230	14269-63-7	0.329	0.29	0.309	1.00		TH
Thorium 232	TH-232	0.174	0.073	0.070	1.00		TH
Total Uranium (ug/g)	7440-61-1	1.13	0.12	0.012	1.00		U_T
Protactinium 231	14331-85-2	0.016	0.063	0.151	1.00	U	PA

200-PW-1 & 200-ZP-1 Spent GAC Canisters and Filters

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DATA SHEETS

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

Test PA Matrix SOLID
SDG 7661
Contact Joseph Verville

LAB METHOD SUMMARY

PA 231 IN SOLIDS
ALPHA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4717

RESULTS

LAB RAW SUP- Protactinium
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID 231

Preparation batch 7320-132

Table with 5 columns: Sample ID, Test Fix, Planchet, Client Sample ID, and Protactinium. Rows include S204016-01, S204016-05, S204016-06, and S204016-07.

Nominal values and limits from method RDLs (pCi/g) 1.00

METHOD PERFORMANCE

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

Preparation batch 7320-132 2 sigma prep error 14.8 % Reference Lab Notebook No. 7301 pg. 61

Table with 13 columns: Sample ID, Test Fix, Client Sample ID, MDA, Aliq, Prep, Dilu, Yield, Eff, Count, FWHM, Drift, Days, and Anal. Rows include S204016-01, S204016-05, S204016-06, and S204016-07.

Nominal values and limits from method 1.00 0.200 30-110 50 180

Table with 3 columns: PROCEDURES, REFERENCE, and PA231_IE_PLATE_AEA. Rows describe SPP-061, SPP-070, CP-910, and CP-008 procedures.

Table with 2 columns: AVERAGES +/- 2 SD FOR 4 SAMPLES and MDA/YIELD values (0.115 +/- 0.068, 60 +/- 16).

METHOD SUMMARIES

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Lab id EBRLINE
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

Test TH Matrix SOLID
 SDG 7661
 Contact Joseph Verville

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOLIDS
 ALPHA SPECTROSCOPY

Client CHPRC
 Contract No. 33677
 Contract SDG H4717

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Thorium 228 Thorium 230 Thorium 232

Preparation batch 7320-132

S204016-01		7661-001	B2KFT0	0.276	0.329	0.174
S204016-02		7661-002	Lab Control Sample		ok	
S204016-03		7661-003	Method Blank	U	U	U
S204016-04		7661-004	Duplicate (S204016-01)	ok	ok U	ok

Nominal values and limits from method RDLs (pCi/g) 1.00 1.00 1.00

METHOD PERFORMANCE

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

Preparation batch 7320-132 2σ prep error 8.0 % Reference Lab Notebook No. 7301 pg. 61

S204016-01		B2KFT0	0.309	0.250			64	884			19	04/13/12	04/16	SS-052
S204016-02		Lab Control Sample	0.613	0.250			83	193				04/13/12	04/14	SS-046
S204016-03		Method Blank	0.363	0.250			52	884				04/13/12	04/16	SS-053
S204016-04		Duplicate (S204016-01)	0.281	0.250			84	884			19	04/13/12	04/16	SS-054

Nominal values and limits from method 1.00 0.250 30-110 150 180

PROCEDURES REFERENCE THISO_IE_PLATE_AEA
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 1
 CP-900 Thorium in Water and Dissolved Solid Samples by
 Extraction Chromatography, rev 5
 CP-008 Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD MDA 0.392 ± 0.303
 FOR 4 SAMPLES YIELD 71 ± 31

METHOD SUMMARIES

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOLIDS

BETA COUNTING

Test TC Matrix SOLID
 SDG 7661
 Contact Joseph Verville

Client CHPRC
 Contract No. 33677
 Contract SDG H4717

RESULTS

LAB	RAW	SUF-		Technetium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	99

Preparation batch 7320-132

S204016-01	7661-001	B2KFT0	U
S204016-02	7661-002	Lab Control Sample	ok
S204016-03	7661-003	Method Blank	U
S204016-04	7661-004	Duplicate (S204016-01)	- U

Nominal values and limits from method RDLs (pCi/g) 15.0

METHOD PERFORMANCE

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

Preparation batch 7320-132 2σ prep error 13.2 % Reference Lab Notebook No. 7301 pg. 61

S204016-01	B2KFT0	0.758	1.03	32	200	17	04/11/12	04/14	GRB-230
S204016-02	Lab Control Sample	0.914	1.03	85	27	04/11/12	04/16	GRB-225	
S204016-03	Method Blank	0.360	1.03	73	200	04/11/12	04/16	GRB-231	
S204016-04	Duplicate (S204016-01)	0.774	1.08	30	200	19	04/11/12	04/16	GRB-232

Nominal values and limits from method 15.0 1.03 30-110 50 180

PROCEDURES	REFERENCE	TC99_TR_SEP_GPC
SPP-062	Sample Aliquoting, rev 1	
CP-021	Preparation of Tc-99m Tracer, rev 6	
CP-431	Technetium-99 Purification of Soil or Resin by Extraction Chromatography, rev 8	
CP-008	Heavy Element Electroplating, rev 13	

AVERAGES ± 2 SD	MDA	<u>0.702</u> ± <u>0.476</u>
FOR 4 SAMPLES	YIELD	<u>55</u> ± <u>56</u>

METHOD SUMMARIES

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

Test I Matrix SOLID
SDG 7661
Contact Joseph Verville

LAB METHOD SUMMARY

IODINE 129 IN SOLIDS
GAMMA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4717

RESULTS

LAB RAW SUF-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Iodine 129

Preparation batch 7320-132

Table with 4 columns: Sample ID, Test Fix, Planchet, Client Sample ID, and Iodine 129. Rows include S204016-01 to S204016-04 with various sample descriptions and results (U, ok, -).

Nominal values and limits from method RDLs (pCi/g) 2.00

METHOD PERFORMANCE

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

Preparation batch 7320-132 2σ prep error 19.4 % Reference Lab Notebook No. 7301 pg. 61

Table with 13 columns: Sample ID, Test Fix, Client Sample ID, MDA, Aliq, Prep, Dilu, Yield, Eff, Count, FWHM, Drift, Days, and Anal. Rows include S204016-01 to S204016-04 with performance metrics.

Nominal values and limits from method 2.00 2.04 40-110 300 180

Table with 3 columns: Procedures, Reference, and I129_SEP_LEPS_GS. Lists various procedures like SPP-070, SPP-062, CP-024, CP-530, and CP-008.

Table with 2 columns: Averages ± 2 SD and MDA. Values: 0.620 ± 0.064, 85 ± 10.

METHOD SUMMARIES

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

Test U T Matrix SOLID
 SDG 7661
 Contact Joseph Verville

Client CHPRC
 Contract No. 33677
 Contract SDG H4717

LAB METHOD SUMMARY

URANIUM, TOTAL IN SOLIDS
 KINETIC PHOSPHORIMETRY

RESULTS

LAB	RAW	SUF-	Total	
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Uranium

Preparation batch 7320-132

S204016-01		7661-001	B2KFT0	1.13
S204016-02		7661-002	Lab Control Sample	ok
S204016-03		7661-003	Method Blank	U
S204016-04		7661-004	Duplicate (S204016-01)	ok

Nominal values and limits from method RDLs (ug/g) 1.00

METHOD PERFORMANCE

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

Preparation batch 7320-132 2σ prep error Reference Lab Notebook No. 7301 pg. 61

S204016-01		B2KFT0	0.012	0.0500								15	04/12/12	04/12	KPA-001
S204016-02		Lab Control Sample	0.116	0.0500									04/12/12	04/12	KPA-001
S204016-03		Method Blank	0.012	0.0500									04/12/12	04/12	KPA-001
S204016-04		Duplicate (S204016-01)	0.012	0.0500								15	04/12/12	04/12	KPA-001

Nominal values and limits from method 1.00 0.0500 180

PROCEDURES	REFERENCE	UTOT_KPA
SPP-062	Sample Aliquoting, rev 1	
SPP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 0	
CP-928	Total Uranium by Kinetic Phosphorimetry, rev 11	

AVERAGES ± 2 SD	MDA <u>0.038 ± 0.104</u>
FOR 4 SAMPLES	YIELD _____ ± _____

METHOD SUMMARIES

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

Test C Matrix SOLID
 SDG 7661
 Contact Joseph Verville

LAB METHOD SUMMARY
 CARBON 14 IN SOLIDS
 LIQUID SCINTILLATION COUNTING

Client CHPRC
 Contract No. 33677
 Contract SDG H4717

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Carbon 14

Preparation batch 7320-132

S204016-01	7661-001	B2KFT0	U
S204016-02	7661-002	Lab Control Sample	ok
S204016-03	7661-003	Method Blank	U
S204016-04	7661-004	Duplicate (S204016-01)	- U

Nominal values and limits from method RDLs (pCi/g) 50.0

METHOD PERFORMANCE

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

Preparation batch 7320-132 2σ prep error 10.0 % Reference Lab Notebook No. 7301 pg. 61

S204016-01	B2KFT0	<u>68.5</u>	0.0176	100	50	16	04/13/12	04/13	LSC-007
S204016-02	Lab Control Sample	<u>152</u>	0.0176	100	<u>9</u>	04/13/12	04/14	LSC-007	
S204016-03	Method Blank	<u>71.0</u>	0.0176	100	50	04/13/12	04/13	LSC-007	
S204016-04	Duplicate (S204016-01)	<u>67.2</u>	0.0181	100	50	16	04/13/12	04/13	LSC-007

Nominal values and limits from method 50.0 0.0176 10 180

PROCEDURES REFERENCE C14_LSC
 CP-251 Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD MDA 89.7 ± 83.2
 FOR 4 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

Test H Matrix SOLID
 SDG 7661
 Contact Joseph Verville

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client CHPRC
 Contract No. 33677
 Contract SDG H4717

RESULTS

LAB	RAW	SUF-		
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Tritium
Preparation batch 7320-132				
S204016-01		7661-001	B2KFT0	U
S204016-02		7661-002	Lab Control Sample	ok
S204016-03		7661-003	Method Blank	U
S204016-04		7661-004	Duplicate (S204016-01)	- U

Nominal values and limits from method RDLs (pCi/g) 400

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7320-132 2σ prep error 10.0 % Reference Lab Notebook No. 7301 pg. 61															
S204016-01		B2KFT0	114	0.0176			100		50		17	04/13/12	04/14	LSC-004	
S204016-02		Lab Control Sample	103	0.0176			100		50			04/13/12	04/14	LSC-004	
S204016-03		Method Blank	111	0.0176			100		50			04/13/12	04/16	LSC-004	
S204016-04		Duplicate (S204016-01)	109	0.0181			100		50		17	04/13/12	04/14	LSC-004	

Nominal values and limits from method 400 0.0176 50 180

PROCEDURES REFERENCE TRITIUM_COX_LSC
 CP-251 Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD MDA 109 ± 9.29
 FOR 4 SAMPLES YIELD 100 ± 0

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

Test NI L Matrix SOLID
 SDG 7661
 Contact Joseph Verville

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client CHPRC
 Contract No. 33677
 Contract SDG H4717

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Nickel 63

Preparation batch 7320-132

S204016-01	7661-001	B2KFT0	U
S204016-02	7661-002	Lab Control Sample	ok
S204016-03	7661-003	Method Blank	U
S204016-04	7661-004	Duplicate (S204016-01)	- U

Nominal values and limits from method RDLs (pCi/g) 30.0

METHOD PERFORMANCE

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

Preparation batch 7320-132 2σ prep error 11.2 % Reference Lab Notebook No. 7301 pg. 61

S204016-01	B2KFT0	4.08	0.500	72	50	15	04/11/12	04/12	LSC-007
S204016-02	Lab Control Sample	3.13	0.500	95	50		04/11/12	04/12	LSC-007
S204016-03	Method Blank	3.15	0.500	93	50		04/11/12	04/12	LSC-007
S204016-04	Duplicate (S204016-01)	3.18	0.500	92	50	15	04/11/12	04/12	LSC-007

Nominal values and limits from method 30.0 0.500 40-110 50 180

PROCEDURES REFERENCE NI63_LSC
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 1
 CP-281 Nickel-63 Purification By Extraction
 Chromatography, rev 5

AVERAGES ± 2 SD MDA 3.38 ± 0.928
 FOR 4 SAMPLES YIELD 88 ± 21

Lab id EBRLNE
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4717

LAB METHOD SUMMARY

SELENIUM 79 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Test SE L Matrix SOLID

SDG 7661

Contact Joseph Verville

Client CHPRC

Contract No. 33677

Contract SDG H4717

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Selenium-79

Preparation batch 7320-132

S204016-01	7661-001	B2KFT0	U
S204016-03	7661-003	Method Blank	U
S204016-04	7661-004	Duplicate (S204016-01)	- U

Nominal values and limits from method RDLs (pCi/g) 10.0

METHOD PERFORMANCE

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

Preparation batch 7320-132 2σ prep error 11.2 % Reference Lab Notebook No. 7301 pg. 61

S204016-01	B2KFT0	3.02	0.520	76	50	20	04/17/12	04/17	LSC-004
S204016-03	Method Blank	2.70	0.520	81	50	04/17/12	04/17	LSC-004	
S204016-04	Duplicate (S204016-01)	2.73	0.560	79	50	20	04/17/12	04/17	LSC-004

Nominal values and limits from method 10.0 0.520 40-110 50 180

PROCEDURES	REFERENCE	SE79_SEP_IE_LSC
	SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 1
	CP-340	Selenium-79 in Soilds and Water, rev 0
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD	MDA	<u>2.82</u> ± <u>0.353</u>
FOR 3 SAMPLES	YIELD	<u>79</u> ± <u>5</u>

METHOD SUMMARIES

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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

REPORT GUIDE

Client CHPRC
Contract No. 33677
Case no SDG_H4717

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 ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

REPORT GUIDE

Client CHPRC
Contract No. 33677
Case no SDG H4717

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 ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

REPORT GUIDE

Client CHPRC
Contract No. 33677
Case no SDG_H4717

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4717

SDG 7661
Contact Joseph Verville

REPORT GUIDE

Client CHPRC
Contract No. 33677
Case no SDG_H4717

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).

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Form DVD-RG
Version 3.06
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APRIL 25, 2012

EBERLINE ANALYTICAL / RICHMOND

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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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- * 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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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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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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- * 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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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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COLLECTOR KAORE Aguilera
COMPANY CONTACT EVANS, RT 44717
TELEPHONE NO. 373-7924
PROJECT COORDINATOR EVANS, RT 4165

SAMPLING LOCATION ZP-1 SPENT GAC, COMPOSITE
PROJECT DESIGNATION 200-PW-1 & 200-ZP-1 Spent GAC Canisters and Filters
FIELD LOGBOOK NO. P3 53
ACTUAL SAMPLE DEPTH N/A
PROJECT NO. SAF NO. F11-031
PRICE CODE 9D
AIR QUALITY **TURNAROUND** 21 Days / 21 Days

ICE CHEST NO. 6005-126
FIELD LOGBOOK NO. HVE-N-585-6
ACTUAL SAMPLE DEPTH N/A
COA 302937ES10
METHOD OF SHIPMENT FEDERAL EXPRESS
ORIGINAL

SHIPPED TO Eberline Services
OFFSITE PROPERTY NO. 3648
BILL OF LADING/AIR BILL NO. 793412278026

MATRIX*
 A=Air
 DL=Drum
 L=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
 Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Isotopic (Thorium-232)	Selenium-79; Isotopic Protactinium;
6 Months	ag	1	60ml			
6 Months	ag	1	60ml			
6 Months	G/P	1	60ml			

SPECIAL HANDLING AND/OR STORAGE

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	OTHER SOLID
BKFT0		3-28-12	1000	

CHAIN OF POSSESSION

REINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	SIGN/ PRINT NAMES	DATE/TIME	SPECIAL INSTRUCTIONS
Ed Kaore Aguilera	3-28-12 1040	SSO #1	3-28-12 1040			Field samplers will composite GAC from Canisters AE-1073, AE-1202, AE-1108, AE-1207, AE-1097, AE-1076, AE-1102, AE-1070, AE-1090; □□** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. (1) Technetium-99; Technetium-99; Iodine-129; Tritium - H3; Carbon-14; Nickel-63; Total Uranium;
SSU-1	APR 03 2012 0940	L.D. Wall	APR 03 2012 0940			
REINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
L.D. Wall	APR 03 2012 1400	RECEIVED BY/STORED IN	DATE/TIME			
REINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
FED EX		RECEIVED BY/STORED IN	DATE/TIME			
REINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
REINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
REINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			

LABORATORY SECTION RECEIVED BY

FINAL SAMPLE DISPOSITION DISPOSAL METHOD

TITLE

DISPOSED BY

DATE/TIME

PRINTED ON 3/7/2012

A-6003-618 (REV 2)



RICHMOND, CA LABORATORY
SAMPLE RECEIPT CHECKLIST

Client: CHPRC City RICHLAND State WA

Date/Time received 4/4/12 10:00 CoC No. F11-031-22

Container I.D. No. SUS-126 Requested TAT (Days) 21 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 [] N/A []
6. Number of samples in shipping container: 1 Sample Matrix OTHER SOLID
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 JK Date: 4/4/12 Time: 10:40

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
<u>B2KFTO</u>	<u>< 80</u>						

Ion Chamber Ser. No. _____
Alpha Meter Ser. No. _____
Beta/Gamma Meter Ser. No. 100482

Calibration date _____
Calibration date _____
Calibration date 6 DEC 2011