

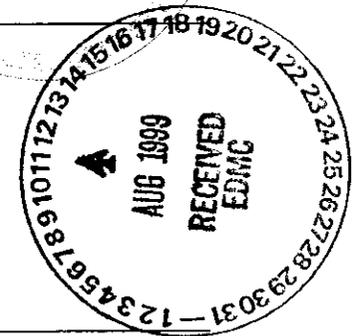
0051461

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

April 30, 1999

Attention: Joan Kessner



SAF Number	:	B99-001
Date First Sample Received	:	April 13, 1998
Number of Samples	:	two
Sample Type	:	Water
SDG Number	:	W02738
Data Deliverable	:	3-Day Priority/15 Day Summary

I. Introduction

On April 13, 1998, two water samples were received by the Quanterra Environmental Services Richland Laboratory (QESRL) for chemical analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

<u>QESRL ID#</u>	<u>BHI ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
9CTK6810	B0TBC2	Water	4/13/99
9CTK6E10 -	B0TBC3	Water	4/13/99

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical errors.

The requested analysis was: **Hexavalent Chromium**
Hexavalent Chromium by EPA7196

Bechtel Hanford, Inc.
April 30, 1999
Page 2

III. Quality Control

The analytical results for the analysis performed under SDG W02738 include a minimum of one Laboratory Control Sample (LCS), one matrix spike (MS), one matrix spike duplicate (MSD), and one method (reagent) blank. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results.

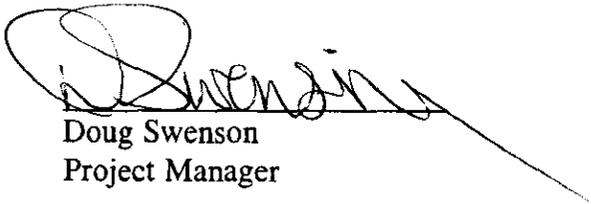
IV. Comments

Hexavalent Chromium Hexavalent Chromium by EPA7196

The LCS, MS, MSD, batch blank, and sample results are within the requirements of the contract.

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

Reviewed and approved:



Doug Swenson
Project Manager

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02738 / 7536
LAB SAMPLE ID: 9CTK68101 MATRIX: SOIL
CLIENT ID: B0TBC2 DATE RECEIVED: 4/13/99 2:45:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	4.00E-02	U	N/A	N/A	4.00E-02	mg/kg	N/A	EPA7196

Number of Results:

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02738 / 7536
LAB SAMPLE ID: 9CTK6E101 MATRIX: SOIL
CLIENT ID: B0TBC3 DATE RECEIVED: 4/13/99 2:45:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	4.00E-02	U	N/A	N/A	4.00E-02	mg/kg	N/A	EPA7196

Number of Results:

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02738 / 7536
LAB SAMPLE ID: CTKFQ101B MATRIX: SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	0.00E+00	U	N/A	N/A	2.00E-03	mg/L	N/A	EPA7196

Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02738 / 7536
LAB SAMPLE ID: CTKFQ102C MATRIX: SOIL

ANALYTE	RESULT	COUNTING Q ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
HEXCHROME	4.93E-01	N/A	N/A	2.00E-03	mg/L	N/A	5.00E-01	98.60%

Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02738 / 7536
LAB SAMPLE ID: CTKFQ103L MATRIX: SOIL

ANALYTE	RESULT	COUNTING Q	ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
HEXCHROME	4.85E-01		N/A	N/A	2.00E-03	mg/L	N/A	5.00E-01	97.00%

Number of Results:



Richland Laboratory
Data Review Check List
METALS

Work Order Number(s): <i>Batch # 9104157 (workorders CTK68 & CTK6E)</i>				
Lab Sample Numbers or SDG: <i>WO2738</i>				
Method/Test/Parameter: <i>CR+6 in SOIL</i>				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 nd Level Review (✓)
A. Initial Calibration				
1. Performed at required frequency with required number of levels?	✓			
2. Correlation coefficient within QC limits?	✓			
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	✓			
4. Initial calibration blank(ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			
B. Continuing Calibration				
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			
C. Sample Analysis				
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?		✓		
2. Were all sample holding times met?	✓			
D. QC Samples				
1. All results for the preparation blank below limits?	✓			
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?			✓	
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?	✓			
4. Analytical spikes within QC limits where applicable?			✓	
5. ICP only: One serial dilution performed per SDG?			✓	
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			✓	
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			✓	

**CHAIN OF
CUSTODY FORMS**

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-001-49	Page 1 of 1
Collector Fahlberg/Kerkow		Company Contact R Coffman		Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code
Project Designation 100 BC Areas - Quick Turn		Sampling Location 100BC 116-B-4		SAF No. B99-001	Data Turnaround 3 DAYS	
Ice Chest No.		Field Logbook No. EL 1327-2		Method of Shipment Hand Delivered AKA		
Shipped To Quanterra Incorporated		Offsite Property No.		Bill of Lading/Air Bill No.		
				COA		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C									
	Type of Container	aG									
	No. of Container(s)	1									
Special Handling and/or Storage	Volume	60mL									
SDG W02738 SAMPLE ANALYSIS Due 4-16 JAD130205			Chromium Hex - 7196								
Sample No.	Matrix *	Sample Date	Sample Time								
B0TBC2	CTK68	Soil	4-13-99 0945	X							tie to B0Y001
B0TBC3	CTK6E	Soil	4-13-99 0950	X							B0Y000

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By	Date/Time	Received By	Date/Time								
R. Fahlberg	4-13-99 1445	K. Schenking	4-13-99 1445								
Relinquished By	Date/Time	Received By	Date/Time								
Relinquished By	Date/Time	Received By	Date/Time								
LABORATORY SECTION	Received By	Title								Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By								Date/Time	

0011

ERC Radiological Counting Facility Analysis Report

RCF Number RCF5659

Sample Date & Time 3/30/99 1045

Project ID: 116-B-4

SAF Number: B99-001

Date Analyzed 3/30/99

Sample ID: B0V001

Gamma Energy Analysis

Nuclide	Activity (pCi/g)	Error (pCi/g)	MDA (pCi/g)
K-40	1.06E+01 +/-	1.14	5.48E-01
Co-60	2.55E-02 +/-	1.53	9.27E-03
Cs-137	3.44E-02 +/-	2.35	1.22E-02
Eu-152	2.04E-01 +/-	.073	4.64E-02
Eu-154	1.23E-01 +/-	4.62	2.52E-02
Eu-155	< 5.56E-02		5.56E-02
Th-232d	6.89E-01 +/-	9.38	2.85E-01
U-235	< 1.68E-01		1.68E-01
Np-237	< 1.94E-02		1.94E-02
U-238d	5.42E-01 +/-	9.03	5.61E-02
U-238	8.66E+00 +/-	3.17	1.15E+00
Am-241	< 5.40E-02		5.40E-02

*116-B-4 plume #2
SSW
(B0V114)
BOTTSZ*

Total GEA (pCi/g) 2.1E+01 +/- 4.66

	Activity (pCi/g)	Error (pCi/g)
Gross Alpha**	< 2.0E-01	
Gross Beta	1.0E+01 +/-	1.8E+00

Alpha MDA (pCi/g)	2.0E-01
Beta MDA (pCi/g)	5.1E+00

Definitions:

All errors reported at 2 standard deviations.

N/R = no result or analysis not requested. <MDA = Less than detection limit.

All GEA results reported as "<" list the MDA value for that radionuclide.

Rounding error may result in the reported total GEA activity differing from the sum of the > MDA GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.

The analysis of Np-237 is based on the activity of Pa-233.

U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products.

The results must then be balanced for the gross alpha analysis.

**The gross alpha results are not corrected for mass absorption

Analyst

David Brehm
David Brehm

3/31/99

Report To

Randy Coffman

Dave St John

Fax

373-9779

372-9487

Report Printed: Wednesday, March 31, 1999

0012

ERC Radiological Counting Facility Analysis Report

RCF Number RCF5623

Sample Date & Time 3/25/99 1305

Project ID: 100B/C

SAF Number: B99-001

Date Analyzed 3/26/99

Sample ID: BOV000

Gamma Energy Analysis

Nuclide	Activity (pCi/g)	Error (pCi/g)
K-40	1.07E+01 +/-	1.25
Co-60	< 1.77E-02	
Cs-137	3.31E-02 +/-	1.60
Eu-152	1.51E-01 +/-	6.03
Bu-154	< 2.98E-02	
Eu-155	< 8.52E-02	
Th-232d	1.03E+00 +/-	.182
U-235	8.59E-01 +/-	.428
Np-237	< 5.71E-02	
U-238d	4.92E-01 +/-	9.18
U-238	5.45E+00 +/-	2.73
Am-241	< 5.54E-02	

*B4 plume #2
SSE
(BOV113)
BOT BC3*

Total GEA (pCi/g) 1.9E+01 +/- 4.76

	Activity (pCi/g)	Error (pCi/g)
Gross Alpha**	5.2E-01 +/-	4.7E-01
Gross Beta	1.6E+01 +/-	2.3E+00

Alpha MDA (pCi/g)
3.8E-01
Beta MDA (pCi/g)
7.8E+00

Definitions:

All errors reported at 2 standard deviations.

N/R = no result or analysis not requested. <MDA = Less than detection limit.

All GEA results reported as "<" list the MDA value for that radionuclide.

Rounding error may result in the reported total GEA activity differing from the sum of the > MDA GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.

The analysis of Np-237 is based on the activity of Pa-233.

U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products.

The results must then be balanced for the gross alpha analysis.

**The gross alpha results are not corrected for mass absorption

Analyst David Brchm

3/26/99

Report To
Randy Coffman

Fax
373-9779

Report Printed: Friday, March 26, 1999

0013

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 4-13-99 1445 SG#: W02738

Work Order Number: AD130205 SAF #: B99-001

Shipping Container ID: EX96-074 Chain of Custody #: B99-001-49

- 1. Custody Seals on shipping container intact? Yes [] No []
- 2. Custody Seals dated and signed? Yes [] No []
- 3. Chain-of-Custody record present? Yes [] No []
- 4. Cooler temperature 4°C
- 5. Vermiculite/packing materials is Wet [] Dry []
- 6. Number of samples in shipping container: 2
- 7. Sample holding times exceeded? Yes [] No []

8. Samples have:

<input checked="" type="checkbox"/> tape	<input type="checkbox"/> hazard labels
<input checked="" type="checkbox"/> custody seals	<input type="checkbox"/> appropriate sample labels

9. Samples are:

<input checked="" type="checkbox"/> in good condition	<input type="checkbox"/> leaking
<input type="checkbox"/> broken	<input type="checkbox"/> have air bubbles

10. Where any anomalies identified in sample receipt? Yes [] No []

11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: L. Pattabiraman Date: 4-13-99

Telephoned To: _____ On _____ By _____

COC Signature Page

Batch #:	Initials/Date	Procedure #
Released By	JA 4-14-99	RL0009
Received	(R) 4-14-99	(R) 4/14/99 RICHROWC5003 R.3
Released By	(R) 4-15-99	n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		