START 9613471.2515 0045080 W0974

Quanterra
Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

SEP 1996 RECEIVED EDMC

MAY 1996 RECEIVED Data Log In

April 22, 1996

Attention: Joan Kessner

Project number	:	550.136
Date Received by Lab	:	April 5, 1996
Number of Samples	:	Three (3)
Sample Type	:	Soil
SDG Number	:	W0974
Data Deliverable	:	Summary

I. Introduction

On April 5, 1996, three (3) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with their specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
10795-001	B0HCK5	60409801	Soil	04/05/96
10795-002	B0HCJ2	60409802	Soil	04/05/96
10795-003	B0HCJ6	60409803	Soil	04/05/96

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested: Lead by EPA Method 6010 following TCLP extraction by EPA Method 1311. Lead by EPA Method 7421.

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III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate analyses were performed per the protocol for each analyte.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Lead
The total results and TCLP results for lead were reported with a PQL of 3 ug/L to allow for the lower limit as produced by the requested graphite analysis method. Since the TCLP results were from a higher level ICAP whose PQL is 100 ug/L, the higher PQL was left off the forms package to enable the reporting of the graphite results with the proper qualifiers. Due to the ICAP results from the TCLP analysis being above the 100 ug/L PQL, no qualifiers were required on the form one. One "B" qualifier was left off the serial dilution result because of this treatment.

The was no MSD page included within the package for the GFAA results since the sample was greater than 4 times the concentration of the spike and both recoveries where below 0%.

The Total Lead result in the QC blank is reported as a negative value. The software used to produce this datum follows the CLP protocol where all absolute values greater than the detection limit are reported, however, SW846 protocol requires that the number only be below the detection limit, regardless of sign, to be reported as undetected.

9613971.2507

Quanterra
Environmental Services

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 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:

Wade H. Price
Project Manager
e:\\price$\abbydave\hanw0974.nar

9613471.2518

Sample Disposition Record

Control #: 96-0066
Revision #: 0
Date Initiated: 04/08/96

Section 1 - BACKGROUND

SAF #: B96-099
OU: 100-BC-1
Project ID: 100-BC-1 EXC PN
Task ID: 3
Sampling Event: 116-C-5 Retention Basin Soil Sampling
Laboratory: Quanterra
Project Coordinator: ME David
Task Manager: KL Dunks

Section 2 - SAMPLE INFORMATION

Number of Samples: 13
ID Numbers: B0HCK5, B0HCJ2, B0HCJ6, B0HCH8, B0HCJ4, B0HCJ7, B0HCJ8, B0HCJ9, B0HCK0, B0HCK1, B0HCK2, B0HCK3, & B0HCK4.
Matrix: Soil
Collection Date: Approximately 04/03/96

Section 3 - ISSUE

Class: Lab Direction
NCR Number: N/A
Type: Inconsistent Sample Documentation
Description: The SAF number associated with the 116-C-5 Retention Basin Soil Sampling is B96-099. The associated Chain-of-Custody forms for the project document the SAF number as B96-100.

N/A
NCR Validation (Print/Sign) Date

Section 4 - DISPOSITION

Type: Repair
Description: The samples associated with the 116-C-5 Retention Basin Soil Sampling will be analyzed and reported under SAF B96-099.

ME David Michael David 4/8/96
Project Coordinator (Print/Sign) Date

KL Dunks Kathy Dunks 4/15/96
Task Manager (Print/Sign) Date

N/A
QA (Print/Sign) Date

Section 5 - INSPECTION (Issue Class: Nonconformance Only)

Inspection Number: N/A
Inspection Results: N/A

N/A
Inspector (Print/Sign) Date

Quanterra April 09, 1996 08:37 am
Account: 10722 Project: 550.136 Quanterra Richland QAS No. 550.136 Rev. 0
Master Sample Login: 10795

Project Manager: W. Price

Draft: Final: Entered and Reviewed by: [signature] PM Review: Abby Wolder

Sample Header Template:

Sample No. / # Data:	Client ID / Container Type	C-Matrix / Analysis	Date: Collected / Class	Received / Preservative	Due / Anal. Due Date	Shipper / Hold Date Site	Rad Category Rad Sample No. / (Container Numbers % Filled)
10795-001	B0HCK5	Soil	03-APR-96 10:49	05-APR-96 12:10	19-APR-96	FED-EX	1 Screening not Required
	!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409801						
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	01-MAY-96 TOD	(223999:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	30-SEP-96 TOD	(223999:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	30-SEP-96 TOD	(223998:100)
1		PM/IT/Q4	S	COLD	17-APR-96	30-SEP-96 TOD	(223998:100)
10795-001MS	B0HCK5	Soil	03-APR-96 10:49	05-APR-96 12:10	19-APR-96	FED-EX	1 Screening not Required
	!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409801						
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	01-MAY-96 TOD	(223999:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	30-SEP-96 TOD	(223999:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	30-SEP-96 TOD	(223998:100)
10795-001MSD	B0HCK5	Soil	03-APR-96 10:49	05-APR-96 12:10	19-APR-96	FED-EX	1 Screening not Required
	!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409801						
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	01-MAY-96 TOD	(223999:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	30-SEP-96 TOD	(223999:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	30-SEP-96 TOD	(223998:100)
10795-002	B0HCJ2	Soil	02-APR-96 13:14	05-APR-96 12:10	19-APR-96	FED-EX	1 Screening not Required
	!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409802						
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	30-APR-96 TOD	(224001:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	29-SEP-96 TOD	(224001:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	29-SEP-96 TOD	(224000:100)
1		PM/IT/Q4	S	COLD	17-APR-96	29-SEP-96 TOD	(224000:100)
10795-003	B0HCJ6	Soil	02-APR-96 14:24	05-APR-96 12:10	19-APR-96	FED-EX	1 Screening not Required
	!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409803						
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	30-APR-96 TOD	(224003:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	29-SEP-96 TOD	(224003:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	29-SEP-96 TOD	(224002:100)
1		PM/IT/Q4	S	COLD	17-APR-96	29-SEP-96 TOD	(224002:100)

*=Sample has not been rad screened.

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Temp 4°C Cur# 6847

[redacted]

Chain of Custody Record

Do St Lowis

Quanterra Environmental Services

QUA-4124-1

Client: Bechtel Hanford	Project Manager: Van Pettey	Date: 4-5-96	Chain Of Custody Number: 54319
Address:	Telephone Number (Area Code)/Fax Number:	Lab Number:	Page 1 of 1
City: / State: / Zip Code:	Site Contact: / Lab Contact:	Analysis (Attach list if more space is needed): SEE COC	Special Instructions/ Conditions of Receipt:
Project Name: SAF B96-100	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH
60409801 BOHCK5		SEE				COC					
↓ 2 ↓ CJ2											
↓ 3 ↓ CJ6											

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☑ Unknown

Sample Disposal: ☑ Return To Client ☐ Disposal By Lab ☐ Archive For Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☑ Other Due 4-20-96

QC Requirements (Specify): SDG W0974

	Date	Time		Date	Time
1. Relinquished By			1. Received By: [signature]	4-6-96	0830
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

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Bechtel Hanford, Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 2

Data Turnaround: ■ Priority / Normal

Collector: Doug Bowers	Company Contact: W. S. Thompson	Telephone: (509) 376-8031
Project Designation: 116-C-5 Retention Basin Soil Sampling	Sampling Location: 100-BC-1	SAF No.: B96-100
Ice Chest No.: GS-24	Field Logbook No.: EL 1261	Method of Shipment: Hand Carry in government vehicle
Shipped To: Quanterra	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks	Preservation	Cool 4 degrees	None	None							
	Type of Container	G/P	G	G/P							
	No. of Container(s)	1	1	1							
Special Handling and/or Storage	Volume	125 ml.	250 ml.	20 ml.							
SAMPLE ANALYSIS 604098 SDG 100974		Lead - EPA 7421 (GFAA)	Lead (TCLP) EPA 1311/7420	Activity Scan							

Sample No.	Matrix*	Date Sampled	Time Sampled										
BOHCK5 01	SOIL	4-3-96	1049	X	X	X	<100 cpm						
~~BOHCK6~~													
~~BOHCK7~~	~~[illegible]~~ 4-3-96			100%	100%								
~~BOHCK8~~													
BOHCJ2 02		4-2-96	1314	X	X	X	400 cpm						
BOHCJ6 03		4-2-96	1424	X	X	X	<100 cpm						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 4-4-96 / 0730	Received By: [illegible] Bartton	Date/Time: 0730 4-4-96
Relinquished By: [illegible] Bartton	Date/Time: 4-5-96 1210	Received By: [illegible]	Date/Time: 4-5-96 1210
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

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

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

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B. 4/8/96

CLIENT CODE ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B
BHI B0H8P3		4/5/96 12:00:00 PM	QUAD22B	4/5/96 2:10:19 PM	B0H8P3	30	0	-0.0475	23	-0.152083
	LIQUID		Bkg:	4/5/96 4:00:02 AM	BKG	800	38	0.0475	735	0.91875
Anl Date: 4/5/96	Tot Sa, Alq: 1.00E+00	, 1.00E+01	Alp; (Dpm/ -1.39E-01	(uCi/ -6.25E-06	(pCi/ -6.25E+00	± 1.9E+01	CAT I	1.0E+00	Lab Alq Lig	
Ppt mg: 0	Units: L	, ml	Bet; Alq): -2.60E-01	Sa): -1.17E-05	Lig): -1.17E+01	± 1.7E+01		1.0E+00		
BHI B0H8W0		4/5/96 12:00:00 PM	QUAD22C	4/5/96 2:10:19 PM	B0H8W0	30	39	1.25125	758	24.356667
	SOLID		Bkg:	4/5/96 4:00:02 AM	BKG	800	39	0.04875	728	0.91
Anl Date: 4/5/96	Tot Sa, Alq: 1.74E+03	, 6.94E+01	Alp; (Dpm/ 5.53E+00	(uCi/ 6.24E-02	(pCi/ 3.59E+01	± 7.9E+00	CAT II	1.4E+00	Lab Alq Lig	
Ppt mg: 69.4	Units: g	, mg	Bet; Alq): 5.12E+01	Sa): 5.79E-01	Lig): 3.33E+02	± 1.3E+01		3.0E-01		
BHI B0H8W1		4/5/96 12:00:00 PM	QUAD22D	4/5/96 2:10:19 PM	B0H8W1	30	19	0.57833333	318	9.71375
	SOLID		Bkg:	4/5/96 4:00:02 AM	BKG	800	44	0.055	709	0.88625
Anl Date: 4/5/96	Tot Sa, Alq: 1.82E+03	, 7.31E+01	Alp; (Dpm/ 2.76E+00	(uCi/ 3.09E-02	(pCi/ 1.70E+01	± 6.5E+00	CAT II	2.9E+00	Lab Alq Lig	
Ppt mg: 73.1	Units: g	, mg	Bet; Alq): 2.05E+01	Sa): 2.29E-01	Lig): 1.26E+02	± 7.8E+00		7.9E-01		
BHI B0HCJ2		4/5/96 12:00:00 PM	QUAD23A	4/5/96 2:10:23 PM	B0HCJ2	30	268	8.88083333	12817	426.29708
	SOLID		Bkg:	4/5/96 4:00:11 AM	BKG	800	42	0.0525	749	0.93625
Anl Date: 4/5/96	Tot Sa, Alq: 2.89E+02	, 1.02E+02	Alp; (Dpm/ 3.71E+01	(uCi/ 4.76E-02	(pCi/ 1.65E+02	± 1.2E+01	CAT III	3.0E-01	Lab Alq Lig	
Ppt mg: 101.6	Units: g	, mg	Bet; Alq): 9.27E+02	Sa): 1.19E+00	Lig): 4.11E+03	± 3.6E+01		2.4E-02		
BHI B0HCJ6		4/5/96 12:00:00 PM	QUAD23B	4/5/96 2:10:23 PM	B0HCJ6	30	27	0.84375	738	23.7075
	SOLID		Bkg:	4/5/96 4:00:11 AM	BKG	800	45	0.05625	714	0.8925
Anl Date: 4/5/96	Tot Sa, Alq: 3.12E+02	, 9.81E+01	Alp; (Dpm/ 4.40E+00	(uCi/ 6.31E-03	(pCi/ 2.02E+01	± 5.9E+00	CAT I	2.5E+00	Lab Alq Lig	
Ppt mg: 98.1	Units: g	, mg	Bet; Alq): 5.17E+01	Sa): 7.41E-02	Lig): 2.37E+02	± 9.1E+00		4.2E-01		
BHI B0HCK5		4/5/96 12:00:00 PM	QUAD23C	4/5/96 2:10:23 PM	B0HCK5	30	85	2.78833333	2319	76.35375
	SOLID		Bkg:	4/5/96 4:00:11 AM	BKG	800	36	0.045	757	0.94625
Anl Date: 4/5/96	Tot Sa, Alq: 4.13E+02	, 9.79E+01	Alp; (Dpm/ 1.39E+01	(uCi/ 2.64E-02	(pCi/ 6.40E+01	± 8.4E+00	CAT II	7.8E-01	Lab Alq Lig	
Ppt mg: 97.9	Units: g	, mg	Bet; Alq): 1.65E+02	Sa): 3.14E-01	Lig): 7.60E+02	± 1.6E+01		1.3E-01		

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$$BOHCK5 = \frac{2.4 \times 10^{-3}\ uci}{\cancel{g}} \times 395\ \cancel{g} = 0.95\ uci/\cancel{g}$$

$$BOHCJ2 = \frac{7.2 \times 10^{-3}\ uci}{\cancel{g}} \times 395\ \cancel{g} = 2.8\ uci$$

$$BOHCJ6 = \frac{3.2 \times 10^{-3}\ uci}{\cancel{g}} \times 395\ \cancel{g} = 1.3\ uci$$

5.05 uci total

Az Value for americium is .008 ci

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RADIOACTIVE SHIPMENT RECORD

3. Page 1 of 1 | 34758

1. SHIP TO
Company: QUANTERRA
Address: 2800 GEORGE WASHINGTON WAY
City, State, Zip: RICHLAND WA 99352
Attention: KARF ACTENBURGH
Phone: 375-3131 EXT 135

2. SHIP FROM U.S. DEPT. OF ENERGY C/O
Company: BHI HANFORD
Address: 4701-C 400 AREA
City, State, Zip: RICHLAND WA 99352
Contact: BILL WHITTEN
Phone:

4. Ship [X] Prepaid [ ] Collect
Via: [ ] Motor-Rail [ ] Air Psgr [ ] Excl. Use [ ] Air Cargo [ ] UPS Surface [ ] Mail [X] Site Carrier
SHIPMENT AUTHORIZATION NUMBER:

5. HM Proper Shipping Name: Radioactive Material,

	excepted package - empty packaging	7	UN2910
	excepted package - instruments or articles	7	UN2910
X	excepted package - limited quantity of material	7	UN2910
	excepted package - articles manufactured from natural or depleted uranium or natural thorium	7	UN2910
	Special Form, n.o.s.	7	UN2974
	Low Specific Activity, n.o.s.	7	UN2912
	n.o.s.	7	UN2982
	Fissile, n.o.s.	7	UN2918
	(other)		

6. Markings Applied: Package Orientation [ ]; Gross Weight [X]; Radioactive - LSA [ ]; Type A [ ]; Type B [ ]

7. For Normal Form Identify
Physical Form: [ ] Liquid [ ] Gas [X] Solid
Chemical Form: [ ] Metal [ ] Oxide [X] Elemental [ ] Nitrate [ ] Mixture
Other:

8. Additional RAM Desc.: Limited Quantity Radioactive Material [X]; Highway Route Controlled Quantity [ ]

9. Placards Applied [ ] Yes [X] No
If Rail Specify Placards:
Route Plan [ ] Yes [X] No

10. EMERGENCY RESPONSE
Telephone: 509, 373-3800
Emergency Response Guide(s): #61

11a. TYPE PACKAGE: Strong Tight [X]; Type A [ ]; Type B [ ]; Type B(U) [ ]; Type B(M) [ ]

11b. CONSTRUCTION: [ ] Box, FB; [ ] Wood; [ ] Steel; [ ] Drum; [ ] Cask; Other Polycube

11c. FISSILE CLASS: Non-Fissile [ ]; Fissile Exempt [X]; Fissile I [ ]; Fissile II [ ]; Fissile III [ ]; Gms Fissile <15gms

11d. Labels Applied: Empty [ ]; Radioactive White I [ ]; Radioactive Yellow II [ ]; Radioactive Yellow III [ ]; Subsidiary Hazard [ ]

Warning -- Fissile Class III Shipment. Do Not Load More Than N/A Packages Per Vehicle. In Loading and Storage Areas, Keep at Least 20 Feet From Other Packages Bearing Radioactive Labels.

12. No. Pkgs.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	T.I.	Curies/Pkg	Gr. Wt.
1	StrongTight	N/A	N/A	N/A	Am-241, Co-60, Cs-137	N/A	5µCi	27lbs
Polycube # G524 Contains soil samples in glass jars packed in wet ice and Vermiculite								
	Sample # BOHCK5, BOHCJ2, BOHCJ6							
(Shipper may describe package in detail on one of the unused lines above)					TOTALS	N/A	5µCi	27lbs

13. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.
Certifier's Signature: J.D. Tanner On behalf of DOE-RL | Date: 4/5/96 | Organization: | Complete Cost Code (Inc. End Function): X60126

14. Surface Dose Rate of Package: [X] <0.5 or ____ mrem/hr (N+β γ)
Dose Rate at 1 Meter from Surface of Package: [X] <0.5 or ____ mrem/hr (N+β γ)
Smears of Outer Container: [X] <22 dpm β γ/cm²; [X] <2.2 dpm α/cm²; [ ] <Tbl. 2-2 HSRCM Onsite Limits
TRUCK LOAD OR EXCLUSIVE USE: Surface [X] <200 mrem/hr (N+β γ); @ 6 feet [X] <10 mrem/hr (N+β γ); @ Cab or sleeper [X] <2 mrem/hr (N+β γ)
Additional Date and Instructions (inc. Readings on Internal Packaging)
Signature - Radiation Monitoring: Shawnlee E. Rodd | Bldg. 4701-C | Survey No. I-200-1209 | Date 4-5-96

15. PICKUP OF SHIPMENT: Vehicle ID 2598 | Driver BILL WHITTEN
RECEIPT: Signature Ken Whitten | Date 4-5-96

16. Shipment has been inspected and verified to be in compliance with DOT regulations
Authorized Signature: M. A. Sams | Printed Name: M.A. SAMS | Date 4-5-96

17. AIR TRANSPORT CERTIFICATION
CARGO AIRCRAFT: [ ] Cargo Aircraft Only Labels Applied
PASSENGER AIRCRAFT: [ ] 1. Ltd Qty [ ] 2. <3 T.I. [ ] 3. Research/Medical Diagnosis [ ] 4. Human Medical Research
Pkg. Dimensions: NA

18. OFFSITE AUTHORIZATION
B/L: RMW 9932 | Date Shipped 4-5-96 | Routing SITE | ETA 4-5-96
Surveyed By: | Date: | Approved for Shipment Offsite: M. A. Sams | Date 4-5-96

Reed Heidelberg 4-5-96 1210

☆ U.S. GOVERNMENT PRINTING OFFICE: 1995—693-181/21013

54-6000-088 (07/95)

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Environmental Restoration Contractor **ERC Team**

Interoffice Memorandum

Job No. 22192
Written Response Required: NO
CCN: N/A
OU: 100-BC-1
TSD: N/A
ERA: N/A
Subject Code: 5850

TO: K.L. Dunks H9-10
W.S. Thompson N1-26
G.E. Van Sickle HO-17

DATE: April 1, 1996

COPIES: See Below

FROM: Michael Wesselman
Radiological Controls
HO-17/ 372-9607

SUBJECT: **SCREENING SOIL SAMPLES FROM 116-C-5 PRIOR TO SHIPMENT**

No additional screening of soils will be required to ship samples collected from near and on the remnants of the 105C basins. The areas expected to be sampled are adequately characterized to allow process knowledge to be used to determine shipping status of the soils in place of screening for total activity at 222S labs. Samples collected in 1992 and in 1996 indicate that the most abundant isotopes present in the soil are Cobalt-60, Cesium-137, Europium-152, Europium-154 and Europium-155. Americium-241 can be found in the most highly contaminated samples at concentrations less than 1% of the total concentration for the soils.

Based on data from the most highly contaminated sample previously obtained in the area, the following ratio to field instrument readings can be used to estimate the concentrations of the samples to be taken in this area:

Total activity in pCi/g = DPM measured by direct reading of GM times .4 .

For example, a soil sample reading 100,000 dpm direct with a GM should be assigned a total activity of 40,000 pCi/g.

This ratio was derived from a sample which was described as moist sediment and scale. It was found to be more conservative than ratios obtained from samples of fully saturated sludge and should be used on both wet and dry samples. This ratio can be used to make determinations relevant to meeting Department of Transportation requirements for shipping radioactive materials and for meeting the acceptance criteria of laboratories with radioactive materials licenses. It can not be used to free release the samples.

Michael Wesselman

Michael Wesselman

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 4-5 @ 1210 Client Name BHI

Project/Client # B96-100 Batch or Case # _____

Cooler ID (if noted on outside of cooler) GS 24

1. Condition of shipping container? OR
2. Custody Seals on cooler intact? Yes [✓] No [ ]
3. Custody Seals dated and signed? Yes [✓] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [✓]
5. Vermiculite/packing material is: Wet [ ] Dry [✓] _____
6. Each sample is in a plastic bag? Yes [✓] No [ ] _____
7. Number of sample containers in cooler: 9
8. Samples have:
   - ✓ tape
   - ✓ custody seals
   - ___ hazard labels
   - ___ appropriate sample labels
9. Samples are:
   - ✓ in good condition
   - ___ broken
   - ___ other
   - ___ leaking
   - ___ have air bubbles
10. Coolant Present? Yes [✓] No [ ] Sample Temperature 3°C
11. The following paperwork should be accounted for (N/A if not applicable):

    Chain of Custody #(s) _____

    Request for Analysis #(s) _____

    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes [ ] No [ ]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Heidelberg Date/Time 4-5-96 1210

Quanterra
Environmental Services

9613471.2527 GC

and C.O.C.
ED TO BW/WP
TE 4-6-96
BY BWB

Login No.: 10795

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Bechtel Handford
Date: 4-6-96 Time: 08:30
Project No: 550.134
Initiated by: George W Byrd
Shipper/No: 267-8899-937
RFA/COC Numbers: 54319

Condition/Variance (Check all that apply):

1. ☐ Sample received broken/leaking.
2. ☐ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C
     Record temperature: _____
   - ☐ pH _____
   - ☐ other: _____
3. ☐ Sample received in improper container.
4. ☐ Sample received without proper paperwork. Explain: _____
5. ☐ Paperwork received without sample.
6. ☐ No sample ID on sample container.
7. ☐ Custody tape disturbed/broken/missing.
8. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
9. ☐ All coolers on airbill not received with shipment.
10. ☐ Other (explain below): _____

☑ No variances were noted during sample receipt. Cooler Temperature Upon Receipt: 4°C

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____
☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". _____
☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) George W Byrd Date: 4-6-96
Project Management Review: Abby Wolden Date: 4-9-96

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

SL-ADMIN-0004, Revised 11/24/95

00013

Quanterra April 09, 1996 08:37 am

Account: 10722 Project: 550.136 Quanterra-Richland QAS No. 550.136 Rev. 0

Master Sample Login: 10795

Project Manager: W. Price

Draft: (Final:) Entered and Reviewed by: PM Review:

Sample Header Template:

Sample No. / Comments / # / Data:	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No
10795-001	B0HCK5	Soil	03-APR-96 10:49	05-APR-96 12:10	19-APR-96	FED EX	1	Screening not Required
!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409801								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	01-MAY-96	TOD	(223999:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	30-SEP-96	TOD	(223999:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	30-SEP-96	TOD	(223998:100)
1		PM/IT/Q4	S	COLD	17-APR-96	30-SEP-96	TOD	(223998:100)

10795-001MS	B0HCK5	Soil	03-APR-96 10:49	05-APR-96 12:10	19-APR-96	FED EX	1	Screening not Required
!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409801								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	01-MAY-96	TOD	(223999:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	30-SEP-96	TOD	(223999:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	30-SEP-96	TOD	(223998:100)

10795-001MSD	B0HCK5	Soil	03-APR-96 10:49	05-APR-96 12:10	19-APR-96	FED-EX	1	Screening not Required
!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409801								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	01-MAY-96	TOD	(223999:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	30-SEP-96	TOD	(223999:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	30-SEP-96	TOD	(223998:100)

10795-002	B0HCJ2	Soil	02-APR-96 13:14	05-APR-96 12:10	19-APR-96	FED-EX	1	Screening not Required
!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409802								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	30-APR-96	TOD	(224001:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	29-SEP-96	TOD	(224001:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	29-SEP-96	TOD	(224000:100)
1		PM/IT/Q4	S	COLD	17-APR-96	29-SEP-96	TOD	(224000:100)

10795-003	B0HCJ6	Soil	02-APR-96 14:24	05-APR-96 12:10	19-APR-96	FED-EX	1	Screening not Required
!!!!!!!!TCLP = PB ONLY!!!!!!!! /RICHLAND I.D. 60409803								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	GN - Glass Jar-250ML	EXTMETAL/TCLP/Q4	S	COLD	17-APR-96	30-APR-96	TOD	(224003:100)
1		ICAP/TCLP/Q4	S	COLD	17-APR-96	29-SEP-96	TOD	(224003:100)
1	GN - Glass Jar-120ML	PB/7421/Q4	S	COLD	17-APR-96	29-SEP-96	TOD	(224002:100)
1		PM/IT/Q4	S	COLD	17-APR-96	29-SEP-96	TOD	(224002:100)

*=Sample has not been rad screened.

9613471.2528

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9613471.2529

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352

Project: 550.136

Category : TCLP ICAP Metals EPA 6010
Matrix : SOLID

Client ID: BOHCK5

Sample Date : 04/03/96
Receipt Date : 04/05/96
Report Date : 04/18/96

Quanterra ID : 10795-001

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Lead	EPA 6010	04/12/96	04/13/96	04/13/96	0.38	MG/L		0.0030	5.0	1

9613471.2530

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352

Quanterra Environmental Services

Project: 550.136

Category : TCLP ICAP Metals EPA 6010
Matrix : SOLID

Client ID: BOHCK5

Sample Date : 04/03/96
Receipt Date : 04/05/96
Report Date : 04/18/96

Quanterra ID : 10795-001MS

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Lead	EPA 6010	04/12/96	04/13/96	04/13/96	97	%REC				1

9613171.2551

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352

Quanterra Environmental Services

Project: 550.136

Category : TCLP ICAP Metals EPA 6010
Matrix : SOLID

Sample Date : 04/03/96
Receipt Date : 04/05/96
Report Date : 04/18/96

Client ID: BOHCK5

Quanterra ID : 10795-001MSD

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Lead	EPA 6010	04/12/96	04/13/96	04/13/96	97	%REC				1

9613471.2552

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352

Project: 550.136

Category : TCLP ICAP Metals EPA 6010
Matrix : SOLID

Client ID: BOHCJ2

Sample Date : 04/02/96
Receipt Date : 04/05/96
Report Date : 04/18/96

Quanterra ID : 10795-002

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Lead	EPA 6010	04/12/96	04/13/96	04/13/96	0.39	MG/L		0.0030	5.0	1

9613071.2599

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352

Project: 550.136

Category : TCLP ICAP Metals EPA 6010
Matrix : SOLID

Client ID: BOHCJ6

Sample Date : 04/02/96
Receipt Date : 04/05/96
Report Date : 04/18/96

Quanterra ID : 10795-003

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Lead	EPA 6010	04/12/96	04/13/96	04/13/96	0.083	MG/L		0.0030	5.0	1

9613071.2534

Quanterra
Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352

Project: 550.136

Category: Lead EPA 7421
Method: EPA 7421
Matrix: SOLID

Sample Date : 04/03/96
Receipt Date : 04/05/96
Report Date : 04/18/96

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BOHCK5	10795-001	Lead	7439-92-1	QCBLK96730-1	04/11/96	04/15/96	407	MG/KG		32.3	100
BOHCK5	10795-001MS	Lead	7439-92-1	QCBLK96730-1	04/11/96	04/15/96	-3270	%REC			100
BOHCK5	10795-001MSD	Lead	7439-92-1	QCBLK96730-1	04/11/96	04/15/96	-2870	%REC			100
BOHCJ2	10795-002	Lead	7439-92-1	QCBLK96730-1	04/11/96	04/15/96	790	MG/KG		32.3	100
BOHCJ6	10795-003	Lead	7439-92-1	QCBLK96730-1	04/11/96	04/15/96	844	MG/KG		33.6	100
NA	QCBLK96730-1	Lead	7439-92-1	QCBLK96730-1	04/11/96	04/15/96	-0.15	MG/KG	B	0.30	1
NA	QCLCS96730-1	Lead	7439-92-1	QCBLK96730-1	04/11/96	04/15/96	83	%REC			10

9613471.2535

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HCJ2

Lab Name: QUANTERRA_MO Contract: 550.136

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0974

Matrix (soil/water): SOIL Lab Sample ID: 10795-002

Level (low/med): LOW Date Received: 04/05/96

% Solids: 92.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	790			F

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

9613471.2536

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HCJ2

Lab Name: QUANTERRA_MO Contract: 550.136
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0974
Matrix (soil/water): WATER Lab Sample ID: P10795-002
Level (low/med): LOW Date Received: 04/05/96
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	394			P

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

9613471.2537

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HCJ6

Lab Name: QUANTERRA MO Contract: 550.136

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0974

Matrix (soil/water): SOIL Lab Sample ID: 10795-003

Level (low/med): LOW Date Received: 04/05/96

% Solids: 89.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	844			F

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

9613471.2538

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HCJ6

Lab Name: QUANTERRA_MO Contract: 550.136

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0974

Matrix (soil/water): WATER Lab Sample ID: P10795-003

Level (low/med): LOW Date Received: 04/05/96

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	83.1			P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

9613471.2539

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HCK5

Lab Name: QUANTERRA_MO Contract: 550.136
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0974
Matrix (soil/water): SOIL Lab Sample ID: 10795-001
Level (low/med): LOW Date Received: 04/05/96
% Solids: 92.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	407			F

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

9613471.2540

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HCK5

Lab Name: QUANTERRA MO Contract: 550.136
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0974
Matrix (soil/water): WATER Lab Sample ID: P10795-001
Level (low/med): LOW Date Received: 04/05/96
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	379			P

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846