START 9613444.0002

W0688

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Quanterra
Environmental Services

0044197

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
P.O. Box 1970
Richland, Washington 99352

October 11, 1995

Attention: Joan Kessner

OCT 1995 RECEIVED Data Log In

Project number	:	550.98
Date Received by Lab	:	August 28, 1995
Number of Samples	:	Four (4)
Sample Type	:	Soil
SDG Number	:	W0688
Data Deliverable	:	Summary

JUN 1996 RECEIVED EDMC

I. Introduction

On August 28, 1995, four (4) 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 the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
9209-001	B0GGB6	50844901	Soil	08/28/95
9209-002	B0GGB7	50844902	Soil	08/28/95
9209-003	B0GGB8	50844903	Soil	08/28/95
9209-004	B0GGC1	50844904	Soil	08/28/95

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.

Quanterra
Environmental Services

Analyses requested: ICP TCLP Metals by EPA method 6010 and Mercury by EPA method 7470 after TCLP Extraction by EPA method 1311.

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

Due to an error in spiking, the Matrix Spike of sample 9209-001 was prepared at half the normal level for the ICP analytes. The Matrix Spike Duplicate was prepared at the correct levels. The forms reflect the correct recoveries for both the Matrix Spike and the Matrix Spike Duplicate. See NCM # SL-94-2041.

Quanterra
Environmental Services

Bechtel Hanford Incorporated
October 11, 1995
Project Number: 550.98
SDG: W0688
Page 3

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\hanw0688.nar

Quanterra August 29, 1995 11:50 am
Account: 10722 Project: 550.98 Quanterra-Richland QAS No. 1129 Rev. 0
Master Sample Login: 9209

Project Manager: W. Price

Draft: Final: Entered and Reviewed by: Bob Cauvar PM Review: W. Price

Sample Header Template:

Sample No. / #	Client ID / Container Type	C-Matrix / Analysis	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No. / (Container Numbers:% Filled)
9209-001	B0GGB6	Soil	21-AUG-95 13:27	28-AUG-95 10:15	02-OCT-95	FED-EX	3*	R4203-004
NOTE: RICHLAND ID 50844901								
1	GN - Glass Jar-500ML	EXTMETAL/TCLP/Q4	S	COLD	25-SEP-95	18-SEP-95	S11B	(175762:100)
1		HG/TCLP/Q4	S	COLD	25-SEP-95	18-SEP-95	S11B	(175762:100)
1		ICAP/TCLP/Q4	S	COLD	25-SEP-95	17-FEB-96	S11B	(175762:100)
9209-001MS	B0GGB6	Soil	21-AUG-95 13:27	28-AUG-95 10:15	02-OCT-95	FED-EX	3*	R4203-004
NOTE: RICHLAND ID 50844901								
1	GN - Glass Jar-500ML	EXTMETAL/TCLP/Q4	S	COLD	25-SEP-95	18-SEP-95	S11B	(175762:100)
1		HG/TCLP/Q4	S	COLD	25-SEP-95	18-SEP-95	S11B	(175762:100)
1		ICAP/TCLP/Q4	S	COLD	25-SEP-95	17-FEB-96	S11B	(175762:100)
9209-001MSD	B0GGB6	Soil	21-AUG-95 13:27	28-AUG-95 10:15	02-OCT-95	FED-EX	3*	R4203-004
NOTE: RICHLAND ID 50844901								
1	GN - Glass Jar-500ML	EXTMETAL/TCLP/Q4	S	COLD	25-SEP-95	18-SEP-95	S11B	(175762:100)
1		HG/TCLP/Q4	S	COLD	25-SEP-95	18-SEP-95	S11B	(175762:100)
1		ICAP/TCLP/Q4	S	COLD	25-SEP-95	17-FEB-96	S11B	(175762:100)
9209-002	B0GGB7	Soil	23-AUG-95 08:13	28-AUG-95 10:15	02-OCT-95	FED-EX	3*	R4203-003
NOTE: RICHLAND ID 50844902								
1	GN - Glass Jar-500ML	EXTMETAL/TCLP/Q4	S	COLD	25-SEP-95	20-SEP-95	S11B	(175764:100)
1		HG/TCLP/Q4	S	COLD	25-SEP-95	20-SEP-95	S11B	(175764:100)
1		ICAP/TCLP/Q4	S	COLD	25-SEP-95	19-FEB-96	S11B	(175764:100)
9209-003	B0GGB8	Soil	25-AUG-95 10:33	28-AUG-95 10:15	02-OCT-95	FED-EX	3*	R4203-002
NOTE: RICHLAND ID 50844903								
1	AN - Amber Glass-500ml	EXTMETAL/TCLP/Q4	S	COLD	25-SEP-95	22-SEP-95	S11B	(175766:100)
1		HG/TCLP/Q4	S	COLD	25-SEP-95	22-SEP-95	S11B	(175766:100)
1		ICAP/TCLP/Q4	S	COLD	25-SEP-95	21-FEB-96	S11B	(175766:100)
9209-004	B0GGC1	Soil	26-AUG-95 08:54	28-AUG-95 10:15	02-OCT-95	FED-EX	3*	R4203-001
NOTE: RICHLAND ID 50844904								
1	AN - Amber Glass-500ml	EXTMETAL/TCLP/Q4	S	COLD	25-SEP-95	23-SEP-95	S11B	(175767:100)
1		HG/TCLP/Q4	S	COLD	25-SEP-95	23-SEP-95	S11B	(175767:100)
1		ICAP/TCLP/Q4	S	COLD	25-SEP-95	22-FEB-96	S11B	(175767:100)

Data:

3*=Sample has not been rad screened.

9613446.0005

0000007

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: ☐ Priority ☒ Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-H-106A Waste Characterization Sampling	Sampling Location: 100 HR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EEL 1137 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 SDL W0688

Preservative	none	none	none	none
Type of Container	P/G	P/G	P/G	P/G
No. of Container(s)	1	3	1	1
Volume	500 ml	500 ml	20 ml	20 ml
	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen
		508450		

Sample No.	Matrix*	Date Sampled	Time Sampled	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen
B0GGB6 01	S	8-21-95	1227	X	X	X	
				100			
			2nd		Container cap cracked (no sample lost)		

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers		8-22-95 1405
Received By: Ken Butler	Butler	8-22-95
Relinquished By: Ken Butler	Butler	8-28-95 10:15
Received By: Karen Stitt	Stitt	8-28-95 10:15
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

N5805

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

DISTRIBUTION: Original - Sample Yellow - Sampler

BC-6000-828 (12/92)

9513044.0006

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: CR-15	Field Logbook No.: EFL-1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 SDL 100688

Sample No.	Matrix*	Date Sampled	Time Sampled	TCLP Metals	See Item #1 below 508150	Activity Scan	Rad Screen											
Preservative				none	none	none	none											
Type of Container				P/G	P/G	P/G	P/G											
No. of Container(s)				1	3	1	1											
Volume				500 mL	500 mL	20 mL	20 mL											
B0GGB7 02	S	8-23-95	0813	X	X	X		N	5806									
				100														

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers		8-23-95/1431
Received By: EC	Kevin Butler	8-23-95 1431
Relinquished By: EC		10:15
Received By: Marilyn	Kevin Butler	8-28-95 10:15
Relinquished By: Kevin Butler		8-28-95
Received By: Kevin Stottenburg		8-28-95
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9615444.0007

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: Doug Bowen	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-H-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 W0688 508450

Preservative	none	none	none	none
Type of Container	A P/G	P/G	P/G	P/G
No. of Container(s)	1	3	1	1
Volume	500 mL	500 mL	20 mL	20 mL
	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen

Sample No.	Matrix*	Date Sampled	Time Sampled				
B0GB8 03	S	8-25-95	1033	X	X	X	N58073
				1			
				10			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowen	8-25-95 1500	K. Trapp / K. Trapp	8/25/95 1500
K. Trapp / K. Trapp	8/28/95 0805	Bahtten	8-28-95 0805
Bahtten	8-28-95 10:15	Kevin Bahtten	8-28-95 10:15

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: Doug Bowers	Company Contact: Randy Hevenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: 095-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

Preservative	none	none	none	none
Type of Container	P/G	P/G	P/G	P/G
No. of Container(s)	1	3	1	1
Volume	500 mL	500 mL	20 mL	20 mL
SAMPLE ANALYSIS	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen

SDG 100688

508449 508450

Sample No.	Matrix*	Date Sampled	Time Sampled						
B0GGC1 04	S	8-28-95	0854	X	X	X		N5810	
				100					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	8-28-95 / 0756	Eric Bettin / Eric Bettin	ER 0756 8-28-95
Eric Bettin / Eric Bettin	ER 10:15 8-28-95	Karen Bettinburg / Karen Bettinburg	10:15 8-28-95

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

DD00012

DD0399HL.0009

SAMPLE STATUS REPORT FOR N 5805 RAD SCREEN 80GGB6 TIME: 8/23/95 7:52
DISPATCHED: 8/16/95 16:32 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 8/23/95 7:45

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
4271	TOT-ACT	2.02790E 02 pCi/G	N	Y	XR5860

END OF REPORT

SAMPLE STATUS REPORT FOR N 5806. RAD SCREEN BOCC87 TIME: 8/24/95 9:13
DISPATCHED: 8/16/95 10:37 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 8/24/95 7:44

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
4271	TOT-ACT	1.93100E 02 pCi/G	N	Y	XR5860

END OF REPORT

SAMPLE STATUS REPORT FOR N 5807. RAD SCREEN 80GGR8 TIME: 8/28/95 8:10
DISPATCHED: 8/16/95 16:32 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 8/25/95 15:32

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
4271	TOT ACT	1.51510E 02 pCi/G	N	Y	XR5860

END OF REPORT

SAMPLE STATUS REPORT FOR N 5810. RAD SCREEN BOGGC1 TIME: 8/28/95 8:10
DISPATCHED: 8/16/95 16:33 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 8/26/95 12:20

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	8.50700E 01 pC1/G	N	Y	XR5860

END OF REPORT

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 8-28-95 10:15 Client Name BHI

Project/Client # B95-086 Batch or Case # _____

Cooler ID (if noted on outside of cooler) ER-15

1. Condition of shipping container? _____
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [X]
5. Vermiculite/packing material is: Wet [ ] Dry [X] _____
6. Each sample is in a plastic bag? Yes [X] No [ ] _____
7. Number of sample containers in cooler: 20
8. Samples have:
   - Y tape
   - Y custody seals
   - ____ hazard labels
   - ____ appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ broken
   - ____ other
   - ____ leaking
   - ____ have air bubbles
10. Coolant Present? Yes [X] No [ ] Sample Temperature 4°C
11. The following paperwork should be accounted for (N/A if not applicable):
    - Chain of Custody #(s) N/A
    - Request for Analysis #(s) ↓
    - Airbill # ↓ Carrier N/A
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [X]

Printed Name/Signature Karen Stettinburg Date/Time 8-28-95 10:15

9613444.0015

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Metals Analysis
Matrix : SOLID

Client ID: B0GGB6

Sample Date : 08/21/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Quanterra ID : 9209-001

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Arsenic	EPA 6010	09/07/95	09/11/95	09/12/95	0.058	MG/L	U	0.50	5.0	1
Barium	EPA 6010	09/07/95	09/11/95	09/12/95	0.73	MG/L		0.20	100	1
Cadmium	EPA 6010	09/07/95	09/11/95	09/12/95	0.0031	MG/L	U	0.020	1.0	1
Chromium	EPA 6010	09/07/95	09/11/95	09/12/95	0.0061	MG/L	B	0.020	5.0	1
Lead	EPA 6010	09/07/95	09/11/95	09/12/95	0.041	MG/L	U	0.10	5.0	1
Selenium	EPA 6010	09/07/95	09/11/95	09/12/95	0.043	MG/L	U	0.25	1.0	1
Silver	EPA 6010	09/07/95	09/11/95	09/12/95	0.0022	MG/L	U	0.20	5.0	1

0000022

0000008 10/11/95

9613444.0016

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Sample Date : 08/21/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Category : TCLP Metals Analysis
Matrix : SOLID

Client ID: B0GGB6

Quanterra ID : 9209-001MS

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Arsenic	EPA 6010	09/07/95	09/11/95	09/12/95	94	%REC				1
Barium	EPA 6010	09/07/95	09/11/95	09/12/95	85	%REC				1
Cadmium	EPA 6010	09/07/95	09/11/95	09/12/95	95	%REC				1
Chromium	EPA 6010	09/07/95	09/11/95	09/12/95	95	%REC				1
Lead	EPA 6010	09/07/95	09/11/95	09/12/95	94	%REC				1
Selenium	EPA 6010	09/07/95	09/11/95	09/12/95	105	%REC				1
Silver	EPA 6010	09/07/95	09/11/95	09/12/95	97	%REC				1

0000023

0000009 10/11/95

9613444.0017

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Metals Analysis
Matrix : SOLID

Client ID: BOGGB6

Sample Date : 08/21/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Quanterra ID : 9209-001MSD

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Arsenic	EPA 6010	09/07/95	09/11/95	09/12/95	97	%REC				1
Barium	EPA 6010	09/07/95	09/11/95	09/12/95	89	%REC				1
Cadmium	EPA 6010	09/07/95	09/11/95	09/12/95	95	%REC				1
Chromium	EPA 6010	09/07/95	09/11/95	09/12/95	95	%REC				1
Lead	EPA 6010	09/07/95	09/11/95	09/12/95	94	%REC				1
Selenium	EPA 6010	09/07/95	09/11/95	09/12/95	101	%REC				1
Silver	EPA 6010	09/07/95	09/11/95	09/12/95	92	%REC				1

9613444.0018

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Metals Analysis
Matrix : SOLID

Client ID: BOGGB7

Sample Date : 08/23/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Quanterra ID : 9209-002

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Arsenic	EPA 6010	09/07/95	09/11/95	09/12/95	0.058	MG/L	U	0.50	5.0	1
Barium	EPA 6010	09/07/95	09/11/95	09/12/95	0.41	MG/L		0.20	100	1
Cadmium	EPA 6010	09/07/95	09/11/95	09/12/95	0.0031	MG/L	U	0.020	1.0	1
Chromium	EPA 6010	09/07/95	09/11/95	09/12/95	0.0028	MG/L	B	0.020	5.0	1
Lead	EPA 6010	09/07/95	09/11/95	09/12/95	0.041	MG/L	U	0.10	5.0	1
Selenium	EPA 6010	09/07/95	09/11/95	09/12/95	0.043	MG/L	U	0.25	1.0	1
Silver	EPA 6010	09/07/95	09/11/95	09/12/95	0.0022	MG/L	U	0.20	5.0	1

0000025

~~0000011~~ 10/11/95

9613444.0019

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Sample Date : 08/25/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Category : TCLP Metals Analysis
Matrix : SOLID

Client ID: BOGGB8

Quanterra ID : 9209-003

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Arsenic	EPA 6010	09/07/95	09/11/95	09/12/95	0.058	MG/L	U	0.50	5.0	1
Barium	EPA 6010	09/07/95	09/11/95	09/12/95	0.55	MG/L		0.20	100	1
Cadmium	EPA 6010	09/07/95	09/11/95	09/12/95	0.0031	MG/L	U	0.020	1.0	1
Chromium	EPA 6010	09/07/95	09/11/95	09/12/95	0.0029	MG/L	B	0.020	5.0	1
Lead	EPA 6010	09/07/95	09/11/95	09/12/95	0.041	MG/L	U	0.10	5.0	1
Selenium	EPA 6010	09/07/95	09/11/95	09/12/95	0.043	MG/L	U	0.25	1.0	1
Silver	EPA 6010	09/07/95	09/11/95	09/12/95	0.0022	MG/L	U	0.20	5.0	1

0000026

~~0000012~~ 10/11/95

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Metals Analysis
Matrix : SOLID

Client ID: BOGGC1

Sample Date : 08/26/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Quanterra ID : 9209-004

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Arsenic	EPA 6010	09/07/95	09/11/95	09/12/95	0.058	MG/L	U	0.50	5.0	1
Barium	EPA 6010	09/07/95	09/11/95	09/12/95	0.55	MG/L		0.20	100	1
Cadmium	EPA 6010	09/07/95	09/11/95	09/12/95	0.0031	MG/L	U	0.020	1.0	1
Chromium	EPA 6010	09/07/95	09/11/95	09/12/95	0.0028	MG/L	U	0.020	5.0	1
Lead	EPA 6010	09/07/95	09/11/95	09/12/95	0.041	MG/L	U	0.10	5.0	1
Selenium	EPA 6010	09/07/95	09/11/95	09/12/95	0.047	MG/L	B	0.25	1.0	1
Silver	EPA 6010	09/07/95	09/11/95	09/12/95	0.0022	MG/L	U	0.20	5.0	1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Mercury
Matrix : SOLID

Client ID: BOGGB6

Sample Date : 08/21/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Quanterra ID : 9209-001

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	09/07/95	09/11/95	09/11/95	0.00010	MG/L	U	0.00020	0.20	1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Mercury
Matrix : SOLID

Client ID: B0GGB6

Sample Date : 08/21/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Quanterra ID : 9209-001MS

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	09/07/95	09/11/95	09/11/95	108	%REC				1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Mercury
Matrix : SOLID

Sample Date : 08/21/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Client ID: BOGGB6

Quanterra ID : 9209-001MSD

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	09/07/95	09/11/95	09/11/95	107	%REC				1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Mercury
Matrix : SOLID

Client ID: BOGGB7

Sample Date : 08/23/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Quanterra ID : 9209-002

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	09/07/95	09/11/95	09/11/95	0.00010	MG/L	U	0.00020	0.20	1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Mercury
Matrix : SOLID

Client ID: BOGGB8

Sample Date : 08/25/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Quanterra ID : 9209-003

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	09/07/95	09/11/95	09/11/95	0.00010	MG/L	U	0.00020	0.20	1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.98

Category : TCLP Mercury
Matrix : SOLID

Client ID: BOGGC1

Sample Date : 08/26/95
Receipt Date : 08/28/95
Report Date : 10/10/95

Quanterra ID : 9209-004

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	09/07/95	09/11/95	09/11/95	0.00010	MG/L	U	0.00020	0.20	1

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U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGB6

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-001

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	734			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	6.1	B		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	43.3	U		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

TCLP

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U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGB7

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-002

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	414			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	2.8	B		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	43.3	U		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

TCLP

9613444.0029

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGB8

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-003

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	549			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	2.9	B		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	43.3	U		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

TCLP

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGC1

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-004

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	549			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	2.8	U		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	47.0	B		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

TCLP

9613444.0031

W0688 R

Quanterra
Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

OCT 1995
RECEIVED
Data
Log In

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

October 26, 1995

Attention: Joan Kessner

SAF Number	:	B95-086
Date SDG Closed	:	September 11, 1995
Number of Samples	:	Four (4)
Sample Type	:	Soil
SDG Number	:	W0688
Data Deliverable	:	Summary

I. Introduction

On August 28, 1995, four soil samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QTESRL ID	BHI ID	Matrix	Date of Receipt
50854001	B0GGB6	Soil	8/28/95
50854002	B0GGB7	Soil	8/28/95
50854003	B0GGB8	Soil	8/28/95
50854004	B0GGC1	Soil	8/28/95

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 analyses were:

Alpha Spectroscopy
Plutonium-238, -239/40 by method ITAS-RD-3209
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204

III. Quality Control

The analytical results for each analysis performed under SDG W0688 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results, with the exception of Gross Alpha and Gross Beta results which are reported in pCi/sample.

IV. Comments

Alpha Spectroscopy

Plutonium-238, -239/40 by method ITAS-RD-3209
The sample aliquot sizes were reduced due to high screening results. The samples meet the RDL requirements using the smaller analysis sizes. The yields were lower than 30% for samples B0GGB7 and B0GGC1. The samples have achieved MDAs that are well below the RDLs. The cause of the low batch yields is uncertain. The sample data are accepted as the MDAs are less than one half the RDL and the yields are above the internal minimum yield criteria. The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements, except as noted.

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Environmental Services

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
Ra-226 and Ra-228 are detected but not reported in the Ottawa sand blank. The radium is a naturally occurring constituent of the blank matrix and is not indicative of batch contamination. The samples were counted in 200 mL geometry's due to insufficient sample. The samples do not meet the Fe-59 RDL due to the combination of smaller than preferred sample sizes analyzed and the short half-life of Fe-59. The Fe-59 RDL is met by the blank, therefore, the sample data are accepted. The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements, except as noted.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements.

Strontium-90 by method ITAS-RD-3204
The sample aliquot sizes were reduced due to high screening results. The sample and sample duplicate results far exceed the calculated MDA and the results are accepted. The LCS, batch blank, sample and sample duplicate (B0GGC1) results are within contractual requirements.

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:

Suzanne Gaines

Suzanne Gaines
Project Manager

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845001	MATRIX:	SOIL
CLIENT ID:	B0GGB6	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-4.89E-02	6.9E-02	7.0E-02	6.91E-01	pCi/g	34.00%	RD3209
PU239/40	0.00E+00	0.0E+00	3.7E-01	3.31E-01	pCi/g	34.00%	RD3209
CO-58	5.47E-03	1.5E-02	1.5E-02	2.51E-02	pCi/g	N/A	RD3219
CO-60	6.41E-01	3.5E-02	7.3E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	-3.90E-03	1.2E-02	1.2E-02	1.93E-02	pCi/g	N/A	RD3219
EU-152	-9.36E-03	3.2E-02	3.2E-02	5.16E-02	pCi/g	N/A	RD3219
EU-154	1.07E-02	3.2E-02	3.2E-02	5.57E-02	pCi/g	N/A	RD3219
EU-155	1.05E-02	5.8E-02	5.8E-02	8.86E-02	pCi/g	N/A	RD3219
FE-59	7.89E-04	4.1E-02	4.1E-02	6.85E-02	pCi/g	N/A	RD3219
K-40	1.45E+01	4.7E-01	1.5E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	4.63E-01	3.9E-02	6.1E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.62E-01	4.7E-02	6.0E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	5.77E-01	8.7E-02	1.0E-01	N/A	pCi/g	N/A	RD3219
TH-228DA	4.91E-01	6.7E-02	8.3E-02	N/A	pCi/g	N/A	RD3219
U-238DLP	5.46E-01	5.0E-01	5.1E-01	N/A	pCi/g	N/A	RD3219
ALPHA	5.43E+00	3.7E+00	3.8E+00	5.43E+00	pCi/g	100.00%	RD3222
BETA	6.49E+02	1.7E+01	4.6E+01	3.70E+00	pCi/g	100.00%	RD3222
STRONTIUM	2.10E+02	6.8E+00	5.7E+01	3.77E+00	pCi/g	100.00%	RD3204

Number of Results: 18

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845002	MATRIX:	SOIL
CLIENT ID:	B0GGB7	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00	0.0E+00	2.1E-01	1.91E-01	pCi/g	26.90%	RD3209
PU239/40	-4.22E-02	4.9E-02	5.0E-02	4.44E-01	pCi/g	26.90%	RD3209
CO-58	-1.73E-02	1.5E-02	1.5E-02	2.39E-02	pCi/g	N/A	RD3219
CO-60	3.02E-01	2.8E-02	4.1E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	-1.63E-02	1.1E-02	1.2E-02	1.82E-02	pCi/g	N/A	RD3219
EU-152	-2.76E-03	2.8E-02	2.8E-02	4.73E-02	pCi/g	N/A	RD3219
EU-154	6.29E-03	3.6E-02	3.6E-02	6.00E-02	pCi/g	N/A	RD3219
EU-155	8.58E-03	4.9E-02	4.9E-02	7.91E-02	pCi/g	N/A	RD3219
FE-59	5.97E-03	4.0E-02	4.0E-02	6.73E-02	pCi/g	N/A	RD3219
K-40	1.56E+01	4.8E-01	1.6E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	3.82E-01	3.3E-02	5.1E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	2.89E-01	4.3E-02	5.2E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	4.50E-01	7.6E-02	8.8E-02	N/A	pCi/g	N/A	RD3219
TH-228DA	3.69E-01	6.5E-02	7.5E-02	N/A	pCi/g	N/A	RD3219
ALPHA	9.06E+00	4.4E+00	4.5E+00	4.88E+00	pCi/g	100.00%	RD3222
BETA	4.64E+02	1.4E+01	3.4E+01	3.71E+00	pCi/g	100.00%	RD3222
STRONTIUM	7.88E+01	2.9E+00	2.1E+01	1.67E+00	pCi/g	100.00%	RD3204

Number of Results: 17

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845003	MATRIX:	SOIL
CLIENT ID:	B0GGB8	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-1.36E-02	2.7E-02	2.7E-02	3.25E-01	pCi/g	34.20%	RD3209
PU239/40	1.22E-01	1.9E-01	2.0E-01	3.24E-01	pCi/g	34.20%	RD3209
CO-58	1.50E-02	1.6E-02	1.7E-02	2.88E-02	pCi/g	N/A	RD3219
CO-60	4.53E-01	3.5E-02	5.7E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	1.99E-02	1.3E-02	1.3E-02	2.23E-02	pCi/g	N/A	RD3219
EU-152	-9.07E-03	3.6E-02	3.6E-02	5.86E-02	pCi/g	N/A	RD3219
EU-154	9.80E-03	3.9E-02	3.9E-02	6.69E-02	pCi/g	N/A	RD3219
EU-155	-5.03E-03	6.2E-02	6.2E-02	1.00E-01	pCi/g	N/A	RD3219
FE-59	-1.35E-02	4.7E-02	4.7E-02	7.78E-02	pCi/g	N/A	RD3219
K-40	1.54E+01	5.5E-01	1.6E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	8.09E-01	4.1E-02	9.1E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	5.29E-01	5.7E-02	7.8E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	8.63E-01	1.0E-01	1.3E-01	N/A	pCi/g	N/A	RD3219
TH-228DA	8.00E-01	7.9E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
ALPHA	9.68E+00	4.4E+00	4.5E+00	3.89E+00	pCi/g	100.00%	RD3222
BETA	3.72E+02	1.3E+01	2.8E+01	3.47E+00	pCi/g	100.00%	RD3222
STRONTIUM	1.18E+02	3.9E+00	3.2E+01	2.06E+00	pCi/g	100.00%	RD3204

Number of Results: 17

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845004	MATRIX:	SOIL
CLIENT ID:	B0GGC1	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-1.12E-02	2.2E-02	2.3E-02	2.67E-01	pCi/g	23.00%	RD3209
PU239/40	-1.11E-02	2.2E-02	2.3E-02	2.67E-01	pCi/g	23.00%	RD3209
CO-58	-1.05E-02	1.6E-02	1.6E-02	2.62E-02	pCi/g	N/A	RD3219
CO-60	2.72E-01	2.9E-02	4.0E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	1.13E-02	1.1E-02	1.1E-02	1.98E-02	pCi/g	N/A	RD3219
EU-152	1.84E-03	3.1E-02	3.1E-02	5.19E-02	pCi/g	N/A	RD3219
EU-154	2.02E-02	4.1E-02	4.1E-02	7.04E-02	pCi/g	N/A	RD3219
EU-155	1.52E-02	4.5E-02	4.5E-02	7.26E-02	pCi/g	N/A	RD3219
FE-59	2.43E-02	4.4E-02	4.4E-02	7.54E-02	pCi/g	N/A	RD3219
K-40	1.84E+01	5.6E-01	1.9E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	5.43E-01	3.6E-02	6.5E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.10E-01	4.6E-02	5.5E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	5.58E-01	8.2E-02	9.9E-02	N/A	pCi/g	N/A	RD3219
TH-228DA	5.70E-01	5.8E-02	8.1E-02	N/A	pCi/g	N/A	RD3219
ALPHA	7.51E+00	4.2E+00	4.3E+00	5.64E+00	pCi/g	100.00%	RD3222
BETA	5.10E+02	1.5E+01	3.7E+01	3.57E+00	pCi/g	100.00%	RD3222
STRONTIUM	5.22E+01	1.9E+00	1.4E+01	1.16E+00	pCi/g	100.00%	RD3204

Number of Results: 17

Quanterra
Environmental Services

DUPLICATE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	G0845001	MATRIX:	SOIL
CLIENT ID:	B0GGB6	DATE RECEIVED:	8/28/95 10:15:00 A
ORIG LAB SAMPLE ID:	50845001		

ISOTOPE	DUP RESULT	COUNTING ERROR1	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
PU-238	-4.57E-02	5.3E-02	5.3E-02	4.81E-01	pCi/g	54.60%	RD3209	-4.89E-02	6.79%
PU239/40	6.09E-02	1.6E-01	1.6E-01	3.65E-01	pCi/g	54.60%	RD3209	0.00E+00	200.00%
CO-58	2.38E-03	1.6E-02	1.6E-02	2.67E-02	pCi/g	N/A	RD3219	5.47E-03	78.83%
CO-60	6.29E-01	3.4E-02	7.2E-02	N/A	pCi/g	N/A	RD3219	6.41E-01	1.90%
CS-137DA	-7.47E-03	1.2E-02	1.2E-02	1.94E-02	pCi/g	N/A	RD3219	-3.90E-03	62.80%
EU-152	-1.96E-02	3.4E-02	3.4E-02	5.49E-02	pCi/g	N/A	RD3219	-9.36E-03	70.72%
EU-154	-3.61E-02	3.7E-02	3.8E-02	5.95E-02	pCi/g	N/A	RD3219	1.07E-02	368.73%
EU-155	4.96E-02	6.2E-02	6.2E-02	9.92E-02	pCi/g	N/A	RD3219	1.05E-02	130.06%
FE-59	1.69E-03	4.4E-02	4.4E-02	7.39E-02	pCi/g	N/A	RD3219	7.89E-04	72.68%
K-40	1.43E+01	4.6E-01	1.5E+00	N/A	pCi/g	N/A	RD3219	1.45E+01	1.32%
RA-224DA	4.48E-01	4.2E-02	6.1E-02	N/A	pCi/g	N/A	RD3219	4.63E-01	3.27%
RA-226DA	3.57E-01	4.7E-02	5.9E-02	N/A	pCi/g	N/A	RD3219	3.62E-01	1.56%
RA-228DA	5.35E-01	9.8E-02	1.1E-01	N/A	pCi/g	N/A	RD3219	5.77E-01	7.60%
TH-228DA	5.22E-01	6.1E-02	8.1E-02	N/A	pCi/g	N/A	RD3219	4.91E-01	6.02%
ALPHA	5.16E+00	3.6E+00	3.6E+00	5.22E+00	pCi/g	100.00%	RD3222	5.43E+00	5.05%
BETA	6.35E+02	1.6E+01	4.5E+01	3.47E+00	pCi/g	100.00%	RD3222	6.49E+02	2.30%

Number of Results: 16

Quanterra
Environmental Services

DUPLICATE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	G0845004	MATRIX:	SOIL
CLIENT ID:	B0GGC1	DATE RECEIVED:	8/28/95 10:15:00 A
ORIG LAB SAMPLE ID:	50845004		

ISOTOPE	DUP RESULT	COUNTING ERROR(1	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
STRONTIUM	5.36E+01	2.0E+00	1.4E+01	1.21E+00	pCi/g	97.00%	RD3204	5.22E+01	2.78%

Number of Results: 1

SAMPLE STATUS REPORT FOR N 5805. RAD SCREEN 60GGB6 TIME: 8/23/95 7:52
DISPATCHED: 8/16/95 16:32 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 8/23/95 7:45

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
4271	TOT-ACT	2.02790E 02 pCi/G	N	Y	XR5860

END OF REPORT

SAMPLE STATUS REPORT FOR N 5806. RAD SCREEN BOCCB7 TIME: 8/24/95 9:13
DISPATCHED: 8/16/95 16:37 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 8/24/95 7:44

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
4271	TOT-ACT	1.93100E 02 pCi/G	N	Y	XR5860

END OF REPORT

SAMPLE STATUS REPORT FOR N 5807. RAD SCREEN 80GGR8 TIME: 8/28/95 8:10
DISPATCHED: 8/16/95 16:32 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 8/25/95 15:32

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
4271	TOT ACT	1.51510E 02 pCi/G	N	Y	XR5860

END OF REPORT

SAMPLE STATUS REPORT FOR N 5810. RAD SCREEN BOGGC1 TIME: 8/28/95 8:10
DISPATCHED: 8/16/95 16:33 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 8/26/95 12:20

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	8.50700E 01 pC1/G	N	Y	XR5860

END OF REPORT

WO# 688
508449
508450

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 8-28-95 10:15 Client Name BHI

Project/Client # B95-086 Batch or Case # _____

Cooler ID (if noted on outside of cooler) ER-15

1. Condition of shipping container? _____
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [X]
5. Vermiculite/packing material is: Wet [ ] Dry [X] _____
6. Each sample is in a plastic bag? Yes [X] No [ ] _____
7. Number of sample containers in cooler: 20
8. Samples have:
   - Y tape
   - Y custody seals
   - ____ hazard labels
   - ____ appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ broken
   - ____ other
   - ____ leaking
   - ____ have air bubbles
10. Coolant Present? Yes [X] No [ ] Sample Temperature 4°C
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) n/a
    Request for Analysis #(s) ↓
    Airbill # _____ Carrier n/a
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [X]

Printed Name/Signature Karen Stettinbug Date/Time 8-28-95 10:15

9613444.0045 *** PUISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

28-Aug-1995
Page 1

CUSTOMER: BHI SAF

SAMPLE DELIVERY GROUP WX0688

MATRIX : SOIL B95-086

BATCH NUMBER 08-450

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
*)	M084501B		BHI		
*)	M084501S	IQHI194	BHI		15.016 ± .53788 pm/SA
3)	50845001 G0845001	DUP	BHI	BOGGB6	ALL ALIQUOTS REDUCED DUE TO SCREENING
4)	50845002		BHI	BOGGB7	
5)	50845003		BHI	BOGGB8	
6)	50845004		BHI	BOGGC1	

ACTIONS (Initial & Date)

1) INITIATED JH 8/28/95

2) PREP LAB RECEIVED 9/12/95 RVE
REC 9-20-95 JN

3) SAMPLE REMAINDER STORED 9-22-95 JN

4) SEPARATION LAB RECEIVED RB 9-22-95
E.D. 9/28/95 M.U.

5) COUNTING/MEASUREMENT LAB AS 9/28/95

6) DATA REVIEWED AND ANALYTICAL PREP STORED MK 10-3-95
MR 10-3-95

9613444.0046 *** GAMMA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

28-Aug-199:
Page 1

CUSTOMER: BHI SAF

SAMPLE DELIVERY GROUP W0688

MATRIX : SOIL B95-086

BATCH NUMBER 08-450

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
*)	M0845018X (WE 9-6-95)		BHI		"OSBK"
*)	M0845018m (EWL 9/6/95)		BHI		Cal 491
3)	50845001 G0845D01		BHI	BOGGB6	dup insufficient sample for Mt
4)	50845002		BHI	BOGGB7	"
5)	50845003		BHI	BOGGB8	"
6)	50845004		BHI	BOGGC1	"

ACTIONS (Initial & Date)

1) INITIATED JH 8/28/95

2) PREP LAB RECEIVED 9/12/95 ZUE

3) SAMPLE REMAINDER STORED 9/19/95 ZUE

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB 9/19/9:

6) DATA REVIEWED AND ANALYTICAL PREP STORED WEF 10/5/95

9613444.0047*** ALPHA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

28-Aug-1995
Page 1

CUSTOMER: BHI SAF

SAMPLE DELIVERY GROUP W0688

MATRIX : SOIL B95-086

BATCH NUMBER 08-450

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
*)	M084501B		BHI		Blank
*)	M084501S		BHI		EQEE 922 10.081 ± .086730 DA
3)	50845001 G084 5001		BHI	BOGGB6	dup
4)	50845002		BHI	BOGGB7	
5)	50845003		BHI	BOGGB8	
6)	50845004		BHI	BOGGC1	

ACTIONS (Initial & Date)

1) INITIATED JH 8/28/95

2) PREP LAB RECEIVED 9/12/95 RVE

3) SAMPLE REMAINDER STORED 9/21/95 RVE

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB AS 9/21/95

6) DATA REVIEWED AND ANALYTICAL PREP STORED SEE 9/28/95

9613444.0048 *** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

28-Aug-1995
Page 1

CUSTOMER: BHI SAF

MATRIX : SOIL B95-086

SAMPLE DELIVERY GROUP W0688

BATCH NUMBER 08-450

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
*)	M084501B		BHI	Blank	30,200 I .37689 dpm/SF
*)	M084501S		BHI	EQAU 406	
3)	50845001		BHI	BOGGB6	
	B0845001				dup
4)	50845002		BHI	BOGGB7	
5)	50845003		BHI	BOGGB8	
6)	50845004		BHI	BOGGC1	

ACTIONS (Initial & Date)

1) INITIATED AH 8/28/95

2) PREP LAB RECEIVED 9/12/95 RVE

3) SAMPLE REMAINDER STORED 9/21/95 RVE

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB AS 9/23/95

6) DATA REVIEWED AND ANALYTICAL PREP STORED GR 9/28/95

9613444.0049 *** TOTAL-SR ***

10-26-95

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

28-Aug-1995
Page 1

CUSTOMER: BHI SAF

SAMPLE DELIVERY GROUP W0688

MATRIX : SOIL B95-086

BATCH NUMBER 08-450

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
*)	M084501B		BHI		
*)	M084501S		BHI		EQGF 105 79.892 ± 1.163 DPM
3)	50845001		BHI	BOGGB6	
4)	50845002		BHI	BOGGB7	
5)	50845003		BHI	BOGGB8	
6)	50845004 G0845004		BHI	BOGGC1	

ACTIONS (Initial & Date)

1) INITIATED JH 8/28/95

2) PREP LAB RECEIVED 9/12/95 RVE

3) SAMPLE REMAINDER STORED 9/22/95

4) SEPARATION LAB RECEIVED BR 9-26-95

5) COUNTING/MEASUREMENT LAB JS 10-2-95

6) DATA REVIEWED AND ANALYTICAL PREP STORED MR 10-3-95

9613444.0050

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

Golder Associates

December 20, 1995

Our ref: 943-1610.110.0400
94-1610/O/421

CH2M Hill
1022 Lee Blvd.
Richland, Washington 99352

DEC 1995
RECEIVED
Validation
Log In

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF DATA VALIDATION PACKAGE, CONTRACT NO. MSH-SWV-315905

Dear Ms. Duncan:

This letter is to transmit the following data validation package:

SAF#	Project	Data Package	Analyses
B95-086	199-N106A Waste Characterization	W0688-QES	Inorganics, Radiochemistry

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Tom Stapp

Thomas M. Stapp
Task Manager

Doug Mather

Douglas Mather
Project Manager

Enclosures

p:\enviros\whc\dv\dptran.ltr

MEMORANDUM

TO: 199-N106A Waste Characterization Sampling, Project QA Record December 13, 1995

FR: Heidi Gregerson, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0688-QES (943-1610.110 688RAD.NR2)

INTRODUCTION

This memo presents the results of data validation on data package W0688-QES prepared by Quanterra Environmental Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0GGB6		RADIOCHEMISTRY	SOIL
B0GGB7			SOIL
B0GGB8		SEE ATTACHMENT 4	SOIL
B0GGC1			SOIL

Data validation was conducted to level C in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Detection Limits. Detection limit goals were met for all sample results, with the exception of strontium for all the sample results. In accordance with validation procedures data qualification is not required.

Completeness. The data package was complete for all requested analyses. A total of four samples were validated in this data package with a total of 69 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the 90 percent objective of the work plan.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

No minor deficiencies were identified during data validation which required qualification of data.

DATA REPORTING

- Reported sample results which are less than the minimum detectable activity (MDA) have been qualified as undetected (U) on the laboratory results form (see Attachment 3).

REFERENCES

WHC 1993, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

ATTACHMENT 1

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the sample result corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the result reported may not accurately reflect the sample concentration. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

WHC-SD-EN-SPP-002, REV.2

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: W0688-QES	REVIEWER: H. Gregerson	DATE: 12-13-95	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION APPLIED			

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0688-QES

	Samp#	B0GGB6		B0GGB7		B0GGB8		B0GGC1	
	Date	8-21-95		8-23-95		8-25-95		8-26-95	
	Location	N5805		N5806		N5807		N5810	
	Depth	---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments								
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
PLUTONIUM-238	pCi/G	-0.049	U	0.000	U	-0.014	U	-0.011	U
PLUTONIUM-239/240	pCi/G	0.000	U	-0.042	U	0.122	U	-0.011	U
COBALT-58	pCi/G	0.005	U	-0.017	U	0.015	U	-0.010	U
COBALT-60	pCi/G	0.641		0.302		0.453		0.272	
CESIUM-137DA	pCi/G	-0.004	U	-0.016	U	0.020	U	0.011	U
EUROPIUM-152	pCi/G	-0.009	U	-0.003	U	-0.009	U	0.002	U
EUROPIUM-154	pCi/G	0.011	U	0.006	U	0.010	U	0.020	U
EUROPIUM-155	pCi/G	0.010	U	0.009	U	-0.005	U	0.015	U
IRON-59	pCi/G	0.001	U	0.006	U	-0.014	U	0.024	U
POTASSIUM-40	pCi/G	14.500		15.600		15.400		0.184	
RADIUM-224DA	pCi/G	0.463		0.382		0.809		0.543	
RADIUM-226DA	pCi/G	0.362		0.289		0.529		0.310	
RADIUM-228DA	pCi/G	0.577		0.450		0.863		0.558	
THORIUM-228DA	pCi/G	0.491		0.369		0.800		0.570	
URANIUM-238DLP	pCi/G	0.546		---		---		---	
GROSS ALPHA	pCi/G	5.430		9.060		9.680		7.510	
GROSS BETA	pCi/G	649.000		464.000		372.000		510.000	
STRONTIUM	pCi/G	210.000		78.800		118.000		52.200	

The decimal places shown do not reflect the precision reported by the laboratory

Verified
RLG 12/13/95

9613444.0058

008

9613444.0059

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845001	MATRIX:	SOIL
CLIENT ID:	B0GGB6	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-4.89E-02	U	6.9E-02	7.0E-02	6.91E-01	pCi/g	34.00%	RD3209
PU239/40	0.00E+00	U	0.0E+00	3.7E-01	3.31E-01	pCi/g	34.00%	RD3209
CO-58	5.47E-03	U	1.5E-02	1.5E-02	2.51E-02	pCi/g	N/A	RD3219
CO-60	6.41E-01		3.5E-02	7.3E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	-3.90E-03	U	1.2E-02	1.2E-02	1.93E-02	pCi/g	N/A	RD3219
EU-152	-9.36E-03	U	3.2E-02	3.2E-02	5.16E-02	pCi/g	N/A	RD3219
EU-154	1.07E-02	U	3.2E-02	3.2E-02	5.57E-02	pCi/g	N/A	RD3219
EU-155	1.05E-02	U	5.8E-02	5.8E-02	8.86E-02	pCi/g	N/A	RD3219
FE-59	7.89E-04	U	4.1E-02	4.1E-02	6.85E-02	pCi/g	N/A	RD3219
K-40	1.45E+01		4.7E-01	1.5E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	4.63E-01		3.9E-02	6.1E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.62E-01		4.7E-02	6.0E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	5.77E-01		8.7E-02	1.0E-01	N/A	pCi/g	N/A	RD3219
TH-228DA	4.91E-01		6.7E-02	8.3E-02	N/A	pCi/g	N/A	RD3219
U-238DLP	5.46E-01		5.0E-01	5.1E-01	N/A	pCi/g	N/A	RD3219
ALPHA	5.43E+00		3.7E+00	3.8E+00	5.43E+00	pCi/g	100.00%	RD3222
BETA	6.49E+02		1.7E+01	4.6E+01	3.70E+00	pCi/g	100.00%	RD3222
STRONTIUM	2.10E+02		6.8E+00	5.7E+01	3.77E+00	pCi/g	100.00%	RD3204

Number of Results: 18

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845002	MATRIX:	SOIL
CLIENT ID:	B0GGB7	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00 Q/U	0.0E+00	2.1E-01	1.91E-01	pCi/g	26.90%	RD3209
PU239/40	-4.22E-02 U	4.9E-02	5.0E-02	4.44E-01	pCi/g	26.90%	RD3209
CO-58	-1.73E-02 U	1.5E-02	1.5E-02	2.39E-02	pCi/g	N/A	RD3219
CO-60	3.02E-01	2.8E-02	4.1E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	-1.63E-02 U	1.1E-02	1.2E-02	1.82E-02	pCi/g	N/A	RD3219
EU-152	-2.76E-03 U	2.8E-02	2.8E-02	4.73E-02	pCi/g	N/A	RD3219
EU-154	6.29E-03 U	3.6E-02	3.6E-02	6.00E-02	pCi/g	N/A	RD3219
EU-155	8.58E-03 U	4.9E-02	4.9E-02	7.91E-02	pCi/g	N/A	RD3219
FE-59	5.97E-03 U	4.0E-02	4.0E-02	6.73E-02	pCi/g	N/A	RD3219
K-40	1.56E+01	4.8E-01	1.6E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	3.82E-01	3.3E-02	5.1E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	2.89E-01	4.3E-02	5.2E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	4.50E-01	7.6E-02	8.8E-02	N/A	pCi/g	N/A	RD3219
TH-228DA	3.69E-01	6.5E-02	7.5E-02	N/A	pCi/g	N/A	RD3219
ALPHA	9.06E+00	4.4E+00	4.5E+00	4.88E+00	pCi/g	100.00%	RD3222
BETA	4.64E+02	1.4E+01	3.4E+01	3.71E+00	pCi/g	100.00%	RD3222
STRONTIUM	7.88E+01	2.9E+00	2.1E+01	1.67E+00	pCi/g	100.00%	RD3204

Number of Results: 17

HRG 12/13/95

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9613444.0061

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845003	MATRIX:	SOIL
CLIENT ID:	B0GGB8	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-1.36E-02 Q U	2.7E-02	2.7E-02	3.25E-01	pCi/g	34.20%	RD3209
PU239/40	1.22E-01 U	1.9E-01	2.0E-01	3.24E-01	pCi/g	34.20%	RD3209
CO-58	1.50E-02 U	1.6E-02	1.7E-02	2.88E-02	pCi/g	N/A	RD3219
CO-60	4.53E-01	3.5E-02	5.7E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	1.99E-02 U	1.3E-02	1.3E-02	2.23E-02	pCi/g	N/A	RD3219
EU-152	-9.07E-03 U	3.6E-02	3.6E-02	5.86E-02	pCi/g	N/A	RD3219
EU-154	9.80E-03 U	3.9E-02	3.9E-02	6.69E-02	pCi/g	N/A	RD3219
EU-155	-5.03E-03 U	6.2E-02	6.2E-02	1.00E-01	pCi/g	N/A	RD3219
FE-59	-1.35E-02 U	4.7E-02	4.7E-02	7.78E-02	pCi/g	N/A	RD3219
K-40	1.54E+01	5.5E-01	1.6E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	8.09E-01	4.1E-02	9.1E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	5.29E-01	5.7E-02	7.8E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	8.63E-01	1.0E-01	1.3E-01	N/A	pCi/g	N/A	RD3219
TH-228DA	8.00E-01	7.9E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
ALPHA	9.68E+00	4.4E+00	4.5E+00	3.89E+00	pCi/g	100.00%	RD3222
BETA	3.72E+02	1.3E+01	2.8E+01	3.47E+00	pCi/g	100.00%	RD3222
STRONTIUM	1.18E+02	3.9E+00	3.2E+01	2.06E+00	pCi/g	100.00%	RD3204

Number of Results: 17

HCG 12/13/95

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Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845004	MATRIX:	SOIL
CLIENT ID:	B0GGC1	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-1.12E-02 Q U	2.2E-02	2.3E-02	2.67E-01	pCi/g	23.00%	RD3209
PU239/40	-1.11E-02 U	2.2E-02	2.3E-02	2.67E-01	pCi/g	23.00%	RD3209
CO-58	-1.05E-02 U	1.6E-02	1.6E-02	2.62E-02	pCi/g	N/A	RD3219
CO-60	2.72E-01	2.9E-02	4.0E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	1.13E-02 U	1.1E-02	1.1E-02	1.98E-02	pCi/g	N/A	RD3219
EU-152	1.84E-03 U	3.1E-02	3.1E-02	5.19E-02	pCi/g	N/A	RD3219
EU-154	2.02E-02 U	4.1E-02	4.1E-02	7.04E-02	pCi/g	N/A	RD3219
EU-155	1.52E-02 U	4.5E-02	4.5E-02	7.26E-02	pCi/g	N/A	RD3219
FE-59	2.43E-02 U	4.4E-02	4.4E-02	7.54E-02	pCi/g	N/A	RD3219
K-40	1.84E+01	5.6E-01	1.9E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	5.43E-01	3.6E-02	6.5E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.10E-01	4.6E-02	5.5E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	5.58E-01	8.2E-02	9.9E-02	N/A	pCi/g	N/A	RD3219
TH-228DA	5.70E-01	5.8E-02	8.1E-02	N/A	pCi/g	N/A	RD3219
ALPHA	7.51E+00	4.2E+00	4.3E+00	5.64E+00	pCi/g	100.00%	RD3222
BETA	5.10E+02	1.5E+01	3.7E+01	3.57E+00	pCi/g	100.00%	RD3222
STRONTIUM	5.22E+01	1.9E+00	1.4E+01	1.16E+00	pCi/g	100.00%	RD3204

Number of Results: 17

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9613444.0064

Quanterra
Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

OCT 1995
RECEIVED
Data
Log In

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

October 26, 1995

Attention: Joan Kessner

SAF Number	:	B95-086
Date SDG Closed	:	September 11, 1995
Number of Samples	:	Four (4)
Sample Type	:	Soil
SDG Number	:	W0688
Data Deliverable	:	Summary

I. Introduction

On August 28, 1995, four soil samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QTESRL ID	BHI ID	Matrix	Date of Receipt
50854001	B0GGB6	Soil	8/28/95
50854002	B0GGB7	Soil	8/28/95
50854003	B0GGB8	Soil	8/28/95
50854004	B0GGC1	Soil	8/28/95

HRG 12/13/95
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Quanterra
Environmental Services

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 analyses were:

Alpha Spectroscopy
Plutonium-238, -239/40 by method ITAS-RD-3209
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204

III. Quality Control

The analytical results for each analysis performed under SDG W0688 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results, with the exception of Gross Alpha and Gross Beta results which are reported in pCi/sample.

IV. Comments

Alpha Spectroscopy

Plutonium-238, -239/40 by method ITAS-RD-3209
The sample aliquot sizes were reduced due to high screening results. The samples meet the RDL requirements using the smaller analysis sizes. The yields were lower than 30% for samples B0GGB7 and B0GGC1. The samples have achieved MDAs that are well below the RDLs. The cause of the low batch yields is uncertain. The sample data are accepted as the MDAs are less than one half the RDL and the yields are above the internal minimum yield criteria. The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements, except as noted.

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Quanterra
Environmental Services

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
Ra-226 and Ra-228 are detected but not reported in the Ottawa sand blank. The radium is a naturally occurring constituent of the blank matrix and is not indicative of batch contamination. The samples were counted in 200 mL geometry's due to insufficient sample. The samples do not meet the Fe-59 RDL due to the combination of smaller than preferred sample sizes analyzed and the short half-life of Fe-59. The Fe-59 RDL is met by the blank, therefore, the sample data are accepted. The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements, except as noted.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements.

Strontium-90 by method ITAS-RD-3204
The sample aliquot sizes were reduced due to high screening results. The sample and sample duplicate results far exceed the calculated MDA and the results are accepted. The LCS, batch blank, sample and sample duplicate (B0GGC1) results are within contractual requirements.

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:

Suzanne Gaines

Suzanne Gaines
Project Manager

HCG 12/13/95
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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priorty [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1337 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 SDL W0688

Sample No.	Matrix*	Date Sampled	Time Sampled	Preservative: none	none	none	none												
				Type of Container: P/G	P/G	P/G	P/G												
				No. of Container(s): 1	3	1	1												
				Volume: 500 mL	500 mL	20 mL	20 mL												
				TCLP Metals	See Item #1 below	Activity Scan	Rad Screen												
B0GGB6 01	S	8-21-95	1327	X	X	X													

508450

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	8-22-95/1405	Eric Whitten (ER) Bwhitten	1405 8-22-95
Eric Whitten (ER) Bwhitten	10:15 8-28-95	Karen Stettinburg (Quanterra)	10:15 8-28-95

SPECIAL INSTRUCTIONS: Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

N5805

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9/12/95 0025 017

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: CR-15	Field Logbook No.: FFL-1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 Sr-90 100688

Preservative	none	none	none	none
Type of Container	P/G	P/G	P/G	P/G
No. of Container(s)	1	3	1	1
Volume	500 mL	500 mL	20 mL	20 mL
	TCLP Metals	See Item #1 below 508450	Activity Scan	Rad Screen

Sample No.	Matrix*	Date Sampled	Time Sampled						
B0GGB7 02	S	8-23-95	0813	X	X	X		N	5806

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	8-23-95/1431	EC Kelly B Whitten	1431 8-23-95
EC Kelly B Whitten	8-28-95 10:15	Marilliz Karen Stetlenburg	10:15 8-28-95

SPECIAL INSTRUCTIONS: Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: Doug Bower	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 SDL W0688

Preservative	none	none	none	none														
Type of Container	P/G	P/G	P/G	P/G														
No. of Container(s)	1	3	1	1														
Volume	500 mL	500 mL	20 mL	20 mL														
	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen														
Sample No.	Matrix*	Date Sampled	Time Sampled															
B0GB38 03	S	8-25-95	1033	X	X	X			N5807									

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
Doug Bower	8-25-95 1500	K. Trapp / K. Trapp	8/25/95 1500
K. Trapp / K. Trapp	8/28/95 0805	Bakhtiar	8-28-95 0805
Bakhtiar	8-28-95 10:15	Bakhtiar	8-28-95 10:15

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priorty [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: EK-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

Preservative	none	none	none	none													
Type of Container	P/G	P/G	P/G	P/G													
No. of Container(s)	1	3	1	1													
Volume	500 mL	500 mL	20 mL	20 mL													
SAMPLE ANALYSIS	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen													

SDG 100688

508449 508450

Sample No.	Matrix*	Date Sampled	Time Sampled															
BOGGC1 04	S	8-28-95	0854	X	X	X			N	5810								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	8-28-95 / 0756	Kim Whitten / B. Whitten	EK 0756 8-28-95
Kim Whitten / B. Whitten	EK 10:15 8-28-95	Karen Potter-Luzo	Overnight 10:15 8-28-95

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9513944.0070

020

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00028

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100 NR 2			DATA PACKAGE: WQ688-QES		
VALIDATOR: H. GREGERSON		LAB: QUANTERRA		DATE: 12/13/95	
CASE:			SDG:		

ANALYSES PERFORMED

☒ Gross Alpha/Beta	☒ Strontium-90	☐ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☐		

SAMPLES/MATRIX	B0GGB6	B0GGB7	B0GGB8	B0GGC1
SOIL				

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments: _____

2. Initial Calibration . . . . . ☒ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes No (N/A)

Initial calibration acceptable? . . . . . Yes No (N/A)

Standards NIST traceable? . . . . . Yes No (N/A)

Standards Expired? . . . . . Yes No (N/A)

Comments: _____

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A
Calibration check acceptable? . . . . . Yes No N/A
Calibration check standards NIST traceable? . . . . . Yes No N/A
Calibration check standards expired? . . . . . Yes No N/A

Comments:_____

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . Yes No N/A
Method blank results acceptable? . . . . . Yes No N/A
Analytes detected in method blank? . . . . . Yes No N/A
Field blank(s) analyzed? . . . . . Yes No N/A
Field blank results acceptable? . . . . . Yes No N/A
Analytes detected in field blank(s)? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed? . . . . . Yes No N/A
Spike recoveries acceptable? . . . . . Yes No N/A
Spike source traceable? . . . . . Yes No N/A
Spike source expired? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . Yes No N/A
Chemical recovery acceptable? . . . . . Yes No N/A
Chemical carrier traceable? . . . . . Yes No N/A
Chemical carrier expired? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A

Comments:_____

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . Yes No N/A
RPD Values Acceptable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

9. Field QC Samples . . . . . ☐ N/A

Field duplicate sample(s) analyzed? . . . . . Yes (No) (N/A)
Field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Field split sample(s) analyzed? . . . . . Yes (No) N/A
Field split RPD values acceptable? . . . . . Yes No (N/A)
Performance audit sample(s) analyzed? . . . . . Yes (No) N/A
Performance audit sample results acceptable? . . . . . Yes No (N/A)

Comments:

10. Holding Times

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . (Yes) No N/A
Results supported in raw data? . . . . . Yes No (N/A)
Results Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation errors? . . . . . Yes No (N/A)
MDA's meet required detection limits? . . . . . Yes (No) N/A
Transcription/calculation errors? . . . . . Yes No (N/A)

Comments: The MDA for all Sr 90 results exceeds the PRQL, however, data qualification is not required!

HOLDING TIME SUMMARY

SDG: W01688-QES | VALIDATOR: HEIDI GREGERSON | DATE: 12/13/95 | PAGE 1 OF 1

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOGGB6	Gross α β	8/21/95	9/2/95	9/21/95	22	31	none
	Sr 90			10/2/95	22	42 HG	none
	α Spec		9/2/95	9/28/95	22	38	none
	Gamma Spec			9/19/95	22	29	none
BOGGB7	Gross α β	8/23/95		9/21/95	20	29	none
	Sr 90			10/2/95	20	40	none
	α Spec		9/2/95	9/28/95	20	36	none
	Gamma Spec			9/19/95	20	27	none
BOGGB8	Gross α β	8/25/95		9/21/95	18	27	none
	Sr 90			10/2/95	18	38	none
	α Spec		9/2/95	9/28/95	18	34	none
	Gamma Spec			9/19/95	18	25	none
BOGGC1	Gross α β	8/26/95		9/21/95	17	26	none
	Sr 90			10/2/95	17	37	none
	α Spec		9/2/95	9/28/95	17	33	none
	Gamma Spec			9/19/95	17	24	none

MEMORANDUM

TO: 199-N106A Waste Characterization Sampling Project QA Record December 20, 1995

FR: Heidi Gregerson, Golder Associates Inc. HG

RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE W0688-QES (943-1610.110 688INO.NR2)

INTRODUCTION

This memo presents the results of data validation on data package W0688-QES prepared by Quanterra Environmental Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0GGB6		INORGANICS	SOIL-TCLP
B0GGB7			SOIL-TCLP
B0GGB8		SEE ATTACHMENT 4	SOIL-TCLP
B0GGC1			SOIL-TCLP

Data validation was conducted to level C in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Detection Limits. Detection limit goals were met for all sample results.

Completeness. The data package was complete for all requested analyses. A total of four samples were validated in this data package with a total of 32 determinations reported, all of which were deemed valid. This results in a completeness of 100%, which meets the 90% objective of the work plan.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

No minor deficiencies were identified during data validation which required qualification of data.

REFERENCES

WHC 1993, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

Glossary of Inorganic Data Reporting Qualifiers.

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

WHC-SD-EN-SPP-002, REV.2

DATA QUALIFICATION SUMMARY - FORM B-7

SDG:W0688-QES	REVIEWER: H. Gregerson	DATE: 12-12-95	PAGE 1 OF 1
COMMENTS: INORGANICS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NO SAMPLES QUALIFIED			

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0688-QES

	Samp#	B0GGB6		B0GGB7		B0GGB8		B0GGC1	
	Date	8-21-95		8-23-95		8-25-95		8-26-95	
	Location	N5805		N5806		N5807		N5810	
	Depth	---		---		---		---	
	Type	SOIL-TCLP		SOIL-TCLP		SOIL-TCLP		SOIL-TCLP	
	Comments								
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
ARSENIC	UG/L	58.200	U	58.200	U	58.200	U	58.200	U
BARIUM	UG/L	734.000		414.000		549.000		549.000	
CADMIUM	UG/L	3.100	U	3.100	U	3.100	U	3.100	U
CHROMIUM	UG/L	6.100	B	2.800	B	2.900	B	2.800	U
LEAD	UG/L	41.300	U	41.300	U	41.300	U	41.300	U
MERCURY	UG/L	0.100	U	0.100	U	0.100	U	0.100	U
SELENIUM	UG/L	43.300	U	43.300	U	43.300	U	47.000	B
SILVER	UG/L	2.200	U	2.200	U	2.200	U	2.200	U

The decimal places shown do not reflect the precision reported by the laboratory

Verified HRG
12/20/95

9615444.0084

9613444.0085

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGB6

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-001

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	734			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	6.1	B		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	43.3	U		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

TCLP

9613444.0086

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGB7

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-002

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	414			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	2.8	B		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	43.3	U		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

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HRG 12/13/95

9613444.0087

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGB8

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-003

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	549			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	2.9	B		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	43.3	U		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

TCLP

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HRG 12/13/95

9613444.0088

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGC1

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-004

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	549			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	2.8	U		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	47.0	B		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

TCLP

012

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HRG 12/13/95

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9613444.0090

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
P.O. Box 1970
Richland, Washington 99352

October 11, 1995

Attention: Joan Kessner

OCT 1995 RECEIVED Data Log In

Project number	:	550.98
Date Received by Lab	:	August 28, 1995
Number of Samples	:	Four (4)
Sample Type	:	Soil
SDG Number	:	W0688
Data Deliverable	:	Summary

I. Introduction

On August 28, 1995, four (4) 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 the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
9209-001	B0GGB6	50844901	Soil	08/28/95
9209-002	B0GGB7	50844902	Soil	08/28/95
9209-003	B0GGB8	50844903	Soil	08/28/95
9209-004	B0GGC1	50844904	Soil	08/28/95

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.

Quanterra
Environmental Services

Analyses requested: ICP TCLP Metals by EPA method 6010 and Mercury by EPA method 7470 after TCLP Extraction by EPA method 1311.

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

Due to an error in spiking, the Matrix Spike of sample 9209-001 was prepared at half the normal level for the ICP analytes. The Matrix Spike Duplicate was prepared at the correct levels. The forms reflect the correct recoveries for both the Matrix Spike and the Matrix Spike Duplicate. See NCM # SL-94-2041.

Quanterra
Environmental Services

Bechtel Hanford Incorporated
October 11, 1995
Project Number: 550.98
SDG: W0688
Page 3

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\hanw0688.nar

~~0000004~~
HRG 12/13/95

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

Preservative	none	none	none	none													
Type of Container	G	P/G	P/G	P/G													
No. of Container(s)	1	3	1	1													
Volume	500 mL	500 mL	20 mL	20 mL													
SAMPLE ANALYSIS	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen													

508449 SDL W0688 508450

Sample No.	Matrix*	Date Sampled	Time Sampled														
B0GGB6 01	S	8-21-95	1327	X	X	X											
				100													
				L													
			2nd		Container cap cracked (no sample lost)												

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: Doug Bowers 8-22-95 1405	Received By: Eric Button 8-22-95 1405	
Relinquished By: Eric Button 8-28-95 10:15	Received By: Karen Butterworth 8-28-95 10:15	
Relinquished By:	Received By:	
Relinquished By:	Received By:	

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

N5805

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9614446.0093

HRG 12/13/95

017

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: CR-15	Field Logbook No.: EFL-1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 Srx 100688

Sample No.	Matrix*	Date Sampled	Time Sampled	Preservative: none	none	none	none											
				Type of Container: P/G	P/G	P/G	P/G											
				No. of Container(s): 1	3	1	1											
				Volume: 500 mL	500 mL	20 mL	20 mL											
				TCLP Metals	See Item #1 below	Activity Scan	Rad Screen											
B0GGB7 02	S	8-23-95	0813	X	X	X		N	5806									
				100														

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers		8-23-95 1431
Received By: EC	Bewhitw	8-23-95 1431
Relinquished By: EC	B Whitw	8-28-95 N:15
Received By:	Karen Stockenburg	8-28-95 10:15
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS: Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613944.0091

018

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: Doug Bowen	Company Contact: Randy Hevenor	Telephone No.: 373-9215
Project Designation: 199-H-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quenterra	Offsite Property No.	Bill of Lading/Air Bill No.

Possible Sample Hazards/Remarks: unknown

Special Handling and/or Storage: none

SAMPLE ANALYSIS: 508449 SDL W0688

Preservative	none	none	none	none
Type of Container	A P/G	P/G	P/G	P/G
No. of Container(s)	1	3	1	1
Volume	500 mL	500 mL	20 mL	20 mL
	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen

Sample No.	Matrix*	Date Sampled	Time Sampled															
BOGGB8 03	S	8-25-95	1033	X	X	X			N5807									
				1														
				10x														

508450

9513444.0095

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
Doug Bowen	8-25-95 1500	K. Trapp / K. Trapp	8/25/95 1500
K. Trapp / K. Trapp	8/28/95 0805	Bakkton	8-28-95 0805
Bakkton	8-28-95 10:15	Kevin Bakkton	8-28-95 10:15
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS: Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original - Sample Yellow - Sampler

BC-6000-628 (12/92)

019

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HPG 12/13/95

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: ☐ Priority ☒ Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: 895-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

Preservative	none	none	none	none													
Type of Container	P/G	P/G	P/G	P/G													
No. of Container(s)	1	3	1	1													
Volume	500 ml	500 ml	20 ml	20 ml													
SAMPLE ANALYSIS	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen													

SDG 100688

508449 508450

Sample No.	Matrix*	Date Sampled	Time Sampled															
BOGGC1 04	S	8-26-95	0854	X	X	X		N	5810									
				1														
				100														

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: Doug Bowers 8-28-95 0756	Received By: Kim Hutton B. Hutton 8-28-95	Date/Time: 0756
Relinquished By: Kim Hutton B. Hutton 8-28-95	Received By: Karen Hutton-Luxe 8-28-95	Date/Time: 10:15
Relinquished By:	Received By:	Date/Time:
Relinquished By:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

Matrix*

- S = Soil
- SE = Sediment
- SD = 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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

020

9513144.0096

0000012

HZG 12/13/95

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 100 NR 2		DATA PACKAGE: W0688-QES
VALIDATOR: H. GREGERSON	LAB: QUANTERRA	DATE: 12/13/95
CASE:		SDG:

ANALYSES PERFORMED

☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☒ TCLP	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX B0GGB6 B0GGB7 B0GGB8 B0GGC1

~~WATER~~ SOIL

HRG 12/13/95

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

022

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments:

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
Comments:

023

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A

Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments:_____

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A

Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A

Were analytical spikes performed as required? . . . . . Yes No N/A

Are analytical spike recoveries acceptable? . . . . . Yes No N/A

Was MSA performed as required? . . . . . Yes No N/A

Are MSA results acceptable? . . . . . Yes No N/A

Comments:_____

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:_____

HOLDING TIME SUMMARY

SDG: WD688-QES	VALIDATOR: HEIDI GREGERSON	DATE: 12/13/95	PAGE 1 OF 1
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOGGB6	~~ICP~~ ICP Metals	8/21/95	9/11/95	9/12/95	21	22	none
↓	CV Hg	↓	9/11/95	9/11/95	21	21	↓
BOGGB7	ICP Metals	8/23/95	9/11/95	9/12/95	~~21~~ 19	20	↓
↓	CV Hg	↓	9/11/95	9/11/95	19	19	↓
BOGGB8	ICP Metals	8/25/95	9/11/95	9/12/95	17	18	↓
↓	CV Hg	↓	9/11/95	9/11/95	17	17	↓
BOGGC1	ICP Metals	8/26/95	9/11/95	9/12/95	16	17	↓
↓	CV Hg	↓	9/11/95	9/11/95	16	16	↓

96134WHC-SD-EN-SPP-002, REV.2

MEMORANDUM

TO: 199-N106A Waste Characterization Sampling, Project QA Record December 13, 1995

FR: Heidi Gregerson, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0688-QES (943-1610.110 688RAD.NR2)

INTRODUCTION

This memo presents the results of data validation on data package W0688-QES prepared by Quanterra Environmental Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0GGB6		RADIOCHEMISTRY	SOIL
B0GGB7			SOIL
B0GGB8		SEE ATTACHMENT 4	SOIL
B0GGC1			SOIL

Data validation was conducted to level C in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Detection Limits. Detection limit goals were met for all sample results, with the exception of strontium for all the sample results. In accordance with validation procedures data qualification is not required.

Completeness. The data package was complete for all requested analyses. A total of four samples were validated in this data package with a total of 69 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the 90 percent objective of the work plan.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

No minor deficiencies were identified during data validation which required qualification of data.

DATA REPORTING

- Reported sample results which are less than the minimum detectable activity (MDA) have been qualified as undetected (U) on the laboratory results form (see Attachment 3).

REFERENCES

WHC 1993, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

ATTACHMENT 1

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the sample result corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the result reported may not accurately reflect the sample concentration. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

WHC-SD-EN-SPP-002, REV.2

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: W0688-QES	REVIEWER: H. Gregerson	DATE: 12-13-95	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION APPLIED			

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0688-QES

	Samp#	B0GGB6		B0GGB7		B0GGB8		B0GGC1	
	Date	8-21-95		8-23-95		8-25-95		8-26-95	
	Location	N5805		N5806		N5807		N5810	
	Depth	---		---		---		---	
	Type	SOIL		SOIL		SOIL		SOIL	
	Comments								
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
PLUTONIUM-238	pCi/G	-0.049	U	0.000	U	-0.014	U	-0.011	U
PLUTONIUM-239/240	pCi/G	0.000	U	-0.042	U	0.122	U	-0.011	U
COBALT-58	pCi/G	0.005	U	-0.017	U	0.015	U	-0.010	U
COBALT-60	pCi/G	0.641		0.302		0.453		0.272	
CESIUM-137DA	pCi/G	-0.004	U	-0.016	U	0.020	U	0.011	U
EUROPIUM-152	pCi/G	-0.009	U	-0.003	U	-0.009	U	0.002	U
EUROPIUM-154	pCi/G	0.011	U	0.006	U	0.010	U	0.020	U
EUROPIUM-155	pCi/G	0.010	U	0.009	U	-0.005	U	0.015	U
IRON-59	pCi/G	0.001	U	0.006	U	-0.014	U	0.024	U
POTASSIUM-40	pCi/G	14.500		15.600		15.400		0.184	
RADIUM-224DA	pCi/G	0.463		0.382		0.809		0.543	
RADIUM-226DA	pCi/G	0.362		0.289		0.529		0.310	
RADIUM-228DA	pCi/G	0.577		0.450		0.863		0.558	
THORIUM-228DA	pCi/G	0.491		0.369		0.800		0.570	
URANIUM-238DLP	pCi/G	0.546		---		---		---	
GROSS ALPHA	pCi/G	5.430		9.060		9.680		7.510	
GROSS BETA	pCi/G	649.000		464.000		372.000		510.000	
STRONTIUM	pCi/G	210.000		78.800		118.000		52.200	

The decimal places shown do not reflect the precision reported by the laboratory

Verified
RCG 12/13/95

9613444.0109

9613444.0110

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845001	MATRIX:	SOIL
CLIENT ID:	B0GGB6	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-4.89E-02	U	6.9E-02	7.0E-02	6.91E-01	pCi/g	34.00%	RD3209
PU239/40	0.00E+00	U	0.0E+00	3.7E-01	3.31E-01	pCi/g	34.00%	RD3209
CO-58	5.47E-03	U	1.5E-02	1.5E-02	2.51E-02	pCi/g	N/A	RD3219
CO-60	6.41E-01		3.5E-02	7.3E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	-3.90E-03	U	1.2E-02	1.2E-02	1.93E-02	pCi/g	N/A	RD3219
EU-152	-9.36E-03	U	3.2E-02	3.2E-02	5.16E-02	pCi/g	N/A	RD3219
EU-154	1.07E-02	U	3.2E-02	3.2E-02	5.57E-02	pCi/g	N/A	RD3219
EU-155	1.05E-02	U	5.8E-02	5.8E-02	8.86E-02	pCi/g	N/A	RD3219
FE-59	7.89E-04	U	4.1E-02	4.1E-02	6.85E-02	pCi/g	N/A	RD3219
K-40	1.45E+01		4.7E-01	1.5E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	4.63E-01		3.9E-02	6.1E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.62E-01		4.7E-02	6.0E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	5.77E-01		8.7E-02	1.0E-01	N/A	pCi/g	N/A	RD3219
TH-228DA	4.91E-01		6.7E-02	8.3E-02	N/A	pCi/g	N/A	RD3219
U-238DLP	5.46E-01		5.0E-01	5.1E-01	N/A	pCi/g	N/A	RD3219
ALPHA	5.43E+00		3.7E+00	3.8E+00	5.43E+00	pCi/g	100.00%	RD3222
BETA	6.49E+02		1.7E+01	4.6E+01	3.70E+00	pCi/g	100.00%	RD3222
STRONTIUM	2.10E+02		6.8E+00	5.7E+01	3.77E+00	pCi/g	100.00%	RD3204

Number of Results: 18

9613444.0111

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845002	MATRIX:	SOIL
CLIENT ID:	B0GGB7	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00 Q U	0.0E+00	2.1E-01	1.91E-01	pCi/g	26.90%	RD3209
PU239/40	-4.22E-02 U	4.9E-02	5.0E-02	4.44E-01	pCi/g	26.90%	RD3209
CO-58	-1.73E-02 U	1.5E-02	1.5E-02	2.39E-02	pCi/g	N/A	RD3219
CO-60	3.02E-01	2.8E-02	4.1E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	-1.63E-02 U	1.1E-02	1.2E-02	1.82E-02	pCi/g	N/A	RD3219
EU-152	-2.76E-03 U	2.8E-02	2.8E-02	4.73E-02	pCi/g	N/A	RD3219
EU-154	6.29E-03 U	3.6E-02	3.6E-02	6.00E-02	pCi/g	N/A	RD3219
EU-155	8.58E-03 U	4.9E-02	4.9E-02	7.91E-02	pCi/g	N/A	RD3219
FE-59	5.97E-03 U	4.0E-02	4.0E-02	6.73E-02	pCi/g	N/A	RD3219
K-40	1.56E+01	4.8E-01	1.6E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	3.82E-01	3.3E-02	5.1E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	2.89E-01	4.3E-02	5.2E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	4.50E-01	7.6E-02	8.8E-02	N/A	pCi/g	N/A	RD3219
TH-228DA	3.69E-01	6.5E-02	7.5E-02	N/A	pCi/g	N/A	RD3219
ALPHA	9.06E+00	4.4E+00	4.5E+00	4.88E+00	pCi/g	100.00%	RD3222
BETA	4.64E+02	1.4E+01	3.4E+01	3.71E+00	pCi/g	100.00%	RD3222
STRONTIUM	7.88E+01	2.9E+00	2.1E+01	1.67E+00	pCi/g	100.00%	RD3204

Number of Results: 17

HRG 12/13/95

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Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845003	MATRIX:	SOIL
CLIENT ID:	B0GGB8	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-1.36E-02 Q U	2.7E-02	2.7E-02	3.25E-01	pCi/g	34.20%	RD3209
PU239/40	1.22E-01 U	1.9E-01	2.0E-01	3.24E-01	pCi/g	34.20%	RD3209
CO-58	1.50E-02 U	1.6E-02	1.7E-02	2.88E-02	pCi/g	N/A	RD3219
CO-60	4.53E-01	3.5E-02	5.7E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	1.99E-02 U	1.3E-02	1.3E-02	2.23E-02	pCi/g	N/A	RD3219
EU-152	-9.07E-03 U	3.6E-02	3.6E-02	5.86E-02	pCi/g	N/A	RD3219
EU-154	9.80E-03 U	3.9E-02	3.9E-02	6.69E-02	pCi/g	N/A	RD3219
EU-155	-5.03E-03 U	6.2E-02	6.2E-02	1.00E-01	pCi/g	N/A	RD3219
FE-59	-1.35E-02 U	4.7E-02	4.7E-02	7.78E-02	pCi/g	N/A	RD3219
K-40	1.54E+01	5.5E-01	1.6E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	8.09E-01	4.1E-02	9.1E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	5.29E-01	5.7E-02	7.8E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	8.63E-01	1.0E-01	1.3E-01	N/A	pCi/g	N/A	RD3219
TH-228DA	8.00E-01	7.9E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
ALPHA	9.68E+00	4.4E+00	4.5E+00	3.89E+00	pCi/g	100.00%	RD3222
BETA	3.72E+02	1.3E+01	2.8E+01	3.47E+00	pCi/g	100.00%	RD3222
STRONTIUM	1.18E+02	3.9E+00	3.2E+01	2.06E+00	pCi/g	100.00%	RD3204

Number of Results: 17

HCG 12/13/95

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9613444.0113

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0688
LAB SAMPLE ID:	50845004	MATRIX:	SOIL
CLIENT ID:	B0GGC1	DATE RECEIVED:	8/28/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-1.12E-02 Q U	2.2E-02	2.3E-02	2.67E-01	pCi/g	23.00%	RD3209
PU239/40	-1.11E-02 U	2.2E-02	2.3E-02	2.67E-01	pCi/g	23.00%	RD3209
CO-58	-1.05E-02 U	1.6E-02	1.6E-02	2.62E-02	pCi/g	N/A	RD3219
CO-60	2.72E-01	2.9E-02	4.0E-02	N/A	pCi/g	N/A	RD3219
CS-137DA	1.13E-02 U	1.1E-02	1.1E-02	1.98E-02	pCi/g	N/A	RD3219
EU-152	1.84E-03 U	3.1E-02	3.1E-02	5.19E-02	pCi/g	N/A	RD3219
EU-154	2.02E-02 U	4.1E-02	4.1E-02	7.04E-02	pCi/g	N/A	RD3219
EU-155	1.52E-02 U	4.5E-02	4.5E-02	7.26E-02	pCi/g	N/A	RD3219
FE-59	2.43E-02 U	4.4E-02	4.4E-02	7.54E-02	pCi/g	N/A	RD3219
K-40	1.84E+01	5.6E-01	1.9E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	5.43E-01	3.6E-02	6.5E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.10E-01	4.6E-02	5.5E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	5.58E-01	8.2E-02	9.9E-02	N/A	pCi/g	N/A	RD3219
TH-228DA	5.70E-01	5.8E-02	8.1E-02	N/A	pCi/g	N/A	RD3219
ALPHA	7.51E+00	4.2E+00	4.3E+00	5.64E+00	pCi/g	100.00%	RD3222
BETA	5.10E+02	1.5E+01	3.7E+01	3.57E+00	pCi/g	100.00%	RD3222
STRONTIUM	5.22E+01	1.9E+00	1.4E+01	1.16E+00	pCi/g	100.00%	RD3204

Number of Results: 17

HCG 12/13/95

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9613444.0115

Quanterra
Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

OCT 1995
RECEIVED
Data
Log In

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

October 26, 1995

Attention: Joan Kessner

SAF Number	:	B95-086
Date SDG Closed	:	September 11, 1995
Number of Samples	:	Four (4)
Sample Type	:	Soil
SDG Number	:	W0688
Data Deliverable	:	Summary

I. Introduction

On August 28, 1995, four soil samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QTESRL ID	BHI ID	Matrix	Date of Receipt
50854001	B0GGB6	Soil	8/28/95
50854002	B0GGB7	Soil	8/28/95
50854003	B0GGB8	Soil	8/28/95
50854004	B0GGC1	Soil	8/28/95

HRG 12/3/95
~~C002~~

Quanterra
Environmental Services

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 analyses were:

Alpha Spectroscopy
Plutonium-238, -239/40 by method ITAS-RD-3209
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204

III. Quality Control

The analytical results for each analysis performed under SDG W0688 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results, with the exception of Gross Alpha and Gross Beta results which are reported in pCi/sample.

IV. Comments

Alpha Spectroscopy

Plutonium-238, -239/40 by method ITAS-RD-3209
The sample aliquot sizes were reduced due to high screening results. The samples meet the RDL requirements using the smaller analysis sizes. The yields were lower than 30% for samples B0GGB7 and B0GGC1. The samples have achieved MDAs that are well below the RDLs. The cause of the low batch yields is uncertain. The sample data are accepted as the MDAs are less than one half the RDL and the yields are above the internal minimum yield criteria. The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements, except as noted.

HRG 12/13/95
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Quanterra
Environmental Services

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
Ra-226 and Ra-228 are detected but not reported in the Ottawa sand blank. The radium is a naturally occurring constituent of the blank matrix and is not indicative of batch contamination. The samples were counted in 200 mL geometry's due to insufficient sample. The samples do not meet the Fe-59 RDL due to the combination of smaller than preferred sample sizes analyzed and the short half-life of Fe-59. The Fe-59 RDL is met by the blank, therefore, the sample data are accepted. The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements, except as noted.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0GGB6) results are within contractual requirements.

Strontium-90 by method ITAS-RD-3204
The sample aliquot sizes were reduced due to high screening results. The sample and sample duplicate results far exceed the calculated MDA and the results are accepted. The LCS, batch blank, sample and sample duplicate (B0GGC1) results are within contractual requirements.

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:

Suzanne Gaines

Suzanne Gaines
Project Manager

HCG 12/13/95
~~0004~~

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1037 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		

Special Handling and/or Storage: none

SAMPLE ANALYSIS: 508449 SDL W0688

			Preservative	none	none	none	none											
			Type of Container	P/G	P/G	P/G	P/G											
			No. of Container(s)	1	3	1	1											
			Volume	500 mL	500 mL	20 mL	20 mL											
				TCLP Metals	See Item #1 below 508450	Activity Scan	Rad Screen											
Sample No.	Matrix*	Date Sampled	Time Sampled															
B0GGB6 01	S	8-21-95	1327	X	X	X												

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: Doug Bowers 8-22-95 1405	Received By: ER Bukhtiar 8-22-95 Date/Time 1405	
Relinquished By: ER Bukhtiar 8-28-95 Date/Time 10:15	Received By: Quanterra Karen Stitt 8-28-95 Date/Time 10:15	
Relinquished By: Date/Time	Received By: Date/Time	
Relinquished By: Date/Time	Received By: Date/Time	

SPECIAL INSTRUCTIONS: Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

N5405

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

017

0025

9511131.0116

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: CR-15	Field Logbook No.: EFL-1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 Sr-90 100688

			Preservative	none	none	none	none											
			Type of Container	P/G	P/G	P/G	P/G											
			No. of Container(s)	1	3	1	1											
			Volume	500 mL	500 mL	20 mL	20 mL											
				TCLP Metals	See Item #1 below	Activity Scan	Rad Screen											
Sample No.	Matrix*	Date Sampled	Time Sampled															
B0GGB7 02	S	8-23-95	0813	X	X	X		N	5806									

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 8-23-95/1431	Received By: EC B Whitten	Date/Time: 1431 8-23-95
Relinquished By: EC B Whitten	Date/Time: 10:15 8-28-95	Received By: Karen Stettenberg	Date/Time: 10:15 8-28-95
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS: Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

018

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priorty [X] Normal

Collector: Doug Bowen	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

Preservative	none	none	none	none
Type of Container	P/G	P/G	P/G	P/G
No. of Container(s)	1	3	1	1
Volume	500 mL	500 mL	20 mL	20 mL
SAMPLE ANALYSIS	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen

8DL W0688 508449 508450

Sample No.	Matrix*	Date Sampled	Time Sampled					
B0GB38 03	S	8-25-95	1033	X	X	X		N5807

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowen	8-25-95/1500	K. Trapp/K. Trapp	8/25/95 1500
K. Trapp/K. Trapp	8/28/95 0805	Bakhtiar	8-28-95 0805
Bakhtiar	8-28-95 10:15	Kurt Schlinger	8-28-95 10:15

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: EK-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 SDL 100688

Preservative	none	none	none	none
Type of Container	P/G	P/G	P/G	P/G
No. of Container(s)	1	3	1	1
Volume	500 mL	500 mL	20 mL	20 mL
	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen

Sample No.	Matrix*	Date Sampled	Time Sampled							
BOGGC1 04	S	8-22-95	0854	X	X	X		N	5810	

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: Doug Bowers 8-28-95	Date/Time: 0756	Received By: Kim Whitton B. Whitton 8-28-95 Date/Time: 0756
Relinquished By: Kim Whitton B. Whitton 8-28-95	Date/Time: 10:15	Received By: Karen Ostrowski 8-28-95 Date/Time: 10:15
Relinquished By:	Date/Time:	Received By: Date/Time:
Relinquished By:	Date/Time:	Received By: Date/Time:

SPECIAL INSTRUCTIONS: Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100 NR 2			DATA PACKAGE: W0688-QES		
VALIDATOR: H. GREGERSON		LAB: QUANTERRA		DATE: 12/13/95	
CASE:			SDG:		

ANALYSES PERFORMED

☒ Gross Alpha/Beta	☒ Strontium-90	☐ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☐		

SAMPLES/MATRIX				
	B0GGB6	B0GGB7	B0GGB8	B0GGC1
SOIL				

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments:

2. Initial Calibration . . . . . ☒ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes No (N/A)

Initial calibration acceptable? . . . . . Yes No (N/A)

Standards NIST traceable? . . . . . Yes No (N/A)

Standards Expired? . . . . . Yes No (N/A)

Comments:

3. Continuing Calibration . . . . . ☒ N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A
Calibration check acceptable? . . . . . Yes No N/A
Calibration check standards NIST traceable? . . . . . Yes No N/A
Calibration check standards expired? . . . . . Yes No N/A

Comments:_____

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . Yes No N/A
Method blank results acceptable? . . . . . Yes No N/A
Analytes detected in method blank? . . . . . Yes No N/A
Field blank(s) analyzed? . . . . . Yes No N/A
Field blank results acceptable? . . . . . Yes No N/A
Analytes detected in field blank(s)? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed? . . . . . Yes No N/A
Spike recoveries acceptable? . . . . . Yes No N/A
Spike source traceable? . . . . . Yes No N/A
Spike source expired? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . Yes No N/A
Chemical recovery acceptable? . . . . . Yes No N/A
Chemical carrier traceable? . . . . . Yes No N/A
Chemical carrier expired? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A

Comments:_____

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . Yes No N/A
RPD Values Acceptable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

9. Field QC Samples . . . . . ☐ N/A

Field duplicate sample(s) analyzed? . . . . . Yes (No) (N/A)
Field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Field split sample(s) analyzed? . . . . . Yes (No) N/A
Field split RPD values acceptable? . . . . . Yes No (N/A)
Performance audit sample(s) analyzed? . . . . . Yes (No) N/A
Performance audit sample results acceptable? . . . . . Yes No (N/A)

Comments:

10. Holding Times

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . (Yes) No N/A
Results supported in raw data? . . . . . Yes No (N/A)
Results Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation errors? . . . . . Yes No (N/A)
MDA's meet required detection limits? . . . . . Yes (No) N/A
Transcription/calculation errors? . . . . . Yes No (N/A)

Comments: The MDA for all Sr 90 results exceeds the ARQL, however, data qualification is not required!

HOLDING TIME SUMMARY

SDG: WO1688-QES	VALIDATOR: HEIDI GREGERSON	DATE: 12/13/95	PAGE 1 OF 1

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOGGB6	Gross α β	8/21/95	9/12/95	9/21/95	22	31	none
	Sr 90			10/2/95	22	42 HG	none
	α Spec		9/12/95	9/28/95	22	38	none
	Gamma Spec			9/19/95	22	29	none
BOGGB7	Gross α β	8/23/95		9/21/95	20	29	none
	Sr 90			10/2/95	20	40	none
	α Spec		9/12/95	9/28/95	20	36	none
	Gamma Spec			9/19/95	20	27	none
BOGGB8	Gross α β	8/25/95		9/21/95	18	27	none
	Sr 90			10/2/95	18	38	none
	α Spec		9/12/95	9/28/95	18	34	none
	Gamma Spec			9/19/95	18	25	none
BOGGC1	Gross α β	8/26/95		9/21/95	17	26	none
	Sr 90			10/2/95	17	37	none
	α Spec		9/12/95	9/28/95	17	33	none
	Gamma Spec			9/19/95	17	24	none

961344.WHC-SD-EN-SPP-002, REV.2

9613444.0128

MEMORANDUM

TO: 199-N106A Waste Characterization Sampling Project QA Record December 20, 1995

FR: Heidi Gregerson, Golder Associates Inc.

RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE W0688-QES (943-1610.110 688INO.NR2)

INTRODUCTION

This memo presents the results of data validation on data package W0688-QES prepared by Quanterra Environmental Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0GGB6		INORGANICS	SOIL-TCLP
B0GGB7			SOIL-TCLP
B0GGB8		SEE ATTACHMENT 4	SOIL-TCLP
B0GGC1			SOIL-TCLP

Data validation was conducted to level C in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Detection Limits. Detection limit goals were met for all sample results.

Completeness. The data package was complete for all requested analyses. A total of four samples were validated in this data package with a total of 32 determinations reported, all of which were deemed valid. This results in a completeness of 100%, which meets the 90% objective of the work plan.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

No minor deficiencies were identified during data validation which required qualification of data.

REFERENCES

WHC 1993, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

Glossary of Inorganic Data Reporting Qualifiers.

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG:W0688-QES	REVIEWER: H. Gregerson	DATE: 12-12-95	PAGE 1 OF 1
COMMENTS: INORGANICS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NO SAMPLES QUALIFIED			

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0688-QES

	Samp#	B0GGB6		B0GGB7		B0GGB8		B0GGC1	
	Date	8-21-95		8-23-95		8-25-95		8-26-95	
	Location	N5805		N5806		N5807		N5810	
	Depth	---		---		---		---	
	Type	SOIL-TCLP		SOIL-TCLP		SOIL-TCLP		SOIL-TCLP	
	Comments								
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
ARSENIC	UG/L	58.200	U	58.200	U	58.200	U	58.200	U
BARIUM	UG/L	734.000		414.000		549.000		549.000	
CADMIUM	UG/L	3.100	U	3.100	U	3.100	U	3.100	U
CHROMIUM	UG/L	6.100	B	2.800	B	2.900	B	2.800	U
LEAD	UG/L	41.300	U	41.300	U	41.300	U	41.300	U
MERCURY	UG/L	0.100	U	0.100	U	0.100	U	0.100	U
SELENIUM	UG/L	43.300	U	43.300	U	43.300	U	47.000	B
SILVER	UG/L	2.200	U	2.200	U	2.200	U	2.200	U

The decimal places shown do not reflect the precision reported by the laboratory

Verified HRG
12/20/95

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9613444.0136

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGB6

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-001

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	734			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	6.1	B		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	43.3	U		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

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HRG 12/13/95

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGB7

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-002

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	414			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	2.8	B		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	43.3	U		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

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HRG 12/13/95

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGB8

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-003

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	549			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	2.9	B		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	43.3	U		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

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HRG 12/13/95

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0GGC1

Lab Name: QUANTERRA_MO Contract: 550.98

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0688

Matrix (soil/water): WATER Lab Sample ID: P9209-004

Level (low/med): LOW Date Received: 08/28/95

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	58.2	U		P
7440-39-3	Barium	549			P
7440-43-9	Cadmium	3.1	U		P
7440-47-3	Chromium	2.8	U		P
7439-92-1	Lead	41.3	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	47.0	B		P
7440-22-4	Silver	2.2	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

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HRG 12/13/95

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9613444.0141

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
P.O. Box 1970
Richland, Washington 99352

October 11, 1995

Attention: Joan Kessner

OCT 1995 RECEIVED Data Log In

Project number	:	550.98
Date Received by Lab	:	August 28, 1995
Number of Samples	:	Four (4)
Sample Type	:	Soil
SDG Number	:	W0688
Data Deliverable	:	Summary

I. Introduction

On August 28, 1995, four (4) 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 the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
9209-001	B0GGB6	50844901	Soil	08/28/95
9209-002	B0GGB7	50844902	Soil	08/28/95
9209-003	B0GGB8	50844903	Soil	08/28/95
9209-004	B0GGC1	50844904	Soil	08/28/95

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.

Quanterra
Environmental Services

Analyses requested: ICP TCLP Metals by EPA method 6010 and Mercury by EPA method 7470 after TCLP Extraction by EPA method 1311.

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

Due to an error in spiking, the Matrix Spike of sample 9209-001 was prepared at half the normal level for the ICP analytes. The Matrix Spike Duplicate was prepared at the correct levels. The forms reflect the correct recoveries for both the Matrix Spike and the Matrix Spike Duplicate. See NCM # SL-94-2041.

Quanterra
Environmental Services

Bechtel Hanford Incorporated
October 11, 1995
Project Number: 550.98
SDG: W0688
Page 3

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\hanw0688.nar

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EEL HJF 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 SDL W0688

Sample No.	Matrix*	Date Sampled	Time Sampled	Preservative: none	none	none	none											
				Type of Container: P/G	P/G	P/G	P/G											
				No. of Container(s): 1	3	1	1											
				Volume: 500 mL	500 mL	20 mL	20 mL											
				TCLP Metals	See Item #1 below	Activity Scan	Rad Screen											
B0GGB6 01	S	8-21-95	1327	X	X	X												
				100														
			2nd		Container cap cracked (no sample lost)													

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: Doug Bowers 8-22-95 1405	Received By: ER Kim Butler Butler 8-22-95	Date/Time: 1405
Relinquished By: ER Kim Butler Butler 8-28-95	Received By: Quanterra Karen Stillwelling 8-28-95	Date/Time: 10:15
Relinquished By:	Received By:	Date/Time:
Relinquished By:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS: Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

N5805

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

DISTRIBUTION: Original - Sample Yellow - Sampler

BC-6000-828 (12/92)

9513444.0144

017

12/13/95

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: 895-086
Ice Chest No.: CR-15	Field Logbook No.: EFL-1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 SDL 100688

Sample No.	Matrix*	Date Sampled	Time Sampled	TCLP Metals (Preservative: none; Type of Container: P/G; No. of Container(s): 1; Volume: 500 mL)	See Item #1 below (Preservative: none; Type of Container: P/G; No. of Container(s): 3; Volume: 500 mL)	Activity Scan (Preservative: none; Type of Container: P/G; No. of Container(s): 1; Volume: 20 mL)	Rad Screen (Preservative: none; Type of Container: P/G; No. of Container(s): 1; Volume: 20 mL)		
B0GGB7 02	S	8-23-95	0813	X	X	X		N	5806
				100					

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers		8-23-95/1431
Received By: E S Bailey		1431
Relinquished By: E S Bailey		10:15
Received By: Bailey		10:15
Relinquished By: B Whitten		8-28-95
Received By: Karen Stockenburg		8-28-95
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original - Sample Yellow - Sampler

BC-6000-828 (12/92)

9513944.0145

0000010

HRG 12/13/95

018

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: Doug Bonch	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: B95-086
Ice Chest No.: ER-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 W0688 8Dk

Sample No.	Matrix*	Date Sampled	Time Sampled	Preservative: none	none	none	none											
				Type of Container: A P/G	P/G	P/G	P/G											
				No. of Container(s): 1	3	1	1											
				Volume: 500 mL	500 mL	20 mL	20 mL											
				TCLP Metals	See Item #1 below	Activity Scan	Red Screen											
					508450													
B0GB88 03	S	8-25-95	1033	X	X	X			N5807									
				1														
				10x														

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Doug Bonch	8-25-95	1500
Received By: K. Trapp / K. Trapp	8/25/95	1500
Relinquished By: K. Trapp / K. Trapp	8/28/95	0805
Received By: Bakkton	8-28-95	0805
Relinquished By: Bakkton	8-28-95	10:15
Received By: Kevin Stottlemyre	8-28-95	10:15
Relinquished By:		
Received By:		

SPECIAL INSTRUCTIONS
Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original - Sample Yellow - Sampler

BC-6000-828 (12/92)

019

~~0000011~~

HRG 12/13/95

9513444.0146

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: Doug Bowers	Company Contact: Randy Havenor	Telephone No.: 373-9215
Project Designation: 199-N-106A Waste Characterization Sampling	Sampling Location: 100 NR-2 / 100 Area	SAF No.: 895-086
Ice Chest No.: EK-15	Field Logbook No.: EFL 1058	Method of Shipment: Hand deliver
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks: unknown		
Special Handling and/or Storage: none		

SAMPLE ANALYSIS: 508449 SDG 100688

Preservative	none	none	none	none
Type of Container	P/G	P/G	P/G	P/G
No. of Container(s)	1	3	1	1
Volume	500 mL	500 mL	20 mL	20 mL
	TCLP Metals	See Item #1 below	Activity Scan	Rad Screen

Sample No.	Matrix*	Date Sampled	Time Sampled						
BOGGC1 04	S	8-28-95	0854	X	X	X		N	5810
				1					
				100					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	8-28-95 0756	Kim Hutton / B. Hutton	8-28-95 0756
Kim Hutton / B. Hutton	8-28-95 10:15	Received By	10:15
Kim Hutton / B. Hutton	8-28-95	Kim Hutton / B. Hutton	8-28-95
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

Item #1 Gross Alpha, Gross Beta, Sr-90, Pu-239, Pu-240, Gamma Spec (to include) Co-60, Cs-137.

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

DISTRIBUTION: Original - Sample Yellow - Sampler

BC-6000-828 (12/92)

9614944.0147

020

~~0000012~~ 12/13/95 HPG

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100 NR 2			DATA PACKAGE: W0688-QES		
VALIDATOR: H. GREGERSON		LAB: QUANTERRA		DATE: 12/13/95	
CASE:			SDG:		
ANALYSES PERFORMED					
☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☒ TCLP	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐
SAMPLES/MATRIX B0GGB6 B0GGB7 B0GGB8 B0GGC1					
~~WATER~~ SOIL					
HRG 12/13/95					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

022

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments:

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
Comments:

023

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A

Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments:

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A

Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A

Were analytical spikes performed as required? . . . . . Yes No N/A

Are analytical spike recoveries acceptable? . . . . . Yes No N/A

Was MSA performed as required? . . . . . Yes No N/A

Are MSA results acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

SDG: WD688-GES	VALIDATOR: HEIDI GREGERSON	DATE: 12/13/95	PAGE 1 OF 1
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOGGB6	~~ICP~~ ICP Metals	8/21/95	9/11/95	9/12/95	21	22	none
↓	CV Hg	↓	9/11/95	9/11/95	21	21	↓
BOGGB7	ICP Metals	8/23/95	9/11/95	9/12/95	~~21~~ 19	20	
↓	CV Hg	↓	9/11/95	9/11/95	19	19	
BOGGB8	ICP Metals	8/25/95	9/11/95	9/12/95	17	18	
↓	CV Hg	↓	9/11/95	9/12/95	17	17	
BOGGC1	ICP Metals	8/26/95	9/11/95	9/12/95	16	17	
↓	CV Hg	↓	9/11/95	9/11/95	16	16	↓