

START

9613490.1569

0045392

W0169-QES-169



1587



Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

Dear Mr. Lerch:

Thank you for purchasing analytical testing services from Quanterra, Inc. It is our intention to supply our clients with data packages which not only meet the industry's highest standards for quality, but are also easy to use. Features which we point out are:

1. A Data Summary Packet which allows you to review your data without searching through the complete data package.

Your Data Summary Packet contains the following items:

- Case Narrative: listing of sample identifications, analyses performed, explanation of any problem associated with samples, corrective action taken.
 - Quality control sample identifications and analyses performed.
 - Data summary.
2. A data package which meets the specific requirements you requested and is easy to use as well. The package is organized in accordance with the Table of Contents which you will find at the beginning of each section. Sections are separated by color-coded tabs, making it easy to find individual analytical parameters which may be of particular interest to you. The data package is custody-sealed at the laboratory - your assurance that parts of the package are not missing.

We are constantly searching for ways to improve our service to you. This current product has many of the features which you have told us are important to you. Your suggestions regarding additional improvements will be appreciated.

Please contact me with any questions or suggestions.

Sincerely,

A handwritten signature in black ink that reads "Wade H. Price".

Wade H. Price
Project Manager

000001

9613490 1570

OFFICE OF SAMPLE MANAGEMENT

RECORD OF DISPOSITION

ROD-B94-013

Record of Disposition No.

DATE: 08/09/94

LABORATORY: Quanterra

PROJECT TITLE/NO.: 200-UP-1 Ground Water - Round 2/B94-018

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

BOC1N7, BOC1N8, BOC1L2

DESCRIPTION OF EVENT:

No radiological screening vial was received with these samples.

DISPOSITION OF SAMPLES:

Perform the rad screen on a sample portion submitted for non-VOA analysis.

APPROVAL SIGNATURES:

R. C. Smith/

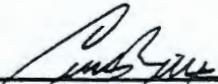


8/9/94

OSM Project Coordinator (Print/Sign Name)

Date

C. D. Wittreich/



8/15/94

Technical Representative (Print/Sign Name)

Date

N/A

Quality Assurance (Print/Sign Name)

Date

9613490.1571



Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

September 15, 1994

Attention: J. A. Lerch



Project number	:	550.05
Date Received by Lab	:	August 08, 1994
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W0169
Data Deliverable	:	Standalone

RECORD COPY

I. Introduction

On August 08, 1994, three (3) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID numbers to correspond with their specific client IDs:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
5774-001	B0C1N7	408182101	Water	08/08/94
5774-002	B0C1N8	408182102	Water	08/08/94
5774-003	B0C1L2	408182103	Water	08/08/94

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.

000002

Westinghouse Hanford Company
September 15, 1994
Project Number: 519.87
Page 2

Analyses requested: The SW846 Metals including ICP Metals by method 6010, Lead by method 7421, Mercury by method 7470, Selenium by method 7740 and Thallium by method 7841. Pesticides by EPA method 8080. Chloride, Fluoride, Nitrate, Nitrite, Sulfate and Phosphate by EPA method 300.0. Nitrate by EPA method 353.1 . CLP/90 Volatiles by method EPA 8240.

III. Quality Control

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

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

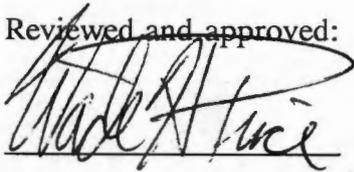
The matrix spike for sample 5774-001 was outside the control limits of 75% to 125% for aluminum and selenium, and the matrix spike for sample 5774-002 was outside control limits for iron and selenium.

The Matrix Spike recovery for the Nitrate analysis was outside the suggested limits for sample 5774-001.

Westinghouse Hanford Company
September 15, 1994
Project Number: 519.87
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
z:\annelars\hanw0169.nar

9613490.1574

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOC1L2

Lab Name: ITAS-ST.LOUIS

Contract: 550-05

Lab Code: ITSL

Case No.: V77401

SAS No.:

SDG No.: W0169

Matrix: (soil/water) WATER

Lab Sample ID: 5774-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E0176

Level: (low/med) LOW

Date Received: 08/08/94

% Moisture: not dec.

Date Analyzed: 08/12/94

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	1	J
67-64-1	-----Acetone	8	BJ
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

9613490.1575

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOC1L2

Lab Name: ITAS-ST.LOUIS

Contract: 550-05

Lab Code: ITSL

Case No.: V77401

SAS No.:

SDG No.: W0169

Matrix: (soil/water) WATER

Lab Sample ID: 5774-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E0176

Level: (low/med) LOW

Date Received: 08/08/94

% Moisture: not dec.

Date Analyzed: 08/12/94

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

000007

9613490.1576

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOC1N7

Lab Name: ITAS-ST.LOUIS

Contract: 550-05

Lab Code: ITSL

Case No.: V77401

SAS No.:

SDG No.: W0169

Matrix: (soil/water) WATER

Lab Sample ID: 5774-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E0177

Level: (low/med) LOW

Date Received: 08/08/94

% Moisture: not dec.

Date Analyzed: 08/12/94

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	2	J
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	6	J
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9613490.1577

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOC1N7

Lab Name: ITAS-ST.LOUIS

Contract: 550-05

Lab Code: ITSL

Case No.: V77401

SAS No.:

SDG No.: W0169

Matrix: (soil/water) WATER

Lab Sample ID: 5774-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E0177

Level: (low/med) LOW

Date Received: 08/08/94

% Moisture: not dec.

Date Analyzed: 08/12/94

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

9613490.1578

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOC1N7

Lab Name: ITAS-ST.LOUIS Contract: 550-05
 Lab Code: ITSL Case No.: P77401 SAS No.: SDG No.: WO169
 Matrix: (soil/water) WATER Lab Sample ID: 5774-001
 Sample wt/vol: 1000 (g/mL) ML Lab File ID:
 % Moisture: decanted: (Y/N) Date Received: 08/08/94
 Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 08/12/94
 Concentrated Extract Volume: 10000 (uL) Date Analyzed: 08/24/94
 Injection Volume: 2.50 (uL) Dilution Factor: 1.00
 GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) N

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

ITAS-ST. LOUIS

NITRATE/NITRITE-N REPORT

Pg. 1 of 2

Analyst: T. ALLEN
 Project No.: 519.58.262.06 550.05 317.27 550.03
 Reviewed by: JM [Signature]

Batch No.: 44517

Analysis Date: 0801-94
 Method No.: 353.1
 Date: 09-02-94

LAB ID	STANDARD ID	RAW VALUE x	DILUTION +	SAMPLE VOLUME (L or g) =	NITRATE/NITRITE x	EXTRACT VOLUME (L) +	FRACTION SOLID =	FINAL CONCENTRATION (ug/L)-N (ug/g)-N	% RECOVERY	RPD
248K4572		2.427 ✓						<50 ✓		
248K4572	A13821-94	533.6 ✓						534 ✓	95 ✓	
S756-001		286.3 ✓	X10 ✓					2860 ✓		
0010P		200.78 ^{uncert} ✓						2000 ^{uncert} 2000 ✓		2 ✓
001MS	A13822-94	339.1 ✓						3390 ✓	94 ✓	
S769-001		444.5 ✓						4440 ✓		
002		275.6 ✓						2760 ✓		
003		66.54 ✓						665 ✓		
004		14.64 ✓						<500 ✓		
S774-001		407.8 ✓	X100 ✓					40800 ✓		
0010P		402.3 ✓						40200 ✓		1 ✓
001MS	A13823-94	397.1 ✓						39700 ✓	φ *	
S787-001		442.0 ✓	X10 ✓					4420 ✓		
0010P		453.6 ✓						4540 ✓		3 ✓
001MS	A13824-94	504.6 ✓						5050 ✓	112 ✓	
002		463.1 ✓						4630 ✓		
003		9.791 ✓						<500 ✓		
004		60.73 ✓						607 ✓		
005		582.1 ✓						5820 ✓		
S893-001		522.9 ✓						5230 ✓		

MS RECOVERY 0.75 to 0.96 LIMITS

9613490.1581

000746

ITAS-ST. LOUIS

NITRATE/NITRITE-N REPORT

Pg. 2 of 2

Analyst: J. ORR
 Project No.: 5.9.58 242g 550.05 37.27 550.13
 Reviewed by: JML

Batch No.: 44517

Analysis Date: 09-01-94
 Method No.: 353.1
 Date: 09-02-94

LAB ID	STANDARD ID	RAW VALUE x	DILUTION +	SAMPLE VOLUME (L or g) =	NITRATE/NITRITE x	EXTRACT VOLUME (L) +	FRACTION SOLID =	FINAL CONCENTRATION (ug/L)-N (ug/g)-N	% RECOVERY	RPD
5893-005		44.86 ✓						<50 ✓		
5791-001		3.030 ✓						<50 ✓		
✓ 002		5.174 ✓						<50 ✓		
5800-001		432.3 ✓	X10 ✓					4320 ✓		
<i>JML 09-01-94</i>										

000047

9613490 1592

SS0.02, SS0.03, S19.87

QUANTERRA ST. LOUIS

Project #: 388.01, 362.03, 340.05, S19.58, SS0.05, 262.01
 Analyst: J. Flandreau
 Reviewed By: JMK
 Reviewed By: JMK
 Page 1 of 2

Prep Date: 08-29-94
 Analysis Date: 08-29-94
 Loop Used: 50ml
 Batch #: 44362
 Method #: 300.0

ANIONS BY I.C.

ug/lb ug/L mg/L
 (circle one)

Standard Value	Sample ID	Standard ID	Solid Fract.	DH.	FI	Cl	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br
	QCBLK44362				<0.100 mg/L	<0.250 mg/L	<1.00 mg/L	<0.020 mg/L	<1.00 mg/L	<0.020 mg/L	<0.250 mg/L
	QCCLS44362	AL3719-94			0.925 mg/L	0.917 mg/L	3.768 mg/L	0.079 mg/L	3.760 mg/L	0.081 mg/L	0.996 mg/L
	QCCLS44362	AL3720-94			0.913	0.898	3.738	0.078	3.784	0.079	0.972
	5904-005				<100	11500	382	14400	<50.0	7.32	<12.5
	006				<100	94000	<50.0	63600	<200	<40.0	<12500
	5926-009				0.140	-	7.46	-	-	-	-
	5746-001				0.216	2.90	13.6	-	-	-	<0.250
	002				<0.100	<0.250	<1.00	-	-	-	<0.250
	003				<0.100	<0.250	<1.00	-	-	-	<0.250
	5794-001				0.220	8.40	22.9	-	-	-	<0.250
	002				0.216	14.7	20.1	-	-	-	<0.250
	5799-001				0.171	11.1	72.3	-	-	-	<0.250
	5819-001				0.133	12.5	76.1	-	-	-	<0.250
	5756-001				0.351	20.3	24.2	2.88	<1.00	<0.020	-
	dup 001				0.365	19.6	23.8	2.92	<1.00	<0.020	-
	MS 001	AL3721-94			2.44	36.8	42.0	3.26	2.02	0.629	-

% Recovery

RPD

	FI	Cl	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br
LCS-1 H ₂ O	92	92	94	99	94	101	100
LCS-2 H ₂ O	91	90	93	98	95	99	97
LCS-3 Soil	93	89	94	96	93	99	-
5756 MB	104	82	89	84	101	103	-
5774 MB	99	98	103	0	85	107	-
5787 MB	101	101	89	-	-	-	-

	FI	Cl	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br
5756 DUP	4	4	2	1	*	*	-
5774 DUP	<1	<1	<1	1	*	<1	-
5787 DUP	4	<1	<1	-	-	-	-

can't calculate

000048

Project #: 262.01, 530.04, 550.03, 519.87
 388.01, 362.03, 340.05, 519.58, 550.05
 Analyst: J. Flanahan
 Reviewed By: JMF
 Reviewed By: JMF
 Page 2 of 2

QUANTERRA ST. LOUIS

ANIONS BY I.C.

ug/L ug/L mg/L
 (circle one)

Prep Date: 08-29-94
 Analysis Date: 08-29-94
 Loop Used: 50ul
 Batch #: 44362
 Method #: 300.0

Standard Value	Sample ID	Standard ID	Solid Fract.	DI.	FI	Cl	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br
	5774-001			FI 10 SO ₄ 10 NO ₃ 200 OP 1	0.415 mg/L	25.6 mg/L	35.6 mg/L	40.6 mg/L	<1.00 mg/L	0.429 mg/L	-
	dup 001			↓	0.417	25.7	35.5	41.2	<1.00	0.428	-
FI 2 NO ₃ 452 CL 20 NO ₂ 604 SO ₄ 20 OP 2	MS 001	AL3722-94	JMF 7/23/94	FI 10 SO ₄ 10 NO ₃ 200 OP 1	2.401 mg/L	45.2	56.2	39.2	1.698 mg/L 1.70	1.080 mg/L 1.080	-
	5787-001			FI 1 SO ₄ 2 Cl 1	0.141	3.32	25.7	-	-	-	-
	dup 001			↓	0.147	3.32	25.6	-	-	-	-
FI 2 NO ₃ 452 CL 20 NO ₂ 604 SO ₄ 20 OP 2	MS 001	AL3723-94		FI 1 SO ₄ 10 Cl 10 OP 2	2.160	23.6	43.5	-	-	-	-
	002			FI 1 SO ₄ 2 Cl 1	0.137	3.33	25.7	-	-	-	-
	003			FI 1 SO ₄ 1 Cl 1	<0.100	<0.250	<1.00	-	-	-	-
	↓ 004			FI 1 SO ₄ 1 Cl 5	0.864	9.85	3.44	-	-	-	-
	5790-001			Cl 5 NO ₃ 500 SO ₄ 5 OP 1	-	8.20	29.4	57.9 mg/L	<1.00 mg/L	<0.020 mg/L	-
	5791-001			Cl 1 NO ₃ 1 SO ₄ 1 OP 1	-	<0.250	<1.00	<0.020	<1.00	<0.020	-
	↓ 002			Cl 1 NO ₃ 1 SO ₄ 1 OP 1	-	<0.250	<1.00	<0.020	<1.00	<0.020	-
	5828-001			Cl 5 NO ₃ 10 SO ₄ 5 OP 1	-	10.7	32.7	2.89	<1.00	<0.020	-
JMF 08-29-94	5832-001										
	002										
	QCLC4436			JMF 08-31-94	<0.100 ug/L	<2.50 ug/L	<1.00 ug/L	<0.200 ug/L	<1.00 ug/L	<0.200 ug/L	-
FI 9.99 NO ₃ 900 Cl 9.99 NO ₂ 1000 SO ₄ 40 OP 40	QCLC4436	AL3724-94			9.28	8.91	37.4	0.770	37.3	0.790	-
	5793-002			JMF 08-31-94	<0.998	<2.50	<9.98	<0.200	<9.98	<0.200	-

J. Flanahan 08-30-94

000049

9613490.1585

Analytical Data Package Prepared For

Bechtel Hanford

RECORD COPY

Chemical Analysis By

Quanterra Environmental Services
St. Louis Laboratory



Sample Delivery Group Number: WO169

WHC IDENTIFICATION NUMBER

QUANTERRA ID NUMBER

BOC1N7

5774-001

BOC1N8

5774-002

BOC1L2

5774-003

0000001

Project Manager: W. Price

Draft: Final Entered and Reviewed by: *[Signature]* PM Review: *[Signature]*

Sample Header Template:

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)	
5774-001	BOC1N7	Water	05-AUG-94 11:30	08-AUG-94 10:35	12-SEP-94	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 40818401								
3 VI - Vial-40ml	VOA/CLP90/Q4	S	COLD	05-SEP-94	19-AUG-94	109C	(90908:100 90909:100 90910:100)	
1 AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	05-SEP-94	02-SEP-94	R1B	(90913:100)	
1	FL/300.0/Q4	S	COLD	05-SEP-94	02-SEP-94	R1B	(90913:100)	
1	NO2/300.0/Q4	S	COLD	05-SEP-94	07-AUG-94	R1B	(90913:100)	
1	NO3/300.0/Q4	S	COLD	05-SEP-94	07-AUG-94	R1B	(90913:100)	
1	OPHOS/300.0/Q4	S	COLD	05-SEP-94	07-AUG-94	R1B	(90913:100)	
1	SO4/300.0/Q4	S	COLD	05-SEP-94	02-SEP-94	R1B	(90913:100)	
1 PN - Plastic-1L	AS/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1	HG/CLP90/Q4	S	HNO3	05-SEP-94	03-SEP-94	R1B	(90912:100)	
1	ICAP/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1	PB/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1	SE/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1	TL/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1 PN - Plastic-500ml	NO3/353.1/Q4	S	H2SO4	05-SEP-94	02-SEP-94	R1B	(90914:100)	
1 AN - Amber Glass-2.5L	PEST/CLP90/Q4	S	COLD	05-SEP-94	12-AUG-94	R1B	(90911:100)	

5774-001DUP	BOC1N7	Water	05-AUG-94 11:30	08-AUG-94 10:35	12-SEP-94	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 40818401								
1 AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	05-SEP-94	02-SEP-94	R1B	(90913:100)	
1	FL/300.0/Q4	S	COLD	05-SEP-94	02-SEP-94	R1B	(90913:100)	
1	NO2/300.0/Q4	S	COLD	05-SEP-94	07-AUG-94	R1B	(90913:100)	
1	NO3/300.0/Q4	S	COLD	05-SEP-94	07-AUG-94	R1B	(90913:100)	
1	OPHOS/300.0/Q4	S	COLD	05-SEP-94	07-AUG-94	R1B	(90913:100)	
1	SO4/300.0/Q4	S	COLD	05-SEP-94	02-SEP-94	R1B	(90913:100)	
1 PN - Plastic-1L	AS/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1	HG/CLP90/Q4	S	HNO3	05-SEP-94	03-SEP-94	R1B	(90912:100)	
1	ICAP/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1	PB/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1	SE/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1	TL/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95	R1B	(90912:100)	
1 PN - Plastic-500ml	NO3/353.1/Q4	S	H2SO4	05-SEP-94	02-SEP-94	R1B	(90914:100)	

5774-001MS	BOC1N7	Water	05-AUG-94 11:30	08-AUG-94 10:35	12-SEP-94	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 40818401								
3 VI - Vial-40ml	VOA/CLP90/Q4	S	COLD	05-SEP-94	19-AUG-94	109C	(90908:100 90909:100 90910:100)	
1 AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	05-SEP-94	02-SEP-94	R1B	(90913:100)	
1	FL/300.0/Q4	S	COLD	05-SEP-94	02-SEP-94	R1B	(90913:100)	
1	NO2/300.0/Q4	S	COLD	05-SEP-94	07-AUG-94	R1B	(90913:100)	

3*=Sample has not been rad screened.

0000011

9613490-1586

Project Manager: W. Price

Draft: Final: Entered and Reviewed by: _____ PM Review: _____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date Site	(Container Numbers:% Filled)	
1		NO3/300.0/Q4	S	COLD	05-SEP-94	07-AUG-94 R1B	(90913:100)	
1		OPHOS/300.0/Q4	S	COLD	05-SEP-94	07-AUG-94 R1B	(90913:100)	
1		SO4/300.0/Q4	S	COLD	05-SEP-94	02-SEP-94 R1B	(90913:100)	
1	PN - Plastic-1L	AS/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90912:100)	
1		HG/CLP90/Q4	S	HNO3	05-SEP-94	03-SEP-94 R1B	(90912:100)	
1		ICAP/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90912:100)	
1		PB/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90912:100)	
1		SE/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90912:100)	
1		TL/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90912:100)	
1	PN - Plastic-500ml	NO3/353.1/Q4	S	H2SO4	05-SEP-94	02-SEP-94 R1B	(90914:100)	
1	AN - Amber Glass-2.5L	PEST/CLP90/Q4	S	COLD	05-SEP-94	12-AUG-94 R1B	(90911:100)	
5774-001MSD BOC1N7 Water 05-AUG-94 11:30 08-AUG-94 10:35 12-SEP-94 FED-EX 1 Screening not Required								
NOTE: RICHLAND ID 40818401								
3	VI - Vial-40ml	VOA/CLP90/Q4	S	COLD	05-SEP-94	19-AUG-94 109C	(90908:100 90909:100 90910:100)	
1	AN - Amber Glass-2.5L	PEST/CLP90/Q4	S	COLD	05-SEP-94	12-AUG-94 R1B	(90911:100)	
5774-002 BOC1N8 Water 05-AUG-94 11:30 08-AUG-94 10:35 12-SEP-94 FED-EX 1 Screening not Required								
NOTE: RICHLAND ID 40818402								
1	PN - Plastic-1L	ASD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		ICAPD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		PBD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		SED/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		TLD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
5774-002DUP BOC1N8 Water 05-AUG-94 11:30 08-AUG-94 10:35 12-SEP-94 FED-EX 1 Screening not Required								
NOTE: RICHLAND ID 40818402								
1	PN - Plastic-1L	ASD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		ICAPD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		PBD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		SED/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		TLD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
5774-002MS BOC1N8 Water 05-AUG-94 11:30 08-AUG-94 10:35 12-SEP-94 FED-EX 1 Screening not Required								
NOTE: RICHLAND ID 40818402								
1	PN - Plastic-1L	ASD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		ICAPD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		PBD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		SED/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	
1		TLD/CLP90/Q4	S	HNO3	05-SEP-94	04-FEB-95 R1B	(90936:100)	

9613490.1587

3*=Sample has not been rad screened.

0000012

Quanterra August 11, 1994 08:48 am
Account: 10722 Project: 550.05 Quanterra-Richland QAS No. 679 Rev. 0
Master Sample Login: 5774

Project Manager: W. Price

Draft: Final: Entered and Reviewed by: _____ PM Review: _____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
#	Comments	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
5774-003	BOC1L2	Water	05-AUG-94 11:30	08-AUG-94 10:35	12-SEP-94	FED-EX	1	Screening not Required
	NOTE: RICHLAND ID 40818403							
3	VI - Vial-40ml	VOA/CLP90/Q4	S	COLD	05-SEP-94	18-AUG-94 109C		(90939:100 90940:100 90941:100)

0000013

9613490.1588

3*=Sample has not been rad screened.

Temp = 30C
CUR # 873

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 481777

Page 1 of 2

Project Name/No. 1 SAF B94-018

Samples Shipment Date 7 8-8-94

Bill to: 5 Quantera

Sample Team Members 2

Lab Destination 8 St. Louis

Profit Center No. 3 4632

Lab Contact 9

Project Manager 4 Van Petten

Project Contact/Phone 12

Report to: 10 Richland
Quantera

Purchase Order No. 6

Carrier/Waybill No. 13

Required Report Date 11

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21 To Fill	Disposal Record No. 22
40818401A	BOCIN7 / W	8-5-94 1150 AS	Amber Per WWC	400ml	COCL 40	AS Per WWC	100	
B			COCL			COCL	100	
C							100	
D				2L			100	
E			Poly	1L			100	
F			Amber	500ml			100	
G			Poly	500ml			100	
40818402A	BOCIN8			1L			100	

Special Instructions: 23

Possible Hazard Identification: 24
 Non-hazard Flammable Skin Irritant Poison B Unknown
 Sample Disposal: 25
 Return to Client Disposal by Lab Archive _____ (mos.)

Turnaround Time Required: 26
 Normal Rush AS Per WWC Contract
 QC Level: 27
 I. II. III. Project Specific (specify): SDG w/1169

1. Relinquished by 28 (Signature/Affiliation) <u>R. Boyd Quantera</u>	Date: <u>8-8-94</u> Time: <u>16:00</u>	1. Received by 28 (Signature/Affiliation) <u>Michael Pachon</u>	Date: <u>8-9-94</u> Time: <u>0900</u>
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

Write: To accompany samples
 Yellow: Field copy
 * See back of form for special instructions.



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No. 30 481777
Page 2 of 2

Project Name SAF B94-018

Project No. _____

Samples Shipment Date 8-8-94

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt % fill	Disposal 22 Record No.
40818403A	BDC1L2 / W	8-5-94 11:00 AM	Amber Per WAC	40ml	COOL 40	AS Per WAC	100	
↓ B	↓	↓	COC	↓	↓	COC	100	
↓ C	↓	↓	↓	↓	↓		100	
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold;">0000015</div> <div style="text-align: center;"> <p>RB 8-8-94</p> </div> </div>								
FOR LAB USE ONLY								
FOR LAB USE ONLY								
FOR LAB USE ONLY								
FOR LAB USE ONLY								
FOR LAB USE ONLY								
FOR LAB USE ONLY								
FOR LAB USE ONLY								
FOR LAB USE ONLY								
FOR LAB USE ONLY								

White: To accompany samples

Yellow: Field copy

* See back of form for special instructions.

9613490-1590



INTERNATIONAL TECHNOLOGY CORPORATION

C.U.R. and C.O.C.
COPIED TO: Wade P
DATE: 8-9-94
TIME: 11:30
BY: MS

Work Order No.: 5774

**Condition Upon Receipt Variance Report
ITAS - St. Louis Laboratory**

Client: _____ Date: 8-9-94
Project No: 550.05 Initiated by: M. Jackson
Analysis Requested: Refer to RFA/COC RFA/COC Numbers: 481761 481777
Client Sample Numbers Affected: Entire Lot MS

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

<input type="checkbox"/> 1. NA Not enough sample received for proper analysis. Received approximately: _____	<input type="checkbox"/> 8. Custody tape disturbed/broken/missing.
<input checked="" type="checkbox"/> 2. Sample received broken/leaking.	<input type="checkbox"/> 9. NA Sample splits performed by lab.
<input checked="" type="checkbox"/> 3. Sample received without proper preservative. <input type="checkbox"/> Cooler temperature not within 4°C ± 2°C Record temperature: <u>30C</u>	<input type="checkbox"/> 10. NA Volatile sample received with approximately _____ mm headspace.
<input type="checkbox"/> pH _____	<input checked="" type="checkbox"/> 11. Sample ID on container does not match sample ID on paperwork. Explain: _____
<input type="checkbox"/> other: _____	<input type="checkbox"/> 12. All coolers on airbill not received with shipment.
<input checked="" type="checkbox"/> 4. Sample received in improper container.	<input type="checkbox"/> 13. Other (explain below): <u>Shipping containers not red surveyed.</u>
<input checked="" type="checkbox"/> 5. Sample received without proper paperwork. Explain: _____	
<input checked="" type="checkbox"/> 6. Paperwork received without sample.	
<input checked="" type="checkbox"/> 7. No sample ID on sample container.	

Notes:

Corrective Action:

Client's Name: _____ Informed verbally on: _____ By: _____
 Client's Name: _____ Informed in writing on: _____ By: _____
 Sample(s) processed "as is". Comments: _____
 Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) _____ Date: 0000016

Project Management Review: _____ Date: _____

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround

Priority
 Normal

Collector <i>K. Trapp</i>	Company Contact PH BUTCHER	Telephone No. (509)376-4388
Project Designation 200-UP-1	Sampling Location 200 AREA	SAF No. B94-018
Ice Chest No. <i>ER-1D</i>	Field Logbook No. <i>EFL-1137</i>	Method of Shipment
Shipped To QUANTERRA(IT)	Offsite Property No. <i>W111-0-0851-4</i>	Bill of Lading/Air Bill No. <i>17A</i>

Possible Sample Hazards/Remarks	Preservative	HCL<2	pH 5-9	HNO3<2	COOL 4	H2SO4<2	HNO3<2	COOL 4	HCL<2		HNO3<2		HCL<2			
	Type of Container	Gs	gG	<i>Pg</i>	G	P	gG	gG	P		<i>Pg</i>		Gs			
	No. of Container(s)	3	1	1	1	1	4	1	1		1		3			
Special Handling and/or Storage COOL 4 DEGREES CENTIGRADE	Volume	40ml	2.5L	1L	500ml	500ml	SEE "SI"	2.5L	1L		1L		40ml			

SAMPLE ANALYSIS		VOA	PCB/PEST	CLP-ICP METALS, GFAA METALS, Hg (UNFIL-TERED)	ANIONS-IC, F, CL, SO4, NO2, NO3, PO4	NO2-NO3	SEE "S. I."	I-129	Tc-99		CLP-ICP METALS, GFAA METALS, Hg (FIL-TERED)	CLP-VOA				
<i>408184</i>		<i>A</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>408</i>	<i>850</i>				<i>ABC</i>				

Sample No.	Matrix*	Date Sampled	Time Sampled													
<i>BOCIN7</i>	<i>W</i>	<i>8/5/94</i>	<i>1130</i>	<i>X</i>												
<i>BOCIN8</i>	<i>W</i>	<i>↓</i>	<i>↓</i>								<i>X</i>					
<i>BOCIL2</i>	<i>W</i>	<i>↓</i>	<i>↓</i>									<i>X</i>				

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix*	
Relinquished By <i>K. Trapp</i>	Date/Time <i>8/5/94</i>	Received By <i>AJ Simpson</i>	Date/Time <i>8/5/94 1039</i>	ANALYTE LIST=GROSS ALPHA/BETA, U-234/235/238, TOTAL URANIUM, Sr-90, GAMMA SPEC(to include):Co-58/60,Cs-137,Eu-152/154/155 and Fe-59. BOTTLE SIZE= 3, 2.5L + 1, 500ml		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	
Relinquished By <i>AJ Simpson</i>	Date/Time <i>8/14/94 1035</i>	Received By <i>C. Henrich</i>	Date/Time <i>8/14/94 1035</i>				
Relinquished By	Date/Time	Received By	Date/Time				
Relinquished By	Date/Time	Received By	Date/Time				

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

0000017

9613490.1592

SCREENING CALCULATION SPREADSHEET

Cust Code	Received		Screening Prep		Count		Mnts. Cntd	BACKGROUND		
	Date		Date		Date			Alpha	Beta	Mnts
WHC	8-8-94		8-8		8-8		30	11	233	240

cat I (R₃) 8/8/94

Customer ID	pH <2 Rcvd/Relq	Residue Wght mG	Vol. Anal. mG mL	Sample Size Gm L	SMPL CNT DATA			Net Sample		DPM / Aliquot		uCi per Sample		2 Sigma Error uCi per Sample		pCi/(Gm or L)		Category 1 Yes/No	Aliquot to Cat 1 Gm or L	
					Hldr Num.	Total Alpha	Counts Beta	Counts/Minute Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		Alpha	Beta
BOC1N7		6.8	10	2.5	2	14	89	0.42	2.00	1.49E+00	3.95E+00	1.7E-04	4.4E-04	1.2E-07	1.4E-07	6.7E+01	1.8E+02	Yes	1.5E+02	5.6E+02

0000018

9613490.1593

9613490.1594

Contractor BHI	OFF-SITE PROPERTY CONTROL	CONTROL NO. <i>(To be obtained from PROPERTY MANAGEMENT)</i> W94-0-0851-4
-------------------	--------------------------------------	---

PART I - TO BE COMPLETED BY ORIGINATOR

Department ER Eng Support	Section Field & Analytical Supp	Unit ER Field Sampling
---------------------------	---------------------------------	------------------------

The following items are to be shipped from Contractor Vendor

Routing Prepaid Collect

Shipped to Company Quanterra (IT) Address 2800 George Washington Way City Richland, WA 99352 Country State Zip Code	Off-site Custodian	On-site Custodian	Payroll No.
--	--------------------	-------------------	-------------

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs.		Sample #: BOCIN7 BOCIN8 BOCILZ Cooler ID: EL-1D Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs.		Sample #: <u>+JS</u> Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

Classified Unclassified Shipped Under DOE Contract Shipped Under Contractor's Use Permit Contract

necessity for the off-site use of this property

Required for Project Work. List Project No. 200 UP 1

Business Trip

Bill of lading # XIA

Off-site Assignment

Shipment to Subcontractor. List Subcontract No. _____

Other (Please specify) Sampling supports RI/FS work in the

RECEIVED

AUG 8 1994

PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

Clearance for Public Release <i>[Signature]</i>	RM Survey No. 181227	Date 8/8/94
--	-------------------------	----------------

Location of and Contact for Property (Name/Phone No./Bldg./Area)

H. Butcher/(509)376-4388

Property Ready for Shipment 8/8/94	Cost Code to be Charged 8B410 / PTIFA	Approximate Date This Property will be Returned NA
---------------------------------------	--	---

Authorized By <u>AJ SIMPSON</u>	Date	Authorized By <u>AJ Simpson</u>	Date 8/8/94
------------------------------------	------	------------------------------------	----------------

Property Representative Signature	Date	Property Management Approval <u>[Signature]</u>	Date 8/8/94
-----------------------------------	------	--	----------------

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
-------------------------------	------

DISTRIBUTION (AFTER FINAL SIGNATURES)

0000019

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

Recd 8-8-94 1030 c Kenich Quent

SAMPLE STATUS REPORT FOR N 1697. RAD SCREEN 6993868A TIME: 8/ 6/94 2:27
 DISPATCHED: 8/ 3/94 13:44 SAMPLE HAS NOT BEEN SLURPED
 RECEIVED: 8/ 5/94 13:48

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
4271	TOT-ACT	6.82000E 01 pci/G	N	Y	J12UP

END OF REPORT

BOCIN7

BOCIN8

BOCILZ

AJS
8/8/94

9613490.1596



INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 8/8/94 1040 Client Name WDC

Project/Client # SAF 894-018 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) ER-1A

- 1. Condition of shipping container? O.K.
- 2. Custody Seals on cooler intact? Yes No
- 3. Custody Seals dated and signed? Yes No
- 4. Chain of Custody record is taped on inside of cooler lid? Yes No
- 5. Vermiculite/packing material is: Wet Dry
- 6. Each sample is in a plastic bag? Yes No
- 7. Number of sample containers in cooler: 17

8. Samples have: _____ tape _____ hazard labels
P custody seals f appropriate sample labels

9. Samples are: P in good condition _____ leaking
_____ broken _____ have air bubbles
_____ other

10. Coolant present? Yes No

Sample temperature 30

11. The following paperwork should be accounted for (N/A if not applicable): N/A
Chain of Custody #'(s) N/A
Request for analysis #'(s) N/A
Airbill # N/A Carrier N/A

- 12. Have any anomalies been identified above? Yes No
- 13. Memos have been initiated for all anomalies identified above? Yes

Printed Name/Signature C. Kentzer Cherry Date/Time 8-8-94 1040

FORM NO. LS-042, Rev.0, 2/94

0000021

9613490.1597



Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

Analytical Data Package Prepared For

Westinghouse/Bechtel Hanford

Radiochemical Analysis By

Quanterra Environmental Services
Richland Laboratory

Sample Delivery Group Number: W0169

CLIENT ID NUMBER

B0C1N7

QUANTERRA ID NUMBER

40818501

PRIORITY



0001

Quanterra Incorporated
 2800 George Washington Way
 Richland, Washington 99352

509 375-3131 Telephone
 509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
 345 Hills
 Richland, WA 99352

September 30, 1994

Attention: Joan Kessner

PRIORITY



SAF Number	:	B94-018
Date SDG Closed	:	August 16, 1994
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W0169
Data Deliverable	:	Stand Alone

I. Introduction

On August 16, 1994, one water sample was received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

<u>QTESRL ID</u>	<u>BHI ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
408185-01A	B0C1N7	Water	8/8/94

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.

Bechtel Hanford, Inc.
September 30, 1994
Page 2

The requested analyses were:

Alpha Spectroscopy
Uranium-234, -235, -238 by method ITAS-RD-3234
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Iodine-129 by method ITAS-RD-3229
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
Liquid Scintillation Counting
Technetium-99 by method ITAS-IT-RS-0001
Total Uranium
Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for each analysis performed under SDG W0169 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.

IV. Comments

Results from the initial radioactivity screening of this sample classified it as Category I.

Alpha Spectroscopy

Uranium-234, -235, -238 by method ITAS-RD-3234

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Bechtel Hanford, Inc.
September 30, 1994
Page 3

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219

Co-57 is detected in the LCS, however, the result is not reported because the peak is caused by interference from Eu-152 at the 122 keV energy line. The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Iodine-129 by method ITAS-RD-3229

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Gross Beta by method ITAS-RD-3222

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Strontium-90 by method ITAS-RD-3204

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Liquid Scintillation Counting

Technetium-99 by method ITAS-IT-RS-0001

Results for sample B0C1N7 and the duplicate of sample B0C1N7 are outside of the three sigma control limit and the matrix spike is biased high (136.6%). The technician noted that the sample was cloudy, therefore, the duplicate disagreement and the high matrix spike can be attributed to possible non-homogeneity of the sample. There is insufficient sample for a reanalysis of the batch. All other aspects of the data are within contractual requirements, therefore, the data are accepted and reported.

Bechtel Hanford, Inc.
September 30, 1994
Page 4

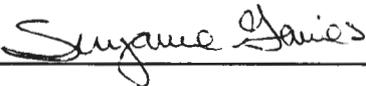
Total Uranium

Total Uranium by method ITAS-RD-4200

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

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
Project Manager

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0169
LAB SAMPLE ID:	40818501	MATRIX:	WATER
CLIENT ID:	B0C1N7	DATE RECEIVED:	8/8/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
U-234	9.42E-01	6.62E-01	6.79E-01	7.57E-01	pCi/L	40.00%	RD3234
U-235	-4.17E-02	3.73E-02	3.79E-02	5.89E-01	pCi/L	40.00%	RD3234
U-238DA	1.76E+00	8.60E-01	9.06E-01	4.76E-01	pCi/L	40.00%	RD3234
CO-58	-7.33E+00	7.05E+00	7.08E+00	1.07E+01	pCi/L	N/A	RD3219
CO-60	-8.26E+00	6.02E+00	6.07E+00	8.15E+00	pCi/L	N/A	RD3219
CS-137DA	-4.15E+00	5.07E+00	5.09E+00	8.31E+00	pCi/L	N/A	RD3219
EU-152	-6.80E+00	1.07E+01	1.07E+01	1.70E+01	pCi/L	N/A	RD3219
EU-154	-2.11E+01	1.83E+01	1.84E+01	2.80E+01	pCi/L	N/A	RD3219
EU-155	-3.47E+00	9.62E+00	9.63E+00	1.54E+01	pCi/L	N/A	RD3219
FE-59	-1.51E+01	1.57E+01	1.58E+01	2.48E+01	pCi/L	N/A	RD3219
I-129	2.03E+00	1.12E+00	1.17E+00	2.39E+00	pCi/L	N/A	RD3219
ALPHA	1.94E+00	1.68E+00	1.69E+00	2.57E+00	pCi/L	100.00%	RD3214
BETA	3.82E+01	3.33E+00	4.28E+00	2.95E+00	pCi/L	100.00%	RD3214
STRONTIUM	2.41E-01	2.43E-01	2.49E-01	8.08E-01	pCi/L	55.70%	RD3204
TC-99	1.49E+02	2.98E+00	2.08E+01	3.08E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TOTAL-URANIUM	3.00E+00	N/A	4.50E-01	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

9613490.1603

SAMPLE RECEIPT VARIANCE REPORT
ITAS-RICHLAND LABORATORY

WORK ORDER NUMBER: 408184 DATE INITIATED: 8-8-94 1045

INITIATED BY: C. Kenitzer

DATE/TIME OF SAMPLE (AND/OR RFA & COC) RECEIPT: 8-8-94 1035

03
01

CLIENT SAMPLE NUMBER	RFA/COC NUMBERS	ANALYSIS REQUESTED
BOC112		
BOC117		

Samples were received with the following deficiencies:

- 1. Not enough sample received for proper analysis.
- 2. Sample received without proper preservative.
- 3. No sample received in container.
- 4. Sample received without a RFA/COC form.
- 5. No sample ID on container.
- 6. Sample received broken or leaking.
- 7. Holding time exceeded at receipt.
- 8. Custody tape broken.
- 9. COC not relinquished by client.
- 10. Sample information on container does not match sample information on the paper work (Explain below).
- 11. All shipping containers (coolers) on waybill not received with shipment.
 - RFA/COC received
 - RFA/COC not received
- 12. Other (Explain below).

NOTES: No activity scan

SUPERVISOR REVIEW: Jami Heidelberg

PROJECT MANAGER REVIEW: _____

TELEPHONED TO: _____ ON _____ BY _____

TELEFAXED TO: _____ ON _____ BY _____

SIGNED ORIGINAL MUST BE RETAINED IN WORK ORDER FILE

MEMORANDUM

TO: 200-UP-1 Round 2 Groundwater Project QA Record

October 26, 1994

FR: Sandra Schildt, Golder Associates Inc. *SS*RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE
W0169-QES-169 (943-1610.017,W0169v.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0169-QES-169 prepared by Quanterra Environmental Services. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0CIN7	8/5/94	WATER	SEE NOTE 1

Note 1: The samples were analyzed for anions and nitrate/nitrite using SW-846 methods.

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

- 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.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met.



Completeness. The data package was complete for all requested analyses. One sample (1) was validated in this data set with a total of 7 determinations reported, of which 6 were deemed valid. This results in a completeness of 86% which does not meet normal work plan objectives of 90%.

MAJOR DEFICIENCIES

The following major deficiencies were identified during data validation which required qualification of data as unusable.

Holding Time

- The result for phosphate was rejected as it was reported as undetected and the holding time was exceeded by more than twice the specified holding time.

MINOR DEFICIENCIES

The following minor deficiencies were identified during validation which required qualification of data.

Holding Time

- The holding time for nitrate, and nitrite was exceeded by more than two times the holding time. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

REFERENCES

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.

WHC 1993b, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993, 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 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. Due to a minor quality control deficiency identified during data validation, the concentration reported 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 CRDL but greater than the 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.

9613490.1608

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613490.1609

WHC-SD-EN-SPP-002. Rev. 2

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0169-QES-169	REVIEWER: S. Schildt	DATE: 10/25/94	PAGE 1 OF 1
COMMENTS: General Chemistry			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate Nitrite	J	B0CIN7	Holding time exceeded by > 2X
Phosphate	UR	B0CIN7	Holding time exceeded by > 2X

9613490.1610

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

ITAS-ST. LOUIS

NITRATE/NITRITE-N REPORT

Pg. 1 of 2

Analyst: J. ARBU
 Project No.: 519.58, 262.06, 550.05, 317.27, 550.03
 Reviewed by: JM [Signature]

Batch No.: 44517

Analysis Date: 08-01-94
 Method No.: 353.1
 Date: 09-02-94

LAB ID	STANDARD ID	RAW VALUE x	DILUTION +	SAMPLE VOLUME (L or g) =	NITRATE/NITRITE x	EXTRACT VOLUME (L) +	FRACTION SOLID =	FINAL CONCENTRATION (ug/L)-N (ug/g)-N	% RECOVERY	RPD
20BLK4517		2.427						250		
20CLS4517	AL3821-94	533.6						534	95	
5756-01		286.3	X10					2860		
0010P		200.78						200.0 ^{200.0} 200.0 ^{200.0}		2
001MS	AL3822-94	339.1						3390	94	
5769-001		444.5						4440		
002		275.6						2760		
003		66.54						665		
004		14.64						<500		
5774-001	BOCIN7	401.8	X100	BOCIN7				4080		
0010P		402.3						40200		1
001MS	AL3823-94	397.1						39700	φ*	
5787-001		442.0	X10					4420		
0010P		453.6						4540		3
001MS	AL3824-94	504.6						5050	112	
002		463.1						4630		
003		9.791						<500		
004		60.73						607		
005		582.1						5820		
5893-001		522.9						5230		

001MS RECOVERY 0.75.00 5466 LIMITS

9613490.1612

Project #: 262.01, 550.02, 550.03, 519.87
 388.01, 342.03, 340.05, 519.58, 550.05
 Analyst: J. Flansburg
 Reviewed By: J. Flansburg
 Reviewed By: J. Flansburg
 Page 2 of 2

QUANTERRA ST. LOUIS

ANIONS BY I.C.

(circle one) ug/L (mg/L)
 (circle one)

Prep Date: 08-29-94
 Analysis Date: 08-29-94
 Loop Used: 50 mL
 Batch #: 44362
 Method #: 300.0

Standard Value	Sample ID	Standard ID	Solid Fract.	Di.	FI	Cl	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br
	5774-001	BOCIN7		FI 1 Cl 10 SO ₄ 10 NO ₃ 200 NO ₂ 10 OP 10	0.415 mg/L	25.6 mg/L	35.6 mg/L	40.6 mg/L	<1.00 mg/L	0.429 mg/L	-
	dup 001			↓	0.417	25.7	35.5	41.2	<1.00	0.428	-
FI 2 Cl 2 SO ₄ 20 NO ₃ 452 NO ₂ 604 OP 2	VMS 001	AL3722-94	JLF 78-30-94	FI 1 Cl 20 SO ₄ 10 NO ₃ 200 NO ₂ 5 OP 5	2.401 mg/L	45.2	56.2	39.2	1.698 mg/L	1.082 mg/L	-
	5787-001			FI 1 Cl 1 SO ₄ 2	0.141	3.32	25.7	-	-	-	-
	dup 001			↓	0.147	3.32	25.6	-	-	-	-
FI 2 Cl 2 SO ₄ 20 NO ₃ 452 NO ₂ 604 OP 2	MS 001	AL3723-94		FI 1 Cl 10 SO ₄ 10 NO ₃ 200 NO ₂ 5 OP 5	2.160	23.6	43.5	-	-	-	-
	002			FI 1 Cl 1 SO ₄ 2	0.137	3.33	25.7	-	-	-	-
	003			FI 1 Cl 1 SO ₄ 1	<0.100	<0.250	<1.00	-	-	-	-
	V 004			FI 1 Cl 5 SO ₄ 1	0.864	9.85	3.44	-	-	-	-
	5790-001			Cl 5 SO ₄ 5 NO ₃ 500 NO ₂ 1 OP 1	-	8.20	29.4	57.9 mg/L	<1.00 mg/L	<0.020 mg/L	-
	5791-001			Cl 1 SO ₄ 1 NO ₃ 1 NO ₂ 1 OP 1	-	<0.250	<1.00	<0.020	<1.00	<0.020	-
	V 002			Cl 1 SO ₄ 1 NO ₃ 1 NO ₂ 1 OP 1	-	<0.250	<1.00	<0.020	<1.00	<0.020	-
	5828-001			Cl 5 SO ₄ 5 NO ₃ 10 NO ₂ 1 OP 1	-	10.7	32.7	2.89	<1.00	<0.020	-
JLF 08-29-94	5832-001										
	02BLK4436				<0.100 ug/L	<2.50 ug/L	<1.00 ug/L	<0.200 ug/L	<1.00 ug/L	<0.200 ug/L	-
FI 4 Cl 4 SO ₄ 40 NO ₃ 400 NO ₂ 100 OP 40	QCLCS4436	AL3724-94		FI 1 Cl 1 SO ₄ 1 NO ₃ 10 NO ₂ 1 OP 1	9.28	8.91	37.4	0.770	37.3	0.790	-
	5793-002			FI 1 Cl 1 SO ₄ 1 NO ₃ 10 NO ₂ 1 OP 1	<0.998	<2.50	<9.98	<0.200	<9.98	<0.200	-

J. Flansburg 08-30-94

000715

08134001 1615

9613490.1616

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9613490.1617



Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

September 15, 1994

Attention: J. A. Lerch



Project number	:	550.05
Date Received by Lab	:	August 08, 1994
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W0169
Data Deliverable	:	Standalone

RECORD COPY

I. Introduction

On August 08, 1994, three (3) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID numbers to correspond with their specific client IDs:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
5774-001	B0C1N7	408182101	Water	08/08/94
5774-002	B0C1N8	408182102	Water	08/08/94
5774-003	B0C1L2	408182103	Water	08/08/94

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.

AKS
10/25/94

~~000102~~

Westinghouse Hanford Company
September 15, 1994
Project Number: 519.87
Page 2

Analyses requested: The SW846 Metals including ICP Metals by method 6010, Lead by method 7421, Mercury by method 7470, Selenium by method 7740 and Thallium by method 7841. Pesticides by EPA method 8080. Chloride, Fluoride, Nitrate, Nitrite, Sulfate and Phosphate by EPA method 300.0. Nitrate by EPA method 353.1 . CLP/90 Volatiles by method EPA 8240.

III. Quality Control

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

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

The matrix spike for sample 5774-001 was outside the control limits of 75% to 125% for aluminum and selenium, and the matrix spike for sample 5774-002 was outside control limits for iron and selenium.

The Matrix Spike recovery for the Nitrate analysis was outside the suggested limits for sample 5774-001.

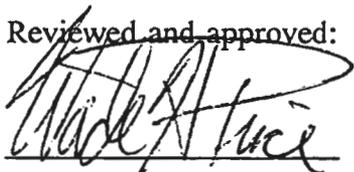
KK
10/25/94

~~000703~~

Westinghouse Hanford Company
September 15, 1994
Project Number: 519.87
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
z:\annetars\hanw0169.nar

WHP
10/25/94
000004 016

9613490.1621

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	<u>D</u>	E
PROJECT: 200-UP-1			DATA PACKAGE: W0169-QES-169		
VALIDATOR: S. Schulte		LAB: Quanterra		DATE: 10/24/14	
CASE: —			SDG: W0169		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Anions/IC	<input type="checkbox"/> TOC	<input type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	Oil and Grease	Alkalinity
<input type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input type="checkbox"/> Chloride	<input type="checkbox"/> Chromium-VI	<input type="checkbox"/> pH	<input checked="" type="checkbox"/> NO ₃ /NO ₂
<input type="checkbox"/> Sulfate	<input type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input type="checkbox"/> Phosphate	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX BOCIN 7 / water					

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: NO₃, NO₂, PO₄ analyses performed > 2x holding time.

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

- Was initial calibration performed for all applicable analyses? Yes No N/A
- Are initial calibration results acceptable? Yes No N/A
- Was a calibration check performed for all applicable analyses? Yes No N/A
- Are calibration check results acceptable? Yes No N/A

Comments: Gov. conf. < 995 for emission. ok

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory 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 at the required frequency? Yes No N/A
- Are spike recoveries acceptable? Yes No N/A
- Were LCS analyses performed at the required frequency? Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments: Recovery NO₃ 0%, NO₃/NO₂ 0% no qualification as results > 4x spike amount.

6. PRECISION

- Were laboratory duplicate samples analyzed at the required frequency? Yes No N/A
- Are laboratory duplicate sample RPD 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

RECORD COPY

MEMORANDUM



TO: 200-UP-1 Round 2 Groundwater Project QA Record

FR: Sandra Schildt, Golder Associates Inc. *SS*

RE: VOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE
W0169-QES-169 (943-1610.017,W0169v.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0169-QES-169 prepared by Quanterra Environmental Services. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0C1N7*	8/5/94	WATER	SEE NOTE 1
B0C1L2	8/5/94	WATER	

Note 1: The samples were analyzed for volatile organics using SW-846 methods.

* - Indicates sample validated 100%.

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

- 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.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. Two samples (2) were

validated in this data set with a total of 66 determinations reported, all of which were deemed valid. This results in a completeness of 100% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiencies were identified during validation which required qualification of data.

Blanks

- Acetone was detected in the laboratory blank. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

REFERENCES

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.

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

9613490.1628

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. 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 quantitation 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 reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.
- NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.
- UJN - Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected due to associated blank contamination.
- UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major 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 has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9613490.1630

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613490.1631

WHC-SD-EN-SPP-002. Rev. 2

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0169-QES-169	REVIEWER: S. Schildt	DATE: 10/25/94	PAGE 1 OF 1
COMMENTS: Volatiles			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
Acetone	U	B0C1L2	Compound present in the blank

9613490.1632

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0169-QES-169

Parameter	Samp#	B0C1L2		B0C1N7	
	Date	8-5-94		8-5-94	
	Location	2-W19-28		2-W19-34B	
	Depth	---		---	
	Type	WATER		WATER	
	Comments				
	Units	Result	Q	Result	Q
CHLOROMETHANE	UG/L	10.000	U	10.000	U
BROMOMETHANE	UG/L	10.000	U	10.000	U
VINYL CHLORIDE	UG/L	10.000	U	10.000	U
CHLOROETHANE	UG/L	10.000	U	10.000	U
METHYLENE CHLORIDE	UG/L	1.000	J	10.000	U
ACETONE	UG/L	10.000	U	10.000	U
CARBON DISULFIDE	UG/L	10.000	U	10.000	U
1,1-DICHLOROETHENE	UG/L	10.000	U	10.000	U
1,1-DICHLOROETHANE	UG/L	10.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/L	10.000	U	10.000	U
CHLOROFORM	UG/L	10.000	U	2.000	J
1,2-DICHLOROETHANE	UG/L	10.000	U	10.000	U
2-BUTANONE	UG/L	10.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/L	10.000	U	10.000	U
CARBON TETRACHLORIDE	UG/L	10.000	U	6.000	J
BROMODICHLOROMETHANE	UG/L	10.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/L	10.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/L	10.000	U	10.000	U
TRICHLOROETHENE	UG/L	10.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/L	10.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/L	10.000	U	10.000	U
BENZENE	UG/L	10.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/L	10.000	U	10.000	U
BROMOFORM	UG/L	10.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/L	10.000	U	10.000	U
2-HEXANONE	UG/L	10.000	U	10.000	U
TETRACHLOROETHENE	UG/L	10.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/L	10.000	U	10.000	U
TOLUENE	UG/L	10.000	U	10.000	U
CHLOROBENZENE	UG/L	10.000	U	10.000	U
ETHYLBENZENE	UG/L	10.000	U	10.000	U
STYRENE	UG/L	10.000	U	10.000	U
XYLENES (TOTAL)	UG/L	10.000	U	10.000	U

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

9613490.1633

800

Handwritten signature and date
11/11/94

9613490.1634

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

BOC1L2

Lab Name: ITAS-ST.LOUIS Contract: 550-05
 Lab Code: ITSL Case No.: V77401 SAS No.: SDG No.: W0169
 Matrix: (soil/water) WATER Lab Sample ID: 5774-003
 Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E0176
 Level: (low/med) LOW Date Received: 08/08/94
 % Moisture: not dec. Date Analyzed: 08/12/94
 GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	1	J	
67-64-1	Acetone	108	BS	U
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-Pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

009

9613490.1635

1E

EPA SAMPLE NC

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

BOC1L2

Lab Name: ITAS-ST.LOUIS

Contract: 550-05

Lab Code: ITSL

Case No.: V77401

SAS No.:

SDG No.: W0169

Matrix: (soil/water) WATER

Lab Sample ID: 5774-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E0176

Level: (low/med) LOW

Date Received: 08/08/94

% Moisture: not dec.

Date Analyzed: 08/12/94

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

Handwritten: 10/25/94

Handwritten: 000007

Handwritten: 010
3/90

9613490.1636

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

BOC1N7

Lab Name: ITAS-ST.LOUIS Contract: 550-05
 Lab Code: ITSL Case No.: V77401 SAS No.: SDG No.: W0169
 Matrix: (soil/water) WATER Lab Sample ID: 5774-001
 Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E0177
 Level: (low/med) LOW Date Received: 08/08/94
 % Moisture: not dec. Date Analyzed: 08/12/94
 GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	2	J
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	6	J
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

MS
10/25

9613490.1637

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

BOC1N7

Lab Name: ITAS-ST.LOUIS

Contract: 550-05

Lab Code: ITSL

Case No.: V77401

SAS No.:

SDG No.: W0169

Matrix: (soil/water) WATER

Lab Sample ID: 5774-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E0177

Level: (low/med) LOW

Date Received: 08/08/94

% Moisture: not dec.

Date Analyzed: 08/12/94

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
-----	-----	-----	-----	-----

Handwritten signature and date: 10/25/94

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

.

.

Quanterra Incorporated
 13715 Rider Trail North
 Earth City, Missouri 63045

314 298-8566 Telephone
 314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
 P.O. Box 1970
 Richland, Washington 99352

September 15, 1994

Attention: J. A. Lerch



Project number	:	550.05
Date Received by Lab	:	August 08, 1994
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W0169
Data Deliverable	:	Standalone

RECORD COPY

I. Introduction

On August 08, 1994, three (3) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID numbers to correspond with their specific client IDs:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
5774-001	B0C1N7	408182101	Water	08/08/94
5774-002	B0C1N8	408182102	Water	08/08/94
5774-003	B0C1L2	408182103	Water	08/08/94

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.

Handwritten: 10/25/94
~~000702~~

Westinghouse Hanford Company
September 15, 1994
Project Number: 519.87
Page 2

Analyses requested: The SW846 Metals including ICP Metals by method 6010, Lead by method 7421, Mercury by method 7470, Selenium by method 7740 and Thallium by method 7841. Pesticides by EPA method 8080. Chloride, Fluoride, Nitrate, Nitrite, Sulfate and Phosphate by EPA method 300.0. Nitrate by EPA method 353.1 . CLP/90 Volatiles by method EPA 8240.

III. Quality Control

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

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

The matrix spike for sample 5774-001 was outside the control limits of 75% to 125% for aluminum and selenium, and the matrix spike for sample 5774-002 was outside control limits for iron and selenium.

The Matrix Spike recovery for the Nitrate analysis was outside the suggested limits for sample 5774-001.

Handwritten signature and date: 10/25/94

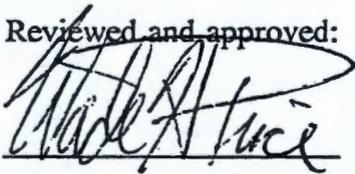
000903

015

Westinghouse Hanford Company
September 15, 1994
Project Number: 519.87
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
z:\annclara\hanw0169.nar

WHD
10/25/94

000004

016

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround

Priority
 Normal

Collector <i>K. Trapp</i>	Company Contact PH BUTCHER	Telephone No. (509)376-4388
Project Designation 200-UP-1	Sampling Location 200 AREA	SAF No. B94-018
Ice Chest No. <i>EFL-1D</i>	Field Logbook No. <i>EFL-1137</i>	Method of Shipment
Shipped To QUANTERRA(IT)	Offsite Property No. <i>W111-0-0851-11</i>	Bill of Lading/Air Bill No. <i>117A</i>

Preservative	HCL<2	pH 5-9	HNO3<2	COOL 4	H2SO4<2	HNO3<2	COOL 4	HCL<2		HNO3<2		HCL<2		
Type of Container	Gs	gG	<i>Pg</i>	G	P	gG	gG	P		<i>Pg</i>		Gs		
No. of Container(s)	3	1	1	1	1	4	1	1		1		3		
Volume	40ml	2.5L	1L	500ml	500ml	SEE "SI"	2.5L	1L		1L		40ml		

Special Handling and/or Storage
COOL 4 DEGREES CENTIGRADE

Possible Sample Hazards/Remarks

SAMPLE ANALYSIS

408184

VOA PCB/PEST CLP-ICP METALS, IC, F, GFAA METALS, Hg (UNFIL-TERED) ANIONS-NO2-NO3 SEE "S. I." I-129 Tc-99 CLP-ICP METALS, GFAA METALS, Hg (FIL-TERED) CLP-VOA

A B C D E F G 408184

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA	PCB/PEST	CLP-ICP METALS, IC, F, GFAA METALS, Hg (UNFIL-TERED)	ANIONS-NO2-NO3	SEE "S. I."	I-129	Tc-99	CLP-ICP METALS, GFAA METALS, Hg (FIL-TERED)	CLP-VOA		
<i>BOCIN7</i>	<i>W</i>	<i>8/5/94</i>	<i>1130</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>				
<i>BOCIN8</i>	<i>W</i>	<i>↓</i>	<i>↓</i>								<i>X</i>			
<i>BOC1L2</i>	<i>W</i>	<i>↓</i>	<i>↓</i>									<i>X</i>		

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix*
Relinquished By <i>K. Trapp</i>	Date/Time <i>8/5/94</i>	Received By <i>A. J. Simpson</i>	Date/Time <i>8/5/94 1035</i>
Relinquished By <i>A. J. Simpson</i>	Date/Time <i>8/5/94 1035</i>	Received By <i>Ph Butcher</i>	Date/Time <i>8/5/94 1035</i>
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
ANALYTE LIST=GROSS ALPHA/BETA, U-234/235/238, TOTAL URANIUM, Sr-90, GAMMA SPEC(to include):Co-58/60,Cs-137,Eu-152/154/155 and Fe-59. BOTTLE SIZE= 3, 2.5L + 1, 500ml

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 <i>PH BUTCHER</i>	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method <i>15/5/94</i>	Disposed By	Date/Time

9613490-1612

9613490.1643

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	<u>D</u>	E
PROJECT:	200-UP-1		DATA PACKAGE: W0169-QES-169		
VALIDATOR:	S. Schlob	LAB: Quanterra	DATE: 10/24/94		
CASE:	-		SDG: W0169		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8260 (packed column)	<input type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX <u>BOCIN7, BOC1K2 / water</u>					

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: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

- Is the GC/MS tuning/performance check acceptable? Yes No N/A
- Are initial calibrations acceptable? Yes No N/A
- Are continuing calibrations acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory 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: Acetone detected in lab blank

5. ACCURACY

- Were surrogates/System Monitoring Compounds analyzed? Yes No N/A
- Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A
- Were MS/MSD samples analyzed? Yes No N/A
- Are MS/MSD results acceptable? Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

- Are MS/MSD RPD 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. SYSTEM PERFORMANCE

- Were internal standards analyzed? Yes No N/A
- Are internal standard areas acceptable? Yes No N/A
- Are internal standard retention times acceptable? Yes No N/A

Comments: _____

8. COMPOUND IDENTIFICATION AND QUANTITATION

- Is compound identification acceptable? Yes No N/A
- Is compound quantitation acceptable? Yes No N/A

Comments: _____

9. REPORTED RESULTS AND QUANTITATION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Do results meet the CRQLs? Yes No N/A
- Has the laboratory properly identified and coded all TIC? Yes No N/A

Comments: _____

9613490.1648

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK01

Lab Name: ITAS-ST.LOUIS Contract: 550-05
 Lab Code: ITSL Case No.: V77401 SAS No.: SDG No.: W0169
 Matrix: (soil/water) WATER Lab Sample ID: QCBLK43025
 Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E0174
 Level: (low/med) LOW Date Received:
 % Moisture: not dec. Date Analyzed: 08/12/94
 GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	16	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

Handwritten signature and date:
10/25/90

RECORD COPY

MEMORANDUM



TO: 200-UP-1 Round 2 Groundwater Project QA Record

FR: Sandra Schildt, Golder Associates Inc. *SS*

RE: PESTICIDES/PCBS DATA VALIDATION SUMMARY FOR DATA PACKAGE
W0169-QES-169 (943-1610.017,W0169p.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0169-QES-169 prepared by Quanterra Environmental Services. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0C1N7	8/5/94	WATER	SEE NOTE 1

Note 1: The samples were analyzed for pesticides/PCBs using SW-846 methods.

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

- 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 with the exception of the minor deficiencies described below.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. One sample (1) was

validated in this data set with a total of 28 determinations reported, all of which were deemed valid. This results in a completeness of 100% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiencies were identified during validation which required qualification of data.

Surrogates

- The recovery of surrogate decachlorobiphenyl was less than the control limits. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

REFERENCES

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.

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

ATTACHMENT 1
GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. 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 quantitation 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 reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.
- NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.
- UJN- Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected due to associated blank contamination.
- UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major 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 has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9613490.1653

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613490.1654

WHC-SD-EN-SPP-002. Rev. 2

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0169-QES-169	REVIEWER: S. Schildt	DATE: 10/25/94	PAGE 1 OF 1
COMMENTS: Pesticides/PCBs			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
All Compounds	UJ	B0C1N7	Surrogate recovery less than control limits

9613490.1655

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

9613490.1657

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOC1N7

Lab Name: ITAS-ST.LOUIS Contract: 550-05
 Lab Code: ITSL Case No.: P77401 SAS No.: SDG No.: WO169
 Matrix: (soil/water) WATER Lab Sample ID: 5774-001
 Sample wt/vol: 1000 (g/mL) ML Lab File ID:
 % Moisture: decanted: (Y/N) Date Received: 08/08/94
 Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 08/12/94
 Concentrated Extract Volume: 10000 (uL) Date Analyzed: 08/24/94
 Injection Volume: 2.50 (uL) Dilution Factor: 1.00
 GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) N

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q

319-84-6	alpha-BHC	0.050	U J
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

Handwritten signature and date: 10/25/94

9613490.1658

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

Quanterra Incorporated
 13715 Rider Trail North
 Earth City, Missouri 63045

314 298-8566 Telephone
 314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
 P.O. Box 1970
 Richland, Washington 99352

September 15, 1994

Attention: J. A. Lerch



Project number	:	550.05
Date Received by Lab	:	August 08, 1994
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W0169
Data Deliverable	:	Standalone

RECORD COPY

I. Introduction

On August 08, 1994, three (3) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID numbers to correspond with their specific client IDs:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
5774-001	B0C1N7	408182101	Water	08/08/94
5774-002	B0C1N8	408182102	Water	08/08/94
5774-003	B0C1L2	408182103	Water	08/08/94

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.

000302
 10/25/94
 011

Westinghouse Hanford Company
September 15, 1994
Project Number: 519.87
Page 2

Analyses requested: The SW846 Metals including ICP Metals by method 6010, Lead by method 7421, Mercury by method 7470, Selenium by method 7740 and Thallium by method 7841. Pesticides by EPA method 8080. Chloride, Fluoride, Nitrate, Nitrite, Sulfate and Phosphate by EPA method 300.0. Nitrate by EPA method 353.1 . CLP/90 Volatiles by method EPA 8240.

III. Quality Control

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

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

The matrix spike for sample 5774-001 was outside the control limits of 75% to 125% for aluminum and selenium, and the matrix spike for sample 5774-002 was outside control limits for iron and selenium.

The Matrix Spike recovery for the Nitrate analysis was outside the suggested limits for sample 5774-001.

XKD
10/25/94
~~2000303~~

Westinghouse Hanford Company

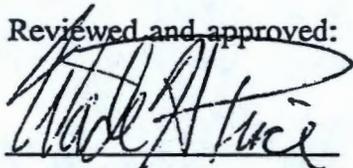
September 15, 1994

Project Number: 519.87

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

z:\annclars\hanw0169.nar

WHP
10/25/94
2000704

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Turnaround

Priority
 Normal

Collector <i>K. Trapp</i>	Company Contact PH BUTCHER	Telephone No. (509)376-4388
Project Designation 200-UP-1	Sampling Location 200 AREA	SAF No. B94-018
Ice Chest No. <i>EEL-1D</i>	Field Logbook No. <i>EFL-1135</i>	Method of Shipment
Shipped To QUANTERRA(IT)	Offsite Property No. <i>W-111-C-0851-11</i>	Bill of Lading/Air Bill No. <i>117A</i>

Possible Sample Hazards/Remarks	Preservative	HCL<2	pH 5-9	HNO3<2	COOL 4	H2SO4<2	HNO3<2	COOL 4	HCL<2		HNO3<2		HCL<2				
		Gs	ag	<i>Pg</i>	G	P	ag	ag	P		<i>Pg</i>		Gs				
	Type of Container																
	No. of Container(s)	3	1	1	1	1	4	1	1		1		3				
Special Handling and/or Storage COOL 4 DEGREES CENTIGRADE	Volume	40ml	2.5L	1L	500ml	500ml	SEE "SI"	2.5L	1L		1L		40ml				

SAMPLE ANALYSIS

408184

VOA PCB/PEST CLP-ICP METALS, IC, F, GFAA, CL, SO4, METALS, NO2, NO3, PO4 (UNFILTERED)
ABL D A B
 ANIONS-NO2-NO3 SEE "SI" "S. I."
F G 408 850
 I-129 Tc-99
 CLP-ICP METALS, GFAA METALS, Hg (FIL-A TERED)
ABC

Sample No.	Matrix*	Date Sampled	Time Sampled	HCL<2	pH 5-9	HNO3<2	COOL 4	H2SO4<2	HNO3<2	COOL 4	HCL<2	HNO3<2	HCL<2				
<i>BOCIN7</i>	W	<i>8/5/94</i>	<i>1130</i>	X	X	X	X	X	X	X	X						
<i>BOCIN8</i>	W	↓	↓									X					
<i>BOCIL2</i>	W	↓	↓										X				

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By <i>K. Trapp</i>	Date/Time <i>8/8/94</i>	Received By <i>R. Simpson</i>	Date/Time <i>8/8/94 1039</i>
Relinquished By <i>R. Simpson</i>	Date/Time <i>8/8/94 1035</i>	Received By <i>Ph Butcher</i>	Date/Time <i>8/8/94 1035</i>
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
 ANALYTE LIST=GROSS ALPHA/BETA, U-234/235/238, TOTAL URANIUM, Sr-90, GAMMA SPEC(to include):Co-58/60,Cs-137,Eu-152/154/155 and Fe-59.
 BOTTLE SIZE= 3, 2.5L + 1, 500ml

- 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
--------------------------	-----------------	-------------	-----------

0000017

9613490.1662

9613490.1663

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	<u>D</u>	E
PROJECT:	200-UP-1		DATA PACKAGE: W0169-QES-169		
VALIDATOR:	S. Schulte		LAB: Quanterra	DATE: 10/24/94	
CASE:	✓		SDG: W0169		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP3/90	<input type="checkbox"/> SW-846 8080	<input type="checkbox"/> SW-846 8081	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX BOCIN7 / water					

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: _____

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable Yes No N/A
 Are calibration standard retention times acceptable? Yes No N/A
 Are DDT and endrin breakdowns acceptable? Yes No N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? Yes No N/A
 Is the GC/MS tuning/performance check acceptable? Yes No N/A

Comments: _____

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and %RSD values acceptable? Yes No N/A
 Are quantitation column calibration factor %RSD values acceptable? Yes No N/A
 Were the analytical sequence requirements met? Yes No N/A
 Are continuing calibration %D values acceptable? Yes No N/A

Comments: _____

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? Yes No N/A
 Was the resolution acceptable in the resolution check mix? . . . Yes No N/A
 Is resolution acceptable in the PEM, INDA and INDB? Yes No N/A
 Are DDT and Endrin breakdowns acceptable? Yes No N/A
 Are retention times in PEMs and calibration mixes acceptable? . Yes No N/A
 Are RPD values in the PEMs acceptable? Yes No N/A
 Are %RSD values acceptable? Yes No N/A

Comments: _____

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? Yes No N/A
 Is resolution acceptable in the PEMs? Yes No N/A
 Are initial calibrations acceptable? Yes No N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

- Are retention times acceptable in the PEMS, INDA and INDB mixes? Yes No N/A
- Are RPD values in the PEMS acceptable? Yes No N/A
- Are the DDT and endrin breakdowns acceptable? Yes No N/A
- Was GPC cleanup performed? Yes No N/A
- Is the GPC calibration check acceptable? Yes No N/A
- Was Florisil cleanup performed? Yes No N/A
- Is the Florisil performance check acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory 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 surrogates analyzed? Yes No N/A
- Are surrogate recoveries acceptable? Yes No N/A
- Were MS/MSD samples analyzed? Yes No N/A
- Are MS/MSD results acceptable? Yes No N/A
- Were LCS samples analyzed? Yes No N/A *12/20/94*
- Are LCS results acceptable? Yes No N/A *11/11/94*

Comments: *DCB surr. recoveries & control limits all results qualified estimated (UJ).*

*Review
12/20/94*

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

- Are MS/MSD RPD values acceptable? Yes No N/A
- Are laboratory duplicate results 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. SYSTEM PERFORMANCE

- Is chromatographic performance acceptable? Yes No N/A
- Are positive results resolved acceptably? Yes No N/A

Comments: _____

8. COMPOUND IDENTIFICATION AND QUANTITATION

- Is compound identification acceptable? Yes No N/A
- Is compound quantitation acceptable? Yes No N/A

Comments: _____

9. REPORTED RESULTS AND QUANTITATION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Do results meet the CRQLs? Yes No N/A

Comments: _____

9613490.1669

2E

WATER PESTICIDE SURROGATE RECOVERY

Lab Name: ITAS-ST.LOUIS

Contract: 550-05

Lab Code: ITSL

Case No.: P77401

SAS No.:

SDG No.: WO169

GC Column(1): DB-5MS

ID: 0.53(mm)

GC Column(2): DB-1701

ID: 0.53(mm)

	EPA SAMPLE NO.	TCX 1 %REC #	TCX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PBLK01	96	92	66	71			0
02	BOC1N7	112	102	39*	40*			2
03	BOC1N7MS	111	102	55*	57*			2
04	BOC1N7MSD	99	97	52*	46*			2

ADVISORY
QC LIMITS
(60-150)
(60-150)

TCX = Tetrachloro-m-xylene

DCB = Decachlorobiphenyl

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate diluted out

RECORD COPY

MEMORANDUM



TO: 200-UP-1 Round 2 Groundwater Project QA Record November 11, 1994

FR: Sandra Schildt, Golder Associates Inc. *SS*

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE
W0169-QES-169 (943-1610.017,W0169m.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0169-QES-169 prepared by Quanterra Environmental Services. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0C1N7*	8/5/94	WATER	SEE NOTE 1
B0C1N8	8/5/94	WATER	

Note 1: The samples were analyzed for target analyte list (TAL) metals.
* - Indicates sample validated 100%.

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

- 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 with the exception of minor deficiencies described below.

Accuracy. Goals for accuracy were met with the exception of the minor deficiencies described below.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met.

*440
11/11/94*

Completeness. The data package was complete for all requested analyses. Two samples (2) were validated in this data set with a total of 46 determinations reported, of which 45 were deemed valid. This results in a completeness of 98% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiencies were identified during validation which required qualification of data.

Blanks

- Beryllium, copper, and vanadium were reported at positive values in the laboratory blanks. Attachments 2 and 5 provide a summary of the samples and data qualification applied.
- Chromium, mercury and lead were reported at negative values in the laboratory blanks. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

Spike Samples

- Sample spike recovery of selenium, aluminum, and iron were outside control limits. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

Laboratory Duplicates

- The percent difference (%D) for copper exceeded the control limit. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

Serial Dilution

- The %D for calcium, iron, magnesium, and manganese exceeded the control limit for sample results greater than 50 times the instrument detection limit (IDL). Attachments 2 and 5 provide a summary of the samples and data qualification applied.

Handwritten signature
11/11/94

Analytical Spikes

- The analytical spike recoveries of lead, selenium, and thallium were less than the control limit. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

REFERENCES

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.

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

Handwritten signature and date: 11/11/94

9613490.1673

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 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. Due to a minor quality control deficiency identified during data validation, the concentration reported 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 CRDL but greater than the 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.

9613490.1675

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0169-QES-169	REVIEWER: S. Schildt	DATE: 10/25/94	PAGE 1 OF 1
COMMENTS: Metals			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
Beryllium Copper Vanadium	U	B0C1N7	Analytes detected in blanks
Beryllium Vanadium	U	B0C1N8	Analytes detected in blanks
Chromium Lead	UJ	B0C1N8	Analytes reported at negative value in blanks
Mercury	UJ	B0C1N7	Analyte reported at negative value in blank
Aluminum	J	B0C1N7	Spike sample recovery >125%
Selenium	BJ	B0C1N7, B0C1N8	Spike sample recovery <75%
Iron	J	B0C1N8	Spike sample recovery >125%
Copper	J	B0C1N8	%D of duplicate >20%
Calcium Iron Magnesium Manganese	J	B0C1N8	%D >10% in serial dilution
Lead	J	B0C1N7	Analytical spike recovery <85%
Thallium	UJ	B0C1N7	Analytical spike recovery <85%
Selenium	BJ	B0C1N8	Analytical spike recovery <85%

ASD
11/15/94

9613490.1677

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0169-QES-169

Parameter	Samp#	BOC1N7		BOC1N8	
	Date	8-5-94		8-5-94	
	Location	2-W19-34B		2-W19-34B	
	Depth	---		---	
	Type	WATER		WATER	
	Comments				
	Units	Result	Q	Result	Q
ALUMINUM	UG/L	4360.000	J	606.000	
ANTIMONY	UG/L	30.500	U	30.500	U
ARSENIC	UG/L	1.200	B	1.100	U
BARIUM	UG/L	160.000	B	137.000	B
BERYLLIUM	UG/L	1.100	U	0.480	U
CADMIUM	UG/L	2.200	U	2.200	U
CALCIUM	UG/L	74900.000		84800.000	J
CHROMIUM	UG/L	37.200		3.000	UJ
COBALT	UG/L	3.500	B	3.200	U
COPPER	UG/L	39.200	U	45.400	J
IRON	UG/L	10800.000		1230.000	J
LEAD	UG/L	3.300	J	1.300	UJ
MAGNESIUM	UG/L	28700.000		32100.000	J
MANGANESE	UG/L	334.000		207.000	J
MERCURY	UG/L	0.100	UJ	0.100	U
NICKEL	UG/L	30.900	B	15.900	B
POTASSIUM	UG/L	7570.000		10500.000	
SELENIUM	UG/L	8.600	BJ	3.100	BJ
SILVER	UG/L	4.200	U	4.200	U
SODIUM	UG/L	24000.000		31200.000	
THALLIUM	UG/L	1.000	UJ	1.100	B
VANADIUM	UG/L	47.400	U	39.500	U
ZINC	UG/L	108.000		35.000	

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

600

Handwritten signature and date
11/14/94

9613490.1678

9613490.1679

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOC1N7

Lab Name: ITAS ST. LOUIS
Lab Code: ITMO Case No.:
Matrix (soil/water): WATER
Level (low/med): LOW
% Solids: 0.0

Contract: 550.05
SAS No.: SDG No.: W0169
Lab Sample ID: 5774-001
Date Received: 08/08/94

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4360	-	N	P
7440-36-0	Antimony	30.5	U		P
7440-38-2	Arsenic	1.2	B		F
7440-39-3	Barium	160	B		P
7440-41-7	Beryllium	1.1	B		P
7440-43-9	Cadmium	2.2	U		P
7440-70-2	Calcium	74900	-		P
7440-47-3	Chromium	37.2	-		P
7440-48-4	Cobalt	3.5	B		P
7440-50-8	Copper	39.2	-		P
7439-89-6	Iron	10800	-		P
7439-92-1	Lead	3.3	-	W	F
7439-95-4	Magnesium	28700	-		P
7439-96-5	Manganese	334	-		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	30.9	B		P
7440-09-7	Potassium	7570	-		P
7782-49-2	Selenium	8.6	B	N	F
7440-22-4	Silver	4.2	U		P
7440-23-5	Sodium	24000	-		P
7440-28-0	Thallium	1.0	B	W	F
7440-62-2	Vanadium	47.4	B		P
7440-66-6	Zinc	108	-		P

J
U
U
J
UJ
UJ
UJ
U

10/21/94

10/11/94

10/21/94

Color Before: COLORLESS
Color After: COLORLESS

Clarity Before: CLEAR
Clarity After: CLEAR

Texture: _____
Artifacts: _____

Comments:

FORM I - IN

ILM03.0

10/25/94

000726

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

Quanterra Incorporated
 13715 Rider Trail North
 Earth City, Missouri 63045

314 298-8566 Telephone
 314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
 P.O. Box 1970
 Richland, Washington 99352

September 15, 1994

Attention: J. A. Lerch



Project number	:	550.05
Date Received by Lab	:	August 08, 1994
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W0169
Data Deliverable	:	Standalone

RECORD COPY

I. Introduction

On August 08, 1994, three (3) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID numbers to correspond with their specific client IDs:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
5774-001	B0C1N7	408182101	Water	08/08/94
5774-002	B0C1N8	408182102	Water	08/08/94
5774-003	B0C1L2	408182103	Water	08/08/94

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.

KAL
 10/25/94
 000702

Westinghouse Hanford Company
September 15, 1994
Project Number: 519.87
Page 2

Analyses requested: The SW846 Metals including ICP Metals by method 6010, Lead by method 7421, Mercury by method 7470, Selenium by method 7740 and Thallium by method 7841. Pesticides by EPA method 8080. Chloride, Fluoride, Nitrate, Nitrite, Sulfate and Phosphate by EPA method 300.0. Nitrate by EPA method 353.1 . CLP/90 Volatiles by method EPA 8240.

III. Quality Control

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

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

The matrix spike for sample 5774-001 was outside the control limits of 75% to 125% for aluminum and selenium, and the matrix spike for sample 5774-002 was outside control limits for iron and selenium.

The Matrix Spike recovery for the Nitrate analysis was outside the suggested limits for sample 5774-001.

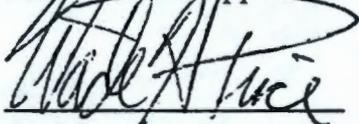
Handwritten signature
10/25/94

000003

Westinghouse Hanford Company
September 15, 1994
Project Number: 519.87
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
z:\annclars\hanw0169.nar

WHP
10/25/94

000704

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround

Priority
 Normal

Collector K. Trapp	Company Contact PH BUTCHER	Telephone No. (509)376-4388
Project Designation 200-UP-1	Sampling Location 200 AREA	SAF No. 894-018
Ice Chest No. EFL-1D	Field Logbook No. EFL-1137	Method of Shipment
Shipped To QUANTERRA(IT)	Offsite Property No. W111-C-0851-4	Bill of Lading/Air Bill No. N/A

Possible Sample Hazards/Remarks	Preservative	HCL<2	pH 5-9	HNO3<2	COOL 4	H2SO4<2	HNO3<2	COOL 4	HCL<2	HNO3<2	HCL<2
	Type of Container	Gs	aG	P.B	G	P	aG	aG	P	P.B	Gs
	No. of Container(s)	3	1	1	1	1	4	1	1	1	3
Special Handling and/or Storage COOL 4 DEGREES CENTIGRADE	Volume	40ml	2.5L	1L	500ml	500ml	SEE "SI"	2.5L	1L	1L	40ml

SAMPLE ANALYSIS

408184

VOA	PCB/PEST	CLP-ICP METALS, GFAA METALS, Hg (UNFIL-TERED)	ANIONS-IC, F, CL, SO4, NO2, NO3, PO4	NO2-NO3	SEE "S. I."	I-129	Tc-99	CLP-ICP METALS, GFAA METALS, Hg (FIL-TERED)	CLP-VOA
A	D	E	F	G	408	850			ABC

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA	PCB/PEST	CLP-ICP METALS, GFAA METALS, Hg (UNFIL-TERED)	ANIONS-IC, F, CL, SO4, NO2, NO3, PO4	NO2-NO3	SEE "S. I."	I-129	Tc-99	CLP-ICP METALS, GFAA METALS, Hg (FIL-TERED)	CLP-VOA
BOCIN7	W	8/5/94	1130	X	X	X	X	X	X	X	X		
BOCIN8	W	↓	↓									X	
BOCIL2	W	↓	↓										X

CHAIN OF POSSESSION

Sign/Print Names

SPECIAL INSTRUCTIONS

Matrix*

Relinquished By K. Trapp	Date/Time 8/8/94	Received By A. J. Simpson	Date/Time 8/8/94 0819
Relinquished By A. J. Simpson	Date/Time 8/14 1035	Received By Phenyl... Butcher	Date/Time 8/18/94 1035
Relinquished By	Date/Time	Received By	Date/Time

ANALYTE LIST=GROSS ALPHA/BETA, U-234/235/238, TOTAL URANIUM, Sr-90, GAMMA SPEC(to include):Co-58/60, Cs-137, Eu-152/154/155 and Fe-59. BOTTLE SIZE= 3, 2.5L + 1, 500ml

- 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

0000017

9613490.1685

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	<u>D</u>	E
PROJECT: 200-UP-1			DATA PACKAGE: W0169-QES-169		
VALIDATOR: S. Schults		LAB: Quanterra		DATE: 10/21/94	
CASE: NA			SDG: W0169		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP/ICP	<input type="checkbox"/> CLP/GFAA	<input type="checkbox"/> CLP/Hg	<input type="checkbox"/> CLP/Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> SW-846/ICP	<input type="checkbox"/> SW-846/GFAA	<input type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX: BOCIN7, BOCIN8, BOCIN2 / water 10/25/94					

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: _____

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: Be in ICB for BOCIN7 & BOCIN8. Cr C neg.
value in ICB for BOCIN8. V detected in CCB for BOCIN8.
Cu & V in Pb/K for BOCIN7. Hg C neg. value in Pb for
BOCIN7. Pb C neg value in Pb/K for BOCIN8.
Neg. blanks estimated (U), positive blanks undetected (u)

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: Se recovery <30% in BOCIN7, Al recovery >125%.
Se recovery <75% and Fe >125% in BOCIN8
Ag recovery <80% in BOCIN8 LCS. ^{N/A} 10/28/94
Selenium in BOCIN7 rejected (R). All others result
qualified & estimated (J, UJ) ^{N/A} 11/11/94

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: %D of Cu > 20% & range > CRDL in duplicate of BOCIN8. Copper estimated (J)
%D of Ca, Fe, Mg, Mn, > 10% and BOCIN8 results > 50x IDL. Results estimated (J)

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 ^{was} 10/21/94
- 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: Spike recoveries of Pb & Ni in BOCIN7 < 85%. Results estimated (J, UJ). Recovery of Sr < 85% for BOCIN8. Previously qualified ^{was} 11/11/94
in BOCIN8. Previously qualified ^{was} 11/11/94

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:		VALIDATOR:			DATE:		PAGE OF	
COMMENTS: <i>Inorganic</i>								
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER	
BOCIN7	ICP	8/5/94	8/23/94	8/24/94	18	19		
BOCIN8			8/24/94	9/7/94	19	33		
BOCIN7								
BOCIN7	GFAA-As		8/23/94	8/25/94	18	20		
BOCIN8	GFAA-As		8/24/94	8/25/94	19	20		
BOCIN7,8	CV		8/24/94	8/24/94	19	19		
BOCIN7	GFAA-Se		8/23/94	8/26/94	18	21		
BOCIN8	GFAA-Se		8/24/94	8/26/94	19	20		
BOCIN7	GFAA-Pb		8/23/94	8/24/94	18	19		
BOCIN8	GFAA-Pb		8/24/94	8/25/94	19	20		
BOCIN7	GFAA-Tl		8/23/94	8/24/94	18	19		
BOCIN8	GFAA-Tl		8/24/94	8/25/94	19	20		

B-1

021

9613490.1690
MHC-SD-EN-SPP-002, Rev. 2

9613490.1692

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_ST._LOUIS _____

Contract: 550.05 _____

Lab Code: ITMO__ Case No.: _____

SAS No.: _____

SDG No.: W0169 _____

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

5774-1

43681

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank		M
			1	C	2	C	3	C	C	C	
Aluminum	34.5	U	34.5	U	34.5	U	34.5	U	34.500	U	P
Antimony	30.5	U	30.5	U	30.5	U	30.5	U	30.500	U	P
Arsenic	1.1	U	1.1	U	1.1	U	1.1	U	1.100	U	F
Barium	1.3	B	1.3	B	1.6	B	1.6	B	1.840	B	P
Beryllium	1.0	B	0.6	B	1.0	B	1.0	B	0.870	B	P
Cadmium	2.2	U	2.2	U	2.8	B	2.2	U	2.200	U	P
Calcium	17.8	U	19.5	B	21.5	B	28.0	B	57.750	B	P
Chromium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Cobalt	3.2	U	3.2	U	3.2	U	3.2	U	3.200	U	P
Copper	4.5	U	9.0	B	13.3	B	12.6	B	8.970	B	P
Iron	10.9	B	16.0	B	41.0	B	17.2	B	51.250	B	P
Lead	1.3	U	1.3	U	1.3	U	1.3	U	1.300	U	F
Magnesium	36.0	U	82.1	B	119.8	B	192.6	B	216.520	B	P
Manganese	1.7	B	1.7	B	3.6	B	2.5	B	3.030	B	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	-0.130	B	CV
Nickel	11.4	U	11.4	U	11.4	U	11.4	U	11.400	U	P
Potassium	2720.0	U	2720.0	U	2720.0	U	2720.0	U	2720.000	U	P
Selenium	1.4	U	1.4	U	1.4	U	1.4	U	1.400	U	F
Silver	4.2	U	4.2	U	4.2	U	4.2	U	4.200	U	P
Sodium	26.7	B	50.1	B	78.4	B	111.8	B	85.140	B	P
Thallium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	F
Vanadium	9.8	U	9.8	U	9.8	U	12.2	B	10.890	B	P
Zinc	3.8	U	8.2	B	6.7	B	3.8	U	7.070	B	P

FORM III - IN

ILM03.0

Handwritten signature
10/25/74

000728

9613490.1694

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_ST._LOUIS _____ Contract: 550.05 _____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W0169 _____

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

5774-7

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank		M
			1	C	2	C	3	C		C	
Aluminum	34.5	U	61.5	B	34.5	U					P
Antimony	30.5	U	30.5	U	30.5	U					P
Arsenic		U									NR
Barium	1.3	U	1.3	U	1.3	U					P
Beryllium	0.6	B	0.5	B	0.5	B					P
Cadmium	2.4	B	2.6	B	2.2	U					P
Calcium	17.8	U	25.5	B	33.1	B					P
Chromium	-3.6	B	3.0	U	3.0	U					P
Cobalt	3.2	U	3.5	B	3.2	U					P
Copper	4.5	U	4.5	U	4.5	U					P
Iron	4.4	U	11.4	B	9.7	B					P
Lead		U									NR
Magnesium	36.0	U	36.0	U	36.0	U					P
Manganese	0.6	U	0.6	U	0.6	U					P
Mercury		U									NR
Nickel	11.4	U	11.4	U	11.4	U					P
Potassium	2720.0	U	2720.0	U	2720.0	U					P
Selenium	1.4	U	1.4	U	1.4	U	1.4	U			F
Silver	4.2	U	4.2	U	4.2	U					P
Sodium	26.3	U	26.3	U	26.3	U					P
Thallium		U									NR
Vanadium	9.8	U	13.7	B	9.8	U					P
Zinc	3.8	U	3.8	U	3.8	U					P

BOCIN8

FORM III - IN

ILM03.0

10/25/94
000732

9613490.1695

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

BOC1N7S

Lab Name: ITAS_ST._LOUIS

Contract: 550.05

Lab Code: ITMO Case No.:

SAS No.:

SDG No.: W0169

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	7084.9600	4357.7000	2000.00	136.4	N	P
Antimony	75-125	484.7800	30.5000	500.00	97.0		P
Arsenic	75-125	40.2200	1.2500	40.00	97.4		F
Barium	75-125	2035.9400	159.7400	2000.00	93.8		P
Beryllium	75-125	55.9100	1.0600	50.00	109.7		P
Cadmium	75-125	47.6700	2.2000	50.00	95.3		P
Calcium							NR
Chromium	75-125	240.8400	37.1700	200.00	101.8		P
Cobalt	75-125	509.4700	3.4700	500.00	101.2		P
Copper	75-125	283.0100	39.2000	250.00	97.5		P
Iron		12721.1900	10762.9500	1000.00	195.8		P
Lead	75-125	20.5100	3.2900	20.00	86.1		F
Magnesium							NR
Manganese	75-125	853.3000	333.9100	500.00	103.9		P
Mercury	75-125	1.0200	0.1000	1.00	102.0		CV
Nickel	75-125	546.3500	30.9000	500.00	103.1		P
Potassium							NR
Selenium	75-125	3.6600	8.5500	10.00	-48.9	N	F
Silver	75-125	48.6000	4.2000	50.00	97.2		P
Sodium							NR
Thallium	75-125	38.6500	1.0000	50.00	77.3		F
Vanadium	75-125	548.0400	47.4100	500.00	100.1		P
Zinc	75-125	635.5500	107.7200	500.00	105.6		P

Comments:

Handwritten: 10/25/94

Handwritten: 000935

9613490.1697

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

BOC1N8D

Lab Name: ITAS_ST._LOUIS

Contract: 550.05

Lab Code: ITMO

Case No.

SAS No.

SDG No.: W0169

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

% Solids for Duplicate: 0.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum	200.0	605.8100		577.9100		4.7		P
Antimony		30.5000	U	30.5000	U			P
Arsenic		1.1000	U	1.1000	U			F
Barium		137.3100	B	137.0900	B	0.2		P
Beryllium		0.4800	B	0.4800	B	0.0		P
Cadmium		2.2000	U	2.2000	U			P
Calcium		84759.7500		84524.4200		0.3		P
Chromium		3.0000	U	3.0000	U			P
Cobalt		3.2000	U	3.2000	U			P
Copper	25.0	45.3800		4.5000	U	200.0	*	P
Iron		1225.6500		1157.3200		5.7		P
Lead		1.3000	U	1.3000	U			F
Magnesium		32052.3000		31962.2300		0.3		P
Manganese		207.2800		205.7000		0.8		P
Mercury		0.1000	U	0.1000	U			CV
Nickel		15.9100	B	12.2100	B	26.3		P
Potassium	5000.0	10530.3700		10468.6100		0.6		P
Selenium	5.0	3.0600	B	6.5000		72.0		F
Silver		4.2000	U	4.7800	B	200.0		P
Sodium		31209.4700		31249.3500		0.1		P
Thallium		1.0600	B	1.0000	U	200.0		F
Vanadium		39.5200	B	39.3700	B	0.4		P
Zinc	20.0	35.0300		33.4200		4.7		P

FORM VI - IN

ILM03.0

rk
10/25/94

0000401

9613490.1698

U.S. EPA - CLP

9
ICP SERIAL DILUTION

EPA SAMPLE NO.

BOC1N8L

Lab Name: ITAS_ST._LOUIS

Contract: 550.05

Lab Code: ITMO

Case No.:

SAS No.:

SDG No.: W0169

Matrix (soil/water): WATER

Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	605.81		955.67	B	57.8		P
Antimony	30.50	U	152.50	U			P
Arsenic							NR
Barium	137.31	B	127.55	B	7.1		P
Beryllium	0.48	B	1.50	U	100.0		P
Cadmium	2.20	U	11.00	U			P
Calcium	84759.75		70854.00		16.4	E	P
Chromium	3.00	U	15.00	U			P
Cobalt	3.20	U	16.00	U			P
Copper	45.38		46.07	B	1.5		P
Iron	1225.65		1689.96		37.9	E	P
Lead							NR
Magnesium	32052.30		27684.37		13.6	E	P
Manganese	207.28		180.30		13.0	E	P
Mercury							NR
Nickel	15.91	B	57.00	U	100.0		P
Potassium	10530.37		13600.00	U	100.0		P
Selenium							NR
Silver	4.20	U	21.00	U			P
Sodium	31209.47		30106.99		3.5		P
Thallium							NR
Vanadium	39.52	B	57.71	B	46.0		P
Zinc	35.03		56.49	B	61.3		P

FORM IX - IN

ILM03.0

SSS
10/25/94

0000410

RECORD COPY
MEMORANDUM



TO: 200-UP-1 Project QA Record

FR: Thomas Stapp, Golder Associates Inc. *TS*

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0169-QES-169 (943-1610.017 169RAD.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0169-QES-169 prepared by Quanterra Environmental Services. A list of the sample validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
BOCIN7*	08/05/94	WATER	SEE NOTE 1
Notes: 1. Indicates the sample was analyzed for technetium-99 (by liquid scintillation), gross alpha/beta, strontium-90 (beta counting), total uranium (laser phosphorimetry), isotopic uranium (by alpha spectroscopy), and selected gamma emitting isotopes (by gamma spectroscopy). * - Indicates the sample recieved 100 % recalculation.			

Data validation was conducted 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 with the exception of the minor deficiencies identified below.

Accuracy. Goals for accuracy were met with the exception of the minor deficiencies identified below.

Sample Result Verification. All sample results were supported in the raw data.

Data Package ID: W0169-OES-169

Analysis: RADIOCHEMISTRY

Detection Limits. Detection limit goals were met with the exception of iron-59 and cobalt-58 for which RDL's were not specified. No qualification was required.

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of sixteen (16) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the 90% objective of the work plan.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Duplicates

- The duplicate result for technetium-99 was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

Matrix Spike

- The matrix spike recovery for technetium-99 was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

REFERENCES

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

WHC 1994, Validation of 200-UP-1 Data, 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 MDA 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 concentration reported may not accurately reflect the sample MDA. 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: W0169-QES-169	REVIEWER: T. STAPP	DATE: 10-27-94	PAGE <u>1</u> OF <u>1</u>
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
TECHNETIUM-99	J	BOC1N7	MATRIX SPIKE RECOVERY EXCEEDS 130%
TECHNETIUM-99	J	BOC1N7	DUPLICATE ANALYSIS RPD EXCEEDS 20%

9613490.1705

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0169-QES-169

Parameter	Samp#	80C1N7	
	Date	8-5-94	
	Location	2-W19-348	
	Depth	---	
	Type	WATER	
	Comments		
Parameter	Units	Result	Q
URANIUM-234	pCi/L	0.942	
URANIUM-235	pCi/L	0.589	U
URANIUM-238	pCi/L	1.760	
COBALT-58	pCi/L	10.700	U
COBALT-60	pCi/L	8.150	U
CESIUM-137	pCi/L	8.310	U
EUROPIUM-152	pCi/L	17.000	U
EUROPIUM-154	pCi/L	28.000	U
EUROPIUM-155	pCi/L	15.400	U
IRON-59	pCi/L	24.800	U
IODINE-129	pCi/L	2.390	U
GROSS ALPHA	pCi/L	2.570	U
GROSS BETA	pCi/L	38.200	
STRONTIUM	pCi/L	0.808	U
TECHNETIUM-99	pCi/L	149.000	J
TOTAL URANIUM	UG/L	3.000	

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

008

Handwritten signature and date: 11/11/94

9613490.1706

SAMPLE RESULTS

Well # 2-W19-34B

LAB NAME: ITAS-RICHLAND
 LAB SAMPLE ID: 40818501
 CLIENT ID: B0C1N7

SDG: W0169
 MATRIX: WATER
 DATE RECEIVED: 8/8/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
U-234	9.42E-01	6.62E-01	6.79E-01	7.57E-01	pCi/L	40.00%	RD3234
U-235	4.17E-02	3.73E-02	3.79E-02	5.89E-01	U pCi/L	40.00%	RD3234
U-238DA	1.76E+00	8.60E-01	9.06E-01	4.76E-01	pCi/L	40.00%	RD3234
CO-58	7.33E+00	7.05E+00	7.08E+00	1.07E+01	U pCi/L	N/A	RD3219
CO-60	8.26E+00	6.02E+00	6.07E+00	8.15E+00	U pCi/L	N/A	RD3219
CS-137DA	4.15E+00	5.07E+00	5.09E+00	8.31E+00	U pCi/L	N/A	RD3219
EU-152	6.80E+00	1.07E+01	1.07E+01	1.70E+01	U pCi/L	N/A	RD3219
EU-154	2.11E+01	1.83E+01	1.84E+01	2.80E+01	U pCi/L	N/A	RD3219
EU-155	3.47E+00	9.62E+00	9.63E+00	1.54E+01	U pCi/L	N/A	RD3219
FE-59	1.51E+01	1.57E+01	1.58E+01	2.48E+01	U pCi/L	N/A	RD3219
I-129	2.03E+00	1.12E+00	1.17E+00	2.39E+00	U pCi/L	N/A	RD3219
ALPHA	1.94E+00	1.68E+00	1.69E+00	2.57E+00	U pCi/L	100.00%	RD3214
BETA	3.82E+01	3.33E+00	4.28E+00	2.95E+00	pCi/L	100.00%	RD3214
STRONTIUM	2.41E-01	2.43E-01	2.49E-01	8.08E-01	U pCi/L	55.70%	RD3204
TC-99	1.49E+02	2.98E+00	2.08E+01	3.08E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TOTAL-URANIUM	3.00E+00	N/A	4.50E-01	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

Verified by 10-27-94

~~0008~~

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

Quanterra Incorporated
 2800 George Washington Way
 Richland, Washington 99352

509 375-3131 Telephone
 509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
 345 Hills
 Richland, WA 99352

September 30, 1994

Attention: Joan Kessner

PRIORITY



SAF Number	:	B94-018
Date SDG Closed	:	August 16, 1994
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W0169
Data Deliverable	:	Stand Alone

I. Introduction

On August 16, 1994, one water sample was received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

<u>QTESRL ID</u>	<u>BHI ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
408185-01A	B0C1N7	Water	8/8/94

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.

~~0004~~

Bechtel Hanford, Inc.
September 30, 1994
Page 2

The requested analyses were:

- Alpha Spectroscopy**
Uranium-234, -235, -238 by method ITAS-RD-3234
- Gamma Spectroscopy**
Gamma Scan by method ITAS-RD-3219
Iodine-129 by method ITAS-RD-3229
- Gas Proportional Counting**
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
- Liquid Scintillation Counting**
Technetium-99 by method ITAS-IT-RS-0001
- Total Uranium**
Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for each analysis performed under SDG W0169 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.

IV. Comments

Results from the initial radioactivity screening of this sample classified it as Category I.

Alpha Spectroscopy

Uranium-234, -235, -238 by method ITAS-RD-3234

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Bechtel Hanford, Inc.
September 30, 1994
Page 3

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219

Co-57 is detected in the LCS, however, the result is not reported because the peak is caused by interference from Eu-152 at the 122 keV energy line. The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Iodine-129 by method ITAS-RD-3229

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Gross Beta by method ITAS-RD-3222

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Strontium-90 by method ITAS-RD-3204

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

Liquid Scintillation Counting

Technetium-99 by method ITAS-IT-RS-0001

Results for sample B0C1N7 and the duplicate of sample B0C1N7 are outside of the three sigma control limit and the matrix spike is biased high (136.6%). The technician noted that the sample was cloudy, therefore, the duplicate disagreement and the high matrix spike can be attributed to possible non-homogeneity of the sample. There is insufficient sample for a reanalysis of the batch. All other aspects of the data are within contractual requirements, therefore, the data are accepted and reported.

~~0006~~

Bechtel Hanford, Inc.
September 30, 1994
Page 4

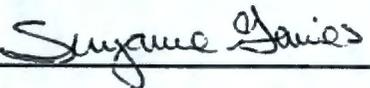
Total Uranium

Total Uranium by method ITAS-RD-4200

The results for the LCS, batch blank, sample B0C1N7, and the duplicate of sample B0C1N7, are within contractual limits.

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
Project Manager

~~0007~~

Date Turnaround
 Priority
 Normal

Collector <i>K. Trapp</i>	Company Contact PH BUTCHER	Telephone No. (509)376-4388
Project Designation 200-UP-1	Sampling Location 200 AREA	SAF No. 894-018
Ice Chest No. <i>ER-1D</i>	Field Logbook No. <i>EFL-1139</i>	Method of Shipment
Shipped To QUANTERRA(IT)	Offsite Property No. <i>WCU-0-0851-4</i>	Bill of Lading/Air Bill No. <i>N/A</i>

Possible Sample Hazards/Remarks	Preservative	HCL<2	pH 5-9	HNO3<2	COOL 4	H2SO4<2	HNO3<2	COOL 4	HCL<2		HNO3<2		HCL<2	
	Type of Container	Gs	gG	<i>KT 8/5/94</i> P8	G	P	gG	gG	P		<i>KT 8/5/94</i> P8		Gs	
	No. of Container(s)	3	1	1	1	1	4	1	1		1		3	
Special Handling and/or Storage COOL 4 DEGREES CENTIGRADE	Volume	40ml	2.5L	1L	500ml	500ml	SEE "S1"	2.5L	1L		1L		40ml	
SAMPLE ANALYSIS <i>408184</i>	VOA	PCB/PEST	CLP-ICP METALS, GFAA METALS, Hg (UNFIL-TERED)	ANIONS-IC, F, CL, SO4, NO2, NO3, PO4	NO2-NO3	SEE "S1" "S. I."	1-129	Tc-99		CLP-ICP METALS, GFAA METALS, Hg (FIL-TERED)		CLP-VOA		
	<i>A B C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>408</i>	<i>850</i>						<i>ABC</i>	

Sample No.	Matrix*	Date Sampled	Time Sampled	VOA	PCB/PEST	CLP-ICP METALS, GFAA METALS, Hg (UNFIL-TERED)	ANIONS-IC, F, CL, SO4, NO2, NO3, PO4	NO2-NO3	SEE "S1" "S. I."	1-129	Tc-99	CLP-ICP METALS, GFAA METALS, Hg (FIL-TERED)	CLP-VOA
<i>01</i> BOCIN7	W	<i>8/5/94</i>	<i>1130</i>	X	X	X	X	X	X	X	X		
<i>02</i> BOCIN8	W	↓	↓									X	
<i>03</i> BOCIL2	W	↓	↓										X

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By <i>K. Trapp</i>	Date/Time <i>8/5/94</i>	Received By <i>CHLA HILL</i>	Date/Time <i>8/5/94</i>
Relinquished By <i>AQ Simpson</i>	Date/Time <i>8/8/94</i>	Received By <i>AQ Simpson</i>	Date/Time <i>8/8/94</i>
Relinquished By <i>AQ Simpson</i>	Date/Time <i>8/8/94</i>	Received By <i>C. Henry</i>	Date/Time <i>8/8/94</i>
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
 ANALYTE LIST=GROSS ALPHA/BETA, U-234/235/238, TOTAL URANIUM, Sr-90, GAMMA SPEC(to include):Co-58/60,Cs-137,Eu-152/154/155 and Fe-59.
 BOTTLE SIZE= 3, 2.5L + 1, 500ml

SDC W0169

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

015 0027

9613490-1712

9613490.1714

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-UP-1		DATA PACKAGE: W0169-QES-169		
VALIDATOR:	T. Staff	LAB: QUANTERRA	DATE: 10-26-94		
CASE:			SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input checked="" type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input checked="" type="checkbox"/> Gamma Spectroscopy	
<input checked="" type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input checked="" type="checkbox"/> I-129		
SAMPLES/MATRIX					
BOCIN7 / WATER					

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? **NOTE ①** 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: ① Detectors for Isotopic U, gross α/β and Strontium, and gamma have not been calibrated within 1 year of sample analysis however continuing calibration for associated detectors is acceptable and no qualification will be applied. 10-26-94

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? NOTE ① Yes No N/A

Field blank(s) analyzed? NOTE ② 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: ① I-129 and Total U had detected results for method blank however sample results were non-detect for I-129 and >5 times blank result for Total U. ∴ NO Qualification.

② Field QC was not included in this SDG.

5. Matrix Spikes N/A

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? NOTE ① 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: ① See Matrix Spike Summary page.

- 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? NOTE ① Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: ① See duplicate summary page.

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: Collected

	ANALYSIS							
	Gra C/B	Sr-90	Tc-99	U-234/5/8	Y	Tot.U	I-129	
BOC IN 7: 8-05-94	9-07	9-07	9-09-94	9-06-94	9-8-94	9-16	9-09	8-24-94
DAYS: ≤180	→							
	✓	✓	✓	✓	✓	✓	✓	✓

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? NOTE. ① Yes No N/A
- Transcription/calculation errors? NOTE. ② Yes No N/A

Comments: ① MDA's meet the RDL for all isotopes with the exception of those not listed by the SOW for established detection limits, including Co-58, Fe-59. Qualif. not required. 8/10-26-94

② MDA's reported are greater than the calculated res amount for all isotopes with the exception of Strontium and technetium, however no qualification is required.

9613490.1719



DUPLICATE RESULTS SUMMARY

LAB NAME:	ITAS-RICHLAND	SDG:	W0169
LAB SAMPLE ID:	F0818501	MATRIX:	WATER
CLIENT ID:	B0C1N7	DATE RECEIVED:	8/8/94
ORIG LAB SAMPLE ID:	40818501		

ISOTOPE	DUP RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
U-234	1.73E+00	6.76E-01	7.17E-01	3.67E-01	pCi/L	64.10%	RD3234	9.42E-01	58.98%
U-235	3.90E-02	1.32E-01	1.32E-01	3.67E-01	pCi/L	64.10%	RD3234	-4.17E-02	5977.78%
U-238DA	1.40E+00	6.10E-01	6.40E-01	3.67E-01	pCi/L	64.10%	RD3234	1.76E+00	22.78%
CO-58	-1.58E+00	5.66E+00	5.66E+00	9.61E+00	pCi/L	N/A	RD3219	-7.33E+0	129.07%
CO-60	2.62E+00	5.37E+00	5.38E+00	1.11E+01	pCi/L	N/A	RD3219	-8.26E+0	385.82%
CS-137DA	1.69E+00	3.48E+00	3.48E+00	7.36E+00	pCi/L	N/A	RD3219	-4.15E+0	474.80%
EU-152	-1.74E+00	1.10E+01	1.10E+01	1.90E+01	pCi/L	N/A	RD3219	-6.80E+0	118.50%
EU-154	1.15E+01	8.66E+00	8.73E+00	2.46E+01	pCi/L	N/A	RD3219	-2.11E+0	679.17%
EU-155	-1.61E+00	7.91E+00	7.91E+00	1.35E+01	pCi/L	N/A	RD3219	-3.47E+0	73.23%
FE-59	3.50E+00	1.40E+01	1.40E+01	2.91E+01	pCi/L	N/A	RD3219	-1.51E+0	320.69%
I-129	1.03E+00	1.80E+00	1.88E+00	3.27E+00	pCi/L	N/A	RD3219	2.03E+00	65.36%
ALPHA	2.41E+00	1.76E+00	1.78E+00	2.49E+00	pCi/L	100.00%	RD3214	1.94E+00	21.61%
BETA	3.68E+01	3.31E+00	4.19E+00	3.06E+00	pCi/L	100.00%	RD3214	3.82E+01	3.73%
STRONTIUM	-1.35E-01	2.31E-01	2.33E-01	8.83E-01	pCi/L	56.40%	RD3204	2.41E-01	709.43%
TC-99	9.36E+01	2.48E+00	1.49E+01	3.08E+00	pCi/L	95.10%	ITAS-IT-RS-0001	1.49E+02	45.67%
TOTAL-URANIUM	2.66E+00	N/A	3.99E-01	3.54E-03	ug/L	100.00%	RD4200	3.00E+00	12.01%

Number of Results: 16

The RPD circled for the indicated analyte exceeds acceptable limits and qualifies the associated sample as estimated.

8/10-26-94

~~0009~~

9613490.1720

MATRIX SPIKE RESULTS
SUMMARY

LAB NAME: ITAS-RICHLAND SDG: W0169
LAB SAMPLE ID: W0818501 MATRIX: WATER

ISOTOPE	SPIKE RESULT*	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	SAMPLE RESULT	EXPECTED	RECOVERY
TC-99	1.24E+02	3.89E+00	3.41E+01	3.08E+00	pCi/L	1.49E+02	9.04E+01	137.17%
TOTAL-URANIUM	1.11E+00	N/A	1.67E-01	3.54E-03	ug/L	3.00E+00	9.02E-01	123.06%

Number of Results:

The circled recovery of the indicated analyte is out of limits and qualifies the associated sample as estimated (J).

J 10-27-94

~~0013~~

W0169-QES-169

Uranium	
HEIS No.:	BOC1N7
Lab ID:	40818501
Aliquot:	2.00E-01
U-234 net cpm:	0.0452
U-234 bkg cpm:	0.0048
Spl count time:	200
Bkg count time:	2500
Eff d/c:	3.7
Decay:	1
Yield:	0.4
U-234 calc:	9.42E-01
U-234 rptd:	9.42E-01
U-234 MDA calc:	6.31E-01
U-234 MDA rptd:	7.57E-01
U-235 net cpm:	-0.002
U-235 bkg cpm:	0.002
U-235 decay:	1
U-235 calc:	-4.17E-02
U-235 rptd:	-4.17E-02
U-235 MDA calc:	5.08E-01
U-235 MDA rptd:	5.89E-01
U-238 net cpm:	0.0842
U-238 bkg cpm:	0.0008
U-238 decay:	1
U-238 calc.:	1.75E+00
U-238 rptd:	1.75E+00
U-238 MDA calc:	4.25E-01
U-238 MDA rptd:	4.76E-01

W0169-QES-169

Gross Alpha	
HEIS No.:	BOC1N7
Lab ID:	40818501
Aliquot:	2.00E-01
Net counts:	0.14
Bkg counts:	0.04
Spl count time:	50
Bkg count time:	500
d/c:	6.137
Calc.:	1.94E+00
Rptd:	1.94E+00
MDA calc:	2.11E+00
MDA rptd:	2.57E+00
Gross Beta	
HEIS No.:	BOC1N7
Lab ID:	40818501
Aliquot:	2.00E-01
Net counts:	6.258
Bkg counts:	0.962
Spl count time:	100
Bkg count time:	500
d/c:	2.713
Calc.:	3.82E+01
Rptd:	3.82E+01
MDA calc:	2.33E+00
MDA rptd:	2.94E+00
Strontium 90	
HEIS No.:	BOC1N7
Sample:	40818501
Sep date:	9/06/94
Sep time:	14:25
Count date:	9/09/94
Count time:	16:05
Hours:	73.666666
Sample amt:	1.00E+00
Net, cpm:	0.232
Count time:	100
Bkg, cpm:	0.948
Count time:	500
D/C 1:	2.083
D/C 2:	1.799
D/C 3:	1.832
Yield:	0.557
Calc:	2.41E-01
Rptd:	2.40E-01
MDA, Calc:	1.28E+00
MDA, rptd:	8.08E-01

W0169-QES-169

Technetium-99	
HEIS No.:	80C1N7
Sample:	40818501
Bkg cpm:	26.26
Spl, amt:	3.50E-01
Spl cpm:	126.62
Count time:	125
Spl dpm:	138.43
d/c:	1.093
Yield:	0.951
Blk, dpm:	2.94E+01
Calc:	1.49E+02
Rptd:	1.49E+02
MDA, calc:	3.18E+00
MDA, rptd:	3.08E+00
Total Uranium	
HEIS No.:	80C1N7
Lab ID:	40818501
ng, raw:	3.00E+00
g, sample:	1.00E-01
Dil. vol:	100
Yield, corr:	1
Calc.:	3.00E+00
Rptd:	3.00E+00