

START

9613497.0640

0045478

WD110-ITC-103

109 2



CERTIFICATE OF ANALYSIS

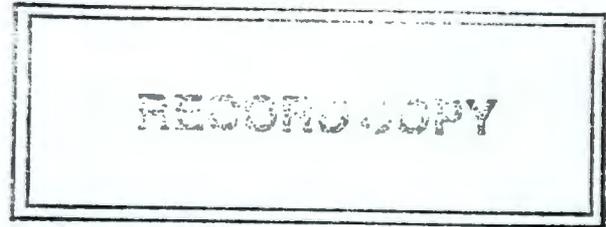
Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

July 28, 1994

Attention: J. A. Lerch



Project number	:	519.59
Date Received by Lab	:	June 24, 1994
Number of Samples	:	Eight (8)
Sample Type	:	Water
SDG Number	:	W0110
Data Deliverable	:	Standalone



I. Introduction

On June 24, 1994, eight (8) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with their specific client ID's:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
5435-009	BOC2S3	40656401	Water	06/24/94
5435-010	BOC2S4	40656402	Water	06/24/94
5435-011	BOC2S5	40656403	Water	06/24/94
5435-012	BOC2S6	40656404	Water	06/24/94
5435-013	BOC2S8	40656405	Water	06/24/94
5435-014	BOC2S9	40656406	Water	06/24/94
5435-015	BOC2T0	40656407	Water	06/24/94
5435-016	BOC2T1	40656408	Water	06/24/94

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.

Analyses requested: ICP Metals by method CLP90.

0001

Westinghouse Hanford Company
July 28, 1994
Project Number: 519.59
Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and 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

There were no comments or nonconformances associated with these samples.

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\hanw0110.nar

9613497 0642

OFFICE OF SAMPLE MANAGEMENT

RECORD OF DISPOSITION

ROD-94-0161

Record of Disposition No.

DATE: 6/29/94

LABORATORY: IT

PROJECT TITLE/NO.: 300-FF-5 Near Shore River Sampling/SAF# 94-083, 300-FF-5 7th Round Groundwater/SAF# 94-084

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

Sample Delivery Groups W0106, W0107, W0109, W0110

DESCRIPTION OF EVENT:

The Sample Authorization Form did not specify the deliverable required.

DISPOSITION OF SAMPLES:

A stand alone package is required for the 300-FF-5 Near River Shore Sampling and 300-FF-5 7th Round Groundwater projects.

APPROVAL SIGNATURES:

W. E. Strohben / *W. E. Strohben*
OSM Project Coordinator (Print/Sign Name)

6/29/94
Date

L. C. Hulstrom / *LC Hulstrom*
Technical Representative (Print/Sign Name)

6/30/94
Date

0003

N/A
Quality Assurance (Print/Sign Name)

Date

ORIGINAL -> RICHLAND

KC: VAN SUEI JODIE
JIM WADE TAMI

9613497.0643

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOC2S3

Lab Name: ITAS_ST._LOUIS _____ Contract: 519.59 _____
 Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W0110 _____
 Matrix (soil/water): WATER Lab Sample ID: 5435-009
 Level (low/med): LOW__ Date Received: 06/24/94
 % Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	67.7	B		P
7440-36-0	Antimony	19.5	U		P
7440-39-3	Barium	28.4	B		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	19200			P
7440-47-3	Chromium	2.8	U		P
7440-48-4	Cobalt	29.0	U		P
7440-50-8	Copper	4.5	U		P
7439-89-6	Iron	86.0	B		P
7439-95-4	Magnesium	4460	B		P
7439-96-5	Manganese	8.7	B		P
7440-02-0	Nickel	4.9	U		P
7440-09-7	Potassium	1060	B		P
7440-22-4	Silver	4.2	U		P
7440-23-5	Sodium	2490	B		P
7440-62-2	Vanadium	9.8	U		P
7440-66-6	Zinc	21.2			P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
 Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

9613497.0650

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOC2T1

Lab Name: ITAS_ST._LOUIS_____ Contract: 519.59_____
 Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: W0110_____
 Matrix (soil/water): WATER Lab Sample ID: 5435-016
 Level (low/med): LOW__ Date Received: 06/24/94
 % Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19.0	U		P
7440-36-0	Antimony	19.5	U		P
7440-39-3	Barium	27.0	B		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	18200			P
7440-47-3	Chromium	2.8	U		P
7440-48-4	Cobalt	29.0	U		P
7440-50-8	Copper	4.5	U		P
7439-89-6	Iron	15.2	B		P
7439-95-4	Magnesium	4210	B		P
7439-96-5	Manganese	2.7	B		P
7440-02-0	Nickel	4.9	U		P
7440-09-7	Potassium	869	B		P
7440-22-4	Silver	4.2	U		P
7440-23-5	Sodium	2400	B		P
7440-62-2	Vanadium	9.8	U		P
7440-66-6	Zinc	8.3	B		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
 Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

ITAS - St. Louis June 28, 1994 10:45 am
 Account: 10722 Project: 519.59 ITAS - Richland QAS No. 609 Rev. 0
 Master Sample Login: 5435

Project Manager: W. Price

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

Sample Header Template: _____

Sample No. #	Client ID	C-Matrix Analysis	Date Collected Class	Received Preservative	Due Anal. Due Date	Shipper Hold Date Site	Rad Category (Container Numbers:% Filled)	Rad Sample No.
1	PN - Plastic-1L	ICAP/CLP90/Q4	S	HNO3	22-JUL-94	21-DEC-94 R13A,B	(83902:100)	
5435-023	BOC2R4 I.T. RICHLAND I.D. # IS 40656213	Water	23-JUN-94	12:18	24-JUN-94 11:00	29-JUL-94 FED-EX	1	Screening not Required
1	PN - Plastic-1L	ICAP/CLP90/Q4	S	HNO3	22-JUL-94	21-DEC-94 R13A,B	(83903:100)	
5435-024	BOC2R5 I.T. RICHLAND I.D. # IS 40656214	Water	23-JUN-94	12:18	24-JUN-94 11:00	29-JUL-94 FED-EX	1	Screening not Required
1	PN - Plastic-1L	ICAP/CLP90/Q4	S	HNO3	22-JUL-94	21-DEC-94 R13A,B	(83904:100)	
5435-025	BOC2R7 I.T. RICHLAND I.D. # IS 40656215	Water	23-JUN-94	12:40	24-JUN-94 11:00	29-JUL-94 FED-EX	1	Screening not Required
1	PN - Plastic-1L	ICAP/CLP90/Q4	S	HNO3	22-JUL-94	21-DEC-94 R13A,B	(83905:100)	
5435-026	BOC2R8 I.T. RICHLAND I.D. # IS 40656216	Water	23-JUN-94	12:40	24-JUN-94 11:00	29-JUL-94 FED-EX	1	Screening not Required
1	PN - Plastic-1L	ICAP/CLP90/Q4	S	HNO3	22-JUL-94	21-DEC-94 R13A,B	(83906:100)	
5435-027	BOC2S0 I.T. RICHLAND I.D. # IS 40656217	Water	23-JUN-94	13:10	24-JUN-94 11:00	29-JUL-94 FED-EX	1	Screening not Required
1	PN - Plastic-1L	ICAP/CLP90/Q4	S	HNO3	22-JUL-94	21-DEC-94 R13A,B	(83907:100)	
5435-028	BOC2S1 I.T. RICHLAND I.D. # IS 40656218	Water	23-JUN-94	13:10	24-JUN-94 11:00	29-JUL-94 FED-EX	1	Screening not Required
1	PN - Plastic-1L	ICAP/CLP90/Q4	S	HNO3	22-JUL-94	21-DEC-94 R13A,B	(83908:100)	

0613497.0651

3°=Sample has not been rad screened.

0000008



SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 6/24/94 1100 Client Name wtc

Project/Client # 94-083 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) N/A

1. Condition of shipping container? ok

2. Custody Seals on cooler intact? Yes No N/A

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 N/A

6. Each sample is in a plastic bag? Yes No

7. Number of sample containers in cooler: 20

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

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

10. Coolant present? Yes No

Sample temperature 10°C

11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #'(s) N/A

Request for analysis #'(s) N/A

Airbill # N/A Carrier WA

12. Have any anomalies been identified above? Yes No

13. Memos have been initiated for all anomalies identified above? Yes

Printed Name/Signature Karen A. Hurlberg Date/Time 6-24-94 11:00
KAREN A. HURLEBERG

0000027



SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 6/24/94 1100 Client Name Witc

Project/Client # 94-083 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) N/A

1. Condition of shipping container? OK

2. Custody Seals on cooler intact? Yes No N/A

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 N/A

6. Each sample is in a plastic bag? Yes No

7. Number of sample containers in cooler: 31

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

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

10. Coolant present? Yes No

Sample temperature 10°

11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #'(s) N/A

Request for analysis #(s) N/A

Airbill # N/A Carrier _____

12. Have any anomalies been identified above? Yes No

13. Memos have been initiated for all anomalies identified above? Yes

Printed Name/Signature Karen Achtenberg Date/Time 6-24-94 11:00
KAREN ACHTENBERG

0000028

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1
 Date Transmitted
 Priority
 Normal

Collector: *Reck, M. McNeill* Company Contact: LC Hulstrom Telephone No. (509) 376-4034
 Project Designation: 300-FF-5 Sampling Location: 300-FF-5 S9P10 SAF No. 94-083
 Ice Chest No. Field Logbook No. BNV 55520 Method of Shipment: Hand Deliver
 Shipped To: ITAS Office Property No. BIV of Loading/Alt. BIV No.

Possible Sample Hazard/Remarks	Preservative	HNO ₃	HNO ₃	HNO ₃														
	Type of Container	P	P	P														
Special Handling and/or Storage COOL TO 4 DEGREES CENTIGRADE	No. of Container(s)	1	1	1														
	Volume	1000 ml	1000 ml	1000 ml														
SAMPLE ANALYSIS 406564		URAN	ICP	ICP(F)														
		406505																

Sample No.	Matrix	Date Sampled	Time Sampled	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BOC2S7	v	6/23/94	0915	1														
BOC2S8 05	v	6/23/94	0920	1	1													
BOC2S9 06	v	6/23/94	0930	1	1													
BOC2T0 07	v	6/23/94	0930					1										
BOC2T1 08	v	6/23/94	0930					1										

CHAIN OF POSSESSION Sign/Print Names SPECIAL INSTRUCTIONS Matrix

Relinquished By: <i>Reck, M. McNeill</i> Date/Time: 6/23/94 1500	Received By: <i>TL Van Arsdale</i> Date/Time: 6/23/94 1500	SPECIAL INSTRUCTIONS <i>Stick WO 110</i>	Matrix S = Soil SE = Sediment SN = Solid SL = Sludge W = Water O = Oil A = Air OS = Dried Solids OL = Drown Liquids T = Tissue WL = Wire L = Liquid V = Vegetation X = Other
Relinquished By: <i>S.J. Orr</i> Date/Time: 6/24/94 1030	Received By: <i>[Signature]</i> Date/Time: 6-24-94 1030		
Relinquished By: <i>[Signature]</i> Date/Time: 6-24-94 1100	Received By: <i>[Signature]</i> Date/Time: 6-24-94 1100		
Relinquished By: _____ Date/Time: _____	Received By: _____ Date/Time: _____		

LABORATORY RECEIVED Received By: _____ Title: _____ Date/Time: _____
 DEPOSIT METHOD: 0000038 Deposited By: _____ Date/Time: _____

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Transmitted
 Priority
 Normal

Collector *Reck, Michael* Company Contact *LC Hulstrom* Telephone No. *(509) 376-4034*
 Project Designation *300-FF-5* Sampling Location *300-FF-5 S9P3* SAF No. *94-083*
 Ice Chest No. Field Logbook No. *BNW 55520* Method of Shipment *Hand Deliver*
 Shipped To *ITAS* Office Property No. B# of Lading/Air Bill No.

Possible Sample Hazards/Remarks	Preservative	HNO ₃	HNO ₃	HNO ₃													
	Type of Container	P	P	P													
Special Handling and/or Storage <i>COOL TO 4 DEGREES CENTIGRADE</i>	No. of Container(s)	1	1	1													
	Volume	1000 ml	1000 ml	1000 ml													
SAMPLE ANALYSIS <i>406504</i>		URAN	ICP	ICP(F)													
		<i>1106505</i>															

Sample No.	Matrix*	Date Sampled	Time Sampled														
BOC2S2	v	<i>6/23/94</i>	<i>0850</i>	<i>41</i>													
BOC2S3 01	v	<i>6/23/94</i>	<i>0855</i>	<i>51</i>	1												
BOC2S4 02	v	<i>6/23/94</i>	<i>0855</i>	<i>61</i>	1												
BOC2S5 03	v	<i>6/23/94</i>	<i>0855</i>			1											
BOC2S6 04	v	<i>6/23/94</i>	<i>0855</i>				1										

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
<i>Reck, Michael</i>	<i>6/23/94 1500</i>	<i>TL VanHredak</i>	<i>6/23/94 1500</i>
<i>J.J. Orr</i>	<i>6/24/94 1030</i>	<i>Michael Reck</i>	<i>6-24-94 1030</i>
<i>Michael Reck</i>	<i>6-24-94 1100</i>	<i>Michael Reck</i>	<i>6-24-94 1100</i>

SPECIAL INSTRUCTIONS
STG W0110

Matrix*
 S = Soil
 SE = Sediment
 SN = Snow
 SL = Sludge
 W = Water
 O = Oil
 A = Air
 OS = Open Solids
 OL = Driven Liquids
 T = Tissue
 Wl = Wire
 L = Liquid
 V = Vegetation
 X = Other

LABORATORY SECTION Received By _____ Title _____ Date/Time _____

FINAL SAMPLE DISTRIBUTION Disposal Method *0000041* Disposed By _____ Date/Time _____

*Correct. JRM
24 June 94*

Cust Code	Received Date	Screening Prep		Count Date	Mnts. Cntd	BACKGROUND		
		Date				Alpha	Beta	Mnts
WHC	62494	62494		6-24	10	19	278	240

Customer ID	pH <2	Residue Wght mG	Vol. Anal. mG mL	Sample Size Gm L	SMPL CNT DATA			Net Sample Counts/Minute		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	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		Alpha	Beta
BOC2T2		0.7	5	1.0	17	0	14	-0.08	0.24	-2.9E-01	5.57E-01	-2.6E-05	5.0E-05	-5.9E-08	8.1E-08	-2.8E+01	5.0E+01	Yes	-3.8E+02	2.0E+03
BOC2T3		0.9	5	1.0	18	1	10	0.02	-0.18	8.07E-02	-3.5E-01	7.3E-06	-3.1E-05	3.0E-08	-4.9E-08	7.3E+00	-3.1E+01	Yes	1.4E+03	-3.2E+03
BOC257		0.6	5	1.0	19	1	10	0.02	-0.16	8.04E-02	-3.4E-01	7.2E-06	-3.1E-05	3.0E-08	-2.1E-07	7.2E+00	-3.1E+01	Yes	1.4E+03	-3.2E+03
BOC258		0.9	5	1.0	20	0	11	-0.08	-0.06	-2.8E-01	-7.2E-02	-2.5E-05	-6.5E-06	-5.9E-08	-8.1E-09	-2.5E+01	-6.5E+00	Yes	4.0E+02	-1.5E+04
BOC259		0.6	5	1.0	21	0	10	-0.08	-0.16	-2.7E-01	-2.8E-01	-2.4E-05	-2.5E-05	-5.9E-08	-5.1E-08	-2.4E+01	-2.5E+01	Yes	4.1E+02	-3.9E+03

Number size

*Box 257
Box 258
Box 259*

6-24-94

9613497.0656

D.R. JRM
24 June 94

Customer Code	Received Date	Screening Prep Date	Count Date	Mnts. Cntd	BACKGROUND		
WHC	62494	62494	6-24	10	Alpha	Beta	Mnts
					9	98	120

Customer ID	pH <2	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
B0C2R7		0.0	5	1.0	11	2	11	0.13	0.28	4.73E-01	5.21E-01	4.3E-05	4.7E-05	8.1E-08	6.7E-08	4.3E+01	4.7E+01	Yes	2.3E+02	2.1E+03
B0C2R9		0.4	5	1.0	12	1	7	0.03	-0.12	1.01E-01	-2.6E-01	9.1E-08	-2.4E-05	3.6E-08	-4.3E-08	9.1E+00	-2.4E+01	Yes	1.1E+03	-4.2E+03
B0C250		0.5	5	1.0	13	0	6	-0.08	-0.22	-2.6E-01	-4.1E-01	-2.6E-05	-3.7E-05	-6.3E-08	-8.4E-08	-2.6E+01	-3.7E+01	Yes	-3.9E+02	-2.7E+03
B0C252		0.4	5	1.0	14	1	14	0.03	0.58	7.88E-02	1.23E+00	7.1E-08	1.1E-04	3.6E-08	1.4E-08	7.1E+00	1.1E+02	Yes	1.4E+03	9.1E+02
B0C253		0.2	5	1.0	15	0	17	-0.08	0.88	-3.2E-01	1.93E+00	-2.9E-05	1.7E-04	-6.3E-08	7.0E-07	-2.9E+01	1.7E+02	Yes	-5.5E+02	5.8E+02
B0C254		0.3	5	1.0	16	1	10	0.03	0.18	9.11E-02	3.74E-01	8.2E-08	3.4E-05	3.6E-08	2.2E-07	8.2E+00	3.4E+01	Yes	1.2E+03	3.0E+03
												1.3E-05	3.0E-04							

9613497.0657

Numbers
air
Bpc 250
Bpc 252
Bpc 253
Bpc 254

62494



5435
**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD***

Reference Document No. 453680
Page 1 of 1

Project Name/No. 1 SAF 94-083
Sample Team Members 2
Profit Center No. 3 4632
Project Manager 4 V. Pettey
Purchase Order No. 6
Required Report Date 11

Samples Shipment Date 7 6-24-94
Lab Destination 8 ST Louis
Lab Contact 9
Project Contact/Phone 12
Carrier/Waybill No. 13

Bill to: 5 IT CUR-566
Richard
Report to: 10 IT
Richard

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	Disposal Record No. 22
40656401A	BCC253 H2O	See WHC	WHC COC	14	Cool 40°	See WHC COC	251 100	
02A	S4		6/23/94 02:55	14	UNB3	Metals	2 2 1/2	
03A	S5						3	
04A	S6						3	
05A	S8		6/23/94 09:20				4	
06A	S9						4	
07A	T0						3	
08A	T1						3	

**FOR LAB
USE ONLY**

**FOR LAB
USE ONLY**

Special Instructions: 23 As per WHC Contract

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
 GC Level: 27
 I. II. III. Project Specific (specify): SDB W0110

1. Relinquished by (Signature/Affiliation) <i>Neidberg Jr</i>	Date: 6-24-94 Time: 16:00	1. Received by (Signature/Affiliation) <i>Jeffrey J. Daniels</i>	Date: 25 June 1994 Time: 09:30
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
0000011

961
0668

9613497.0659

SAMPLE RECEIPT VARIANCE REPORT
ITAS-RICHLAND LABORATORY

WORK ORDER NUMBER: _____ DATE INITIATED: 6-24-94

INITIATED BY: Karen Acktenburg

BEST COPY
AVAILABLE

DATE/TIME OF SAMPLE (AND/OR RFA & COC) RECEIPT: 6-24-94 11:00

CLIENT SAMPLE NUMBER	RFA/COC NUMBERS	ANALYSIS REQUESTED
<u>BOC252</u>	<u>94-083</u>	<u>Uran</u>
<u>BOC253</u>	↓	<u>Uran, ICP</u>
<u>BOC254</u>		<u>Uran, ICP</u>
<u>BOC255</u>		<u>ICP</u>
<u>BOC256</u>		<u>ICP</u>

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: Received samples at 10°C

NO serum (bottled for samples)
to serum this day

SUPERVISOR REVIEW: Jami Needham

PROJECT MANAGER REVIEW: _____

TELEPHONED TO: _____ ON _____ BY _____

TELEFAXED TO: _____ ON _____ BY _____

SIGNED ORIGINAL MUST BE RETAINED IN FILE

0000035

9613497.0660

SAMPLE RECEIPT VARIANCE REPORT
ITAS-RICHLAND LABORATORY

WORK ORDER NUMBER: _____ DATE INITIATED: 6-24-94

INITIATED BY: Karen Astbury

BEST COPY
AVAILABLE

DATE/TIME OF SAMPLE (AND/OR RFA & COC) RECEIPT: 6-24-94 11:00

CLIENT SAMPLE NUMBER	RFA/COC NUMBERS	ANALYSIS REQUESTED
<u>BOC 257</u>	<u>94-013</u>	<u>Uran</u>
<u>BOC 258</u>		<u>Uran, ICP</u>
<u>BOC 259</u>		<u>Uran, ICP</u>
<u>BOC 270</u>		<u>ICP</u>
<u>BOC 271</u>		<u>ICP</u>

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 way not received with shipment.
 - RFA/COC received
 - RFA/COC not received
- 12. Other (Explain below).

NOTES: Received samples at 10
No screen bottles for analysis
No screen forms for analysis

SUPERVISOR REVIEW: Jane Herdich

PROJECT MANAGER REVIEW: _____

TELEPHONED TO: _____ ON _____ BY _____

TELEFAXED TO: _____ ON _____ BY _____

SIGNED ORIGINAL MUST BE RETAINED IN WORK ORDER FILE

0000037



INTERNATIONAL
TECHNOLOGY
CORPORATION

CERTIFICATE OF ANALYSIS

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

July 29, 1994

Attention: J.A.Lerch

SAF Number : 94-083
Date SDG Closed : June 29, 1994
Number of Samples : Six (6)
Sample Type : Water
SDG Number : W0110
Data Deliverable : Stand Alone

I. Introduction

On June 24, 1994, six water samples were received by ITAS-Richland for radiochemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the WHC specific ID:

<u>ITAS-Richland ID</u>	<u>WHC ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
406565-01A	B0C2S7	Water	6/24/94
406565-02A	B0C2S8	Water	6/24/94
406565-03A	B0C2S9	Water	6/24/94
406565-04A	B0C2S2	Water	6/24/94
406565-05A	B0C2S3	Water	6/24/94
406565-06A	B0C2S4	Water	6/24/94

Regional Office

2800 George Washington Way • Richland, Washington 99352-1613 • 509-375-3131 • FAX: 509-375-5590

IT Corporation is a wholly owned subsidiary of International Technology Corporation

0003

Westinghouse Hanford Company
July 29, 1994
Page 2

II. Analytical Results/Methodology

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

The requested analysis was: **Total Uranium**
 Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for the analysis performed under SDG W0110 include one Laboratory Control Sample (LCS), two matrix spikes, 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 these samples classified them as Category I.

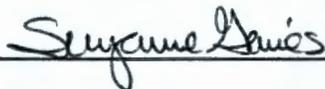
Total Uranium by method ITAS-RD-4200

Two matrix spikes were analyzed with this batch. The matrix spike, LCS, batch blank, sample and sample duplicate (duplicate of sample B0C2S7) results are within contractual requirements.

Westinghouse Hanford Company
July 29, 1994
Page 3

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: W0110
LAB SAMPLE ID: 40656501 MATRIX: WATER
CLIENT ID: B0C2S7 DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	4.46E-01	N/A	6.70E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

9613497.0665

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0110
LAB SAMPLE ID: 40656502 MATRIX: WATER
CLIENT ID: B0C2S8 DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	4.94E-01	N/A	7.40E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

0007

9613497.0666

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0110
LAB SAMPLE ID: 40656503 MATRIX: WATER
CLIENT ID: B0C2S9 DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	4.81E-01	N/A	7.20E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

0008

9613497.0667

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0110
LAB SAMPLE ID: 40656504 MATRIX: WATER
CLIENT ID: B0C2S2 DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	4.88E-01	N/A	7.30E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

0009

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0110
LAB SAMPLE ID: 40656505 MATRIX: WATER
CLIENT ID: B0C2S3 DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	5.01E-01	N/A	7.50E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 1

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0110
LAB SAMPLE ID: 40656506 MATRIX: WATER
CLIENT ID: B0C2S4 DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	5.12E-01	N/A	7.70E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

0011

DUPLICATE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0110
LAB SAMPLE ID: F0656501 MATRIX: WATER
CLIENT ID: BOC2S7 DATE RECEIVED: 6/24/94
ORIG LAB SAMPLE ID: 40656501

ISOTOPE	DUP RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
TOTAL-URANIUM	5.14E-01	N/A	7.70E-02	3.54E-03	ug/L	100.00%	RD4200	4.46E-01	14.17%

Number of Results:

9613497.0671

DON'T SAY IT --- *Write It!*

DATE: September 14, 1994

TO: W0110-ITC-103

FROM: Pat Reich

H4-19

Telephone: 372-2785

cc:

SUBJECT: FINAL VAL SUMMARY FOR 300-FF-5, 2ND QTR

THE FINAL VALIDATION SUMMARY FOR THIS DATA PACKAGE IS FILED IN SDG # W0106-ITC-095.

PAT REICH
DATA MANAGEMENT & VALIDATION

8/24/94

Data Validation Check List

for Project 300-FF-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N	Y VOA	Y N SEMI VOA	Y N PEST/PCB	Y N WETCHEM	Y N METALS	COMMENTS	Y N RADCHEM	Date OSM Rcvd DP
BOC2S2		W0110	103	ITC	N	N	N	N	N	N	06/24/94 - SAF- 94-083	Y 8/02/94	8/02/94
BOC2S3		W0110	103	ITC	N	N	N	N	N	Y 8/01/94	06/24/94 - SAF- 94-083	Y 8/02/94	8/02/94
BOC2S4		W0110	103	ITC	N	N	N	N	N	Y 8/01/94	06/24/94 - SAF- 94-083	Y 8/02/94	8/02/94
BOC2S5		W0110	103	ITC	N	N	N	N	N	Y 8/01/94	06/24/94 - SAF- 94-083	N	8/01/94
BOC2S6		W0110	103	ITC	N	N	N	N	N	Y 8/01/94	06/24/94 - SAF- 94-083	N	8/01/94
BOC2S7		W0110	103	ITC	N	N	N	N	N	N	06/24/94 - SAF- 94-083	Y 8/02/94	8/02/94
BOC2S8		W0110	103	ITC	N	N	N	N	N	Y 8/01/94	06/24/94 - SAF- 94-083	Y 8/02/94	8/02/94
BOC2S9		W0110	103	ITC	N	N	N	N	N	Y 8/01/94	06/24/94 - SAF- 94-083	Y 8/02/94	8/02/94
BOC2T0		W0110	103	ITC	N	N	N	N	N	Y 8/01/94	06/24/94 - SAF- 94-083	N	8/01/94
BOC2T1		W0110	103	ITC	N	N	N	N	N	Y 8/01/94	06/24/94 - SAF- 94-083	N	8/01/94

Data Entry Complete: DP SKW

DATATRAC

Validation Rcvd

8/23/94
8/24/94

MEMORANDUM



TO: 300-FF-5 Project QA Record

FR: Susan Manchester, Golder Associates Inc. *SM*

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0110-ITC-103 (943-1610.001, Filename W0110-R.FF5)

INTRODUCTION

This memo presents the results of data validation on data package W0110-ITC-103 prepared by the International Technology Corporation (ITC) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0C2S2	06/23/94	Water	
B0C2S3	06/23/94	Water	
B0C2S4	06/23/94	Water	
B0C2S7	06/23/94	Water	
B0C2S8	06/23/94	Water	
B0C2S9	06/23/94	Water	

VALIDATION DOCUMENTATION
SDLA

Note 1. All samples were analyzed for total uranium using a WHC approved method.

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.

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. A total of six samples were validated in this data package with a total of 6 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, 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

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

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 300-FF-5 Data, Statement of Work, Environmental and Waste Characterization Analytical Data Validation, Task Order MSH-SWV-315905, August 10, 1994, Westinghouse Hanford Company, Richland, Washington.

9613497.0675

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

sgm
8/23/94

002A

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.

9613497.0677

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613497.0679

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0110-ITC-103

Parameter	Samp#	BOC2S2	BOC2S3	BOC2S4	BOC2S7	BOC2S8	BOC2S9
	Date	6-23-94	6-23-94	6-23-94	6-23-94	6-23-94	6-23-94
	Location	SPRING 9,3 ft	SPRING 9,3 ft	SPRING 9,3 ft	SPRING 9,10 ft	SPRING 9,10 ft	SPRING 9,10 ft
	Depth	1.25	2.25	2.25	1.92	3.75	3.75
	Type	WATER	WATER	DUPLICATE	WATER	WATER	DUPLICATE
	Comments	---	---	---	---	---	---
	Units	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
URANIUM	UG/L	0.488	0.501	0.512	0.446	0.494	0.481

*Verified
sgm 8/23/94*

9613497.0680

9613497.0681

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

300-FF-5

Spring # 9
Site 3 ft.
mid Depth

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0110
LAB SAMPLE ID:	40656504	MATRIX:	WATER
CLIENT ID:	<u>BOC2S2</u>	DATE RECEIVED:	6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	4.88E-01	N/A	7.30E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

Verified
sgm 8/17/94

~~0009~~

008

9613497.0682

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

300-FF-5

Spring #9

Site 32A

Bottom Depth

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0110
LAB SAMPLE ID:	40656505	MATRIX:	WATER
CLIENT ID:	<u>B0C2S3</u>	DATE RECEIVED:	6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	5.01E-01	N/A	7.50E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

Verified
sgm 8/17/94

009 ~~0010~~

9613497.0683

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

300-FF-5

SAMPLE RESULTS

Spring #9
Site 3 ft.
Bottom Depth
Duplicate

LAB NAME: ITAS-RICHLAND
LAB SAMPLE ID: 40656506
CLIENT ID: B0C2S4

SDG: W0110
MATRIX: WATER
DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	5.12E-01	N/A	7.70E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

Verified
sgm 3/17/94

~~0011~~

010

9613497.0684

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

sgm 8/17/94

300-FF-S, Spring #9

SAMPLE RESULTS

*Site 10 St.
mid level Depth
sgm 8/17/94*

LAB NAME: ITAS-RICHLAND
LAB SAMPLE ID: 40656501
CLIENT ID: B0C2S7

SDG: W0110
MATRIX: WATER
DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	4.46E-01	N/A	6.70E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

*Verified
sgm 8/17/94*

011 ~~0006~~

9613497.0685

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

300-FF-5

SAMPLE RESULTS

Spring #9
Site 10 St.
Bottom Depth

LAB NAME: ITAS-RICHLAND SDG: W0110
LAB SAMPLE ID: 40656502 MATRIX: WATER
CLIENT ID: BOC2S8 DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	4.94E-01	N/A	7.40E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

Verified
sgm 8/17/94

012 ~~0007~~

9613497.0686

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

300-FF-5

SAMPLE RESULTS

Spring # 9
Site 10 ft.
Bottom Depth
Duplicate

LAB NAME: ITAS-RICHLAND
LAB SAMPLE ID: 40656503
CLIENT ID: B0C2S9

SDG: W0110
MATRIX: WATER
DATE RECEIVED: 6/24/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	4.81E-01	N/A	7.20E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results:

Verified
sgm 8/17/94

013

~~0008~~

9613497.0687

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION



CERTIFICATE OF ANALYSIS

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

July 29, 1994

Attention: J.A.Lerch

SAF Number	:	94-083
Date SDG Closed	:	June 29, 1994
Number of Samples	:	Six (6)
Sample Type	:	Water
SDG Number	:	W0110
Data Deliverable	:	Stand Alone

I. Introduction

On June 24, 1994, six water samples were received by ITAS-Richland for radiochemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the WHC specific ID:

<u>ITAS-Richland ID</u>	<u>WHC ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
406565-01A	B0C2S7	Water	6/24/94
406565-02A	B0C2S8	Water	6/24/94
406565-03A	B0C2S9	Water	6/24/94
406565-04A	B0C2S2	Water	6/24/94
406565-05A	B0C2S3	Water	6/24/94
406565-06A	B0C2S4	Water	6/24/94

015

Regional Office

2800 George Washington Way • Richland, Washington 99352-1613 • 509-375-3131 • FAX: 509-375-5590

IT Corporation is a wholly owned subsidiary of International Technology Corporation

~~0003~~

Westinghouse Hanford Company
July 29, 1994
Page 2

II. Analytical Results/Methodology

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

The requested analysis was: **Total Uranium**
 Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for the analysis performed under SDG W0110 include one Laboratory Control Sample (LCS), two matrix spikes, 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 these samples classified them as Category I.

Total Uranium by method ITAS-RD-4200

Two matrix spikes were analyzed with this batch. The matrix spike, LCS, batch blank, sample and sample duplicate (duplicate of sample B0C2S7) results are within contractual requirements.

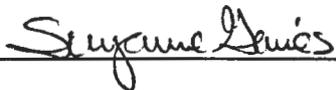
016

~~0004~~

Westinghouse Hanford Company
July 29, 1994
Page 3

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

017

~~0005~~

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Transmitted
 Priority
 Normal

Collector: *Reck, J. M. Miller*
 Company Contact: LC Hulstrom
 Telephone No.: (509) 376-4034
 Project Designation: 300-FF-5
 Sampling Location: 300-FF-5 S9P3
 SAF No.: 94-083
 Ice Chest No.:
 Field Logbook No.: BNW 55520
 Method of Shipment: Hand Deliver
 Shipped To: ITAS
 Office Property No.:
 Date of Loading/Air BN No.:

Preservative	HNO ₃	HNO ₃	HNO ₃															
Type of Container	P	P	P															
No. of Container(s)	1	1	1															
Volume	1000 ml	1000 ml	1000 ml															
Special Handling and/or Storage	COOL TO 4 DEGREES CENTIGRADE																	
SAMPLE ANALYSIS	406504	1106505																
		URAN	ICP	ICP(F)														

Sample No.	Matrix	Date Sampled	Time Sampled															
BOC2S2	v	6/23/94	0850	41														
BOC2S3 01	v	6/23/94	0855	51	1													
BOC2S4 02	v	6/23/94	0855	61	1													
BOC2S5 03	v	6/23/94	0855			1												
BOC2S6 04	v	6/23/94	0855				1											

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix
Relinquished By: <i>Reck, J. M. Miller</i> Date/Time: 6/23/94 1500	Received By: <i>TL Van Arsdale</i> Date/Time: 6/23/94 1500	<p>STG W0110</p>	<ul style="list-style-type: none"> S = Soil SE = Sediment SN = Solid SL = Sludge W = Water O = Oil A = Air DS = Drums Solids DL = Drums Liquid T = Tissue WL = Wire L = Liquid V = Vegetation X = Other
Relinquished By: <i>J. J. Orr</i> Date/Time: 6/24/94 1030	Received By: <i>J. M. Miller</i> Date/Time: 6-24-94 1030		
Relinquished By: <i>J. M. Miller</i> Date/Time: 6-24-94 1100	Received By: <i>J. M. Miller</i> Date/Time: 6-24-94 1100		
Relinquished By:	Received By:		

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

DISTRIBUTION: Original - Sample Yellow - Sampler

018

7613197-0691

0000041

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Transmitted
 Priority
 Normal

Collector Reck, M. Ellis Company Contact LC Hulstrom Telephone No. (509) 376-4034
 Project Designation 300-FF-5 Sampling Location 300-FF-5 S9P10 SAF No. 94-083
 Ice Chest No. Field Logbook No. BNW 55520 Method of Shipment Hand Deliver
 Shipped To ITAS Office Property No. BNL of Lading/Air Bill No.

Possible Sample Hazards/Remarks	Preservative	HNO ₃	HNO ₃	HNO ₃														
	Type of Container	No. of Container(s)	Volume	URAN	ICP	ICP(F)												
Special Handling and/or Storage <u>COOL TO 4 DEGREES CENTIGRADE</u>	P	1	1000 ml	1000 ml	1000 ml													
SAMPLE ANALYSIS <u>406564</u>																		
				<u>406565</u>														

Sample No.	Matrix*	Date Sampled	Time Sampled															
BOC2S7	V	6/23/94	0915	10														
BOC2S8 05	V	6/23/94	0920	10	1													
BOC2S9 06	V	6/23/94	0920	10	1													
BOC2T0 07	V	6/23/94	0920			1												
BOC2T1 08	V	6/23/94	0920			1												

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix*	
Relinquished By <u>Reck, M. Ellis</u>	Date/Time <u>6/23/94 1500</u>	Received By <u>TL Van Arsdale</u>	Date/Time <u>6/23/94 1500</u>	<u>STIX WO 110</u>		S	Soil
Relinquished By <u>J. J. Orr</u>	Date/Time <u>6/24/94 1030</u>	Received By <u>M. J. ...</u>	Date/Time <u>6-24-94 1030</u>			SE	Sediment
Relinquished By <u>M. J. ...</u>	Date/Time <u>6-24-94 1100</u>	Received By <u>...</u>	Date/Time <u>...</u>			SN	Solid
Relinquished By	Date/Time	Received By	Date/Time			SL	Sludge

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	<u>0000038</u>	Disposed By

- S = Soil
- SE = Sediment
- SN = Solid
- SL = Sludge
- W = Water
- O = Oil
- A = Air
- OS = Other Solids
- UL = Other Liquids
- T = Trace
- WI = Wire
- L = Liquid
- V = Vegetation
- X = Other

010

REMARKS: Original - Sample Yellow - Sampler

9613497.0693

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 300-FFS			DATA PACKAGE: W0110-ITC-103		
VALIDATOR: AGM		LAB: ITC		DATE: 08/17/94	
CASE:			SDG: W0110-ITC-103		
ANALYSES PERFORMED					
<input type="checkbox"/> Gross Alpha/Beta	<input type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input type="checkbox"/> Alpha Spectroscopy	<input type="checkbox"/> Gamma Spectroscopy	
<input checked="" type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input type="checkbox"/>		
SAMPLES/MATRIX Waters					
BOC257 BOC254					
BOC258					
BOC259					
BOC252					
BOC253					

1. Completeness N/A

Technical verification forms present? **Yes** No N/A

Comments: _____

2. Initial Calibration N/A

Instruments/detectors calibrated within one year of sample analysis? **Yes** No N/A

Initial calibration acceptable? **Yes** No N/A

Standards NIST traceable? **Yes** No N/A

Standards Expired? Yes **No** N/A

Comments: _____

3. Continuing Calibration N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards NIST traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Comments: _____

4. Blanks N/A

Method blank analyzed? Yes No N/A

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

Field blank(s) analyzed? Yes No N/A

Field blank results acceptable? Yes No N/A

Analytes detected in field blank(s)? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

5. Matrix Spikes N/A

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

Spike source traceable? Yes No N/A

Spike source expired? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

sgm 8/17/14

Comments: The MS & R were incorrectly calculated by the laboratory. The correct MS & R are attached and reported out on the attached MS summary forms. *sgm 8/17/14*

6. Laboratory Control Samples N/A

LCS analyzed? Yes No N/A

LCS recoveries acceptable? Yes No N/A

LCS traceable? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

7. Chemical Recovery N/A

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

Chemical carrier traceable? Yes No N/A

Chemical carrier expired? Yes No N/A

Transcription/Calculation errors? Yes No N/A

Comments: _____

8. Duplicates N/A

Duplicates Analyzed? Yes No N/A

RPD Values Acceptable? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

9. Field QC Samples N/A

Field duplicate sample(s) analyzed? Yes No N/A

Field duplicate RPD values acceptable? Yes No N/A

Field split sample(s) analyzed? Yes No N/A

Field split RPD values acceptable? Yes No N/A

Performance audit sample(s) analyzed? Yes No N/A

Performance audit sample results acceptable? Yes No N/A

Comments: See attached field duplicate precision worksheet.

10. Holding Times

Are sample holding times acceptable? Yes No N/A

Comments: Samples were collected on 6/23/94 and analyzed on 7/29/94.

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

Results reported for all required sample analyses? Yes No N/A

Results supported in raw data? Yes No N/A

Results Acceptable? Yes No N/A

Transcription/Calculation errors? Yes No N/A

MDA's meet required detection limits? Yes No N/A

Transcription/calculation errors? Yes No N/A

Comments: _____

MATRIX SPIKE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0110
 LAB SAMPLE ID: W0656501 MATRIX: WATER

ISOTOPE	SPIKE RESULT*	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	SAMPLE RESULT	EXPECTED RECOVERY
TOTAL-URANIUM	1.37E+00	N/A	2.05E-01	3.54E-03	UGM/	4.46E-01	9.11E-01

Number of Results:

~~150.38%~~
 101%
 sgm 8/17/94

* Spike result is NOT corrected for the sample result as according to the raw data.

$$MSR = \frac{1.37 - 0.446}{0.911} \times 100 = \boxed{101\%}$$

sgm 8/17/94

sgm 8/17/94

025

~~0015~~

MATRIX SPIKE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0110
 LAB SAMPLE ID: W0656502 MATRIX: WATER

ISOTOPE	SPIKE RESULT*	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	SAMPLE RESULT	EXPECTED RECOVERY
TOTAL-URANIUM	1.42E+00	N/A	2.13E-01	3.54E-03	UGM/	4.94E-01	9.03E-01

~~157.25%~~
 → 102.6%
 agm 8/17/94

Number of Results:

* Spike Result is NOT corrected for the sample result as according to the raw data.

$$MSR = \frac{1.42 - 0.494}{0.903} \times 100 = 102.6 = \boxed{103\%}$$

agm 8/17/94

026

~~0016~~

9613497.0700

SDG NO.: W0110-ITC-103			
SAMPLE ID: B0C2S8 DUPLICATE SAMPLE ID: B0C2S9			
SAMPLE LOCATION: SPRING #9, SITE 10 FT., BOTTOM DEPTH			
PARAMETER	B0C2S8 RESULT	B0C2S9 RESULT	RPD
TOTAL URANIUM	0.494	0.481	3
SAMPLE ID: B0C2S3 DUPLICATE SAMPLE ID: B0C2S4			
SAMPLE LOCATION: SPRING #9, SITE 3 FT., BOTTOM DEPTH			
PARAMETER	B0C2S3 RESULT	B0C2S4 RESULT	RPD
TOTAL URANIUM	0.501	0.512	2

sym
8/17/94

MEMORANDUM

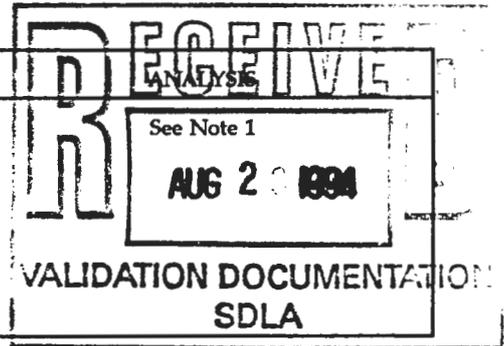
TO: 300-FF-5 Project QA Record

FR: Susan Manchester, Golder Associates Inc. *SJM*RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0110-ITC-103
(943-1610.001, Filename W0110-M.FF5)

INTRODUCTION

This memo presents the results of data validation on data package W0110-ITC-103 prepared by the International Technology Corporation (ITC) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B0C2S3	06/23/94	Water
B0C2S4	06/23/94	Water
B0C2S5	06/23/94	Water (Filtered)
B0C2S6	06/23/94	Water (Filtered)
B0C2S8	06/23/94	Water
B0C2S9	06/23/94	Water
B0C2T0	06/23/94	Water (Filtered)
B0C2T1	06/23/94	Water (Filtered)



Note 1. Samples were analyzed for CLP metals analyzed by ICP.

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.

Accuracy. Goals for accuracy were met.

Data Package ID: W0110-ITC-103

Analysis: Metals

Sample Result Verification. All sample results were supported in the raw data with the exception of the cobalt result for sample B0C2S8 which has been corrected on the laboratory report form and the qualified data summary.

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. A total of eight samples were validated in this data package with a total of 144 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, 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 data validation which required qualification of data as estimated.

Laboratory Blanks

- **Positive Blanks.** Aluminum, antimony, iron, manganese, potassium, and zinc were detected at positive concentrations in the associated calibration and/or preparation blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.
- **Negative Blanks.** Nickel and silver were detected at negative concentrations in the calibration blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

REFERENCES

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

WHC 1994, Validation of 300-FF-5 Data, Statement of Work, Environmental and Waste Characterization Analytical Data Validation, Task Order MSH-SWV-315905, August 10, 1994, Westinghouse Hanford Company, Richland, Washington.

9613497.0703

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

- B -** Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.
- U -** Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ -** Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.
- BJ -** Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- J -** Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- UR -** Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.
- R -** Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

9613497.0705

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
SDG: W0110-ITC-103 VALIDATOR: <i>[Signature]</i> DATE: September 6, 1994 PAGE <u>1</u> OF <u>1</u>			
COMMENTS: METALS ANALYSIS			
ALUMINUM	U	B0C2S3 B0C2S4	PRESENT IN ASSOCIATED CCB AT A POSITIVE CONCENTRATION
ANTIMONY	U	B0C2S8	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION
IRON	U	B0C2S3 B0C2S4 B0C2S5 B0C2S6 B0C2S8 B0C2S9 B0C2T0 B0C2T1	PRESENT IN CCB AND PREP. BLANK AT POSITIVE CONCENTRATIONS
MANGANESE	U	B0C2S5 B0C2S6 B0C2T0 B0C2T1	PRESENT IN ICB, CCB, AND PREP. BLANK AT POSITIVE CONCENTRATIONS
NICKEL	UJ	B0C2S3 B0C2S4 B0C2S5 B0C2S6 B0C2S8 B0C2S9 B0C2T0 B0C2T1	PRESENT IN CCB AT NEGATIVE CONCENTRATIONS
POTASSIUM	U	B0C2S3 B0C2S4 B0C2S6 B0C2S8 B0C2S9 B0C2T0 B0C2T1	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION
SILVER	UJ	B0C2S3 B0C2S4 B0C2S5 B0C2S6 B0C2S8 B0C2S9 B0C2T0 B0C2T1	PRESENT IN ICB AND CCB AT NEGATIVE CONCENTRATIONS
ZINC	U	B0C2S3 B0C2S4 B0C2S5 B0C2S6 B0C2S8 B0C2S9 B0C2T0 B0C2T1	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION

9613497.0707

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0110-ITC-103

Parameter	Samp# Date Location Depth Type Comments	BOC2S3 6-23-94 SPRING 9,3 ft 2.25 WATER ---		BOC2S4 6-23-94 SPRING 9,3 ft 2.25 DUPLICATE ---		BOC2S5 6-23-94 SPRING 9,3 ft 2.25 WATER FILTERED		BOC2S6 6-23-94 SPRING 9,3 ft 2.25 DUPLICATE FILTERED		BOC2S8 6-23-94 SPRING 9,10 ft 3.75 WATER ---		BOC2S9 6-23-94 SPRING 9,10 ft 3.75 DUPLICATE ---	
	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	UG/L	67.700	U	70.400	U	19.000	U	19.000	U	68.000	B	45.400	B
ANTIMONY	UG/L	19.500	U	19.500	U	19.500	U	19.500	U	32.700	U	19.500	U
BARIUM	UG/L	28.400	B	27.800	B	28.400	B	27.000	B	29.900	B	27.800	B
BERYLLIUM	UG/L	0.300	U	0.300	U	0.300	U	0.300	U	0.300	U	0.300	U
CADMIUM	UG/L	1.800	U	1.800	U	1.800	U	1.800	U	2.000	B	1.800	U
CALCIUM	UG/L	19200.000		19300.000		20700.000		18700.000		20100.000		19400.000	
CHROMIUM	UG/L	2.800	U	2.800	U	2.800	U	2.800	U	2.800	U	2.800	U
COBALT	UG/L	29.000	U	29.000	U	29.000	U	29.000	U	29.000	U	29.000	U
COPPER	UG/L	4.500	U	4.500	U	4.500	U	4.500	U	7.200	B	4.500	U
IRON	UG/L	86.000	U	95.000	U	10.200	U	13.600	U	78.200	U	55.300	U
MAGNESIUM	UG/L	4460.000	B	4470.000	B	4740.000	B	4330.000	B	4580.000	B	4460.000	B
MANGANESE	UG/L	8.700	B	8.700	B	3.700	U	3.100	U	9.500	B	8.300	B
NICKEL	UG/L	4.900	UJ	4.900	UJ	4.900	UJ	4.900	UJ	4.900	UJ	4.900	UJ
POTASSIUM	UG/L	1060.000	U	1010.000	U	1340.000	B	1020.000	U	1120.000	U	955.000	U
SILVER	UG/L	4.200	UJ	4.200	UJ	4.200	UJ	4.200	UJ	4.200	UJ	4.200	UJ
SODIUM	UG/L	2490.000	B	2520.000	B	2630.000	B	2370.000	B	2430.000	B	2380.000	B
VANADIUM	UG/L	9.800	U	9.800	U	9.800	U	10.400	B	12.500	B	9.800	U
ZINC	UG/L	21.200	U	6.900	U	11.200	U	6.700	U	7.200	U	10.400	U

9613497.0708

*Verified
SPM 8/23/94*

Validated Data Summary, Data Package: W0110-ITC-103

Parameter	Samp#	BOC2T0		BOC2T1	
	Date	6-23-94		6-23-94	
	Location	SPRING 9,10 ft		SPRING 9,10 ft	
	Depth	3.75		3.75	
	Type	WATER		DUPLICATE	
	Comments	FILTERED		FILTERED	
	Units	Result	Q	Result	Q
ALUMINUM	UG/L	19.000	U	19.000	U
ANTIMONY	UG/L	19.500	U	19.500	U
BARIUM	UG/L	27.800	B	27.000	B
BERYLLIUM	UG/L	0.300	U	0.300	U
CADMIUM	UG/L	1.800	U	1.800	U
CALCIUM	UG/L	19000.000		18200.000	
CHROMIUM	UG/L	2.800	U	2.800	U
COBALT	UG/L	29.000	U	29.000	U
COPPER	UG/L	4.500	U	4.500	U
IRON	UG/L	14.200	U	15.200	U
MAGNESIUM	UG/L	4370.000	B	4210.000	B
MANGANESE	UG/L	3.000	U	2.700	U
NICKEL	UG/L	4.900	UJ	4.900	UJ
POTASSIUM	UG/L	1050.000	U	869.000	U
SILVER	UG/L	4.200	UJ	4.200	UJ
SODIUM	UG/L	2430.000	B	2400.000	B
VANADIUM	UG/L	9.800	U	9.800	U
ZINC	UG/L	5.300	U	8.300	U

Verified
 agm 8/23/94

9613497.0709

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
300-FF-5

BOC2S3

Lab Name: ITAS ST. LOUIS Contract: 519.59

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0110

Matrix (soil/water): WATER 300-FF-5 Lab Sample ID: 5435-009

Level (low/med): LOW Spring #9, Site 35A Date Received: 06/24/94

% Solids: 0.0 Bottom Depth

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	67.7	B		P
7440-36-0	Antimony	19.5	U		P
7440-39-3	Barium	28.4	B		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	19200			P
7440-47-3	Chromium	2.8	U		P
7440-48-4	Cobalt	29.0	U		P
7440-50-8	Copper	4.5	U		P
7439-89-6	Iron	86.0	B		P
7439-95-4	Magnesium	4460	B		P
7439-96-5	Manganese	8.7	B		P
7440-02-0	Nickel	4.9	U		P
7440-09-7	Potassium	1060	B		P
7440-22-4	Silver	4.2	U		P
7440-23-5	Sodium	2490	B		P
7440-62-2	Vanadium	9.8	U		P
7440-66-6	Zinc	21.2			P

Q13
3
333
3

~~0000045~~

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Verified
sgm 8/18/94

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOC2S5
Filtered

Lab Name: ITAS_ST._LOUIS Contract: 519.59

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0110

Matrix (soil/water): WATER *300-FF-5* Lab Sample ID: 5435-011

Level (low/med): LOW *Spring #9, Site 35A* Date Received: 06/24/94

% Solids: 0.0 *Bottom Depth Filtered*

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19.0	U		P
7440-36-0	Antimony	19.5	U		P
7440-39-3	Barium	28.4	B		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	20700			P
7440-47-3	Chromium	2.8	U		P
7440-48-4	Cobalt	29.0	U		P
7440-50-8	Copper	4.5	U		P
7439-89-6	Iron	10.2	B		P
7439-95-4	Magnesium	4740	B		P
7439-96-5	Manganese	3.7	B		P
7440-02-0	Nickel	4.9	U		P
7440-09-7	Potassium	1340	B		P
7440-22-4	Silver	4.2	B		P
7440-23-5	Sodium	2630	B		P
7440-62-2	Vanadium	9.8	U		P
7440-66-6	Zinc	11.2	B		P

Q
3 3585 3

sgm 8/18/94

45000047

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

*Verified
sgm 8/18/94*

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS_ST_LOUIS Contract: 519.59

BOC2S6
Filtered

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0110

Matrix (soil/water): WATER 300-FF-5 Lab Sample ID: 5435-012

Level (low/med): LOW Spring #9, Site 3 Ft. Date Received: 06/24/94

% Solids: 0.0 Bottom Depth - Filtered Duplicate

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19.0	U		P
7440-36-0	Antimony	19.5	U		P
7440-39-3	Barium	27.0	B		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	18700			P
7440-47-3	Chromium	2.8	U		P
7440-48-4	Cobalt	29.0	U		P
7440-50-8	Copper	4.5	U		P
7439-89-6	Iron	13.6	B		P
7439-95-4	Magnesium	4330	B		P
7439-96-5	Manganese	3.1	B		P
7440-02-0	Nickel	4.9	U		P
7440-09-7	Potassium	1020	B		P
7440-22-4	Silver	4.2	U		P
7440-23-5	Sodium	2370	B		P
7440-62-2	Vanadium	10.4	B		P
7440-66-6	Zinc	6.7	B		P

Q

3
3
3
3

sgm 8/18/94

000000

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Verified
sgm 8/18/94

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOC2S8

Lab Name: ITAS_ST._LOUIS Contract: 519.59

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0110

Matrix (soil/water): WATER 300-FF-S Lab Sample ID: 5435-013

Level (low/med): LOW ~~Site 10 ft~~ Date Received: 06/24/94

% Solids: 0.0

Spring #9, Site 10 ft.
Bottom Depth

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	68.0	B		P
7440-36-0	Antimony	32.7	B		P
7440-39-3	Barium	29.9	B		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	2.0	B		P
7440-70-2	Calcium	20100			P
7440-47-3	Chromium	2.8	U		P
7440-48-4	Cobalt	29.0	B		P
7440-50-8	Copper	7.2	B		P
7439-89-6	Iron	78.2	B		P
7439-95-4	Magnesium	4580	B		P
7439-96-5	Manganese	9.5	B		P
7440-02-0	Nickel	4.9	U		P
7440-09-7	Potassium	1120	B		P
7440-22-4	Silver	4.2	U		P
7440-23-5	Sodium	2430	B		P
7440-62-2	Vanadium	12.5	B		P
7440-66-6	Zinc	7.2	B		P

2
3
3
3
3
3

sgm 8/18/94

000000

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Verified
sgm 8/18/94

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOC2S9

Lab Name: ITAS_ST._LOUIS Contract: 519.59

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0110

Matrix (soil/water): WATER 300-FF-5 Lab Sample ID: 5435-014

Level (low/med): LOW Spring #9 Date Received: 06/24/94

% Solids: 0.0 Bottom Depth - Duplicate

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	45.4	B		P
7440-36-0	Antimony	19.5	U		P
7440-39-3	Barium	27.8	B		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	19400			P
7440-47-3	Chromium	2.8	U		P
7440-48-4	Cobalt	29.0	U		P
7440-50-8	Copper	4.5	U		P
7439-89-6	Iron	55.3	B		P
7439-95-4	Magnesium	4460	B		P
7439-96-5	Manganese	8.3	B		P
7440-02-0	Nickel	4.9	U		P
7440-09-7	Potassium	955	B		P
7440-22-4	Silver	4.2	U		P
7440-23-5	Sodium	2380	B		P
7440-62-2	Vanadium	9.8	U		P
7440-66-6	Zinc	10.4	B		P

2
3
3
3

0000050

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

Verified
JMM 8/18/94

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ROC2T0
F. Hesse

Lab Name: ITAS_ST._LOUIS Contract: 519.59

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0110

Matrix (soil/water): WATER 300-FF-5 Lab Sample ID: 5435-015

Level (low/med): LOW Spring #9 Date Received: 06/24/94

% Solids: 0.0 Site 10 ft - Bottom Depth Filtered

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19.0	U		P
7440-36-0	Antimony	19.5	U		P
7440-39-3	Barium	27.8	B		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	19000			P
7440-47-3	Chromium	2.8	U		P
7440-48-4	Cobalt	29.0	U		P
7440-50-8	Copper	4.5	U		P
7439-89-6	Iron	14.2	B		P
7439-95-4	Magnesium	4370	B		P
7439-96-5	Manganese	3.0	B		P
7440-02-0	Nickel	4.9	U		P
7440-09-7	Potassium	1050	B		P
7440-22-4	Silver	4.2	U		P
7440-23-5	Sodium	2430	B		P
7440-62-2	Vanadium	9.8	U		P
7440-66-6	Zinc	5.3	B		P

Q
3
3
3

0000051

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Verified
sgm 8/18/94

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOC2T1
Filtered

Lab Name: ITAS_ST._LOUIS Contract: 519.59

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0110

Matrix (soil/water): WATER 300-FF-5 Lab Sample ID: 5435-016

Level (low/med): LOW Spring #9 Date Received: 06/24/94

% Solids: 0.0 Site 10 - Bottom Depth, Filtered Duplicate

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19.0	U		P
7440-36-0	Antimony	19.5	U		P
7440-39-3	Barium	27.0	B		P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	1.8	U		P
7440-70-2	Calcium	18200			P
7440-47-3	Chromium	2.8	U		P
7440-48-4	Cobalt	29.0	U		P
7440-50-8	Copper	4.5	U		P
7439-89-6	Iron	15.2	B		P
7439-95-4	Magnesium	4210	B		P
7439-96-5	Manganese	2.7	B		P
7440-02-0	Nickel	4.9	U		P
7440-09-7	Potassium	869	B		P
7440-22-4	Silver	4.2	U		P
7440-23-5	Sodium	2400	B		P
7440-62-2	Vanadium	9.8	U		P
7440-66-6	Zinc	8.3	B		P

Q
3
3
3
3
3

0000052

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Verified
sgm 8/18/94

9613497.0718

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

CERTIFICATE OF ANALYSIS

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

July 28, 1994

Attention: J. A. Lerch



Project number	:	519.59
Date Received by Lab	:	June 24, 1994
Number of Samples	:	Eight (8)
Sample Type	:	Water
SDG Number	:	W0110
Data Deliverable	:	Standalone

RECORD COPY

I. Introduction

On June 24, 1994, eight (8) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with their specific client ID's:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
5435-009	BOC2S3	40656401	Water	06/24/94
5435-010	BOC2S4	40656402	Water	06/24/94
5435-011	BOC2S5	40656403	Water	06/24/94
5435-012	BOC2S6	40656404	Water	06/24/94
5435-013	BOC2S8	40656405	Water	06/24/94
5435-014	BOC2S9	40656406	Water	06/24/94
5435-015	BOC2T0	40656407	Water	06/24/94
5435-016	BOC2T1	40656408	Water	06/24/94

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.

Analyses requested: ICP Metals by method CLP90.

~~0001~~

Westinghouse Hanford Company
July 28, 1994
Project Number: 519.59
Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and 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

There were no comments or nonconformances associated with these samples.

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\hanw0110.nar

020

~~0002~~

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Transmitted
 Priority
 Normal

Collector <i>Reck, Mark</i>	Company Contact LC Hulstrom	Telephone No. (509) 376-4034
Project Designation 300-FF-5	Sampling Location 300-FF-5 S9P3	SAF No. 94-083
Ice Chest No.	Field Logbook No. BNW 55520	Method of Shipment Hand Deliver
Shipped To ITAS	Offsite Property No.	DN of Logging/Alt DN No.

Possible Sample Hazards/Remarks	Preservative	HNO ₃	HNO ₃	HNO ₃														
		Type of Container	P	P	P													
	No. of Container(s)	1	1	1														
	Volume	1000 ml	1000 ml	1000 ml														
		URAN	ICP	ICP(F)														

Special Handling and/or Storage
COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS

406564

1106565

Sample No.	Matrix	Date Sampled	Time Sampled															
BOC2S2	v	6/23/94	0850	41														
BOC2S3 01	v	6/23/94	0855	51	1													
BOC2S4 02	v	6/23/94	0855	61	1													
BOC2S5 03	v	6/23/94	0855			1												
BOC2S6 04	v	6/23/94	0855				1											

CHAIN OF POSSESSION		Signature Names		SPECIAL INSTRUCTIONS				Matrix	
Relinquished By <i>Reck, Mark</i>	Date/Time 6/23/94 1500	Received By <i>TL Van Arsdale</i>	Date/Time 6/23/94 1500	SIDE W0110				S	Soil
Relinquished By <i>J.J. Orr</i>	Date/Time 6/24/94 1030	Received By <i>Mark</i>	Date/Time 6-24-94 1030					SE	Soilment
Relinquished By <i>Mark</i>	Date/Time 6-24-94 1100	Received By <i>Mark</i>	Date/Time 6-24-94 1100					SN	Soil
Relinquished By	Date/Time	Received By	Date/Time					SL	Sludge
				W	Water			O	Oil
				A	Air			DS	Drum Solids
				DL	Drum Liquid			T	Tissue
				W	Wire			L	Liquid
				V	Vegetation			X	Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	0000041	Disposed By
			Date/Time

DISTRIBUTION: Original - Sample Yellow - Sampler

021

17/07/45196

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Transferred

Priority
 Normal

Collector <i>Reck, M. Williams</i>	Company Contact LC Hulstrom	Telephone No. (509) 376-4034
Project Designation 300-FF-5	Sampling Location 300-FF-5 S9P10	SAF No. 94-083
Ice Chest No.	Field Logbook No. BNW 55520	Method of Shipment Hand Deliver
Shipped To ITAS	Offsite Property No.	DN of Logging/Ab DN No.

Possible Sample Hazards/Remarks	Preservative	HNO ₃	HNO ₃	HNO ₃															
	Type of Container	P	P	P															
	No. of Containers	1	1	1															
	Volume	1000 ml	1000 ml	1000 ml															

Special Handling and/or Storage
COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS
406564

406305

URAN ICP ICP(F)

Sample No.	Matrix	Date Sampled	Time Sampled																
BOC2S7	v	6/23/94	0915	10															
BOC2S8 05	v	6/23/94	0920	12	1														
BOC2S9 06	v	6/23/94	0920	13	1														
BOC2T0 07	v	6/23/94	0920																
BOC2T1 08	v	6/23/94	0920																

CHAIN OF POSSESSION	Sign/Print Name	SPECIAL INSTRUCTIONS	Matrix
Relinquished By <i>Reck, M. Williams</i>	Date/Time 6/23/94 1500	Received By <i>TL Van Arsdale</i>	Date/Time 6/23/94 1500
Relinquished By <i>S.J. Orr</i>	Date/Time 6/24/94 1030	Received By <i>S. J. Orr</i>	Date/Time 6-24-94 1030
Relinquished By <i>William Hulstrom</i>	Date/Time 6-24-94 1100	Received By <i>William Hulstrom</i>	Date/Time 6-24-94 1100

STX
W0110

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposition	0000038	Disposed By

- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Dried Solid
- DL - Dried Liquid
- T - Tissue
- WI - Wire
- L - Liquid
- V - Vegetation
- X - Other

022

2700-7410-0722

9613497.0723

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	300-PP-5		DATA PACKAGE: W0110-ITC-103		
VALIDATOR:	sgm	LAB: ITC	DATE: 8/18/94		
CASE:			SDG: W0110-ITC-103		
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 <u>Waters</u>					
<u>Boc253</u>		<u>Boc258</u>			
<u>Boc254</u>		<u>Boc259</u>			
<u>Boc255</u>		<u>Boc260</u>			
<u>Boc256</u>		<u>Boc261</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: Samples were collected on
6/23/94 and analyzed on 7/12/94.

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: See attached blank summary form
and form B-7 for blank contaminants,
samples affected and qualifications
required.

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: _____

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: Refer to field duplicate precision worksheet attached to this checklist.

7. FURNACE AA QUALITY CONTROL

- Were duplicate injections performed as required? Yes No N/A
- Are duplicate injection %RSD values acceptable? Yes No N/A
- Were analytical spikes performed as required? Yes No N/A
- Are analytical spike recoveries acceptable? Yes No N/A
- Was MSA performed as required? Yes No N/A
- Are MSA results acceptable? Yes No N/A

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

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

Comments: All sample results were supported in the raw data with the exception of cobalt in sample B06258. The result has been corrected from a positive result (a "B" qualifier) to a nondetect (a "U" qualifier) as according to the raw data.

3
BLANKS

Lab Name: ITAS_ST._LOUIS _____ Contract: 519.59 _____
 Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0110 _____
 Preparation Blank Matrix (soil/water): WATER
 Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
		C	1	C	2	C	3	C		C	
Aluminum	19.0	U	32.5	B	19.0	U	19.0	U	19.000	U	P
Antimony	19.5	U	19.5	U	19.5	U	19.5	U	19.890	B	P
Barium	1.3	U	1.3	U	1.3	U	1.3	U	1.300	U	P
Beryllium	0.3	U	0.5	B	0.3	U	0.3	U	0.300	U	P
Cadmium	1.8	U	1.8	U	1.8	U	1.8	U	1.800	U	P
Calcium	17.2	B	35.0	B	23.0	B	22.7	B	178.670	B	P
Chromium	2.8	U	2.8	U	2.8	U	2.8	U	2.800	U	P
Cobalt	29.0	U	29.0	U	29.0	U	29.0	U	29.000	U	P
Copper	4.5	U	4.5	U	4.5	U	4.5	U	4.500	U	P
Iron	4.4	U	14.2	B	5.7	B	7.4	B	26.080	B	P
Magnesium	24.7	U	24.7	U	24.7	U	24.7	U	-33.710	B	P
Manganese	0.9	B	1.0	B	1.0	B	1.0	B	1.350	B	P
Nickel	4.9	U	4.9	U	6.7	B	-5.3	B	14.760	B	P
Potassium	207.9	U	207.9	U	207.9	U	207.9	U	250.520	B	P
Silver	-5.0	B	4.2	U	-7.1	B	-5.0	B	4.200	U	P
Sodium	26.3	U	26.3	U	26.7	B	32.0	B	98.980	B	P
Vanadium	9.8	U	9.8	U	9.8	U	9.8	U	9.800	U	P
Zinc	1.3	U	1.3	U	1.3	U	1.3	U	7.640	B	P

Assoc with
 BOC2S3
 BOC2S4 FORM III - IN
 BOC2S5
 BOC2S6

Assoc w/
 BOC2S8
 BOC2S9
 BOC2TO
 BOC2TI

sgw 8/13/94

0000058
 ILM03.0

Sample BOC258

Method: ITMD Sample Name: 5435-013 Operator: TGM
 Run Time: 07/12/94 17:14:07
 Comment: TJA 9000
 Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	L.00197	.06803	L.00531	.01519	.02986	L.00026	20.083
SDev	.00716	.03113	.00784	.00543	.00175	.00000	.683
ZRSD	362.94	45.762	147.83	35.727	5.8519	.00000	3.4025

#1	.00704	.09004	L.01085	.01903	.03110	L.00026	20.566
#2	L-.00309	.04602	L-.00024	.01135	.02863	L.00026	19.600

Errors	LC Low	LC Pass	LC Low	LC Pass	LC Pass	LC Low	LC Pass
High	10.000	700.00	100.00	100.00	100.00	100.00	600.00
Low	.00440	.01870	.02280	.00400	.00120	.00050	.01590

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00197	.00298	L.00230	.00715	.07826	.74678	1.1195
SDev	.00162	.00307	.00448	.00722	.00440	.28803	.0554
ZRSD	82.313	103.20	195.00	101.02	5.6194	38.569	4.9448

#1	.00311	.00515	.00547	.01226	.08137	.95044	1.1587
#2	L.00082	L.00080	L-.00087	L.00204	.07515	.54311	1.0804

Errors	LC Pass	LC Pass	LC Low	LC Pass	LC Pass	NOCHECK	LC Pass
High	50.000	50.000	500.00	100.00	500.00		1000.0
Low	.00160	.00190	.00270	.00480	.00520		.16540

Elem	Li	Hg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01213	4.5816	.00947	L.00207	2.4323	L.00251	L.01663
SDev	.00308	.1399	.00106	.00568	.0158	.00867	.02582
ZRSD	25.383	3.0544	11.206	274.52	.64885	344.64	155.29

#1	.01431	4.6805	.01022	.00609	2.4435	.00864	.03489
#2	.00996	4.4826	.00872	L-.00195	2.4212	L-.00361	L-.00163

Errors	LC Pass	LC Pass	LC Pass	LC Low	LC Pass	LC Low	LC Low
High	100.00	550.00	100.00	100.00	500.00	200.00	50.000
Low	.00210	.02510	.00050	.00250	.02700	.00500	.01830

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03266	L.00569	2.7672	.01901	.09457	.01111	.19215
SDev	.02449	.00090	.0888	.00326	.00071	.00276	.22403
ZRSD	74.973	15.768	3.2093	17.142	.75491	24.874	116.59

#1	.04998	L.00633	2.8300	.02132	.09507	.01306	.35056
#2	L.01535	L.00506	2.7044	.01671	.09406	.00915	L.03373

Errors	LC Pass	LC Low	LC Pass				
High	100.00	100.00	200.00	100.00	100.00	10.000	100.00
Low	.01920	.02850	.01290	.01640	.00020	.00300	.12100

0000108

Signature 8/23/94

SDG NO.: W0110-ITC-103									
SAMPLE LOCATION: SPRING #9, SITE 3 FT., BOTTOM DEPTH									
SAMPLE ID: B0C2S3 DUPLICATE SAMPLE ID: B0C2S4 MEDIA: UNFILTERED WATER					SAMPLE ID: B0C2S5 DUPLICATE SAMPLE ID: B0C2S6 MEDIA: FILTERED WATER				
PARAMETER	CRDL	B0C2S3 RESULT	B0C2S4 RESULT	RPD	PARAMETER	CRDL	B0C2S5 RESULT	B0C2S6 RESULT	RPD
BARIUM	200	28.4	27.8	2	BARIUM	200	28.4	27	5
CALCIUM	5000	19200	19300	1	CALCIUM	5000	20700	18700	10
MAGNESIUM	5000	4460	4470	0	MAGNESIUM	5000	4740	4330	9
MANGANESE	15	8.7	8.7	0	POTASSIUM	5000	1340	ND	200
SODIUM	5000	2490	2520	1	SODIUM	5000	2630	2370	10
					VANADIUM	50	ND	10.4	200
SAMPLE LOCATION: SPRING #9, SITE 10 FT. BOTTOM DEPTH									
SAMPLE ID: B0C2S8 DUPLICATE SAMPLE ID: B0C2S9 MEDIA: UNFILTERED WATER					SAMPLE ID: B0C2T0 DUPLICATE SAMPLE ID: B0C2T1 MEDIA: FILTERED WATER				
PARAMETER	CRDL	B0C2S8 RESULT	B0C2S9 RESULT	RPD	PARAMETER	CRDL	B0C2T0 RESULT	B0C2T1 RESULT	RPD
ALUMINUM	200	68	45.4	40	BARIUM	200	27.8	27	3
BARIUM	200	29.9	27.8	7	CALCIUM	5000	19000	18200	4
CADMIUM	5	2	ND	200	MAGNESIUM	5000	4370	4210	4
CALCIUM	5000	20100	19400	4	SODIUM	5000	2430	2400	1
COPPER	25	7.2	ND	200					
MAGNESIUM	5000	4580	4460	3					
MANGANESE	15	9.5	8.3	13					
SODIUM	5000	2430	2380	2					
VANADIUM	50	12.5	ND	200					

9613497.0729

gmc
8/19/94

029