START 9613408.2908 9309L849-WES-1288

0043475

WESTON

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client : WESTINGHOUSE HANFORD
RFW# : 9309L849

W.O. #: 06168-002-001-9999-00
Date Received: 09-09-93

INORGANIC

The following is a summary of the quality control results and a description of any problems encountered during the analysis of this batch of samples:

1. All sample holding times as required by 40CFR136 were met with the exception of Nitrite by IC and Phosphate by IC, which were received past hold.

2. All preparation blank results were below the required detection limits.

3. All laboratory control standards (blank spikes) were within the control limits of 80-120%. All %RPD were within the 20% guidance limit.

4. All calibration verification checks were within the required control limits of 90-110%. Calibration verification is performed using independent standards.

5. Matrix spike recoveries are summarized on the Inorganic Accuracy Report contained within this document. All recoveries were within the 75-125% guidance limits. All %RPD were within the 20% guidance limit.

6. Replicate results are summarized on the Inorganic Precision Report contained within this document. All results were within the 20% RPD guidance limit.

7. The analytical methods applied by the laboratory, unless otherwise requested, for all inorganic analyses are derived from the USEPA Method for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), Standard Methods for the Examination of Water and Wastewater 16 ed. and Test Methods for Evaluating Solid Waste (USEPA SW846).

10.2.93

J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

Date

FEB 1996 RECEIVED EDMC

OCT 1993 RECEIVED SDLA

pas/i09-849

0001

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 09/27/93

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9309L849

WORK ORDER: 06168-002-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B09505	Alkalinity	96.0		MG/L	2.0	1.0
		Chloride by IC	26.8		MG/L	1.2	5.0
		Fluoride by IC	0.50	u	MG/L	0.50	1.0
		Nitrite by IC	0.25	u	MG/L	0.25	1.0
		Cyanide, Total	20.0	u	UG/L	20.0	1.0
		Phosphate by IC	0.25	u	MG/L	0.25	1.0
		Sulfate by IC	86.4		MG/L	5.0	20.0
		Nitrate Nitrite	2.1		MG-N/L	0.50	5.0
		Sulfate	94.3		MG/L	10.0	4.0
		Total Dissolved Solids	399		MG/L	5.0	1.0

9613408.2910

93094849

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-93-0198
Record of Disposition No.

DATE: November 5, 1993

LABORATORY: Weston

PROJECT TITLE/NO.: 200-BP-1 Groundwater Sampling — 8th Round/ 93-266

NCR NO.: None

SAMPLE IDENTIFICATION NUMBERS:

— B09501	— B094Y9	— B094Z1	— B09503	— B09559
— B094V3	— B094V7	— B094V9	— B094W1	— B094W5
— B094X3	— B094X5	— B094X7	— B094X9	— B094Z3
— B09561	— B09505	— B094W3	— B094X1	— B09509
— B09521	— B09541	— B09543	— B09545	— B094Z5

DESCRIPTION OF EVENT:

►► Sulfate analysis was requested by both EPA 300.0 and EPA 375.4 methods.

DISPOSITION OF SAMPLES:

►► Cancel sulfate analysis by EPA 375.4, and perform analysis by EPA 300.0. Analysis for metals is to include the full CLP target analysis list plus silica and bismuth.

APPROVAL SIGNATURES:

J. A. Lerch/ 11/5/93
OSM Project Coordinator (Print/Sign Name) Date

M. A. Buckmaster/ 11/8/93
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

9613408.2911

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

DATE: April 25, 1994

TO: 9309L849-WES-1288

FROM: Pat Reich H4-19

Telephone: 372-2785

cc:

SUBJECT: DATA VALIDATION REPORT FOR 200-BP-1, 3RD QTR GROUNDWATER SAMPLING

The RAS validation report for this package is filed in SDG # 25016-WES-1275.

Pat Reich
SDLA

54-3000-101 (12/92) GEF014

WESTON Analytics Use Only
9309L849

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

0019

Client: Westinghouse - Hanford
Est. Final Proj. Sampling Date:
Work Order #: 06168-002-001-9999-00
Project Contact/Phone #:
AD Project Manager: Josie Edwards
QC: CLP Del: CLP TAT: 35 DAY
Date Rec'd: 9-9-93 Date Due: 10/14/93
Account #: WS-HANFORD

Refrigerator #						3	3	3	3	3	3	3	3	3			
#/Type Container	Liquid					1PL	1PL	1PL	1PL	1PL	1PL	1PL	1PL	1PL			
	Solid																
Volume	Liquid					250ml	250ml	500ml	1LPL	1LPL	250ml	250ml	1LPL				
	Solid																
Preservatives						—	H2SO4	—	HNO3	HNO3	—	—	HNO3				
ANALYSES REQUESTED →		ORGANIC				AHKL	NBN2	FLOR	INORG		TPS	SOV	Radio Chem	SOV metals			
		VOA	BNA	Pest/PCB	Herb				Metal Total	CN							
WESTON Analytics Use Only						IIAHKL	IIN3N2	IIFL IICCL IICGCL IICHCL IIRC-1	soil inlaw	ICUND	IITDS	ISOV	ISUB	SOV below			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
S - Soil	001	B09505			W	9/7/93	1325					X	X	X	X	X	X	X	X			
SE - Sediment	002	B09506			W	9/7/93	↓												X			
SO - Solid																						
SL - Sludge																						
W - Water																						
O - Oil																						
A - Air																						
DS - Drum Solids																						
DL - Drum Liquids																						
L - EP/TCLP Leachate																						
WI - Wipe																						
X - Other																						
F - Fish																						
		metals - HSL + Bi, Si																				

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

Temp = 4.1°C

Task # 93-266

Target Date - 16
Orig. Rewritten

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped X or
Hand Delivered ___
Airbill # 2536956015
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N
ICUND2, ICUB1

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec'd Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Emery	B Shuff	9-9-93	1325		BSS 9-9-93		
	BSS 9-9-93						

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# ____ Cooler# ____ 381-596a

9613408.2912

9613408.2913

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 200-BP1

Collection Date 9/7/93

Ice Chest No. ~~WHC~~ AJS 9/8/93 GWS056

Field Logbook No. WHC-N-446-1

Bill of Lading/Airbill No.

Offsite Property No. 253 695 6015

Method of Shipment WESTON

Shipped to

Possible Sample Hazards/Remarks

Sample Identification

BO 9505

1, 1L, P, WATER: METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi), SELENIUM (HNO3 pH<2) UNFILTERED
1, 500ml, G, WATER; IC ANIONS(F,Cl,SO4,NO2,PO4)
1, 500ml, P, WATER; NO2/NO3(H2SO4 pH<2)
1, 250ml, P, WATER; ALKALINITY
1, 250ml, P, WATER; TDS
1, 250ml, P, WATER; SULFATE
1, 1L, P, WATER; CYANIDE(NaOH pH>12)
3, 2L, P, WATER: GROSS ALPHA/BETA, GAMMA SPEC(Cs-137,Co-60,Ru-106), Pu-238, Pu-239/240, Sr-90, TOTAL URANIUM(HNO3 pH<2)
1, 250ml, Gs, WATER; TRITIUM
1, 1L, G/P, WATER; Tc-99(HCl pH<2)

BO 9506

1, 1L, P, WATER; METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi), SELENIUM (HNO3 pH<2) FILTERED

Temp. = 4.1°C

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
PCLde	9/7/93	1431	AJSimpson AJ SIMPSON	9/8/93	0819
AJSimpson AJ SIMPSON	9/8/93	0819			
Emery	9-9-93	13:25	B. Burnett	9-9-93	13:25

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Reline. to Frig #1C 1431 PCC

A-6000-407 (12/92) WEF061

9613408.2914

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD LEE/GG HAMILTON Date Sampled 9/7/93 Time 1325 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
BO 9505	1, 1L, P	WATER	METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi),
			SELENIUM (HNO3 pH<2)
	1, 500ml, G	WATER	IC ANIONS(F,Cl,SO4,NO2,PO4)
	1, 500ml, P	WATER	NO2/NO3(H2SO4 pH<2)
	1, 250ml, P	WATER	ALKALINITY
	1, 250ml, P	WATER	TDS
	1, 250ml, P	WATER	SULFATE
	1, 1L, P	WATER	CYANIDE (NaOH pH>12)
	3, 2L, P	WATER	GROSS ALPHA/BETA, GAMMA SPEC(Cs-137,Co-60,
			Ru-106), Pu-238, Pu-239/240, Sr-90, TOTAL
			URANIUM (HNO3 pH<2)
	1, 250ml, Gs	WATER	TRITIUM
	1, 1L, G/P	WATER	Tc-99 (HCl pH<2)
BO 9506	1, 1L, P	WATER	METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi),
			SELENIUM (HNO3 pH<2)
			TASK #: 93-266
		9/8/93 AJS	~~OPC #:~~ BOL# 2536955015
		AJS 9/8/93	~~BOL #:~~ OPC WA3-0-0718-23

Field Information** _____

Special Handling and/or Storage _____

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

0021

A-6000-406(05/90)

0023

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

Bill to Shipper ☐ Bill to Consignee ☐ Third Party Billing ☐

EMERY WORLDWIDE

A CF Company

SERVICES

UNITED STATES CANADA: Express ☐ Standard Plus ☐ Preferred ☐ Standard ☐ AM ☐ PM ☐ Second Day ☐ Saturday Delivery ☐

INTERNATIONAL: Express ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

Shipper's Account Number: E 85 7281585

Origin: DC

Shipment Number: 253695601 5

From:

WESTINGHOUSE SHIPPING DEPT. (509) 376-6665
U.S. DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA

Canada ☐

To:

RF WESTINGHOUSE
RF WESTON
25 6 WELSH POOL ROAD
LONVILLE PA USA 19341

Consignee's Account Number: E

Hold for Pick Up ☐ Canada ☐

Tariff Dest. | Gateway

Check to Shipper $

EMERY will accept Carrier's check with all risks being assumed by Shipper, including but not limited to non-payment, fraud and misrepresentation.

Declared Value $

Customer's Reference Numbers: W81232 PL3E A PT1AB W93-0718 99352

PH BUTCHER 422 & 423
2 COOLERS ID GWS056
540; SML 26 81#
WATER SAMPLE

Remarks: OVERNIGHT DELIVERY SIGNATURE SECURITY SERVICE

Pcs	Dimensions L	W	H	Total Pieces	Total Weight lbs.
2	11	16	11	2	139

Zip Ship ☐ For shipments within the 50 United States Shipper has the option to check this box and, by checking, agrees that the ZIP Ship conditions, described in the area to the right, apply.

Mark if Emery Packaging is used: Urgent Letter 9X12 ☐ Urgent Pack 12X15 ☐

FOR INFORMATION OR RATES CALL 1-800 44 EMERY (1-800-443-63 79)

2536956015

Commodity Code

Bill Charge

Third Party Account Number mandatory for Third Party Billing: E

Third Party Account Number

International Customs Value

International Insurance

Total Transportation Charges

Other Charges/Advance at Origin ☐ OC/AO $

3-PhL-A

Terms and Conditions on Back

9613408.2915

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9309L849

W.O. #: 06168-002-001-9999-00
Date Received: 09-09-93

CLP METALS

1. This narrative covers the analyses of two (2) water samples.

2. The samples were prepared and analyzed in accordance with the following protocols: CLP SOW 3/90.

3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.

4. All analyses were performed within the required holding times.

5. All Initial and Continuing Calibration Verifications (ICV/CCV's) were within control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.

7. All Preparation/Method Blanks were below Reporting Limits.

8. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.

9. All Laboratory Control Samples (LCS) were within the 80-120% control limits.

10. All Serial Dilution percent differences were within USEPA SOW control limits except for:

RFW #	Element	%Difference
001	Iron	11.1

11. All Matrix Spike recoveries were within the 75-125% control limits (exception allowed when sample concentration exceeds the spike added concentration by a factor of 4 or more)
except for:

RFW #	Element	%Recovery
001	Lead	70.5
	Selenium	13.0

For analytes where the Matrix Spike is out of control, a Post-digestion Matrix Spike and Serial Dilution are performed (exception allowed for Ag).
Matrix spike analyses are not required for Ca, Mg, Na, and K in waters.

WESTON

12. All Duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits for samples values greater than 5X Reporting Limit, or +/- the Reporting Limits for sample values less than 5X Reporting Limit.

13. Method of Standard Additions (MSA) analyses were performed on the following samples:

Element	Sample #'s
Selenium	001, 001R

14. The code CV is currently in use by the laboratory for both mercury instruments in operation (HG1 and HG2). HG1 is complete with autosampler and software, but still requires manual digestion; HG2 is operated by the analyst, produces a strip chart and also requires manual digestion.

15. HG1 requires less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionally scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 ml. For soils, 0.1 gram of sample is taken to a final volume of 50 ml (including all reagents).

16. ICP Interelement Correction Factors for IC1 and IC3 are included in this package, but do not appear on EDD.

17. The graphite furnace time that appears on form XIV is the time of the first injection. The time that appears on the data is the print time.

18. Solubles and totals were digested within the same digestion batch; therefore, will have the same flags.

Margaret M. Zeik for
Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

10/26/93
Date

mlj/clp-met.nar

9613408.2918

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9309L849

W.O. #: 06168-002-001-9999-00
Date Received: 09-09-93

CLP METALS ADDENDUM

1. Following Exhibit E, Section V, Item 10, page E-23 of the USEPA Statement of Work for Inorganics Analysis, Document Number ILM02.0 ICP Instrument Detection Limits (IDLs) are reported for two (2) ICP instruments. The instrument identification numbers are "IC1" and "IC3". The highest IDL for the two instruments is used for reporting concentration values in this sample data package.

2. A discrepancy exists between raw data and Form XIVs analytical spikes recovery calculations performed for graphite furnace AA analytes. Instrument software calculates spike recoveries based on absolute values below the IDL for sample results. This is hard-coded by the vendor and is currently not correctable. CLP convention (SOW ILM02.0, Exhibit E, Section V, Item 6, page E-20) requires that when values fall below the IDL, the sample result is equal to zero (0) for the purposes of calculating the percent recovery. The Form XIVs contain the correct calculation.

Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

10/26/93
Date

mlj\clp-met.nar

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 10/25/93

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9309L849

WORK ORDER: 06168-002-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B09505	Silver, Total	10.0	u	UG/L	10.0	1.0
		Aluminum, Total	200	u	UG/L	200	1.0
		Arsenic, Total	10.0	u	UG/L	10.0	1.0
		Barium, Total	200	u	UG/L	200	1.0
		Beryllium, Total	5.0	u	UG/L	5.0	1.0
		Bismuth, Total	150	u	UG/L	150	1.0
		Calcium, Total	53500		UG/L	5000	1.0
		Cadmium, Total	5.0	u	UG/L	5.0	1.0
		Cobalt, Total	50.0	u	UG/L	50.0	1.0
		Chromium, Total	14.3		UG/L	10.0	1.0
		Copper, Total	25.0	u	UG/L	25.0	1.0
		Iron, Total	378		UG/L	100	1.0
		Mercury, Total	0.20	u	UG/L	0.20	1.0
		Potassium, Total	7130		UG/L	5000	1.0
		Magnesium, Total	15700		UG/L	5000	1.0
		Manganese, Total	15.0	u	UG/L	15.0	1.0
		Sodium, Total	21800		UG/L	5000	1.0
		Nickel, Total	40.0	u	UG/L	40.0	1.0
		Lead, Total	3.0	u	UG/L	3.0	1.0
		Antimony, Total	60.0	u	UG/L	60.0	1.0
		Selenium, Total	7.8		UG/L	5.0	1.0
		Silicon, Total	20700		UG/L	100	1.0
		Thallium, Total	10.0	u	UG/L	10.0	1.0
		Vanadium, Total	50.0	u	UG/L	50.0	1.0
		Zinc, Total	24.4		UG/L	20.0	1.0

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 10/25/93

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9309L849

WORK ORDER: 06168-002-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B09506	Silver, Soluble	10.0	u	UG/L	10.0	1.0
		Aluminum, Soluble	200	u	UG/L	200	1.0
		Arsenic, Soluble	10.0	u	UG/L	10.0	1.0
		Barium, Soluble	200	u	UG/L	200	1.0
		Beryllium, Soluble	5.0	u	UG/L	5.0	1.0
		Bismuth, Soluble	150	u	UG/L	150	1.0
		Calcium, Soluble	51100		UG/L	5000	1.0
		Cadmium, Soluble	5.0	u	UG/L	5.0	1.0
		Cobalt, Soluble	50.0	u	UG/L	50.0	1.0
		Chromium, Soluble	10.0	u	UG/L	10.0	1.0
		Copper, Soluble	25.0	u	UG/L	25.0	1.0
		Iron, Soluble	100	u	UG/L	100	1.0
		Mercury, Soluble	0.20	u	UG/L	0.20	1.0
		Potassium, Soluble	6660		UG/L	5000	1.0
		Magnesium, Soluble	14400		UG/L	5000	1.0
		Manganese, Soluble	15.0	u	UG/L	15.0	1.0
		Sodium, Soluble	19600		UG/L	5000	1.0
		Nickel, Soluble	40.0	u	UG/L	40.0	1.0
		Lead, Soluble	3.0	u	UG/L	3.0	1.0
		Antimony, Soluble	60.0	u	UG/L	60.0	1.0
		Selenium, Soluble	5.0	u	UG/L	5.0	1.0
		Silicon, Soluble	19600		UG/L	100	1.0
		Thallium, Soluble	10.0	u	UG/L	10.0	1.0
		Vanadium, Soluble	50.0	u	UG/L	50.0	1.0
		Zinc, Soluble	27.4		UG/L	20.0	1.0

9613408.2921

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09505

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP849

Matrix (soil/water): WATER Lab Sample ID: 930984901

Level (low/med): LOW Date Received: 9/09/93

% 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	73.60	B		P
7440-36-0	Antimony	46.00	U		P
7440-38-2	Arsenic	3.00	U		F
7440-39-3	Barium	118.00	B		P
7440-41-7	Beryllium	2.00	B		P
7440-43-9	Cadmium	5.00	U		P
7440-70-2	Calcium	53500.00			P
7440-47-3	Chromium	14.30			P
7440-48-4	Cobalt	25.20	B		P
7440-50-8	Copper	13.10	B		P
7439-89-6	Iron	378.00		E	P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	15700.00			P
7439-96-5	Manganese	12.20	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	31.40	B		P
7440-09-7	Potassium	7130.00			P
7782-49-2	Selenium	7.80		NS	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	21800.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	42.10	B		P
7440-66-6	Zinc	24.40			P
	Cyanide	20.00	U		C

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613408.2922

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09506

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP849

Matrix (soil/water): WATER Lab Sample ID: 930984902

Level (low/med): LOW Date Received: 9/09/93

% 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	48.00	U		P
7440-36-0	Antimony	46.00	U		P
7440-38-2	Arsenic	3.30	B		F
7440-39-3	Barium	56.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	5.00	U		P
7440-70-2	Calcium	51100.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	7.00	U		P
7440-50-8	Copper	7.00	U		P
7439-89-6	Iron	86.20	B	E	P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	14400.00			P
7439-96-5	Manganese	4.60	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	12.00	U		P
7440-09-7	Potassium	6660.00			P
7782-49-2	Selenium	2.50	B	NW	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	19600.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	23.90	B		P
7440-66-6	Zinc	27.40			P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613408.2923 9309L849 -WES-1288

MEMORANDUM

TO: 200-BP-1 Project QA Record January 17, 1994

FR: Christina Jensen, Golder Associates Inc. CJ

RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE: 9309L849-WES-1288 (913-1719)

INTRODUCTION

This memo presents the results of data validation on data package 9309L849-WES-1288 consisting of two water samples analyzed for CLP Target Analyte List (TAL) metals including bismuth and silicon. The samples were analyzed by the Weston Analytics laboratory of Lionville, Pennsylvania using the CLP statement of work (SOW) ILM01.0 for TAL metals and using SW-846 method 6010 for bismuth and silicon (EPA 1986). A list of samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09505 B09506*	09/07/93 09/07/93	WATER WATER, FILTERED	SEE NOTE 1

Notes:

* Indicates samples which received 100% validation.

1. All unfiltered samples were analyzed for CLP TAL metals plus bismuth, silicon and cyanide. All filtered samples were analyzed for CLP TAL metals, bismuth and silicon only.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993) and validation procedures (WHC 1992). 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

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DATA QUALITY OBJECTIVES

Precision. Goals for precision were met with the exception of the ICP serial dilution results as discussed under "Minor Deficiencies" below.

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Accuracy. Goals for accuracy were met with the exception of the GFAA analytical spike recoveries as discussed under "Minor Deficiencies" below.

Sample Result Verification. All sample results were supported in the raw data. The silicon and bismuth results were not reported on the results forms (Form 1s), therefore, have been added.

Detection Limits. Detection limit goals were met for all sample results with the exception of bismuth which was reported at a detection limit of 150 ug/L, and specified in the work plan at 60 ug/L (DOE-RL 1992).

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data package with a total of 51 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the work plan objectives of 90% (DOE-RL 1990).

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.

Laboratory Blanks

- Barium, vanadium, zinc and bismuth were detected in the laboratory blanks. Therefore, samples B09505 and B09506 have been qualified as undetected (U) for these metals for results less than five times the associated blank concentration.

ICP Serial Dilution

- The ICP serial dilution percent difference (%D) for iron was outside the control limit of 10% for samples B09505 and B09506. Therefore, the positive results for iron have been qualified as estimated (J, BJ).

Laboratory Spikes

- Spike sample recoveries of lead and selenium were less than 75% but greater than 30%. Therefore, associated sample results for lead and selenium have been qualified as estimated (J for detects, UJ for nondetects).

- The GFAA analytical spikes were outside the control limits of 85 to 115% for lead for samples B09505 and B09506 and selenium for sample B09506. The indicated results have been qualified as estimated (J, UJ or BJ) as shown in Attachment 2.

REFERENCES

WHC 1993, Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision G, May 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1992, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 1, 1992. Westinghouse Hanford Company, Richland, Washington.

DOE-RL 1990, Remedial Investigation/Feasibility Study Work Plan for the 200-BP-1 Operable Unit Hanford Site, DOE/RL 88-32, U.S. Department of Energy, Richland, Washington.

DOE-RL 1992, Remedial Investigation/Feasibility Study Work Plan for the 200-BP-1 Operable Unit Hanford Site, DOE/RL 88-32, Change Order 26, U.S. Department of Energy, Richland, Washington.

EPA, 1986, Test Methods for Evaluating Solid Waste (SW-846): Physical/Chemical Methods, U.S. Environmenal Protection Agency, Office of Solid Waste, Washington, D.C.

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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.

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Attachment 2

Summary of Data Qualifications

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DATA QUALIFICATION SUMMARY - FORM B-7

Package 9309L849-WES-1288

SDG: CLP849	REVIEWER: LJ	DATE: 1/11/94	PAGE 1 OF 1
COMMENTS: Inorganics			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Barium	U	B09506	CCB Contam.
Vanadium	U	B09506	PBLK
Zinc	U	B09505, B09506	PBLK
Bismuth	U	B09505, B09506	ICB
Iron	~~UBJ~~/UJ	B09505, B09506	Serial DL ~~2D~~
Lead	UJ	B09505, B09506	GF~~AA Spike~~
Selenium	BJ, J	B09506, B09505	GF~~AA Spike~~

Sample matl spike <7:
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Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: 9309L849-WES-1288

	Samp#	B09505		B09506	
	Date	9-7-93		9-7-93	
	Location	699-47-50		699-47-50	
	Depth	---		---	
	Type	UNFILTERED		FILTERED	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
ALUMINUM	UG/L	73.600	B	48.000	U
ANTIMONY	UG/L	46.000	U	46.000	U
ARSENIC	UG/L	3.000	U	3.300	B
BARIUM	UG/L	118.000	B	56.400	U
BERYLLIUM	UG/L	2.000	B	1.000	U
CADMIUM	UG/L	5.000	U	5.000	U
CALCIUM	UG/L	53500.000		51100.000	
CHROMIUM	UG/L	14.300		6.000	U
COBALT	UG/L	25.200	B	7.000	U
COPPER	UG/L	13.100	B	7.000	U
IRON	UG/L	378.000	J	86.200	BJ
LEAD	UG/L	2.000	UJ	2.000	UJ
MAGNESIUM	UG/L	15700.000		14400.000	
MANGANESE	UG/L	12.200	B	4.600	B
MERCURY	UG/L	0.100	U	0.100	U
NICKEL	UG/L	31.400	B	12.000	U
POTASSIUM	UG/L	7130.000		6660.000	
SELENIUM	UG/L	7.800	J	2.500	BJ
SILVER	UG/L	7.000	U	7.000	U
SODIUM	UG/L	21800.000		19600.000	
THALLIUM	UG/L	2.000	U	2.000	U
VANADIUM	UG/L	42.100	B	23.900	U
ZINC	UG/L	24.400	U	27.400	U
CYANIDE	UG/L	20.000	U	N/R	
BISMUTH	UG/L	121.000	U	134.000	U
SILICON	UG/L	20670.000		19590.000	

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U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09505

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP849

Matrix (soil/water): WATER Lab Sample ID: 930984901

Level (low/med): LOW Date Received: 9/09/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	73.60	B		P	
7440-36-0	Antimony	46.00	U		P	
7440-38-2	Arsenic	3.00	U		F	
7440-39-3	Barium	118.00	B		P	
7440-41-7	Beryllium	2.00	B		P	
7440-43-9	Cadmium	5.00	U		P	
7440-70-2	Calcium	53500.00			P	
7440-47-3	Chromium	14.30			P	
7440-48-4	Cobalt	25.20	B		P	
7440-50-8	Copper	13.10	B		P	
7439-89-6	Iron	378.00	—	E	P	J
7439-92-1	Lead	2.00	~~U~~	NW	F	UJ
7439-95-4	Magnesium	15700.00			P	
7439-96-5	Manganese	12.20	B		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	31.40	B		P	
7440-09-7	Potassium	7130.00			P	
7782-49-2	Selenium	7.80	—	NS	F	J AAS 3/1/94
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	21800.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	42.10	B		P	
7440-66-6	Zinc	24.40	—		P	U
	Cyanide	20.00	U		C	
7440-69-9	Bismuth	121	U			~~B~~ U
7440-21-3	Silicon	20670				

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN 03/90

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VERified

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U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B09506

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP849

Matrix (soil/water): WATER Lab Sample ID: 930984902

Level (low/med): LOW Date Received: 9/09/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	48.00	U		P	
7440-36-0	Antimony	46.00	U		P	
7440-38-2	Arsenic	3.30	B		F	
7440-39-3	Barium	56.40	~~B~~		P	U
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	5.00	U		P	
7440-70-2	Calcium	51100.00			P	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt	7.00	U		P	
7440-50-8	Copper	7.00	U		P	
7439-89-6	Iron	86.20	~~B~~	E	P	BJ
7439-92-1	Lead	2.00	~~U~~	NW	F	UJ
7439-95-4	Magnesium	14400.00			P	
7439-96-5	Manganese	4.60	B		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	12.00	U		P	
7440-09-7	Potassium	6660.00			P	
7782-49-2	Selenium	2.50	~~B~~	NW	F	BJ
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	19600.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	23.90	~~B~~		P	U
7440-66-6	Zinc	27.40	—		P	U
	Cyanide				NR	
7440-69-9	Bismuth	134				~~B~~ U
7440-21-3	Silicon	19590				

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN 03/90

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Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9309L849

W.O. #: 06168-002-001-9999-00
Date Received: 09-09-93

CLP METALS

1. This narrative covers the analyses of two (2) water samples.

2. The samples were prepared and analyzed in accordance with the following protocols: CLP SOW 3/90.

3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.

4. All analyses were performed within the required holding times.

5. All Initial and Continuing Calibration Verifications (ICV/CCV's) were within control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.

7. All Preparation/Method Blanks were below Reporting Limits.

8. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.

9. All Laboratory Control Samples (LCS) were within the 80-120% control limits.

10. All Serial Dilution percent differences were within USEPA SOW control limits except for:

RFW #	Element	%Difference
001	Iron	11.1

11. All Matrix Spike recoveries were within the 75-125% control limits (exception allowed when sample concentration exceeds the spike added concentration by a factor of 4 or more)
except for:

RFW #	Element	%Recovery
001	Lead	70.5
	Selenium	13.0

For analytes where the Matrix Spike is out of control, a Post-digestion Matrix Spike and Serial Dilution are performed (exception allowed for Ag).
Matrix spike analyses are not required for Ca, Mg, Na, and K in waters.

WESTON

12. All Duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits for samples values greater than 5X Reporting Limit, or +/- the Reporting Limits for sample values less than 5X Reporting Limit.

13. Method of Standard Additions (MSA) analyses were performed on the following samples:

Element	Sample #'s
Selenium	001, 001R

14. The code CV is currently in use by the laboratory for both mercury instruments in operation (HG1 and HG2). HG1 is complete with autosampler and software, but still requires manual digestion; HG2 is operated by the analyst, produces a strip chart and also requires manual digestion.

15. HG1 requires less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionally scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 ml. For soils, 0.1 gram of sample is taken to a final volume of 50 ml (including all reagents).

16. ICP Interelement Correction Factors for IC1 and IC3 are included in this package, but do not appear on EDD.

17. The graphite furnace time that appears on form XIV is the time of the first injection. The time that appears on the data is the print time.

18. Solubles and totals were digested within the same digestion batch; therefore, will have the same flags.

Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

10/26/93
Date

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ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9309L849

W.O. #: 06168-002-001-9999-00
Date Received: 09-09-93

CLP METALS ADDENDUM

1. Following Exhibit E, Section V, Item 10, page E-23 of the USEPA Statement of Work for Inorganics Analysis, Document Number ILM02.0 ICP Instrument Detection Limits (IDLs) are reported for two (2) ICP instruments. The instrument identification numbers are "IC1" and "IC3". The highest IDL for the two instruments is used for reporting concentration values in this sample data package.

2. A discrepancy exists between raw data and Form XIVs analytical spikes recovery calculations performed for graphite furnace AA analytes. Instrument software calculates spike recoveries based on absolute values below the IDL for sample results. This is hard-coded by the vendor and is currently not correctable. CLP convention (SOW ILM02.0, Exhibit E, Section V, Item 6, page E-20) requires that when values fall below the IDL, the sample result is equal to zero (0) for the purposes of calculating the percent recovery. The Form XIVs contain the correct calculation.

Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

10/26/93
Date

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Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 200BP1

Collection Date 9/7/93

Ice Chest No. ~~WHC~~ AJS 9/8/93 GNS056

Field Logbook No. WHC-N-446-1

Bill of Lading/Airbill No.

Offsite Property No. 253 695 6015

Method of Shipment WESTON

Shipped to

Possible Sample Hazards/Remarks

Sample Identification

BO 9505

1, 1L, P, WATER: METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi), SELENIUM (HNO3 pH<2) UNFILTERED
1, 500ml, G, WATER; IC ANIONS(F,Cl,SO4,NO2,PO4)
1, 500ml, P, WATER; NO2/NO3(H2SO4 pH<2)
1, 250ml, P, WATER; ALKALINITY
1, 250ml, P, WATER; TDS
1, 250ml, P, WATER; SULFATE
1, 1L, P, WATER; CYANIDE(NaOH pH>12)
3, 2L, P, WATER; GROSS ALPHA/BETA, GAMMA SPEC(Cs-137,Co-60,Ru-106), Pu-238, Pu-239/240, Sr-90, TOTAL URANIUM(HNO3 pH<2)
1, 250ml, Gs, WATER; TRITIUM
1, 1L, G/P, WATER; Tc-99(HCl pH<2)

BO 9506

1, 1L, P, WATER; METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi), SELENIUM (HNO3 pH<2) FILTERED

Temp. = 4.1°C

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
PCCde	9/7/93	1431	AJSimpson AJ SIMPSON	9/8/93	0819
AJSimpson AJ SIMPSON	9/8/93	0819			
Emery	9-9-93	13:25	B. Burnett	9-9-93	13:25

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Reling. to Frig #1C 1431 PCC

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A-6000-407 (12/92) WEF061

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Attachment 5

Data Validation Supporting Documentation

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

package 93091L849-WES-1258

PROJECT: 200 BP1	REVIEWER: CJ	DATE: 1/11/94
LABORATORY: WESTON	CASE:	SDG: CLP849
SAMPLES/MATRIX: WATERS		
B09505, B09506*		

1. COMPLETENESS AND CONTRACT COMPLIANCE

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	—	—	—
Cover Page	—	—	—
Traffic Reports	—	—	—
Sample Data			
Inorganic Analysis Data Sheets	—	—	—
Standards Data			
Initial and Continuing Calibration Verification	—	—	—
CRDL Standard for AA and ICP	—	—	—
QC Summary			
Blanks	—	—	—
ICP Interference Check Summary	—	—	—
Spike Sample Recovery	—	—	—
Post-Digestion Spike Sample Recovery	—	—	—
Duplicate	—	—	—
Laboratory Control Sample	—	—	—
Standard Addition Results	—	—	—
ICP Serial Dilutions	—	—	—
Instrument Detection Limits	—	—	—
ICP Interelement Correction Factors	—	—	—
ICP Linear Ranges	—	—	—
Preparation Log	—	—	—
Analysis Run Log	—	—	—
Raw Data			
ICP Raw Data	—	—	—
Furnace AA Raw Data	—	—	—
Mercury Raw Data	—	—	—
Cyanide Raw Data	—	—	—
Additional Data			
Internal laboratory chain-of-custody	—	—	—
Laboratory Sample Preparation Records	—	—	—

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Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	—	—	—
Reduction Formulae	—	—	—
Instrument Run Logs	—	—	—
Chemist Notebook Pages	—	—	—

2. HOLDING TIMES

Have all samples been analyzed within holding times? Yes No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? Yes No N/A

Are the correlation coefficients ≥0.995? Yes No N/A

Was a midrange cyanide standard distilled? Yes No N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency? Yes No N/A

Are the AB solution %R values within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

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6. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? (Yes) No N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No (N/A)

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

See comment 1

Are spike recoveries within the control limits? Yes (No) N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

020

10. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analyses in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

1516. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

021

If no, were MSA analyses performed when required? Yes No N/A

Are MSA correlation coefficients $\geq$0.995? Yes No N/A

If no, was a second MSA analysis performed? Yes No N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is $\geq$10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS

See Comment 2

Have results been reported and calculated correctly? Yes No N/A

Are results within the calibrated range of the instruments and within the linear range of the ICP? Yes No N/A

Are all detection limits below the CRQL? Yes No N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW? Yes No N/A

See comment 3

Were project specific data quality objectives met for this analysis? Yes No N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

(1.) The MS recoveries for sample B095D5S for lead and Selenium were 70.5 and 13 %, respectively. Since these are GFAA analyses, the sample ~~specific~~ analytical spike will be used to qualify all lead and selenium results have been qualified as estimated (J, UJ). ASS 3/1/94

(2.) The Bi and Si results were not included on the Form 1s. and therefore have been added. Only Ca, Mg, Na, K, Fe, Mn, Si, Al and Bi were requested on the COC, but all TAL metals were reported.

(3) The detection limit of 60 ug/L is specified in the 200 BP1 Workplan. The laboratory reports 150 ug/L as its limit.

023

3/11/94

HOLDING TIME SUMMARY - FORM B-1

Package 9309L849-WES-1288

SDG: L849	REVIEWER: C Jensen	DATE: 1/11/94	PAGE 1 OF 1
COMMENTS: Inorganic			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
All	ICP Metals	9/7/93	10/7/93	10/18/93	30	11	none
	Cn		9/18/93	9/18/93	11	0	none
	Hg		9/23/93	9/24/93	16	1	none
	Se		10/7/93	10/13/93	30	6	
	Pb		10/7/93	10/13/93	30	6	
	Tl		10/7/93	10/13/93	30	6	
	As		10/7/93	10/15/93	30	8	
	Ag	9/7/93	10/20/93	10/21/93	43	1	

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

Package 93092849 - WES-1288

SDG: C4849	REVIEWER: C. Jensen	DATE: 1/11/94	PAGE 1 OF 1
COMMENTS: Inorganics			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Barium	11.9	B		ug/L	59.5		B09506	U
PBLK	Vanadium	5.5	B		ug/L	30.3		B09506	U
PBLK	Zinc	13.3	B		ug/L	66.5		B09505, B09506	U
ICB	Bismuth	56.4	B		ug/L	282		B09505, B09506	U

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U.S. EPA - CLP

3
BLANKS

Lab name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab code: WESTON Case No.: WEST SAS No.: SDG No.: CLP849

Preparation Blank Matrix (soil/water): WATER

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	48.0	U	48.0	U	48.0	U	48.0	U	48.000	U	P
Antimony	46.0	U	46.0	U	46.0	U	46.0	U	46.000	U	P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	F
Barium	14.3	B	22.3	B	59.5 11.9	B	7.2	B	6.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Calcium	58.4	B	107.0	B	226.5 45.3	B	29.5	B	28.000	U	P
Chromium	6.0	U	6.0	U	6.0	U	6.0	U	6.000	U	P
Cobalt	7.0	U	8.0	B	7.0	U	7.0	U	7.000	U	P
Copper	7.0	U	7.0	U	7.0	U	7.0	U	7.000	U	P
Iron	43.5 8.7	B	23.9	B	7.6	B	7.0	U	7.000	U	P
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Magnesium	58.0	U	109.2	B	356 71.2	B	58.0	U	58.000	U	P
Manganese	2.0	U	3.1	B	2.0	U	4.6	B	2.000	U	P
Mercury	.1	U	.1	U	.1	U	.1	U	.100	U	CV
Nickel	12.0	U	12.0	U	12.0	U	12.0	U	12.000	U	P
Potassium	905.0	U	905.0	U	905.0	U	905.0	U	905.000	U	P
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Silver	7.0	U	7.0	U	7.0	U	7.0	U	7.000	U	P
Sodium	47.0	U	69.7	B	47.0	U	47.0	U	385 77.000	B	P
Thallium	2.0	U	2.0	U	2.0	U	-2.1	B	2.000	U	F
Vanadium	4.0	B	9.0	B	4.5	B	3.0	U	30.3 5.500	B	P
Zinc	3.0	U	3.0	U	-3.7	B	3.0	U	66.5 13.300	B	P
Cyanide	10.0	U	10.0	U	10.0	U			10.000	U	C
Bismuth	202 56.4										
Silicon	22.6		14.4		20.4 B09505				227. 45.4		

FORM III - IN 03/90

ICP B09506

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5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

B09505S

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP849

Matrix: 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	2120.4000		73.6000	B	2000.00	102.3		P
Antimony	75-125	439.8999		46.0000	U	500.00	88.0		P
Arsenic	75-125	40.5000		3.0000	U	40.00	101.2		F
Barium	75-125	2110.8000		117.6000	B	2000.00	99.7		P
Beryllium	75-125	49.1000		2.0000	B	50.00	94.2		P
Cadmium	75-125	51.3000		5.0000	U	50.00	102.6		P
Calcium									NR
Chromium	75-125	199.9000		14.3000		200.00	92.8		P
Cobalt	75-125	486.1001		25.2000	B	500.00	92.2		P
Copper	75-125	244.6000		13.1000	B	250.00	92.6		P
Iron	75-125	1315.1000		377.8000		1000.00	93.7		P
Lead	75-125	14.1000		2.0000	U	20.00	70.5	N	F
Magnesium									NR
Manganese	75-125	499.5000		12.2000	B	500.00	97.5		P
Mercury									NR
Nickel	75-125	494.8000		31.4000	B	500.00	92.7		P
Potassium									NR
Selenium	75-125	9.1000		7.8000		10.00	13.0	N	F
Silver	75-125	47.4000		7.0000	U	50.00	94.8		P
Sodium									NR
Thallium	75-125	49.1000		2.0000	U	50.00	98.2		F
Vanadium	75-125	529.8000		42.1000	B	500.00	97.5		P
Zinc	75-125	500.0000		24.4000		500.00	95.1		P
Cyanide	75-125	98.0740		20.0000	U	100.00	98.1		C

Comments:

FORM V (Part 1) - IN 03/90

See Comment 1.

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9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

B09505L

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP849

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	73.60	B	240.00	U	100.0		P
Antimony	46.00	U	230.00	U			P
Arsenic							
Barium	117.60	B	79.50	B	32.4		P
Beryllium	2.00	B	5.00	U	100.0		P
Cadmium	5.00	U	25.00	U			P
Calcium	53538.20		55068.50		2.8		P
Chromium	14.30		30.00	U	100.0		P
Cobalt	25.20	B	35.00	U	100.0		P
Copper	13.10	B	35.00	U	100.0		P
Iron	377.80		336.00	B	11.1	E	P
Lead							
Magnesium	15664.70		15688.00	B	.1		P
Manganese	12.20	B	10.00	U	100.0		P
Mercury							
Nickel	31.40	B	60.00	U	100.0		P
Potassium	7131.20		9554.00	B	34.0		P
Selenium							
Silver	7.00	U	35.00	U			P
Sodium	21808.20		21639.49	B	.8		P
Thallium							
Vanadium	42.10	B	15.00	U	100.0		P
Zinc	24.40		37.00	B	51.6		P

FORM IX - IN

03/90

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MEMORANDUM

TO: 200-BP-1 Project QA Record

January 17, 1994

FR: Christina Jensen, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: 9309L849-WES-1288 (913-1719)

INTRODUCTION

This memo presents the results of data validation on data package 9309L849-WES-1288 consisting of one water sample analyzed for general chemistry parameters. The samples were analyzed by the Weston Analytics laboratory of Lionville, Pennsylvania using WHC approved methods. A list of samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09505*	09/07/93	WATER	SEE NOTE 1

Notes:

* Indicates samples which received 100% validation.

1. Indicates sample was analyzed for anions by ion chromatography (chloride, fluoride, nitrite, phosphate and sulfate), alkalinity, cyanide, nitrate+nitrite, and total dissolved solids and sulfate.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993) and validation procedures (WHC 1992). 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

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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VALIDATION DOCUMENTATION
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Sample Result Verification. All sample results were supported in the raw data with the exception of fluoride which was reported as undetected for sample B09505, however, the raw data result was 1.1 mg/L. The results form has been corrected.

Detection Limits. Detection limit goals were met for all sample results as specified in the work plan (DOE-RL 1992) with the exception of cyanide which was specified at 10 ug/L and reported at 20 ug/L for sample B09505.

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 10 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the work plan objectives of 90% (DOE-RL 1990).

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.

Holding Times

- Nitrite and phosphate for sample B09505 were analyzed past the holding time of two days, and therefore results have been qualified as estimated (UJ).

REFERENCES

WHC 1993, Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision G, May 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1992, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 1, 1992. Westinghouse Hanford Company, Richland, Washington.

DOE-RL 1990, Remedial Investigation/Feasibility Study Work Plan for the 200-BP-1 Operable Unit Hanford Site, DOE/RL 88-32, U.S. Department of Energy, Richland, Washington.

DOE-RL 1992, Remedial Investigation/Feasibility Study Work Plan for the 200-BP-1 Operable Unit Hanford Site, DOE/RL 88-32, Change Order 26, U.S. Department of Energy, Richland, Washington.

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Attachment 1

Glossary of Data Reporting Qualifiers

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

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

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

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

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

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

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

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

Attachment 2

Summary of Data Qualifications

package 93091549-WES-288

DATA QUALIFICATION SUMMARY - FORM B-7

SDG:	REVIEWER:	DATE: 1/19/94	PAGE 1 OF 1
COMMENTS: Wet Chemistry			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrite	UJ	B09505	Holding Time
Phosphate	UJ	B09505	Holding Time
Fluoride	1.1 detect	B09505	Reported as U

006

Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: 9309L849-WES-1288

	Samp#	B09505	
	Date	9-7-93	
	Location	699-47-50	
	Type	UNFILT.	
Parameter	Units	Result	Q
ALKALINITY	MG/L	96.000	
CHLORIDE-IC	MG/L	26.800	
FLUORIDE-IC	MG/L	1.100	
NITRITE-IC	MG/L	0.250	UJ
CYANIDE	UG/L	20.000	U
PHOSPHATE-IC	MG/L	0.250	UJ
SULFATE-IC	MG/L	86.400	
NITRATE+NITRITE	MG-N/L	2.100	
SULFATE	MG/L	94.300	
TOTAL DISSOLVED SOLIDS	MG/L	399.000	
PERCENT SOLIDS		N/R	

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ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 09/27/93

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9309L849

WORK ORDER: 06168-002-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR	Q
-001	B09505	Alkalinity	96.0		MG/L	2.0	1.0	
		Chloride by IC	26.8		MG/L	1.2	5.0	
		Fluoride by IC	1.1	~~0.50~~ ~~u~~	MG/L	0.50	1.0	
		Nitrite by IC		0.25 ~~u~~	MG/L	0.25	1.0	UJ
		Cyanide, Total	20.0	u	UG/L	20.0	1.0	
		Phosphate by IC		0.25 ~~u~~	MG/L	0.25	1.0	UJ
		Sulfate by IC	86.4		MG/L	5.0	20.0	
		Nitrate Nitrite	2.1		MG-N/L	0.50	5.0	
		Sulfate	94.3		MG/L	10.0	6.0	
		Total Dissolved Solids	399		MG/L	5.0	1.0	

verified
5/19/94

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3/1/94

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Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

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ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client : WESTINGHOUSE HANFORD
RFW# : 9309L849

W.O. #: 06168-002-001-9999-00
Date Received: 09-09-93

INORGANIC

The following is a summary of the quality control results and a description of any problems encountered during the analysis of this batch of samples:

1. All sample holding times as required by 40CFR136 were met with the exception of Nitrite by IC and Phosphate by IC, which were received past hold.

2. All preparation blank results were below the required detection limits.

3. All laboratory control standards (blank spikes) were within the control limits of 80-120%. All %RPD were within the 20% guidance limit.

4. All calibration verification checks were within the required control limits of 90-110%. Calibration verification is performed using independent standards.

5. Matrix spike recoveries are summarized on the Inorganic Accuracy Report contained within this document. All recoveries were within the 75-125% guidance limits. All %RPD were within the 20% guidance limit.

6. Replicate results are summarized on the Inorganic Precision Report contained within this document. All results were within the 20% RPD guidance limit.

7. The analytical methods applied by the laboratory, unless otherwise requested, for all inorganic analyses are derived from the USEPA Method for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), Standard Methods for the Examination of Water and Wastewater 16 ed. and Test Methods for Evaluating Solid Waste (USEPA SW846).

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OCT 1993
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SDLA

10.2.93

J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

Date

pas/i09-849

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Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 200-BP1

Collection Date 9/7/93

Ice Chest No. ~~WHG~~ AFS 4/4/97 GWS056

Field Logbook No. WHC-N-446-1

Bill of Lading/Airbill No.

Offsite Property No. 253 695 6015

Method of Shipment WESTON

Shipped to

Possible Sample Hazards/Remarks

Sample Identification

BO 9505

1, 1L, P, WATER: METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi), SELENIUM (HNO3 pH<2) UNFILTERED
1, 500ml, G, WATER; IC ANIONS(F,Cl,SO4,NO2,PO4)
1, 500ml, P, WATER; NO2/NO3(H2SO4 pH<2)
1, 250ml, P, WATER; ALKALINITY
1, 250ml, P, WATER; TDS
1, 250ml, P, WATER; SULFATE
1, 1L, P, WATER; CYANIDE(NaOH pH>12)
3, 2L, P, WATER; GROSS ALPHA/BETA, GAMMA SPEC(Cs-137,Co-60,Ru-106), Pu-238, Pu-239/240, Sr-90, TOTAL URANIUM(HNO3 pH<2)
1, 250ml, Gs, WATER; TRITIUM
1, 1L, G/P, WATER; Tc-99(HCl pH<2)

BO 9506

1, 1L, P, WATER; METALS-CLP TAL(Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi), SELENIUM (HNO3 pH<2) FILTERED

Temp. = 4.1°C

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
PCCde	9/7/93	1431	AJSimpson AJ SIMPSON	9/8/93	0819
AJSimpson AJ SIMPSON	9/8/93	0819			
Emery	9-9-93	13:25	B. Burnett	9-9-93	13:25

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: Reline. to Fig #1C 1431 PCC

012

A-6000-407 (12/92) WEF061

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Attachment 5

Data Validation Supporting Documentation

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT: 200 BP1	REVIEWER: GJ	DATE: 1/20/94
LABORATORY: Weston	CASE:	SDG: 93091849 -
SAMPLES/MATRIX: water B09505*		WES-1288

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	—	—	—
Cover Page	—	—	—
Traffic Reports/Chain-of-Custody	—	—	—
Sample Analysis Data Report Forms	—	—	—
Standards Data	—	—	—
QC Summary			
Blanks Summary Report Forms	—	—	—
Spike Sample Recovery Report Forms	—	—	—
Duplicate Sample Analysis Report Forms	—	—	—
Laboratory Control Sample Report Forms	—	—	—
Raw Data			
Ion Chromatograph Chromatograms	—	—	—
TOC and TOX Instrument Printouts	—	—	—
Laboratory Bench Sheets	—	—	—
Additional Data			
Laboratory Sample Preparation Logs	—	—	—
Instrument Run Logs	—	—	—
Internal Laboratory Chain-of-Custory	—	—	—
Percent Solids Analysis Records	—	—	—
Reduction Formulae	—	—	—
Chemist Notebook Pages	—	—	—

GJ 1/18/94

2. HOLDING TIMES

Were all samples analyzed within holding times? Yes (No) N/A

Action: If any holding times were exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

014

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used?	Yes	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a balance check conducted prior to the TDS analysis?	Yes	No	N/A
Was the titrant normality checked?	Yes	No	N/A

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Have ICV and CCV been analyzed at the proper frequency?	Yes	No	N/A
Are ICV and CCV percent recoveries within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with the validation requirements.

5. LABORATORY BLANKS

CJ 11/9/94

Are target analytes present in the laboratory blanks?	~~Yes~~	No	N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U) and list the affected samples and analytes below.

6. FIELD BLANKS

Are target analytes present in the field blanks?	Yes	No	N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

7. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the acceptance limits?	Yes	No	N/A

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are >CRQL, qualify the data as estimated (J). If the spike recovery is <30% and the sample results are less then the IDL qualify the data as unusable (R).

8. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the affected results according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS %R is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

9. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

10. DUPLICATE SAMPLE ANALYSIS

Are RPD values within the acceptance limits? Yes No N/A

Action: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD falls outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

12. FIELD SPLIT SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

13. ANALYTE QUANTITATION AND DETECTION LIMITS

See comment 1

Have results been reported and calculated correctly?	Yes	(No)	N/A
Are instrument detection limits below the CRDL?	(Yes)	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

14. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	(Yes)	No	N/A
Were project specific data quality objectives met for this analysis?	(Yes)	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

017

COMMENTS (attach additional sheets as necessary):

1. Fluoride by IC was reported for sample B09SD5 at 0.5 ug/ml ✓. The IC report identifies fluoride at 1.1 ug/ml. Form 1 has been corrected to reflect this.

C18

HOLDING TIME SUMMARY - FORM B-I

package 93091849-WES-1288

SDG:	REVIEWER: C Jones	DATE: 1/19/94	PAGE 1 OF 1
COMMENTS: Wet Chemistry			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B09505	Alk.	9/7/93	9/13/93	9/13/93	6	0	none
	IC Anions		9/14/93	9/14/93	7	0	none
	Nitrite		9/14/93	9/14/93	7	0	UJ
	Phosphate		9/14/93	9/14/93	7	0	UJ
	Cn		9/18/93	9/18/93	11	0	none
	SO4		9/14/93	9/14/93	7	0	none
	TDS		9/13/93	9/14/93	6	1	none

9613408.2969

1/26/94

Data Package Receipt Dates

for Project 200-BP-1

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N	VOA	Y N	SEMI VOA	Y N	PEST/PCB	Y N	WETCHEM	Y N	METALS	COMMENTS	Y N	RADCHEM	Date OSM Rcvd DP
B09505		9309L849	1288	WESTON	N		N		N		Y	10/29/93	Y	10/29/93	09/09/93 - SAF-93-266	Y	10/29/93	10/29/93
B09506		9309L849	1288	WESTON	N		N		N		N		Y	10/29/93	09/09/93 - SAF-93-266	N		10/29/93

Validation Rcvd
1-25-94

9613408.2970

9613408.2971

Golder Associates Inc.

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

Golder Associates

January 24, 1994

Our ref: 913-1719
S/O/2775

Westinghouse Hanford Company
Hanford Analytical Services Management
345 Hills, MSIN H4-29
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: 200-BP-1 DATA VALIDATION, TRANSMITTAL OF DATA VALIDATION PACKAGES, TASK ORDER S91-19

Dear Ms. Duncan:

Enclosed are the following analytical data packages for the 200-BP-1 data validation project:

Chemistry

- 9309L849-WES-1288
- B09555-TMA-589

Radiochemistry

- 2734-WES-1326

The data verification and validation documentation is located in the front of the data package. Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Christina J Jensen

Christina Jensen
Task Manager

Donald M. Caldwell

Donald M. Caldwell
Project Director

CJ/DMC/ah 2775.ltr who-2

Enclosures
cc: P.K. Brockman, SAIC-Kennewick

JAN 1994
RECEIVED
TQO

RECEIVED
JAN 25 1994
VALIDATION DOCUMENTATION
SDLA