START 9613402.0770

9108L425-WES-142

0043030

OCT 1991 RECEIVED DATA RECEIPT

WESTON

ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 08-12-9
RFW #: 9108L425
W.O. #: 6168-02-01

INORGANIC NARRATIVE

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. Sample holding times as required by 40CFR136 were met for water samples with the exception of nitrate, nitrite and pH, which were received and analyzed past hold.

2. All preparation blanks were analyzed below the required detection limit.

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 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) and Standard Methods for the Examination of Water and Wastewater 16 ed. Methods for the analysis of solid samples are derived from Test Methods for Evaluating Solid Waste (USEPA SW846).

FEB 1996 RECEIVED EDMC

9.17.91.

Jack R. Tuschall, Ph.D. Date
Laboratory Manager
Lionville Analytical Laboratory

pas.21\i8-425

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9613402.0771

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 09/10/91

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9108L425

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	BO1188	Alkalinity	100	MG/L	2.0
		Chloride by IC	6.0	mg/L	0.25
		Fluoride by IC	0.66	mg/L	0.50
		Nitrite by IC	0.25 u	mg/L	0.25
		Nitrate by IC	72.2	mg/L	2.5
		Cyanide, Total	31.6	UG/L	20.0
		Phosphate by IC	0.25 u	mg/L	0.25
		Sulfate by IC	36.0	mg/L	2.5
		Nitrate Nitrite	15.6	MG/L	2.5
		Total Organic Carbon	0.79	MG/L	0.50
		pH	8.0	PH UNITS	0.010
		Total Dissolved Solids	298	MG/L	5.0

Task # W91-0001

WESTON Analytics Use Only
9108L425

Custody Transfer Record/Lab Work Request

WESTON

Client: Westinghouse Hanford Company
Est. Final Proj. Sampling Date:
Work Order #: 6168-02-01
Project Contact/Phone #: P.H.Butcher/(509)376-5045
AD Project Manager: Josie King
QC: CLP Del: CLP TAT: 35day
Date Rec'd: 8/12/91 Date Due: 9/16/91
Account #: WS4b.Mord

Refrigerator #																
#/Type Container	Liquid	3,Gs				1,G	1,P	3,P	1,P	1,P	1,P	1,P	1,G			
	Solid															
Volume	Liquid	40ml				250ml	1L	1L	1L	1,L	1,L	1,L	250ml			
	Solid			40ml												
Preservatives							none	HNO3	HCL	HNO3	NaOH	HNO3	none			
ANALYSES REQUESTED		ORGANIC				* See below			*	INORG			* See below			*
		VOA	BNA	Pest/PCB	Herb	1	2	3	4	Metal (un)	CN	Metal F	5			
						DOT Radium	see below	TSS	TSS	CLP MTS	CLP CLP	CLP Analysis	TSS			

MATRIX CODES:
S - Soil
SE - Sediment
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

Lab ID	Client ID/Description	Matrix QC Chosen (✓)	Matrix	Date Collected	1	2	3	4	Metal (un)	CN	Metal F	5
001	~~[illegible]~~ 801188	W		8/8/91	✓	✓	✓	✓	✓	✓		✓
002	~~[illegible]~~ 801189	W		8/8/91							✓	
	~~[illegible]~~	W										
	*1)TOC,NO_2/NO_3											
	2)Anions,TDS,Alk,pH, IC SO4, IC PO4, IC Cl, IC F, IC NO3, IC NO2											
	3)Gross Alpha,Beta,Tc-99,Sr-90,Cs-137,Co-60,Pu-238,Pu-239/240											
	4)Total Uranium											
	5)Tritium											
	CLP - Metal, Bi/Se/Si											

Special Instructions:
NOTE: (F) = Filtered
(Un) = Unfiltered

BOL # 2474251896
OPC # W91-0481 #7

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

WESTON Analytics Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill #
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Properly Preserved (Y) or N
5) Received Within Holding Times Y or N

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't (Y) or N

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

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[illegible]	[illegible]	8/12/91	1120		[illegible] 8/12		
	[illegible] 8/12/91						

BFW 21-21-001/A 8/90 L372 L373 L375 L377 L378 Ref# N/A Cooler# N/A 381 596a

9613402.0772

Roy F. Weston, INC.
Lionville Laboratory

CLIENT: WESSTINGHOUSE HANFORD **SAMPLES RECEIVED:** 8/12/91
RFW #: 9108L425
W.O. #: 6168-02-01

METALS NARRATIVE

The set of samples consisted of two (2) water samples collected on 8/8/91.

The samples were analyzed according to criteria set forth in CLP SOW 3/90.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analysis:

1. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory.

2. All ICV and CCV values were within control limits.

3. All ICB and CCB values were within control limits.

4. All preparation blank values were within control limits.

5. All LCS results were within the 80-120% control limits.

6. Cn matrix spike recoveries were within the 75-125% control limits.

7. All other matrix spike and duplicate analyses were performed on a different RFW# within the same digestion batch, as a result there are no corresponding Forms 5, 6 or 9. The associated forms have been reported with RFW lot 9108L375.

8. Cn duplicate analyses were within the 20% RPD control limit.

9. 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.

WESTON

10. 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).

11. Quarterly Detection Limits for IC2 are included in this package.

Jack R. Tuschall, Ph.D.
Laboratory Manager
Lionville Analytical Laboratories

10.2.91.
Date

9613402.0775 0000010

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 09/30/91

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9108L425

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B01188	Silver, Total	10.0	u	UG/L	10.0
		Aluminum, Total	200	u	UG/L	200
		Arsenic, Total	10.0	u	UG/L	10.0
		Barium, Total	200	u	UG/L	200
		Beryllium, Total	5.0	u	UG/L	5.0
		Bismuth, Total	200	u	UG/L	200
		Calcium, Total	34300		UG/L	5000
		Cadmium, Total	5.0	u	UG/L	5.0
		Cobalt, Total	50.0	u	UG/L	50.0
		Chromium, Total	10.0	u	UG/L	10.0
		Copper, Total	25.0	u	UG/L	25.0
		Iron, Total	100	u	UG/L	100
		Mercury, Total	0.20	u	UG/L	0.20
		Potassium, Total	7150		UG/L	5000
		Magnesium, Total	10400		UG/L	5000
		Manganese, Total	15.0	u	UG/L	15.0
		Sodium, Total	30000		UG/L	5000
		Nickel, Total	40.0	u	UG/L	40.0
		Lead, Total	3.0	u	UG/L	3.0
		Antimony, Total	60.0	u	UG/L	60.0
		Selenium, Total	5.0	u	UG/L	5.0
		Silicon, Total	13100		UG/L	100
		Thallium, Total	10.0	u	UG/L	10.0
		Vanadium, Total	50.0	u	UG/L	50.0
		Zinc, Total	20.0	u	UG/L	20.0

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 09/30/91

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9108L425

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-002	BO1189	Silver, Soluble	10.0	u	UG/L	10.0
		Aluminum, Soluble	200	u	UG/L	200
		Arsenic, Soluble	10.0	u	UG/L	10.0
		Barium, Soluble	200	u	UG/L	200
		Beryllium, Soluble	5.0	u	UG/L	5.0
		Bismuth, Soluble	200	u	UG/L	200
		Calcium, Soluble	36700		UG/L	5000
		Cadmium, Soluble	5.0	u	UG/L	5.0
		Cobalt, Soluble	50.0	u	UG/L	50.0
		Chromium, Soluble	10.0	u	UG/L	10.0
		Copper, Soluble	25.0	u	UG/L	25.0
		Iron, Soluble	100	u	UG/L	100
		Mercury, Soluble	0.20	u	UG/L	0.20
		Potassium, Soluble	7380		UG/L	5000
		Magnesium, Soluble	11100		UG/L	5000
		Manganese, Soluble	15.0	u	UG/L	15.0
		Sodium, Soluble	31300		UG/L	5000
		Nickel, Soluble	40.0	u	UG/L	40.0
		Lead, Soluble	3.0	u	UG/L	3.0
		Antimony, Soluble	60.0	u	UG/L	60.0
		Selenium, Soluble	5.0	u	UG/L	5.0
		Silicon, Soluble	14000		UG/L	100
		Thallium, Soluble	10.0	u	UG/L	10.0
		Vanadium, Soluble	50.0	u	UG/L	50.0
		Zinc, Soluble	20.0	u	UG/L	20.0

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01188
6-49-57A

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

Lab Code: WESTON Case No.: WEST1 SAS No.: SDG No.: CLP425

Matrix (soil/water): WATER Lab Sample ID: 910842501

Level (low/med): LOW Date Received: 8/12/91

% 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	5.50	B		F
7440-39-3	Barium	25.60	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	34300.00			P
7440-47-3	Chromium	7.90	B		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	6.00	U		P
7439-89-6	Iron	88.30	B		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	10400.00			P
7439-96-5	Manganese	3.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	7150.00			P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	30000.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	31.60	B		P
7440-66-6	Zinc	8.80	B		P
	Cyanide	31.60			C

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01189
6-49-57A

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

Lab Code: WESTON Case No.: WEST1 SAS No.: SDG No.: CLP425

Matrix (soil/water): WATER Lab Sample ID: 910842502

Level (low/med): LOW Date Received: 8/12/91

% 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	5.90	B		F
7440-39-3	Barium	27.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	36700.00			P
7440-47-3	Chromium	8.20	B		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	6.00	U		P
7439-89-6	Iron	36.00	U		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	11100.00			P
7439-96-5	Manganese	3.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	7380.00			P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	31300.00			P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	31.20	B		P
7440-66-6	Zinc	11.10	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613402.0779

VALIDATION SUMMARY

9613402.0780

9108L425-WES-142

Report To

Westinghouse Hanford Company
Richland, Washington

Data Validation Report
200-BP-1 RI/FS
Data Package: 9108L425-WES-142
SDG No.: CLP425
Analysis Type: Metals/Cyanide/Bi/Si/Wet Chemistry

Prepared By

Golder Associates Inc.
Redmond, Washington

Validated by: Sandy Sutton-Schildt
Staff Environmental Scientist

Reviewed by: Kent Angelos
Associate

February 18, 1992

913-1719

TABLE OF CONTENTS

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3. QUALIFIED DATA	1
3.1 Major Deficiencies	1
3.2 Minor Deficiencies	2
4. CONCLUSIONS	2
5. REFERENCES	2

1. INTRODUCTION

This report presents the results of data validation on case WEST1 and SDG: CLP425 consisting of two (2) water samples for contract laboratory program/target analyte list (CLP/TAL) total and dissolved metals, CLP/TAL total cyanide, bismuth, silicon, and wet chemistry analysis. Sample identifications, locations and sample dates are provided in the tabular data summary provided in Attachment 3. The samples were analyzed by the Weston - Lionville laboratory using the 3/90 statement of work (SOW) for metals and cyanide. Bismuth and silicon were analyzed by ICP methods. Anions (chloride, fluoride, nitrite, nitrate, phosphate and sulfate), were analyzed by ion chromatography (IC), (EPA, 1984). Total organic carbon (TOC) was analyzed by method 505.B (APHA, 1985). pH, total dissolved solids (TDS), alkalinity and nitrate+nitrite were analyzed using EPA methods (EPA, 1979). Validation was conducted in accordance with "Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision 0, November 1991" including Revision A, dated December 1991.

2. DATA QUALITY OBJECTIVES

The data packages were complete for all requested analyses and met the data quality objectives of the "RI/FS Work Plan for the 200-BP-1 Operable Unit, Hanford Site, Richland, Washington, DOE/RL 88-32". Data quality objectives for the project specified the use of CLP methods for the TAL metals and cyanide, the use of standard methods for the analysis of silicon, bismuth and wet chemistry parameters.

Sample quantitation limits were in most samples less than the contract required quantitation limit (CRQL) specified in the QAPjP (DOE, 1989) with the exception of bismuth, cyanide, nitrate, and sulfate. Bismuth was reported to a quantitation limit of 200 µg/L and the estimated detection limit specified in method 3111A (APHA, 1989) is 60 µg/L. Cyanide was reported to a quantitation limit of 20 µg/L and the CRQL is 10 µg/L. Nitrate and sulfate were reported to a quantitation limit of 2.5 mg/L and the estimated quantitation limit specified is 0.5 mg/L. However, all analyses were reported to within five times the CRQL.

3. QUALIFIED DATA

This section presents a summary of the qualifications required based on validation of the subject data package.

3.1 Major Deficiencies

Selenium results were rejected due to the matrix spike recovery being less than 30%.

Nitrate+nitrite results determined by the hydrazine reduction method 353.1 (EPA 1979) are rejected since they do not compare favorably with the IC data. Results for nitrate+nitrite are typically five times lower than the same results determined by IC. This may be due to acid preservation of the nitrate+nitrite samples which causes oxidation of any nitrite

present to nitrate. If the samples are not pH adjusted to between 5 and 9 prior to analysis, reduction of nitrate to nitrite during application of the hydrazine reagent may be inhibited.

3.2 Minor Deficiencies

The following qualifications were required as a result of the validation. Attachment 2 provides a summary of the samples affected.

- Matrix spike recoveries for silicon, iron, lead, and thallium were not within the control limits of 75 to 125%. All associated sample results have been qualified as estimated (J for detects, UJ for non-detects).

- Nitrate, nitrite, and phosphate analyses were not performed within the 48 hour holding time. Associated results have been qualified as estimated (J for detects, UJ for non-detects.)

- A method blank was run only for the ion chromatography. Detected results may not be representative of sample conditions for other parameters.

- A matrix spike was performed on the method blank only. Therefore, sample results may not represent sample conditions.

- A laboratory control sample was run for cyanide analysis only. Therefore, sample results for other parameters may not represent sample conditions.

- The detection limit for nitrate/nitrite exceeded the calibration range of the instrument. Therefore, results may not represent sample conditions.

4. CONCLUSIONS

Sections 1 through 3 present a summary of the data quality for the subject data package. The attachments provide supporting documentation and a tabular summary of the qualified data. The original, as-received data package is enclosed for submittal to the project QA record. In addition, the original report forms in the metal/cyanide data summary packet were inadvertently annotated by the data validator.

5. REFERENCES

APHA 1985, Standard Methods for the Examination of Water and Wastewater, 16th Edition. American Public Health Association, Washington, D.C.

APHA, 1989, Standard Methods for the Examination of Water and Wastewater, 17th Edition, American Public Health Association, Washington, D.C.

DOE, 1989, Remedial Investigation/Feasibility Study Work Plan for the 200-BP-1 Operable Unit Hanford Site, Richland, Washington, DOE/RL 88-32. United States Department of Energy, Richland, Washington.

EPA 1979, Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

EPA 1984, Test Method: The Determination of Inorganic Anions in Water by Ion Chromatography - Method 300.0. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

WHC, 1991, Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision A, November 1991. Westinghouse Hanford Company, Richland, Washington.

LIST OF ATTACHMENTS

1 Glossary of Data Qualifiers
2 Summary of Data Qualifications - Form B-7
3 As-Qualified Data Summary
4 Data Review Supporting Documentation

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

U - Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to identified quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are usable for decision making processes.

B - Indicates the compound or analyte was analyzed for and detected. The associated value is less than the CRQL but greater than the IDL.

R - Indicates the compound or analyte was analyzed for and due to an identified quality control deficiency the data are unusable.

NJ - Indicates presumptive evidence of a compound at an estimated value.

N - Indicates presumptive evidence of a compound.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: CLP425	REVIEWER: SSchulz	DATE: 2/12/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Si	J	all	Matrix spike
Fe	J	B001188	recovery < 75%
↓	UJ	B001189	or
Pb	UJ	all	
Se	R	all	
Tl	UJ	all	↓

SS 2/18/92

AAS 2/18/92

9613402.0788

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: CLP425	REVIEWER: S Schulz	DATE: 2/18/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO_2	UJ	B01188	Holding time
NO_3	J	↓	exceeded
PO_4	UJ	↓	↓
NO_2/NO_3	R	B01188	Result disparity

SSchulz 2/18/92

9613402.0789

ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

Project	200-BP-1																						
Laboratory	WESTON																						
Case WEST	SDG	CLP425																					
Sample Number		B01188		B01189																			
Location		6-49-57A		6-49-57A																			
Remarks		total		dissolved		total		dissolved		total		dissolved		total		dissolved		total		dissolved		total	
Sample Date		8-8-91		8-8-91																			
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	96	U	96	U																		
Antimony	60	55	U	55	U																		
Arsenic	10	5.5	B	5.9	B																		
Barium	200	25.6	B	27	B																		
Beryllium	5	1	U	1	U																		
Cadmium	5	4	U	4	U																		
Calcium	5000	34300		36700																			
Chromium	10	7.9	B	8.2	B																		
Cobalt	50	8	U	8	U																		
Copper	25	6	U	6	U																		
Iron	100	88.3	J	36	UJ																		
Lead	5	2	UJ	2	UJ																		
Magnesium	5000	10400		11100																			
Manganese	15	3	U	3	U																		
Mercury	0.2	0.1	U	0.1	U																		
Nickel	40	10	U	10	U																		
Potassium	5000	7150		7380																			
Selenium	5	2	R	2	R																		
Silver	10	7	U	7	U																		
Sodium	5000	30000		31300																			
Thallium	10	2	UJ	2	UJ																		
Vanadium	50	31.6	B	31.2	B																		
Zinc	20	8.8	B	11.1	B																		
Cyanide	10	31.6																					
Bismuth		200	U	200	U																		
Silicon		13100	J	14000	J																		

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9613402.0791 0000018

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01188
6-49-57A

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

Lab Code: WESTON Case No.: WEST1 SAS No.: SDG No.: CLP425

Matrix (soil/water): WATER Lab Sample ID: 910842501

Level (low/med): LOW Date Received: 8/12/91

% 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	96.00	U		P	
7440-36-0	Antimony	55.00	U		P	
7440-38-2	Arsenic	5.50	B		F	
7440-39-3	Barium	25.60	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	34300.00			P	
7440-47-3	Chromium	7.90	B		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	6.00	U		P	
7439-89-6	Iron	88.30	~~B~~		P	J
7439-92-1	Lead	2.00	~~U~~		F	UJ
7439-95-4	Magnesium	10400.00			P	
7439-96-5	Manganese	3.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	10.00	U		P	
7440-09-7	Potassium	7150.00			P	
7782-49-2	Selenium	2.00	~~U~~		F	R
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	30000.00			P	
7440-28-0	Thallium	2.00	~~U~~		F	UJ
7440-62-2	Vanadium	31.60	B		P	
7440-66-6	Zinc	8.80	B		P	
	Cyanide	31.60			C	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN 03/90

2/18/92

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01189
6-49-57A

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

Lab Code: WESTON Case No.: WEST1 SAS No.: SDG No.: CLP425

Matrix (soil/water): WATER Lab Sample ID: 910842502

Level (low/med): LOW Date Received: 8/12/91

% 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	96.00	U		P	
7440-36-0	Antimony	55.00	U		P	
7440-38-2	Arsenic	5.90	B		F	
7440-39-3	Barium	27.00	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	36700.00			P	
7440-47-3	Chromium	8.20	B		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	6.00	U		P	
7439-89-6	Iron	36.00	~~U~~		P	UJ
7439-92-1	Lead	2.00	~~U~~		F	UJ
7439-95-4	Magnesium	11100.00			P	
7439-96-5	Manganese	3.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	10.00	U		P	
7440-09-7	Potassium	7380.00			P	
7782-49-2	Selenium	2.00	~~U~~		F	R
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	31300.00			P	
7440-28-0	Thallium	2.00	~~U~~	W	F	UJ
7440-62-2	Vanadium	31.20	B		P	
7440-66-6	Zinc	11.10	B		P	
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

2/18/92
2/19/92

Project	200-BP-1																							
Laboratory	WESTON																							
Case WEST	SDG	CLP425																						
Sample Number		B01188																						
Location		6-49-57A																						
Remarks																								
Sample Date		8-8-91																						
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Alkalinity	2	100																						
Chloride	0.25	6																						
Fluoride	0.50	0.66																						
Nitrite	0.25	0.25	UJ																					
Nitrate	2.5	72.2	J																					
Cyanide, total	20 µg/L	31.6																						
Phosphate	0.25	0.25	UJ																					
Sulfate	2.5	36																						
Nitrate/Nitrite	2.5	15.6	R																					
Total Organic Carbon	0.5	0.79																						
pH	0.01 units	8																						
Total Dissolved Solids	5.0	298																						

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9613402.0794

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 09/10/91

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9108L425

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	B01188	Alkalinity	100	MG/L	2.0
	6-49-57A	Chloride by IC	6.0	mg/L	0.25
		Fluoride by IC	0.66	mg/L	0.50
		Nitrite by IC	0.25 u	mg/L	0.25 U
		Nitrate by IC	72.2	mg/L	2.5 J
		Cyanide, Total	31.6	UG/L	20.0
		Phosphate by IC	0.25 u	mg/L	0.25 U
		Sulfate by IC	36.0	mg/L	2.5
		~~Nitrate Nitrite~~	~~15.6~~	~~MG/L~~	~~2.5~~ R
		Total Organic Carbon	0.79	MG/L	0.50
		pH	8.0	PH UNITS	0.010
		Total Dissolved Solids	298	MG/L	5.0

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ATTACHMENT 4

DATA REVIEW SUPPORTING DOCUMENTATION

DRAFT 7/91

INORGANIC ANALYSIS DATA REVIEW CHECKLIST - FORM A-6

PROJECT: 913-1719	REVIEWER: S Schild	DATE: 2/10/91
LABORATORY: Weston	CASE: West 1	SDG: CLP425
SAMPLES/MATRIX: B001188, 1189/water		

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	✓	—	—

2/17/92

Data Package Item	Present?: Yes	No	N/A
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	✓		
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 non-detects).

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 CN 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 CN 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.

2/17/92

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.

6. LABORATORY BLANKS

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

ACTION: Qualify all associated sample results for any analyte <5X the amount in any laboratory blank as non-detected (U).

7. FIELD BLANKS

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

ACTION: Qualify all sample results for any analyte <5X the amount in any valid field blank as non-detected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

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 non-detects as estimated (UJ). If spike recovery is <30%, reject all non-detects (R).

2/17/92

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.

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.

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.

2/17/92

2/18/

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.

15. 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
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 non-detects). If the analytical spike recovery is less than 40 percent qualify detects as estimated (J). If the analytical spike recovery is greater than or equal to 10% but less than 40 percent, qualify all non-detects as estimated (UJ) and if the analytical spike recovery is less than 10 percent, reject all non-detects (R). If the sample absorbance is less than 50% of the analytical spike absorbance and the analytical spike recovery is less than 85% or greater than 115%, qualify all results as estimated (J for detects and UJ for non-detects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was less than 0.995, qualify the associated detected results as estimated (J).

2/17/92

16. ANALYTE QUANTITATION AND DETECTION LIMITS

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).

17. 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 of the data validation requirements.

2/17/92

ACCURACY DATA SUMMARY - FORM B-4

SDG: CLP425	REVIEWER: S Schulott	DATE: 2/12/92	PAGE 1 OF 1	
COMMENTS: Spike sample recovery from CLP 426 attached				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
	Si		all	J
	Fe		B001188	J
	↓		B001189	UJ
	Pb		all	UJ
	Se		all	R
	Tl		all	UJ

B-4

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ACCURACY DATA SUMMARY - FORM B-4

SDG: CLP 426	REVIEWER: S Schulak	DATE: 2/12/92	PAGE 1 OF 1	
COMMENTS: Spike sample recovery				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B001185S	Si	0	all	J
	Fe	63.6	all	J
	Pb	25.5	all	UJ
	Se	0	B001185,6	J
	↓		B001167,8	R
	Tl	33.6	all	UJ

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DRAFT 7/91

WET CHEMISTRY DATA REVIEW CHECKLIST - FORM A-7

PROJECT: 913-1719	REVIEWER: S Schulds	DATE: 2/17/92
LABORATORY: Weston	CASE:	SDG: CLP425
SAMPLES/MATRIX: B01188 / Water		

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	✗ SS 2/18/92	✓	

2/18/92

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 non-detects).

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

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

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

ACTION: Qualify all associated sample results for any analyte <5X the amount in any laboratory blank as non-detected (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 <5X the amount in any valid field blank as non-detected (U).

2/18/92

7. MATRIX SPIKE SAMPLE ANALYSIS

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

ACTION: If spike recovery is outside the control limits and the sample results are greater than the CRQL, qualify the data as estimated (J). If the spike recovery is less than 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.

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7/19

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

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 of the data validation requirements.

2/18/92

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COMMENTS (attach additional sheets as necessary):

1. NO_3/NO_2 results rejected due to results significantly less than NO_3 IC results.

2. Reference buffers for pH analysis not shown on raw data.

3. No raw data for TDS analysis of sample B01188.

4. NO_3/NO_2 reporting limit exceeds calibration.

5. Method blank only run on IC.

6. No sample matrix spike.

7. Laboratory control sample run only for CN analysis.

2/18/92

HOLDING TIME SUMMARY - FORM B-1

SDG: CLP425	REVIEWER: SSchilabt	DATE: 2/17/92	PAGE 1 OF 1
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01188	TOC	8/8/91		8/26/91		18	none
	NO_2/NO_3			8/28/91		20	
	TDS			8/13/91		5	
	Alk			8/19/91		11	
	SO_4			8/15/91 SSS 2/18/92		7	
	PO_4			8/15/91		7	UJ SSS 2/18/92 ~~none~~
	Cl			8/15/91 SSS 2/18/92		7	none
	F			8/15/91 SSS 2/18/92		7	
	NO_2			8/15/91		7	UJ SSS 2/18/92 ~~none~~
	NO_3			8/15/91		7	J SSS 2/18/92 ~~none~~
	CN		8/22/91	8/22/91	14	14	none

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2/18/92

2/18/92