9302L578-WES-10379 3
2

START 9616402.2367

0043053

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

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Client: WESTINGHOUSE HANFORD
RFW #: 9302L578

W.O. #: 06168-002-001-9999-00
Date Received: 02-11-93

GC/MS VOLATILE

The set of samples consisted of two (2) water samples collected on 02-09-93.

The samples were analyzed according to criteria set forth in CLP SOW 03/90 for TCL Volatile target compounds on 02-12-93.

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

1. Non-target compounds were not detected in these samples.

2. All system monitoring compound (surrogate) recoveries were within EPA QC limits.

3. All matrix spike recoveries were within EPA QC limits.

4. The laboratory blank contained the common contaminants Methylene Chloride and Acetone at levels less than the CRQL.

5. All internal standard area and retention time criteria were met.

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

03.23.93
Date

sma/voa/02-578v.cn

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EDMC

25

WESTON Analytics Use Only

93021578

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 2

Client: Westinghouse-Hanford
Est. Final Proj. Sampling Date:
Work Order #: CUCL08-002-001-9999-00
Project Contact/Phone #:
AD Project Manager: Josie Edwards
QC: CLP Del: CLP TAT: 35 days
Date Rec'd: 2/11/93 Date Due: 3/18/93
Account #: WS-HANFORD

Refrigerator #		1				4						4				
#/Type Container	Liquid	3G				1G	1P	1P	1P	1P		1P				
	Solid															
Volume	Liquid	40ml				500	250	1L	1L	1L		1L				
	Solid															
Preservatives		HCL				—	H2SO4	—	HNO3	NaOH		HNO3				
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb	Anions	Cyanide	8245 TCLP	INORG: Metal	CN		Sol. metals				

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Anions	Cyanide	8245 TCLP	Metals + Mercury	CN		Metals + Mercury				
		WESTON Analytics Use Only										ICP, ICP, ICP, ICP	ICP/MS	ICP/MS	ICP/MS	ICP/MS		ICP/MS + Mercury				
S - Soil	001	B08312			W	2/9/93						✓	✓	✓	✓	✓						
SE - Sediment	002	B08314																✓				
SO - Solid	003	B08315						✓														
SL - Sludge	004	B08308										✓	✓	✓	✓	✓						
W - Water	005	B08310																✓				
O - Oil	006	B08312										✓	✓	✓	✓	✓						
A - Air	007	B08314																✓				
DS - Drum Solids	008	B08318										✓	✓	✓	✓	✓						
DL - Drum Liquids	009	B08320																✓				
L - EP/TCLP Leachate	010	B08321						✓														
WI - Wipe																						
X - Other																						
F - Fish																						

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

DATE/REVISIONS: RAD INFO TO FOLLOW

1. 2. 3. 4. 5. 6.

Special Instructions:

Temp = 7.2°C, 5.6°C
Cooler #SML-279, SML-285

ORIGINAL RE-WRITTEN

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
EMERY	SPerka	2/11/93	1210		SP 2/11/93		
	SP 2/11/93						

WESTON Analytics Use Only

Samples were: 1) Shipped X or Hand Delivered Airbill # EMERY
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 SP 2/11/93 (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: Hard copy rec'd not mailed.

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

EMERY	SPerka	2/11/93	1210		SP 2/11/93		
	2/11/93						

Samples Labels and COC Record? Y or N
NOTES:
5) Received Within Holding Times Y or N
Upon Sample Rec't Y or N

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

9613402.2368

2

WESTON Analytics Use Only
93021578

Custody Transfer Record/Lab Work Request

WESTON

Client: Westinghouse Hanford
Est. Final Proj. Sampling Date:
Work Order #: 0U0U08-002-001-9999-00
Project Contact/Phone #:
AD Project Manager: Susie Edwards
QC: CLP Del: CLP TAT: 35 DAY
Date Rec'd: 2/11/93 Date Due: 3/12/93
Account #: WS-Hanford

Refrigerator #																	
#/Type Container	Liquid					1G	1D	1P	1P	1D		1G					
	Solid																
Volume	Liquid					500	850	1L	1L	1L		1L					
	Solid																
Preservatives		HCL				—	H2SO4	—	HNO3	NaOH		HNO3					
ANALYSES REQUESTED		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb	Anions	VOC/NVOC	Alk/TDS	Metal	CN		Sol. metals					
						WESTON Analytics Use Only											
		8260				300/300.0	9060	310.1/160.1	6010/7470	9010		6010/7470					

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 (✓) MS	MSD	Matrix	Date Collected	Time Collected														
01	B082P8			W	2/9/93					✓	✓	✓	✓	✓						
02	B082Q0			↓	↓											✓				

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

Temp = 7.2°C
Cooler # SML-279

DATE/REVISIONS: BAD INFO TO FOLLOW

1.
2.
3.
4.
5.
6.

ORIGINAL RE-WRITTEN

Relinquished by	Received by	Date	Time
EMERY	SOUTHLA	2/11/93	1210
	2/11/93		

Relinquished by	Received by	Date	Time
	SP 2/11/93		

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

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) Labels Indicate 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

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

9613402.2369

3

9613902.2370 9302578

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 200-BP-1

Collection Date 2-9-93

Ice Chest No. SML-279

Field Logbook No. EFL-1020

Bill of Lading/Airbill No. 2536953122

Offsite Property No. W93-0-0226-35

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks N/A

Sample Identification

BO 8312
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (UNFILTERED)
- 1, 500ml, G, WATER, ANIONS(PO4,SO4,Cl,F)
- 1, 250ml, P, WATER, NO2/NO3 (H2SO4)
- 1, 1L, P, WATER, ALKALINITY/TDS
- 1, 1L, P, WATER, CLP-CYANIDE(NaOH)

BO 8314
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (FILTERED)

BO 8315
- 3, 40ml, Gs, WATER, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker L.D. Walker 2-9-93	Received by: K. Trapp / K. Trapp	Date/Time: 2/10/93 0800
Relinquished by: K. Trapp / K. Trapp 2/10/93 0830	Received by:	Date/Time:
Relinquished by: EMERY	Received by: Susan Rosa	Date/Time: 2/11/93 910
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Refrig. # 5

4

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9613402.2371

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD LEE/GG HAMILTON Date Sampled 2-9-93 Time 1200 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B08312	1, 1L, P	WATER	TAL METALS + Bi (HNO3) UNFILTERED
	1, 500ml, G	"	ANIONS (PO4,SO4,Cl,F)
	1, 250ml, P	"	NO2/NO3 (H2SO4)
	1, 1L, P	"	ALKALINITY, TDS
	1, 1L, P	"	CLP-CYANIDE (NaOH)
~~B08314~~	xc 2/10/93		
B08314	1, 1L P	WATER	TAL METALS + Bi (HNO3) FILTERED
B08315	3, 40ml, Gs	WATER	CLP-VOA
			TASK #: 93-011
			OPC#: W93-0-0226-35
			BOL#: 2536953122

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.

A-6000-406(05/90)

9613402.2372

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 200-BP-1

Collection Date 2/9/93

Ice Chest No. SML-279

Field Logbook No. EFC-1020

Bill of Lading/Airbill No. 2536953122

Offsite Property No. W93-0-0226-35

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks N/A

Sample Identification

BO 8308
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (UNFILTERED)
- 1, 500ml, G, WATER, ANIONS(PO4,SO4,Cl,F)
- 1, 250ml, P, WATER, NO2/NO3 (H2SO4)
- 1, 1L, P, WATER, ALKALINITY/TDS
- 1, 1L, P, WATER, CLP-CYANIDE(NaOH)

BO 8310
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (FILTERED)

~~BO 8311~~
- ~~3, 40ml, G, WATER, CLP-VOA~~ KT 2/10/93

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: 2/9/93 Katy Baker K. Baker 1238	Received by: K. Umpp / K. Trapp	Date/Time: 2/10/93 0800
Relinquished by: 2/10/93 K. Umpp / K. Trapp 0830	Received by:	Date/Time:
Relinquished by: EMERY	Received by: Susan Resta	Date/Time: 2/11/93 1210
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Flight 5

7

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9613402.2373

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD LEE/GG HAMILTON Date Sampled 2/9/93 Time 1000 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B08308	1, 1L, P	WATER	TAL METALS + Bi (HNO3) UNFILTERED
	1, 500ml, G	"	ANIONS (PO4,SO4,Cl,F)
	1, 250ml, P	"	NO2/NO3 (H2SO4)
	1, 1L, P	"	ALKALINITY, TDS
	1, 1L, P	"	CLP-CYANIDE (NaOH)
B08310	1, 1L P	WATER	TAL METALS + Bi (HNO3) FILTERED
~~B08311~~	~~3, 40ml, Gs~~	~~WATER~~	~~CLP-VOA~~ KT 2/10/93
			TASK #: 93-011
			OPC#: W93-0-0226-35
			BOL#: 2536953122

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.

A-6000-406(05/90)

5.0 9613402.2374

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 200-BP-1

Collection Date 2/9/93

Ice Chest No. SML-285

Field Logbook No. WHC-N-4461

Bill of Lading/Airbill No. 2536953122

Offsite Property No. W93-0-0226-35

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks N/A

Sample Identification

B08242
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (UNFILTERED)
- 1, 500ml, G, WATER, ANIONS(PO4,SO4,Cl,F)
- 1, 250ml, P, WATER, NO2/NO3 (H2SO4)
- 1, 1L, P, WATER, ALKALINITY/TDS
- 1, 1L, P, WATER, CLP-CYANIDE(NaOH)

B08244
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (FILTERED)

~~B08245~~
- 3, 40ml, ~~G, WATER, CLP-VOA~~ KT 2/10/93

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
2/9/93 C. Cebulski 1202	K. Umana / K. Trapp	2/10/93 0800
2/10/93 K. Umana / K. Trapp 0830		
EMERY	Susan Russ	2/11/93 1210

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Ref. #2

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9613402.2375

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD LEE/GG HAMILTON Date Sampled 2/4/93 Time 1100 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B08212	1, 1L, P	WATER	TAL METALS + Bi (HNO3) UNFILTERED
	1, 500ml, G	"	ANIONS (PO4,SO4,Cl,F)
	1, 250ml, P	"	NO2/NO3 (H2SO4)
	1, 1L, P	"	ALKALINITY, TDS
	1, 1L, P	"	CLP-CYANIDE (NaOH)
B08214	1, 1L P	WATER	TAL METALS + Bi (HNO3) FILTERED
~~B08215~~	~~3, 40ml, Gs~~	~~WATER~~	~~CLP VOA~~ KT 2/10/93
			TASK #: 93-011
			OPC#: W93-0-0226-35
			BOL#: 2536973122

Field Information** Cloudy, slight wind, 90°

Special Handling and/or Storage NA

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.

A-6000-406(05/90)

9613402526 76

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 200-BP-1

Collection Date 2/09/93

Ice Chest No. SML-285

Field Logbook No. EFL-1020

Bill of Lading/Airbill No. 2536953122

Offsite Property No. W93-0-022C-35

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks N/A

Sample Identification

B0 82T8

1, 1L, P, WATER, TAL METALS+Bi(HNO3) (UNFILTERED)
1, 500ml, G, WATER, ANIONS(PO4,SO4,Cl,F)
1, 250ml, P, WATER, NO2/NO3 (H2SO4)
1, 1L, P, WATER, ALKALINITY/TDS
1, 1L, P, WATER, CLP-CYANIDE(NaOH)

B0 82V0

1, 1L, P, WATER, TAL METALS+Bi(HNO3) (FILTERED)

~~B0 82V1~~

~~3, 40ml, Gs, WATER, CLP-VOA~~ KT 2/10/93

B0 82V1 3, 40mL, Gs, WATER, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: P.C. Cole P.C. Cole 2/09/93 1200	Received by: K. Trapp / K. Trapp	Date/Time: 2/10/93 0800
Relinquished by: 2/10/93 K. Trapp / K. Trapp 0830	Received by:	Date/Time:
Relinquished by: EMERY	Received by: Susan Perto	Date/Time: 2/11/93 1210
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:
FIG. # 1

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9613402.2377

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD LEE/GG HAMILTON Date Sampled 2/09/93 Time 0915 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B082T8	1, 1L, P	WATER	TAL METALS + Bi (HNO3) UNFILTERED
	1, 500ml, G	"	ANIONS (PO4,SO4,Cl,F)
	1, 250ml, P	"	NO2/NO3 (H2SO4)
	1, 1L, P	"	ALKALINITY, TDS
	1, 1L, P	"	CLP-CYANIDE (NaOH)
B082V0	1, 1L P	WATER	TAL METALS + Bi (HNO3) FILTERED
B082V1	3, 40ml, Gs	WATER	CLP-VOA
			TASK #: 93-011
			OPC#: ~~8~~ W27-0-0226-35 KT 2/10/93
			BOL#: 2536953122

Field Information** Cloudy, Calm, 37°F

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.

A-6000-406(05/90)

9613402.2378

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Project Designation/Sampling Locations 200-BP-1

Ice Chest No. ML-285

Bill of Lading/Airbill No. 2536993122

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks N/A

Telephone (509)376-5045

Collection Date 2/9/93

Field Logbook No. WHK-N-446

Offsite Property No. W93-0-0226-35

Sample Identification

B0 82P8
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (UNFILTERED)
- 1, 500ml, G, WATER, ANIONS(PO4,SO4,Cl,F)
- 1, 250ml, P, WATER, NO2/NO3 (H2SO4)
- 1, 1L, P, WATER, ALKALINITY/TDS
- 1, 1L, P, WATER, CLP-CYANIDE(NaOH)

B0 82Q0
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (FILTERED)

~~B0 82Q1~~
- 3, 40ml, Gs, ~~WATER, CLP-VOA~~ KT 2/10/93

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: 2/9/93 C. Cellurate CCELLBRATI 1200	Received by: K. Trapp / K. Trapp	Date/Time: 2/10/93 0800
Relinquished by: 2/10/93 K. Trapp / K. Trapp 0830	Received by:	Date/Time:
Relinquished by: EMERY	Received by: Susan Rusk	Date/Time: 2/11/93 1210
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Refridg. #7

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9613402.2379

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD LEE/GG HAMILTON Date Sampled 4/9/92 Time 0900 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B092P8	1, 1L, P	WATER	TAL METALS + Bi (HNO3) UNFILTERED
	1, 500ml, G	"	ANIONS (PO4,SO4,Cl,F)
	1, 250ml, P	"	NO2/NO3 (H2SO4)
	1, 1L, P	"	ALKALINITY, TDS
	1, 1L, P	"	CLP-CYANIDE (NaOH)
B092Q0	1, 1L P	WATER	TAL METALS + Bi (HNO3) FILTERED
~~B092Q1~~	~~3, 40ml, Gs~~	~~WATER~~	~~CLP-VOA~~ KT 2/10/93
			TASK #: 93-011
			OPC#: W93-0-0226-35
			BOL#: 2576993122

Field Information** Cloudy, slight wind, 40°

Special Handling and/or Storage NA

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.

A-6000-406(05/90)

FORM OF PAYMENT

Check ☐ # ☐ ☐ CC(O) ☐

E 850281585

EMERY WORLDWIDE

A CF Company

SERVICES **

UNITED STATES / CANADA: Same Day (Extra Charges) ☐ AM ☐ PM ☐ Second Day ☐ Saturday Delivery ☐

INTERNATIONAL: Express ☐ Standard Plus ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

Date 02-10-93 | Origin PBC | Shipment Number 253695312 2

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:
JOSIE KING
ROY F WESTON INC
256 WELSH POOL ROAD
LIONVILLE PA 19341
Hold for Pick Up ☐
Canada ☐

Tariff Dest. | Gateway

Check to Shipper $

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

Customer's Reference Numbers: W81232 PL3EA W93-0-0226#35 99352

Consignee's Account Number: E

Description: 2 COOLER ID: SML 285 640
SML 279 580
WATER SAMPLES

Dimensions: L 11 W 16 H 17 | Total Pieces 2 | Total Weight (lbs) 122

FOR INFORMATION OR RATES CALL 1-800 44 EMERY (1-800-443-6379)

Declared Value $

2 5 3 6 9 5 3 1 2 2

Remarks: OVERNIGHT DELIVERY
SIGNATURE SECURITY SERVICE

Shipper's Signature X 5-10-93

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

Mark if Emery Packaging is used
Urgent Letter 9X12 | Urgent Pak 12X15

Free Domestic ☐ | Commodity Code

Third Party Account Number mandatory for Third Party Billing: E | Third Party Account Number

International Customs Value | International Insurance

Base Charge 1

Total Transportation Charges

Other Charges/Advance at Origin ☐ OC/AO $

3-PhL-A

Terms and Conditions on Back

9613402.2380

EMERY WORLDWIDE — A CF Company

SIGNATURE AND TALLY RECORD

60029-46 (8/89) Litho USA

DATE: 02-10-93 SHIPMENT NO.: 253695312 2 95)
SHIPPER: WESTINGHOUSE SHIPPING DEPT. (509) 376-6665
REFERENCE NO.: W93-0-0226#35

SHIPPER NAME AND ADDRESS

WESTINGHOUSE SHIPPING DEPT. (509) 376-6665
G2-06 U.S. DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD COMPANY
2355 STEVENS DRIVE 1163 BUILDING
PO BOX 1970
RICHLAND WA 99352

PX

CONSIGNEE NAME AND ADDRESS

JOSIE KING
RF WESTON INC
256 WELSH POOL ROAD
LIONVILLE PA 19341

PHL

Pieces	Weight	Description/Marks	Emery Authorization No.
2	122 LBS	COOLER ID: SML 285 64#; SML 279 58# WATER SAMPLES	

EACH PERSON HANDLING OR TAKING CUSTODY OF THIS SHIPMENT MUST SIGN AND COMPLETE THE INFORMATION BELOW

	Name of Person/Company	Transship Point/Destination	Signature of Person Accepting Custody	Time/Date
1.				
2.				
3.				
4.	K Rueschen Halcon	PHL	K Rueschen	[illegible]
5.	[illegible]	[illegible]	[illegible]	[illegible]
6.	D/E Sutter/RF Weston	[illegible]	D/E Sutter	[illegible]
7.	W D SNYER FHWA	PHL	[illegible]	1010/11
8.				

CONSIGNEE COPY

20

Roy F. Weston, Inc. - Lionville Laboratory
Volatiles by GC/MS, HSL List

Report Date: 03/08/93 16:30

RFW Batch Number: 9302L578 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-0 Page: 1a

	Cust ID:	B08315		B082V1		B082V1		B082V1		VBLK	
Sample Information	RFW#:	003		010		010 MS		010 MSD		93LVX027-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L		UG/L		UG/L	
Surrogate Recovery	Toluene-d8	98	%	99	%	94	%	100	%	100	%
	Bromofluorobenzene	96	%	94	%	90	%	97	%	98	%
	1,2-Dichloroethane-d4	93	%	94	%	91	%	98	%	98	%
Chloromethane		10	U	10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U
Methylene Chloride		4	JB	3	JB	3	JB	3	JB	2	J
Acetone		12	B	10	U	10	U	10	U	7	J
Carbon Disulfide		10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethene		10	U	10	U	99	%	100	%	10	U
1,1-Dichloroethane		10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethene (total)		10	U	10	U	10	U	10	U	10	U
Chloroform		10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane		10	U	10	U	10	U	10	U	10	U
2-Butanone		10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		10	U	10	U	10	U	10	U	10	U
Carbon Tetrachloride		10	U	10	U	10	U	10	U	10	U
Bromodichloromethane		10	U	10	U	10	U	10	U	10	U
1,2-Dichloropropane		10	U	10	U	10	U	10	U	10	U
cis-1,3-Dichloropropene		10	U	10	U	10	U	10	U	10	U
Trichloroethene		10	U	10	U	99	%	101	%	10	U
Dibromochloromethane		10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane		10	U	10	U	10	U	10	U	10	U
Benzene		10	U	10	U	97	%	99	%	10	U
trans-1,3-Dichloropropene		10	U	10	U	10	U	10	U	10	U
Bromoform		10	U	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		10	U	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane		10	U	10	U	10	U	10	U	10	U
Toluene		10	U	10	U	97	%	99	%	10	U

*= Outside of EPA CLP QC limits.

22

9613402.2382

RFW Batch Number: 9302L578 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-0 Page: 1b

Cust ID:	BO8315	BO82V1	BO82V1	BO82V1	VBLK
RFW#:	003	010	010 MS	010 MSD	93LVX027-MB1
Chlorobenzene	10 U	10 U	100 %	102 %	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U
Xylene (total)	10 U	10 U	10 U	10 U	10 U

*= Outside of EPA CLP QC limits.

23

9402.0497

9613402.2384

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BO8315

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L578-003

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

Lab File ID: AX2C07

Level: (low/med) LOW

Date Received: 02/11/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	JB
67-64-1	Acetone	12	B
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9613402.2385

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BO8315

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L578-003

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

Lab File ID: AX2C07

Level: (low/med) LOW

Date Received: 02/11/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

9613402.2386

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BO82V1

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L578-010

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

Lab File ID: AX2C08

Level: (low/med) LOW

Date Received: 02/11/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

9613402.2387

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B082V1

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L578-010

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

Lab File ID: AX2C08

Level: (low/med) LOW

Date Received: 02/11/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

9613402.2388 0000001

MAR 1993 RECEIVED OSM DMO

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

Client : WESTINGHOUSE HANFORD
RFW# : 9302L578

W.O. #: 06168-002-001-9999-00
Date Received: 02-11-93

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 Phosphate by IC which was received past hold.

2. All preparation blank results were 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 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).

Margaret M. Beaty for
J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

3/9/93
Date

pas/i02-578

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/07/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B08312	Alkalinity	0.50	u	MG/L	0.50
		Chloride by IC	0.25	u	MG/L	0.25
		Fluoride by IC	0.50	u	MG/L	0.50
		Cyanide, Total	10.0	u	UG/L	10.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	0.25	u	MG/L	0.25
		Nitrate Nitrite	0.10	u	MG-N/L	0.10
		Total Dissolved Solids	5.0	u	MG/L	5.0
-004	B08308	Alkalinity	0.50	u	MG/L	0.50
		Chloride by IC	0.25	u	MG/L	0.25
		Fluoride by IC	0.50	u	MG/L	0.50
		Cyanide, Total	10.0	u	UG/L	10.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	0.25	u	MG/L	0.25
		Nitrate Nitrite	0.10	u	MG-N/L	0.10
		Total Dissolved Solids	26.0		MG/L	5.0
-006	B082L2	Alkalinity	94.0		MG/L	2.0
		Chloride by IC	15.0		MG/L	5.0
		Fluoride by IC	0.50	u	MG/L	0.50
		Cyanide, Total	20.0	u	UG/L	20.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	90.0		MG/L	5.0
		Nitrate Nitrite	2.3		MG-N/L	0.20
		Total Dissolved Solids	321		MG/L	5.0

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/07/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-008	B082T8	Alkalinity	96.0		MG/L	2.0
		Chloride by IC	22.5		MG/L	5.0
		Fluoride by IC	0.63		MG/L	0.50
		Cyanide, Total	84.2		UG/L	10.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	137		MG/L	5.0
		Nitrate Nitrite	22.2		MG-N/L	2.5
		Total Dissolved Solids	461		MG/L	5.0
-011	B082P8	Alkalinity	130		MG/L	2.0
		Chloride by IC	8.7		MG/L	0.25
		Fluoride by IC	0.60		MG/L	0.50
		Cyanide, Total	10.0	u	UG/L	10.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	16.7		MG/L	5.0
		Nitrate Nitrite	0.36		MG-N/L	0.10
		Total Dissolved Solids	220		MG/L	5.0

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

Client: WESTINGHOUSE HANFORD
RFW #: 9302L578

W.O. #: 06168-002-001-9999-00
Date Received: 02-11-93

CLP METALS

1. This narrative covers the analysis of ten (10) 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 form Inorganic Ventures Laboratory.

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.

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).

    Matrix spike analyses are not required for Ca, Mg, Na, and K in waters.

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 except for:

RFW #	Element	%RPD
001R	Zinc	200.0

WESTON

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

Element	Sample #'s
Selenium	006, 007, 008, 009

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 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. Leahy for

Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

3/10/93
Date

mlj/clp-met.nar

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

Client: WESTINGHOUSE HANFORD
RFW #: 9302L578

W.O. #: 06168-002-001-9999-00
Date Received: 02-11-93

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.

Margaret M. Beaty for
Raymond A. Siery
Inorganic Section Manager

3/10/93
Date

mlj\clp-met.nar

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B08312	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	150	u	UG/L	150
		Calcium, Total	5000	u	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	5000	u	UG/L	5000
		Magnesium, Total	5000	u	UG/L	5000
		Manganese, Total	15.0	u	UG/L	15.0
		Sodium, Total	5000	u	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
		Thallium, Total	10.0	u	UG/L	10.0
		Vanadium, Total	50.0	u	UG/L	50.0
		Zinc, Total	30.0		UG/L	20.0

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-002	B08314	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	150	u	UG/L	150
		Calcium, Soluble	5000	u	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	5000	u	UG/L	5000
		Magnesium, Soluble	5000	u	UG/L	5000
		Manganese, Soluble	15.0	u	UG/L	15.0
		Sodium, Soluble	5000	u	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
		Thallium, Soluble	10.0	u	UG/L	10.0
		Vanadium, Soluble	50.0	u	UG/L	50.0
		Zinc, Soluble	20.4		UG/L	20.0

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ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-004	B08308	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	150	u	UG/L	150
		Calcium, Total	5000	u	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	5000	u	UG/L	5000
		Magnesium, Total	5000	u	UG/L	5000
		Manganese, Total	15.0	u	UG/L	15.0
		Sodium, Total	5000	u	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
		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.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-005	B08310	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	150	u	UG/L	150
		Calcium, Soluble	5000	u	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	5000	u	UG/L	5000
		Magnesium, Soluble	5000	u	UG/L	5000
		Manganese, Soluble	15.0	u	UG/L	15.0
		Sodium, Soluble	5000	u	UG/L	5000
		Nickel, Soluble	40.0	u	UG/L	40.0
		Lead, Soluble	3.0	u	UG/L	3.0
		Antimony, Soluble	97.1		UG/L	60.0
		Selenium, Soluble	5.0	u	UG/L	5.0
		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

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-006	B082L2	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	150	u	UG/L	150
		Calcium, Total	45800		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	1060		UG/L	100
		Mercury, Total	0.20	u	UG/L	0.20
		Potassium, Total	8480		UG/L	5000
		Magnesium, Total	13500		UG/L	5000
		Manganese, Total	30.7		UG/L	15.0
		Sodium, Total	23000		UG/L	5000
		Nickel, Total	40.0	u	UG/L	40.0
		Lead, Total	3.0	u	UG/L	3.0
		Antimony, Total	76.6		UG/L	60.0
		Selenium, Total	5.5		UG/L	5.0
		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.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-007	BO82L4	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	150	u	UG/L	150
		Calcium, Soluble	46500		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	8630		UG/L	5000
		Magnesium, Soluble	13700		UG/L	5000
		Manganese, Soluble	15.0	u	UG/L	15.0
		Sodium, Soluble	23500		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	7.7		UG/L	5.0
		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

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-008	B082T8	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	150	u	UG/L	150
		Calcium, Total	74700		UG/L	5000
		Cadmium, Total	5.0	u	UG/L	5.0
		Cobalt, Total	50.0	u	UG/L	50.0
		Chromium, Total	146		UG/L	10.0
		Copper, Total	25.0	u	UG/L	25.0
		Iron, Total	2220		UG/L	100
		Mercury, Total	0.20	u	UG/L	0.20
		Potassium, Total	8920		UG/L	5000
		Magnesium, Total	22600		UG/L	5000
		Manganese, Total	76.1		UG/L	15.0
		Sodium, Total	29400		UG/L	5000
		Nickel, Total	82.7		UG/L	40.0
		Lead, Total	3.0	u	UG/L	3.0
		Antimony, Total	60.0	u	UG/L	60.0
		Selenium, Total	12.2		UG/L	5.0
		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.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-009	B082V0	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	150	u	UG/L	150
		Calcium, Soluble	72400		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	8630		UG/L	5000
		Magnesium, Soluble	22000		UG/L	5000
		Manganese, Soluble	48.5		UG/L	15.0
		Sodium, Soluble	28300		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	12.9		UG/L	5.0
		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

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-011	B082P8	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	150	u	UG/L	150
		Calcium, Total	31100		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	5000	u	UG/L	5000
		Magnesium, Total	7320		UG/L	5000
		Manganese, Total	15.0	u	UG/L	15.0
		Sodium, Total	22200		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
		Thallium, Total	10.0	u	UG/L	10.0
		Vanadium, Total	50.0	u	UG/L	50.0
		Zinc, Total	44.6		UG/L	20.0

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/09/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-012	B082Q0	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	150	u	UG/L	150
		Calcium, Soluble	31300		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	5000	u	UG/L	5000
		Magnesium, Soluble	7370		UG/L	5000
		Manganese, Soluble	15.0	u	UG/L	15.0
		Sodium, Soluble	22300		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
		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

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B08312

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257801

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	5.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	37.40	B		P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	10.00	U		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	44.00	U		P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	27.30	B		P
7440-09-7	Potassium	934.00	B		P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	155.00	U		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	7.00	U		P
7440-66-6	Zinc	30.00		*	P
	Cyanide	10.00	U		C

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B08314

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257802

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	5.00	U		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	19.70	B		P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	10.00	U		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	44.00	U		P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	24.30	B		P
7440-09-7	Potassium	1070.00	B		P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	155.00	U		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	7.00	U		P
7440-66-6	Zinc	20.40		*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B08308

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257804

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	5.00	U		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	17.00	U		P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	10.00	U		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	44.00	U		P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	24.00	B		P
7440-09-7	Potassium	1670.00	B		P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	155.00	U		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	7.00	U		P
7440-66-6	Zinc	9.90	B	*	P
	Cyanide	10.00	U		C

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613402.2407 0000049

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B08310

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257805

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	97.10			P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	5.00	U		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	24.10	B		P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	10.00	U		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	44.00	U		P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	877.00	U		P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	155.00	U		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	7.00	U		P
7440-66-6	Zinc	14.60	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B082L2

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257806

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	76.60			P
7440-38-2	Arsenic	3.80	B		F
7440-39-3	Barium	20.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	45800.00			P
7440-47-3	Chromium	9.00	B		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	1060.00			P
7439-92-1	Lead	2.00	U	W	F
7439-95-4	Magnesium	13500.00			P
7439-96-5	Manganese	30.70			P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	8480.00			P
7782-49-2	Selenium	5.50		S	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	23000.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	8.20	B		P
7440-66-6	Zinc	8.00	U	*	P
	Cyanide	20.00	U		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.

B082L4

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257807

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	3.30	B		F
7440-39-3	Barium	20.30	B		P
7440-41-7	Beryllium	1.10	B		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	46500.00			P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	51.10	B		P
7439-92-1	Lead	2.00	U	W	F
7439-95-4	Magnesium	13700.00			P
7439-96-5	Manganese	14.70	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	8630.00			P
7782-49-2	Selenium	7.70		S	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	23500.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	10.60	B		P
7440-66-6	Zinc	8.00	U	*	P
	Cyanide				NR

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.

B082T8

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257808

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	2.20	B		F
7440-39-3	Barium	23.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	74700.00			P
7440-47-3	Chromium	146.00			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	2220.00			P
7439-92-1	Lead	2.00	U	W	F
7439-95-4	Magnesium	22600.00			P
7439-96-5	Manganese	76.10			P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	82.70			P
7440-09-7	Potassium	8920.00			P
7782-49-2	Selenium	12.20		S	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	29400.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	7.00	U		P
7440-66-6	Zinc	8.00	U	*	P
	Cyanide	84.20			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.

BO82V0

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257809

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	21.20	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	72400.00			P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	76.30	B		P
7439-92-1	Lead	2.00	U	W	F
7439-95-4	Magnesium	22000.00			P
7439-96-5	Manganese	48.50			P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	8630.00			P
7782-49-2	Selenium	12.90		S	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	28300.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	7.00	U		P
7440-66-6	Zinc	8.00	U	*	P
	Cyanide				NR

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.

B082P8

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257811

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	65.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	31100.00			P
7440-47-3	Chromium	8.10	B		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	99.50	B		P
7439-92-1	Lead	2.00	U	W	F
7439-95-4	Magnesium	7320.00			P
7439-96-5	Manganese	14.70	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	4800.00	B		P
7782-49-2	Selenium	2.00	U	W	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	22200.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	7.00	U		P
7440-66-6	Zinc	44.60		*	P
	Cyanide	10.00	U		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.

B082Q0

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257812

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	65.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	31300.00			P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	12.80	B		P
7439-92-1	Lead	2.00	U	W	F
7439-95-4	Magnesium	7370.00			P
7439-96-5	Manganese	12.90	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	22.70	B		P
7440-09-7	Potassium	4450.00	B		P
7782-49-2	Selenium	2.00	U	W	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	22300.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	7.00	U		P
7440-66-6	Zinc	12.80	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613402.2414

9302L578-WES-1037

MEMORANDUM

TO: 200-BP-1 Project QA Record May 11, 1993

FR: Susan Winter, Golder Associates Inc.

RE: VOLATILE ORGANIC ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 9302L578-WES-1037

INTRODUCTION

This memo presents the results of data validation on data package 9302L578-WES-1037 consisting of two (2) low level water samples submitted for volatile organic analysis. The samples were analyzed by Weston Analytics according to the CLP protocol for TCL volatile compounds. A list of the samples included in this data set is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B08315	02/09/93	WATER
B082V1	02/09/93	WATER

Data validation was conducted in accordance with the revised WHC statement of work (WHC 1993) and validation procedures (Bechtold 1992) in which twenty percent (20%) of the samples were randomly assigned for validation. The samples in this data set were verified and blank adjusted as summarized below since they were not selected for full data validation.

Attachments 1 through 3 to this memo provide the data reporting qualifiers, a summary of the verified results, and a summary of the associated blank results.

DATA QUALITY OBJECTIVES

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

Blank Adjustment. Methylene chloride and acetone were detected in the laboratory blank at a concentration of 2 µg/L and 7 µg/L, respectively. Therefore, the methylene chloride results in samples B08315 and B082V1 have been qualified as undetected (U) and corrected to the reporting limit of 10 µg/L. The acetone result of 12 µg/L in sample B08315 has also been qualified as undetected (U).

REFERENCES

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

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

9613402.2416

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the compound was analyzed for and detected in the associated blank. The "B" qualifier for organic data is applied by the laboratory only and is not applied by the data validators.

U - Indicates the compound was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory. The data are usable for decision making purposes.

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

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data are usable for decision making purposes.

UR - Indicates the compound was analyzed for and not detected; however, due to an identified quality control deficiency the data are unusable.

R - Indicates the compound was analyzed for and detected; however, 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.

9613402.2418

ATTACHMENT 2

AS QUALIFIED DATA SUMMARY

9613402.2419

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B082V1

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L578-010

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

Lab File ID: AX2C08

Level: (low/med) LOW

Date Received: 02/11/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

5/7/93

43

FORM 1 VOA Verified 3/90

9613402.2420

ATTACHMENT 3

ASSOCIATED BLANK DATA SUMMARY

9613402.2421

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B08315

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER — Lab Sample ID: 9302L578-003

Sample wt/vol: 5.00 (g/mL) ML — Lab File ID: AX2C07

Level: (low/med) LOW — Date Received: 02/11/93

% Moisture: not dec. — Date Analyzed: 02/12/93

GC Column: DB624 ID: .53(mm) — Dilution Factor: 1.00

Soil Extract Volume: (uL) — Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	10 ~~6~~	~~JB~~	u
67-64-1	Acetone	12	~~B~~	u
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

Verified. 5/7/93

9613402.2422

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLK

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 93LVX027-MB1

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

Lab File ID: AX2C03

Level: (low/med) LOW

Date Received: 02/12/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	2	J	x10=20
67-64-1	Acetone	7	J	x10=70
75-15-0	Carbon Disulfide	10	U	
75-35-4	1,1-Dichloroethene	10	U	
75-34-3	1,1-Dichloroethane	10	U	
540-59-0	1,2-Dichloroethene (total)	10	U	
67-66-3	Chloroform	10	U	
107-06-2	1,2-Dichloroethane	10	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
56-23-5	Carbon Tetrachloride	10	U	
75-27-4	Bromodichloromethane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
79-01-6	Trichloroethene	10	U	
124-48-1	Dibromochloromethane	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
71-43-2	Benzene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
75-25-2	Bromoform	10	U	
108-10-1	4-Methyl-2-pentanone	10	U	
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	10	U	
79-34-5	1,1,2,2-Tetrachloroethane	10	U	
108-88-3	Toluene	10	U	
108-90-7	Chlorobenzene	10	U	
100-41-4	Ethylbenzene	10	U	
100-42-5	Styrene	10	U	
1330-20-7	Xylene (total)	10	U	

5/7/93

9613402.2423

MEMORANDUM

TO: 200-BP-1 Project QA Record May 12, 1993

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL CHEMISTRY ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 9302L578-WES-1037

INTRODUCTION

This memo presents the results of data validation on data package 9302L578-WES-1037 consisting of five (5) low level water samples submitted for general chemistry analysis. The samples were analyzed by Weston Analytics using standard methods for all associated parameters. The samples included in this data package are provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B08312	02/09/93	WATER
B08308	02/09/93	WATER
B082L2	02/09/93	WATER
B082T8	02/09/93	WATER
B082P8	02/09/93	WATER

Data validation was conducted in accordance with the revised WHC statement of work (WHC 1993) and validation procedures (Bechtold 1992) in which twenty percent (20%) of the samples were randomly assigned for validation. The samples in this data set were verified and blank adjusted as summarized below since they were not selected for full data validation.

Attachments 1 and 2 to this memo provide the data reporting qualifiers and a summary of the verified results.

DATA QUALITY OBJECTIVES

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

Blank Adjustment. All results in the associated blank sample were undetected and therefore, blank adjustment was not required.

REFERENCES

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

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

9613402.2425

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the analyte was analyzed for and detected. The value reported is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). The data are usable for decision making purposes.

U - Indicates the 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. The data are usable for decision making purposes.

UJ - Indicates the analyte was analyzed for and not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit. The data are usable for decision making purposes.

BJ - Indicates the analyte was analyzed for and detected at a concentration greater than the IDL but less than the CRQL. The associated value is estimated due to a deficiency identified during data validation. The data are usable for decision making purposes.

J - Indicates the analyte was analyzed for and detected at a concentration greater than the CRQL. The associated value is estimated due to a deficiency identified during data validation. The data are usable for decision making purposes.

UR - Indicates the analyte was analyzed for and not detected; however, due to an identified quality control deficiency the data are unusable.

R - Indicates the analyte was analyzed and detected; however, due to an identified quality control deficiency the data are unusable.

9613402.2427

ATTACHMENT 2

AS QUALIFIED DATA SUMMARY

9613402.2428 0106002

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/07/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B08312	Alkalinity	0.50	u	MG/L	0.50
		Chloride by IC	0.25	u	MG/L	0.25
		Fluoride by IC	0.50	u	MG/L	0.50
Equipment Blank 2		Cyanide, Total	10.0	u	UG/L	10.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	0.25	u	MG/L	0.25
		Nitrate Nitrite	0.10	u	MG-N/L	0.10
		Total Dissolved Solids	5.0	u	MG/L	5.0
-004	B08308	Alkalinity	0.50	u	MG/L	0.50
		Chloride by IC	0.25	u	MG/L	0.25
		Fluoride by IC	0.50	u	MG/L	0.50
Equipment Blank 1		Cyanide, Total	10.0	u	UG/L	10.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	0.25	u	MG/L	0.25
		Nitrate Nitrite	0.10	u	MG-N/L	0.10
		Total Dissolved Solids	26.0		MG/L	5.0
-006	B082L2	Alkalinity	94.0		MG/L	2.0
		Chloride by IC	15.0		MG/L	5.0
299-E34-1		Fluoride by IC	0.50	u	MG/L	0.50
		Cyanide, Total	20.0	u	UG/L	20.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	90.0		MG/L	5.0
		Nitrate Nitrite	2.3		MG-N/L	0.20
		Total Dissolved Solids	321		MG/L	5.0

No blank adjustment required.
verified 3/7/93

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/07/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9302L578

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-008	B082T8	Alkalinity	96.0		MG/L	2.0
		Chloride by IC	22.5		MG/L	5.0
	699-55-57	Fluoride by IC	0.63		MG/L	0.50
		Cyanide, Total	84.2		UG/L	10.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	137		MG/L	5.0
		Nitrate Nitrite	22.2		MG-N/L	2.5
		Total Dissolved Solids	461		MG/L	5.0
-011	B082P8	Alkalinity	130		MG/L	2.0
		Chloride by IC	8.7		MG/L	0.25
		Fluoride by IC	0.60		MG/L	0.50
	699-49-57B	Cyanide, Total	10.0	u	UG/L	10.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	16.7		MG/L	5.0
		Nitrate Nitrite	0.36		MG-N/L	0.10
		Total Dissolved Solids	220		MG/L	5.0

verified 5/7/93

No Work adjustment required

9613402.2430

VALIDATION SUMMARY

9613402.2431

MEMORANDUM

TO: 200-BP-1 Project QA Record May 11, 1993

FR: Susan Winter, Golder Associates Inc.

RE: METALS ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 9302L578-WES-1037

INTRODUCTION

This memo presents the results of data validation on data package 9302L578-WES-1037 consisting of ten (10) water samples submitted for total and dissolved metals analysis. The samples were analyzed by Weston Analytics using the CLP protocol for TAL metals/cyanide analytes. A list of the samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B08312	02/09/93	WATER
B08314	02/09/93	WATER
B08308	02/09/93	WATER
B08310*	02/09/93	WATER
B082L2	02/09/93	WATER
B082L4*	02/09/93	WATER
B082T8	02/09/93	WATER
B082V0	02/09/93	WATER
B082P8	02/09/93	WATER
B082Q0	02/09/93	WATER

Data validation was conducted in accordance with the revised WHC statement of work (WHC 1993) and validation procedures (Bechtold 1992) in which twenty percent (20%) of the samples, marked with an asterisk (*), were randomly assigned for validation. Attachments 1 through 4 to this memo provide the data validation supporting documentation and a summary of the validated results.

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met with the exception of the laboratory duplicate as summarized under "Minor Deficiencies".

Accuracy. Goals for accuracy were met with the exception of the GFAA analytical spikes as summarized under "Minor Deficiencies".

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

Detection Limits. Detection limit goals were met for all analyses.

Completeness. The data package was complete for all requested analyses. Ten (10) samples were validated in this data set with a total of 245 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan objectives of 90%.

Samples B08308 and B08310 were identified as equipment blank 1, and samples B08312 and B08314 were identified as equipment blank 2. All results were undetected with the exception of barium and antimony as summarized below in "Minor Deficiencies".

MAJOR DEFICIENCIES

No deficiencies were identified for the metals fraction which required rejection of data.

MINOR DEFICIENCIES

Laboratory Blanks

Calcium, chromium, nickel, potassium, and zinc were detected in the laboratory blank samples. Therefore, the associated sample results which are less than five times the respective blank concentration have been qualified as undetected (U).

Equipment Blanks

Antimony was detected in sample B08310 which was identified as equipment blank 1 and barium was detected in sample B08312 which was identified as equipment blank 2. Therefore, all associated sample results which are less than five times the respective field blank concentration have been qualified as undetected (U).

Laboratory Duplicate

The laboratory duplicate percent difference for zinc was out of the control limits. Therefore, all associated sample results have been qualified as estimated (UJ).

GFAA Analytical Spikes

GFAA analytical spikes for the following samples were out of the control limits of 85% to 115%:

- Lead, samples B082L2, B082L4, B082T8, and B082V0.
- Selenium, samples B082L2, B082L4, B082T8, B082V0, B082P8, and B082Q0.

The associated sample results have been qualified as estimated (J for detects greater than the CRQL, BJ for detects less than the CRQL but greater than the IDL, and UJ for non-detects) with the exception of selenium in samples B082L2, B082L4, B082T8, and B082V0 which were analyzed by the method of standard additions (MSA).

REFERENCES

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

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

9613402.2434

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the analyte was analyzed for and detected. The value reported is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). The data are usable for decision making purposes.

U - Indicates the 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. The data are usable for decision making purposes.

UJ - Indicates the analyte was analyzed for and not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit. The data are usable for decision making purposes.

BJ - Indicates the analyte was analyzed for and detected at a concentration greater than the instrument detection limit (IDL) but less than the contract required quantitation limit (CRQL). The associated value is estimated due to a deficiency identified during data validation. The data are usable for decision making purposes.

J - Indicates the analyte was analyzed for and detected at a concentration greater than the contract required quantitation limit (CRQL). The associated value is estimated due to a deficiency identified during data validation. The data are usable for decision making purposes.

UR - Indicates the analyte was analyzed for and not detected; however, due to an identified quality control deficiency the data are unusable.

R - Indicates the analyte was analyzed and detected; however, due to an identified quality control deficiency the data are unusable.

9613402.2436

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

9302L578-WES-1037

SDG:	REVIEWER: [illegible]	DATE: 5/07/93	PAGE 1 OF 2
COMMENTS: Metals			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium	u	B08312	Present in lab blanks
		B08314	
		B08310	
Chromium	u	B082L2	
		B082P8	
Nickel	u	B08312	
		B08314	
		B08308	
		B082T8	
		B082Q0	
Potassium	u	B08312	
		B08314	
		B08308	
		B082P8	
		B082Q0	
Zinc	u	B08312	
		B08314	
		B08308	
		B08310	
		B082P8	
		B082Q0	
Antimony	u	B082L2	Present in field blank

DATA QUALIFICATION SUMMARY - FORM B-7

9302L578-WES-1037

SDG:	REVIEWER:	DATE: 5/07/93	PAGE 2 OF 2
COMMENTS: Metals			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Barium	u	B082L2	Present in field blanks
↓	↓	B082L4	↓
		B082T8	
		B082V0	
		B082P8	
Zinc	UJ	All	Dup RPD out of CL
Lead	UJ	B082L2	GFAA Analytical spike out of CL
↓	UJ	B082L4	↓
	UJ	B082T8	
	UJ	B082V0	
Selenium	None - analyzed by MS/ft	B082L2	
↓	↓	B082L4	↓
		B082T8	
		B082V0	
Selenium	UJ	B082P8	
	UJ	B082Q0	

9613402.2439

ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

9613402.2440 000046

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Equipment Blank 2

B08312

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257801

Level (low/med): LOW Date Received: 2/11/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	5.10	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	37.40	~~B~~		P	u
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	10.00	U		P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	44.00	U		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	27.30	~~B~~		P	u
7440-09-7	Potassium	934.00	~~B~~		P	u
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	155.00	U		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	30.00	/	*	P	K UJ
	Cyanide	10.00	U		C	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN verified 3/7/93 03/90

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Equipment Blank 2

B08314

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257802

Level (low/med): LOW Date Received: 2/11/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	5.00	U		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	19.70	~~B~~		P	u
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	10.00	U		P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	44.00	U		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	24.30	~~B~~		P	u
7440-09-7	Potassium	1070.00	~~B~~		P	u
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	155.00	U		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	20.40		*	P	KUJ
	Cyanide				NR	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN Unverified 3/7/93 03/90

9613402.2442 0000078

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Equipment Blank 1

B08308

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257804

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	5.00	U		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	17.00	U		P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	10.00	U		P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	44.00	U		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	24.00	~~B~~		P	u
7440-09-7	Potassium	1670.00	~~B~~		P	u
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	155.00	U		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	9.90	~~B~~	*	P	KWS
	Cyanide	10.00	U		C	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN Verified 5/7/93 03/90

9613402.2443 0000049

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Equipment Blank 1

B08310

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257805

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P	
7440-36-0	Antimony	97.10			P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	5.00	U		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	24.10	~~B~~		P	u
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	10.00	U		P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	44.00	U		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	877.00	U		P	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	155.00	U		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	14.60	~~B~~	*	P	u u5
	Cyanide				NR	
7440-69-9	Bismuth	150.00	u		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN Verified Validated 5/7/93 03/90

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-E34-1

B082L2

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257806

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P	
7440-36-0	Antimony	76.60	/		P	u
7440-38-2	Arsenic	3.80	B		F	
7440-39-3	Barium	20.70	~~B~~		P	u
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	45800.00			P	
7440-47-3	Chromium	9.00	~~B~~		P	u
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	1060.00			P	
7439-92-1	Lead	2.00	~~B~~	W	F	uJ
7439-95-4	Magnesium	13500.00			P	
7439-96-5	Manganese	30.70			P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	8480.00			P	
7782-49-2	Selenium	5.50		S	F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	23000.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	8.20	B		P	
7440-66-6	Zinc	8.00	~~U~~	*	P	uJ
	Cyanide	20.00	U		C	
7440-69-9	Bismuth	150.00	u		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN Verified 5/7/93 03/90

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
299-E34-1

B082L4

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257807

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	3.30	B		F	
7440-39-3	Barium	20.30	~~B~~		P	u
7440-41-7	Beryllium	1.10	B		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	46500.00			P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	51.10	B		P	
7439-92-1	Lead	2.00	~~U~~	W	F	uJ
7439-95-4	Magnesium	13700.00			P	
7439-96-5	Manganese	14.70	B		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	8630.00			P	
7782-49-2	Selenium	7.70		S	F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	23500.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	10.60	B		P	
7440-66-6	Zinc	8.00	~~U~~	*	P	uJ
	Cyanide				NR	
7440-69-9	Bismuth	150.00	u		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN Verified Validated 5/7/93 03/90

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
699-55-57

B082T8

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257808

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.20	B		F	
7440-39-3	Barium	23.00	~~B~~		P	u
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	74700.00			P	
7440-47-3	Chromium	146.00			P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	2220.00			P	
7439-92-1	Lead	2.00	~~U~~	W	F	us
7439-95-4	Magnesium	22600.00			P	
7439-96-5	Manganese	76.10			P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	82.70	/		P	u
7440-09-7	Potassium	8920.00			P	
7782-49-2	Selenium	12.20		S	F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	29400.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	8.00	~~U~~	*	P	us
	Cyanide	84.20			C	
7440-69-9	Bismuth	150.00	u		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN Verified 3/7/93 03/90

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
699-55-57

B082V0

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257809

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	21.20	~~B~~		P	u
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	72400.00			P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	76.30	B		P	
7439-92-1	Lead	2.00	~~U~~	W	F	us
7439-95-4	Magnesium	22000.00			P	
7439-96-5	Manganese	48.50			P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	8630.00			P	
7782-49-2	Selenium	12.90		S	F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	28300.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	8.00	~~U~~	*	P	us
	Cyanide				NR	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN Verified 5/7/93

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
699-49-578

B082P8

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257811

Level (low/med): LOW Date Received: 2/11/93

% 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	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	65.00	~~B~~		P	u
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	31100.00			P	
7440-47-3	Chromium	8.10	~~B~~		P	u
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	99.50	B		P	
7439-92-1	Lead	2.00	U	W	F	
7439-95-4	Magnesium	7320.00			P	
7439-96-5	Manganese	14.70	B		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	4800.00	~~B~~		P	u
7782-49-2	Selenium	2.00	~~U~~	W	F	uJ
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	22200.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	44.60	/	*	P	~~u~~ uJ
	Cyanide	10.00	U		C	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
699-49-57B

B082Q0

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257812

Level (low/med): LOW Date Received: 2/11/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	65.40	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	31300.00			P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	12.80	B		P	
7439-92-1	Lead	2.00	U	W	F	
7439-95-4	Magnesium	7370.00			P	
7439-96-5	Manganese	12.90	B		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	22.70	~~B~~		P	U
7440-09-7	Potassium	4450.00	~~B~~		P	U
7782-49-2	Selenium	2.00	~~U~~	W	F	UJ
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	22300.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	12.80	~~B~~	*	P	~~U~~ UJ
	Cyanide				NR	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

5/7/93

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ATTACHMENT 4

DATA VALIDATION SUPPORTING DOCUMENTATION

9613402.2451

WHC-SD-EN-SPP-002, Rev. 1

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: 200-BP-1	REVIEWER: [illegible]	DATE: 5/07/93
LABORATORY: Weston	CASE:	SDG: 93C2L578
SAMPLES/MATRIX: Water		-WES-1037
B08312	B08212	B08298
B08314	B08214	B08290
B08308	B08278	
B08310	B08270	

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	✓	—	—

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.

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

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.

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

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥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 ≥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

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
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):

The matrix spike, duplicate, and ICP serial dilution were performed using sample B0831Q - an equipment blank.

5/7/93

HOLDING TIME SUMMARY - FORM B-1

9302L578-WES-1037

SDG:	REVIEWER: [illegible]	DATE: 05/07/93	PAGE 1 OF 1
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B08312	ICP	02/09/93	NA	03/07/93	NA	26	None
B08314	Bi	↓	↓	03/07/93	↓	26	↓
B08308	As	↓	↓	03/04/93	↓	23	↓
B08310	Pb	↓	↓	03/04/93	↓	23	↓
B08312	Tl	↓	↓	03/05/93	↓	24	↓
B08314	Se	↓	↓	03/05/93	↓	24	↓
B08278	Hg	↓	↓	03/08/93	↓	27	↓
B08290							
B08298							
B08290							

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BLANKS

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

Lab code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

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
			5x		5x				5x		
Aluminum	64.0	U	64.0	U	64.0	U	64.0	U	64.000	U	P
Antimony	57.0	U	57.0	U	57.0	U	57.0	U	57.000	U	P
Arsenic	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Barium	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Cadmium	4.0	U	4.0	U	4.0	U	4.0	U	4.000	U	P
Calcium	17.0	U	17.0	U	17.0	U	17.0	U	130 26.000	B	P
Chromium	7.0	U	7.0	U	7.0	U	7.1	B	37.5 7.500	B	P
Cobalt	-12.0	B	-8.3	B	8.0	U	8.0	U	8.000	U	P
Copper	-14.0	B	9.0	U	-9.1	B	-9.1	B	9.000	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	10.000	U	P
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Magnesium	-77.0	B	44.0	U	44.0	U	53.2	B	44.000	U	P
Manganese	2.0	U	-2.5	B	-3.1	B	2.0	U	2.000	U	P
Mercury	.1	U	.1	U	.1	U	.1	U	.100	U	CV
Nickel	19.0	U	6118 19.0	U	127 25.4	B	19.0	U	5888.5 19.000	U	P
Potassium	877.0	U	1383.6	B	1374.0	B	995.8	B	1177.700	B	P
Selenium	2.0	U	2.0	U	6870 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	-290.0	B	155.0	U	155.0	U	155.0	U	155.000	U	P
Thallium	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Vanadium	-11.0	B	7.0	U	7.0	U	7.0	U	7.000	U	P
Zinc	8.0	U	8.0	U	8.0	U	8.0	U	96.5 19.300	B	P
Cyanide	10.0	U	10.0	U	10.0	U			10.000	U	C

FORM III - IN 03/90

Assoc w/
B08312
B08314
B08308

Assoc w/
B08310
B08212
B08214
B08218
B08210
B08218
B08210

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
Equipment Blank 2
B08312

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257801

Level (low/med): LOW Date Received: 2/11/93

% Solids: 0.0

Field Blank
Total Metals

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

CAS No.	Analyte	Concentration	C	Q	M	Q
		5X				
7429-90-5	Aluminum	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	25.5 5.10	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	37.40	B		P	u
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	10.00	U		P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	44.00	U		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	27.30	B		P	u
7440-09-7	Potassium	934.00	B		P	u
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	155.00	U		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	30.00		*	P	u
	Cyanide	10.00	U		C	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN verified 5/7/93 03/90

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Equipment Blank 2

BO8314

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257802

Level (low/med): LOW Date Received: 2/11/93

% Solids: 0.0 Dissolved Metals

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	5.00	U		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	19.70	~~B~~		P	u
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	10.00	U		P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	44.00	U		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	24.30	~~B~~		P	u
7440-09-7	Potassium	1070.00	~~B~~		P	u
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	155.00	U		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	20.40		*	P	u
	Cyanide				NR	
7440-69-9	Bismuth	150.00	u		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Equipment Blank 1

B08308

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257804

Level (low/med): LOW Date Received: 2/11/93

% Solids: 0.0 Total Metals

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	5.00	U		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	17.00	U		P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	10.00	U		P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	44.00	U		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	24.00	~~B~~		P	u
7440-09-7	Potassium	1670.00	~~B~~		P	u
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	155.00	U		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	9.90	~~B~~	*	P	u
	Cyanide	10.00	U		C	
7440-69-9	Bismuth	150.00	u		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Equipment Blank 1

B08310

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (soil/water): WATER Lab Sample ID: 930257805

Level (low/med): LOW Date Received: 2/11/93

% Solids: 0.0

Dissolved Metals

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	64.00	U		P	
7440-36-0	Antimony	485.5 97.10			P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	5.00	U		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	24.10	~~B~~		P	u
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	10.00	U		P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	44.00	U		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	877.00	U		P	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	155.00	U		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	7.00	U		P	
7440-66-6	Zinc	14.60	~~B~~	*	P	u
	Cyanide				NR	
7440-69-9	Bismuth	150.00	u		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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U.S. EPA - CLP

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DUPLICATES

EPA SAMPLE NO.

B08312D

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP578

Matrix (water/soil): WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum		64.0000	U	64.0000	U			P
Antimony		57.0000	U	57.0000	U			P
Arsenic		2.0000	U	2.0000	U			F
Barium		5.1000	B	5.0000	U	200.0		P
Beryllium		1.0000	U	1.0000	U			P
Cadmium		4.0000	U	4.0000	U			P
Calcium		37.4000	B	17.0000	U	200.0		P
Chromium		7.0000	U	7.0000	U			P
Cobalt		8.0000	U	8.0000	U			P
Copper		9.0000	U	9.0000	U			P
Iron		10.0000	U	10.0000	U			P
Lead		2.0000	U	2.0000	U			F
Magnesium		44.0000	U	44.0000	U			P
Manganese		2.0000	U	2.0000	U			P
Mercury		.1000	U	.1000	U			CV
Nickel		27.3000	B	19.0000	U	200.0		P
Potassium		933.5000	B	1283.0000	B	31.5		P
Selenium		2.0000	U	2.0000	U			F
Silver		7.0000	U	7.0000	U			P
Sodium		155.0000	U	155.0000	U			P
Thallium		2.0000	U	2.0000	U			F
Vanadium		7.0000	U	7.0000	U			P
Zinc	20.0	30.0000		8.0000	U	200.0	*	P
Cyanide								NR

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ACCURACY DATA SUMMARY - FORM B-4

9302L578-WES-1037

SDG:	REVIEWER:	DATE: 5/07/93	PAGE 1 OF 1
COMMENTS: GFAA Analytical Spikes			

SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B082L2	Lead	61%	B082L2	UJ
B082L4	↓	69%	B082L4	UJ
B082T8	↓	64%	B082T8	UJ
B082V0	↓	65%	B082V0	UJ
B082L2	Selenium	51%	B082L2	None-analyzed by MSA
B082L4	↓	59%	↓ L4	↓
B082T8	↓	63%	↓ T8	↓
B082V0	↓	56%	↓ V0	↓
B082P8	Selenium	74%	B082P8	UJ
B082Q0	↓	73%	B082Q0	UJ

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