

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. 5ML-227 277 h: 2/9/93
 Bill of Lading/Airbill No. 2536952990
 Method of Shipment EMERY
 Shipped to WESTON
 Possible Sample Hazards/Remarks N/A

Telephone (509)376-5045
 Collection Date 2-8-93
 Field Logbook No. WMC-N-4461
 Offsite Property No. W93-0-0226-33

RW# 9302504

Sample Identification

BO82Q2
 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 82Q4
 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (FILTERED)

BO82Q5
 3, 40ml, Gs, WATER, CLP-VOA

[] Field Transfer of Custody		Chain of Possession		(Sign and Print Names)
Relinquished by: <i>[Signature]</i> B. WHITTEN 2-8-93 1245	Received by: K. Trapp / K. Trapp	Date/Time: 2/9/93 0800		
Relinquished by: K. Trapp / K. Trapp 2/9/93 0830	Received by:	Date/Time:		
Relinquished by: EMERY	Received by: Suzanne Reed	Date/Time: 2/10/93 1300		
Relinquished by:	Received by:	Date/Time:		
Final Sample Disposition				
Disposal Method:	Disposed by:	Date/Time:		
Comments: FRIG #1 Temp = 6.1°C				

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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. ~~SML-227~~ 277 wt 2/9/93

Bill of Lading/Airbill No. 2936952990

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks N/A

Telephone (509)376-5045

Collection Date 2-8-93

Field Logbook No. WHP-N-4461

Offsite Property No. W93-0-0226-33

BFW# 93026504

Sample Identification

BO 82R0

- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (UNFILTERED)
- 1, 500ml, G, WATER, ANIONS(PO4,SO4,C1,F)
- 1, 250ml, P, WATER, NO2/NO3 (H2SO4)
- 1, 1L, P, WATER, ALKALINITY/TDS
- 1, 1L, P, WATER, CLP-CYANIDE(NaOH)

BO 82R2

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

BO 82R3

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

[] Field Transfer of Custody		Chain of Possession	(Sign and Print Names)
Relinquished by: <i>PH BUTCHER</i> 2-8-93 1245 B. WITTEN	Received by: <i>K. Trapp / K. Trapp</i>	Date/Time: 2/9/93 0800	
Relinquished by: <i>K. Trapp / K. Trapp</i> 2/9/93 0830	Received by:	Date/Time:	
Relinquished by: EMERY	Received by: <i>Susan R...</i>	Date/Time: 2/10/93 1300	
Relinquished by:	Received by:	Date/Time:	
Final Sample Disposition			
Disposal Method:	Disposed by:	Date/Time:	
Comments: <i>FRIGHT 1 TEMP = 6.1°C</i>			

Cust ID: B082Q5 B082R3 B082R3 B082R3 VBLK VBLK BS

RFW#: 003 006 006 MS 006 MSD 93LVQ019-MB1 93LVQ019-MB1

Chlorobenzene	10	U	10	U	91	%	92	%	10	U	98	%
Ethylbenzene	10	U										
Styrene	10	U										
Xylene (total)	10	U										

*= Outside of EPA CLP QC limits.

0727-276996

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



Client: WESTINGHOUSE HANFORD
RFW #: 9302L564

W.O. #: 06168-002-001-9999-00
Date Received: 02-10-93

GC/MS VOLATILE

The set of samples consisted of two (2) water samples collected on 02-08-93.

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. Two (2) of eighteen (18) system monitoring compound (surrogate) recoveries were outside EPA QC limits. The analysis of sample BO82R3 fulfilled the re-analysis requirement for its matrix spike samples.
3. All matrix spike recoveries were within EPA QC limits.
4. All blank spike recoveries were within EPA QC limits.
5. The laboratory blank contained the common contaminant Acetone at a level less than the CRQL.
6. All internal standard area and retention time criteria were met.

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

03.23.93

Date

WESTON.ADDENDUM

I certify that this data package is in compliance with the terms and conditions of this contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Som N. Basuthakur Name: SOM N. BASUTHAKUR
Date: 03.23.93 Title: UNIT-LEADER

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B082Q5

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L564-003

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

Lab File ID: 0021214

Level: (low/med) LOW

Date Received: 02/10/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	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	J
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

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B082Q5

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L564-003

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

Lab File ID: 0021214

Level: (low/med) LOW

Date Received: 02/10/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: SP1000 ID: 2.00(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.				

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B082R3

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L564-006

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

Lab File ID: 0021215

Level: (low/med) LOW

Date Received: 02/10/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	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
67-64-1	-----Acetone	4	JB
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

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B082R3

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L564-006

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

Lab File ID: 0021215

Level: (low/med) LOW

Date Received: 02/10/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: SP1000 ID: 2.00(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.				

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



Client : WESTINGHOUSE HANFORD
RFW# : 9302L564

W.O. #: 06168-002-001-9999-00
Date Received: 02-10-93

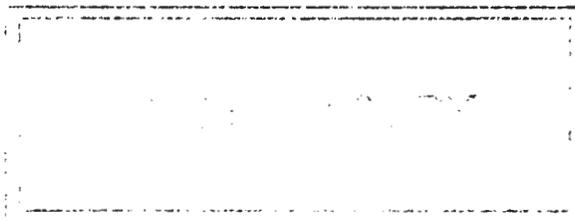
INORGANIC

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 with the exception of Cyanide. 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. Sealey for
J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

3/9/93
Date





ADDENDUM

I certify that this data package is in compliance with the terms and conditions of this contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Margaret M. Beaty

Date: 3/9/93

Name: MARGARET M. BEATY

Title: SECTION MANAGER

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ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 02/25/93

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

WESTON BATCH #: 9302L564

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
=====	=====	=====	=====	=====	=====
-001	BO82Q2	Alkalinity	88.0	MG/L	2.0
		Chloride by IC	61.6	MG/L	12.5
		Fluoride by IC	0.50	u MG/L	0.50
		Cyanide, Total	199	UG/L	20.0
		Phosphate by IC	0.25	u MG/L	0.25
		Sulfate by IC	306	MG/L	12.5
		Nitrate Nitrite	43.9	MG-N/L	5.0
		Total Dissolved Solids	880	MG/L	5.0
-004	BO82R0	Alkalinity	100	MG/L	2.0
		Chloride by IC	22.4	MG/L	5.0
		Fluoride by IC	0.63	MG/L	0.50
		Cyanide, Total	169	UG/L	20.0
		Phosphate by IC	0.25	u MG/L	0.25
		Sulfate by IC	164	MG/L	5.0
		Nitrate Nitrite	28.4	MG-N/L	2.5
		Total Dissolved Solids	545	MG/L	5.0



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

Client: WESTINGHOUSE HANFORD
RFW #: 9302L564

W.O. #: 06168-002-001-9999-00
Date Received: 02-10-93

CLP METALS

1. This narrative covers the analysis of (4) 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 or 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)
except for:

<u>SAMPLE #</u>	<u>Element</u>	<u>%Recovery</u>
001S	Lead	49.5
	Selenium	27.0
	Cyanide	139.1

A Post-Matrix Spike analysis was performed for those ICP elements that did not meet the specified control limits (exception allowed for Ag).

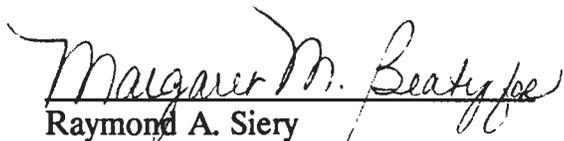
Matrix spike analyses are not required for Ca, Mg, Na, and K in waters.



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

<u>Element</u>	<u>Sample #'s</u>
Selenium	001
	001R
	002
	004
	005

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 and ICP Linear Ranges 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.


 Raymond A. Siery
 Inorganic Section Manager
 Lionville Analytical Laboratory


 Date

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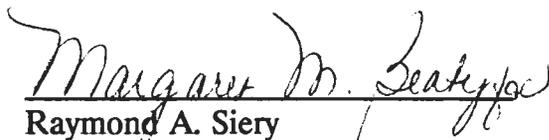
ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9302L564

W.O. #: 06168-002-001-9999-00
Date Received: 02-10-93

CLP METALS ADDENDUM

1. Following Exhibit E, Section V, Item 10, page E-23 of the USEPA Statement of Work for Inorganics Analysis, Document Number ILM02.0 ICP Instrument Detection Limits (IDLs) are reported for two (2) ICP instruments. The instrument identification numbers are "IC1" and "IC3". The highest IDL for the two instruments is used for reporting concentration values in this sample data package.
2. A discrepancy exists between raw data and Form XIVs analytical spikes recovery calculations performed for graphite furnace AA analytes. Instrument software calculates spike recoveries based on absolute values below the IDL for sample results. This is hard-coded by the vendor and is currently not correctable. CLP convention (SOW ILM02.0, Exhibit E, Section V, Item 6, page E-20) requires that when values fall below the IDL, the sample result is equal to zero (0) for the purposes of calculating the percent recovery. The Form XIVs contain the correct calculation.


Raymond A. Siery
Inorganic Section Manager

3/11/93
Date

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ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/10/93

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

WESTON BATCH #: 9302L564

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	B082Q2	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	139000	UG/L	5000
		Cadmium, Total	5.0	u UG/L	5.0
		Cobalt, Total	50.0	u UG/L	50.0
		Chromium, Total	32.1	UG/L	10.0
		Copper, Total	25.0	u UG/L	25.0
		Iron, Total	366	UG/L	100
		Mercury, Total	0.20	u UG/L	0.20
		Potassium, Total	12800	UG/L	5000
		Magnesium, Total	38900	UG/L	5000
		Manganese, Total	15.0	u UG/L	15.0
		Sodium, Total	44800	UG/L	5000
		Nickel, Total	40.0	u UG/L	40.0
		Lead, Total	30.0	u UG/L	30.0
		Antimony, Total	73.6	UG/L	60.0
		Selenium, Total	17.5	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

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ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/10/93

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

WESTON BATCH #: 9302L564

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-002	BO82Q4	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	157	UG/L	150
		Calcium, Soluble	134000	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	8860	UG/L	5000
		Magnesium, Soluble	37300	UG/L	5000
		Manganese, Soluble	15.0	u UG/L	15.0
		Sodium, Soluble	43100	UG/L	5000
		Nickel, Soluble	40.0	u UG/L	40.0
		Lead, Soluble	30.0	u UG/L	30.0
		Antimony, Soluble	60.0	u UG/L	60.0
		Selenium, Soluble	18.1	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

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ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/10/93

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

WESTON BATCH #: 9302L564

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-004	BO82R0	Silver, Total	10.0	u UG/L	10.0
		Aluminum, Total	236	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	81700	UG/L	5000
		Cadmium, Total	5.0	u UG/L	5.0
		Cobalt, Total	50.0	u UG/L	50.0
		Chromium, Total	36.5	UG/L	10.0
		Copper, Total	25.0	u UG/L	25.0
		Iron, Total	1550	UG/L	100
		Mercury, Total	0.20	u UG/L	0.20
		Potassium, Total	8580	UG/L	5000
		Magnesium, Total	24500	UG/L	5000
		Manganese, Total	21.5	UG/L	15.0
		Sodium, Total	40800	UG/L	5000
		Nickel, Total	40.0	u UG/L	40.0
		Lead, Total	3.0	u UG/L	3.0
		Antimony, Total	62.8	UG/L	60.0
		Selenium, Total	11.1	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

9613427.2236

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/10/93

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

WESTON BATCH #: 9302L564

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-005	BO82R2	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	73800	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	9460	UG/L	5000
		Magnesium, Soluble	22200	UG/L	5000
		Manganese, Soluble	15.0	u UG/L	15.0
		Sodium, Soluble	37600	UG/L	5000
		Nickel, Soluble	40.0	u UG/L	40.0
		Lead, Soluble	3.0	u UG/L	3.0
		Antimony, Soluble	60.6	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

9613427.2257

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

B082Q2

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP564

Matrix (soil/water): WATER Lab Sample ID: 930256401

Level (low/med): LOW Date Received: 2/10/93

% 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	73.60			P
7440-38-2	Arsenic	3.50	B		F
7440-39-3	Barium	40.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	139000.00			P
7440-47-3	Chromium	32.10			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	366.00			P
7439-92-1	Lead	20.00	U	N	F
7439-95-4	Magnesium	38900.00			P
7439-96-5	Manganese	12.50	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	12800.00			P
7782-49-2	Selenium	17.50		NS	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	44800.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	25.70	B		P
7440-66-6	Zinc	8.00	U		P
	Cyanide	199.00		N	C

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

FORM I - IN

03/90

9613427.2238

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BO82Q4

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP564

Matrix (soil/water): WATER

Lab Sample ID: 930256402

Level (low/med): LOW

Date Received: 2/10/93

% 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	133.00	B		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	3.70	B		F
7440-39-3	Barium	37.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	134000.00			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	88.70	B		P
7439-92-1	Lead	20.00	U	N	F
7439-95-4	Magnesium	37300.00			P
7439-96-5	Manganese	8.40	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	8860.00			P
7782-49-2	Selenium	18.10		NS	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	43100.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	23.10	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:

FORM I - IN

03/90

9613427.2239

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

B082R0

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP564

Matrix (soil/water): WATER Lab Sample ID: 930256404

Level (low/med): LOW Date Received: 2/10/93

% 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	236.00			P
7440-36-0	Antimony	62.80			P
7440-38-2	Arsenic	5.80	B		F
7440-39-3	Barium	58.20	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	81700.00			P
7440-47-3	Chromium	36.50			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	1550.00			P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	24500.00			P
7439-96-5	Manganese	21.50			P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	8580.00			P
7782-49-2	Selenium	11.10		NS	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	40800.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	14.90	B		P
7440-66-6	Zinc	18.60	B		P
	Cyanide	169.00		N	C

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

FORM I - IN

03/90

9613427.2240

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BO82R2

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP564

Matrix (soil/water): WATER Lab Sample ID: 930256405

Level (low/med): LOW Date Received: 2/10/93

% 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	60.60			P
7440-38-2	Arsenic	5.40	B		F
7440-39-3	Barium	47.80	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	73800.00			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	68.60	B		P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	22200.00			P
7439-96-5	Manganese	4.20	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	9460.00			P
7782-49-2	Selenium	12.90		NS	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	37600.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	27.90	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:

FORM I - IN

03/90

9613427.2241

VALIDATION SUMMARY

9613427 2242 9302L564-WES-1038

Golder Associates Inc.

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



May 12, 1993

Our ref: 913-1719
S/O/2252

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

ATTENTION: Ms. Brianna Colley

RE: 200-BP-1 DATA VALIDATION, TASK ORDER S-92-19, TRANSMITTAL OF DATA
VALIDATION PACKAGES

Dear Ms. Colley:

Enclosed are the following radiochemistry analytical data packages for the 200-BP-1 Project.

- B082X6-TMA-367
- B082Y0-TMA-425
- 9302L594-WES-1036
- 9302L564-WES-1038

The data verification and validation documentation is located in the front of the data package.

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.


for Kent M. Angelos
Task Manager


for Donald M. Caldwell
Project Director

Enclosures

cc: Mark Buckmaster, WHC
P.K. Brockman, SAIC-Kennewick

Transmittal Form to Validator

1 To Validator (BOA) _____
Project/OU 200-BA-1

2 Data Packages Attached (list and attach) _____
9302LS64-WES-1038

3 The attached data packages have been verified and (check one)
 All required checklist items are included
 Checklist items circled on attached verification checklist forms cannot be provided and the decision has been made to proceed with validation anyway
NCR # _____

4 Certified by Verifier
Samuel R. Rome
Signature
4/7/93 11:15 am
Date

5 Received by Validator
CH Saldin 4/19/93
Signature
4/19/93
Date

GENERAL CHEMISTRY DATA VERIFICATION CHECKLIST - FORM A-7

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.

<u>Data Package Item</u>	Present?	Yes	No	N/A
<input checked="" type="checkbox"/> Anions by Ion Chromatography (Method 300.0)				
Sample Results		<input checked="" type="checkbox"/>		
Initial Calibration Data		<input checked="" type="checkbox"/>		
Continuing Calibration Verification		<input checked="" type="checkbox"/>		
Calibration Standard Concentrations		<input checked="" type="checkbox"/>		
Blank Analysis Data or Summary Report Forms		<input checked="" type="checkbox"/>		
Duplicate Sample Analysis Report Forms		<input checked="" type="checkbox"/>		
Spike Sample Recovery Data		<input checked="" type="checkbox"/>		
Laboratory Control Sample Data				<input checked="" type="checkbox"/>
Raw Data		<input checked="" type="checkbox"/>		
Analytical Sequence		<input checked="" type="checkbox"/>		
Ion Chromatograms		<input checked="" type="checkbox"/>		
Quantitation Report		<input checked="" type="checkbox"/>		
Additional Data				
Moisture/% Solids data sheets				<input checked="" type="checkbox"/>
Sample preparation sheets(Soils, Other only)				<input checked="" type="checkbox"/>

Colorimetric (Note: Identify by Name, Analyte and EPA Method) _____

Nitrate + Nitrite - 353.1

Sample Results		<input checked="" type="checkbox"/>		
Initial Calibration Data		<input checked="" type="checkbox"/>		
Continuing Calibration Verification		<input checked="" type="checkbox"/>		
Calibration Standard Concentrations		<input checked="" type="checkbox"/>		
Blank Analysis Data or Summary Report Forms		<input checked="" type="checkbox"/>		
Duplicate Sample Analysis Report Forms		<input checked="" type="checkbox"/>		
Spike Sample Recovery Data		<input checked="" type="checkbox"/>		
Laboratory Control Sample Data				<input checked="" type="checkbox"/>
Raw Data		<input checked="" type="checkbox"/>		
Analytical Sequence		<input checked="" type="checkbox"/>		
Laboratory Bench Sheets		<input checked="" type="checkbox"/>		
Chart Recorder Printouts		<input checked="" type="checkbox"/>		
Additional Data				
Moisture/% Solids data sheets				<input checked="" type="checkbox"/>
Sample preparation sheets				<input checked="" type="checkbox"/>

Gravimetric (Note: Identify by Name, Analyte and EPA Method) _____
TDS -160.1

Sample Results	<u>X</u>	_____
Balance Check	<u>X</u>	_____
Blank Analysis Data or Summary Report Forms	<u>X</u>	_____
Duplicate Sample Analysis Report Forms	<u>X</u>	_____
Laboratory Control Sample Report Forms	_____	<u>X</u>
Raw Data	<u>X</u>	_____
Additional Data		
Moisture/% Solids data sheets	_____	<u>X</u>
Sample preparation sheets	_____	<u>X</u>

Ion Selective Electrode (Note: Identify by Name, Analyte and EPA Method) _____

Sample Results	_____	_____
Initial Calibration Data	_____	_____
Continuing Calibration Verification	_____	_____
Blank Analysis Data or Summary Report Forms	_____	_____
Duplicate Sample Analysis Report Forms	_____	_____
Spike Sample Recovery Data	_____	_____
Laboratory Control Sample Data	_____	_____
Raw Data	_____	_____
m% Check	_____	_____
Additional Data		
Moisture/% Solids data sheets	_____	_____
Sample preparation sheets	_____	_____

Titrimetric (Note: Identify by Name, Analyte and EPA Method) _____
Alkalinity - 310.1

Sample Results	<u>X</u>	_____
Initial Calibration Data (Auto)	<u>X</u>	_____
Continuing Calibration Verification (Auto)	<u>X</u>	_____
Titrant Normality Checks	<u>X</u>	_____
Blank Analysis Data or Summary Report Forms	<u>X</u>	_____
Duplicate Sample Analysis Report Forms	<u>X</u>	_____
Laboratory Control Sample Data	_____	<u>X</u>
Raw Data	<u>X</u>	_____
Additional Data		
Moisture/% Solids data sheets	_____	<u>X</u>
Sample preparation sheets	_____	<u>X</u>

* MS included

GENERAL CHEMISTRY DATA VERIFICATION CHECKLIST - FORM A-7

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.

<u>Data Package Item</u>	Present?	Yes	No	N/A
<input type="checkbox"/> Anions by Ion Chromatography (Method 300.0)				
Sample Results				
Initial Calibration Data				
Continuing Calibration Verification				
Calibration Standard Concentrations				
Blank Analysis Data or Summary Report Forms				
Duplicate Sample Analysis Report Forms				
Spike Sample Recovery Data				
Laboratory Control Sample Data				
Raw Data				
Analytical Sequence				
Ion Chromatograms				
Quantitation Report				
Additional Data				
Moisture/% Solids data sheets				
Sample preparation sheets(Soils, Other only)				
<input checked="" type="checkbox"/> Colorimetric (Note: Identify by Name, Analyte and EPA Method) _____				
<u>Total Cyanide</u>				
Sample Results		X		
Initial Calibration Data		X		
Continuing Calibration Verification		X		
Calibration Standard Concentrations		X		
Blank Analysis Data or Summary Report Forms		X		
Duplicate Sample Analysis Report Forms		X		
Spike Sample Recovery Data		X		
Laboratory Control Sample Data		X		
Raw Data		X		
Analytical Sequence		X		
Laboratory Bench Sheets		X		
Chart Recorder Printouts				X
Additional Data				
Moisture/% Solids data sheets				X
Sample preparation sheets				X

INORGANIC ANALYSIS DATA VERIFICATION CHECKLIST - FORM A-6

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.

<u>Data Package Item</u>	Present?:	Yes	No	N/A
Cover Page (CLP only)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inorganic Analysis Data Sheets		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standards Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Initial and Continuing Calibration Verification		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRDL Standard for AA and ICP (Detection Limit Verification)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
QC Summary		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blanks		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interference Check Summary		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spike Sample Recovery		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post-Digestion Spike Sample Recovery		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Duplicates		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laboratory Control Sample		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standard Addition Results		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Serial Dilutions		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Instrument Detection Limits		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correction Factors		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Linear Ranges		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Preparation Log		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Instrument Run Log		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raw Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Raw Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Furnace AA Raw Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flame AA Raw Data		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mercury Raw Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Raw Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional Data		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moisture/% Solids data sheets		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample preparation sheets		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

VOLATILE ORGANIC DATA VERIFICATION CHECKLIST - FORM A-1

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

<u>Data Package Item</u>	Present?:	Yes	No	N/A
Quality Control (QC) Summary				
Surrogate Summary report		<u>X</u>	_____	
MS/MSD Summary report		<u>X</u>	_____	
Blank summary report		<u>X</u>	_____	
GC/MS tuning report		<u>X</u>	_____	
Sample Data				
Sample reports		<u>X</u>	_____	
TIC reports for each sample		<u>X</u>	_____	
Chromatograms for all samples		<u>X</u>	_____	
Raw and corrected spectra for all detected results		<u>X</u>	_____	
Raw and corrected library search data for all reported TIC		_____	_____	<u>X</u>
Quantitation and calculation data for all TIC		_____	_____	<u>X</u>
Standards Data				
Initial calibration report		<u>X</u>	_____	
RIC and quantitation reports for initial calibration		<u>X</u>	_____	
Continuing calibration reports		<u>X</u>	_____	
RIC and quantitation reports for cont. calibrations		<u>X</u>	_____	
Internal standard summary report		<u>X</u>	_____	
Raw QC Data				
Tuning, spectra and mass lists		<u>X</u>	_____	
Blank Data				
Blank analysis reports		<u>X</u>	_____	
TIC reports for all blanks		<u>X</u>	_____	
RIC and quantitation reports for blanks		<u>X</u>	_____	
Raw and corrected spectra for all detected results in blanks		<u>X</u>	_____	
Raw and corrected library search data for all reported TIC		_____	_____	<u>X</u>
Quantitation and calculation data for all TIC		_____	_____	<u>X</u>
Matrix Spike/Matrix Spike Duplicate (MS/MSD) Data				
MS/MSD Analysis Reports		<u>X</u>	_____	
RIC and quantitation reports for MS/MSD		<u>X</u>	_____	
Additional Data				
Moisture/% solids data sheets		<u>X</u>	_____	
Sample preparation sheets		<u>X</u>	_____	

Comments: _____

MEMORANDUM

TO: 200-BP-1 Project QA Record

May 11, 1993

FR: Tom Stapp, Golder Associates Inc. RE: METALS ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE
9302L564-WES-1038

INTRODUCTION

This memo presents the results of data validation on data package 9302L564-WES-1038 consisting of four (4) water samples submitted for total and dissolved metals and cyanide analysis. The samples were analyzed by Weston Analytics using the CLP protocol for TAL metals plus bismuth and cyanide analytes. A list of the samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B082Q2	02/08/93	WATER
B082Q4	02/08/93	WATER
B082R0	02/08/93	WATER
B082R2	02/08/93	WATER

Data validation was conducted in accordance with the WHC statement of work (WHC 1993) and validation procedures (Bechtold 1992). Attachments 1 through 4 to this memo provide the data validation supporting documentation and a summary of the validated results.

DATA QUALITY OBJECTIVES

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

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

Blanks

Aluminum, potassium and vanadium 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).

Sample results

The result for antimony for sample B082R2 was changed on the form 1 sheet to reflect the result found in the raw data.

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.

9613427.2252

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.
- J -** Indicates the analyte was analyzed for and detected. 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.

9613427.2254

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

9613127.2256

ATTACHMENT 3
AS QUALIFIED DATA SUMMARY

9613427.2257

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BO82Q2

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP564

Matrix (soil/water): WATER Lab Sample ID: 930256401

Level (low/med): LOW Date Received: 2/10/93

% 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	73.60			P
7440-38-2	Arsenic	3.50	B		F
7440-39-3	Barium	40.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	139000.00			P
7440-47-3	Chromium	32.10			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	366.00			P
7439-92-1	Lead	20.00	U	N	F
7439-95-4	Magnesium	38900.00			P
7439-96-5	Manganese	12.50	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	12800.00			P
7782-49-2	Selenium	17.50		NS	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	44800.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	25.70	B		P
7440-66-6	Zinc	8.00	U		P
	Cyanide	199.00		N	C
	Bismuth	150.00	U		

Color Before: COLORLESS Clarity Before: CLEAR Texture:
 Color After: COLORLESS Clarity After: CLEAR Artifacts:
 Comments:

R 5/7/93

9613427.2258

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BO82Q4

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP564

Matrix (soil/water): WATER Lab Sample ID: 930256402

Level (low/med): LOW Date Received: 2/10/93

* 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	133.00	B		P U
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	3.70	B		F
7440-39-3	Barium	37.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	134000.00			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	88.70	B		P
7439-92-1	Lead	20.00	U	N	F
7439-95-4	Magnesium	37300.00			P
7439-96-5	Manganese	8.40	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	8860.00			P U
7782-49-2	Selenium	18.10		NS	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	43100.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	23.10	B		P U
7440-66-6	Zinc	8.00	U		P
	Cyanide				NR
	Bismuth	157.00			

Color Before: COLORLESS Clarity Before: CLEAR Texture:
 Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BO82R0

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP564

Matrix (soil/water): WATER Lab Sample ID: 930256404

Level (low/med): LOW Date Received: 2/10/93

* 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	236.00			P U
7440-36-0	Antimony	62.80			P
7440-38-2	Arsenic	5.80	B		P
7440-39-3	Barium	58.20	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	81700.00			P
7440-47-3	Chromium	36.50			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	1550.00			P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	24500.00			P
7439-96-5	Manganese	21.50			P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	8580.00			P U
7782-49-2	Selenium	11.10		NS	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	40800.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	14.90	B		P U
7440-66-6	Zinc	18.60	B		P
	Cyanide	169.00		N	C
	Bismuth	150.00	U		

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

RS 5/7/93

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U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BO82R2

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP564

Matrix (soil/water): WATER Lab Sample ID: 930256405

Level (low/med): LOW Date Received: 2/10/93

‡ 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	5.40 60.60			P
7440-38-2	Arsenic	5.40	B		F
7440-39-3	Barium	47.80	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	73800.00			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	68.60	B		P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	22200.00			P
7439-96-5	Manganese	4.20	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	9460.00			P
7782-49-2	Selenium	12.90		NS	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	37600.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	27.90	B		P
7440-66-6	Zinc	8.00	U		P
	Cyanide				NR
	Bismuth	150.00	U		

Color Before: COLORLESS Clarity Before: CLEAR Texture:
 Color After: COLORLESS Clarity After: CLEAR Artifacts:
 Comments:

RS 5/7/93

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ATTACHMENT 4

DATA VALIDATION SUPPORTING DOCUMENTATION

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

93022564

SDG: ↓		REVIEWER: T. Stapp		DATE: 5/7/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
ICB	Aluminum	119.4			ug/L	597		B082Q4	U
"	"				}			B082R0	U
ICB	Vanadium	13.3				66.5		B082Q2	U
"	↓							B082Q4	U
"								B082R0	U
"								B082R2	U
PB	Potassium	1888.9				9445		B082Q4	U
"	↓							B082R0	U
CCB3	Chromium	7.7			↓	38.5		None	—

B-3

9613427.2262
 WHC-SD-EN-SPP-002, Rev. 1

MEMORANDUM

TO: 200-BP-1 Project QA Record

May 10, 1993

FR: Tom Stapp, Golder Associates Inc. 

RE: GENERAL CHEMISTRY ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 9302L564-WES-1038

INTRODUCTION

This memo presents the results of data validation on data package 9302L564-WES-1038 consisting of two (2) water samples submitted for general chemistry analysis. The samples were analyzed by Weston Analytics using standard methods for all associated parameters. A list of the samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B082Q2	02/08/93	WATER
B082R0	02/08/93	WATER

Data validation was conducted in accordance with the WHC statement of work (WHC 1993) and validation procedures (Bechtold 1992). Attachments 1 and 2 of this memo provide the data validation supporting documentation and a summary of the validated results.

DATA QUALITY OBJECTIVES

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

MAJOR DEFICIENCIES

No deficiencies were identified for the wet chemistry parameters which required rejection of data.

MINOR DEFICIENCIES

No deficiencies were identified for the wet chemistry parameters which required qualification of data.

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.

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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.
- J - Indicates the analyte was analyzed for and detected. 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.

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ATTACHMENT 2
AS QUALIFIED DATA SUMMARY

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ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 02/25/93

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

WESTON BATCH #: 9302L564

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	BO82Q2	Alkalinity	88.0	MG/L	2.0
		Chloride by IC	61.6	MG/L	12.5
		Fluoride by IC	0.50	u MG/L	0.50
		Cyanide, Total	199	UG/L	20.0
		Phosphate by IC	0.25	u MG/L	0.25
		Sulfate by IC	306	MG/L	12.5
		Nitrate Nitrite	43.9	MG-N/L	5.0
		Total Dissolved Solids	880	MG/L	5.0
-004	BO82R0	Alkalinity	100	MG/L	2.0
		Chloride by IC	22.4	MG/L	5.0
		Fluoride by IC	0.63	MG/L	0.50
		Cyanide, Total	169	UG/L	20.0
		Phosphate by IC	0.25	u MG/L	0.25
		Sulfate by IC	164	MG/L	5.0
		Nitrate Nitrite	28.4	MG-N/L	2.5
		Total Dissolved Solids	545	MG/L	5.0

RS 5/7/93

MEMORANDUM

TO: 200-BP-1 Project QA Record

May 11, 1993

FR: Tom Stapp, Golder Associates Inc. 

RE: VOLATILE ORGANIC ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 9302L564-WES-1038

INTRODUCTION

This memo presents the results of data validation on data package 9302L564-WES-1038 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 validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B082Q5	02/08/93	WATER
B082R3	02/08/93	WATER

Data validation was conducted in accordance with the WHC statement of work (WHC 1993) and validation procedures (Bechtold 1992). Attachments 1 through 4 to this memo provide the data validation supporting documentation and a summary of the validated results.

DATA QUALITY OBJECTIVES

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

MAJOR DEFICIENCIES

No deficiencies were identified in the volatile fraction that require rejection of data.

MINOR DEFICIENCIESBlanks

Acetone was detected in the laboratory method blank. Therefore, associated sample results less than ten times the blank result were raised to the contract required detection limit (CRDL) and 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.

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Data Package: 9302L564-WES-1038

Analysis: Volatile Organic

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

9613427.2270

ATTACHMENT 1

GLOSSARY OF ORGANIC 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.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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ATTACHMENT 3
AS QUALIFIED DATA SUMMARY

9613427.2275

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B082Q5

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L564-003

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

Lab File ID: 0021214

Level: (low/med) LOW

Date Received: 02/10/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

FORM 1 VOA

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5/7/93

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B082R3

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

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L564-006

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

Lab File ID: 0021215

Level: (low/med) LOW

Date Received: 02/10/93

% Moisture: not dec.

Date Analyzed: 02/12/93

GC Column: SP1000 ID: 2.00(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	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
67-64-1	-----Acetone	10	JB 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

FORM 1 VOA

3/90

RS 5/7/93

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ATTACHMENT 4

DATA VALIDATION SUPPORTING DOCUMENTATION

