This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

Document number: SD-WM-DP-053

Section 4 **of** 6

Title: DST Evaporator Project 242A for Tank 241AP107 [Pgs. 665 Thru 894]

Date: 01/28/1994 **Revision:** A000

Originator: Miller GL
Co: WHC

Recipient:
Co:

References: EDT-140729

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PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 · REV 0

Batch 1520

Serial No	Sample Point	Date	Time Issued	Priority
V 24.-5597	107-AP	8- 3-93	8:31	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	% RECOVERY	N1L17	0

Sample Size	Customer ID
? .300 ml.	STD

Remarks, Calculations, Results

PK. HT. .315

EDP R716 HG/HYDRD
STD# 2/N11-C RESULT 0.100 ng. 30.03
STD VAL 0.100 ppm %REC
100.1%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date	Time Completed	Lab Unit Mgr.		
9-6-93	2330	9-8-93		

54-6900-064 (R-10-83)

BEST AVAILABLE COPY

CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		STANDARD	DUPLICATE
Serial No.	Sample Size in mL SS	0.300	
V24-5597	Hg ng (Nanograms)	30.03	
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	0.100	N/A
1520	Conc Hg µg/L (PPB)	100.1	N/A
Rerun No.		N/A	N/A
0		N/A	N/A
Instrument ID:		N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst			
Date:			
09/06/93			

	STANDARD	DUPLICATE
Conc Hg µg/mL	1.00E-01	
	N/A	N/A
	N/A	N/A

Data Entry by:		Date:	07-Sep-93
Approved by:		Date:	9-8-93

Form 1 Rev. 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 25.-5697	107-AP	8- 3-93	8:36	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? /ml.	BLK

Remarks, Calculations, Results

REAGENT BLANK

PK. Ht. -0.010

ng. -0.94

<0.005 µg/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
9-6-93	2330	9-8-93

54-6800-001 (8-10-83)

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CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		BLANK	DUPLICATE
Serial No.	Sample Size in mL SS	1.000	
V25-5697	Hg ng (Nanograms)	-0.94	
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	-0.001	N/A
1520	Conc Hg µg/L (PPB)	-0.9	N/A
Rerun No.		N/A	N/A
0		N/A	N/A
Instrument ID:		N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.005	
	Detection Limit (µg/L) =	5.0	

	BLANK	DUPLICATE
Conc Hg µg/mL	<0.005	
	N/A	N/A
	N/A	N/A

The Result is < Detection Limit

Data Entry by:		Date:	07-Sep-93
Approved by:		Date:	9-8-93

Form 1 Rev. 1

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No	Sample Point	Date	Time Issued	Priority
V 26.-5797	107-AP	8- 3-93	8:45	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? 2ml.	107-AP-C

Remarks Calculations Results

PK. Ht. .017

ng. 1.63

<0.003 µg/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
9-6-93	2330	9-5-93

6800-061 (R-10-83)

BEST AVAILABLE COPY

CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		SAMPLE	DUPLICATE
Serial No.	Sample Size in mL SS	2.000	
V26-5797	Hg ng (Nanograms)	1.63	
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	0.001	N/A
1520	Conc Hg µg/L (PPB)	0.8	N/A
Rerun No.		N/A	N/A
0		N/A	N/A
Instrument ID:		N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.003	
	Detection Limit (µg/L) =	2.5	

	SAMPLE	DUPLICATE
Conc Hg µg/mL	<0.003	
	N/A	N/A
	N/A	N/A

The Result is < Detection Limit

Data Entry by:		Date:	07-Sep-93
Approved by:		Date:	9-8-93

Form 1 Rev. 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 26.-5897	107-AP	8- 3-93	8:45	25

Determination	Method/Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? 2 ml	107-AP-C

Remarks, Calculations, Results

DUPLICATE SAMPLE

PK. Ht. .017

ng. 1.63

<0.003 µg/ml

Jeff Solbrack

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
9-6-93	2330	RE Shoda 9-8-93

54-6800-001 (8-10-83)

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CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		SAMPLE	DUPLICATE
Serial No.	Sample Size in mL SS	2.000	2.000
V26-5897	Hg ng (Nanograms)	1.63	1.63
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	0.001	0.001
1520	Conc Hg µg/L (PPB)	0.8	0.8
Rerun No.	Average Conc (µg/mL)	N/A	N/A
0	Average Conc (µg/L)	N/A	N/A
Instrument ID:	Relative % Difference	N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.003	
	Detection Limit (µg/L) =	2.5	

	SAMPLE	DUPLICATE
Conc Hg µg/mL	<0.003	<0.003
Average Conc (µg/mL)	N/A	N/A
Relative % Difference	N/A	N/A

Both Results are < Detection Limit

Data Entry by:	RE Shoda	Date:	07-Sep-93
Approved by:	RE Shoda	Date:	9-8-93

Form 1 Rev. 1

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No	Sample Point	Date	Time Issued	Priority
V 27.-5797	107-AP	8- 3-93	8:55	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? 2ml.	107-AP-D

Remarks Calculations Results

PK. Ht. .011

ng. 1.06

<0.003 µg/mL

Analyst 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date	Time Completed	Lab Unit Mgr		
9-3-93	2330	9-8-93		

BEST AVAILABLE COPY

CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		SAMPLE	DUPLICATE
Serial No.	Sample Size in mL SS	2.000	
V27-5797	Hg ng (Nanograms)	1.06	
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	0.001	N/A
1520	Conc Hg µg/L (PPB)	0.5	N/A
Rerun No.		N/A	N/A
0		N/A	N/A
Instrument ID:		N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1 µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1 µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.003	
	Detection Limit (µg/L) =	2.5	

	SAMPLE	DUPLICATE
Conc Hg µg/mL	<0.003	
	N/A	N/A
	N/A	N/A

The Result is < Detection Limit

Data Entry by:		Date:	07-Sep-93
Approved by:		Date:	9-8-93

Form 1 Rev. 1

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 27.-5897	107-AP	8- 3-93	8:55	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? 2 ml.	107-AP-D

Remarks, Calculations, Results

DUPLICATE SAMPLE

PKHt. .012

ng. 1.16

= <0.003 µg/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
9-6-93	2330	9-8-93

54-6800-057 (8-10-83)

BEST AVAILABLE COPY

CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		SAMPLE	DUPLICATE
Serial No.	Sample Size in mL SS	2.000	2.000
V27-5897	Hg ng (Nanograms)	1.06	1.16
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	0.001	0.001
1520	Conc Hg µg/L (PPB)	0.5	0.6
Rerun No.	Average Conc (µg/mL)	N/A	N/A
0	Average Conc (µg/L)	N/A	N/A
Instrument ID:	Relative % Difference	N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.003	
	Detection Limit (µg/L) =	2.5	

	SAMPLE	DUPLICATE
Conc Hg µg/mL	<0.003	<0.003
Average Conc (µg/mL)	N/A	N/A
Relative % Difference	N/A	N/A

Both Results are < Detection Limit

Data Entry by:		Date:	07-Sep-93
Approved by:		Date:	9-8-93

Form 1 Rev. 1

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 28.-5797	107-AP	8- 3-93	8:57	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? 2mL	107-AP-E

Remarks, Calculations, Results

PK.Ht. .009

ng. 0.87

<0.003 µg/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 9-6-93	Time Completed: 2330	Lab Unit Mgr: 9-8-93		

54-6800-061 (R 10-83)

BEST AVAILABLE COPY

CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		SAMPLE	DUPLICATE
Serial No.	Sample Size in mL SS	2.000	
V28-5797	Hg ng (Nanograms)	0.87	
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	0.000	N/A
1520	Conc Hg µg/L (PPB)	0.4	N/A
Rerun No.		N/A	N/A
0		N/A	N/A
Instrument ID:		N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.003	
	Detection Limit (µg/L) =	2.5	

	SAMPLE	DUPLICATE
Conc Hg µg/mL	<0.003	
	N/A	N/A
	N/A	N/A

The Result is < Detection Limit

Data Entry by:	RE Shroder	Date:	07-Sep-93
Approved by:	RE Shroder	Date:	9-8-93

Form 1 Rev. 1

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 28.-5897	107-AP	8- 3-93	8:57	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? 2 ml.	107-AP-E

Remarks Calculations, Results

DUPLICATE SAMPLE

PK. HT. .010

ng. ~~0.94~~ 0.96 9-7-93

<0.003 µg/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-6-93	2330	9-8-93	9/12

54-6800-061 (8-10-83)

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CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		SAMPLE	DUPLICATE
Serial No.	Sample Size in mL SS	2.000	2.000
V28-5897	Hg ng (Nanograms)	0.87	0.96
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	0.000	0.000
1520	Conc Hg µg/L (PPB)	0.4	0.5
Rerun No.	Average Conc (µg/mL)	N/A	N/A
0	Average Conc (µg/L)	N/A	N/A
Instrument ID:	Relative % Difference	N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.003	
	Detection Limit (µg/L) =	2.5	

	SAMPLE	DUPLICATE
Conc Hg µg/mL	<0.003	<0.003
Average Conc (µg/mL)	N/A	N/A
Relative % Difference	N/A	N/A

Both Results are < Detection Limit

Data Entry by:		Date:	07-Sep-93
Approved by:		Date:	9-8-93

Form 1 Rev. 1

#1520

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY WHC-SD-WM-DP-053 REV 0

CALIBRATION RECORD

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Analyte:	Hg		
Procedure:	LA 325-104	Revision:	A-1
Instrument:	PE2380 (Hydride AA)	Property No.:	WB26847
Technologist	J SOLBRACK Jeff Solbrack	Payroll No.: —	Date: 09/06/93

Calibration Standard ID:	23N11-B
Analyte Concentration:	.147
Type of Calibration:	LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	.000mL	0ng	-.003
2	.034mL	5ng	.047
3	.100mL	14.7ng	.144
4	.250mL	36.75 ng	.387
5	.500mL	73.5 ng	.791
6	.750mL	110.25 ng	1.169
7	1.000mL	147 ng	1.524
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Comments: r= .9998 Y-intercept = -0.0001 SLOPE= 0.0105

A-6000-882 (03/92)

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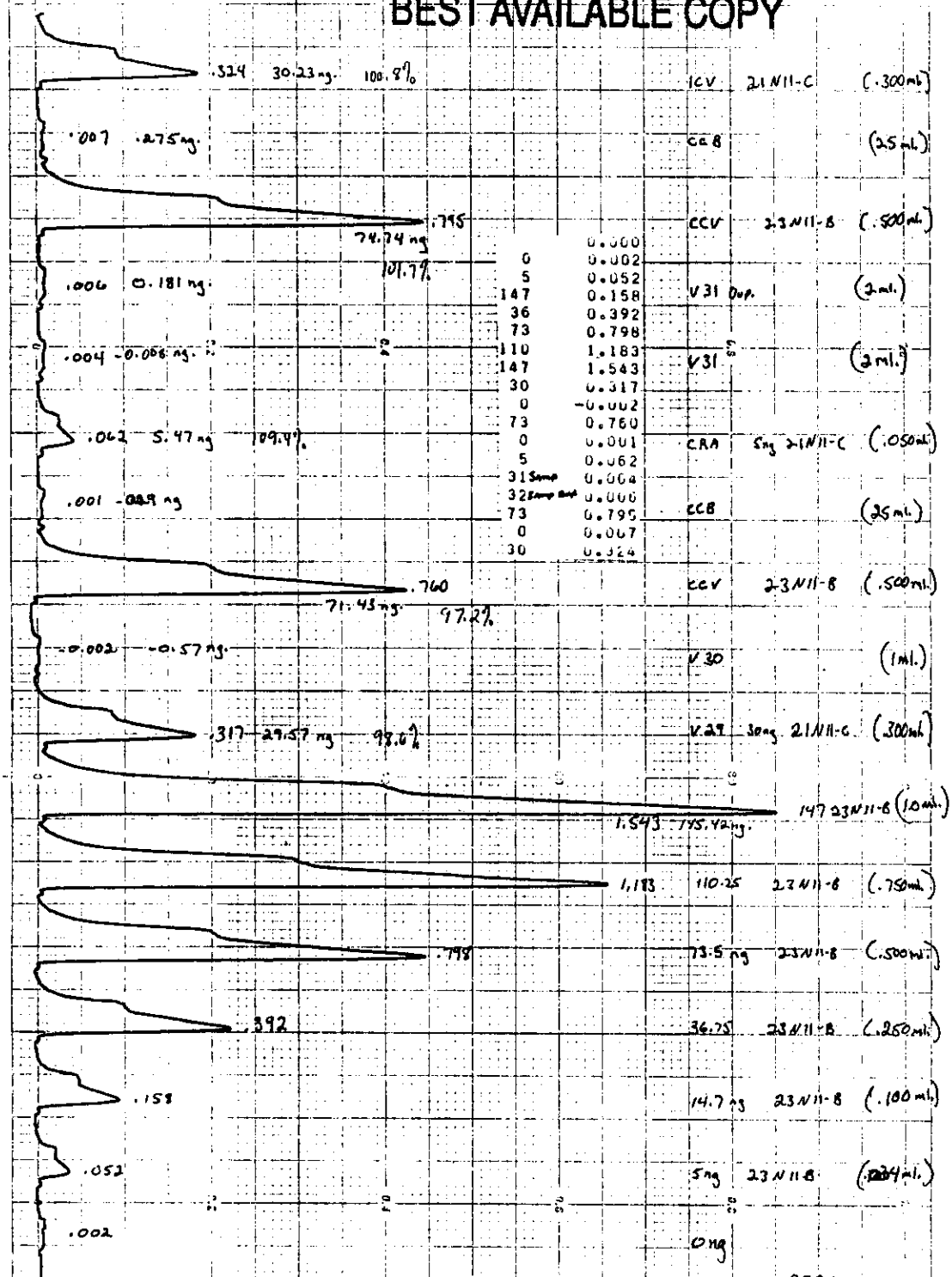


0	0.000
0	0.002
5	0.052
147	0.158
36	0.392
73	0.798
110	1.183
147	1.543
30	0.317
0	-0.002
73	0.760
0	0.001
5	0.062
31 Samp	0.004
32 Samp Dup	0.006
73	0.795
0	0.007
30	0.324

r = .9998

Signal	- conc	Purge I	60
mode	- PK Ht.	Purge II	90
Recorder	- TC3	RXN	18
T	- 60	Speed	5 mm/min
Exp	- 10	mV	20
Lamp Amp	- 5	Temp.	175°C

Jeff Sollbrock 82020

9-6-93 Hg

Intercept: 0.0041
Slope: 0.0106

slope = 0.0106
y-int = 0.0041
cor. coff = 0.9998

PERKIN-ELMER

Batch # 1532 ✓ QA

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-053 REV 0

Lab Segment Serial No. V 31	Customer ID: 107AP-FB
Analysis: Hg	Sample Prep: RES 9-8-93 ~~UNDIGESTED~~ DIRECT

Instrument: PE2380(Hydride AA) WB26847	Procedure/ Rev: LA 325-104 / A-1
Technologist: JSolbrack Jeff Solbrack	Date: 09/06/93
Starting Time: 1600	Temperature 175 C
Ending Time: 2330	Chemist: R.A. SKODA

Comments: r = .9998 Y-intercept = .0041 SLOPE = .0106

* See Batch Summary sheet for chemist comment.

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	V 29-5597	11		
2	REAGENT BLANK	V 30-5697	12		
3	SAMPLE	V 31-5797	13		
4	DUPLICATE SAMPLE	V 31-5897	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	21N11C .300mL			

675

A-6000-881 (03/92)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-325-104	DATE START: 9-06-93	WHC-SD-WM-DP-053 REV 0
PREPARED BY: R. E. SKODA	DATE COMPLETE: 9-10-93	

	UNITS:		ug/mL	ug/mL	ug/mL			ug/mL	
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	AVERAGE	RPD%	%REC	DET LIM	% CT ER
STD/21N11C	V29	Hg	0.099				98.6		
BLANK	V30	Hg	<0.005					0.005	
107 AP	V31	Hg	<0.003	<0.003	N/A	N/A		0.003	
STD/21N11C		Hg	0.101				100.8		

NARRATIVE: [ ] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH
LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Detection limits for sample and blank are different due to difference in sample size.

The first point on the cal. curve was not entered into the HP48SX calculator correctly. 0.000 was entered for the first point instead of 0.002 (see cal. sheet). This analysis will still be accepted for the following reasons:

① The differences resulting from 0.000 to 0.002 are small. $\Delta r^2 = 0.0000$; Δ slope = 0.0000, Δ intercept = 0.0006, Δ STD (LMCS) = 0.04%

② The samples, V31 and V31Dup will still be < 0.003 µg/mL so the final answer will not have changed.

R E Skoda
12-17-93

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 REV 0

Batch 1532

Serial No	Sample Point	Date	Time Issued	Priority
V 29.-5597	107-AP	8- 3-93	10:36	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	% RECOVERY	N1L17	.0

Sample Size	Customer ID
? .300ml.	STD

Remarks Calculations Results

PK.Ht. .317

EDP R716 HG/HYDRD
STD# 21N11-e RESULT 0.099 ug/ml ng. 29.57
STD VAL %REC 98.6%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs		Hrs

Date	Time Completed	Lab Unit Mgr	
9-6-93	2330	9-8-93	

54-6800-081 (R-10-83)

BEST AVAILABLE COPY

CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT		STANDARD	DUPLICATE
Serial No.	Sample Size in mL SS	0.300	
V29-5597	Hg ng (Nanograms)	29.57	
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	0.099	N/A
1532	Conc Hg µg/L (PPB)	98.6	N/A
Rerun No.		N/A	N/A
0		N/A	N/A
Instrument ID		N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst			
Date:			
09/06/93			

	STANDARD	DUPLICATE
Conc Hg µg/mL	9.86E-02	
	N/A	N/A
	N/A	N/A

Data Entry by:		Date:	07-Sep-93
Approved by:		Date:	9-8-93

Form 1 Rev. 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 30.-5697	107-AP	8- 3-93	10:38	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? /ml.	BLK

Remarks, Calculations, Results

REAGENT BLANK

PK. Ht. -0.002

ng ~~-0.2915~~ RES 9-8-93

-0.57ng

<0.005 ug/ml

Jeff Sollbrack

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-6-93	2330	RE Sloda 9-13-93	[signature] 9/10/93

54-6800-001 (R-10-83)

BEST AVAILABLE COPY

CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		BLANK	DUPLICATE
Serial No.	Sample Size in mL SS	1.000	
V30-5697	Hg ng (Nanograms)	-0.57 ~~-0.29~~ RES	
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	-0.001 ~~-0.000~~ 9-10-93	N/A
1532	Conc Hg µg/L (PPB)	-0.6 ~~-0.3~~	N/A
Rerun No.		N/A	N/A
0		N/A	N/A
Instrument ID:		N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.005	
	Detection Limit (µg/L) =	5.0	

	BLANK	DUPLICATE
Conc Hg µg/mL	<0.005	
	N/A	N/A
	N/A	N/A

The Result is < Detection Limit

Data Entry by:	RE Sloda	Date:	07-Sep-93
Approved by:	RE Sloda	Date:	9-13-93

Form 1 Rev. 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 31.-5797	107-AP	8- 3-93	10:40	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? 2 ml.	107AP-FB

Remarks Calculations Results

PK Ht. .004

ng. -0.0080

<0.003 µg/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Mgr	
9-6-93	2330	9-8-93	9/14

BEST AVAILABLE COPY

CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		SAMPLE	DUPLICATE
Serial No.	Sample Size in mL SS	2.000	
V31-5797	Hg ng (Nanograms)	-0.01	
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	-0.000	N/A
1532	Conc Hg µg/L (PPB)	-0.0	N/A
Rerun No.		N/A	N/A
0		N/A	N/A
Instrument ID:		N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1 µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1 µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.003	
	Detection Limit (µg/L) =	2.5	

	SAMPLE	DUPLICATE
Conc Hg µg/mL	<0.003	
	N/A	N/A
	N/A	N/A

The Result is < Detection Limit

Data Entry by:		Date:	07-Sep-93
Approved by:		Date:	9-8-93

Form 1 Rev. 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 31.-5897	107-AP	8- 3-93	10:40	25

Determination	Method Standard	Result Units	Charge Code	Reruns
Hg	LA-325-104	uG/ML	N1L17	0

Sample Size	Customer ID
? 2ml.	107AP-FB

Remarks Calculations Results

DUPLICATE SAMPLE

Pk. ht. .006

ng. 0.181

<0.003 µg/mL

Jeff Sollmark

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Ind Mgr	
9-6-93	2330	RE Shoda 9-8-93	9/13

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

CVAA: LA-325-104 (A-1) Hg LIQUIDS-DIRECT

		SAMPLE	DUPLICATE
Serial No.	Sample Size in mL SS	2.000	2.000
V31-5897	Hg ng (Nanograms)	-0.01	0.18
Batch ID	Conc Hg µg/mL (or mg/L or PPM)	-0.000	0.000
1532	Conc Hg µg/L (PPB)	-0.0	0.1
Rerun No.	Average Conc (µg/mL)	N/A	N/A
0	Average Conc (µg/L)	N/A	N/A
Instrument ID:	Relative % Difference	N/A	N/A
WB26847	Conc Hg µg/mL=(Hg ng/SS)*(1µg/1000ng)		
Calibration Date	Average Conc.=(Sample + Duplicate)/2		
09/06/93	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Analyst	Detection Limit = (5 ng/SS)*(1µg/1000ng)		
	Detection Limit is Corrected for Sample Prep/Dilution		
Date:			
09/06/93	Detection Limit (µg/mL) =	0.003	
	Detection Limit (µg/L) =	2.5	

	SAMPLE	DUPLICATE
Conc Hg µg/mL	<0.003	<0.003
Average Conc (µg/mL)	N/A	N/A
Relative % Difference	N/A	N/A

Both Results are < Detection Limit

Data Entry by:	RE Shoda	Date:	07-Sep-93
Approved by:	RE Shoda	Date:	9-8-93

Form 1 Rev. 1 Page 1 of 1

#1532

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

CALIBRATION RECORD

WHC-SD-WM-DP-053 REV 0

Analyte:	Hg		
Procedure:	LA 325-104	Revision:	A-1
Instrument:	PE2380 (Hydride AA)	Property No.:	WB26847
Technologist	J SOLBRACK Jeff Solbrack	Payroll No.:	Date: 09/06/93

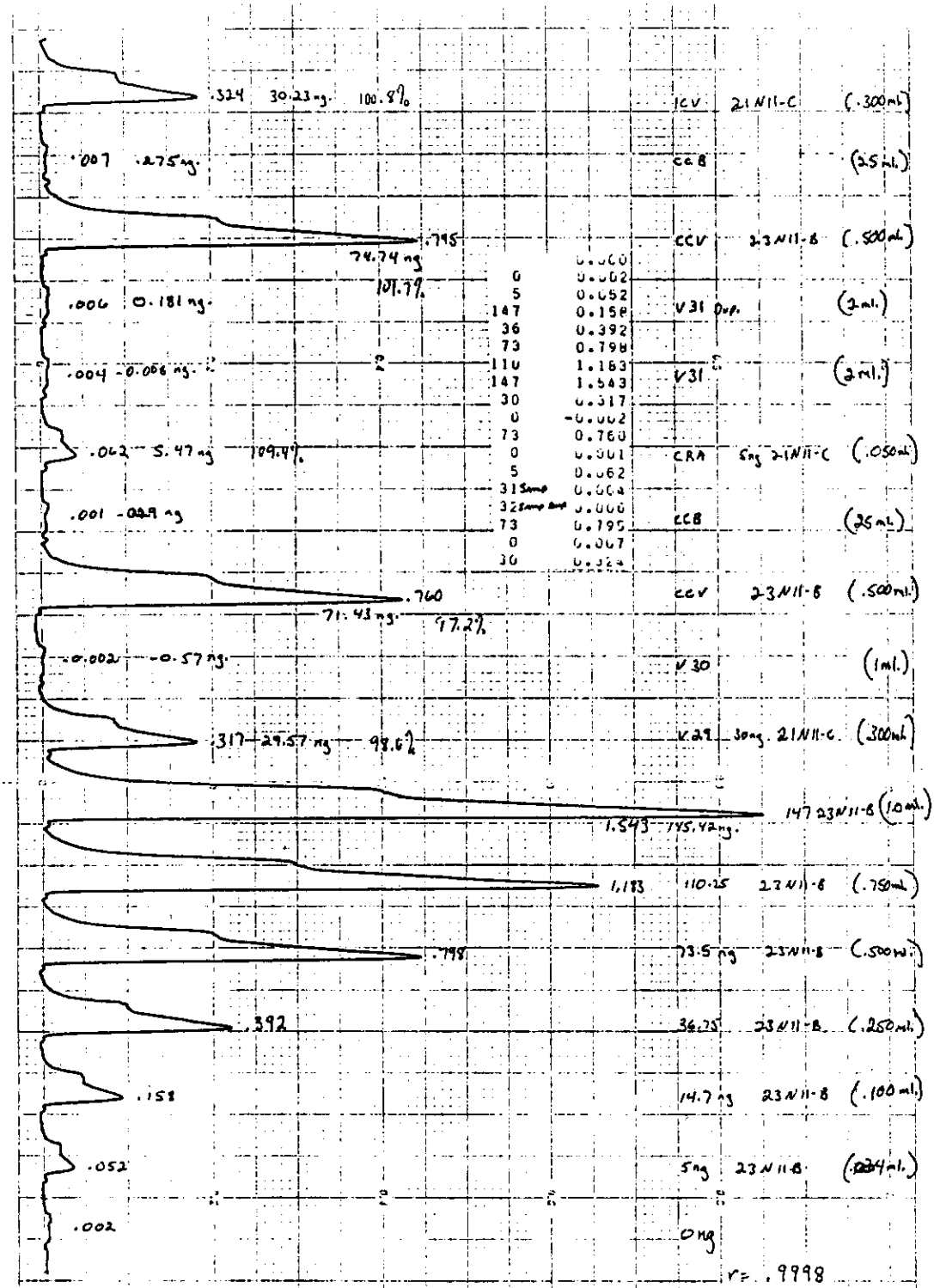
Calibration Standard ID:	23N11-B
Analyte Concentration:	.147
Type of Calibration:	LINEAR

BEST AVAILABLE COPY

	Dilution	Concentration	Instrument Reading Unit
1	.000mL	0ng	.002
2	.034mL	5ng	.052
3	.100mL	14.7ng	.158
4	.250mL	36.75 ng	.392
5	.500mL	73.5 ng	.798
	.750mL	110.25 ng	1.183
7	1.000mL	147 ng	1.543
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Comments: r= .9998 Y-intercept = 0.0041 SLOPE= 0.0106

A-6000-882 (03/92)



0	0.000		
0	0.002		
5	0.052		
147	0.158	V31 Dup.	(2 ml.)
36	0.392		
73	0.798		
110	1.183	V31	(2 ml.)
147	1.543		
30	0.317		
0	-0.002		
73	0.760		
0	0.001	CRA 5ng 21N11-C	(.050 ml)
5	0.062		
31 5amp	0.004		
32 5amp Amp	0.006		
73	0.795	CCB	(25 ml.)
0	0.007		
30	0.324		

Signal	- CONC	Purge I	60
mode	- PKHt.	Purge II	90
Recorder	- TC3	RXN	18
T	- 60	Speed	5mm/min
Exp	- 10	mV	20
Lamp Amp	- 5	Temp.	175°C

Intercept: 0.[illegible]
Slope: 0.[illegible]

9-6-93 Hg

slope = 0.0106
y-int = 0.0041
corr. coff = 0.9998

P.O. Box 1970 Richland, WA 99352

V19A
CASE NARRATIVE - ICP

WHCPAL LABORATORIES
WHCPAL/CUSTOMER SAMPLE NOS: V21 107-AP-A
V23 107-AP-B

INORGANIC ANALYSIS

The data evaluation for this project will follow the guidelines specified in "Technical Project Plan for the 222-S Laboratory in Support of the 242-A Evaporator Waste Analysis Plan, WHC-SD-WM-EV-060, Revision 2," (WHC-SD-WM-TPP-048, Rev.0). Contained in this report is the evaluation of the data generated by Westinghouse Hanford Company - Processing and Analytical Laboratories (WHC-PAL), 222-S Laboratory. Information will be organized by quality control parameter. No computer-readable data will be submitted on floppy diskette as mentioned in the comment on the following cover page.

INITIAL AND CONTINUING CALIBRATION VERIFICATION
All instrument calibration requirements were within control limits set by the Laboratory Management Control System.

INITIAL AND CONTINUING CALIBRATION BLANKS - (REAGENT BLANK)
All ICB and CCB analytical measurements were 0±IDL (Instrument Detection Limit) with the exception of Chromium and Silver in CCB-2, Iron in CCB-1 and Zinc in all calibration blanks. Values reported for Chromium, Silver and Zinc are within expected variances resulting from minor temporal instability of the instrument.

PREPARATION BLANK
Contamination is indicated for Iron, Calcium, Magnesium and Zinc. Contamination is judged to be present when the blank analyte concentrations are greater than 20% of the average sample concentration. This criterion applies only when the sample concentration is greater than 10 times the IDL.

SPIKE SAMPLE RECOVERIES
No spike recovery failures were noted.

SPIKE DUPLICATE ANALYSES
No spike duplicate precision failures were noted.

DUPLICATE ANALYSES
Duplicate precision failures were noted as follows:

For V21: Calcium (78.0%), Chromium (200.0%), Iron (52.4%), Lead (200.0%) and Zinc (103.6%).

For V23: Barium (30.0%), Calcium (36.4%), Chromium (200.0%), Iron (22.8%), Lead (200.0%) and Magnesium (36.3%).

Failures for Barium, Chromium and Lead are attributed to the low level of these analytes in the sample. Failures for Calcium, Iron, Magnesium and Zinc may be influenced by contamination levels. No acceptance criteria apply to the duplicate analysis.

V21 107-AP-A
V23 107-AP-B

LABORATORY CONTROL SAMPLE
Failures were noted for Calcium, Magnesium and Zinc. These failures are attributed to contamination, although a good correlation with the preparation blank does not exist.

ABBREVIATIONS
* = Duplicate failure. E = Serial dilution failure. N = Spike failure. NR = Not required. P = ICP method used. U = less than IDL.

Brian Wels
11-4-93

Brian Wels
Senior Scientist, WHCPAL

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.:V19A__

SOW No.: ILM02

EPA Sample No.	Lab Sample ID
_V21	__V21
_V21D	__V21D
_V21S2	__V21S2
_V21S1	__V21S1
_V23	__V23
_V23D	__V23D

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

I certify that this data package is in compliance with the terms and conditions of the 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: Thomas Bushaw Name: TH BUSHAW

Date: 12/8/93 Title: Mgr. Inorganic Chem.

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

V21

Lab Name: WHC_PAL Contract: _____
Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A__
Matrix (soil/water): WATER Lab Sample ID: V21
Level (low/med): LOW__ Date Received: 08/02/93
% 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_	794			P
7440-39-3	Barium___	15.0	U		P
7440-43-9	Cadmium__	20.0	U		P
7440-70-2	Calcium__	20500		*	P
7440-47-3	Chromium_	30.8		*	P
7439-89-6	Iron_____	304		*	P
7439-92-1	Lead_____	190	U	*	P
7439-95-4	Magnesium	875			P
7439-96-5	Manganese	15.0	U		P
7440-22-4	Silver___	30.0	U		P
7440-23-5	Sodium___	1980000			P
7440-66-6	Zinc_____	560		*	P

Color Before: BROWN____ Clarity Before: OPAQUE Texture: _____
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:
RESULTS=_(RAW_DATA)(FINAL_VOLUME)/(SAMPLE_WT._OR_INITIAL_VOLUME)_____

1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

V23

Lab Name: WHC_PAL Contract: _____
Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A
Matrix (soil/water): WATER Lab Sample ID: V23
Level (low/med): LOW Date Received: 08/02/93
% 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	941			P
7440-39-3	Barium	16.2		*	P
7440-43-9	Cadmium	20.0	U		P
7440-70-2	Calcium	47100		*	P
7440-47-3	Chromium	30.0	U	*	P
7439-89-6	Iron	462		*	P
7439-92-1	Lead	507		*	P
7439-95-4	Magnesium	1990		*	P
7439-96-5	Manganese	63.5			P
7440-22-4	Silver	30.0	U		P
7440-23-5	Sodium	2230000			P
7440-66-6	Zinc	2100			P

Color Before: BROWN Clarity Before: OPAQUE Texture: _____
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
RESULTS=_(RAW_DATA)(FINAL_VOLUME)/(SAMPLE_WT._OR_INITIAL_VOLUME)

1

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A__

Initial Calibration Source: PLASMACHEM__

Continuing Calibration Source: PLASMACHEM__

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	5000.0	4893.15	97.9	5000.0	4843.42	96.9	4870.11	97.4	P
Barium	5000.0	5002.66	100.1	5000.0	4992.94	99.9	5007.12	100.1	P
Cadmium	5000.0	5015.86	100.3	5000.0	4986.23	99.7	5015.47	100.3	P
Calcium	5000.0	5138.49	102.8	5000.0	5141.06	102.8	5171.74	103.4	P
Chromium	5000.0	5077.39	101.5	5000.0	5059.83	101.2	5060.85	101.2	P
Iron	5000.0	5041.02	100.8	5000.0	5040.69	100.8	5044.60	100.9	P
Lead	5000.0	5048.46	101.0	5000.0	5017.86	100.4	5023.70	100.5	P
Magnesium	5000.0	4931.40	98.6	5000.0	4896.14	97.9	4906.04	98.1	P
Manganese	5000.0	5017.99	100.4	5000.0	5012.28	100.2	5030.30	100.6	P
Silver	5000.0	4997.15	99.9	5000.0	4990.08	99.8	4962.65	99.3	P
Sodium	5000.0	5053.49	101.1	5000.0	4991.75	99.8	5022.16	100.4	P
Zinc	5000.0	4961.22	99.2	5000.0	4912.79	98.3	4965.27	99.3	P

(1) Control Limits: Mercury 80-120; Other Metals ~~90-110~~; Cyanide 85-115
BW 12-9-93

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A__

Initial Calibration Source: PLASMACHEM__

Continuing Calibration Source: PLASMACHEM__

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				5000.0	4846.29	96.9			P
Barium				5000.0	4989.34	99.8			P
Cadmium				5000.0	5004.32	100.1			P
Calcium				5000.0	5140.16	102.8			P
Chromium				5000.0	5052.84	101.1			P
Iron				5000.0	5060.60	101.2			P
Lead				5000.0	5007.99	100.2			P
Magnesium				5000.0	4907.91	98.2			P
ganese				5000.0	5018.20	100.4			P
ver				5000.0	4983.73	99.7			P
Sodium				5000.0	5002.64	100.1			P
Zinc				5000.0	4950.88	99.0			P

(1) Control Limits: Mercury 80-120; Other Metals ~~90-110~~ 80 Cyanide 85-115

FORM II (PART 1) - IN 12-9-93 ILM02.1

3
BLANKS

WHC-SD-WM-DP-053 REV 0

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A__

Preparation Blank Matrix (soil/water): WATER

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	22.0	U	22.0	U	22.0	U	22.0	U	49.479		P
Barium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Cadmium	4.0	U	4.0	U	4.0	U	4.0	U	4.000	U	P
Calcium	8.0	U	8.0	U	8.0	U	8.0	U	3001.283		P
Chromium	6.0	U	6.0	U	9.0		6.0	U	6.000	U	P
Iron	11.0	U	-180.7		11.0	U	11.0	U	474.568		P
Lead	38.0	U	38.0	U	38.0	U	38.0	U	38.000	U	P
Magnesium	3.0	U	3.0	U	3.0	U	3.0	U	165.513		P
Manganese	3.0	U	3.0	U	3.0	U	3.0	U	4.251		P
Silver	6.0	U	6.0	U	6.9		6.0	U	6.000	U	P
Sodium	19.0	U	19.0	U	19.0	U	19.0	U	263.124		P
Zinc	-4.5		-5.2		-4.2		-4.2		104.835		P

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5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

V21S1

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	10530.5200		793.6700		10000.00	97.4		P
Barium	75-125	9887.6300		15.0000	U	10000.00	98.9		P
Cadmium	75-125	246.5150		20.0000	U	250.00	98.6		P
Calcium									NR
Chromium	75-125	1034.2800		30.8200		1000.00	100.3		P
Iron	75-125	5232.8900		304.2950		5000.00	98.6		P
Lead	75-125	2709.9200		190.0000	U	2500.00	108.4		P
Magnesium									NR
Manganese	75-125	2453.9100		15.0000	U	2500.00	98.2		P
Silver	75-125	258.3500		30.0000	U	250.00	103.3		P
dium									NR
Zinc	75-125	2481.7350		559.7500		2500.00	76.9		P

Comments:
NO_CONTROL_LIMITS_IF_SAMPLE_>_4X_SPIKE_ADDED

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

V21S2

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	10646.7550		793.6700		10000.00	98.5		P
Barium	75-125	9951.5900		15.0000	U	10000.00	99.5		P
Cadmium	75-125	245.3000		20.0000	U	250.00	98.1		P
Calcium									NR
Chromium	75-125	1034.2800		30.8200		1000.00	100.3		P
Iron	75-125	5193.1750		304.2950		5000.00	97.8		P
Lead	75-125	2597.5100		190.0000	U	2500.00	103.9		P
Magnesium									NR
Manganese	75-125	2507.5550		15.0000	U	2500.00	100.3		P
Silver	75-125	255.5700		30.0000	U	250.00	102.2		P
Sodium									NF
Zinc	75-125	2514.7200		559.7500		2500.00	78.2		P

Comments:
NO_CONTROL_LIMITS_IF_SAMPLE_>_4X_SPIKE_ADDED

6
DUPLICATES

EPA SAMPLE NO.

V21D

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A

Matrix (soil/water): 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		793.6700		935.0850		16.4		P
Barium		15.0000	U	15.0000	U			P
Cadmium		20.0000	U	20.0000	U			P
Calcium		20483.5450		8992.9500		78.0	*	P
Chromium		30.8200		30.0000	U	200.0	*	P
Iron		304.2950		177.8800		52.4	*	P
Lead		190.0000	U	352.9800		200.0	*	P
Magnesium		875.0200		836.3550		4.5		P
Manganese		15.0000	U	15.0000	U			P
Silver		30.0000	U	30.0000	U			P
Sodium		1977867.5950		2184108.0150		9.9		P
Zinc		559.7500		177.7650		103.6	*	P

6
DUPLICATES

EPA SAMPLE NO.

V23D

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A

Matrix (soil/water): 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		940.5350		1007.3050		6.9		P
Barium		16.1600		21.8550		30.0	*	P
Cadmium		20.0000	U	20.0000	U			P
Calcium		47149.1600		68138.7500		36.4	*	P
Chromium		30.0000	U	77.5550		200.0	*	P
Iron		462.0400		581.1850		22.8	*	P
Lead		507.2050		190.0000	U	200.0	*	P
Magnesium		1985.2750		1374.7800		36.3	*	P
Manganese		63.4700		74.9500		16.6		P
Silver		30.0000	U	30.0000	U			P
Sodium		2225342.4550		2232852.6400		0.3		P
Zinc		2097.0450		2371.8550		12.3		P

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

V21S2

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A__

Matrix (soil/water): 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		10530.5200		10646.7550		1.1		P
Barium		9887.6300		9951.5900		0.6		P
Cadmium		246.5150		245.3000		0.5		P
Calcium		4708.1350		5521.4600		15.9		P
Chromium		1034.2800		1034.2800		0.0		P
Iron		5232.8900		5193.1750		0.8		P
Lead		2709.9200		2597.5100		4.2		P
Magnesium		696.3250		689.8800		0.9		P
Manganese		2453.9100		2507.5550		2.2		P
Silver		258.3500		255.5700		1.1		P
Sodium		2029363.9500		2030509.9600		0.1		P
Zinc		2481.7350		2514.7200		1.3		P

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A__

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	100000	108278.6	108.3						
Barium	100000	98562.90	98.6						
Cadmium	100000	97156.20	97.2						
Calcium	100000	1278535	1278						
Chromium	100000	99863.50	99.9						
Iron	100000	112690.3	112.7						
Lead	100000	100164.0	100.2						
Magnesium	100000	179621.0	179.6						
Manganese	100000	101121.8	101.1						
Silver	100000	98039.90	98.0						
Sodium	100000	110220.0	110.2						
Zinc	100000	156188.1	156.2						

ICP SERIAL DILUTION

EPA SAMPLE NO.

V21L

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A

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

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	158.73		189.14		19.2		P
Barium	3.00	U	15.00	U			P
Cadmium	4.00	U	20.00	U			P
Calcium	4096.71		4162.04		1.6		P
Chromium	6.16		30.00	U	100.0		P
Iron	60.86		55.00	U	100.0		P
Lead	38.00	U	190.00	U			P
Magnesium	175.00		178.99		2.3		P
Manganese	3.00	U	15.00	U			P
Silver	6.00	U	30.00	U			P
Sodium	395573.52		401151.90		1.4		P
Zinc	111.95		112.13		0.2		P

ICP SERIAL DILUTION

EPA SAMPLE NO.

V23L

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19A

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

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	188.11		282.14		50.0		P
Barium	3.23		15.00	U	100.0		P
Cadmium	4.00	U	20.00	U			P
Calcium	9429.83		9667.73		2.5		P
Chromium	6.00	U	54.44				P
Iron	92.41		111.32		20.5		P
Lead	101.44		190.00	U	100.0		P
Magnesium	397.06		406.31		2.3		P
Manganese	12.69		15.00	U	100.0		P
Silver	6.00	U	30.00	U			P
Sodium	445068.49		453292.09		1.8		P
Zinc	419.41		406.98		3.0		P

U.S. EPA - CLP

10

Instrument Detection Limits (Quarterly)

Lab Name: WHCPAL Contract:

Lab Code: Case No.: 107AP SAS No.: SDG No.: V19A

ICP ID Number: ICP-1 Date: 07/30/93

Flame AA ID Number :

Furnace AA ID Number :

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.22			22.0	P
Barium	493.41			3.0	P
Cadmium	226.50			4.0	P
Calcium	393.37			8.0	P
Chromium	267.72			6.0	P
Iron	259.94			11.0	P
Lead	220.35			38.0	P
Magnesium	279.55			3.0	P
Manganese	257.61			3.0	P
Silver	328.07			6.0	P
Sodium	589.89			19.0	P
Zinc	213.86			3.0	P

Comments:

U.S. EPA - CLP

11A

ICP Interelement Correction Factors (Annually)

Lab Name: WHCPAL Contract:

Lab Code: Case No.: 107AP SAS No.: SDG No.: V19A

ICP ID Number: ICP-1 Date: 01/29/93

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	___
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	
Barium	493.41	0.0000000	0.0000000	0.0000000	0.0000000	
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	
Calcium	393.37	0.0000000	0.0000000	0.0000000	0.0000000	
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	
Iron	259.94	0.0000000	0.0000000	0.0000000	0.0000000	
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	
Magnesium	279.55	0.0000000	0.0000000	0.0000000	0.0000000	
Manganese	257.61	0.0000000	0.0007007	0.0000000	0.0000000	
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	
Sodium	589.89	0.0000000	0.0000000	0.0000000	0.0000000	
Zinc	213.86	0.0000000	0.0000000	0.0000000	0.0000000	

Comments:

U.S. EPA - CLP

12

ICP Linear Ranges (Quarterly)

Lab Name: WHCPAL Contract:

Lab Code: Case No.: 107AP SAS No.: SDG No.: V19A

ICP ID Number: ICP-1 Date: 06/13/93

Analyte	Integ. Time (sec.)	Concentration (ug/L)	M
Aluminum	5.00	300000.0	P
Barium	5.00	100000.0	P
Cadmium	5.00	50000.0	P
Calcium	5.00	50000.0	P
Chromium	5.00	300000.0	P
Iron	5.00	100000.0	P
Lead	5.00	50000.0	P
Magnesium	5.00	50000.0	P
Manganese	5.00	100000.0	P
Silver	5.00	50000.0	P
Sodium	5.00	1000000.0	P
Zinc	5.00	100000.0	P

Comments:

FORM XII - IN ILM02.1

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PREPARATION LOG

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.:_107AP SAS No.: _____ SDG No.:V19A__

Method: P_

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCS	08/11/93		25
PB	08/11/93		25
V21	08/11/93		25
V21D	08/11/93		25
V21S1	08/11/93		25
V21S2	08/11/93		25
V23	08/11/93		25
V23D	08/11/93		25

ANALYSIS RUN LOG

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.: 107AP_ SAS No.: _____ SDG No.:V19A__

Instrument ID Number: ICP-1_____ Method: P_

Start Date: 09/08/93 End Date: 09/08/93

EPA Sample No.	D/F	Time	% R	Analytes																						
				AL	BA	CD	CA	CR	FE	PB	MG	MN	AG	NA	ZN											
ICV	1.00	1423		X	X	X	X	X	X	X	X	X	X	X	X											
ICB	1.00	1426		X	X	X	X	X	X	X	X	X	X	X	X											
ICSA	1.00	1431		X			X		X		X															
RINSE	1.00	1434																								
PB	1.00	1437		X	X	X	X	X	X	X	X	X	X	X	X											
LCS	1.00	1442		X	X	X	X	X	X	X	X	X	X	X	X											
V21L	5.00	1445		X	X	X	X	X	X	X	X	X	X	X	X											
V21D	5.00	1448																								
V23L	5.00	1452		X	X	X	X	X	X	X	X	X	X	X	X											
[illegible]D	5.00	1456																								
[illegible]V1	1.00	1459		X	X	X	X	X	X	X	X	X	X	X	X											
CCB1	1.00	1502		X	X	X	X	X	X	X	X	X	X	X	X											
V21S1	1.00	1505		X	X	X		X	X	X		X	X		X											
V21S2	1.00	1508		X	X	X		X	X	X		X	X		X											
V21A	5.00	1513																								
V21	1.00	1517		X	X	X	X	X	X	X	X	X	X	X	X											
V21D	1.00	1521		X	X	X	X	X	X	X	X	X	X	X	X											
V23	1.00	1525		X	X	X	X	X	X	X	X	X	X	X	X											
V23D	1.00	1530		X	X	X	X	X	X	X	X	X	X	X	X											
CCV2	1.00	1535		X	X	X	X	X	X	X	X	X	X	X	X											
CCB2	1.00	1538		X	X	X	X	X	X	X	X	X	X	X	X											
ICSA	1.00	1541		X			X		X		X															
RINSE	1.00	1544																								
CCV3	1.00	1546		X	X	X	X	X	X	X	X	X	X	X	X											
CCB3	1.00	1548		X	X	X	X	X	X	X	X	X	X	X	X											

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

WHC-SD-WM-DP-053 REV 0

ANALYTICAL BATCH

Lab Segment Serial No. V19-23	Customer ID: 107-AP-A, 107-AP-B
Analysis: ICP	Sample Prep: ACID DIGEST

Instrument: WB 39939	Procedure/ Rev: LA-505-151, D-0
Technologist: B. GOECKE	Date: 9-8-93
Starting Time: 2:00	Temperature NA
Ending Time: 4:00	Chemist: B. WELS

Comments:

	Description	Lab ID		Description	Lab ID
1	107-AP DIG STD	V19-8550	11		
2	107-AP DIG BLK	V20-8650	12		
3	107-AP-A sample	V21-8750	13		
4	107-AP-A DUP	V21-8850	14		
5	107-AP-A DIG spike#1	V21-8950	15		
6	107-AP-A DIG spike #2	V21-8050	16		
7	107-AP-B sample	V23-8750	17		
8	107-AP-B DUP	V23-8850	18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
ICV (SST4)	25N10C DIRECT			DIRECT
POST spike (SST4)	25N10C 1mL			BJG 9-8-93 ~~1mL~~ 5mL

A-6000-881 (03/92)

WHC-SD-WM-DP-053 REV 0

Batch 1512

Serial No	Sample Point	Date	Time Issued	Priority
V 19.-8550	107-AP	8- 2-93	15:14	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	N1L17	0

Sample Size	Customer ID
? .250 mL EA. QC-19 + QC-7 DF = 100 ~~20~~ 25 mL	STD

Remarks, Calculations, Results:

1st STD Digested STD

Undigested - Direct

SST4 25N10C

COMPLETED 9/8/93
SEE WARD'S PACKAGE

LMCS ✓

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-8-93	13:20	Brian Wels	9-8-93

54-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
V 20.-8650	107-AP	8- 2-93	15:14	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
? DIRECT	BLK

Remarks, Calculations, Results:

REAGENT BLANK

COMPLETED 9/8/93
SEE WARD'S PACKAGE

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-8-93	13:20	Brian Wels	9-8-93

54-6800-061 (R-10-83)

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Serial No	Sample Point	Date	Time Issued	Priority
V 21.-8750	107-AP	8- 2-93	15:16	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
DF = 5 ? 5mL to 25mL - 1mL - 4mL	107-AP-A

Remarks, Calculations, Results

COMPLETED 9/8/93
SEE WARD'S PACKAGE

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-8-93	13:20	Brian Wells	9-8-93

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 21.-8850	107-AP	8- 2-93	15:16	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
DF = 5 ? 5mL to 25mL - 1mL - 4mL	107-AP-A

Remarks, Calculations, Results

DUPLICATE SAMPLE

COMPLETED 9/8/93
SEE WARD'S PACKAGE

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-8-93	13:20	Brian Wells	9-8-93

54-6800-061 (R-10-83)

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WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 21.-8950	107-AP	8- 2-93	15:16	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	N1L17	0

Sample Size 5mL sample in 25mL DF=5
? ~~.250mL TO~~ 9-8-93

Customer ID: 107-AP-A

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID spex spike #1
SPIKE VOLUME .250mL

COMPLETED 9/8/93
SEE WARD'S PACKAGE

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-8-93	13:20	Brian Wels	9-8-93

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 21.-8050	107-AP	8- 2-93	15:16	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	N1L17	0

Sample Size
? 5mL sample in 25mL

Customer ID: 107-AP-A

Remarks, Calculations, Results:

SAMPLE SPIKE
DUPLICATE

SPIKE ID spex spike #1
SPIKE VOL .250mL

COMPLETED 9/8/93
SEE WARD'S PACKAGE

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-8-93	13:20	Brian Wels	9-8-93

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 23.-8750	107-AP	8- 3-93	8:30	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
DF = 5 ? 5mL in 25mL, -1mL-4mL	107-AP-B

Remarks, Calculations, Results

COMPLETED 9/8/93
SEE WARD'S PACKAGE

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-8-93	13:20	Brian Wels	9-8-93

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 23.-8850	107-AP	8- 3-93	8:30	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
DF = 5 ? 5mL in 25mL, -1mL-4mL	107-AP-B

Remarks, Calculations, Results

DUPLICATE SAMPLE

COMPLETED 9/8/93
SEE WARD'S PACKAGE

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
9-8-93	13:20	Brian Wels	9-8-93

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

Identity 1: wp-284 Identity 2: wp-284 2:20 PM September 8, 1993

Task name : TWC93

Sar Weight : 1.0000 Solution Volume : 1.00

On . Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-6.275	0.148	-23.038	381.442	144.378	36.113	4.998	-0.553
S.D.	2.202	0.154	14.399	3.762	6.890	2.950	0.572	1.127
% R.S.D.	35.087	104.080	62.502	0.986	4.772	8.170	11.455	203.700

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5.156	20.245	-5.434	28.192	24.988	11.300	9.261	-189.283
S.D.	0.068	1.990	2.360	2.051	0.147	2.052	4.005	78.324
% R.S.D.	1.310	9.828	43.424	7.274	0.588	18.156	43.244	41.379

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-32.560	-28.202	28.454	7.001	47.176	0.586	36.750	99.791
S.D.	28.266	18.317	0.092	11.644	6.219	0.176	4.354	8.982
% R.S.D.	86.812	64.950	0.325	166.303	13.181	30.000	11.848	9.001

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-4.626	12.362	-2.184	32.381	-0.538	9.598	38.963	-19.414
S.D.	1.949	2.535	0.911	25.148	0.929	0.646	0.886	55.504
% R.S.D.	42.120	20.504	41.693	77.663	172.678	6.735	2.274	285.897

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	11.410	79.777	128.622	29.574	28.543
S.D.	0.166	32.588	1.297	0.146	27.449
% R.S.D.	1.454	40.848	1.008	0.493	96.168

9-8-93

107-AP
V 19-23

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 729 TO 734.

Identity 1: ICV Identity 2: Quality Control 2:23 PM September 8, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4982.801	5117.362	4969.768	5812.877	4893.146	4916.181	4879.480	5000.532
S.D.	19.514	19.534	23.413	29.260	13.062	27.374	14.458	12.516
% R.S.D.	0.392	0.382	0.471	0.503	0.267	0.557	0.296	0.250

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4961.218	5016.242	5342.551	5041.024	5138.492	5077.390	5240.003	-362.248
S.D.	22.342	20.698	17.823	30.210	17.652	29.233	45.228	37.066
% R.S.D.	0.450	0.413	0.334	0.599	0.344	0.576	0.863	10.232

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4839.617	5056.783	5002.656	5114.639	4866.365	4931.405	4985.636	5053.486
S.D.	28.494	4.716	19.117	6.722	46.359	21.019	9.722	9.212
% R.S.D.	0.589	0.093	0.382	0.131	0.953	0.426	0.195	0.182

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4948.143	2840.769	4997.151	5048.461	4836.582	5015.861	5049.303	5118.510
S.D.	36.631	40.145	14.817	21.150	20.162	27.074	12.876	10.568
% R.S.D.	0.740	1.413	0.297	0.419	0.417	0.540	0.255	0.206

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	5017.991	4790.075	4841.349	5137.995	4706.572
S.D.	17.039	70.362	22.463	19.469	30.233
% R.S.D.	0.340	1.469	0.464	0.379	0.642

Identity 1: ICB Identity 2: Quality Control 2:25 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
0 k Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.024	0.135	-20.282	12.459	12.008	-4.053	-1.623	0.430
S.D.	0.775	0.056	23.817	2.444	2.635	2.675	0.390	0.819
% R.S.D.	75.637	41.658	117.431	19.614	21.946	66.010	24.031	190.425

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-4.458	8.338	-8.115	4.587	-4.609	-4.928	-9.134	75.060
S.D.	0.396	0.219	4.089	2.474	0.083	0.924	7.697	44.866
% R.S.D.	8.877	2.625	50.386	53.933	1.807	18.756	84.265	59.773

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	34.851	-23.485	0.696	30.289	22.446	0.703	-8.147	-12.921
S.D.	2.176	7.580	0.148	70.825	12.767	0.101	9.793	1.663
% R.S.D.	6.243	32.277	21.210	233.834	56.882	14.434	120.201	12.872

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.439	-12.398	0.094	-28.461	0.697	1.367	5.494	-14.130
S.D.	1.786	19.463	0.150	11.355	0.372	1.026	1.492	18.557
% R.S.D.	73.223	156.985	159.152	39.896	53.383	75.045	27.153	131.332

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.378	113.012	1.415	0.421	72.587
S.D.	0.138	42.764	0.424	0.146	5.905
% R.S.D.	10.022	37.840	29.994	34.641	8.135

Identity 1: icsa-i Identity 2: icsa 2:30 PM September 8, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-7.479	-0.197	-27.086	43.641	3.760	-8.106	-2.560	-1.352
S.D.	1.245	0.077	31.434	7.076	6.019	1.842	0.541	0.942
% R.S.D.	16.653	39.032	116.050	16.213	160.072	22.721	21.129	69.648

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-3.288	4.109	-9.400	-6.488	16.343	3.802	-42.598	-159.911
S.D.	0.376	1.142	2.315	3.890	0.141	2.164	19.763	16.958
% R.S.D.	11.440	27.784	24.627	59.951	0.865	56.924	46.394	10.604

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-23.855	-37.634	0.705	-82.266	49.590	1.113	-23.628	433317.123
S.D.	12.106	1.361	0.113	6.722	8.868	0.000	11.769	2435.359
% R.S.D.	50.748	3.618	15.949	8.172	17.883	0.000	49.807	0.562

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.362	0.010	-1.558	-8.022	-0.268	-1.204	6.855	-7.084
S.D.	0.277	13.805	0.608	6.324	0.201	0.545	2.270	19.052
% R.S.D.	76.489	133707.439	39.018	78.828	74.929	45.274	33.112	268.929

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-2.084	26.400	0.283	0.169	9.243
S.D.	0.332	26.049	0.490	0.146	3.091
% R.S.D.	15.923	98.671	173.037	86.602	33.441

Identity 1: xxx Identity 2: rinse 2:34 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
0 k Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-5.156	-0.209	-36.424	-5.397	4.178	-4.174	-3.747	0.092
S.D.	1.746	0.098	9.002	2.185	3.398	0.583	0.325	0.692
% R.S.D.	33.868	46.691	24.715	40.491	81.335	13.976	8.662	749.887

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-5.269	2.405	2.805	-4.810	-7.601	3.083	-21.737	-199.073
S.D.	0.507	4.072	2.329	1.397	0.001	0.924	15.010	89.731
% R.S.D.	9.622	169.325	83.013	29.048	0.016	29.984	69.055	45.075

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-26.755	-14.053	-0.608	10.883	-12.940	0.234	-11.558	12.668
S.D.	4.525	7.580	0.042	6.722	7.810	0.176	2.848	6.477
% R.S.D.	16.913	53.943	6.947	61.772	60.355	75.000	24.645	51.131

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-1.034	-5.216	-2.810	-1.776	-1.310	-1.579	2.772	1.722
S.D.	0.633	9.690	0.401	7.349	0.613	2.367	2.459	35.183
% R.S.D.	61.224	185.786	14.273	413.709	46.779	149.896	88.679	2042.688

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-2.067	94.884	0.566	-0.758	-52.745
S.D.	0.453	25.696	1.123	0.292	5.811
% R.S.D.	21.930	27.082	198.335	38.490	11.017

Identity 1: V20 dig blk Identity 2: direct 2:37 PM September 8, 1993 .
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-7.200	3.387	21.433	79.947	49.479	-2.238	0.563	0.092
S.D.	0.387	0.154	9.110	8.647	7.261	2.748	0.375	1.015
% R.S.D.	5.373	4.542	42.504	10.816	14.675	122.787	66.576	1100.533

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	104.835	6.243	-10.870	474.568	3001.283	5.856	4.977	-339.403
S.D.	0.312	1.610	4.661	99.567	2.883	2.773	27.757	59.014
% R.S.D.	0.298	25.795	42.883	20.981	0.096	47.355	557.712	17.388

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-32.624	-292.316	0.546	49.694	25.466	165.513	-15.728	263.124
S.D.	19.325	17.699	0.539	37.429	9.880	0.268	7.875	2.261
% R.S.D.	59.234	6.055	98.753	75.318	38.798	0.162	50.068	0.859

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-1.301	-9.395	-2.711	-26.848	-1.773	0.810	164.019	43.995
S.D.	1.080	13.652	0.797	13.315	0.704	0.562	2.421	38.226
% R.S.D.	83.000	145.309	29.377	49.594	39.726	69.355	1.476	86.887

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4.251	58.628	-3.820	-0.084	-0.778
S.D.	0.158	28.557	0.648	0.292	15.088
% R.S.D.	3.727	48.708	16.974	346.411	1939.892

Identity 1: V19 dig std 107-ap Identity 2: .250ml in 25ml 2:42 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
O k Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.676	11.627	-92.672	1362.821	1082.786	957.576	962.255	0.092
S.D.	1.364	0.113	12.074	5.678	3.710	4.454	1.601	0.508
% R.S.D.	201.675	0.971	13.028	0.417	0.343	0.465	0.166	550.267

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	1561.881	996.278	-3.897	1126.903	12785.352	998.635	-67.736	-169.702
S.D.	4.932	6.527	7.094	5.049	16.607	3.553	9.277	16.958
% R.S.D.	0.316	0.655	182.060	0.448	0.130	0.356	13.696	9.993

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-23.364	-1179.771	985.629	53.576	-0.156	1796.210	921.569	1102.200
S.D.	14.150	4.909	0.652	41.981	4.327	0.703	15.541	4.679
% R.S.D.	60.563	0.416	0.066	78.359	2771.160	0.039	1.686	0.425

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	977.048	564.092	980.399	1001.640	975.370	971.562	1003.268	10034.501
S.D.	6.570	15.795	2.171	13.570	0.579	0.805	2.642	39.660
% R.S.D.	0.672	2.800	0.221	1.355	0.059	0.083	0.263	0.395

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1011.218	962.014	947.611	1011.574	938.939
S.D.	1.907	54.496	1.698	2.043	23.595
% R.S.D.	0.189	5.665	0.179	0.202	2.513

Identity 1: V21 sam dil 107-ap Identity 2: 5ml in 25ml-1ml-4ml 2:45 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-6.830	0.702	13.442	647.788	37.828	-0.302	-0.936	-0.215
S.D.	0.671	0.149	2.067	3.752	6.004	1.731	0.859	0.488
% R.S.D.	9.829	21.271	15.380	0.579	15.872	572.339	91.726	226.865

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	22.426	9.347	4.102	8.167	832.407	3.905	6.786	-179.492
S.D.	0.613	1.894	4.083	6.482	0.651	0.712	5.976	19.581
% R.S.D.	2.733	20.263	99.546	79.368	0.078	18.224	88.071	10.909

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-21.699	-78.509	0.023	728.902	30.125	35.798	-16.284	80230.379
S.D.	3.765	9.818	0.230	64.829	11.780	0.268	6.142	378.895
% R.S.D.	17.351	12.505	1001.283	8.894	39.105	0.750	37.717	0.472

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-5.840	16.979	-2.004	-14.529	-0.383	-0.668	76.415	2767.078
S.D.	3.643	13.597	1.104	5.739	0.306	1.627	1.617	71.482
% R.S.D.	62.376	80.078	55.103	39.498	79.893	243.591	2.116	2.583

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.140	41.507	-0.707	0.169	-28.786
S.D.	0.257	24.608	1.531	0.636	20.802
% R.S.D.	22.509	59.285	216.417	377.491	72.267

Identity 1: V21 dup dil 107-ap Identity 2: 5ml in 25ml-1ml-4ml 2:48 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
C k Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-5.540	0.172	33.108	776.646	42.416	-8.045	-1.186	-0.553
S.D.	0.974	0.217	35.432	9.070	5.326	2.871	0.886	0.508
% R.S.D.	17.578	125.556	107.019	1.168	12.556	35.688	74.666	91.806

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4.503	5.812	-2.712	18.459	375.523	4.213	9.425	-140.330
S.D.	0.716	0.788	2.380	10.215	1.528	4.183	11.234	107.695
% R.S.D.	15.899	13.566	87.775	55.337	0.407	99.304	119.200	76.744

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4.406	-54.927	0.170	725.020	20.193	37.731	-4.937	90636.808
S.D.	6.523	17.382	0.317	71.143	20.107	4.059	4.650	465.652
% R.S.D.	148.032	31.646	186.384	9.813	99.572	10.758	94.186	0.514

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-1.062	-22.220	-1.036	31.053	0.620	-0.931	111.749	3115.829
S.D.	0.851	19.744	0.817	20.970	0.658	0.992	2.675	10.568
% R.S.D.	80.148	88.859	78.845	67.531	106.184	106.521	2.394	0.339

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.033	83.806	-1.132	0.000	54.755
S.D.	0.183	38.257	0.849	0.146	10.833
% R.S.D.	17.752	45.650	75.018	64416728.561	19.785

Identity 1: V23 sam dil 107-ap Identity 2: 5ml in 25ml-1ml-4ml 2:52 PM September 8, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.533	2.131	-3.728	883.845	56.429	-4.416	-1.936	0.338
S.D.	2.131	0.296	9.486	3.046	4.229	1.313	0.658	0.513
% R.S.D.	139.063	13.909	254.461	0.345	7.495	29.729	33.999	151.811

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	81.396	9.154	4.140	22.263	1933.546	10.889	-10.207	-179.492
S.D.	0.946	2.151	4.126	0.888	6.287	0.990	18.429	51.806
% R.S.D.	1.163	23.502	99.646	3.989	0.325	9.096	180.563	28.863

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-33.324	-183.054	0.478	822.050	0.824	81.262	-8.291	90658.418
S.D.	20.662	14.727	0.285	11.644	8.246	0.176	5.569	429.211
% R.S.D.	62.002	8.045	59.685	1.416	1000.992	0.216	67.166	0.473

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-2.664	-18.157	-0.789	2.779	-1.464	-0.243	10.232	3103.500
S.D.	1.977	17.214	0.397	13.795	0.698	0.350	1.372	29.103
% R.S.D.	74.211	94.809	50.276	496.310	47.669	144.357	13.409	0.938

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1.092	65.678	-1.556	-0.506	26.847
S.D.	0.418	64.116	0.000	0.146	15.172
% R.S.D.	38.268	97.623	0.000	28.868	56.515

Identity 1: V23 dup dil 107-ap Identity 2: 5ml in 25ml-1ml-4ml 2:55 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.627	1.811	12.460	791.297	36.712	-4.597	-1.936	-0.307
S.D.	1.026	0.056	7.505	0.403	3.695	3.176	0.390	0.845
% R.S.D.	163.648	3.117	60.234	0.051	10.064	69.088	20.153	275.028

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	88.533	8.016	-13.539	33.227	2705.290	1.440	-18.786	-172.965
S.D.	0.980	1.807	2.386	1.689	2.033	1.082	12.157	14.955
% R.S.D.	1.107	22.544	17.621	5.084	0.075	75.167	64.715	8.646

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-1.425	-251.441	0.564	825.931	22.528	54.956	-14.572	90256.208
S.D.	3.323	13.130	0.068	59.750	11.592	0.203	6.541	293.285
% R.S.D.	233.225	5.222	11.993	7.234	51.455	0.369	44.886	0.325

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-5.250	-13.922	-2.034	-31.986	-0.383	-0.374	78.481	3131.682
S.D.	1.232	10.604	1.259	6.553	0.417	1.466	2.675	26.421
% R.S.D.	23.459	76.165	61.876	20.488	108.876	391.760	3.409	0.844

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1.827	98.913	-1.981	0.169	-5.398
S.D.	0.601	37.535	0.735	0.146	22.453
% R.S.D.	32.889	37.947	37.121	86.602	415.984

Identity 1: CCV Identity 2: Quality Control 2:58 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4980.331	5095.377	4933.484	5740.386	4843.422	4873.293	4883.353	4970.756
S.D.	17.668	25.629	48.840	9.811	32.788	26.665	21.363	24.920
% R.S.D.	0.355	0.503	0.990	0.171	0.677	0.547	0.437	0.501

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4912.786	4992.453	5346.634	5040.688	5141.063	5059.827	5240.684	-179.492
S.D.	17.189	35.266	21.536	17.521	19.971	18.235	46.219	93.395
% R.S.D.	0.350	0.706	0.403	0.348	0.388	0.360	0.882	52.033

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4785.687	5053.639	4992.943	5141.807	4785.261	4896.135	4922.726	4991.750
S.D.	36.008	22.288	23.863	112.286	49.749	26.439	15.166	28.844
% R.S.D.	0.752	0.441	0.478	2.184	1.040	0.540	0.308	0.578

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4883.810	2828.318	4990.075	5017.860	4810.491	4986.229	5053.033	5042.771
S.D.	32.404	28.270	15.335	24.521	28.446	17.554	12.100	47.361
% R.S.D.	0.664	1.000	0.307	0.489	0.591	0.352	0.239	0.939

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	5012.276	4859.566	4841.774	5113.814	4705.145
S.D.	18.359	35.018	24.141	29.425	17.311
% R.S.D.	0.366	0.721	0.499	0.575	0.368

Identity 1: CCB Identity 2: Quality Control 3:01 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
C k Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-2.444	0.259	-1.476	1.135	-3.710	-3.811	-0.936	0.092
S.D.	0.807	0.077	12.984	0.388	5.519	1.456	1.124	0.213
% R.S.D.	33.010	29.737	879.661	34.185	148.756	38.194	120.098	230.734

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-5.156	8.464	-8.128	-180.676	-4.379	2.878	-3.376	-88.114
S.D.	0.305	2.398	4.058	3.525	0.083	0.356	18.935	55.671
% R.S.D.	5.907	28.330	49.931	1.951	1.896	12.365	560.889	63.180

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-5.743	0.882	0.561	14.764	19.488	0.469	-6.285	7.833
S.D.	19.610	4.084	0.254	26.890	7.783	0.203	10.889	6.588
% R.S.D.	341.444	462.872	45.261	182.132	39.938	43.301	173.257	84.108

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-2.995	4.081	0.721	-4.722	-0.190	-2.298	0.353	15.813
S.D.	0.893	27.615	0.457	2.099	0.535	1.837	1.484	47.655
% R S.D.	29.828	676.729	63.298	44.451	280.789	79.969	420.535	301.357

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.618	62.656	0.142	0.000	-5.236
S.D.	0.558	9.230	0.849	0.146	36.615
% R.S.D.	34.500	14.732	598.840	64416728.561	699.337

Identity 1: V21 dig spk#1 107-ap Identity 2: 5ml sample in 25ml 3:05 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-2.830	2.784	-38.851	3215.097	2106.104	476.368	245.233	0.768
S.D.	1.748	0.192	21.949	6.550	4.136	0.756	1.190	0.213
% R.S.D.	61.741	6.898	56.494	0.204	0.196	0.159	0.485	27.710

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	496.347	501.073	1.389	1046.578	941.627	206.856	2.134	-88.114
S.D.	1.182	4.763	2.338	12.951	1.721	0.178	11.377	87.751
% R.S.D.	0.238	0.951	168.291	1.237	0.183	0.086	533.042	99.588

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	2.905	-77.723	1977.526	4035.670	61.891	139.265	1915.335	405872.790
S.D.	13.977	17.856	3.934	64.829	0.612	0.176	17.692	867.481
% R.S.D.	481.095	22.974	0.199	1.606	0.989	0.126	0.924	0.214

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-0.488	1338.515	51.670	541.984	1.662	49.303	402.083	14156.113
S.D.	1.834	50.602	0.147	23.850	0.334	1.793	4.902	24.972
% R.S.D.	376.016	3.780	0.284	4.400	20.110	3.636	1.219	0.176

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	490.782	558.159	480.527	49.795	1869.394
S.D.	0.599	32.306	2.559	0.813	34.935
% R.S.D.	0.122	5.788	0.532	1.632	1.869

Identity 1: V21 dig spk#2 107-ap Identity 2: 5ml sample in 25ml 3:08 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	2.365	2.340	-39.952	3420.562	2129.351	483.869	246.295	-0.799
S.D.	2.713	0.242	13.034	26.030	5.475	3.312	0.602	1.228
% R.S.D.	114.705	10.354	32.623	0.761	0.257	0.684	0.245	153.670

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	502.944	519.234	2.770	1038.635	1104.292	206.856	-6.195	-68.533
S.D.	1.845	5.635	2.366	6.389	4.474	2.313	10.377	82.108
% R.S.D.	0.367	1.085	85.410	0.615	0.405	1.118	167.508	119.807

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-10.133	-117.812	1990.318	3616.502	66.764	137.976	1932.674	406101.992
S.D.	7.632	17.382	6.373	41.981	6.727	0.442	8.403	1188.820
% R.S.D.	75.316	14.754	0.320	1.161	10.077	0.321	0.435	0.293

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-3.478	1303.295	51.114	519.502	1.624	49.060	240.282	14318.160
S.D.	2.124	24.590	0.756	21.390	0.482	1.114	4.401	88.893
% R.S.D.	61.076	1.887	1.478	4.117	29.692	2.270	1.832	0.621

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	501.511	516.867	491.281	50.132	1914.730
S.D.	2.483	30.214	0.424	0.253	58.500
% R.S.D.	0.495	5.846	0.086	0.504	3.055

Identity 1: V21 post spk 107-ap Identity 2: 1ml sample in 4ml 3:12 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	1007.531	1034.099	977.381	2095.139	1006.427	975.542	991.488	993.948
S.D.	1.560	4.926	13.736	4.876	5.028	4.656	3.619	5.091
% R.S.D.	0.155	0.476	1.405	0.233	0.500	0.477	0.365	0.512

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	974.793	1009.034	1086.693	1040.313	1427.555	1016.198	1085.835	-16.317
S.D.	5.891	13.351	8.486	7.122	7.432	8.388	12.725	73.483
% R.S.D.	0.604	1.323	0.781	0.685	0.521	0.825	1.172	450.333

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	963.268	957.510	1012.973	1668.148	940.823	1020.614	997.774	91158.882
S.D.	9.851	7.580	5.024	84.232	25.313	4.123	9.062	552.298
% R.S.D.	1.023	0.792	0.496	5.049	2.691	0.404	0.908	0.606

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	977.312	548.853	544.259	1028.522	971.587	994.897	1123.232	4195.551
S.D.	8.084	17.740	7.478	8.647	4.515	6.303	3.088	60.787
% R.S.D.	0.827	3.232	1.374	0.841	0.465	0.634	0.275	1.449

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1009.335	1017.406	977.326	1033.059	1000.259
S.D.	3.934	79.499	6.282	5.244	23.109
% R.S.D.	0.390	7.814	0.643	0.508	2.310

Identity 1: V21 sample 107-ap-a Identity 2: direct 3:16 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
C ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-2.306	4.175	3.633	3234.551	158.734	0.726	1.250	0.092
S.D.	0.805	0.085	13.231	37.567	2.954	3.902	0.962	0.464
% R.S.D.	34.896	2.044	364.184	1.161	1.861	537.558	76.927	502.874

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	111.950	3.408	2.727	60.859	4096.709	6.164	12.399	-182.756
S.D.	1.000	5.498	2.343	4.069	7.557	3.553	7.798	46.268
% R.S.D.	0.893	161.311	85.913	6.686	0.184	57.647	62.888	25.317

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-11.619	-372.493	2.373	3915.353	50.306	175.004	-13.017	395573.520
S.D.	5.020	12.101	0.202	37.429	12.955	0.442	4.636	1321.442
% R.S.D.	43.206	3.249	8.492	0.956	25.752	0.253	35.614	0.334

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-2.118	-42.202	3.290	9.021	1.353	-3.502	379.048	13935.942
S.D.	1.850	17.016	0.303	14.740	0.417	1.011	8.152	24.406
% R S.D.	87.345	40.320	9.215	163.392	30.847	28.868	2.151	0.175

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1.385	89.849	0.000	-0.253	13.959
S.D.	0.514	29.032	2.414	0.146	21.008
% R.S.D.	37.102	32.312	880498.364	57.735	150.503

Identity 1: V21 dup 107-ap-a Identity 2: direct 3:20 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	1.557	3.116	32.535	3717.332	187.017	-0.847	0.500	0.369
S.D.	1.118	0.064	15.205	16.621	5.005	0.943	0.709	0.768
% R.S.D.	71.832	2.054	46.735	0.447	2.676	111.344	141.756	208.120

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	35.553	0.573	1.415	35.576	1798.590	1.029	-9.032	-84.851
S.D.	0.510	2.472	2.347	4.250	3.292	1.082	14.020	39.568
% R.S.D.	1.434	431.697	165.857	11.945	0.183	105.184	155.222	46.632

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	13.046	-172.050	2.568	4338.402	84.275	167.271	6.575	436821.603
S.D.	5.754	3.602	0.138	53.357	13.728	0.203	10.838	773.628
% R.S.D.	44.105	2.094	5.367	1.230	16.290	0.121	164.827	0.177

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-0.802	9.619	2.474	70.596	2.318	0.213	526.131	15489.472
S.D.	1.886	13.025	0.310	12.817	0.372	1.525	2.031	137.421
% R.S.D.	235.163	135.409	12.514	18.155	16.055	716.144	0.386	0.887

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.418	68.699	-0.849	-0.084	68.230
S.D.	0.203	33.281	0.245	0.386	28.552
% R.S.D.	14.304	48.444	28.877	458.259	41.847

Identity 1: V23 sample 107-ap-b Identity 2: direct 3:25 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
ak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.722	10.654	10.523	4442.645	188.107	-2.420	-0.124	0.246
S.D.	1.949	0.161	16.227	24.369	6.624	2.871	0.943	0.244
% R.S.D.	269.985	1.512	154.205	0.549	3.521	118.664	759.626	99.183

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	419.409	9.573	-9.440	92.408	9429.832	5.548	-25.020	-228.445
S.D.	2.635	1.289	2.398	1.463	30.902	2.939	20.222	64.200
% R.S.D.	0.628	13.465	25.407	1.583	0.328	52.981	80.823	28.103

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-13.922	-855.917	3.232	4582.917	75.954	397.055	-2.099	445068.491
S.D.	20.203	14.409	0.329	30.806	17.719	1.235	3.827	2766.550
% R.S.D.	145.117	1.683	10.169	0.672	23.328	0.311	182.301	0.622

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-1.598	8.578	2.397	101.441	1.739	-1.680	63.763	15727.258
S.D.	1.775	15.096	0.397	5.637	0.838	2.005	1.631	95.894
% R.S.D.	111.060	175.978	16.554	5.557	48.158	119.306	2.558	0.610

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	12.694	37.478	-0.566	0.421	-13.553
S.D.	0.355	20.117	1.491	0.146	18.834
% R.S.D.	2.797	53.677	263.519	34.641	138.959

Identity 1: V23 dup 107-ap-b Identity 2: direct 3:29 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.231	9.792	18.905	4031.232	201.461	-3.448	1.000	-0.123
S.D.	2.365	0.171	12.088	35.981	5.258	0.733	0.757	1.027
% R.S.D.	192.134	1.743	63.942	0.893	2.610	21.271	75.719	835.723

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	474.371	11.273	1.471	116.237	13627.751	15.511	-33.477	-42.425
S.D.	2.298	3.193	2.387	1.538	87.068	0.178	20.478	64.200
% R.S.D.	0.484	28.325	162.291	1.323	0.639	1.147	61.171	151.326

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	10.740	-1234.795	4.371	3760.106	55.038	274.956	-11.573	446570.528
S.D.	12.104	24.620	0.494	108.187	15.030	1.860	1.436	3013.673
% R.S.D.	112.700	1.994	11.306	2.877	27.308	0.677	12.407	0.675

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.759	-19.720	1.424	19.822	2.704	-0.627	387.415	16012.600
S.D.	1.449	5.954	1.217	20.742	0.869	0.535	3.088	84.930
% R.S.D.	190.817	30.191	85.439	104.642	32.137	85.286	0.797	0.530

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	14.990	6.258	2.123	-0.758	63.142
S.D.	0.438	23.598	0.884	0.146	5.922
% R.S.D.	2.919	377.093	41.628	19.245	9.378

Identity 1: CCV Identity 2: Quality Control 3:34 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
C k Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	5008.261	5109.751	4969.255	5736.079	4870.108	4895.614	4901.030	4973.583
S.D.	7.001	9.938	8.848	5.115	17.641	9.328	4.067	13.510
% R.S.D.	0.140	0.194	0.178	0.089	0.362	0.191	0.083	0.272

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4965.271	5018.807	5375.038	5044.604	5171.739	5060.854	5321.930	-182.756
S.D.	9.553	4.001	10.866	13.112	1.966	19.391	31.629	48.295
% R.S.D.	0.192	0.080	0.202	0.260	0.038	0.383	0.594	26.426

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4812.223	5072.504	5007.116	4804.144	4745.347	4906.036	4921.913	5022.165
S.D.	32.530	9.818	7.419	139.723	48.514	12.074	32.026	22.841
% R.S.D.	0.676	0.194	0.148	2.908	1.022	0.246	0.651	0.455

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4886.492	2860.488	4962.651	5023.703	4822.881	5015.466	5063.215	5113.226
S.D.	16.362	18.500	1.765	33.449	13.105	10.390	14.836	65.999
% R.S.D.	0.335	0.647	0.036	0.666	0.272	0.207	0.293	1.291

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	5030.299	4822.302	4853.518	5125.610	4686.901
S.D.	6.657	82.134	0.884	12.189	8.815
% R.S.D.	0.132	1.703	0.018	0.238	0.188

Identity 1: CCB Identity 2: Quality Control 3:37 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.120	0.456	-0.128	9.506	2.080	-0.423	-1.061	0.031
S.D.	2.334	0.161	11.040	3.204	5.286	1.637	0.709	0.627
% R.S.D.	1940.564	35.342	8595.699	33.711	254.096	386.495	66.859	2036.612

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-4.211	2.150	-5.530	2.461	-4.195	9.040	51.197	-91.378
S.D.	0.305	2.790	2.403	0.581	0.086	2.863	20.440	64.200
% R.S.D.	7.234	129.749	43.460	23.617	2.050	31.670	39.925	70.258

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-23.868	7.171	1.030	3.120	27.857	0.469	6.346	14.219
S.D.	5.750	19.061	0.102	35.572	5.769	0.101	9.100	4.947
% R.S.D.	24.091	265.809	9.903	1140.034	20.708	21.651	143.384	34.789

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	1.008	-2.223	6.913	-33.448	0.118	0.972	5.091	-33.505
S.D.	1.585	30.884	1.099	6.804	0.067	0.658	2.086	9.152
% R.S.D.	157.342	1389.266	15.905	20.343	56.507	67.653	40.978	27.316

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.193	76.756	1.132	0.337	43.741
S.D.	0.122	22.271	2.178	0.000	11.810
% R.S.D.	10.216	29.015	192.388	0.000	27.001

Identity 1: icsa-f Identity 2: icsa 3:41 PM September 8, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

C k Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.767	-1.269	12.185	46.497	-50.820	-7.985	-8.994	-3.718
S.D.	1.829	0.043	9.020	15.394	6.009	4.059	0.676	0.319
% R.S.D.	238.542	3.363	74.022	33.107	11.824	50.837	7.512	8.589

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-3.490	2.088	-10.754	2.238	16.543	-1.744	-45.834	19.581
S.D.	0.528	3.390	4.673	3.225	0.083	2.052	18.886	37.066
% R.S.D.	15.116	162.349	43.457	144.124	0.500	117.613	41.206	189.297

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	30.529	-150.826	1.271	-55.098	27.647	1.465	-25.127	425517.231
S.D.	13.581	11.633	0.234	6.722	11.035	0.176	1.861	3575.826
% R.S.D.	44.484	7.713	18.405	12.201	39.914	12.000	7.405	0.840

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-4.739	-35.281	3.549	-35.064	0.388	-2.561	-0.151	70.416
S.D.	2.021	14.781	1.594	21.411	0.482	0.531	4.455	24.972
% R.S.D.	42.655	41.896	44.909	61.061	124.091	20.723	2947.910	35.463

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.579	5.251	1.557	-0.084	71.024
S.D.	0.201	12.211	1.914	0.292	33.429
% R.S.D.	12.702	232.556	122.958	346.411	47.067

Identity 1: xxx Identity 2: rinse 3:44 PM September 8, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.025	0.099	-18.168	5.210	7.352	-5.384	-1.061	0.031
S.D.	1.342	0.093	29.093	3.510	8.153	1.731	0.286	0.654
% R.S.D.	130.969	94.368	160.135	67.373	110.896	32.155	26.976	2122.703

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-5.697	1.267	2.784	1.119	-7.606	7.191	-12.439	-150.121
S.D.	0.628	1.897	2.364	4.440	0.004	3.102	2.525	44.866
% R.S.D.	11.017	149.719	84.900	396.799	0.053	43.132	20.296	29.886

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	12.381	13.459	0.184	34.170	-11.548	-0.117	-2.566	18.199
S.D.	8.787	4.909	0.167	47.057	21.127	0.000	6.115	4.645
% R.S.D.	70.971	36.472	90.713	137.715	182.949	0.000	238.342	25.525

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-1.042	-8.428	-0.083	-29.371	-0.306	-0.972	2.974	-56.403
S.D.	1.115	24.431	0.457	12.914	0.583	0.438	0.572	43.999
% R.S.D.	107.026	289.889	552.303	43.969	190.296	45.085	19.250	78.009

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.562	55.607	-1.415	0.000	28.582
S.D.	0.332	24.421	1.365	0.146	21.579
% R.S.D.	21.246	43.918	96.455	64416728.561	75.497

Identity 1: CCV Identity 2: Quality Control 3:45 PM September 8, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4990.802	5096.831	4890.119	5766.293	4846.294	4883.698	4877.169	4955.975
S.D.	30.595	33.011	62.731	37.137	46.149	35.560	26.774	35.139
% R.S.D.	0.613	0.648	1.283	0.644	0.952	0.728	0.549	0.709

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4950.883	5007.151	5353.281	5060.602	5140.159	5052.843	5310.832	-153.384
S.D.	26.901	41.844	36.630	33.304	32.023	35.775	30.715	45.220
% R.S.D.	0.543	0.836	0.684	0.658	0.623	0.708	0.578	29.482

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4787.108	5062.286	4989.342	5203.906	4821.694	4907.911	4926.259	5002.643
S.D.	38.592	29.953	32.336	35.572	54.619	31.517	20.597	35.693
% R.S.D.	0.806	0.592	0.648	0.684	1.133	0.642	0.418	0.713

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4881.964	2876.044	4983.734	5007.990	4809.951	5004.320	5055.856	5123.794
S.D.	33.170	18.957	29.149	53.439	31.850	27.360	29.111	23.033
% R.S.D.	0.679	0.659	0.585	1.067	0.662	0.547	0.576	0.450

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	5018.203	4826.331	4851.537	5121.060	4655.070
S.D.	32.816	33.959	33.442	34.390	13.574
% R.S.D.	0.654	0.704	0.689	0.672	0.292

Identity 1: CCB Identity 2: Quality Control 3:48 PM September 8, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.150	0.764	41.287	12.472	-11.971	-6.231	-2.123	1.321
S.D.	2.333	0.077	21.230	6.028	7.440	1.109	0.602	0.373
% R.S.D.	202.900	10.073	51.421	48.332	62.150	17.796	28.374	28.194

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-4.211	0.444	-2.690	-0.783	-3.563	3.699	-0.251	-71.797
S.D.	0.550	5.596	2.312	1.656	0.252	1.849	19.966	99.363
% R.S.D.	13.065	1259.967	85.982	211.458	7.071	49.977	7945.717	138.394

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-1.404	-14.839	0.861	-12.405	28.584	0.820	-2.416	12.832
S.D.	23.954	14.976	0.158	35.572	7.341	0.268	17.242	4.224
% R.S.D.	1706.093	100.928	18.384	286.764	25.683	32.733	713.588	32.920

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.917	-33.363	3.373	-20.906	-0.229	0.294	10.182	-45.835
S.D.	2.420	20.144	1.207	4.445	0.241	0.276	3.567	35.183
% R.S.D.	82.939	60.376	35.792	21.261	105.227	93.759	35.029	76.762

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-0.290	-26.977	0.425	0.506	27.375
S.D.	0.201	36.256	1.491	0.146	9.899
% R.S.D.	69.251	134.396	350.962	28.868	36.162

9-8-93
107-AP
V19-23

V19AR
CASE NARRATIVE - ICP

WHCPAL LABORATORIES
WHCPAL/CUSTOMER SAMPLE NOS: V23 107-AP-B

INORGANIC ANALYSIS

The data evaluation for this project will follow the guidelines specified in "Technical Project Plan for the 222-S Laboratory in Support of the 242-A Evaporator Waste Analysis Plan, WHC-SD-WM-EV-060, Revision 2," (WHC-SD-WM-TPP-048, Rev.0). Contained in this report is the evaluation of the data generated by Westinghouse Hanford Company - Processing and Analytical Laboratories (WHC-PAL), 222-S Laboratory. Information will be organized by quality control parameter. No computer-readable data will be submitted on floppy diskette as mentioned in the comment on the following cover page.

INITIAL AND CONTINUING CALIBRATION VERIFICATION
All instrument calibration requirements were within control limits set by the Laboratory Management Control System.

INITIAL AND CONTINUING CALIBRATION BLANKS - (REAGENT BLANK)
All ICB and CCB analytical measurements were 0±IDL (Instrument Detection Limit) with the exception of Calcium and Silver in all calibration blanks, Sodium in CCB-2 and CCB-3 and Zinc in the ICB, CCB-1 and CCB-3. Values reported for Calcium and Zinc are within expected variances resulting from minor temporal instability of the instrument. The high values for Sodium in CCB-2 and CCB-3 are attributed to sample carryover.

PREPARATION BLANK
Contamination is indicated for Aluminum, Iron, Calcium, Magnesium and Zinc. Contamination is judged to be present when the blank analyte concentrations are greater than 20% of the average sample concentration. This criterion applies only when the sample concentration is greater than 10 times the IDL.

SPIKE SAMPLE RECOVERIES
No spike recovery failures were noted. The acceptance criterion is 75-125%.

SPIKE DUPLICATE ANALYSES
No spike duplicate precision failures were noted. The acceptance criterion is 20%.

DUPLICATE ANALYSES
Duplicate precision failures were noted for Calcium (31.1%) and Iron (31.8%). These failures may be influenced by contamination levels. No acceptance criteria apply to the duplicate analysis.

LABORATORY CONTROL SAMPLE
A failure was noted for Sodium. This failure is attributed to contamination.

Brian Wels
11-30-93

Brian Wels
Senior Scientist, WHCPAL

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

I Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.:V19AR_

SOW No.: ILM02

EPA Sample No.	Lab Sample ID
_V23	__V23
_V23D	__V23D
_V23S2	__V23S2
_V23S	__V23S

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

I certify that this data package is in compliance with the terms and conditions of the 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: Thomas Bushaw Name: TH BUSHAW

Date: 11/30/93 Title: Mgr. Inorganic Chem

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

V23

Lab Name: WHC_PAL Contract: _____
Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19AR_
Matrix (soil/water): WATER Lab Sample ID: V23
Level (low/med): LOW Date Received: 08/02/93
% 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	1540			P
7440-39-3	Barium	30.0	U		P
7440-43-9	Cadmium	40.0	U		P
7440-70-2	Calcium	2590		*	P
7440-47-3	Chromium	55.0	U		P
7439-89-6	Iron	245		*	P
7439-92-1	Lead	320	U		P
7439-95-4	Magnesium	107			P
7439-96-5	Manganese	15.0	U		P
7440-22-4	Silver	77.8			P
7440-23-5	Sodium	2260000			P
7440-66-6	Zinc	71.0			P

Color Before: BROWN Clarity Before: OPAQUE Texture: _____
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
RESULTS= (RAW_DATA)(FINAL_VOLUME)/(SAMPLE_WT._OR_INITIAL_VOLUME)

U.S. EPA - CLP

WHC-SD-WM-DP-053 REV 0

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19AR_

Initial Calibration Source: PLASMACHEM__

Continuing Calibration Source: PLASMACHEM__

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum_	5000.0	4866.55	97.3	5000.0	4710.99	94.2	4793.77	95.9	P_
Barium___	5000.0	5123.90	102.5	5000.0	4952.84	99.1	5062.76	101.3	P_
Cadmium__	5000.0	5121.37	102.4	5000.0	4852.94	97.1	4986.27	99.7	P_
Calcium__	5000.0	5100.02	102.0	5000.0	4955.60	99.1	5070.68	101.4	P_
Chromium_	5000.0	5182.66	103.7	5000.0	4937.75	98.8	5057.33	101.1	P_
Iron_____	5000.0	5061.38	101.2	5000.0	4878.32	97.6	4962.94	99.3	P_
Lead_____	5000.0	5092.47	101.8	5000.0	4912.90	98.3	5000.70	100.0	P_
Magnesium	5000.0	4997.51	100.0	5000.0	4763.37	95.3	4865.68	97.3	P_
ganese	5000.0	5058.68	101.2	5000.0	4873.63	97.5	4987.57	99.8	P_
Silver___	5000.0	5092.71	101.9	5000.0	4889.67	97.8	4895.20	97.9	P_
Sodium___	5000.0	5042.14	100.8	5000.0	4990.53	99.8	5238.39	104.8	P_
Zinc_____	5000.0	5233.88	104.7	5000.0	5137.48	102.7	5209.76	104.2	P_

(1) Control Limits: Mercury 80-120; Other Metals ~~90-110~~, BW Cyanide 85-115

FORM II (PART 1) - IN 12-9-93 ILM02.1

U.S. EPA - CLP

WHC-SD-WM-DP-053 REV 0

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19AR_

Initial Calibration Source: PLASMACHEM__

Continuing Calibration Source: PLASMACHEM__

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				5000.0	4835.85	96.7			P
Barium				5000.0	5097.08	101.9			P
Cadmium				5000.0	5107.48	102.1			P
Calcium				5000.0	5091.26	101.8			P
Chromium				5000.0	5156.32	103.1			P
Iron				5000.0	5046.82	100.9			P
Lead				5000.0	5060.68	101.2			P
Magnesium				5000.0	4968.36	99.4			P
Manganese				5000.0	5061.68	101.2			P
Silver				5000.0	4915.13	98.3			P
Sodium				5000.0	5115.91	102.3			P
Zinc				5000.0	5290.00	105.8			P

(1) Control Limits: Mercury 80-120; Other Metals ~~90-110~~; Cyanide 85-115

BW 12-9-93

FORM II (PART 1) - IN ILM02.1

U.S. EPA - CLP

3
BLANKS

WHC-SD-WM-DP-053 REV 0

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19AR_

Preparation Blank Matrix (soil/water): WATER

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	38.0	U	38.0	U	38.0	U	38.0	U	180.281		P
Barium	6.0	U	6.0	U	6.0	U	6.0	U	6.000	U	P
Cadmium	8.0	U	8.0	U	8.0	U	8.0	U	8.000	U	P
Calcium	21.9		19.3		19.7		23.6		310.462		P
Chromium	11.0	U	11.0	U	11.0	U	11.0	U	11.000	U	P
Iron	21.0	U	21.0	U	21.0	U	21.0	U	58.008		P
Lead	64.0	U	64.0	U	64.0	U	64.0	U	64.000	U	P
Magnesium	5.0	U	5.0	U	5.0	U	5.0	U	114.105		P
' nganese	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
. ıver	6.6		21.8		27.0		31.7		6.000	U	P
Sodium	28.0	U	28.0	U	100.1		53.4		699.000		P
Zinc	8.1		5.0		3.0	U	4.6		14.025		P

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

V23S

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19AR_
Matrix: WATER Level (low/med): LOW
% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	6761.1950		1543.7350		5000.00	104.3		P
Barium	75-125	4874.5350		30.0000	U	5000.00	97.5		P
Cadmium	75-125	4653.2750		40.0000	U	5000.00	93.1		P
Calcium	75-125	7272.5350		2593.1700		5000.00	93.6		P
Chromium	75-125	4865.0400		55.0000	U	5000.00	97.3		P
Iron	75-125	5316.1400		244.8400		5000.00	101.4		P
Lead	75-125	4796.8900		320.0000	U	5000.00	95.9		P
Magnesium	75-125	4798.5050		107.4350		5000.00	93.8		P
Manganese	75-125	4767.9450		15.0000	U	5000.00	95.4		P
Silver	75-125	5036.9250		77.7750		5000.00	99.2		P
Sodium		2118978.6400		2263215.7400		5000.00	-2884.7		P
Zinc	75-125	4943.2750		70.9950		5000.00	97.4		P

Comments:
NO_CONTROL_LIMITS_IF_SAMPLE_>_4X_SPIKE_ADDED

U.S. EPA - CLP

WHC-SD-WM-DP-053 REV 0

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

V23S2

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19AR_
Matrix: WATER Level (low/med): LOW
% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	6732.8800		1543.7350		5000.00	103.8		P
Barium	75-125	5005.6900		30.0000	U	5000.00	100.1		P
Cadmium	75-125	4839.1400		40.0000	U	5000.00	96.8		P
Calcium	75-125	7069.2950		2593.1700		5000.00	89.5		P
Chromium	75-125	5021.4750		55.0000	U	5000.00	100.4		P
Iron	75-125	5195.6000		244.8400		5000.00	99.0		P
Lead	75-125	4822.0800		320.0000	U	5000.00	96.4		P
Magnesium	75-125	4922.3050		107.4350		5000.00	96.3		P
Manganese	75-125	4923.3300		15.0000	U	5000.00	98.5		P
Silver	75-125	4975.7550		77.7750		5000.00	98.0		P
[illegible]ium		2150139.3450		2263215.7400		5000.00	-2261.5		P
[illegible]c	75-125	5040.6100		70.9950		5000.00	99.4		P

Comments:
NO_CONTROL_LIMITS_IF_SAMPLE_>_4X_SPIKE_ADDED

U.S. EPA - CLP

WHC-SD-WM-DP-053 REV 0

6
DUPLICATES

EPA SAMPLE NO.

V23D

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19AR_

Matrix (soil/water): 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		1543.7350		1292.0750		17.7		P
Barium		30.0000	U	30.0000	U			P
Cadmium		40.0000	U	40.0000	U			P
Calcium		2593.1700		1895.8850		31.1	*	P
Chromium		55.0000	U	55.0000	U			P
Iron		244.8400		177.6650		31.8	*	P
Lead		320.0000	U	320.0000	U			P
Magnesium		107.4350		97.8650		9.3		P
Manganese		15.0000	U	15.0000	U			P
Silver		77.7750		71.0100		9.1		P
Sodium		2263215.7400		2194277.3450		3.1		P
Zinc		70.9950		63.3250		11.4		P

7

LABORATORY CONTROL SAMPLE

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19AR_

Solid LCS Source: _____

Aqueous LCS Source: SST4_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	5000.0	5486.46	109.7						
Barium	5000.0	4501.88	90.0						
Cadmium	5000.0	4309.24	86.2						
Calcium	5000.0	5951.98	119.0						
Chromium	5000.0	4524.18	90.5						
Iron	5000.0	4690.86	93.8						
Lead	5000.0	4389.66	87.8						
Magnesium	5000.0	4550.29	91.0						
Manganese	5000.0	4451.80	89.0						
Silver	5000.0	4436.48	88.7						
Sodium	5000.0	10802.73	216.1						
[illegible]	5000.0	4517.07	90.3						

U.S. EPA - CLP

9

ICP SERIAL DILUTION

EPA SAMPLE NO.

V23L

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V19AR_

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

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	308.75		301.14		2.5		P
Barium	6.00	U	30.00	U			P
Cadmium	8.00	U	40.00	U			P
Calcium	518.63		537.66		3.7		P
Chromium	11.00	U	55.00	U			P
Iron	48.97		105.00	U	100.0		P
Lead	64.00	U	320.00	U			P
Magnesium	21.49		25.00	U	100.0		P
Manganese	3.00	U	15.00	U			P
Silver	15.56		30.00	U	100.0		P
Sodium	452643.15		464252.08		2.6		P
Zinc	14.20		82.62		481.8		P

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10

Instrument Detection Limits (Quarterly)

Lab Name: WHCPAL Contract:

Lab Code: Case No.: 107AP SAS No.: SDG No.: V19AR

ICP ID Number: ICP-1 Date: 11/08/93

Flame AA ID Number :

Furnace AA ID Number :

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.22			38.0	P
Barium	493.41			6.0	P
Cadmium	226.50			8.0	P
Calcium	393.37			19.0	P
Chromium	267.72			11.0	P
Iron	259.94			21.0	P
Lead	220.35			64.0	P
Magnesium	279.55			5.0	P
Manganese	257.61			3.0	P
Silver	328.07			6.0	P
Sodium	589.89			28.0	P
Zinc	213.86			3.0	P

Comments:

11A
ICP Interelement Correction Factors (Annually)

Lab Name: WHCPAL Contract:

Lab Code: Case No.: 107AP SAS No.: SDG No.: V19AR

ICP ID Number: ICP-1 Date: 01/29/93

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	___
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	
Barium	493.41	0.0000000	0.0000000	0.0000000	0.0000000	
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	
Calcium	393.37	0.0000000	0.0000000	0.0000000	0.0000000	
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	
Iron	259.94	0.0000000	0.0000000	0.0000000	0.0000000	
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	
Magnesium	279.55	0.0000000	0.0000000	0.0000000	0.0000000	
Manganese	257.61	0.0000000	0.0007007	0.0000000	0.0000000	
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	
Sodium	589.89	0.0000000	0.0000000	0.0000000	0.0000000	
Zinc	213.86	0.0000000	0.0000000	0.0000000	0.0000000	

Comments:

12

ICP Linear Ranges (Quarterly)

Lab Name: WHCPAL Contract:

Lab Code: Case No.: 107AP SAS No.: SDG No.: V19AR

ICP ID Number: ICP-1 Date: 09/29/93

Analyte	Integ. Time (sec.)	Concentration (ug/L)	M
Aluminum	5.00	300000.0	P
Barium	5.00	10000.0	P
Cadmium	5.00	10000.0	P
Calcium	5.00	10000.0	P
Chromium	5.00	300000.0	P
Iron	5.00	50000.0	P
Lead	5.00	10000.0	P
Magnesium	5.00	10000.0	P
Manganese	5.00	10000.0	P
Silver	5.00	50000.0	P
Sodium	5.00	1000000.0	P
Zinc	5.00	100000.0	P

Comments:

13

WHC-SD-WM-DP-053 REV 0

PREPARATION LOG

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.:_107AP SAS No.: _____ SDG No.:V19AR_

Method: P_

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCS	11/19/93		25
PB	11/19/93		25
V23	11/19/93		25
V23D	11/19/93		25
V23S	11/19/93		25
V23S2	11/19/93		25

U.S. EPA - CLP

14
ANALYSIS RUN LOG

WHC-SD-WM-DP-053 REV 0

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.: 107AP_ SAS No.: _____ SDG No.:V19AR_

Instrument ID Number: ICP-1_____ Method: P_

Start Date: 11/29/93 End Date: 11/29/93

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	BA	CD	CA	CR	FE	PB	MG	MN	AG	NA	ZN												
ICV	1.00	1343		X	X	X	X	X	X	X	X	X	X	X	X												
ICB	1.00	1345		X	X	X	X	X	X	X	X	X	X	X	X												
ICSA	1.00	1348																									
RINSE	1.00	1353																									
PB	1.00	1357		X	X	X	X	X	X	X	X	X	X	X	X												
LCS	1.00	1401		X	X	X	X	X	X	X	X	X	X	X	X												
V23L	5.00	1405		X	X	X	X	X	X	X	X	X	X	X	X												
V23DL	5.00	1409																									
V23A	5.00	1413																									
[illegible]1	1.00	1417		X	X	X	X	X	X	X	X	X	X	X	X												
[illegible]1	1.00	1420		X	X	X	X	X	X	X	X	X	X	X	X												
V23S	1.00	1425		X	X	X	X	X	X	X	X	X	X	X	X												
V23S2	1.00	1428		X	X	X	X	X	X	X	X	X	X	X	X												
V23	1.00	1432		X	X	X	X	X	X	X	X	X	X	X	X												
V23D	1.00	1435		X	X	X	X	X	X	X	X	X	X	X	X												
CCV2	1.00	1439		X	X	X	X	X	X	X	X	X	X	X	X												
CCB2	1.00	1442		X	X	X	X	X	X	X	X	X	X	X	X												
ICSA	1.00	1447																									
RINSE	1.00	1449																									
CCV3	1.00	1452		X	X	X	X	X	X	X	X	X	X	X	X												
CCB3	1.00	1454		X	X	X	X	X	X	X	X	X	X	X	X												

FORM XIV - IN ILM02.1

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-053 REV 0

Lab Segment Serial No. V19-23 RERUN	Customer ID: 107-AP-B
Analysis: ICP	Sample Prep: ACID DIGEST

Instrument:	UB 39939	Procedure/ Rev:	LA-505-151 / 1.0
Technologist:	B. GOECKE	Date:	11-29-93
Starting Time:	13:00	Temperature	NA
Ending Time:	15:00	Chemist:	B. WELS

Comments:

	Description	Lab ID		Description	Lab ID
1	107-AP DIG STD	V19-8550	11		
2	107-AP DIG BLK	V20-8650	12		
3	107-AP SAM	V23-8750	13		
4	107-AP DUP	V23-8850	14		
5	107-AP DIG SPK	V23-8950	15		
6	107-AP DUP DIG SPK	V23-8050	16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
ICV (SSTY)	31NIOB DIRECT			DIRECT

752

A-6000-881 (03/92)

INDUCTIVELY COUPLED PLASMA ANALYSIS - ACID DIGESTION

RERUN #1 FOR ICP

Serial No	Sample Point	Date	Time Issued	Priority
V 19.-8550	107-AP	8- 2-93	15:14	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	N1L17	0

Sample Size	Customer ID
? 5mL in 25mL 30N10A SST4 @ 5ppm	STD

Remarks, Calculations, Results:
1st STD Digested STD

Undigested - Direct
SST-4 31N10B

COMPLETED 11/29/93
SEE WARD'S PACKAGE

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
Hrs	Hrs	Hrs	Hrs	Hrs
				[signature]

Date	Time Completed	Lab Unit Mgr	
11-29-93	15:00	11-30-93 Brian Wels	11-29-93

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 20.-8650	107-AP	8- 2-93	15:14	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
? 25mL Direct	BLK

Remarks, Calculations, Results:
REAGENT BLANK

COMPLETED 11/29/93
SEE WARD'S PACKAGE

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
Hrs	Hrs	Hrs	Hrs	Hrs
				[signature]

Date	Time Completed	Lab Unit Mgr	
11-29-93	15:00	11-30-93 Brian Wels	11-29-93

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

INDUCTIVELY COUPLED PLASMA ANALYSIS - ACID DIGESTION

Serial No	Sample Point	Date	Time Issued	Priority
V 23.-8750	107-AP	8- 3-93	8:30	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
? 5 mL in 25 mL, - 1 mL - 4 mL	107-AP-B

Remarks, Calculations, Results

COMPLETED 11/29/93
SEE WARD'S PACKAGE

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
Hrs	Hrs	Hrs	Hrs	Hrs
			[signature]	
Date	Time Completed	Lab Unit Mgr 11-30-93		
11-22-93	15:00	Brian Wiebe	11-29-93	

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 23.-8850	107-AP	8- 3-93	8:30	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
? 5 mL in 25 mL, - 1 mL - 4 mL	107-AP-B

Remarks, Calculations, Results

DUPLICATE SAMPLE

COMPLETED 11/29/93
SEE WARD'S PACKAGE

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
Hrs	Hrs	Hrs	Hrs	Hrs
			[signature]	
Date	Time Completed	Lab Unit Mgr 11-30-93		
11-22-93	15:00	Brian Wiebe	11-29-93	

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

INDUCTIVELY COUPLED PLASMA ANALYSIS - ACID DIGESTION

Serial No	Sample Point	Date	Time Issued	Priority
V 23.-8050	107-AP	8- 3-93	8:31	26

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	N1L17	0

Sample Size	Customer ID
? 5mL in 25mL	107-AP-B

Remarks, Calculations, Results

SPIKE SAMPLE
SPIKE ID 30W.OA
SPIKE VOLUME 5mL

COMPLETED 11/29/93
SEE WARD'S PACKAGE

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
Hrs	Hrs	Hrs	Hrs	Hrs
			[signature]	

Date	Time Completed	Lab Unit Mgr 11-30-93	
11-29-93	15:00	Brian Wells	11-29-93

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 23.-8050	107-AP	8- 3-93	8:31	26

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	N1L17	0

Sample Size	Customer ID
? 5mL in 25mL	107-AP-B

Remarks, Calculations, Results

SAMPLE SPIKE
DUPLICATE

SPIKE ID 30W.OA
SPIKE VOL 5mL

COMPLETED 11/29/93
SEE WARD'S PACKAGE

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
Hrs	Hrs	Hrs	Hrs	Hrs
				[signature]

Date	Time Completed	Lab Unit Mgr 11-30-93	
11-29-93	15:00	Brian Wells	11-29-93

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

Identity 1: WP-284 Identity 2: WP-284 1:39 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	2.860	0.179	-45.842	367.222	132.212	44.003	5.426	-2.081
S.D.	3.233	0.102	34.715	4.515	7.645	1.763	0.319	0.619
% R.S.D.	113.048	56.695	75.727	1.229	5.782	4.006	5.873	29.730

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	12.047	21.412	7.618	25.488	28.012	1.214	-2.834	335.637
S.D.	0.580	7.133	11.499	3.348	0.158	2.885	3.578	78.354
% R.S.D.	4.811	33.311	150.937	13.135	0.564	237.705	126.248	23.345

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	52.422	-35.507	30.096	14.600	180.185	0.000	3.895	68.388
S.D.	15.455	14.868	0.226	9.521	3.424	0.185	14.963	6.629
% R.S.D.	29.482	41.872	0.751	65.212	1.900	3920935.687	384.170	9.694

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-5.353	48.489	3.770	18.932	2.579	9.427	35.854	56.590
S.D.	2.074	5.327	0.452	7.917	0.837	2.150	1.826	26.389
% R.S.D.	38.736	10.986	11.996	41.818	32.469	22.806	5.094	46.631

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	11.078	-11.736	140.084	29.585	80.754
S.D.	0.424	14.789	0.737	0.313	29.555
% R.S.D.	3.827	126.016	0.526	1.059	36.599

11-29-93
V 19-23 RERUN
107-AP-13

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 756 TO 777.

Identity 1: ICV Identity 2: Quality Control 1:42 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
(ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	5079.636	5049.336	4978.343	4693.182	4866.547	5166.323	5215.870	5057.236
S.D.	6.146	4.569	57.401	8.217	10.837	5.037	7.436	9.596
% R.S.D.	0.121	0.090	1.153	0.175	0.223	0.097	0.143	0.190

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5233.875	5097.733	5064.528	5061.380	5100.020	5182.662	5185.875	-253.373
S.D.	9.284	7.281	6.952	9.351	5.569	6.624	24.335	30.158
% R.S.D.	0.177	0.143	0.137	0.185	0.109	0.128	0.469	11.903

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	5035.214	5031.871	5123.902	5148.430	5024.711	4997.509	4962.252	5042.136
S.D.	23.777	2.478	6.091	77.932	28.130	4.874	0.612	3.442
% R.S.D.	0.472	0.049	0.119	1.514	0.560	0.098	0.012	0.068

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	5089.423	4696.439	5092.714	5092.474	4970.064	5121.372	5010.859	5162.150
S.D.	5.011	58.381	5.745	44.783	6.398	13.491	1.668	51.883
% R.S.D.	0.098	1.243	0.113	0.879	0.129	0.263	0.033	1.005

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	5058.683	4828.471	5197.543	5261.456	4863.236
S.D.	1.921	134.289	5.817	8.695	27.229
% R.S.D.	0.038	2.781	0.112	0.165	0.560

Identity 1: ICB Identity 2: Quality Control 1:45 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	2.970	3.505	-51.289	-2.371	11.035	-0.326	5.704	1.939
S.D.	1.711	0.123	27.573	1.409	2.541	1.643	0.752	0.404
% R.S.D.	57.600	3.520	53.761	59.417	23.024	503.190	13.187	20.849

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	8.138	1.972	13.741	9.166	21.947	0.703	-17.842	207.305
S.D.	0.705	2.433	2.559	3.021	0.088	2.431	35.841	17.098
% R.S.D.	8.667	123.344	18.624	32.962	0.402	345.639	200.882	8.248

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	19.503	-14.858	4.222	41.609	105.748	3.149	-7.967	-2.069
S.D.	6.741	13.647	0.209	6.233	22.216	0.185	1.835	4.294
% R.S.D.	34.566	91.854	4.949	14.980	21.009	5.882	23.032	207.599

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4.642	95.197	6.609	-0.814	5.116	2.922	18.523	41.699
S.D.	0.776	12.443	0.899	15.553	0.209	0.412	4.935	26.389
% R.S.D.	16.715	13.070	13.604	1911.157	4.091	14.095	26.640	63.283

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1.091	-11.736	7.238	3.619	64.552
S.D.	0.359	1.849	0.279	0.271	8.564
% R.S.D.	32.882	15.752	3.849	7.500	13.266

Identity 1: icsa-i Identity 2: icsa 1:48 PM November 29, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

r ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	11.673	8.544	-52.355	66.146	247168.608	-2.285	7.860	0.627
S.D.	1.944	0.199	21.178	1.280	793.786	1.444	0.843	0.471
% R.S.D.	16.656	2.334	40.450	1.935	0.321	63.181	10.727	75.103

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	39.603	2.549	31.574	94209.898	183015.552	17.996	-494.605	213.886
S.D.	0.171	1.274	2.624	136.074	280.465	3.224	29.543	79.179
% R.S.D.	0.433	49.970	8.309	0.144	0.153	17.915	5.973	37.019

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-81.253	-22088.308	4.909	151.724	336.807	190279.571	-98.279	99676.286
S.D.	11.546	12.716	0.274	25.950	8.340	119.112	3.481	334.129
% R.S.D.	14.210	0.058	5.576	17.103	2.476	0.063	3.542	0.335

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	1.498	107.279	-20.136	-168.119	2.860	20.524	-82.323	-21.585
S.D.	2.566	19.814	1.185	1.771	0.608	1.623	3.748	50.048
% R.S.D.	171.303	18.470	5.885	1.053	21.263	7.907	4.552	231.863

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	30.721	-65.101	6.756	3.619	10.209
S.D.	1.231	54.558	1.004	0.271	18.143
% R.S.D.	4.006	83.805	14.868	7.500	177.715

Identity 1: xxx Identity 2: rinse 1:53 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	2.535	0.179	-48.317	1.482	18.030	-1.763	-1.806	-0.570
S.D.	1.065	0.102	23.867	4.764	4.426	2.094	0.209	0.857
% R.S.D.	42.017	56.695	49.396	321.471	24.548	118.808	11.549	150.250

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	1.088	-0.065	-1.608	8.664	22.306	1.220	37.935	39.487
S.D.	0.113	1.500	2.584	6.614	1.848	2.614	23.113	9.872
% R.S.D.	10.414	2312.646	160.711	76.345	8.285	214.348	60.928	25.000

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	20.268	-1.642	0.068	56.153	-15.077	22.537	-9.130	-0.578
S.D.	6.293	8.702	0.208	14.394	10.810	1.855	10.016	5.144
% R.S.D.	31.049	529.955	307.448	25.634	71.695	8.233	109.711	889.211

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-1.008	19.537	1.236	2.497	0.887	0.436	-0.108	-81.147
S.D.	2.220	22.646	1.369	6.617	0.735	1.297	2.404	46.495
% R.S.D.	220.305	115.918	110.706	264.928	82.892	297.466	2225.424	57.298

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-2.708	-19.207	3.378	0.452	2.915
S.D.	0.260	19.476	1.474	0.415	31.221
% R.S.D.	9.609	101.403	43.635	91.651	1071.072

Identity 1: V20 dig blk 107ap Identity 2: direct 1:57 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
C ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	3.102	0.448	-31.214	282.658	180.281	-5.484	1.810	-0.513
S.D.	0.848	0.066	22.023	1.837	24.404	1.666	0.525	0.342
% R.S.D.	27.337	14.846	70.555	0.650	13.537	30.375	29.011	66.667

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	14.025	0.920	10.577	58.008	310.462	-0.167	34.510	138.203
S.D.	0.669	1.696	4.543	13.944	31.129	0.788	12.392	43.030
% R.S.D.	4.772	184.230	42.956	24.038	10.027	470.793	35.910	31.135

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	28.651	-31.377	1.259	22.911	0.202	114.105	-9.269	699.000
S.D.	13.096	7.570	0.131	12.466	5.484	29.816	3.234	16.255
% R.S.D.	45.710	24.126	10.434	54.411	2716.248	26.130	34.889	2.325

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-0.680	27.986	1.982	15.033	2.256	1.948	337.798	26.809
S.D.	1.286	20.045	0.435	8.648	0.571	1.606	0.952	9.672
% R.S.D.	189.046	71.624	21.932	57.529	25.310	82.456	0.282	36.076

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.832	-37.351	-0.803	0.452	17.712
S.D.	0.383	40.670	1.950	0.415	24.760
% R.S.D.	20.904	108.885	242.688	91.651	139.794

Identity 1: V19 dig std 107ap Identity 2: 5ml in 25ml 2:00 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	896.442	923.043	796.453	5631.509	1097.293	898.920	927.796	910.234
S.D.	7.012	6.422	12.041	34.223	5.834	4.943	5.097	4.355
% R.S.D.	0.782	0.696	1.512	0.608	0.532	0.550	0.549	0.478

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	903.414	889.378	964.422	938.172	1190.395	904.835	938.924	75.683
S.D.	5.291	6.553	7.032	7.186	4.669	1.041	33.458	39.896
% R.S.D.	0.586	0.737	0.729	0.766	0.392	0.115	3.563	52.715

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	940.115	852.420	900.377	874.740	859.992	910.058	867.881	2160.546
S.D.	7.264	12.472	6.051	14.394	8.099	4.380	11.407	12.842
% R.S.D.	0.773	1.463	0.672	1.646	0.942	0.481	1.314	0.594

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	888.069	833.129	887.296	877.931	876.009	861.848	1699.822	942.571
S.D.	6.812	37.207	5.096	26.394	6.081	4.528	21.161	40.266
% R.S.D.	0.767	4.466	0.574	3.006	0.694	0.525	1.245	4.272

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	890.361	783.403	911.907	914.245	782.113
S.D.	5.113	16.116	6.071	5.891	41.512
% R.S.D.	0.574	2.057	0.666	0.644	5.308

Identity 1: V23 sam dil 107ap Identity 2: 5ml in 25ml-1ml-4ml 2:04 PM November 29, 1993

Task name : TWC93

WHC-SD-WM-DP-053 REV 0

Sample Weight : 1.0000 Solution Volume : 1.00

Or ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	5.783	0.358	-24.196	1925.310	60.227	-4.113	-1.806	-1.939
S.D.	3.934	0.197	6.898	1.587	5.021	3.049	0.834	0.550
% R.S.D.	68.029	54.981	28.508	0.082	8.338	74.129	46.196	28.364

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	16.524	2.331	9.161	5.273	107.532	-1.118	-11.788	269.826
S.D.	0.343	5.080	2.651	4.333	0.324	2.839	37.786	72.765
% R.S.D.	2.074	217.909	28.934	82.168	0.302	253.789	320.554	26.967

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	66.399	-32.203	1.484	887.206	30.991	3.952	-13.828	92850.415
S.D.	20.966	27.852	0.442	15.686	10.386	0.283	7.984	885.946
% R.S.D.	31.576	86.487	29.752	1.768	33.514	7.160	57.737	0.954

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	3.094	70.486	3.773	25.843	2.176	-1.416	1.679	3278.509
S.D.	1.618	13.729	1.736	35.243	0.939	0.686	2.149	30.754
% R.S.D.	52.279	19.478	46.004	136.371	43.141	48.462	127.999	0.938

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-2.229	-20.274	2.252	-0.181	60.468
S.D.	0.259	59.931	0.965	0.271	15.741
% R.S.D.	11.612	295.601	42.844	150.003	26.032

Identity 1: V23 dup dil 107ap Identity 2: 5ml in 25ml-1ml-4ml 2:08 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	1.548	0.281	-36.926	1804.969	48.774	-5.223	-1.598	-2.281
S.D.	0.647	0.059	8.685	4.383	5.353	1.689	0.552	0.346
% R.S.D.	41.803	20.830	23.520	0.243	10.974	32.331	34.545	15.155

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	2.573	6.139	9.155	7.785	85.582	0.703	-9.498	207.305
S.D.	0.928	0.846	7.015	2.470	0.235	1.540	18.069	51.295
% R.S.D.	36.066	13.784	76.626	31.729	0.274	218.969	190.244	24.744

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	25.858	-24.769	0.782	783.324	19.233	3.334	-8.454	88732.583
S.D.	8.729	19.247	0.478	18.699	4.423	0.185	4.950	542.176
% R.S.D.	33.759	77.706	61.077	2.387	22.999	5.556	58.549	0.611

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-4.374	34.849	3.326	-3.649	0.806	-3.829	-1.841	3133.327
S.D.	0.368	35.697	1.319	12.742	0.488	0.910	0.338	43.373
% R.S.D.	8.408	102.434	39.657	349.154	60.578	23.779	18.370	1.384

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-2.273	-46.957	0.644	0.090	46.877
S.D.	0.546	65.801	1.551	0.271	11.995
% R.S.D.	24.018	140.132	240.842	299.986	25.588

Identity 1: V23 post spk 107ap Identity 2: 1ml sample - 4ml 2:12 PM November 29, 1993

Task name : TWC93

WHC-SD-WM-DP-053 REV 0

Sample Weight : 1.0000 Solution Volume : 1.00

O ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	995.268	991.947	940.514	2973.374	1014.123	994.367	1033.913	995.025
S.D.	2.733	4.333	6.313	2.799	6.028	4.257	3.443	9.633
% R.S.D.	0.275	0.437	0.671	0.094	0.594	0.428	0.333	0.968

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	1007.479	1001.012	996.007	1000.072	1116.041	1005.363	1105.444	42.777
S.D.	3.456	2.557	10.540	4.858	5.017	3.797	26.422	132.565
% R.S.D.	0.343	0.255	1.058	0.486	0.450	0.378	2.390	309.896

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	988.384	973.013	1007.288	1880.314	994.632	974.458	952.725	95299.784
S.D.	23.433	12.390	3.990	47.057	26.368	2.884	14.613	993.079
% R.S.D.	2.371	1.273	0.396	2.503	2.651	0.296	1.534	1.042

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	992.765	892.720	909.664	967.479	972.560	982.567	979.111	4317.118
S.D.	8.344	33.006	5.157	8.411	2.811	5.140	3.059	3.224
% R.S.D.	0.841	3.697	0.567	0.869	0.289	0.523	0.312	0.075

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	985.951	881.595	1017.733	1020.462	973.265
S.D.	3.289	95.002	0.737	3.803	29.979
% R.S.D.	0.334	10.776	0.072	0.373	3.080

Identity 1: CCV Identity 2: Quality Control 2:16 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4897.531	4856.846	4871.981	4536.178	4710.993	4902.242	5098.070	4999.045
S.D.	13.858	6.631	18.223	8.947	20.969	8.270	8.792	2.365
% R.S.D.	0.283	0.137	0.374	0.197	0.445	0.169	0.172	0.047

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5137.478	4878.260	4906.071	4878.316	4955.595	4937.751	5252.972	-335.637
S.D.	6.362	16.876	32.324	19.487	11.742	20.257	80.597	39.487
% R.S.D.	0.124	0.346	0.659	0.399	0.237	0.410	1.534	11.765

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4741.937	4903.018	4952.835	4772.378	4727.024	4763.372	4764.296	4990.529
S.D.	11.455	9.912	8.541	10.796	9.121	8.062	41.880	8.043
% R.S.D.	0.242	0.202	0.172	0.226	0.193	0.169	0.879	0.161

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4817.675	4506.077	4889.668	4912.898	4762.904	4852.937	4922.795	5020.691
S.D.	9.049	31.902	8.579	38.595	8.515	14.129	16.429	35.900
% R.S.D.	0.188	0.708	0.175	0.786	0.179	0.291	0.334	0.715

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4873.630	4705.732	5009.855	4974.471	4684.760
S.D.	16.798	77.201	13.836	9.367	22.825
% R.S.D.	0.345	1.641	0.276	0.188	0.487

Identity 1: CCB Identity 2: Quality Control 2:20 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
(ak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	3.669	1.266	-42.639	-4.421	-10.333	-1.959	-0.068	-0.884
S.D.	3.064	0.123	16.461	3.103	6.359	1.274	0.120	0.907
% R.S.D.	83.522	9.741	38.605	70.184	61.542	65.064	177.411	102.569

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5.022	-2.324	6.122	2.009	19.277	-1.490	-14.169	75.683
S.D.	0.409	5.338	4.568	4.166	0.177	4.282	17.164	69.336
% R.S.D.	8.139	229.668	74.616	207.382	0.919	287.339	121.143	91.614

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	27.936	-24.769	1.670	54.075	23.736	1.235	-9.011	-0.920
S.D.	9.456	22.484	0.355	16.491	3.565	0.107	7.646	1.236
% R.S.D.	33.850	90.774	21.231	30.496	15.021	8.660	84.850	134.456

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4.719	45.799	21.828	-18.595	2.458	4.253	0.434	-62.534
S.D.	1.447	27.637	1.288	13.325	0.436	0.243	2.045	29.547
% R.S.D.	30.664	60.345	5.899	71.662	17.728	5.711	471.567	47.250

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.090	-120.600	2.091	1.990	-42.707
S.D.	0.289	8.058	1.474	0.271	48.026
% R.S.D.	26.465	6.682	70.479	13.636	112.455

Identity 1: V23 dig spk 107ap Identity 2: 5ml in 25ml 2:24 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	971.876	999.097	916.456	13923.132	1352.239	960.223	1011.382	977.092
S.D.	2.332	1.000	27.215	26.292	10.966	6.172	1.389	4.471
% R.S.D.	0.240	0.100	2.970	0.189	0.811	0.643	0.137	0.458

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	988.655	945.729	1035.789	1063.228	1454.507	973.008	1015.100	69.102
S.D.	1.280	2.926	4.579	14.373	1.470	0.686	6.969	45.238
% R.S.D.	0.129	0.309	0.442	1.352	0.101	0.071	0.687	65.465

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	990.340	919.324	974.907	5117.265	1027.336	959.701	941.953	423795.728
S.D.	12.746	3.785	1.162	71.971	14.296	1.157	11.394	1711.822
% R.S.D.	1.287	0.412	0.119	1.406	1.392	0.121	1.210	0.404

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	956.166	849.262	1007.385	959.378	945.492	930.655	1082.286	15840.459
S.D.	2.170	4.545	1.755	22.903	1.674	3.861	4.622	97.359
% R.S.D.	0.227	0.535	0.174	2.387	0.177	0.415	0.427	0.615

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	953.589	928.556	984.602	985.991	942.968
S.D.	3.126	47.167	1.447	2.073	27.219
% R.S.D.	0.328	5.080	0.147	0.210	2.887

Identity 1: V23 dup digspk 107ap Identity 2: 5ml in 25ml 2:28 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	994.981	1025.255	950.202	12809.777	1346.576	985.554	1034.678	987.356
S.D.	1.118	1.329	44.454	21.596	5.551	2.887	0.637	5.326
% R.S.D.	0.112	0.130	4.678	0.169	0.412	0.293	0.062	0.539

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	1008.122	986.068	1078.334	1039.120	1413.859	1004.295	1047.962	187.562
S.D.	1.791	7.067	7.035	10.254	1.608	3.397	34.122	51.295
% R.S.D.	0.178	0.717	0.652	0.987	0.114	0.338	3.256	27.348

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	1021.978	959.797	1001.138	5177.517	1059.608	984.461	941.607	430027.870
S.D.	15.450	6.236	1.314	12.466	5.917	1.660	15.845	2166.522
% R.S.D.	1.512	0.650	0.131	0.241	0.558	0.169	1.683	0.504

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	975.694	913.563	995.151	964.416	972.681	967.828	1260.473	16218.304
S.D.	2.559	19.234	1.420	23.840	1.108	2.262	6.951	40.395
% R.S.D.	0.262	2.105	0.143	2.472	0.114	0.234	0.551	0.249

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	984.666	945.633	1016.124	1013.315	1002.228
S.D.	1.655	12.122	1.950	1.695	25.997
% R.S.D.	0.168	1.282	0.192	0.167	2.594

Identity 1: V23 sam 107ap Identity 2: 5ml in 25ml 2:32 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	0.002	4.157	-44.262	9640.359	308.747	-0.979	2.296	0.428
S.D.	0.882	0.123	22.045	13.959	3.008	1.197	0.637	0.226
% R.S.D.	38769.654	2.967	49.804	0.145	0.974	122.202	27.753	52.915

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	14.199	0.564	10.681	48.968	518.634	1.314	-10.877	85.554
S.D.	0.535	4.548	9.142	7.546	0.620	6.579	19.434	30.158
% R.S.D.	3.769	805.717	85.591	15.410	0.120	500.839	178.675	35.251

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	38.364	-50.375	3.922	4336.075	96.188	21.487	-6.639	452643.149
S.D.	7.939	6.556	0.338	27.169	5.817	0.370	7.486	1979.881
% R.S.D.	20.693	13.014	8.627	0.627	6.047	1.724	112.769	0.437

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Tl (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	1.795	52.102	15.555	-19.402	5.519	2.391	23.831	16095.458
S.D.	1.740	13.085	0.505	26.941	0.140	0.452	0.522	61.254
% R.S.D.	96.939	25.115	3.250	138.856	2.528	18.894	2.192	0.381

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-0.004	83.254	4.826	1.719	-0.088
S.D.	0.187	45.168	1.393	0.271	16.254
% R.S.D.	4644.978	54.254	28.864	15.789	18370.429

Identity 1: V23 dup 107ap Identity 2: 5ml in 25ml 2:35 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
C ak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	2.968	4.835	-27.048	9200.595	258.415	-2.154	0.975	0.257
S.D.	2.338	1.679	34.698	20.603	13.724	2.947	1.823	2.000
% R.S.D.	78.753	34.725	128.282	0.224	5.311	136.767	186.903	779.599

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	12.665	9.306	6.165	35.533	379.177	5.717	-33.273	26.324
S.D.	1.094	3.805	4.503	7.537	2.051	2.237	27.716	20.550
% R.S.D.	8.638	40.883	73.039	21.210	0.541	39.132	83.298	78.062

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	58.621	-69.372	4.627	4132.467	85.532	19.573	0.738	438855.470
S.D.	3.220	5.723	1.830	35.986	1.327	2.628	5.543	3216.248
% R.S.D.	5.493	8.249	39.555	0.871	1.552	13.428	751.502	0.733

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.789	-27.911	14.202	-27.001	6.325	3.314	20.635	15656.190
S.D.	2.145	10.841	2.181	15.447	1.108	2.270	4.439	111.539
% R.S.D.	76.911	38.841	15.359	57.209	17.511	68.496	21.511	0.712

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.572	-22.409	5.147	2.533	47.973
S.D.	1.718	3.202	0.965	1.780	22.526
% R.S.D.	300.200	14.289	18.748	70.258	46.955

Identity 1: CCV Identity 2: Quality Control 2:38 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	5011.094	4962.627	5049.591	4617.320	4793.766	5003.043	5199.598	5045.774
S.D.	5.006	0.607	24.861	4.985	13.557	7.095	6.578	13.857
% R.S.D.	0.100	0.012	0.492	0.108	0.283	0.142	0.127	0.275

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5209.757	4998.883	5022.907	4962.942	5070.680	5057.326	5414.886	-253.373
S.D.	3.452	3.441	9.443	14.920	5.018	11.458	27.524	34.668
% R.S.D.	0.066	0.069	0.188	0.301	0.099	0.227	0.508	13.683

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4834.214	5014.525	5062.763	4820.164	4792.262	4865.683	4850.163	5238.388
S.D.	6.752	9.912	2.494	40.072	47.890	1.403	23.739	12.907
% R.S.D.	0.140	0.198	0.049	0.831	0.999	0.029	0.489	0.246

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4916.614	4463.140	4895.199	5000.700	4867.914	4986.271	5022.720	5147.260
S.D.	12.788	76.739	6.554	6.282	2.375	5.392	5.629	31.090
% R.S.D.	0.260	1.719	0.134	0.126	0.049	0.108	0.112	0.604

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4987.574	4896.779	5128.869	5102.764	4783.592
S.D.	7.166	77.201	9.666	1.339	24.678
% R.S.D.	0.144	1.577	0.188	0.026	0.516

Identity 1: CCB Identity 2: Quality Control 2:41 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
ak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	3.952	1.701	-44.895	4.895	-7.057	2.807	0.628	0.000
S.D.	1.526	0.044	19.690	2.435	9.795	1.595	1.325	0.226
% R.S.D.	38.617	2.605	43.859	49.740	138.796	56.822	211.139	38045037.158

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	2.573	6.136	10.621	3.516	19.676	8.256	15.115	138.203
S.D.	0.281	4.019	4.583	3.847	0.266	0.795	7.205	43.030
% R.S.D.	10.921	65.506	43.146	109.439	1.352	9.632	47.668	31.135

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	25.830	-0.816	2.397	18.755	25.700	1.235	-4.413	100.058
S.D.	3.203	23.638	0.155	12.975	9.893	0.214	3.874	5.220
% R.S.D.	12.401	2896.493	6.460	69.180	38.495	17.320	87.796	5.217

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Tl (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.421	46.207	27.035	-53.211	3.465	1.354	-0.108	-62.534
S.D.	0.915	12.590	0.874	21.695	0.767	0.839	0.988	58.030
% R.S.D.	37.811	27.247	3.231	40.771	22.150	61.989	914.727	92.797

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Ti (ppb)
Mean	-0.911	-68.303	2.413	1.267	50.366
S.D.	0.548	32.705	2.657	0.415	32.100
% R.S.D.	60.178	47.883	110.121	32.733	63.735

Identity 1: icsa-f Identity 2: icsa-f 2:45 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	9.976	7.022	-27.179	59.497	243954.266	-1.959	3.896	0.171
S.D.	1.527	0.044	11.273	6.582	859.914	2.057	0.869	0.760
% R.S.D.	15.308	0.631	41.477	11.062	0.352	105.040	22.294	444.408

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	36.857	-0.198	27.015	90043.372	177119.155	11.863	-498.020	105.298
S.D.	0.343	2.478	6.954	582.514	652.553	2.660	15.119	67.195
% R.S.D.	0.930	1250.346	25.742	0.647	0.368	22.425	3.036	63.814

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-109.882	-21691.012	2.621	130.947	12.535	183790.429	-107.655	99696.975
S.D.	12.581	10.014	0.150	15.686	31.555	754.332	10.884	290.084
% R.S.D.	11.450	0.046	5.735	11.979	251.732	0.410	10.110	0.291

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.365	44.288	-7.620	-145.538	0.846	21.010	-93.860	6.334
S.D.	1.327	4.073	1.115	8.552	0.620	1.869	2.978	17.950
% R.S.D.	363.805	9.196	14.633	5.876	73.258	8.895	3.173	283.369

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	29.704	77.917	2.574	3.348	-110.771
S.D.	0.176	21.795	1.004	0.271	15.262
% R.S.D.	0.593	27.972	39.021	8.108	13.778

Identity 1: xxx Identity 2: rinse 2:49 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
(ak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	3.383	0.090	-38.462	5.567	26.549	-0.392	-1.945	-1.711
S.D.	0.242	0.160	31.279	4.264	6.269	1.755	0.241	0.171
% R.S.D.	7.155	178.429	81.324	76.600	23.612	448.144	12.382	10.000

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	0.297	-2.815	0.085	3.892	24.990	-6.667	-36.952	102.007
S.D.	0.281	1.587	6.982	2.451	2.315	4.847	3.788	31.733
% R.S.D.	94.628	56.381	8187.541	62.965	9.265	72.697	10.252	31.109

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	26.561	-10.728	0.434	0.057	-2.845	25.007	-1.922	94.804
S.D.	2.099	17.346	0.065	20.036	3.776	2.779	9.408	3.629
% R.S.D.	7.904	161.687	15.013	35421.179	132.759	11.111	489.493	3.828

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.062	51.144	12.535	24.504	1.370	-1.766	-7.799	39.838
S.D.	1.058	29.316	0.597	9.107	0.320	1.085	3.546	37.180
% R.S.D.	51.302	57.320	4.764	37.166	23.335	61.473	45.470	93.327

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-2.321	-9.601	0.966	1.086	68.937
S.D.	0.781	16.638	1.004	0.157	15.210
% R.S.D.	33.651	173.287	104.012	14.434	22.064

Identity 1: CCV Identity 2: Quality Control 2:51 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	5058.049	5017.180	4954.597	4670.794	4835.853	5136.748	5202.379	5017.862
S.D.	17.914	16.903	17.564	15.058	15.761	24.545	14.922	9.314
% R.S.D.	0.354	0.337	0.354	0.322	0.326	0.478	0.287	0.186

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5290.001	5080.806	5049.068	5046.815	5091.265	5156.315	5290.355	-368.542
S.D.	19.352	21.938	12.038	30.560	16.488	12.233	19.754	106.474
% R.S.D.	0.366	0.432	0.238	0.606	0.324	0.237	0.373	28.891

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4940.085	5021.133	5097.082	4982.219	4920.243	4968.365	4949.236	5115.913
S.D.	9.593	14.306	15.982	125.950	49.993	15.573	32.094	1.957
% R.S.D.	0.194	0.285	0.314	2.528	1.016	0.313	0.648	0.038

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	5062.713	4608.948	4915.127	5060.679	4941.062	5107.477	5003.602	4979.742
S.D.	18.765	83.103	8.396	21.146	16.021	20.977	14.700	34.872
% R.S.D.	0.371	1.803	0.171	0.418	0.324	0.411	0.294	0.700

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	5061.681	4809.260	5180.978	5223.095	4781.947
S.D.	14.966	79.275	13.658	16.233	38.607
% R.S.D.	0.296	1.648	0.264	0.311	0.807

Identity 1: CCB Identity 2: Quality Control 2:54 PM November 29, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
(ak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4.661	2.187	-65.572	2.612	1.564	-6.202	1.323	1.254
S.D.	3.528	0.193	1.467	3.178	10.050	3.285	1.460	0.300
% R.S.D.	75.691	8.830	2.238	121.698	642.371	52.967	110.389	23.945

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4.552	1.904	9.135	3.892	23.590	2.183	-0.723	157.947
S.D.	0.371	1.526	2.670	9.245	0.387	0.686	17.324	64.733
% R.S.D.	8.152	80.183	29.229	237.507	1.641	31.403	2395.073	40.984

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	74.751	18.181	3.341	76.929	20.863	3.705	-4.997	53.431
S.D.	13.749	12.472	0.570	30.746	6.487	0.185	0.073	3.279
% R.S.D.	18.393	68.598	17.054	39.967	31.092	5.000	1.453	6.137

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	1.705	60.894	31.670	11.725	3.062	2.634	6.662	17.502
S.D.	1.217	29.199	1.198	20.581	0.725	0.892	3.006	17.059
% R.S.D.	71.359	47.950	3.782	175.540	23.680	33.859	45.126	97.468

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.193	77.917	4.504	1.900	84.566
S.D.	0.767	20.585	1.474	0.157	45.702
% R.S.D.	397.335	26.419	32.728	8.248	54.043

11-29-93
V19-23 REVIEW
107-HP-B

P.O. Box 1970 Richland, WA 99352

V25A
CASE NARRATIVE - ICP

WHCPAL LABORATORIES

WHCPAL/CUSTOMER SAMPLE NOS:	V26	107-AP-C
	V27	107-AP-D
	V28	107-AP-E

INORGANIC ANALYSIS

The data evaluation for this project will follow the guidelines specified in "Technical Project Plan for the 222-S Laboratory in Support of the 242-A Evaporator Waste Analysis Plan, WHC-SD-WM-EV-060, Revision 2," (WHC-SD-WM-TPP-048, Rev.0). Contained in this report is the evaluation of the data generated by Westinghouse Hanford Company - Processing and Analytical Laboratories (WHC-PAL), 222-S Laboratory. Information will be organized by quality control parameter. No computer-readable data will be submitted on floppy diskette as mentioned in the comment on the following cover page.

INITIAL AND CONTINUING CALIBRATION VERIFICATION
All instrument calibration requirements were within control limits set by the Laboratory Management Control System.

INITIAL AND CONTINUING CALIBRATION BLANKS - (REAGENT BLANK)
All ICB and CCB analytical measurements were 0±IDL (Instrument Detection Limit) with the exception of Aluminum in the ICB, CCB-1 and CCB-2, Cadmium in CCB-2, Chromium in the ICB, Iron and Zinc in all calibration blanks, Lead in CCB-1, Silver and Sodium in CCB-1, CCB-2 and CCB-3. Values reported for Aluminum, Cadmium, Chromium, Lead, Sodium and Zinc are within expected variances resulting from minor temporal instability of the instrument.

PREPARATION BLANK
Contamination is indicated for Aluminum, Calcium, Magnesium and Zinc. Contamination is judged to be present when the blank analyte concentrations are greater than 20% of the average sample concentration. This criterion applies only when the sample concentration is greater than 10 times the IDL.

DUPLICATE ANALYSES
Duplicate precision failures were noted as follows:

For V26: Calcium (124.3%), Lead (200.0%), Magnesium (97.4%), Manganese (200.0%) and Zinc (168.3%).

For V27: Aluminum (38.3%), Barium (200.0%), Manganese (200.0%), Silver (30.5%) and Zinc (59.0%).

For V28: Aluminum (40.4%), Barium (35.0%), Calcium (167.6%), Iron (200.0%), Magnesium (163.8%), Manganese (200.0%), and Zinc (177.4%).

Failures for Barium, Iron, Lead, Silver and Manganese are attributed to the low level of these analytes in the sample. Failures for Aluminum may be influenced by the contamination reported for the preparation blank. No acceptance criteria apply to the duplicate analysis.

LABORATORY CONTROL SAMPLE
Failures were noted for Calcium and Silver. The failure for Calcium may be influenced by the contamination reported for the preparation blank. The low recovery for Silver may be attributed to matrix effects of the digestion process.

SERIAL DILUTION
Serial dilution failures were noted for Calcium in V26 and V27 and Magnesium in V27.

COMMENTS
Instrument Detection Limits, Interelement Correction Factors and Linear Ranges are reported with V21.

ABBREVIATIONS
* = Duplicate failure. E = Serial dilution failure. N = Spike failure. NR = Not required. P = ICP method used. U = less than IDL.

Brian Wels
11-30-93
Brian Wels
Senior Scientist, WHCPAL

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A

SOW No.: ILM02

EPA Sample No.	Lab Sample ID
V26	V26
V26D	V26D
V27	V27
V27D	V27D
V28	V28
V28D	V28D

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the 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: Thomas Bushman Name: TH BUSHMAN

Date: 12/8/93 Title: Mgr. Inorganic Chem.

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

V26

Lab Name: WHC_PAL Contract: _____
Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A
Matrix (soil/water): WATER Lab Sample ID: V26
Level (low/med): LOW Date Received: 08/03/93
% 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	1150			P
7440-39-3	Barium	18.6			P
7440-43-9	Cadmium	20.0	U		P
7440-70-2	Calcium	4600		E*	P
7440-47-3	Chromium	30.0	U		P
7439-89-6	Iron	55.0	U		P
7439-92-1	Lead	232		*	P
7439-95-4	Magnesium	468		*	P
7439-96-5	Manganese	15.0	U	*	P
7440-22-4	Silver	50.9			P
7440-23-5	Sodium	2310000			P
7440-66-6	Zinc	75.6		*	P

Color Before: BROWN Clarity Before: OPAQUE Texture: _____
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

C ents:
RESULTS=_(RAW_DATA)(FINAL_VOLUME)/(SAMPLE_WT._OR_INITIAL_VOLUME)

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

V27

Lab Name: WHC_PAL Contract: _____
Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A
Matrix (soil/water): WATER Lab Sample ID: V27
Level (low/med): LOW Date Received: 08/03/93
% 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	1290		*	P
7440-39-3	Barium	15.8		*	P
7440-43-9	Cadmium	20.0	U		P
7440-70-2	Calcium	10400		E	P
7440-47-3	Chromium	30.0	U		P
7439-89-6	Iron	55.0	U		P
7439-92-1	Lead	190	U		P
7439-95-4	Magnesium	1460		E	P
7439-96-5	Manganese	15.0	U	*	P
7440-22-4	Silver	50.0		*	P
7440-23-5	Sodium	2450000			P
7440-66-6	Zinc	234		*	P

Color Before: BROWN Clarity Before: OPAQUE Texture: _____
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
RESULTS= (RAW_DATA)(FINAL_VOLUME)/(SAMPLE_WT. OR INITIAL_VOLUME)

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

V28

Lab Name: WHC_PAL Contract: _____
Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A
Matrix (soil/water): WATER Lab Sample ID: V28
Level (low/med): LOW Date Received: 08/03/93
% 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	1260		*	P
7440-39-3	Barium	52.4		*	P
7440-43-9	Cadmium	20.0	U		P
7440-70-2	Calcium	113000		*	P
7440-47-3	Chromium	30.0	U		P
7439-89-6	Iron	399		*	P
7439-92-1	Lead	200			P
7439-95-4	Magnesium	6900		*	P
7439-96-5	Manganese	189		*	P
7440-22-4	Silver	51.8			P
7440-23-5	Sodium	2340000			P
7440-66-6	Zinc	5020		*	P

Color Before: BROWN Clarity Before: OPAQUE Texture: _____
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

C ents:
RESULTS=_(RAW_DATA)(FINAL_VOLUME)/(SAMPLE_WT._OR_INITIAL_VOLUME)

1

U.S. EPA - CLP

WHC-SD-WM-DP-053 REV 0

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A__

Initial Calibration Source: PLASMACHEM__

Continuing Calibration Source: PLASMACHEM__

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	5000.0	4885.11	97.7	5000.0	4963.98	99.3	4953.01	99.1	P
Barium	5000.0	5002.64	100.1	5000.0	5113.03	102.3	5118.88	102.4	P
Cadmium	5000.0	4892.17	97.8	5000.0	5076.22	101.5	4995.57	99.9	P
Calcium	5000.0	5265.09	105.3	5000.0	5399.57	108.0	5349.40	107.0	P
Chromium	5000.0	4979.99	99.6	5000.0	5135.29	102.7	5051.24	101.0	P
Iron	5000.0	5029.32	100.6	5000.0	5156.06	103.1	5095.00	101.9	P
Lead	5000.0	4917.94	98.4	5000.0	4979.35	99.6	4991.81	99.8	P
Magnesium	5000.0	4898.15	98.0	5000.0	5040.59	100.8	4997.66	100.0	P
Manganese	5000.0	4910.24	98.2	5000.0	5050.17	101.0	5011.03	100.2	P
Silver	5000.0	4943.03	98.9	5000.0	5010.34	100.2	4933.82	98.7	P
Sodium	5000.0	5068.96	101.4	5000.0	5149.81	103.0	5181.24	103.6	P
Zinc	5000.0	4941.06	98.8	5000.0	5088.44	101.8	5094.94	101.9	P

(1) Control Limits: Mercury 80-120; Other Metals ~~90-110;~~ Cyanide 85-115

BW 12-9-93

FORM II (PART 1) - IN ILM02.1

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A__

Initial Calibration Source: PLASMACHEM__

Continuing Calibration Source: PLASMACHEM__

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				5000.0	4977.98	99.6			P
Barium				5000.0	5148.01	103.0			P
Cadmium				5000.0	5028.50	100.6			P
Calcium				5000.0	5409.21	108.2			P
Chromium				5000.0	5051.55	101.0			P
Iron				5000.0	5083.93	101.7			P
Lead				5000.0	4988.71	99.8			P
Magnesium				5000.0	5020.18	100.4			P
ganese				5000.0	5014.20	100.3			P
ver				5000.0	5057.53	101.2			P
Sodium				5000.0	5186.80	103.7			P
Zinc				5000.0	5126.31	102.5			P

(1) Control Limits: Mercury 80-120; Other Metals ~~90-110;~~ Cyanide 85-115

BW 12-9-93

FORM II (PART 1) - IN ILM02.1

3
BLANKS

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A__

Preparation Blank Matrix (soil/water): WATER

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	24.1		31.7		38.3		22.0	U	153.790		P
Barium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Cadmium	4.0	U	4.0	U	4.5		4.0	U	4.000	U	P
Calcium	8.0	U	8.0	U	8.0	U	8.0	U	4311.615		P
Chromium	-7.4		6.0	U	6.0	U	6.0	U	6.000	U	P
Iron	-106.5		-105.2		-105.8		-111.5		-35.682		P
Lead	38.0	U	48.9		38.0	U	38.0	U	38.000	U	P
Magnesium	3.0	U	3.0	U	3.0	U	3.0	U	281.774		P
Manganese	3.0	U	3.0	U	3.0	U	3.0	U	8.433		P
Silver	6.0	U	11.8		77.2		9.0		6.520		P
Sodium	19.0	U	23.7		32.8		30.0		614.582		P
Zinc	-4.5		-4.5		-3.7		-4.5		175.877		P

6
DUPLICATES

EPA SAMPLE NO.

V26D

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A

Matrix (soil/water): 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		1151.3150		1046.8950		9.5		P
Barium		18.5650		20.6450		10.6		P
Cadmium		20.0000	U	20.0000	U			P
Calcium		4596.1150		19692.9700		124.3	*	P
Chromium		30.0000	U	30.0000	U			P
Iron		55.0000	U	55.0000	U			P
Lead		231.9000		190.0000	U	200.0	*	P
Magnesium		467.8600		1356.8250		97.4	*	P
Manganese		15.0000	U	35.1800		200.0	*	P
Silver		50.9150		60.2300		16.8		P
Sodium		2311826.9200		2319745.0950		0.3		P
Zinc		75.6050		876.9050		168.3	*	P

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

V27D

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A

Matrix (soil/water): 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		1294.2050		877.9200		38.3	*	P
Barium		15.7500		15.0000	U	200.0	*	P
Cadmium		20.0000	U	20.0000	U			P
Calcium		10442.8250		12171.9750		15.3		P
Chromium		30.0000	U	30.0000	U			P
Iron		55.0000	U	55.0000	U			P
Lead		190.0000	U	190.0000	U			P
Magnesium		1456.8050		1662.9450		13.2		P
Manganese		15.0000	U	15.8300		200.0	*	P
Silver		50.0500		36.7900		30.5	*	P
Sodium		2446161.9500		2427442.8750		0.8		P
Zinc		234.3750		430.4950		59.0	*	P

U.S. EPA - CLP

WHC-SD-WM-DP-053 REV 0

6
DUPLICATES

EPA SAMPLE NO.

V28D

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A

Matrix (soil/water): 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		1256.4450		834.5450		40.4	*	P
Barium		52.3800		36.7800		35.0	*	P
Cadmium		20.0000	U	20.0000	U			P
Calcium		112984.7950		9970.9900		167.6	*	P
Chromium		30.0000	U	30.0000	U			P
Iron		399.3850		55.0000	U	200.0	*	P
Lead		200.4100		245.0350		20.0		P
Magnesium		6902.3300		687.8200		163.8	*	P
Manganese		188.5050		15.0000	U	200.0	*	P
Silver		51.8500		45.6350		12.8		P
Sodium		2336013.5950		2293567.7500		1.8		P
Zinc		5023.2100		300.6150		177.4	*	P

7

LABORATORY CONTROL SAMPLE

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A__

Solid LCS Source: _____

Aqueous LCS Source: SST1,2,3____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	50000.0	58780.13	117.6						
Barium	100000	97741.58	97.7						
Cadmium	100000	97104.71	97.1						
Calcium	100000	139275.6	139.3						
Chromium	50000.0	49624.83	99.2						
Iron	50000.0	50770.21	101.5						
Lead	100000	98012.47	98.0						
Magnesium	50000.0	53924.15	107.8						
Manganese	50000.0	49112.33	98.2						
Silver	100000	58330.59	58.3						
Sodium	100000	114565.8	114.6						
Zinc	100000	93231.91	93.2						

9

ICP SERIAL DILUTION

EPA SAMPLE NO.

V26L

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A

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

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	230.26		213.44		7.3		P
Barium	3.71		15.00	U	100.0		P
Cadmium	4.00	U	20.00	U			P
Calcium	919.22		1470.26		59.9	E	P
Chromium	6.00	U	30.00	U			P
Iron	11.00	U	55.00	U			P
Lead	46.38		190.00	U	100.0		P
Magnesium	93.57		235.54		151.7		P
Manganese	3.00	U	15.00	U			P
Silver	10.18		30.00	U	100.0		P
Sodium	462365.38		456502.28		1.3		P
Zinc	15.12		414.24		999.9		P

9

ICP SERIAL DILUTION

EPA SAMPLE NO.

V27L

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A

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

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	258.84		308.62		19.2		P
Barium	3.15		15.00	U	100.0		P
Cadmium	4.00	U	20.00	U			P
Calcium	2088.56		2455.05		17.5	E	P
Chromium	6.00	U	30.00	U			P
Iron	11.00	U	55.00	U			P
Lead	38.00	U	190.00	U			P
Magnesium	291.36		409.64		40.6	E	P
Manganese	3.00	U	15.00	U			P
Silver	10.01		30.00	U	100.0		P
Sodium	489232.39		493648.98		0.9		P
Zinc	46.88		27.08		42.2		P

9

ICP SERIAL DILUTION

EPA SAMPLE NO.

V28L

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V25A

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

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	251.29		444.15		76.7		P
Barium	10.48		15.00	U	100.0		P
Cadmium	4.00	U	20.00	U			P
Calcium	22596.96		23257.65		2.9		P
Chromium	6.00	U	30.00	U			P
Iron	79.88		55.00	U	100.0		P
Lead	40.08		190.00	U	100.0		P
Magnesium	1380.47		1516.20		9.8		P
Manganese	37.70		35.18		6.7		P
Silver	10.37		30.00	U	100.0		P
Sodium	467202.72		461948.08		1.1		P
Zinc	1004.64		1002.16		0.2		P

U.S. EPA - CLP

13
PREPARATION LOG

WHC-SD-WM-DP-053 REV 0

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.:_107AP SAS No.: _____ SDG No.:V25A__

Method: P_

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCS	08/16/93		25
PB	08/16/93		25
V26	08/16/93		25
V26D	08/16/93		25
V27	08/16/93		25
V27D	08/16/93		25
V28	08/16/93		25
V28D	08/16/93		25

U.S. EPA - CLP

14
ANALYSIS RUN LOG

WHC-SD-WM-DP-053 REV 0

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.: 107AP_ SAS No.: _____ SDG No.:V25A__

Instrument ID Number: ICP-1_____ Method: P_

Start Date: 09/09/93 End Date: 09/09/93

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	BA	CD	CA	CR	FE	PB	MG	MN	AG	NA	ZN												
ICV	1.00	1321		X	X	X	X	X	X	X	X	X	X	X	X												
ICB	1.00	1322		X	X	X	X	X	X	X	X	X	X	X	X												
ICSA	1.00	1324																									
RINSE	1.00	1326																									
PB	1.00	1328		X	X	X	X	X	X	X	X	X	X	X	X												
LCS	1.00	1331		X	X	X	X	X	X	X	X	X	X	X	X												
V26L	5.00	1335		X	X	X	X	X	X	X	X	X	X	X	X												
V26D	5.00	1337																									
V26A	5.00	1341																									
7L	5.00	1348		X	X	X	X	X	X	X	X	X	X	X	X												
/D	5.00	1351																									
V27A	5.00	1358																									
CCV1	1.00	1401		X	X	X	X	X	X	X	X	X	X	X	X												
CCB1	1.00	1403		X	X	X	X	X	X	X	X	X	X	X	X												
V28L	5.00	1405		X	X	X	X	X	X	X	X	X	X	X	X												
V28D	5.00	1409																									
V28A	5.00	1413																									
V26	1.00	1417		X	X	X	X	X	X	X	X	X	X	X	X												
V26D	1.00	1421		X	X	X	X	X	X	X	X	X	X	X	X												
V27	1.00	1427		X	X	X	X	X	X	X	X	X	X	X	X												
V27D	1.00	1431		X	X	X	X	X	X	X	X	X	X	X	X												
ZZZZZZ	1.00	1435																									
V28	1.00	1440		X	X	X	X	X	X	X	X	X	X	X	X												
V28D	1.00	1444		X	X	X	X	X	X	X	X	X	X	X	X												
CCV2	1.00	1450		X	X	X	X	X	X	X	X	X	X	X	X												
CCB2	1.00	1452		X	X	X	X	X	X	X	X	X	X	X	X												
ICSA	1.00	1454																									
RINSE	1.00	1457																									
CCV3	1.00	1459		X	X	X	X	X	X	X	X	X	X	X	X												
CCB3	1.00	1501		X	X	X	X	X	X	X	X	X	X	X	X												

FORM XIV - IN ILM02.1

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-053 REV 0

Lab Segment Serial No. V24-V28 BATCH #1527	Customer ID: 107-AP
Analysis: ICP	Sample Prep: ~~WATER~~ DIGEST ACID TA 9/9/93

Instrument: WB39939	Procedure/ Rev: LA-505-151/D-0
Technologist: TA FRAZIER	Date: 09/09/93
Starting Time: 13:00PM	Temperature N/A
Ending Time: 15:15PM	Chemist: B. WELS

Comments:

	Description	Lab ID
1	INITIAL UNDIG LMCS STDS	----
2	DIGESTED REAGENT BLANK	V25-8650
3	DIGESTED LMCS STD	V24-8550
4	107-AP SAM 107-AP-C	V26-8750
5	107-AP DUP 107-AP-C	V26-8850
6	107-AP POST SPK 107-AP-C	----
7	107-AP SAM 107-AP-D	V27-8750
8	107-AP DUP 107-AP-D	V27-8850
9	107-AP POST SPK 107-AP-D	----
10	CCV,CCB	----

	Description	Lab ID
11	107-AP SAM 107-AP-E	V28-8750
12	107-AP DUP 107-AP-E	V28-8850
13	CCV,CCB	----
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
ICPSST4 (CCV)	25N10C DIRECT			DIRECT
SPIKE - ICPSST4	25N10C 1ML			5ML

A-6000-881 (03/92)

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 25.-8650	107-AP	8- 3-93	8:36	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
? DIRECT	BLK

Remarks, Calculations, Results:
REAGENT BLANK

COMPLETED 9/9/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
				9/10/93

Date	Time Completed	Lab Unit Mgr
9/9/93	15:15pm	Brian Wels Teresa L. Frazier

54-6800-061 (R 10-83)

Batch 1527

Serial No	Sample Point	Date	Time Issued	Priority
V 24.-8550	107-AP	8- 3-93	8:31	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	N1L17	0

Sample Size	Customer ID
? 2.5 mL Ext 13N10-C 21B49-C 14N10-D in 25mL Digested DF = 10	STD

Remarks, Calculations, Results:
1st STD Digested STD
Undigested - Direct
ICPSST4 25NNC

COMPLETED 9/9/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
				9/10/93

Date	Time Completed	Lab Unit Mgr
9/9/93	15:15pm	Brian Wels Teresa L. Frazier

54-6800-061 (R 10-83)

BEST AVAILABLE COPY

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 26.-8750	107-AP	8- 3-93	8:45	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
DF = 5 ? 5mL in 25mL, -1ml in 5ml	107-AP-C

Remarks, Calculations, Results

COMPLETED 9/9/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs 9/10/93

Date	Time Completed	Lab Unit Mgr	
9/9/93	15:15pm	Brian Wels	Teresa L. Frazier

54-6800-061 (R 10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 26.-8850	107-AP	8- 3-93	8:45	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
DF = 5 ? 5mL in 25mL, -1ml in 5ml	107-AP-C

Remarks, Calculations, Results

DUPLICATE SAMPLE

COMPLETED 9/9/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs 9/10/93

Date	Time Completed	Lab Unit Mgr	
9/9/93	15:15pm	Brian Wels	Teresa L. Frazier

54-6800-061 (R 10-83)

BEST AVAILABLE COPY

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 27.-8750	107-AP	8- 3-93	8:55	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size DF = 5
? 5mL in 25mL, -1ml in 5ml

Customer ID: 107-AP-D

Remarks, Calculations, Results

COMPLETED 9/9/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs
			9/10/93

Date	Time Completed	Lab Unit Mgr	
9/9/93	15:15pm	Brian Wels	Teresa L. Frazier

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 27.-8850	107-AP	8- 3-93	8:55	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size DF = 5
? 5mL in 25mL, -1ml in 5ml

Customer ID: 107-AP-D

Remarks, Calculations, Results

DUPLICATE SAMPLE

COMPLETED 9/9/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs
			9/10/93

Date	Time Completed	Lab Unit Mgr	
9/9/93	15:15pm	Brian Wels	Teresa L. Frazier

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 28.-8750	107-AP	8- 3-93	8:57	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size DF=5
? 5mL in 25mL, 1ml in 5ml

Customer ID: 107-AP-E

Remarks, Calculations, Results

COMPLETED 9/9/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs 9/10/93

Date	Time Completed	Lab Unit Mgr	
9/9/93	15:15pm	Brian Wels	Teresa L. Frazier

54-6800-061 (R 10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 28.-8850	107-AP	8- 3-93	8:57	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size DF = 5
? 5mL in 25mL, 1ml in 5ml

Customer ID: 107-AP-E

Remarks, Calculations, Results
DUPLICATE SAMPLE

COMPLETED 9/9/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs 9/10/93

Date	Time Completed	Lab Unit Mgr	
9/9/93	15:15pm	Brian Wels	Teresa L. Frazier

54-6800-061 (R 10-83)

BEST AVAILABLE COPY

Identity 1: WP-284 Identity 2: WP-284 1:18 PM September 9, 1993
Task name : TWC93
S ? Weight : 1.0000 Solution Volume : 1.00
O. ak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-5.633	0.473	-40.359	386.739	170.897	41.035	9.720	0.655
S.D.	2.713	0.188	16.625	2.403	5.532	3.152	0.760	0.675
% R.S.D.	48.155	39.736	41.193	0.621	3.237	7.682	7.822	102.988

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	3.972	18.368	10.771	-82.228	26.262	7.678	5.051	89.215
S.D.	0.274	2.665	2.344	4.205	0.220	1.229	13.740	26.227
% R.S.D.	6.889	14.510	21.761	5.114	0.838	16.000	272.001	29.397

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-13.100	3.527	29.091	-2.921	10.095	0.176	21.171	126.218
S.D.	3.779	11.226	0.116	20.434	10.905	0.102	7.116	2.470
% R.S.D.	28.848	318.276	0.397	699.475	108.031	57.733	33.613	1.957

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-0.988	-3.164	0.029	63.665	0.235	11.240	38.301	121.467
S.D.	2.872	7.639	0.799	12.922	0.538	0.314	4.045	30.490
% D.	290.691	241.443	2778.572	20.296	228.488	2.796	10.560	25.101

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	12.776	-5.021	126.102	29.848	7.558
S.D.	0.274	24.204	1.297	0.635	20.530
% R.S.D.	2.141	482.018	1.029	2.127	271.645

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 801 TO 821.

Teresa L. Frazier
V24 - V28
Acid Digest
9/9/93

Identity 1: ICV Identity 2: Quality Control 1:20 PM September 9, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4932.430	5128.739	4736.306	5763.580	4885.111	4864.315	4849.719	5040.319
S.D.	12.170	13.824	8.447	13.522	16.250	9.127	15.614	24.700
% R.S.D.	0.247	0.270	0.178	0.235	0.333	0.188	0.322	0.490

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4941.063	4926.127	5268.155	5029.323	5265.091	4979.990	5038.132	-16.521
S.D.	28.064	11.626	2.371	24.446	16.308	15.324	36.985	40.062
% R.S.D.	0.568	0.236	0.045	0.486	0.310	0.308	0.734	242.487

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4831.907	5060.292	5002.643	5502.628	5043.744	4898.148	4950.507	5068.965
S.D.	3.993	8.565	12.996	108.982	60.602	12.001	43.651	32.427
% R.S.D.	0.083	0.169	0.260	1.981	1.202	0.245	0.882	0.640

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4959.807	2851.235	4943.032	4917.942	4818.765	4892.171	4942.744	5007.597
S.D.	18.602	13.265	12.952	14.415	12.926	18.442	16.394	43.640
% R.S.D.	0.375	0.465	0.262	0.293	0.268	0.377	0.332	0.871

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4910.242	4668.222	4784.518	5059.581	4604.333
S.D.	11.370	36.711	12.659	16.293	9.005
% R.S.D.	0.232	0.786	0.265	0.322	0.196

Identity 1: ICB Identity 2: Quality Control 1:22 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
(ak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-2.310	1.629	-2.399	6.389	24.062	3.324	0.377	1.310
S.D.	3.131	0.495	19.634	2.364	20.424	1.542	1.437	0.766
% R.S.D.	135.570	30.410	818.273	37.003	84.879	46.391	381.494	58.459

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-4.536	0.819	10.782	-106.538	-3.022	-7.371	0.031	118.953
S.D.	0.847	1.363	6.194	3.212	0.582	3.071	20.944	78.680
% R.S.D.	18.661	166.440	57.447	3.014	19.254	41.667	67887.144	66.144

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-15.306	-17.853	2.047	-42.247	-12.261	1.529	9.964	6.630
S.D.	23.104	20.204	0.626	18.021	8.243	0.444	6.124	5.470
% R.S.D.	150.945	113.170	30.578	42.657	67.230	29.038	61.456	82.492

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	9.835	-35.316	0.013	29.720	2.641	3.995	10.951	90.246
S.D.	2.626	8.535	1.980	12.490	0.708	1.931	1.212	37.643
% R.S.D.	26.704	24.169	15373.385	42.025	26.810	48.327	11.072	41.712

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1.766	-37.209	0.708	2.186	-4.289
S.D.	0.277	12.195	1.123	0.385	39.776
% R.S.D.	15.683	32.776	158.661	17.625	927.475

Identity 1: ICSA-I Identity 2: ICSA 1:24 PM September 9, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	0.656	0.037	14.424	38.046	17.257	-3.143	0.941	0.905
S.D.	2.579	0.205	17.339	4.769	3.551	2.570	0.543	0.532
% R.S.D.	393.091	550.733	120.207	12.535	20.579	81.793	57.712	58.812

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-4.288	-3.146	12.062	-99.510	17.134	-3.174	29.278	247.819
S.D.	0.305	0.981	3.994	5.997	0.085	2.753	25.630	43.209
% R.S.D.	7.120	31.195	33.112	6.026	0.496	86.738	87.542	17.436

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	16.026	-34.482	2.054	-26.517	24.668	1.000	-3.757	435922.519
S.D.	4.545	11.226	0.236	42.537	10.958	0.102	5.722	1504.626
% R.S.D.	28.362	32.558	11.515	160.416	44.422	10.188	152.310	0.345

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.678	-20.634	1.682	10.478	0.895	1.797	5.450	124.936
S.D.	1.559	4.914	0.295	5.532	0.708	2.099	2.250	7.949
% R.S.D.	58.188	23.814	17.515	52.793	79.119	116.786	41.283	6.362

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.383	-41.232	2.548	0.757	98.490
S.D.	0.209	14.885	1.607	0.252	21.141
% R.S.D.	54.557	36.101	63.090	33.333	21.465

Identity 1: XXX Identity 2: Rinse 1:26 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
O k Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.894	-0.274	-11.225	12.525	15.127	-2.055	0.251	0.343
S.D.	0.446	0.254	12.023	2.080	1.979	0.363	0.326	0.329
% R.S.D.	49.919	92.821	107.115	16.603	13.081	17.647	129.706	95.729

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-6.748	2.333	12.164	-110.571	-7.692	-5.835	-15.190	244.515
S.D.	0.310	4.101	0.030	3.013	0.083	1.536	13.060	28.616
% R.S.D.	4.598	175.772	0.245	2.725	1.084	26.316	85.979	11.703

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	24.039	-15.477	0.798	-85.505	-13.555	-0.294	-9.977	110.155
S.D.	5.775	4.945	0.255	47.190	9.060	0.000	3.893	26.139
% R.S.D.	24.024	31.951	31.926	55.191	66.836	0.000	39.026	23.729

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	1.243	-54.705	-0.260	36.255	1.904	2.309	4.900	159.627
S.D.	2.571	6.509	0.404	4.887	0.682	0.873	1.394	10.407
% R.S.D.	206.795	11.899	155.726	13.479	35.827	37.819	28.442	6.520

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.348	-62.356	0.708	0.757	99.894
S.D.	0.405	50.614	1.123	0.000	26.020
% R.S.D.	116.581	81.170	158.661	0.000	26.048

Identity 1: V25 Dig Blk 107-AP Identity 2: Direct Acid Digest 1:28 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	7.655	5.547	40.314	1949.899	153.790	1.450	10.033	1.997
S.D.	8.982	1.066	42.077	27.036	34.384	4.846	3.776	3.270
% R.S.D.	117.339	19.219	104.375	1.387	22.358	334.090	37.639	163.802

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	175.877	7.859	13.418	-35.682	4311.615	-0.614	25.368	555.115
S.D.	2.113	3.596	8.318	5.234	29.791	4.768	43.708	550.761
% R.S.D.	1.202	45.750	61.990	14.669	0.691	776.213	172.297	99.216

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	72.695	-291.042	2.690	-57.977	26.235	281.775	21.677	614.582
S.D.	105.646	111.026	2.464	29.690	18.095	1.836	5.839	49.034
% R.S.D.	145.328	38.148	91.599	51.210	68.972	0.652	26.935	7.978

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4.485	3.178	6.520	21.229	4.736	3.182	164.055	216.866
S.D.	2.958	49.000	6.285	29.539	3.953	3.620	3.208	107.526
% R.S.D.	65.963	1542.030	96.394	139.146	83.454	113.748	1.955	49.582

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	8.433	40.243	3.256	0.925	200.319
S.D.	0.598	35.747	7.403	0.146	187.353
% R.S.D.	7.086	88.829	227.395	15.746	93.527

Identity 1: V24 Dig Std 2.5-25ml Identity 2: 13N10C,21B48C,14N10D 1:31 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	10004.114	9746.257	9220.897	27184.244	5878.013	9514.271	4736.539	9418.413
S.D.	142.803	96.658	146.807	382.723	92.188	177.585	28.600	26.988
% R.S.D.	1.427	0.992	1.592	1.408	1.568	1.867	0.604	0.287

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	9323.191	5017.696	10098.947	5077.021	13927.561	4962.483	9866.570	9978.853
S.D.	110.273	109.297	131.352	84.353	142.782	108.106	112.401	640.148
% R.S.D.	1.183	2.178	1.301	1.661	1.025	2.178	1.139	6.415

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	9505.014	9203.261	9774.158	10418.297	4847.982	5392.415	4929.565	11456.582
S.D.	236.877	187.849	79.548	491.598	113.612	91.298	85.852	57.963
% R.S.D.	2.492	2.041	0.814	4.719	2.343	1.693	1.742	0.506

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	10004.955	2879.467	5833.059	9801.247	4950.268	9710.471	6343.684	4100.446
S.D.	192.320	101.992	46.299	236.202	66.411	212.691	60.721	122.735
% R.S.D.	1.922	3.542	0.794	2.410	1.342	2.190	0.957	2.993

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4911.233	5137.960	10021.078	10097.637	3496.917
S.D.	79.508	45.398	164.887	160.568	199.687
% R.S.D.	1.619	0.884	1.645	1.590	5.710

-1ml in 5

Identity 1: V26 Sam 107-AP-C Identity 2: 5ml in 25ml Acid Dig 1:34 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-2.056	1.443	-5.371	1225.281	42.688	1.269	0.251	0.156
S.D.	0.894	0.151	19.332	3.947	2.102	2.604	0.326	0.602
% R.S.D.	43.486	10.452	359.949	0.322	4.923	205.206	129.706	385.303

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	82.849	-0.564	16.224	-100.547	294.052	2.764	-23.192	102.432
S.D.	4.580	3.013	4.060	3.404	1.105	2.128	8.667	49.893
% R.S.D.	5.528	533.776	25.024	3.386	0.376	76.980	37.369	48.709

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	1.439	-44.776	1.483	826.844	470.408	47.109	0.728	91300.457
S.D.	16.963	16.629	0.361	41.432	10.880	0.102	8.154	598.888
% R.S.D.	1178.495	37.138	24.311	5.011	2.313	0.216	1119.893	0.656

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	3.791	-14.804	1.518	9.027	0.585	3.433	94.603	3118.710
S.D.	1.119	4.909	1.221	5.520	0.242	1.626	1.604	41.737
% R.S.D.	29.522	33.158	80.461	61.151	41.455	47.359	1.695	1.338

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.505	-59.338	-0.424	1.093	-11.733
S.D.	0.317	57.992	1.365	0.291	15.855
% R.S.D.	62.708	97.732	321.739	26.647	135.127

Identity 1: V26 Dup 107-AP-C Identity 2: 5ml in 25ml Acid Dig 1:37 PM September 9, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.020	2.040	-19.780	1129.653	47.177	2.055	-1.003	0.250
S.D.	1.342	0.078	15.945	10.734	5.711	1.108	1.036	0.301
% R.S.D.	131.578	3.808	80.616	0.950	12.105	53.913	103.306	120.459

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	63.124	4.094	13.456	-92.713	965.031	-2.355	8.872	132.170
S.D.	0.295	2.378	4.662	3.530	1.450	3.030	4.105	63.730
% R.S.D.	0.468	58.083	34.647	3.808	0.150	128.684	46.262	48.218

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	11.619	-110.499	1.315	948.752	532.614	99.512	-6.094	93435.848
S.D.	18.313	5.486	0.373	24.559	5.534	0.102	6.875	206.539
% R.S.D.	157.620	4.965	28.392	2.589	1.039	0.102	112.806	0.221

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.074	-2.667	1.601	17.098	0.662	-0.099	71.152	3285.223
S.D.	2.606	37.599	0.770	3.480	1.015	0.668	0.937	23.464
% R.S.D.	3516.470	1409.576	48.112	20.351	153.263	671.462	1.317	0.714

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1.404	-34.191	-1.698	0.084	32.193
S.D.	0.509	6.282	0.649	0.291	15.751
% R.S.D.	36.227	18.372	38.197	346.340	48.926

9-1-93

V26 P. Spk.

Identity 1: ~~V27~~ ~~Spm~~ 107-AP-D Identity 2: 5ml in 25ml-1ml in 4 1:41 PM September 9, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	989.627	1031.993	910.227	2575.100	1023.897	977.275	978.121	1003.273
S.D.	2.805	2.330	16.883	4.362	10.393	2.722	2.505	3.354
% R.S.D.	0.283	0.226	1.855	0.169	1.015	0.278	0.256	0.334

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	974.807	986.671	1060.618	925.312	1334.339	997.759	1017.227	138.779
S.D.	3.063	5.677	8.037	1.728	3.462	4.475	20.839	26.227
% R.S.D.	0.314	0.575	0.758	0.187	0.259	0.449	2.049	18.898

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	989.270	998.093	1005.233	1935.818	1441.470	1034.055	1003.093	93069.714
S.D.	10.978	7.127	2.608	37.924	19.663	2.869	20.689	265.921
% R.S.D.	1.110	0.714	0.259	1.959	1.364	0.277	2.062	0.286

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	994.625	533.850	638.830	989.763	969.769	977.186	1086.982	4159.419
S.D.	6.790	13.047	7.372	35.487	2.859	6.953	2.240	25.668
% R.S.D.	0.683	2.444	1.154	3.585	0.295	0.711	0.206	0.617

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	984.779	929.426	961.121	1020.139	960.086
S.D.	3.885	26.821	2.364	2.576	36.458
% R.S.D.	0.394	2.886	0.246	0.253	3.797

5AM 9/9/93

Identity 1: V27 Dup 107-AP-D Identity 2: 5ml in 25ml-1ml in ~~1~~ 5 1:44 PM September 9, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

0 k Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.279	1.032	-1.875	1387.563	61.724	-2.659	1.693	1.809
S.D.	2.722	0.108	16.480	9.947	6.957	1.922	0.928	0.849
% R.S.D.	212.893	10.434	878.746	0.717	11.270	72.264	54.797	46.929

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5.416	3.402	12.043	-102.275	491.011	-2.969	37.841	158.604
S.D.	0.385	2.930	10.689	2.610	1.532	4.651	9.002	86.418
% R.S.D.	7.108	86.110	88.761	2.551	0.312	156.660	23.788	54.486

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	30.564	-28.939	1.171	740.328	37.221	81.927	18.244	98729.797
S.D.	15.284	10.712	0.431	31.214	18.976	0.353	5.625	341.810
% R.S.D.	50.007	37.016	36.833	4.216	50.983	0.431	30.831	0.346

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-0.689	-42.565	1.425	10.082	0.391	0.041	159.505	3167.276
S.D.	1.293	5.311	0.296	4.078	0.904	0.974	2.329	36.051
% R.S.D.	187.602	12.477	20.786	40.455	231.533	2375.465	1.460	1.138

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1.104	-24.133	1.133	0.168	89.424
S.D.	0.398	26.821	0.849	0.291	44.100
% R.S.D.	36.086	111.139	74.975	173.188	49.316

Identity 1: V27 Dup 107-AP-D Identity 2: 5ml in 25ml-1ml in 4 1:51 PM September 9, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.890	1.604	-7.717	1256.437	36.131	0.242	3.700	1.591
S.D.	1.359	0.114	17.673	6.148	8.350	3.413	0.287	0.648
% R.S.D.	152.791	7.105	229.010	0.489	23.110	1411.851	7.766	40.750

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	16.452	3.779	5.277	-96.169	593.018	1.024	51.083	204.864
S.D.	0.156	0.289	2.368	2.249	0.837	3.961	15.698	24.947
% R.S.D.	0.950	7.655	44.876	2.338	0.141	386.910	30.729	12.177

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	28.369	-29.731	1.371	838.641	61.808	91.396	-4.614	96552.697
S.D.	4.370	10.712	0.304	41.432	11.167	0.102	4.721	250.176
% R.S.D.	15.403	36.030	22.209	4.940	18.067	0.111	102.324	0.259

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-0.046	1.870	1.689	19.742	1.438	1.195	10.851	3115.241
S.D.	1.661	11.198	0.620	13.189	0.485	1.799	1.282	10.407
% R.S.D.	3638.526	598.777	36.681	66.807	33.698	150.569	11.812	0.334

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1.612	11.073	1.557	1.093	67.352
S.D.	0.357	28.521	1.531	0.385	20.824
% R.S.D.	22.123	257.585	98.310	35.250	30.918

Identity 1: V27 P.Spk 107-AP-D Identity 2: 5ml in 25ml-1ml in 4 1:56 PM September 9, 1993
Task name : TWC93
Samole Weight : 1.0000 Solution Volume : 1.00
ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	987.025	1032.752	942.284	2741.989	1042.331	973.407	980.441	1010.572
S.D.	1.914	2.548	28.352	3.171	7.408	4.920	2.643	2.638
% R.S.D.	0.194	0.247	3.009	0.116	0.711	0.505	0.270	0.261

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	970.451	980.952	1060.654	926.579	1576.958	995.916	1001.553	138.779
S.D.	3.108	10.150	4.027	14.185	4.556	2.222	14.825	55.192
% R.S.D.	0.320	1.035	0.380	1.531	0.289	0.223	1.480	39.770

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	976.880	991.758	1006.421	2010.537	1101.375	1080.518	981.575	99802.277
S.D.	7.060	15.087	2.520	47.679	12.172	2.814	12.337	212.847
% R.S.D.	0.723	1.521	0.250	2.371	1.105	0.260	1.257	0.213

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	987.344	550.315	698.016	996.688	969.071	967.914	1145.784	4117.791
S.D.	7.464	18.387	7.682	28.147	1.522	5.196	2.893	10.832
% R.S.D.	0.756	3.341	1.101	2.824	0.157	0.537	0.253	0.263

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	978.765	1017.942	955.602	1014.254	906.017
S.D.	4.004	63.608	0.735	2.242	7.806
% R.S.D.	0.409	6.249	0.077	0.221	0.862

Identity 1: CCV Identity 2: Quality Control 2:01 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	5065.371	5247.220	4904.006	5870.946	4963.978	5026.700	4944.528	5093.849
S.D.	21.100	31.882	1.609	19.731	36.911	18.503	21.249	36.322
% R.S.D.	0.417	0.608	0.033	0.336	0.744	0.368	0.430	0.713

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5088.436	5081.350	5383.811	5156.058	5399.574	5135.294	5127.088	42.955
S.D.	28.806	26.415	12.033	17.834	23.167	39.135	41.247	58.084
% R.S.D.	0.566	0.520	0.224	0.346	0.429	0.762	0.804	135.218

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4978.064	5132.351	5113.029	4649.268	4885.127	5040.594	5092.312	5149.814
S.D.	28.932	27.737	29.589	120.505	101.366	29.201	51.918	24.697
% R.S.D.	0.581	0.540	0.579	2.592	2.075	0.579	1.020	0.480

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	5101.267	2937.416	5010.340	4979.350	4950.307	5076.220	5029.946	5116.872
S.D.	45.550	32.139	23.449	23.551	29.069	21.190	19.028	16.727
% R.S.D.	0.893	1.094	0.468	0.473	0.587	0.417	0.378	0.327

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	5050.170	4727.568	4922.650	5226.395	4660.202
S.D.	22.631	60.678	25.737	32.957	21.464
% R.S.D.	0.448	1.283	0.523	0.631	0.461

Identity 1: CCB Identity 2: Quality Control 2:03 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	3.246	1.642	18.688	22.031	31.733	4.109	2.759	1.841
S.D.	1.400	0.859	6.522	1.405	2.174	2.043	0.392	0.564
% R.S.D.	43.148	52.339	34.901	6.378	6.851	49.718	14.191	30.646

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-4.514	8.375	13.368	-105.156	-2.453	-1.433	47.405	313.904
S.D.	1.322	0.654	2.312	1.309	0.869	1.546	9.462	66.002
% R.S.D.	29.278	7.805	17.293	1.244	35.436	107.855	19.960	21.026

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	44.383	9.862	2.995	-77.640	14.631	1.764	-3.491	23.744
S.D.	7.004	6.285	0.802	27.245	2.033	0.796	7.270	3.027
% R.S.D.	15.782	63.730	26.787	35.092	13.896	45.092	208.227	12.750

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	6.268	4.209	11.768	48.947	4.581	3.553	9.451	149.220
S.D.	1.979	14.334	0.557	10.075	0.934	1.847	3.035	28.972
% R.S.D.	31.578	340.553	4.731	20.583	20.381	51.969	32.113	19.416

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	2.555	31.190	2.265	1.766	107.652
S.D.	1.150	28.521	0.884	0.757	30.582
% R.S.D.	45.013	91.444	39.025	42.857	28.408

Identity 1: V28 Sam 107-AP-E Identity 2: 5ml in 25ml-1ml in 4 2:05 PM September 9, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-17.790	6.243	-3.709	1050.283	88.830	-0.000	7.023	1.560
S.D.	0.591	0.149	24.238	11.264	5.440	1.542	0.498	0.108
% R.S.D.	3.323	2.390	653.504	1.072	6.125	12893567.479	7.086	6.927

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	200.432	-0.892	4.015	-79.233	4651.530	-1.945	13.626	-865.715
S.D.	0.244	1.180	0.053	3.212	16.255	2.787	23.274	22.893
% R.S.D.	0.122	132.324	1.324	4.053	0.349	143.270	170.800	2.644

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-202.474	-356.765	-2.032	803.248	79.157	303.241	13.513	92389.617
S.D.	8.267	13.919	0.339	18.021	6.092	0.834	9.396	394.335
% R.S.D.	4.083	3.902	16.677	2.244	7.696	0.275	69.535	0.427

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4.004	-31.065	-6.911	15.026	-4.537	0.061	62.052	3005.966
S.D.	1.709	7.894	0.265	21.550	0.356	0.901	2.643	39.286
% R.S.D.	42.692	25.410	3.832	143.418	7.838	1475.680	4.259	1.307

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	7.037	19.119	-9.057	1.177	-322.764
S.D.	0.194	45.398	0.849	0.291	23.852
% R.S.D.	2.753	237.443	9.375	24.743	7.390

Identity 1: V28 Dup 107-AP-E Identity 2: 5ml in 25ml-1ml in 4 2:09 PM September 9, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.635	1.045	-18.684	1034.644	56.535	-0.544	5.769	0.562
S.D.	2.421	0.094	8.189	6.490	4.144	2.775	0.217	0.162
% R.S.D.	381.460	8.988	43.831	0.627	7.329	510.254	3.765	28.858

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	7.718	2.206	6.575	-97.206	459.731	-1.229	72.340	135.474
S.D.	0.334	0.763	6.126	3.212	0.077	4.876	21.998	69.625
% R.S.D.	4.327	34.585	93.162	3.304	0.017	396.864	30.409	51.393

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	9.454	-32.106	1.887	870.101	85.429	42.463	4.122	91963.554
S.D.	17.784	5.486	0.256	54.063	4.514	0.204	6.735	44.950
% R.S.D.	188.104	17.087	13.543	6.213	5.284	0.480	163.422	0.049

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	3.378	-13.070	2.042	38.484	0.662	2.279	62.402	3196.763
S.D.	2.220	5.524	0.948	18.301	0.349	0.381	2.439	28.659
% R.S.D.	65.737	42.264	46.427	47.555	52.741	16.728	3.908	0.896

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.626	28.172	-2.547	0.757	93.624
S.D.	0.395	17.681	1.716	0.252	7.630
% R.S.D.	63.087	62.762	67.367	33.333	8.150

Identity 1: V28 P.Spk 107-AP-E Identity 2: 5ml in 25ml-1ml in 4 2:12 PM September 9, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	1013.310	1063.843	963.461	2491.625	1057.026	986.642	1005.272	1027.854
S.D.	1.945	5.041	14.344	31.117	6.959	2.746	4.250	6.913
% R.S.D.	0.192	0.474	1.489	1.249	0.658	0.278	0.423	0.673

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	1248.090	997.158	1084.860	973.932	5738.183	1009.634	1020.673	72.694
S.D.	9.126	6.888	4.020	7.990	27.550	5.224	9.824	58.084
% R.S.D.	0.731	0.691	0.371	0.820	0.480	0.517	0.962	79.902

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	994.465	610.878	1033.245	1939.751	1107.682	1301.009	995.179	96221.071
S.D.	14.419	14.450	4.904	72.085	17.038	5.471	10.853	529.773
% R.S.D.	1.450	2.365	0.475	3.716	1.538	0.420	1.091	0.551

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	1017.734	567.472	717.379	988.174	989.559	984.733	1067.631	4280.835
S.D.	12.364	22.499	1.333	14.019	3.731	3.838	8.742	27.038
% R.S.D.	1.215	3.965	0.186	1.419	0.377	0.390	0.819	0.632

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1000.729	901.262	979.945	1028.715	922.399
S.D.	2.481	45.297	3.806	3.658	30.533
% R.S.D.	0.248	5.026	0.388	0.356	3.310

Identity 1: V26 Sam 107-AP-C Identity 2: 5ml in 25ml 2:17 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	1.174	2.923	43.030	6254.884	230.263	13.295	4.013	0.842
S.D.	2.367	0.197	22.157	11.653	4.048	1.408	0.752	0.408
% R.S.D.	201.650	6.755	51.493	0.186	1.758	10.592	18.748	48.422

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	15.121	9.638	8.138	-81.537	919.223	-3.378	-21.886	280.862
S.D.	0.244	4.226	4.055	3.926	1.687	1.710	6.169	58.084
% R.S.D.	1.614	43.847	49.832	4.815	0.184	50.616	28.185	20.680

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	41.446	-97.038	3.713	4401.518	2228.484	93.572	-3.448	462365.384
S.D.	5.778	13.227	0.056	29.690	17.944	0.176	7.592	2445.264
% R.S.D.	13.942	13.630	1.500	0.675	0.805	0.189	220.162	0.529

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.675	-35.297	10.183	46.380	3.184	0.252	458.664	15811.893
S.D.	0.796	24.365	0.395	12.750	0.470	1.520	1.517	109.646
% R.S.D.	117.847	69.030	3.875	27.490	14.774	603.645	0.331	0.693

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.699	5.037	-0.141	0.673	61.750
S.D.	0.208	19.634	1.123	0.385	3.165
% R.S.D.	29.741	389.762	795.835	57.281	5.125

Identity 1: V26 Dup 107-AP-C Identity 2: 5ml in 25ml 2:20 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	0.677	5.895	12.773	5651.794	209.379	11.422	4.390	0.406
S.D.	0.593	0.078	9.760	26.567	2.617	0.105	0.564	0.992
% R.S.D.	87.519	1.318	76.406	0.470	1.250	0.916	12.856	244.478

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	175.381	8.114	18.866	-46.282	3938.594	0.614	-0.280	323.817
S.D.	1.119	0.716	2.328	6.336	9.199	1.407	12.804	66.002
% R.S.D.	0.638	8.820	12.338	13.689	0.234	229.128	4576.572	20.383

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	23.917	-348.847	4.129	3886.356	2146.093	271.365	10.330	463949.019
S.D.	11.554	6.285	0.318	142.714	31.804	0.620	9.300	1300.766
% R.S.D.	48.308	1.802	7.692	3.672	1.482	0.228	90.030	0.280

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	5.737	-6.754	12.046	26.520	3.146	0.754	338.560	15863.929
S.D.	1.075	17.928	1.076	5.580	0.586	0.426	4.969	41.628
% R.S.D.	18.743	265.434	8.929	21.041	18.627	56.550	1.468	0.262

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	7.036	-64.367	1.557	0.168	84.561
S.D.	0.232	23.047	1.698	0.291	38.475
% R.S.D.	3.297	35.806	109.065	173.188	45.500

Identity 1: V27 Sam 107-AP-D Identity 2: 5ml in 25ml 2:27 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
Or ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	0.277	3.718	65.449	6986.099	258.841	-1.088	8.277	2.028
S.D.	1.612	0.086	8.442	28.580	4.503	3.911	1.149	0.796
% R.S.D.	582.523	2.317	12.899	0.409	1.740	359.522	13.886	39.250

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	46.875	9.759	10.707	-46.051	2088.565	-3.583	32.972	178.430
S.D.	0.707	1.041	4.702	18.698	5.329	1.279	26.669	114.320
% R.S.D.	1.508	10.664	43.921	40.602	0.255	35.686	80.883	64.070

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	18.137	-166.721	3.150	4224.554	204.247	291.361	8.681	489232.390
S.D.	12.026	4.945	0.167	37.924	1.724	3.380	4.454	1636.332
% R.S.D.	66.306	2.966	5.294	0.898	0.844	1.160	51.308	0.334

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.216	0.392	10.010	14.478	4.736	1.436	754.222	15260.317
S.D.	0.686	10.505	0.913	15.485	0.420	0.303	2.247	81.282
% R.S.D.	316.960	2682.085	9.122	106.957	8.861	21.106	0.298	0.533

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	2.934	-98.567	0.283	0.336	64.328
S.D.	0.504	9.700	1.531	0.291	5.505
% R.S.D.	17.177	9.841	540.117	86.598	8.558

Identity 1: V27 Dup 107-AP-D Identity 2: 5ml in 25ml 2:31 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.756	4.353	-22.466	6462.084	175.584	-2.115	5.644	0.468
S.D.	1.118	0.086	10.490	24.910	5.038	2.936	0.109	0.675
% R.S.D.	147.916	1.979	46.694	0.385	2.869	138.828	1.924	144.167

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	86.099	11.837	13.496	-62.987	2434.395	-2.150	-8.381	26.434
S.D.	0.682	2.363	4.693	1.309	6.178	3.236	13.570	48.899
% R.S.D.	0.792	19.963	34.778	2.078	0.254	150.510	161.923	184.983

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-32.102	-231.653	2.639	4547.022	228.199	332.589	-5.144	485488.576
S.D.	7.020	11.718	0.075	89.330	9.444	0.668	8.894	570.441
% R.S.D.	21.869	5.059	2.837	1.965	4.138	0.201	172.905	0.117

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.172	-71.579	7.358	29.860	2.796	2.108	34.701	15262.052
S.D.	1.395	15.986	0.458	9.902	0.293	1.310	4.181	29.589
% R.S.D.	813.455	22.333	6.220	33.161	10.477	62.151	12.050	0.194

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	3.166	16.102	-2.406	0.589	-47.967
S.D.	0.361	48.124	1.768	0.291	25.290
% R.S.D.	11.412	298.873	73.482	49.486	52.723

Identity 1: zzz Identity 2: zzz 2:35 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.422	19.251	25.566	4046.315	216.695	0.302	19.501	3.775
S.D.	14.391	10.686	35.590	2701.645	70.665	3.187	4.457	4.518
% R.S.D.	3408.982	55.506	139.210	66.768	32.610	1054.745	22.854	119.681

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	720.503	21.679	18.903	22.962	16283.364	-6.040	-16.562	270.949
S.D.	491.106	8.772	2.240	89.018	10907.362	6.099	58.885	727.447
% R.S.D.	68.162	40.464	11.850	387.684	66.985	100.972	355.536	268.481

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	38.212	-1932.550	7.932	3021.198	247.477	992.533	5.392	334636.184
S.D.	171.470	158.012	1.263	1955.747	165.173	668.680	3.373	226001.696
% R.S.D.	448.734	8.176	15.921	64.734	66.743	67.371	62.568	67.537

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.228	10.743	6.648	31.982	2.952	4.336	201.556	11874.543
S.D.	1.995	21.144	5.615	15.590	3.792	0.411	134.274	7626.464
% R.S.D.	89.533	196.810	84.461	48.744	128.489	9.478	66.619	64.225

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	27.089	25.155	-0.141	0.589	51.646
S.D.	17.636	49.980	7.464	0.146	271.221
% R.S.D.	65.104	198.693	5287.534	24.743	525.155

Identity 1: V28 Sam 107-AP-E Identity 2: 5ml in 25ml 2:39 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.905	25.233	10.902	5556.602	251.289	1.088	23.326	0.718
S.D.	1.691	0.233	10.672	13.415	5.139	0.456	0.965	0.108
% R.S.D.	186.749	0.923	97.890	0.241	2.045	41.944	4.138	15.058

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	1004.643	34.821	12.271	79.877	22596.959	4.709	-61.851	109.040
S.D.	2.234	5.506	0.064	4.317	68.321	3.690	28.099	9.913
% R.S.D.	0.222	15.812	0.523	5.405	0.302	78.351	45.430	9.091

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-12.861	-2043.409	10.476	4016.130	305.216	1380.466	-4.570	467202.719
S.D.	7.020	11.226	0.255	130.487	31.532	4.228	12.973	1327.529
% R.S.D.	54.588	0.549	2.434	3.249	10.331	0.306	283.873	0.284

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.268	-11.075	10.370	40.082	2.525	3.784	276.508	16278.478
S.D.	1.148	3.078	0.315	17.990	0.839	0.945	2.029	24.591
% R.S.D.	50.589	27.793	3.036	44.883	33.249	24.960	0.734	0.151

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	37.701	5.037	-0.990	0.168	10.957
S.D.	0.618	29.308	1.123	0.291	4.910
% R.S.D.	1.640	581.823	113.432	173.188	44.815

Identity 1: V28 Dup 107-AP-E Identity 2: 5ml in 25ml 2:44 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.243	3.457	10.879	5286.916	166.909	-6.225	23.264	0.655
S.D.	0.775	0.131	4.089	14.054	3.786	1.632	0.217	0.248
% R.S.D.	318.173	3.790	37.588	0.266	2.269	26.214	0.934	37.786

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	60.123	22.861	16.132	-66.674	1994.198	0.512	16.795	85.911
S.D.	0.808	1.704	4.032	2.395	3.501	0.469	9.980	74.401
% R.S.D.	1.344	7.454	24.996	3.592	0.176	91.651	59.425	86.603

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	2.128	-148.508	7.356	4554.887	340.084	137.564	-21.474	458713.551
S.D.	6.552	13.508	0.270	88.548	24.555	0.270	11.155	2171.856
% R.S.D.	307.976	9.096	3.675	1.944	7.220	0.196	51.944	0.473

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.690	-20.252	9.127	49.007	2.175	3.102	294.959	15752.920
S.D.	1.589	29.034	1.009	8.367	0.202	0.753	4.168	23.464
% R.S.D.	59.067	143.362	11.056	17.073	9.268	24.272	1.413	0.149

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	1.789	-63.361	-1.273	0.757	56.407
S.D.	0.119	23.951	2.414	0.252	10.104
% R.S.D.	6.639	37.801	189.597	33.333	17.913

Identity 1: CCV Identity 2: Quality Control 2:49 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	5098.954	5239.771	4972.874	5852.332	4953.011	4910.849	4990.365	5111.442
S.D.	10.133	16.804	38.465	30.317	20.971	21.771	10.001	18.116
% R.S.D.	0.199	0.321	0.773	0.518	0.423	0.443	0.200	0.354

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5094.936	5042.505	5333.898	5094.995	5349.399	5051.244	5156.461	102.432
S.D.	11.178	1.915	16.375	6.147	12.111	20.578	18.142	46.846
% R.S.D.	0.219	0.038	0.307	0.121	0.226	0.407	0.352	45.734

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4895.956	5192.532	5118.878	5376.787	5039.793	4997.660	5053.549	5181.245
S.D.	26.623	7.257	13.594	93.641	54.888	16.840	4.670	14.680
% R.S.D.	0.544	0.140	0.266	1.742	1.089	0.337	0.092	0.283

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	5016.825	2870.233	4933.821	4991.811	4894.043	4995.566	5067.347	5129.013
S.D.	16.377	22.555	12.934	17.911	15.158	23.799	14.826	28.972
% R.S.D.	0.326	0.786	0.262	0.359	0.310	0.476	0.293	0.565

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	5011.034	4878.447	4925.197	5106.077	4697.365
S.D.	13.463	22.649	8.910	19.070	7.321
% R.S.D.	0.269	0.464	0.181	0.373	0.156

Identity 1: CCB Identity 2: Quality Control 2:51 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
' ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	0.535	2.811	-39.311	9.998	38.256	3.384	4.640	3.369
S.D.	2.159	0.550	17.067	2.041	5.874	1.009	0.889	0.743
% R.S.D.	403.785	19.554	43.414	20.418	15.353	29.827	19.157	22.047

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-3.679	-1.199	16.051	-105.847	-3.223	-0.819	52.634	128.866
S.D.	0.724	0.664	4.049	3.663	0.502	4.475	6.218	90.852
% R.S.D.	19.679	55.407	25.229	3.461	15.576	546.440	11.814	70.501

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-5.867	22.532	2.484	-34.382	-5.937	2.000	-2.016	32.814
S.D.	20.288	20.755	0.567	13.623	5.710	0.529	3.963	3.185
% R.S.D.	345.815	92.115	22.846	39.622	96.165	26.471	196.547	9.705

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	9.132	-4.623	77.244	20.677	2.952	4.527	8.100	60.759
S.D.	0.251	2.661	5.750	18.801	0.409	0.724	0.770	13.767
% R.S.D.	2.753	57.564	7.444	90.928	13.851	16.003	9.503	22.659

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	2.819	-44.250	-1.556	2.438	8.991
S.D.	0.526	39.383	1.069	0.525	65.046
% R.S.D.	18.644	89.001	68.651	21.534	723.484

Identity 1: ICSA-I Identity 2: ICSA 2:54 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	3.237	0.373	24.827	47.116	28.376	-2.659	1.317	0.343
S.D.	1.776	0.270	12.920	3.984	6.325	1.584	0.947	0.677
% R.S.D.	54.857	72.341	52.040	8.455	22.291	59.569	71.882	197.193

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-3.611	6.491	14.827	-106.077	17.812	-6.859	-1.561	300.687
S.D.	0.373	2.457	4.691	3.297	0.146	1.515	23.325	84.307
% R.S.D.	10.327	37.847	31.638	3.108	0.821	22.088	1494.526	28.038

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	52.415	-17.061	2.222	48.202	14.807	1.176	7.990	442548.761
S.D.	19.406	25.178	0.483	36.042	11.504	0.204	1.557	3080.865
% R.S.D.	37.023	147.577	21.756	74.774	77.691	17.320	19.492	0.696

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	6.394	-54.405	36.837	7.794	2.525	2.600	11.101	190.848
S.D.	2.778	27.940	4.664	13.984	0.233	1.902	2.042	20.814
% R.S.D.	43.451	51.357	12.661	179.418	9.222	73.151	18.397	10.906

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-0.197	-37.209	1.699	0.841	109.055
S.D.	0.199	17.159	0.884	0.291	14.980
% R.S.D.	101.005	46.115	52.030	34.640	13.736

Identity 1: xxx Identity 2: Rinse 2:57 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-3.736	0.423	20.321	8.006	31.062	1.209	3.700	0.031
S.D.	2.158	0.075	20.645	2.750	9.617	0.654	0.287	0.301
% R.S.D.	57.769	17.647	101.594	34.347	30.960	54.084	7.766	958.850

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-5.529	1.515	7.977	-100.662	-7.167	-2.867	48.438	181.734
S.D.	0.203	3.781	4.085	4.718	0.143	1.163	18.923	24.947
% R.S.D.	3.673	249.596	51.207	4.687	1.995	40.564	39.067	13.727

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	11.650	21.740	0.588	-42.247	-30.447	-0.118	1.965	83.452
S.D.	7.670	18.554	0.182	13.623	10.397	0.176	6.625	3.925
% R.S.D.	65.834	85.344	30.969	32.246	34.148	150.008	337.201	4.704

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.121	-7.239	12.776	2.615	2.641	2.881	2.750	65.963
S.D.	2.412	16.633	0.317	14.944	0.233	1.098	2.250	5.204
% R.S.D.	1999.288	229.759	2.477	571.383	8.815	38.114	81.811	7.889

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.005	74.442	0.283	0.084	78.204
S.D.	0.418	42.282	1.123	0.291	11.547
% R.S.D.	8278.743	56.799	396.337	346.340	14.766

Identity 1: CCV Identity 2: Quality Control 2:58 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	5162.760	5273.237	5081.212	5876.223	4977.979	4892.658	5014.380	5091.447
S.D.	5.550	13.904	43.224	36.093	20.329	13.400	10.915	39.560
% R.S.D.	0.107	0.264	0.851	0.614	0.408	0.274	0.218	0.777

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5126.306	5054.402	5348.585	5083.934	5409.211	5051.551	5214.066	237.906
S.D.	8.003	19.808	10.263	15.616	10.092	15.250	56.450	219.204
% R.S.D.	0.156	0.392	0.192	0.307	0.187	0.302	1.083	92.139

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4965.904	5274.092	5148.008	4908.815	4867.747	5020.185	5059.624	5186.803
S.D.	24.083	29.191	13.676	187.405	47.403	10.605	33.114	27.514
% R.S.D.	0.485	0.553	0.266	3.818	0.974	0.211	0.654	0.530

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	5029.149	2862.656	5057.532	4988.707	4907.856	5028.502	5075.348	5233.084
S.D.	27.139	20.142	3.368	1.999	7.548	26.886	12.308	78.572
% R.S.D.	0.540	0.704	0.067	0.040	0.154	0.535	0.243	1.501

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	5014.203	4863.359	4970.628	5099.939	4798.695
S.D.	5.108	121.468	2.137	8.581	84.247
% R.S.D.	0.102	2.498	0.043	0.168	1.756

Identity 1: CCB Identity 2: Quality Control 3:01 PM September 9, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.629	1.990	30.434	13.668	16.921	2.478	3.261	1.248
S.D.	2.049	0.224	33.567	2.185	3.757	0.831	0.862	0.270
% R.S.D.	325.601	11.250	110.296	15.986	22.201	33.531	26.435	21.648

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-4.491	-3.780	14.882	-111.492	-3.849	-0.921	-25.473	72.694
S.D.	0.568	1.258	2.318	6.758	0.288	1.710	25.437	101.737
% R.S.D.	12.643	33.269	15.573	6.062	7.481	185.593	99.859	139.953

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	15.987	12.238	2.104	-77.640	6.222	1.235	-11.941	30.021
S.D.	15.801	27.396	0.218	29.690	9.174	0.444	3.566	10.239
% R.S.D.	98.839	223.869	10.355	38.241	147.452	35.951	29.863	34.106

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	9.038	-17.171	9.040	-10.543	2.214	2.409	9.651	59.025
S.D.	1.523	15.490	0.544	7.657	0.409	0.668	1.623	28.659
% R.S.D.	16.846	90.211	6.021	72.629	18.463	27.726	16.813	48.554

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	2.319	-27.150	-0.141	2.270	35.438
S.D.	0.389	34.801	0.849	0.000	48.312
% R.S.D.	16.790	128.177	601.595	0.000	136.329

9/9/93

V29A
CASE NARRATIVE - ICP

WHCPAL LABORATORIES
WHCPAL/CUSTOMER SAMPLE NOS: V31 107-AP-FB

INORGANIC ANALYSIS

The data evaluation for this project will follow the guidelines specified in "Technical Project Plan for the 222-S Laboratory in Support of the 242-A Evaporator Waste Analysis Plan, WHC-SD-WM-EV-060, Revision 2," (WHC-SD-WM-TPP-048, Rev.0). Contained in this report is the evaluation of the data generated by Westinghouse Hanford Company - Processing and Analytical Laboratories (WHC-PAL), 222-S Laboratory. Information will be organized by quality control parameter. No computer-readable data will be submitted on floppy diskette as mentioned in the comment on the following cover page.

INITIAL AND CONTINUING CALIBRATION VERIFICATION
All instrument calibration requirements were within control limits set by the Laboratory Management Control System.

INITIAL AND CONTINUING CALIBRATION BLANKS - (REAGENT BLANK)
All ICB and CCB analytical measurements were 0±IDL (Instrument Detection Limit) with the exception of Lead in the ICB and CCB-2, Silver in CCB-1 and Sodium in the ICB. Values reported for Lead and Sodium are within expected variances resulting from minor temporal instability of the instrument.

PREPARATION BLANK
Contamination is indicated for Calcium, Magnesium and Sodium. Contamination is judged to be present when the blank analyte concentrations are greater than 20% of the average sample concentration. This criterion applies only when the sample concentration is greater than 10 times the IDL.

DUPLICATE ANALYSES
Duplicate precision failures were noted for Aluminum (23.1%), Barium (200.0%), Calcium (192.5%), Iron (102.5%), Magnesium (162.9%), Manganese (200.0%), Silver (200.0%) and Zinc (177.1%). Failures for Aluminum, Barium, Manganese and Silver are attributed to the low level of these analytes in the sample. Failures for Calcium, Iron, Magnesium and Zinc indicate contamination of the duplicate; however, a good correlation with the preparation blank does not exist. No acceptance criteria apply to the duplicate analysis.

LABORATORY CONTROL SAMPLE
Failures were noted for Silver. The low recovery for Silver may be attributed to matrix effects of the digestion process.

SERIAL DILUTION
A serial dilution failure was noted for Calcium.

COMMENTS

Instrument Detection Limits, Interelement Correction Factors and Linear Ranges are reported with V21.

ABBREVIATIONS

* = Duplicate failure. E = Serial dilution failure. N = Spike failure. NR = Not required. P = ICP method used. U = less than IDL.

Brian Wels
11-30-93

Brian Wels
Senior Scientist, WHCPAL

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

V31

Lab Name: WHC_PAL Contract: _____
Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V29A
Matrix (soil/water): WATER Lab Sample ID: V31
Level (low/med): LOW Date Received: 08/03/93
% 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	895		*	P
7440-39-3	Barium	15.0	U	*	P
7440-43-9	Cadmium	20.0	U		P
7440-70-2	Calcium	3530		E*	P
7440-47-3	Chromium	30.0	U		P
7439-89-6	Iron	272		*	P
7439-92-1	Lead	190	U		P
7439-95-4	Magnesium	375		*	P
7439-96-5	Manganese	15.0	U	*	P
7440-22-4	Silver	30.0	U	*	P
7440-23-5	Sodium	5160			P
7440-66-6	Zinc	382		*	P

Color Before: BROWN Clarity Before: OPAQUE Texture: _____
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

C ents:
RESULTS= (RAW_DATA)(FINAL_VOLUME)/(SAMPLE_WT._OR_INITIAL_VOLUME)

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.:V29A__

SOW No.: ILM02

EPA Sample No.	Lab Sample ID
_V31	__V31
_V31D	__V31D

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

I certify that this data package is in compliance with the terms and conditions of the 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: Thomas Bushaw Name: TH BUSHAW

Date: 12/8/93 Title: Mgr Inorganic Chem

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V29A__

Initial Calibration Source: PLASMACHEM__

Continuing Calibration Source: PLASMACHEM__

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	5000.0	4632.34	92.6	5000.0	4561.31	91.2	4577.22	91.5	P
Barium	5000.0	4905.26	98.1	5000.0	4791.62	95.8	4797.22	95.9	P
Cadmium	5000.0	4868.37	97.4	5000.0	4780.77	95.6	4794.02	95.9	P
Calcium	5000.0	5073.48	101.5	5000.0	5002.42	100.0	4987.62	99.8	P
Chromium	5000.0	4937.82	98.8	5000.0	4860.91	97.2	4902.73	98.1	P
Iron	5000.0	4930.88	98.6	5000.0	4881.15	97.6	4882.24	97.6	P
Lead	5000.0	4905.05	98.1	5000.0	4886.23	97.7	4894.27	97.9	P
Magnesium	5000.0	4777.25	95.5	5000.0	4663.26	93.3	4702.54	94.1	P
[illegible]nganese	5000.0	4896.16	97.9	5000.0	4831.55	96.6	4833.45	96.7	P
[illegible]ver	5000.0	4890.52	97.8	5000.0	4617.92	92.4	4821.95	96.4	P
Sodium	5000.0	4934.60	98.7	5000.0	4834.71	96.7	4878.58	97.6	P
Zinc	5000.0	4838.71	96.8	5000.0	4765.42	95.3	4811.03	96.2	P

(1) Control Limits: Mercury 80-120; Other Metals ~~90-110;~~ BW Cyanide 85-115

FORM II (PART 1) - IN 12-9-93 ILM02.1

U.S. EPA - CLP

3
BLANKS

WHC-SD-WM-DP-053 REV 0

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V29A__

Preparation Blank Matrix (soil/water): WATER

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	22.0	U	22.0	U	22.0	U			103.436		P
Barium	3.0	U	3.0	U	3.0	U			3.000	U	P
Cadmium	4.0	U	4.0	U	4.0	U			4.000	U	P
Calcium	8.0	U	8.0	U	8.0	U			401.693		P
Chromium	6.0	U	6.0	U	6.0	U			6.000	U	P
Iron	11.0	U	11.0	U	11.0	U			35.852		P
Lead	-38.5		38.0	U	-49.0				38.000	U	P
Magnesium	3.0	U	3.0	U	3.0	U			39.165		P
Manganese	3.0	U	3.0	U	3.0	U			3.000	U	P
Silver	6.0	U	106.9		6.0	U			6.000	U	P
Sodium	21.2		19.0	U	19.0	U			532.193		P
Zinc	3.0	U	3.0	U	3.0	U			14.391		P

WHC-SD-WM-DP-053 REV 0

6
DUPLICATES

EPA SAMPLE NO.

V31D

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V29A

Matrix (soil/water): 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		894.7050		709.4600		23.1	*	P
Barium		15.0000	U	32.5400		200.0	*	P
Cadmium		20.0000	U	20.0000	U			P
Calcium		3528.8350		184714.7900		192.5	*	P
Chromium		30.0000	U	30.0000	U			P
Iron		272.1650		844.3650		102.5	*	P
Lead		190.0000	U	190.0000	U			P
Magnesium		374.9800		3670.6800		162.9	*	P
Manganese		15.0000	U	234.4500		200.0	*	P
Silver		30.0000	U	33.1450		200.0	*	P
Sodium		5160.0650		4738.6450		8.5		P
Zinc		382.1050		6300.1500		177.1	*	P

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LABORATORY CONTROL SAMPLE

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V29A__

Solid LCS Source: _____

Aqueous LCS Source: SST1,2,3____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	50000.0	54842.77	109.7						
Barium	100000	94255.55	94.3						
Cadmium	100000	91887.01	91.9						
Calcium	100000	111506.6	111.5						
Chromium	50000.0	47466.07	94.9						
Iron	50000.0	47650.69	95.3						
Lead	100000	94726.57	94.7						
Magnesium	50000.0	48123.50	96.2						
Manganese	50000.0	46976.74	94.0						
Silver	100000	54396.53	54.4						
Sodium	100000	112822.4	112.8						
Zinc	100000	90952.17	91.0						

WHC-SD-WM-DP-053 REV 0

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ICP SERIAL DILUTION

EPA SAMPLE NO.

V31L

Lab Name: WHC_PAL Contract: _____

Lab Code: _____ Case No.: 107AP SAS No.: _____ SDG No.: V29A

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

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	178.94		236.29		32.0		P
Barium	3.00	U	15.00	U			P
Cadmium	4.00	U	20.00	U			P
Calcium	705.77		1358.57		92.5	E	P
Chromium	6.00	U	30.00	U			P
Iron	54.43		84.16		54.6		P
Lead	38.00	U	190.00	U			P
Magnesium	75.00		232.56		210.1		P
Manganese	3.00	U	15.00	U			P
Silver	6.00	U	30.00	U			P
Sodium	1032.01		1094.46		6.1		P
Zinc	76.42		114.97		50.4		P

13
PREPARATION LOG

WHC-SD-WM-DP-053 REV 0

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.:_107AP SAS No.: _____ SDG No.:V29A__

Method: P_

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCS	08/16/93		25
PB	08/16/93		25
V31	08/16/93		25
V31D	08/16/93		25

U.S. EPA - CLP

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ANALYSIS RUN LOG **WHC-SD-WM-DP-053 REV 0**

Lab Name: WHC_PAL_____ Contract: _____

Lab Code: _____ Case No.: 107AP_ SAS No.: _____ SDG No.:V29A__

Instrument ID Number: ICP-1_____ Method: P_

Start Date: 09/10/93 End Date: 09/10/93

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	BA	CD	CA	CR	FE	PB	MG	MN	AG	NA	ZN												
ICV	1.00	1236		X	X	X	X	X	X	X	X	X	X	X	X												
ICB	1.00	1238		X	X	X	X	X	X	X	X	X	X	X	X												
ICSA	1.00	1240																									
RINSE	1.00	1242																									
PB	1.00	1244		X	X	X	X	X	X	X	X	X	X	X	X												
LCS	1.00	1247		X	X	X	X	X	X	X	X	X	X	X	X												
V31L	5.00	1251		X	X	X	X	X	X	X	X	X	X	X	X												
V31D	5.00	1254																									
V31A	5.00	1259																									
[illegible]	1.00	1303		X	X	X	X	X	X	X	X	X	X	X	X												
[illegible]D	1.00	1307		X	X	X	X	X	X	X	X	X	X	X	X												
CCV1	1.00	1312		X	X	X	X	X	X	X	X	X	X	X	X												
CCB1	1.00	1315		X	X	X	X	X	X	X	X	X	X	X	X												
ICSA	1.00	1317																									
RINSE	1.00	1319																									
CCV2	1.00	1321		X	X	X	X	X	X	X	X	X	X	X	X												
CCB2	1.00	1323		X	X	X	X	X	X	X	X	X	X	X	X												

FORM XIV - IN ILM02.1

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

WHC-SD-WM-DP-053 REV 0

ANALYTICAL BATCH

Lab Segment Serial No. V29-V31	Customer ID: 107-AP
Analysis: ICP	Sample Prep: ACID DIGEST

Instrument: WB39939	Procedure/ Rev: LA-505-151 D-0 BW 12-8-93
Technologist: TA FRAZIER	Date: 09/10/93
Starting Time: 09:55	Temperature NA
Ending Time: 13:30	Chemist: BR WELS

Comments:

	Description	Lab ID		Description	Lab ID
1	INITIAL UNDIG LMCS STDS	----	11		
2	DIGESTED REAGENT BLANK	V30-8650	12		
3	DIGESTED LMCS STD	V29-8550	13		
4	107-AP SAM 107-AP-FB	V31-8750	14		
5	107-AP DUP 107-AP-FB	V31-8850	15		
6	107-AP POST SPK 107-AP-FB	----	16		
7	CCV, CCB	----	17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
ICPSST	25N10B DIRECT			DIRECT
		843		

WHC-SD-WM-DP-053 REV 0

Batch 1537

Serial No	Sample Point	Date	Time Issued	Priority
V 29.-8550	107-AP	8- 3-93	10:36	25

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	N1L17	0

Sample Size: ? DF = 10 2.5 mL EA. 13N10-C, 21B48-C, 14N10-D in 25 mL

Customer ID: STD

Remarks, Calculations, Results:

1st STD Digested STD

Direct - Undigested

SST4 25N10B

COMPLETED 9/10/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs 9/10/93

Date	Time Completed	Lab Unit Mgr
9/10/93	13:30pm	Brian Wels Teresa L. Frazier

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 30.-8650	107-AP	8- 3-93	10:38	25

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size: ? DIRECT

Customer ID: BLK

Remarks, Calculations, Results:

REAGENT BLANK

COMPLETED 9/10/93
SEE WARD'S PACKAGE

Teresa L. Frazier

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs 9/10/93

Date	Time Completed	Lab Unit Mgr
9/10/93	13:30pm	Brian Wels Teresa L. Frazier

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

WHC-SD-WM-DP-053 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
V 31.-8750	107-AP	8- 3-93	10:40	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
DF = 5 ? 5mL in 25mL	107AP-FB

Remarks, Calculations, Results

COMPLETED 9/10/93
SEE WARD'S PACKAGE

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs 9/10/93

Date	Time Completed	Lab Unit Mgr
9/10/93	13:30pm	Brian Wels

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
V 31.-8850	107-AP	8- 3-93	10:40	25

Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	uG/ML	N1L17	0

Sample Size	Customer ID
DF=5 ? 5mL in 25mL	107AP-FB

Remarks, Calculations, Results

DUPLICATE SAMPLE

COMPLETED 9/10/93
SEE WARD'S PACKAGE

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs 9/10/93

Date	Time Completed	Lab Unit Mgr
9/10/93	13:30pm	Brian Wels

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

Calibration Standard : BLANK 9:55 AM 10/ 9/93
Task name : TWC93
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Ag (KPulses)	Al (KPulses)	As (KPulses)	B (KPulses)	Ba (KPulses)	Be (KPulses)	Bi (KPulses)	Ca (KPulses)
On Peak 1	1.819	8.520	0.789	1.493	3.681	1.132	3.107	0.280
On Peak 2	1.827	8.536	0.776	1.529	3.688	1.133	3.128	0.279
On Peak 3	1.820	8.475	0.789	1.467	3.678	1.133	3.115	0.280
OffPeak1 1		8.249	0.793	1.513		1.133		
OffPeak2 1	1.844				3.679		3.013	0.237
Mean	-0.022	0.261	-0.008	-0.017	0.003	-0.000	0.104	0.043
S.D.	0.004	0.032	0.008	0.031	0.005	0.001	0.011	0.001
% R.S.D.	19.813	12.103	90.067	186.805	153.948	173.205	10.224	1.353

	Cd (KPulses)	Ce (KPulses)	Co (KPulses)	Cr (KPulses)	Cu (KPulses)	Fe (KPulses)	K (KPulses)	La (KPulses)
On Peak 1	4.323	3.846	1.571	1.311	2.076	0.763	2.233	0.324
On Peak 2	4.351	3.858	1.589	1.302	2.084	0.767	2.227	0.324
On Peak 3	4.305	3.833	1.582	1.290	2.079	0.787	2.219	0.321
OffPeak1 1	4.463		1.599	1.307	2.009	0.781		
OffPeak2 1		3.816					2.154	0.319
Mean	-0.137	0.030	-0.018	-0.006	0.071	-0.009	0.072	0.004
S.D.	0.023	0.013	0.009	0.011	0.004	0.013	0.007	0.002
% R.S.D.	16.961	42.146	49.493	175.594	5.719	148.364	9.710	43.301

	Li (KPulses)	Mg (KPulses)	Mn (KPulses)	Mo (KPulses)	Na (KPulses)	Nd (KPulses)	Ni (KPulses)	P (KPulses)
On Peak 1	2.976	0.230	0.596	1.008	5.937	9.850	1.916	0.317
On Peak 2	2.978	0.232	0.592	1.011	5.947	9.886	1.948	0.321
On Peak 3	2.949	0.231	0.592	1.027	5.934	9.863	1.944	0.320
OffPeak1 1	2.998	0.231		0.992	5.884	9.836		0.308
OffPeak2 1			0.572				1.879	
Mean	-0.030	-0.000	0.021	0.023	0.055	0.030	0.057	0.011
S.D.	0.016	0.001	0.002	0.010	0.007	0.018	0.017	0.002
% R.S.D.	53.396	439804651150.000	10.825	43.776	12.302	60.099	30.589	18.368

	Pb (KPulses)	S (KPulses)	Sb (KPulses)	Se (KPulses)	Si (KPulses)	Sm (KPulses)	Sr (KPulses)	Ti (KPulses)
On Peak 1	1.133	0.693	0.995	1.290	2.533	3.893	2.864	2.577
On Peak 2	1.129	0.693	1.016	1.290	2.548	3.904	2.870	2.581
On Peak 3	1.111	0.690	1.026	1.277	2.530	3.885	2.858	2.565
OffPeak1 1	1.132		1.031	1.356		3.919	2.861	
OffPeak2 1		0.658			2.426			2.448
Mean	-0.008	0.034	-0.019	-0.070	0.111	-0.025	0.003	0.126
S.D.	0.012	0.002	0.016	0.008	0.010	0.010	0.006	0.008
% R.S.D.	152.856	5.094	84.760	10.671	8.688	38.158	200.000	6.591

	Tl (KPulses)	U (KPulses)	V (KPulses)	Zn (KPulses)	Zr (KPulses)
On Peak 1	2.918	4.413	1.778	0.983	3.345
On Peak 2	2.918	4.422	1.778	0.990	3.352
On Peak 3	2.908	4.406	1.779	0.979	3.347
OffPeak1 1				0.857	
OffPeak2 1	2.979	4.368	1.749		3.285
Mean	-0.064	0.046	0.029	0.127	0.063
S.D.	0.006	0.008	0.001	0.006	0.004
% R.S.D.	8.974	17.564	1.968	4.384	5.723

Teresa R. Frazier
V29 - V31
Reid Wyeast
9/10/93

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 846 TO 871.

Calibration Standard : 1 PPM 9:58 AM 10/ 9/93

Task name : TWC93

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Ag (KPulses)	Al (KPulses)	As (KPulses)	B (KPulses)	Ba (KPulses)	Be (KPulses)	Bi (KPulses)	Ca (KPulses)
On Peak 1	5.522	11.395	1.874	8.199	23.365	5.017	4.507	7.440
On Peak 2	5.517	11.378	1.871	8.226	23.375	5.014	4.458	7.432
On Peak 3	5.535	11.401	1.873	8.205	23.455	5.039	4.494	7.459
OffPeak1 1		8.358	0.827	1.554		1.146		
OffPeak2 1	1.858				3.779		3.120	0.273
Mean	3.667	3.033	1.046	6.656	19.619	3.877	1.366	7.171
S.D.	0.009	0.012	0.002	0.014	0.049	0.014	0.025	0.014
% R.S.D.	0.253	0.393	0.146	0.213	0.251	0.352	1.858	0.193

	Cd (KPulses)	Ce (KPulses)	Co (KPulses)	Cr (KPulses)	Cu (KPulses)	Fe (KPulses)	K (KPulses)	La (KPulses)
On Peak 1	37.266	4.303	7.174	4.534	7.571	3.735	2.390	0.566
On Peak 2	37.420	4.306	7.242	4.533	7.559	3.731	2.395	0.565
On Peak 3	37.535	4.299	7.286	4.533	7.579	3.809	2.390	0.565
OffPeak1 1	4.566		1.632	1.367	2.030	0.796		
OffPeak2 1		3.824					2.139	0.318
Mean	32.841	0.479	5.602	3.166	5.540	2.962	0.253	0.247
S.D.	0.135	0.004	0.056	0.001	0.010	0.044	0.003	0.001
% R.S.D.	0.411	0.734	1.007	0.018	0.182	1.483	1.143	0.233

	Li (KPulses)	Mg (KPulses)	Mn (KPulses)	Mo (KPulses)	Na (KPulses)	Nd (KPulses)	Ni (KPulses)	P (KPulses)
On Peak 1	13.502	5.930	13.058	5.252	7.769	13.078	7.205	0.402
On Peak 2	13.528	5.926	12.982	5.206	7.765	13.204	7.224	0.397
On Peak 3	13.584	5.955	13.065	5.246	7.782	13.132	7.262	0.402
OffPeak1 1	3.058	0.244		1.049	5.872	9.829		0.308
OffPeak2 1			0.617				1.899	
Mean	10.480	5.693	12.418	4.186	1.900	3.309	5.331	0.092
S.D.	0.042	0.016	0.046	0.025	0.009	0.063	0.029	0.003
% R.S.D.	0.400	0.276	0.371	0.597	0.468	1.910	0.544	3.126

	Pb (KPulses)	S (KPulses)	Sb (KPulses)	Se (KPulses)	Si (KPulses)	Sm (KPulses)	Sr (KPulses)	Ti (KPulses)
On Peak 1	1.826	1.604	1.367	1.845	4.072	4.349	29.810	11.327
On Peak 2	1.836	1.599	1.342	1.846	4.089	4.346	29.823	11.320
On Peak 3	1.825	1.621	1.364	1.826	4.081	4.344	29.944	11.375
OffPeak1 1	1.154		1.053	1.385		3.948	2.929	
OffPeak2 1		0.662			2.447			2.476
Mean	0.675	0.946	0.305	0.454	1.634	0.398	26.930	8.865
S.D.	0.006	0.012	0.014	0.011	0.009	0.003	0.074	0.030
% R.S.D.	0.901	1.219	4.480	2.482	0.521	0.632	0.274	0.338

	Tl (KPulses)	V (KPulses)	Zn (KPulses)	Zr (KPulses)
On Peak 1	3.095	4.255	16.168	6.022
On Peak 2	3.089	4.259	16.219	6.020
On Peak 3	3.087	4.282	16.235	6.036
OffPeak1 1			0.910	
OffPeak2 1	2.960	1.818		3.307
Mean	0.130	2.447	15.297	2.719
S.D.	0.004	0.015	0.035	0.009
% R.S.D.	3.194	0.595	0.229	0.321

Calibration Standard : 2.5 PPM 10:00 AM 10/ 9/93

Task name : TWC93

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Ag (KPulses)	Al (KPulses)	As (KPulses)	B (KPulses)	Ba (KPulses)	Be (KPulses)	Bi (KPulses)	Ca (KPulses)
On Peak 1	11.590	15.966	3.586	18.454	55.716	11.318	6.647	18.589
On Peak 2	11.582	15.999	3.623	18.369	55.669	11.289	6.678	18.556
On Peak 3	11.609	15.985	3.570	18.462	55.800	11.323	6.664	18.608
OffPeak1 1		8.173	0.830	1.658		1.164		
OffPeak2 1	1.896				3.953		3.029	0.326
Mean	9.698	7.810	2.763	16.770	51.775	10.146	3.634	18.258
S.D.	0.014	0.017	0.027	0.052	0.066	0.018	0.016	0.026
% R.S.D.	0.143	0.212	0.984	0.307	0.128	0.181	0.427	0.144

	Cd (KPulses)	Ce (KPulses)	Cr (KPulses)	Fe (KPulses)	K (KPulses)	La (KPulses)	Li (KPulses)	Mg (KPulses)
On Peak 1	90.290	5.085	9.732	8.499	2.670	0.958	30.886	15.149
On Peak 2	89.932	5.089	9.795	8.472	2.681	0.958	30.813	15.121
On Peak 3	89.705	5.084	9.773	8.474	2.690	0.954	31.124	15.157
OffPeak1 1	4.614		1.400	0.812			3.192	0.265
OffPeak2 1		3.857			2.122	0.319		
Mean	85.362	1.229	8.367	7.670	0.558	0.638	27.749	14.877
S.D.	0.295	0.003	0.032	0.015	0.010	0.002	0.163	0.019
% R.S.D.	0.346	0.215	0.382	0.196	1.794	0.362	0.586	0.127

	Mn (KPulses)	Mo (KPulses)	Na (KPulses)	Nd (KPulses)	Ni (KPulses)	P (KPulses)	Pb (KPulses)	S (KPulses)
On Peak 1	33.087	11.731	10.821	18.498	15.575	0.514	2.973	2.958
On Peak 2	33.056	11.722	10.809	18.462	15.611	0.518	2.948	2.986
On Peak 3	33.087	11.809	10.843	18.443	15.617	0.526	2.961	3.040
OffPeak1 1		1.063	5.797	9.913		0.308	1.155	
OffPeak2 1	0.680				1.919			0.674
Mean	32.397	10.691	5.027	8.555	13.682	0.211	1.806	2.321
S.D.	0.018	0.048	0.017	0.028	0.023	0.006	0.013	0.042
% R.S.D.	0.055	0.448	0.343	0.327	0.166	2.891	0.692	1.796

	Sb (KPulses)	Se (KPulses)	Si (KPulses)	Sm (KPulses)	Sr (KPulses)	Ti (KPulses)	Tl (KPulses)	Zr (KPulses)
On Peak 1	1.897	2.735	6.351	5.105	73.895	24.993	3.382	10.167
On Peak 2	1.904	2.725	6.368	5.109	73.799	24.943	3.384	10.156
On Peak 3	1.877	2.727	6.375	5.104	74.008	24.992	3.380	10.166
OffPeak1 1	1.054	1.386		3.995	3.056			
OffPeak2 1			2.476			2.528	2.953	3.333
Mean	0.839	1.343	3.889	1.111	70.845	22.448	0.429	6.830
S.D.	0.014	0.005	0.012	0.003	0.105	0.029	0.002	0.006
% R.S.D.	1.671	0.394	0.317	0.238	0.148	0.127	0.466	0.089

Calibration Standard : 5 PPM 10:02 AM 10/ 9/93 WHC-SD-WM-DP-053 REV 0

Task name : TWC93

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Ag (KPulses)	Al (KPulses)	As (KPulses)	B (KPulses)	Ba (KPulses)	Be (KPulses)	Bi (KPulses)	Ca (KPulses)
On Peak 1	21.964	24.244	6.573	36.444	109.640	21.913	10.528	37.900
On Peak 2	21.847	24.173	6.528	36.140	108.898	21.763	10.464	37.633
On Peak 3	21.892	24.179	6.491	36.188	109.123	21.813	10.467	37.714
OffPeak1 1		9.226	0.891	1.819		1.195		
OffPeak2 1	1.992				4.319		3.826	0.424
Mean	19.909	14.973	5.640	34.438	104.901	20.635	6.660	37.325
S.D.	0.059	0.039	0.041	0.163	0.380	0.076	0.036	0.137
% R.S.D.	0.296	0.263	0.728	0.475	0.363	0.370	0.542	0.367

	Cd (KPulses)	Ce (KPulses)	Co (KPulses)	Cr (KPulses)	Cu (KPulses)	Fe (KPulses)	K (KPulses)	La (KPulses)
On Peak 1	179.286	6.443	29.749	18.520	29.753	16.399	3.224	1.625
On Peak 2	178.185	6.442	29.575	18.400	29.577	16.363	3.220	1.616
On Peak 3	178.525	6.447	29.695	18.452	29.622	16.373	3.217	1.621
OffPeak1 1	5.034		1.754	1.523	2.138	0.873		
OffPeak2 1		3.975					2.139	0.325
Mean	173.631	2.469	27.919	16.934	27.513	15.505	1.081	1.296
S.D.	0.564	0.003	0.089	0.060	0.091	0.019	0.004	0.005
% R.S.D.	0.325	0.107	0.319	0.355	0.332	0.120	0.325	0.348

	Li (KPulses)	Mg (KPulses)	Mn (KPulses)	Mo (KPulses)	Na (KPulses)	Nd (KPulses)	Ni (KPulses)	P (KPulses)
On Peak 1	61.135	30.516	67.107	22.610	16.242	27.871	29.870	0.761
On Peak 2	60.306	30.385	66.589	22.528	16.078	27.743	29.797	0.770
On Peak 3	60.411	30.454	66.740	22.615	16.109	27.698	29.744	0.776
OffPeak1 1	3.455	0.301		1.158	5.875	10.338		0.313
OffPeak2 1			0.798				2.015	
Mean	57.162	30.151	66.014	21.426	10.268	17.433	27.789	0.456
S.D.	0.451	0.066	0.266	0.049	0.087	0.090	0.063	0.008
% R.S.D.	0.790	0.217	0.404	0.228	0.849	0.515	0.228	1.656

	Pb (KPulses)	S (KPulses)	Sb (KPulses)	Se (KPulses)	Si (KPulses)	Sm (KPulses)	Sr (KPulses)	Ti (KPulses)
On Peak 1	4.882	5.471	2.848	4.253	10.331	6.465	147.457	47.926
On Peak 2	4.896	5.423	2.796	4.229	10.318	6.456	146.498	47.649
On Peak 3	4.864	5.426	2.817	4.215	10.329	6.457	146.826	47.769
OffPeak1 1	1.189		1.086	1.433		4.187	3.319	
OffPeak2 1		0.686			2.597			2.671
Mean	3.692	4.754	1.734	2.799	7.729	2.272	143.608	45.110
S.D.	0.016	0.027	0.026	0.019	0.007	0.005	0.487	0.139
% R.S.D.	0.435	0.566	1.508	0.687	0.091	0.217	0.339	0.308

	Tl (KPulses)	V (KPulses)	Zn (KPulses)	Zr (KPulses)
On Peak 1	3.933	14.345	77.079	17.237
On Peak 2	3.945	14.278	76.677	17.143
On Peak 3	3.945	14.301	76.986	17.171
OffPeak1 1			1.127	
OffPeak2 1	2.998	2.106		3.443
Mean	0.943	12.202	75.787	13.741
S.D.	0.007	0.034	0.210	0.048
% R.S.D.	0.735	0.279	0.278	0.351

Calibration Standard : 10 PPM 10:12 AM 10/ 9/93

Task name : TWC93

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Ag (KPulses)	Al (KPulses)	As (KPulses)	B (KPulses)	Ba (KPulses)	Be (KPulses)	Bi (KPulses)	Ca (KPulses)
On Peak 1	41.394	39.505	12.214	70.125	212.673	41.872	17.674	73.118
On Peak 2	41.670	39.540	12.270	70.691	213.940	42.007	17.808	73.614
On Peak 3	41.523	39.438	12.284	70.401	213.010	41.854	17.786	73.368
OffPeak1 1		10.397	1.004	2.136		1.261		
OffPeak2 1	2.168				5.035		4.758	0.619
Mean	39.361	29.097	11.252	68.270	208.173	40.650	12.998	72.748
S.D.	0.138	0.052	0.037	0.283	0.656	0.084	0.072	0.248
% R.S.D.	0.351	0.178	0.329	0.415	0.315	0.206	0.553	0.341

	Cd (KPulses)	Ce (KPulses)	Co (KPulses)	Cr (KPulses)	Cu (KPulses)	Fe (KPulses)	K (KPulses)	La (KPulses)
On Peak 1	348.743	9.058	58.176	35.389	56.935	31.759	4.206	2.896
On Peak 2	350.538	9.060	58.248	35.446	57.288	32.042	4.217	2.910
On Peak 3	348.991	9.033	57.846	35.371	57.103	31.941	4.217	2.897
OffPeak1 1	5.540		1.942	1.777	2.315	0.952		
OffPeak2 1		4.201					2.154	0.341
Mean	343.884	4.849	56.148	33.625	54.794	30.962	2.059	2.560
S.D.	0.973	0.015	0.214	0.039	0.177	0.143	0.006	0.008
% R.S.D.	0.283	0.310	0.382	0.116	0.322	0.463	0.308	0.305

	Li (KPulses)	Mg (KPulses)	Mn (KPulses)	Mo (KPulses)	Na (KPulses)	Nd (KPulses)	Ni (KPulses)	P (KPulses)
On Peak 1	115.243	59.622	131.338	43.926	25.997	45.473	56.988	1.181
On Peak 2	116.021	59.827	132.014	44.035	26.094	45.713	57.023	1.147
On Peak 3	115.618	59.549	131.526	43.802	26.025	45.767	57.069	1.173
OffPeak1 1	4.000	0.374		1.333	5.995	10.951		0.321
OffPeak2 1			1.041				2.262	
Mean	111.627	59.292	130.585	42.588	20.044	34.700	54.765	0.846
S.D.	0.389	0.144	0.349	0.117	0.050	0.156	0.041	0.018
% R.S.D.	0.349	0.243	0.267	0.274	0.249	0.451	0.074	2.101

	Pb (KPulses)	S (KPulses)	Sb (KPulses)	Se (KPulses)	Si (KPulses)	Sm (KPulses)	Sr (KPulses)	Ti (KPulses)
On Peak 1	8.583	9.943	4.611	7.208	17.773	9.030	287.580	92.288
On Peak 2	8.699	9.870	4.605	7.190	17.858	9.060	289.110	92.569
On Peak 3	8.720	9.903	4.577	7.145	17.821	9.036	287.811	92.076
OffPeak1 1	1.276		1.104	1.475		4.527	3.824	
OffPeak2 1		0.784			2.824			2.935
Mean	7.391	9.121	3.494	5.706	14.993	4.515	284.343	89.376
S.D.	0.074	0.037	0.018	0.032	0.043	0.016	0.825	0.247
% R.S.D.	0.998	0.401	0.519	0.569	0.284	0.352	0.290	0.277

	Tl (KPulses)	V (KPulses)	Zn (KPulses)	Zr (KPulses)
On Peak 1	5.007	26.995	152.851	30.768
On Peak 2	5.008	27.121	153.287	30.931
On Peak 3	4.998	27.013	152.831	30.846
OffPeak1 1			1.425	
OffPeak2 1	3.050	2.494		3.634
Mean	1.954	24.549	151.565	27.214
S.D.	0.006	0.068	0.258	0.082
% R.S.D.	0.282	0.278	0.170	0.300

Calibration Standard : 50 PPM 10:15 AM 10/ 9/93

Task name : TWC93

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Al (KPulses)	Bi (KPulses)	Ca (KPulses)	Fe (KPulses)	K (KPulses)	Na (KPulses)	P (KPulses)	S (KPulses)
On Peak 1	153.294	73.385	339.371	152.413	12.121	105.359	4.558	45.859
On Peak 2	152.978	73.361	338.979	152.040	12.150	105.676	4.593	45.836
On Peak 3	152.648	73.023	338.557	151.770	12.075	104.964	4.669	46.236
OffPeak1 1	9.014			1.551		6.409	0.330	
OffPeak2 1		3.428	2.062		2.223			1.088
Mean	143.959	69.828	336.907	150.523	9.892	98.924	4.277	44.889
S.D.	0.323	0.202	0.407	0.323	0.038	0.357	0.057	0.225
% R.S.D.	0.224	0.290	0.121	0.214	0.382	0.361	1.327	0.500

Calibration Standard : U-50 PPM 10:28 AM 10/ 9/93

Task name : TWC93

On-Peak Integrations : 3 Off-Peak Integrations : 1

	U (KPulses)
On Peak 1	9.876
On Peak 2	9.877
On Peak 3	9.861
OffPeak1 1	
OffPeak2 1	4.462
Mean	5.409
S.D.	0.009
% R.S.D.	0.166

Identity 1: SST4 Identity 2: Quality Control 10:33 AM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4963.931	5102.232	4768.272	5759.872	4867.108	4916.616	4905.719	5044.942
S.D.	19.505	22.248	25.289	23.013	13.590	13.850	15.691	27.525
% R.S.D.	0.393	0.436	0.530	0.400	0.279	0.282	0.320	0.546

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5118.916	4963.094	5282.229	4969.137	5334.775	5037.440	5108.394	-183.332
S.D.	14.712	22.034	26.333	38.735	21.809	22.236	34.049	85.437
% R.S.D.	0.287	0.444	0.499	0.780	0.409	0.441	0.667	46.602

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4834.428	4953.124	4986.590	5572.997	5118.019	4910.009	4981.504	5094.583
S.D.	10.705	9.319	21.795	110.869	17.069	19.480	16.945	16.682
% R.S.D.	0.221	0.188	0.437	1.989	0.334	0.397	0.340	0.327

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4926.967	2887.696	4981.537	5017.803	4826.320	4958.417	5023.226	5086.089
S.D.	16.878	30.660	10.370	30.022	21.723	13.363	27.951	25.540
% R.S.D.	0.343	1.062	0.208	0.598	0.450	0.269	0.556	0.502

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4976.768	4881.416	4846.925	5097.942	4691.013
S.D.	22.487	59.229	21.998	23.711	21.586
% R.S.D.	0.452	1.213	0.454	0.465	0.460

Identity 1: WP-284 Identity 2: WP-284 12:34 PM September 10, 1993
Task name : TWC93
S Weight : 1.0000 Solution Volume : 1.00
On . ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	0.293	0.558	-4.338	381.840	150.056	43.746	7.182	1.298
S.D.	0.566	0.176	27.765	5.410	3.365	2.471	0.658	0.470
% R.S.D.	192.975	31.486	640.072	1.417	2.243	5.648	9.166	36.243

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	7.679	18.197	6.583	24.156	31.291	6.937	9.759	177.118
S.D.	0.569	0.843	2.276	1.735	0.140	2.908	8.220	5.382
% R.S.D.	7.411	4.634	34.571	7.183	0.448	41.928	84.229	3.039

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	19.813	-12.523	28.827	64.270	10.065	0.848	30.023	97.208
S.D.	2.103	4.660	0.109	55.113	2.742	0.000	2.661	1.465
% R.S.D.	10.614	37.209	0.377	85.752	27.237	0.000	8.862	1.507

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-4.567	-15.539	0.000	-13.339	0.303	7.133	38.423	-15.114
S.D.	0.405	11.966	0.003	19.416	0.195	1.161	1.255	7.803
% D.	8.866	77.006	32875.371	145.562	64.342	16.275	3.267	51.626

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	12.336	-0.812	127.180	29.116	91.591
S.D.	0.195	36.609	1.423	0.248	2.913
% R.S.D.	1.582	4506.656	1.119	0.852	3.181

Identity 1: ICV Identity 2: Quality Control 12:36 PM September 10, 1993

Task name : TWC93

WHC-SD-WM-DP-053 REV 0

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4858.629	5002.352	4610.441	5679.384	4632.335	4806.360	4815.030	4918.313
S.D.	13.640	16.490	29.159	22.774	5.506	20.526	16.358	21.517
% R.S.D.	0.281	0.330	0.632	0.401	0.119	0.427	0.340	0.437

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4838.714	4875.658	5239.888	4930.881	5073.479	4937.815	5159.187	-177.118
S.D.	14.997	9.837	17.798	8.904	16.497	19.481	23.277	44.054
% R.S.D.	0.310	0.202	0.340	0.181	0.325	0.395	0.451	24.873

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4726.889	4928.500	4905.262	5008.204	4749.900	4777.254	4829.152	4934.596
S.D.	16.471	13.677	16.048	107.390	7.417	14.345	35.038	18.525
% R.S.D.	0.348	0.278	0.327	2.144	0.156	0.300	0.726	0.375

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4791.820	2794.339	4890.515	4905.050	4723.852	4868.372	4965.075	4912.417
S.D.	11.915	24.373	13.581	54.520	14.852	17.226	21.812	13.515
% R.S.D.	0.249	0.872	0.278	1.112	0.314	0.354	0.439	0.275

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4896.161	4655.722	4751.096	5028.461	4555.497
S.D.	16.975	33.972	15.929	12.981	63.294
% R.S.D.	0.347	0.730	0.335	0.258	1.389

Identity 1: ICB Identity 2: Quality Control 12:37 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
0 k Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.968	0.985	6.218	2.853	17.591	-0.000	0.487	2.324
S.D.	1.667	0.082	10.236	1.357	5.797	3.957	0.823	0.791
% R.S.D.	84.721	8.347	164.618	47.546	32.957	23287713.308	169.039	34.035

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-2.707	4.114	-0.047	6.230	-0.091	-1.910	24.165	-201.976
S.D.	0.476	1.933	3.925	2.326	0.279	0.348	15.535	137.321
% R.S.D.	17.588	46.976	8302.482	37.339	307.678	18.233	64.284	67.989

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-31.441	35.231	-0.000	-27.211	49.728	0.452	-17.217	21.196
S.D.	31.681	34.774	0.357	31.570	6.969	0.259	4.997	9.694
% R.S.D.	100.765	98.704	135612.982	116.020	14.015	57.282	29.024	45.736

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	2.572	10.244	-0.850	-38.479	-0.484	2.632	9.593	-1.492
S.D.	2.911	9.184	1.898	8.743	0.225	0.945	2.211	31.900
% R.S.D.	113.170	89.652	223.289	22.722	46.424	35.890	23.042	2137.692

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-0.801	-31.100	-3.148	0.165	-35.948
S.D.	0.310	12.203	1.034	0.379	49.587
% R.S.D.	38.693	39.238	32.835	229.128	137.944

Identity 1: ICSA-I Identity 2: ICSA 12:40 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-3.448	0.582	30.700	29.796	34.865	-2.259	-0.182	0.181
S.D.	2.407	0.109	34.110	18.417	8.299	0.817	0.558	0.781
% R.S.D.	69.794	18.704	111.108	61.811	23.805	36.178	305.786	430.301

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-0.176	-0.179	3.953	9.728	21.256	-1.005	6.046	-205.084
S.D.	0.364	1.912	7.913	3.976	0.141	0.921	4.879	47.837
% R.S.D.	206.438	1067.858	200.188	40.868	0.662	91.663	80.695	23.325

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-51.089	21.054	0.250	-39.143	58.749	1.413	6.229	428012.615
S.D.	4.382	14.216	0.274	11.932	15.146	0.259	12.490	3128.465
% R.S.D.	8.577	67.522	109.850	30.484	25.781	18.330	200.508	0.731

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	3.139	-16.750	-1.360	-20.463	-0.821	1.400	7.724	47.885
S.D.	0.830	9.899	1.153	7.632	0.626	0.683	4.217	28.133
% R.S.D.	26.446	59.095	84.815	37.297	76.186	48.780	54.595	58.750

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-1.178	-11.560	-4.243	-0.331	-35.211
S.D.	0.448	16.923	1.087	0.143	24.911
% R.S.D.	38.007	146.394	25.609	43.301	70.748

Identity 1: XXX Identity 2: Rinse 12:42 PM September 10, 1993
Task name : TWC93
Sa~'e Weight : 1.0000 Solution Volume : 1.00
O k Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-3.324	0.582	0.178	0.655	6.210	1.189	0.609	1.570
S.D.	1.333	0.161	24.642	2.868	5.533	1.338	1.096	0.415
% R.S.D.	40.107	27.608	13879.947	437.587	89.101	112.585	179.950	26.432

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-2.002	12.456	6.472	0.547	-2.275	-3.217	58.425	-9.322
S.D.	0.440	2.451	4.580	4.853	0.081	1.256	3.908	44.054
% R.S.D.	21.950	19.676	70.763	887.658	3.562	39.033	6.688	472.582

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-6.864	37.469	0.150	-3.346	-2.212	0.396	-4.397	198.423
S.D.	9.494	7.861	0.051	0.000	14.821	0.098	14.345	46.710
% R.S.D.	138.332	20.980	33.966	0.000	670.086	24.744	326.236	23.541

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-4.217	15.121	-0.413	-33.992	0.153	1.556	3.493	10.426
S.D.	1.112	17.956	0.388	5.525	0.789	0.725	2.907	28.133
% R.S.D.	26.361	118.747	93.948	16.253	516.989	46.561	83.228	269.821

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-0.929	-49.664	-5.749	-0.331	-35.188
S.D.	0.383	81.141	1.255	0.287	39.782
% R.S.D.	41.186	163.380	21.825	86.603	113.056

Identity 1: V30 Dig Blank Identity 2: Direct Acid Digest 12:44 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	1.611	1.080	11.929	1872.363	103.436	-0.119	0.487	1.298
S.D.	2.167	0.082	36.145	8.729	1.602	0.309	0.380	0.314
% R.S.D.	134.506	7.613	303.003	0.466	1.549	259.770	78.036	24.162

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	14.391	-5.825	6.631	35.852	401.693	2.513	-11.236	-124.293
S.D.	0.433	3.454	6.014	6.755	0.662	3.322	17.969	60.653
% R.S.D.	3.008	59.300	90.698	18.841	0.165	132.175	159.935	48.798

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-39.867	-30.431	0.005	24.496	94.265	39.165	-6.878	532.193
S.D.	2.430	11.267	0.326	27.556	5.891	0.170	5.832	3.302
% R.S.D.	6.096	37.024	7070.083	112.494	6.250	0.433	84.794	0.620

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-1.640	-18.204	0.080	-14.098	0.303	-0.890	150.837	-33.843
S.D.	0.894	23.647	0.899	14.279	0.389	1.231	3.132	65.081
% R.S.D.	54.506	129.899	1126.036	101.284	128.685	138.335	2.076	192.303

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.210	20.682	-3.558	-0.579	-44.038
S.D.	0.090	44.773	1.255	0.143	31.436
% R.S.D.	42.773	216.480	35.259	24.744	71.384

Identity 1: V29 Dig Std 2.5-25 Identity 2: 13N10C,21B48C,14N10C 12:47 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
0 k Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	9563.864	9364.209	7802.792	26507.765	5484.277	9162.717	4636.817	9407.967
S.D.	12.958	12.037	7.020	43.476	13.425	11.667	7.630	37.040
% R.S.D.	0.135	0.129	0.090	0.164	0.245	0.127	0.165	0.394

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	9095.217	4781.948	9762.466	4765.069	11150.662	4746.607	9516.075	9399.664
S.D.	12.813	12.377	9.945	32.914	14.707	4.527	14.586	61.128
% R.S.D.	0.141	0.259	0.102	0.691	0.132	0.095	0.153	0.650

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	9691.592	8746.564	9425.555	10254.422	4651.938	4812.350	4672.255	11282.244
S.D.	4.180	7.861	13.991	76.714	36.222	4.091	34.620	40.709
% R.S.D.	0.043	0.090	0.148	0.748	0.779	0.085	0.741	0.361

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	9522.664	2669.052	5439.653	9472.657	4770.159	9188.701	6239.711	4779.608
S.D.	9.226	39.207	3.182	17.338	4.882	10.001	9.773	27.029
% R.S.D.	0.097	1.469	0.058	0.183	0.102	0.109	0.157	0.566

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4697.674	4983.027	9502.465	9767.996	4466.836
S.D.	4.007	38.701	12.727	15.975	16.058
% R.S.D.	0.085	0.777	0.134	0.164	0.359

Identity 1: V31 Sam 107AP-FB Identity 2: 5ml in 25ml-1ml in 5 12:51 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.225	2.350	-0.643	473.359	47.258	6.954	18.625	1.841
S.D.	1.188	0.356	22.028	7.150	4.442	4.487	0.587	0.954
% R.S.D.	96.981	15.152	3427.584	1.511	9.399	64.529	3.151	51.805

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	22.994	20.000	11.799	16.833	271.714	-7.339	37.044	34.181
S.D.	0.339	3.464	0.027	1.550	0.640	0.348	12.016	63.453
% R.S.D.	1.473	17.321	0.233	9.206	0.235	4.745	32.436	185.642

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-20.938	-34.908	1.951	-7.324	142.248	46.512	16.536	218.892
S.D.	8.509	9.319	0.387	24.839	14.376	0.259	8.417	11.235
% R.S.D.	40.637	26.698	19.825	339.165	10.106	0.557	50.903	5.132

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.910	-20.277	1.557	-25.781	1.014	0.920	74.336	59.804
S.D.	1.304	21.170	0.684	7.726	0.659	0.825	2.092	49.260
% R.S.D.	143.253	104.404	43.956	29.966	64.923	89.678	2.815	82.369

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-0.061	-69.205	-2.600	0.579	40.999
S.D.	0.338	20.795	1.087	0.430	30.376
% R.S.D.	555.155	30.049	41.789	74.231	74.090

Identity 1: V31 Dup 107AP-FB Identity 2: 5ml in 25ml-1ml in 5 12:54 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-3.664	5.341	-19.360	237.383	29.498	0.238	16.373	1.177
S.D.	1.480	0.340	5.349	14.596	5.747	2.277	1.346	0.428
% R.S.D.	40.386	6.360	27.628	6.149	19.483	957.604	8.220	36.342

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	247.262	12.745	6.581	37.491	7782.365	-1.407	10.520	-170.903
S.D.	1.026	4.729	4.509	1.977	32.879	3.051	33.299	102.259
% R.S.D.	0.415	37.103	68.506	5.272	0.422	216.790	316.524	59.834

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-64.520	-666.899	0.524	60.293	128.016	175.481	-17.312	223.639
S.D.	14.584	16.900	0.388	38.357	13.159	0.449	7.972	11.057
% R.S.D.	22.603	2.534	74.053	63.618	10.279	0.256	46.051	4.944

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-2.681	-22.919	-0.412	-19.792	0.602	-1.457	62.775	59.804
S.D.	2.140	15.642	0.900	16.503	0.361	0.094	3.945	45.401
% R.S.D.	79.806	68.247	218.688	83.380	59.989	6.474	6.284	75.916

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	8.642	-27.192	-6.433	-0.331	-36.388
S.D.	0.218	10.154	1.897	0.143	24.337
% R.S.D.	2.520	37.340	29.486	43.301	66.882

Identity 1: V31 PSpk 107AP-FB Identity 2: 5ml in 25ml-1ml in 5 12:59 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	967.884	1001.812	951.724	1708.889	960.938	967.703	981.144	985.999
S.D.	5.430	4.778	3.338	16.886	7.808	10.809	5.376	6.818
% R.S.D.	0.561	0.477	0.351	0.988	0.813	1.117	0.548	0.691

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	975.471	991.009	1057.133	1018.377	1321.926	992.630	1070.084	-167.796
S.D.	4.754	6.459	9.160	11.345	6.727	4.537	9.459	79.283
% R.S.D.	0.487	0.652	0.867	1.114	0.509	0.457	0.884	47.249

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	904.911	941.806	979.011	1066.580	1125.874	1027.056	970.068	1232.644
S.D.	22.560	11.267	4.784	67.850	19.573	4.426	20.156	7.154
% R.S.D.	2.493	1.196	0.489	6.361	1.738	0.431	2.078	0.580

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	960.389	548.615	618.235	931.123	944.211	962.538	1060.631	982.652
S.D.	3.914	7.620	26.511	6.918	4.684	4.928	7.097	19.339
% R.S.D.	0.408	1.389	4.288	0.743	0.496	0.512	0.669	1.968

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	978.898	945.932	940.500	1010.043	878.880
S.D.	4.829	34.557	3.444	4.963	30.951
% R.S.D.	0.493	3.653	0.366	0.491	3.522

Identity 1: V31 Sam 107AP-FB Identity 2: 5ml in 25ml 1:03 PM September 10, 1993
Task name : TWC93
Sr 'e Weight : 1.0000 Solution Volume : 1.00
C k Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	0.500	1.567	24.271	2321.179	178.941	-1.010	83.507	1.721
S.D.	0.565	0.142	23.614	19.888	5.347	2.780	0.183	0.603
% R.S.D.	112.905	9.091	97.293	0.857	2.988	275.086	0.219	35.037

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	76.421	89.866	4.010	54.433	705.767	2.513	-18.935	-130.508
S.D.	0.624	4.620	0.012	1.054	1.349	3.771	5.295	29.966
% R.S.D.	0.816	5.141	0.302	1.936	0.191	150.033	27.967	22.961

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-43.386	-67.738	0.169	76.202	448.537	74.996	2.517	1032.013
S.D.	18.357	9.319	0.149	6.889	11.837	0.196	7.550	8.977
% R.S.D.	42.311	13.758	88.247	9.041	2.639	0.261	299.949	0.870

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-3.126	-37.824	4.390	26.037	-0.447	0.480	366.318	75.128
S.D.	1.468	11.579	0.897	4.423	0.468	0.953	5.081	26.542
% R.S.D.	46.951	30.613	20.428	16.986	104.745	198.612	1.387	35.329

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-0.210	18.728	-7.802	-0.331	-84.258
S.D.	0.233	80.929	0.474	0.143	29.633
% R.S.D.	111.379	432.120	6.078	43.301	35.170

Identity 1: V31 Dup 107AP-FB Identity 2: 5ml in 25ml 1:07 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	0.525	23.071	-24.559	1169.309	141.892	-4.398	83.203	-0.151
S.D.	0.739	0.188	14.926	19.645	2.262	1.393	0.279	0.395
% R.S.D.	140.775	0.817	60.775	1.680	1.595	31.663	0.335	262.107

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	1260.030	78.243	16.089	168.873	36942.958	3.117	-108.296	55.932
S.D.	0.298	2.605	3.950	3.185	22.730	1.219	5.866	42.035
% R.S.D.	0.024	3.329	24.551	1.886	0.062	39.109	5.416	75.154

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-4.500	-3315.741	6.508	20.518	399.044	734.136	-3.780	947.729
S.D.	4.382	10.094	0.338	11.932	6.218	0.897	3.570	11.957
% R.S.D.	97.394	0.304	5.201	58.154	1.558	0.122	94.446	1.262

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-5.797	-24.652	6.629	13.174	1.314	-0.518	277.469	730.656
S.D.	1.061	13.534	0.398	5.774	0.737	1.385	4.742	70.840
% R.S.D.	18.302	54.902	6.005	43.832	56.085	267.312	1.709	9.695

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	46.890	19.705	-2.053	-0.331	67.284
S.D.	0.365	23.992	2.672	0.287	28.679
% R.S.D.	0.779	121.754	130.185	86.603	42.625

Identity 1: CCV Identity 2: Quality Control 1:12 PM September 10, 1993
Task name : TWC93
S 'e Weight : 1.0000 Solution Volume : 1.00
L .ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4748.815	4875.165	4563.402	5497.208	4561.311	4727.724	4735.114	4828.802
S.D.	10.049	9.461	15.790	22.167	3.861	11.701	7.145	20.171
% R.S.D.	0.212	0.194	0.346	0.403	0.085	0.248	0.151	0.418

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4765.418	4802.237	5189.739	4881.148	5002.421	4860.910	5162.651	-80.791
S.D.	8.740	11.045	18.081	15.832	6.069	10.423	33.213	61.128
% R.S.D.	0.183	0.230	0.348	0.324	0.121	0.214	0.643	75.663

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4530.035	4827.024	4791.623	5131.504	4672.182	4663.262	4754.607	4834.706
S.D.	12.724	9.047	8.579	30.029	44.363	7.982	22.142	16.206
% R.S.D.	0.281	0.187	0.179	0.585	0.950	0.171	0.466	0.335

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4652.237	2741.878	4617.925	4886.229	4615.089	4780.772	4919.765	4895.390
S.D.	13.000	46.982	8.057	52.208	7.533	4.491	13.754	34.011
% R.S.D.	0.279	1.713	0.174	1.068	0.163	0.094	0.280	0.695

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4831.552	4649.860	4654.171	4957.656	4463.681
S.D.	2.568	54.153	11.265	6.950	20.838
% R.S.D.	0.053	1.165	0.242	0.140	0.467

Identity 1: CCB Identity 2: Quality Control 1:14 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-053 REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.839	1.555	26.451	4.622	-1.321	1.189	-1.278	1.328
S.D.	0.979	0.425	8.630	6.057	4.511	1.265	0.738	0.138
% R.S.D.	53.216	27.321	32.627	131.041	341.421	106.421	57.743	10.412

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-1.012	-0.858	3.926	3.607	1.119	-2.212	17.599	-251.693
S.D.	0.550	2.069	6.862	2.827	0.656	2.929	3.304	47.837
% R.S.D.	54.300	241.197	174.772	78.375	58.640	132.451	18.775	19.006

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-45.492	26.277	0.656	12.564	11.132	1.526	0.794	-5.718
S.D.	3.654	8.475	0.328	61.232	9.083	0.449	5.726	5.008
% R.S.D.	8.031	32.251	50.003	487.375	81.595	29.397	721.568	87.588

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	3.364	-10.345	106.949	-15.803	0.415	0.558	7.675	-40.654
S.D.	3.655	9.745	3.612	19.676	0.515	0.132	0.983	20.644
% R.S.D.	108.655	94.206	3.377	124.509	124.124	23.714	12.804	50.780

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.878	-63.342	-4.380	1.406	-74.091
S.D.	0.474	39.579	0.627	0.624	10.207
% R.S.D.	53.935	62.484	14.323	44.411	13.776

Identity 1: ICSA-F Identity 2: ICSA 1:17 PM September 10, 1993
Task name : TWC93
Sr e Weight : 1.0000 Solution Volume : 1.00
O. ak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-1.351	0.427	17.435	25.574	24.212	0.951	-1.887	0.725
S.D.	0.931	0.155	29.111	5.317	1.546	1.248	0.587	0.318
% R.S.D.	68.920	36.324	166.971	20.789	6.387	131.252	31.111	43.879

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-0.814	-0.548	6.602	5.356	21.069	-0.804	1.353	-195.762
S.D.	0.267	3.317	2.294	0.825	0.084	3.196	3.875	29.966
% R.S.D.	32.765	605.622	34.742	15.407	0.398	397.514	286.383	15.307

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-32.834	19.562	0.216	52.338	56.972	1.582	1.328	419767.085
S.D.	7.592	2.585	0.135	18.227	8.875	0.098	5.472	1310.574
% R.S.D.	23.123	13.213	62.713	34.825	15.577	6.186	412.038	0.312

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-0.630	-4.700	21.103	8.699	-1.533	0.940	5.067	-21.924
S.D.	0.592	24.074	1.683	6.979	0.324	0.545	1.478	15.324
% R.S.D.	94.012	512.168	7.977	80.231	21.162	58.044	29.174	69.895

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-0.816	56.833	-5.064	0.579	-34.214
S.D.	0.134	23.510	0.411	0.430	0.285
% R.S.D.	16.464	41.367	8.110	74.231	0.832

Identity 1: XXX Identity 2: Rinse 1:19 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	-0.119	0.249	24.410	0.399	3.054	-1.486	-0.548	0.996
S.D.	2.167	0.094	11.264	5.497	4.404	3.070	0.738	0.188
% R.S.D.	1827.908	37.796	46.147	1378.377	144.179	206.570	134.756	18.918

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-2.861	5.218	10.535	-5.684	-2.418	-0.201	12.842	-34.181
S.D.	0.152	0.282	2.288	1.182	0.083	2.008	5.290	72.807
% R.S.D.	5.329	5.396	21.722	20.802	3.434	999.367	41.195	213.007

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-16.685	34.485	0.010	-3.346	11.593	0.226	-2.709	168.116
S.D.	8.510	13.677	0.204	31.570	8.879	0.098	8.584	17.487
% R.S.D.	51.002	39.662	1994.393	943.469	76.589	43.301	316.825	10.402

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	0.225	-29.822	13.434	-65.702	0.003	1.194	-1.131	73.425
S.D.	0.986	22.618	0.685	10.493	0.731	0.969	0.890	16.420
% R.S.D.	438.650	75.842	5.100	15.970	25760.572	81.117	78.629	22.363

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	-0.929	18.728	-4.927	-0.414	20.664
S.D.	0.272	29.651	1.442	0.248	31.209
% R.S.D.	29.323	158.322	29.271	60.000	151.032

Identity 1: CCV Identity 2: Quality Control 1:20 PM September 10, 1993
Task name : TWC93
S[illegible] Weight : 1.0000 Solution Volume : 1.00
O[illegible]k Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4738.587	4891.269	4493.076	5547.589	4577.223	4772.896	4724.828	4853.428
S.D.	15.980	21.362	49.729	8.511	18.849	29.470	18.207	32.013
% R.S.D.	0.337	0.437	1.107	0.153	0.412	0.617	0.385	0.660

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4811.033	4815.237	5162.221	4882.241	4987.624	4902.730	5078.773	-149.152
S.D.	16.123	16.007	11.923	8.246	14.978	14.880	22.244	53.007
% R.S.D.	0.335	0.332	0.231	0.169	0.300	0.304	0.438	35.539

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4621.678	4799.416	4797.220	5215.030	4838.157	4702.540	4792.329	4878.579
S.D.	26.490	10.258	19.852	83.809	83.445	19.400	46.338	25.474
% R.S.D.	0.573	0.214	0.414	1.607	1.725	0.413	0.967	0.522

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4712.435	2781.415	4821.949	4894.270	4650.307	4794.020	4894.379	4861.337
S.D.	29.497	18.695	11.711	6.485	21.379	3.936	17.101	13.515
% R.S.D.	0.626	0.672	0.243	0.133	0.460	0.082	0.349	0.278

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	4833.450	4557.042	4653.897	4978.914	4436.706
S.D.	12.649	21.136	16.070	19.810	11.063
% R.S.D.	0.262	0.464	0.345	0.398	0.249

Identity 1: CCB Identity 2: Quality Control 1:22 PM September 10, 1993
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	1.366	1.436	-4.829	7.213	6.143	1.010	-1.035	2.626
S.D.	1.399	0.303	22.814	2.402	13.488	1.517	0.483	0.530
% R.S.D.	102.418	21.087	472.463	33.305	219.563	150.089	46.697	20.203

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	-1.848	6.626	7.946	-0.328	0.517	-4.524	-9.393	-3.107
S.D.	0.402	0.486	0.047	2.789	0.490	0.302	20.674	88.600
% R.S.D.	21.723	7.341	0.594	850.907	94.784	6.667	220.094	2851.315

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-20.218	8.369	1.149	-3.346	12.430	1.582	-25.296	4.774
S.D.	12.816	12.728	0.146	31.570	7.416	0.427	3.628	8.070
% R.S.D.	63.389	152.084	12.720	943.469	59.668	26.964	14.343	169.049

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4.410	14.779	5.850	-48.988	0.715	-2.495	8.905	-69.599
S.D.	1.901	22.103	0.791	22.390	0.531	2.160	0.852	12.855
% R.S.D.	43.106	149.557	13.527	45.705	74.322	86.583	9.569	18.470

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	0.646	7.981	-2.737	1.572	54.422
S.D.	0.454	38.775	0.627	0.496	37.712
% R.S.D.	70.305	485.841	22.920	31.579	69.295

RADIOCHEMICAL ANALYSES

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WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

Batch 1536

WHC-SD-WM-DP-053 REV 0

Segment Serial No. V31	Customer ID: 107 GP-FB
Analysis: GEA	Sample Prep: acid digestion

Instrument:	WC38461	Procedure/ Rev:	2A-548-12 / 10-0
Technologist:	SUE LAI (Sue Lai)	Date:	8-24-93
Starting Time:	10: 10	Temperature	25°C
Ending Time:	11: 20	Chemist:	A. K. Dasgupta

Comments: 8-26-93

This batch is good A.K. Dasgupta 8/26/93

	Description	Lab ID		Description	Lab ID
1	STD	V29-8530	11		
2	BLK	V30-8630	12		
3	Sample	V31-8730	13		
4	Duplicate Sample	V31-8830	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	32851 (0.1 ml)			

A-6000-881 (03/92)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: 1 LA-548-121 DATE START: 4 8/24/93

PREPARED BY: 2 A.K. DasGupta DATE COMPLETE: 3 8/25/93

	UNITS:	uCi/mL							
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	AVERAGE	RPD%	%REC	DET LIM	% CT ER
STD	V-29-8	CS-137	137 uCi/L				103%		0.9%
		CO-60	109 "				102%		1.4%
BLANK	V-30	CS-137	<1.35x10^-4 uCi/ml					1.4x10^-4 uCi/ml	
		CS-134	<1.11x10^-4 "					1.3x10^-4 "	
		Co-60	<9.81x10^-5 "					1.1x10^-4 "	
		CePr144	<8.12x10^-4 "					8.1x10^-4 "	
		RuRh106	<1.86x10^-3 "					2.0x10^-3 "	
		Nb94	<1.07x10^-4 "					1.1x10^-4 "	
		Eu-154	<3.0x10^-4 "					3.6x10^-4 "	
		Eu-155	<2.49x10^-4 "					2.6x10^-4 "	
		Ra-226	<1.73x10^-3 "					1.6x10^-3 "	
107-AP	V31-8	CS-137	1.04x10^-5 uCi/ml	<6.85x10^-4 uCi/ml					
		CS-134	<5.60x10^-4 "	<5.35x10^-4 "					
		Co-60	<6.35x10^-4 "	<5.55x10^-4 "					
		CoPr144	<4.12x10^-3 "	<4.02x10^-3 "					
		RuRh106	<9.35x10^-3 "	<9.35x10^-3 "					
		Nb-94	<4.96x10^-4 "	<4.96x10^-4 "					
		Eu-154	<1.94x10^-3 "	<1.83x10^-3 "					
		Eu-155	<1.21x10^-3 "	<1.18x10^-3 "					
		Ra-226	<9.05x10^-3 "	<9.05x10^-3 "					

NARRATIVE: [ ] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH
LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The activity of CePr-144 represents the sum of the activities of the daughter (Pr-144) and parent (Ce-144) in a secular equilibrium condition. The activity was determined from the gamma line of Ce-144. Similarly, the activity of RuRh-106 represents the sum of activities of the daughter (Rh106) and parent (Ru106) in a secular equilibrium condition. The activity of RuRh-106 was determined using the gamma line of Rh106 DAG

GAMMA ENERGY ANALYSIS - ACID DIGESTION

JK 8-24-93 ~~#189~~ 4190.

Serial No	Sample Point	Date	Time Issued	Priority
V 29.-8530	107-AP	8- 3-93	10:36	25

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	N1L17	0

Sample Size	Customer ID
? 0.1 ml	STD

Remarks, Calculations, Results

COLX STD# 3285/
R901 STD VAL 133.3 µCi/L
RESULT 137 µCi/L % REC 103%.
R905 STD VAL 104.6
RESULT 109 µCi/L % REC 102%.

LMCS R901 103.7%
R905 103.6%

Sue Li

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
8-24-93	11:20	A.K. 8/25/93

54-5800-061 (R-10-83)

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GAMMA ENERGY ANALYSIS - ACID DIGESTION

4190

Serial No.	Sample Point	Date	Time Issued	Priority
V 30.-8630	107-AP	8- 3-93	10:38	25

Determination	Method-Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	N1L17	0

Sample Size	Customer ID
? 0.1 ml	BLK

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

Cs-137 : <1.35 x 10^-4 uCi/ml
Cs-134 : <1.11 x 10^-4 "
Co-60 : <9.81 x 10^-5 "
CePr144 : <8.12 x 10^-4 "
RuRh106 : <1.86 x 10^-3 "

See fax

Ar	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
				See back of card
Hrs	Hrs	Hrs	Hrs	Hrs
Date	Time Completed	Lab Unit Mgr		
8-24-93	11:20	A.K. 8/24/93		

54-6800-061 (R-10-83)

V30. 8630

Nb-94 : <1.07 x 10^-4 "
Eu-154 : <3.0 x 10^-4 "
Eu-155 : <2.49 x 10^-4 "
Ra-226 : <1.73 x 10^-3 "

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GAMMA ENERGY ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-053 REV 0

4191

Serial No	Sample Point	Date	Time Issued	Priority
V 31.-8730	107-AP	8- 3-93	10:40	25

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	N1L17	0

Sample Size	Customer ID
? 0.1 ml	107AP-FB

Remarks, Calculations, Results:

COUNT AS uCI/L
LASER PRINTOUT

CS-137 : ~~2.05 x 10^-4~~ uCi/ml 1.04 E-03 uCi/mL

CS-134 : < ~~1.12 x 10^-4~~ " < 5.60 E-04 "

Co-60 : < ~~1.27 x 10^-4~~ " < 6.35 E-04 "

CePr144 : < ~~8.23 x 10^-4~~ " < 4.12 E-03 "

Sue Lai

[signature] Bachelor

	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]			See Learn g. [illegible] Card [illegible]
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
8-24-93	11:20	A.K. [signature] 8/25/93	[signature] 8/26

54-6800-061 (R-10-83)

V31-8730:

RuRh106 : < ~~1.87 x 10^-3 uCi/ml~~ < 9.35 E-03 uCi/mL

Nb94 : < ~~9.91 x 10^-5~~ " < 4.96 E-04 "

Eu-154 : < ~~3.87 x 10^-4~~ " < 1.94 E-03 "

Eu-155 : < ~~2.42 x 10^-4~~ " < 1.21 E-03 "

Ra-226 : < ~~1.81 x 10^-3~~ " < 9.05 E-03 "

[signature] Bachelor

BEST AVAILABLE COPY

4192

Serial No	Sample Point	Date	Time Issued	Priority
V 31.-8830	107-AP	8- 3-93	10:40	25

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	N1L17	0

Sample Size	Customer ID
? 0/ml	107AP-FB

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

Duplicate sample

Cs-137: ~~<1.37×10^-4 uCi/ml~~ <6.85 E-04 uCi/ml

Cs-134: ~~<1.07×10^-4~~ " < 5.35 E-04 "

Co-60: ~~<1.11×10^-4~~ " <5.55 E-04 "

CePr144: ~~<8.04×10^-4~~ " < 4.02 E-03 "

Sue Lai

[signature] Bachelor

	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Barela			See leaving in card 0
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
8-24-93	11:20	A.K. [signature] 8/25/93 [signature] 8/26

54-6800-561 (R-10-83)

V31-8830

RuRh106: ~~<1.87×10^-3 uCi/ml~~ <9.35 E-03 uCi/mL

Nb94: ~~<9.91×10^-5~~ " <4.96 E-04 "

Eu-154: ~~<3.66×10^-4~~ " <1.83 E-03 "

Eu-155: ~~<2.35×10^-4~~ " <1.18 E-03 "

Ra-226: ~~<1.81×10^-3~~ " <9.05 E-03 "

[signature] Bachelor

BEST AVAILABLE COPY

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*                                                                   *
*          G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                   *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE **WHC-SD-WM-DP-053 REV 0**

24-AUG-9314:38:14

Rwellis 8-24-93

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 1 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 4 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AND:
ANALYZED BY:

SAMPLE DESCRIPTION: V29-8530
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 24-AUG-93 AT 13:47:43

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3024. SECONDS
DEAD TIME: 0.79 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 30-MAR-93
EFFICIENCY CALIBRATION PERFORMED 1-APR-93

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 879 TO 894.

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	94.19	47.07	1.00	1705.	1253.	10.4	PB-210
2	950.45	475.22	1.35	3666.	462.	38.6	CS-134
3C	1126.23	563.12	1.38	2210.	2578.	6.2	CS-134, EU-152
4C	1138.37	569.19	1.38	2214.	4541.	5.2	CS-134, BI-207
5	1209.14	604.58	1.50	2025.	30514.	1.2	CS-134
6	1322.92	661.48	1.52	1634.	46984.	0.9	CS-137
6B		661.44			159.	5.8	
7C	1591.16	795.63	1.61	1366.	22172.	1.7	CS-134
8C	1603.34	801.72	1.61	1347.	2062.	7.4	CS-134
9C	2334.73	1167.52	1.91	863.	330.	22.8	CS-134
10C	2345.35	1172.84	1.91	776.	26100.	1.4	CO-60
11	2663.65	1332.05	2.10	216.	23524.	1.3	CO-60
12	2729.03	1364.75	1.96	106.	574.	10.0	CS-134
13	2799.66	1400.08	2.32	93.	256.	17.1	BI-214
14	2920.11	1460.34	2.10	68.	786.	7.7	K-40
14B		1460.67			769.	1.7	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0014
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 22-JUL-92 AT 14:00:00
BACKGROUND LIVE TIME: 60000. SECONDS

24-AUG-9314:38:14

SAMPLE: V29-8530
DA COLLECTED ON 24-AUG-93 AT 13:47:43
DEC..ED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	LLD<1.62E+00		LLD<1.62E+00		59.54	
AM-243	LLD<4.31E-01		LLD<4.31E-01		74.67	
BA-133	LLD<4.90E-01		LLD<4.90E-01		356.02	
BA-140	LLD<1.39E+00		LLD<1.39E+00		537.27	
BI-212	LLD<2.86E+00		LLD<2.86E+00		727.20	
CEPR144	LLD<2.40E+00		LLD<2.40E+00		133.51	
CO-60	1.09E+02	+-1.49E+00	1.09E+02	+-1.49E+00	1332.50	-0.45
					1173.24	-0.40
CR-51	LLD<2.76E+00		LLD<2.76E+00		320.09	
CS-134	7.59E+01	+-1.33E+00	7.59E+01	+-1.33E+00	795.84	-0.22
					604.70	-0.12
CS-137	1.37E+02	+-1.45E+00	1.37E+02	+-1.45E+00	661.65	-0.17
EU-152	LLD<7.11E-01		LLD<7.11E-01		1408.01	
EU-154	LLD<6.32E-01		LLD<6.32E-01		1274.45	
EU-154H	LLD<6.27E-01		LLD<6.27E-01		1274.80	
EU-155	LLD<7.39E-01		LLD<7.39E-01		105.31	
FE	LLD<8.69E-01		LLD<8.69E-01		1099.25	
I-[illegible]	LLD<3.80E-01		LLD<3.80E-01		364.48	
K-40	LLD<3.17E+00		LLD<3.17E+00		1460.75	
LA-140	LLD<1.98E-01		LLD<1.98E-01		1596.20	
MN-54	LLD<3.91E-01		LLD<3.91E-01		834.83	
NA-22	LLD<2.14E-01		LLD<2.14E-01		1274.55	
NB-94	LLD<3.26E-01		LLD<3.26E-01		702.63	
NB-95	LLD<3.62E-01		LLD<3.62E-01		765.78	
NP-237	LLD<1.58E+00		LLD<1.58E+00		86.50	
PB-212	LLD<5.21E-01		LLD<5.21E-01		239.00	
PU-239	LLD<2.29E+03		LLD<2.29E+03		129.30	
PU-241	LLD<7.40E+04		LLD<7.40E+04		148.57	
RA-224	LLD<5.74E+00		LLD<5.74E+00		240.99	
RA-226	LLD<5.49E+00		LLD<5.49E+00		186.10	
RU-103	LLD<3.51E-01		LLD<3.51E-01		497.08	
RU103	LLD<3.69E-01		LLD<3.69E-01		497.08	
RURH106	LLD<6.55E+00		LLD<6.55E+00		621.80	
SB-125	LLD<1.17E+00		LLD<1.17E+00		427.89	
SB-125A	LLD<1.17E+00		LLD<1.17E+00		427.89	
SE-75	LLD<3.90E-01		LLD<3.90E-01		264.66	
SN-113	LLD<5.11E-01		LLD<5.11E-01		391.67	
SR-85	LLD<3.38E-01		LLD<3.38E-01		513.99	
TH-228	LLD<1.64E+01		LLD<1.64E+01		84.37	
TL-208	LLD<4.27E-01		LLD<4.27E-01		583.20	
U-235	LLD<3.32E-01		LLD<3.32E-01		185.71	
Y-[illegible]	LLD<1.38E-01		LLD<1.38E-01		1836.06	
ZN [illegible]	LLD<9.83E-01		LLD<9.83E-01		1115.55	
ZR-95	LLD<6.28E-01		LLD<6.28E-01		756.73	
TOTAL	3.21E+02	+-2.46E+00	3.21E+02	+-2.46E+00		

STANDARD DEVIATION = 0.15

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.38E-09 UC/LI
TOTAL MEASURED ACTIVITY = 3.21E+02 (+-2.46E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
94.19	47.07	1253.	10.4	4.46E+01
950.45	475.22	462.	38.6	3.22E+00
1126.23	563.12	2578.	6.2	2.06E+01
1138.37	569.19	4541.	5.2	3.67E+01
1603.34	801.72	2062.	7.4	2.24E+01
2334.73	1167.52	330.	22.8	5.04E+00
2729.03	1364.75	574.	10.0	1.00E+01
2799.66	1400.08	256.	17.1	4.56E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2920.11	1460.34	786.	7.7	1.44E+01

8-25-92

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*          G A M M A   S P E C T R U M   A N A L Y S I S              *
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ANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-053 REV 0

5-AUG-9314:55:01

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 1 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 4 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER ANO:
ANALYZED BY:

SAMPLE DESCRIPTION: V 30-8630 8-24-93
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 24-AUG-93 AT 14:43:00

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3003. SECONDS
DEAD TIME: 0.10 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 30-MAR-93
EFFICIENCY CALIBRATION PERFORMED 1-APR-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	1021.85	510.92	2.37	189.	348.	15.6	RN-222,I-133,
1B		510.83			317.	3.8	TL-208,NA-22,
							ZN-65,RH-106
2	1218.45	609.23	1.53	123.	171.	24.3	BI-214A,
2B		609.18			177.	5.7	RU-103
3	1323.14	661.59	1.17	119.	180.	23.0	CS-137
3B		661.44			159.	5.8	
4	2920.22	1460.39	2.32	34.	881.	6.9	K-40
4B		1460.67			769.	1.7	
5	3526.98	1763.93	1.76	23.	72.	31.5	BI-214C
5B		1764.58			64.	7.3	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0014
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 22-JUL-92 AT 14:00:00
BACKGROUND LIVE TIME: 60000. SECONDS

25-AUG-9314:55:01

SAMPLE: V 30-8650
DA COLLECTED ON 24-AUG-93 AT 14:43:00
DEC...ED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	LLD<5.13E-01		LLD<5.13E-01		59.54	
AM-243	LLD<1.54E-01		LLD<1.54E-01		74.67	
BA-133	LLD<1.47E-01		LLD<1.47E-01		356.02	
BA-140	LLD<3.30E-01		LLD<3.30E-01		537.27	
BI-212	LLD<9.17E-01		LLD<9.17E-01		727.20	
CEPR144	LLD<8.12E-01		LLD<8.12E-01		133.51	
CO-60	LLD<9.81E-02		LLD<9.81E-02		1332.50	
CR-51	LLD<8.17E-01		LLD<8.17E-01		320.09	
CS-134	LLD<1.11E-01		LLD<1.11E-01		795.84	
CS-137	LLD<1.35E-01		LLD<1.35E-01		661.65	
EU-152	LLD<5.87E-01		LLD<5.87E-01		1408.01	
EU-154	LLD<3.00E-01		LLD<3.00E-01		1274.45	
EU-154H	LLD<3.00E-01		LLD<3.00E-01		1274.80	
EU-155	LLD<2.49E-01		LLD<2.49E-01		105.31	
FE-59	LLD<2.15E-01		LLD<2.15E-01		1099.25	
I-131	LLD<9.47E-02		LLD<9.47E-02		364.48	
K-	5.20E+00	+-2.89E+00	5.20E+00	+-2.89E+00	1460.75	-0.36
LA...0	LLD<1.43E-01		LLD<1.43E-01		1596.20	
MN-54	LLD<1.10E-01		LLD<1.10E-01		834.83	
NA-22	LLD<1.00E-01		LLD<1.00E-01		1274.55	
NB-94	LLD<1.07E-01		LLD<1.07E-01		702.63	
NB-95	LLD<9.79E-02		LLD<9.79E-02		765.78	
NP-237	LLD<5.73E-01		LLD<5.73E-01		86.50	
PB-212	LLD<1.80E-01		LLD<1.80E-01		239.00	
PU-239	LLD<7.73E+02		LLD<7.73E+02		129.30	
PU-241	LLD<2.52E+04		LLD<2.52E+04		148.57	
RA-224	LLD<1.88E+00		LLD<1.88E+00		240.99	
RA-226	LLD<1.73E+00		LLD<1.73E+00		186.10	
RU-103	LLD<8.87E-02		LLD<8.87E-02		497.08	
RU103	LLD<9.33E-02		LLD<9.33E-02		497.08	
RURH106	LLD<1.86E+00		LLD<1.86E+00		621.80	
SB-125	LLD<2.79E-01		LLD<2.79E-01		427.89	
SB-125A	LLD<2.79E-01		LLD<2.79E-01		427.89	
SE-75	LLD<1.15E-01		LLD<1.15E-01		264.66	
SN-113	LLD<1.17E-01		LLD<1.17E-01		391.67	
SR-85	LLD<1.36E-01		LLD<1.36E-01		513.99	
TH-228	LLD<5.78E+00		LLD<5.78E+00		84.37	
TL-208	LLD<1.23E-01		LLD<1.23E-01		583.20	
U-235	LLD<1.07E-01		LLD<1.07E-01		185.71	
Y-88	LLD<6.37E-02		LLD<6.37E-02		1836.06	
ZN-65	LLD<3.06E-01		LLD<3.06E-01		1115.55	
ZR	LLD<1.78E-01		LLD<1.78E-01		756.73	
TOTAL	5.20E+00	+-2.89E+00	5.20E+00	+-2.89E+00		

EBAR = 7.01 MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.43E-01 UC/LI

TOTAL MEASURED ACTIVITY = 5.20E+00 (+-2.89E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LD CONFIDENCE LEVEL AT 85.0%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1021.85	510.92	348.	15.6	2.58E+00
1218.45	609.23	171.	24.3	1.46E+00
1323.14	661.59	180.	23.0	1.65E+00
3526.98	1763.93	72.	31.5	1.51E+00

Em Barela
8-24-93

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*          G A M M A   S P E C T R U M   A N A L Y S I S            *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

24-AUG-9318:02:25

WHC-SD-WM-DP-053 REV 0

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 1 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 4 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER ANO:
AN ED BY:

SAMPLE DESCRIPTION: V-31-8730
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 24-AUG-93 AT 17:12:16

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3002. SECONDS
DEAD TIME: 0.07 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 30-MAR-93
EFFICIENCY CALIBRATION PERFORMED 1-APR-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	704.18	352.07	1.58	259.	128.	39.8	PB-214A
1B		351.84			131.	8.8	
2	1022.00	510.99	2.07	180.	344.	15.4	RN-222,I-133,
2B		510.83			317.	3.8	TL-208,NA-22,
							ZN-65,RH-106
3	1165.79	582.90	1.35	150.	108.	38.3	EU-154,
3B		583.05			117.	7.9	TL-208
4	1218.34	609.18	1.32	143.	157.	27.4	BI-214A,
4B		609.18			177.	5.7	RU-103
5	1323.20	661.62	1.79	124.	230.	19.5	CS-137
5B		661.44			159.	5.8	
6	1821.71	910.93	1.25	74.	122.	28.2	AC-228A
6B		910.95			101.	7.7	
7	2920.16	1460.36	2.06	33.	825.	7.2	K-40
7B		1460.67			769.	1.7	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0014
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 22-JUL-92 AT 14:00:00
BACKGROUND LIVE TIME: 60000. SECONDS

24-AUG-9318:02:25

SAMPLE: V-31-8730
DA COLLECTED ON 24-AUG-93 AT 17:12:16
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	LLD<5.18E-01		LLD<5.18E-01		59.54	
AM-243	LLD<1.62E-01		LLD<1.62E-01		74.67	
BA-133	LLD<1.48E-01		LLD<1.48E-01		356.02	
BA-140	LLD<3.71E-01		LLD<3.71E-01		537.27	
BI-212	LLD<9.67E-01		LLD<9.67E-01		727.20	
CEPR144	LLD<8.23E-01		LLD<8.23E-01		133.51	
CO-60	LLD<1.27E-01		LLD<1.27E-01		1332.50	
CR-51	LLD<7.89E-01		LLD<7.89E-01		320.09	
CS-134	LLD<1.12E-01		LLD<1.12E-01		795.84	
CS-137	2.08E-01	+-1.34E-01	2.08E-01	+-1.34E-01	661.65	-0.03
EU-152	LLD<6.23E-01		LLD<6.23E-01		1408.01	
EU-154	LLD<3.87E-01		LLD<3.87E-01		1274.45	
EU-154H	LLD<3.87E-01		LLD<3.87E-01		1274.80	
EU-155	LLD<2.42E-01		LLD<2.42E-01		105.31	
FE-59	LLD<2.29E-01		LLD<2.29E-01		1099.25	
I-131	LLD<1.01E-01		LLD<1.01E-01		364.48	
K-	LLD<3.00E+00		LLD<3.00E+00		1460.75	
LA-140	LLD<1.25E-01		LLD<1.25E-01		1596.20	
MN-54	LLD<1.20E-01		LLD<1.20E-01		834.83	
NA-22	LLD<1.28E-01		LLD<1.28E-01		1274.55	
NB-94	LLD<9.91E-02		LLD<9.91E-02		702.63	
NB-95	LLD<9.60E-02		LLD<9.60E-02		765.78	
NP-237	LLD<5.55E-01		LLD<5.55E-01		86.50	
PB-212	LLD<1.84E-01		LLD<1.84E-01		239.00	
PU-239	LLD<7.68E+02		LLD<7.68E+02		129.30	
PU-241	LLD<2.52E+04		LLD<2.52E+04		148.57	
RA-224	LLD<1.90E+00		LLD<1.90E+00		240.99	
RA-226	LLD<1.81E+00		LLD<1.81E+00		186.10	
RU-103	LLD<9.32E-02		LLD<9.32E-02		497.08	
RU103	LLD<9.80E-02		LLD<9.80E-02		497.08	
RURH106	LLD<1.87E+00		LLD<1.87E+00		621.80	
SB-125	LLD<2.63E-01		LLD<2.63E-01		427.89	
SB-125A	LLD<2.63E-01		LLD<2.63E-01		427.89	
SE-75	LLD<1.18E-01		LLD<1.18E-01		264.66	
SN-113	LLD<1.24E-01		LLD<1.24E-01		391.67	
SR-85	LLD<1.35E-01		LLD<1.35E-01		513.99	
TH-228	LLD<5.91E+00		LLD<5.91E+00		84.37	
TL-208	LLD<1.25E-01		LLD<1.25E-01		583.20	
U-235	LLD<1.10E-01		LLD<1.10E-01		185.71	
Y-88	LLD<1.01E-01		LLD<1.01E-01		1836.06	
ZN-65	LLD<3.48E-01		LLD<3.48E-01		1115.55	
ZR	LLD<1.82E-01		LLD<1.82E-01		756.73	
TOTAL	2.08E-01	+-1.34E-01	2.08E-01	+-1.34E-01		

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.16E-08 UC/LI

TOTAL MEASURED ACTIVITY = 2.08E-01 (+-1.34E-01) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LD CONFIDENCE LEVEL AT 85.0%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
704.18	352.07	128.	39.8	7.17E-01
1022.00	510.99	344.	15.4	2.54E+00
1165.79	582.90	108.	38.3	8.90E-01
1218.34	609.18	157.	27.4	1.34E+00
1821.71	910.93	122.	28.2	1.49E+00
2920.16	1460.36	825.	7.2	1.51E+01

Em Barela
8-24-93

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* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                   *
*          G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                   *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

24-AUG-9318:57:53

WHC-SD-WM-DP-053 REV 0

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 1 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 4 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AND:
AN ZED BY:

SAMPLE DESCRIPTION: V-31-8830
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 24-AUG-93 AT 18:07:44

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3002. SECONDS
DEAD TIME: 0.07 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 30-MAR-93
EFFICIENCY CALIBRATION PERFORMED 1-APR-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	703.82	351.89	1.22	263.	148.	35.3	PB-214A
1B		351.84			131.	8.8	
2C	1021.87	510.93	2.79	276.	428.	16.9	RN-222,I-133,
2B		510.83			317.	3.8	TL-208,NA-22, ZN-65,RH-106
3	1166.23	583.12	1.13	141.	94.	41.2	EU-154,
3B		583.05			117.	7.9	TL-208
4	1218.35	609.19	1.10	145.	166.	26.2	BI-214A,
4B		609.18			177.	5.7	RU-103
5	1323.04	661.54	1.87	126.	185.	23.0	CS-137
5B		661.44			159.	5.8	
6	1821.59	910.87	2.07	77.	95.	34.4	AC-228A
6B		910.95			101.	7.7	
7	2920.43	1460.49	2.62	24.	798.	7.2	K-40
7B		1460.67			769.	1.7	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0014
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 22-JUL-92 AT 14:00:00
BACKGROUND LIVE TIME: 60000. SECONDS

24-AUG-9318:57:53

SAMPLE: V-31-8830

DA COLLECTED ON 24-AUG-93 AT 18:07:44
DEC...ED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	LLD<5.09E-01		LLD<5.09E-01		59.54	
AM-243	LLD<1.59E-01		LLD<1.59E-01		74.67	
BA-133	LLD<1.43E-01		LLD<1.43E-01		356.02	
BA-140	LLD<3.68E-01		LLD<3.68E-01		537.27	
BI-212	LLD<7.71E-01		LLD<7.71E-01		727.20	
CEPR144	LLD<8.04E-01		LLD<8.04E-01		133.51	
CO-60	LLD<1.11E-01		LLD<1.11E-01		1332.50	
CR-51	LLD<7.88E-01		LLD<7.88E-01		320.09	
CS-134	LLD<1.07E-01		LLD<1.07E-01		795.84	
CS-137	LLD<1.37E-01		LLD<1.37E-01		661.65	
EU-152	LLD<5.68E-01		LLD<5.68E-01		1408.01	
EU-154	LLD<3.66E-01		LLD<3.66E-01		1274.45	
EU-154H	LLD<3.95E-01		LLD<3.95E-01		1274.80	
EU-155	LLD<2.35E-01		LLD<2.35E-01		105.31	
FE-59	LLD<2.01E-01		LLD<2.01E-01		1099.25	
I-131	LLD<1.01E-01		LLD<1.01E-01		364.48	
K-[illegible]	LLD<2.95E+00		LLD<2.95E+00		1460.75	
LA[illegible]	LLD<1.13E-01		LLD<1.13E-01		1596.20	
MN-54	LLD<9.96E-02		LLD<9.96E-02		834.83	
NA-22	LLD<1.21E-01		LLD<1.21E-01		1274.55	
NB-94	LLD<9.91E-02		LLD<9.91E-02		702.63	
NB-95	LLD<1.07E-01		LLD<1.07E-01		765.78	
NP-237	LLD<5.30E-01		LLD<5.30E-01		86.50	
PB-212	LLD<1.78E-01		LLD<1.78E-01		239.00	
PU-239	LLD<7.53E+02		LLD<7.53E+02		129.30	
PU-241	LLD<2.45E+04		LLD<2.45E+04		148.57	
RA-224	LLD<1.86E+00		LLD<1.86E+00		240.99	
RA-226	LLD<1.81E+00		LLD<1.81E+00		186.10	
RU-103	LLD<8.63E-02		LLD<8.63E-02		497.08	
RU103	LLD<9.08E-02		LLD<9.08E-02		497.08	
RURH106	LLD<1.87E+00		LLD<1.87E+00		621.80	
SB-125	LLD<2.94E-01		LLD<2.94E-01		427.89	
SB-125A	LLD<2.94E-01		LLD<2.94E-01		427.89	
SE-75	LLD<1.22E-01		LLD<1.22E-01		264.66	
SN-113	LLD<1.22E-01		LLD<1.22E-01		391.67	
SR-85	LLD<1.30E-01		LLD<1.30E-01		513.99	
TH-228	LLD<6.16E+00		LLD<6.16E+00		84.37	
TL-208	LLD<1.26E-01		LLD<1.26E-01		583.20	
U-235	LLD<1.10E-01		LLD<1.10E-01		185.71	
Y-88	LLD<7.66E-02		LLD<7.66E-02		1836.06	
ZN-65	LLD<3.53E-01		LLD<3.53E-01		1115.55	
ZR	LLD<1.82E-01		LLD<1.82E-01		756.73	
TOTAL	0.00E-01	+-0.00E-01	0.00E-01	+-0.00E-01		

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1021.87	510.93	111.	66.0	8.21E-01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
703.82	351.89	148.	35.3	8.26E-01
1166.23	583.12	94.	41.2	7.78E-01
1218.35	609.19	166.	26.2	1.42E+00
1323.04	661.54	185.	23.0	1.70E+00
1821.59	910.87	95.	34.4	1.16E+00
2920.43	1460.49	798.	7.2	1.46E+01