012193 857
4 of 10

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

222-S/RCRA Analytical Laboratories

9 1 1 2 9 5 0 1 0 5 7

Project: Single-Shell Tank Waste Characterization

Tank: 241-U-110

Core: 6

Segment: 4

Customer Id. Number: 89-045

AUG 1990
RECEIVED
J.H. KESSNER

Report Revision: 1

Date Printed: August 24, 1990

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Appendix A Analytical Analysis Cards

I have reviewed this report and certify that the package is in compliance with Quality Assurance Project Plan - WHC-SD-CP-QAPP-002. I found it to be a true and accurate accounting both technically and for completeness of the laboratory analyses performed on this sample.

Shirley Cervantes — Date August 24, 1990
Shirley A. Cervantes
Data Coordinator

Cary M Seidel — Date Aug 24, 1990
Cary M. Seidel
Unit Manager

L. H. Taylor — Date Aug 30, 1990
Larry H. Taylor
Laboratory Q.A. Officer

INTRODUCTION

INTRODUCTION

Westinghouse Hanford Company 222-S/RCRA Analytical Laboratories are supporting the characterization efforts of the single shell tanks. The characterization of tank 241-U-110 was performed under Phase 1A and 1B of the Waste Characterization Plan for the Hanford Site Single-Shelled Tanks (WHC-EP-0210).

Tank 241-U-110 has a 500,000 gallon capacity, construction was completed in 1944. The tank received first cycle waste, REDOX high-level waste, coating waste, and laboratory waste until 1975. Between July 7, 1975 and February 2, 1976, P-10 pumps were installed, and 41,700 gallons of liquid waste were pumped from the tank. Tank 241-U-110 still contains an estimated 195,000 gallons of waste.

Analytical Laboratories performs all analytical analysis to the specifications of the Quality Assurance Project Plan, WHC-SD-CP-QAPP-002. In accordance with WHC-SD-CP-QAPP-002 the following laboratory policies are being followed. Spikes are performed on either the undissolved sample, or the sample after dissolution as directed by the chemist. If the spike addition is found to be less than 20% of an analyte concentration, the spike recovery is not reported due to errors introduced by the precision of the sample analysis. The concentration of spike additions will be re-evaluated before the start of phase 1C. Two spiking routines are being used during phase 1A and 1B. For the following analyses, Ion Chromatography, Inductively Coupled Plasma, Mercury Hydride, Total Organic Carbon, and Carbonate analyses the solid sample is spiked independently from the sample digestion. Any non-homogeneity of the sample could adversely affect the spike recoveries. For the radio-isotopic analysis and other analyses not specified above the spikes were preformed by spiking an aliquot of sample after digestion.

The laboratory does not report sample results from batch analyses that are questionable. The results from questionable batches are discarded and the analysis is repeated. Sample cards (laboratory travelers) for the repeated analysis are reissued for analysis after they have been stamped "rerun". Laboratory travelers are issued using a computerized routine according to a "sample point". This sample point label (segment-n) on the Laboratory travelers and on the GEA analysis reports has no relationship to the sampling activities or the sample identification. All results in this data package relate only to the sample identified as segment 4 from core 6 taken from tank 241-U-110.

The organic analysis of this sample will be performed by Pacific Northwest Laboratories (PNL). Due to instrument and procedure problems, PNL has been unable to separate organics from the normal paraffin hydrocarbon present in the samples. The results from the organic analysis will be provided when available.

Samples analyzed for Total Organic Carbon between November 1, 1989 and February 22, 1990 were not acidified. The results from these analyses include total organic carbon, carbonate, and dissolved carbon dioxide from the air. The validity of these analysis are subject to interpretation. The total organic carbon procedure was corrected and these analyses will be repeated wherever possible.

All sample results reported here by weight are reported as the "wet weight" of the sample. Some samples did noticeably lose moisture during the process of aliquoting and weighing the sample for digestion. In order to minimize errors due to loss of moisture, the percent moisture was determined at the earliest opportunity. Attempts to dry the sample before analysis resulted in approximately a ten fold increase in radiation levels. In order to reduce and control radiation exposure to laboratory personnel the samples were not dried before aliqouting and digestion. This may result in some laboratory results being biased high.

This report is formatted into sections corresponding to the type of dissolutions performed prior to analysis. A brief summary of analytical results is reported, followed by calibration data and an analysis batch report. Any notable observations regarding an analysis are noted on the batch report for that analysis. Copies of laboratory travelers can be found in Appendix A.

SAMPLING AND CUSTODY DATA

9 1 1 2 2 5 0 1 0 7 4

Lab segment Serial #
F0101

9 1 1 2 9 6 0 1 0 7 5

CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number S-024-89 (2) Sample Number 89-045 (3) Supervisor D.C. Hartley

(4) Tank 110U (5) Riser 17 (6) Segment #4 (7) Cask Serial Number 1003C

Radiation Survey Data:	(8) FIELD	(20) LABORATORY
Over Top Dose Rate	<.5mr/HR	<.5mR/hr
Side Dose Rate	2 mr/HR	2mR/hr
Bottom Dose Rate	1mr/HR	1mR/hr
Smearable Contamination	<DET. (alpha)	<Det (alpha)
	<DET. (beta-gamma)	<Det (beta-gamma)
	RPT R Sain (Signature)	RPT D. Arnold (Signature)

(9) Shipment Description:

A. Work Package Number	2W-89-0098W
B. Cask Seal Number	For Future Use
C. Sampler Number Used	#49
D. Date and Time Sampler Unseated	11-14-89, 1730
E. Expected Liquid Content	20%
F. Expected Solid Content	80%
G. Dose Rate Through Drill String	70mr/HR.
H. Expected Sample Length	19"

(10) INFORMATION *(Include statement of laboratory tests to be performed.*)*

Core #006, WHC-EP-0210, Waste Characterization Plan for the Hanford Site Single Shell Tank

*Reference laboratory work request, if available.

Comments:

(11) POINT OF ORIGIN	(12) SENDER NAME / SENDER SIGNATURE	(13) DATE AND TIME RELEASED	(14) DESTINATION	(16) RECIPIENT NAME / RECIPIENT SIGNATURE	(17) DATE AND TIME RECEIVED
241-U 116	D.C. Hartley / DC Hartley	11-15-89 1025	222S LABS. 200 West	C. M. Seidel / Carry M Seidel	1045 11-15-89

(15) Seal Intact Upon Release?	(18) Seal Intact Upon Receipt?	(19) Seal Data Consistent with this Record? Shipment No.	Sample No.
☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No

Single Shell Tank Waste Characterization
Summary of Core Sample

Phase I-A

Tank ID:	241-U-110
Riser ID:	17
Core ID:	006

Date Sampling Initiated:	11/10/90
Date Sampling Completed:	11/14/90

Segment 1	Lab Serial No.	F0029
	Customer ID. No.	89-042
	Last Segment?	No
Segment 2	Lab Serial No.	F0053
	Customer ID. No.	89-043
	Last Segment?	No
Segment 3	Lab Serial No.	F0077
	Customer ID. No.	89-044
	Last Segment?	No
Segment 4	Lab Serial No.	F0101
	Customer ID. No.	89-045
	Last Segment?	Yes
Segment 5	Lab Serial No.	
	Customer ID. No.	
	Last Segment?	
Segment 6	Lab Serial No.	
	Customer ID. No.	
	Last Segment?	
Segment 7	Lab Serial No.	
	Customer ID. No.	
	Last Segment?	

Segment 8	Lab Serial No.	
	Customer ID. No.	
	Last Segment?	
Segment 9	Lab Serial No.	
	Customer ID. No.	
	Last Segment?	
Segment 10	Lab Serial No.	
	Customer ID. No..	
	Last Segment?	
Segment 11	Lab Serial No.	
	Customer ID. No.	
	Last Segment?	
Segment 12	Lab Serial No.	
	Customer ID. No.	
	Last Segment?	
Segment 13	Lab Serial No.	
	Customer ID. No.	
	Last Segment?	
Segment 14	Lab Serial No.	
	Customer ID. No.	
	Last Segment?	

REMARKS: CUSTOMER ID# 89-042 WAS RECEIVED EMPTY.

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 07/07/90

Verified by: Carey M Seidel (Signature) C. M. Seidel (Printed Name) Date: 07/07/90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

9112151076

Interim

SST-1 Rev. B 3/27/90

SAMPLE DATA SUMMARY

9 1 1 2 2 5 2 1 0 7 7

SUMMARY DATA REPORT

Tank	241-U-110
Core	6
Segment	4
Customer ID	89-045

Untreated Sample

	Sample	Duplicate
pH	11.96	12.22
Percent Water	38.50 %	37.30 %

Fusion Analysis

Total Alpha	<0.517 uci/g	<0.873 uci/g
Total Beta	84.6 uci/g	86.0 uci/g
GEA		
Cs-137	18.7 uci/g	23.4 uci/g
Uranium	1390 ug/g	1310 ug/g
	1080 ug/g	

Water Digestion

Fluoride	17200 ug/g	18600 ug/g
Chloride	<953 ug/g	<979 ug/g
Nitrate	25500 ug/g	26600 ug/g
Phosphate	146000 ug/g	159000 ug/g
Sulfate	4060 ug/g	<9790 ug/g
Total Organic Carbon *	726 ug/g	693 ug/g

*Samples were acidified before analysis

LT Less Than Detection Limit

Acid Digestion

	Wet Weight Sample	Wet Weight Sample Duplicate
Aluminum	45520 ug/g	52568 ug/g
Antimony	LT	LT
Arsenic	LT	LT
Barium	LT	LT
Beryllium	LT	LT
Bismuth	21590 ug/g	26620 ug/g
Boron	LT	LT
Cadmium	LT	LT
Calcium	295 ug/g	1113 ug/g
Cerium	LT	LT
Chromium	119 ug/g	188 ug/g
Copper	LT	LT
Iron	14837 ug/g	16885 ug/g
Lanthanum	LT	LT
Lead	LT	602 ug/g
Magnesium	479 ug/g	449 ug/g
Manganese	156 ug/g	269 ug/g
Mercury	LT	LT
Molybdenum	LT	LT
Nickel	LT	LT
Phosphorous	53626 ug/g	47284 ug/g
Potassium	LT	LT
Samarium	LT	LT
Selenium	LT	LT
Silver	LT	LT
Sodium	187906 ug/g	168975 ug/g
Strontium	120 ug/g	106 ug/g
Sulfur	113 ug/g	278 ug/g
Tantalum	LT	LT
Thallium	LT	LT
Thorium	LT	LT
Tin	LT	LT
Titanium	LT	LT
Uranium	LT	LT
Vanadium	LT	LT
Zinc	142 ug/g	5380 ug/g
Zirconium	LT	97 ug/g

revised August 24, 1990

PHYSICAL TEST RESULTS

Single Shell Tank
Extrusion of Segment -- Physical Tests

Phase I-A

Lab Segment Serial No.: F-0101 Customer ID: 89-045

Analyst: RICHARD L. WEISS Date Extruded: 11-16-89

Drainable Liquid Liquid Submitted for Segment Analysis? -- No

Gross 25mL	Tare	Net
Serial	Date/Time_____/_____	Estimated
Specific	Calculated	

Appearance of Liquid:

Dimensions of Segment

Complete Segment Obtained? NO	Length: 6.0 in	Calculated Volume: 4.71 cubic in
Remarks		

Appearance of Solid:

SAMPLE DARK BROWN GRADING UPWARD TO MEDIUM BROWN. GRANULAR LOOKING THROUGHOUT SAMPLE. MOIST AND STICKY APPEARANCE AT THE BOTTOM; GRADING UPWARDS TO CRUMBLY AND NON-COHESIVE AT THE TOP.

Penetrometer 10 lbs/sq in Remarks:

Homogenization

Procedure: T038A-00712 Revision: F	Quantity of Material 138.63 grams
Date Homogenized: 12-29-89	Time Homogenized: 5 Minutes
Opperator: JOHN R. SMITH (65286)	

Laboratory Notebook Reference WHC-N-313-4 (Notebook No.) 13 (Page No.)

Prepared by: [signature] Signature	HERLENE S. RICH Printed Name	Date:	6-01-90
Verified by: Carry M Seidel Signature	C.M. SEIDEL Printed Name	Date:	6-01-90
Approved by: [signature] Signature	L.H. Taylor Printed Name	Date:	08-30-90

Interim

SST-3 Rev. C 3/27/90

12

Single Shell Tank Segment -- Subsamples	Phase 1A

Customer ID: 89-045 Lab Segment Serial No. F0101

Volatile Organic Analysis		
VOA Sample	Laboratory Serial Number: 89-045-36	Date Sampled: 11/15/89

Particle Size Distribution Analysis		
Particle Size Sample	Laboratory Serial Number: F0101	Date Sampled: 11/16/89

Homogenized Solids

Undigested Solids Analysis		
Laboratory Serial Number for Sample:	F0101	Date Sampled: 11/16/89
Laboratory Serial Number of Duplicate Sample:	F0102	

Fusion Analysis of Solids		
Laboratory Serial Number for Sample:	F0107	Date Sampled: 11/16/89
Laboratory Serial Number of Duplicate Sample::	F0108	
Laboratory Serial Number of Spiked Sample:		

Acid Digestion Analysis of Solids		
Laboratory Serial Number for Sample:	F0116	Date Sampled: 11/16/89
Laboratory Serial Number of Duplicate Sample:	F0117	
Laboratory Serial Number of Spiked Sample:	F0118	

Water Digestion Analysis of Solids		
Laboratory Serial Number for Sample:	F0111	Date Sampled 11/16/89
Laboratory Serial Number of Duplicate Sample:	F0112	
Laboratory Serial Number of Spiked Sample:	F0113	

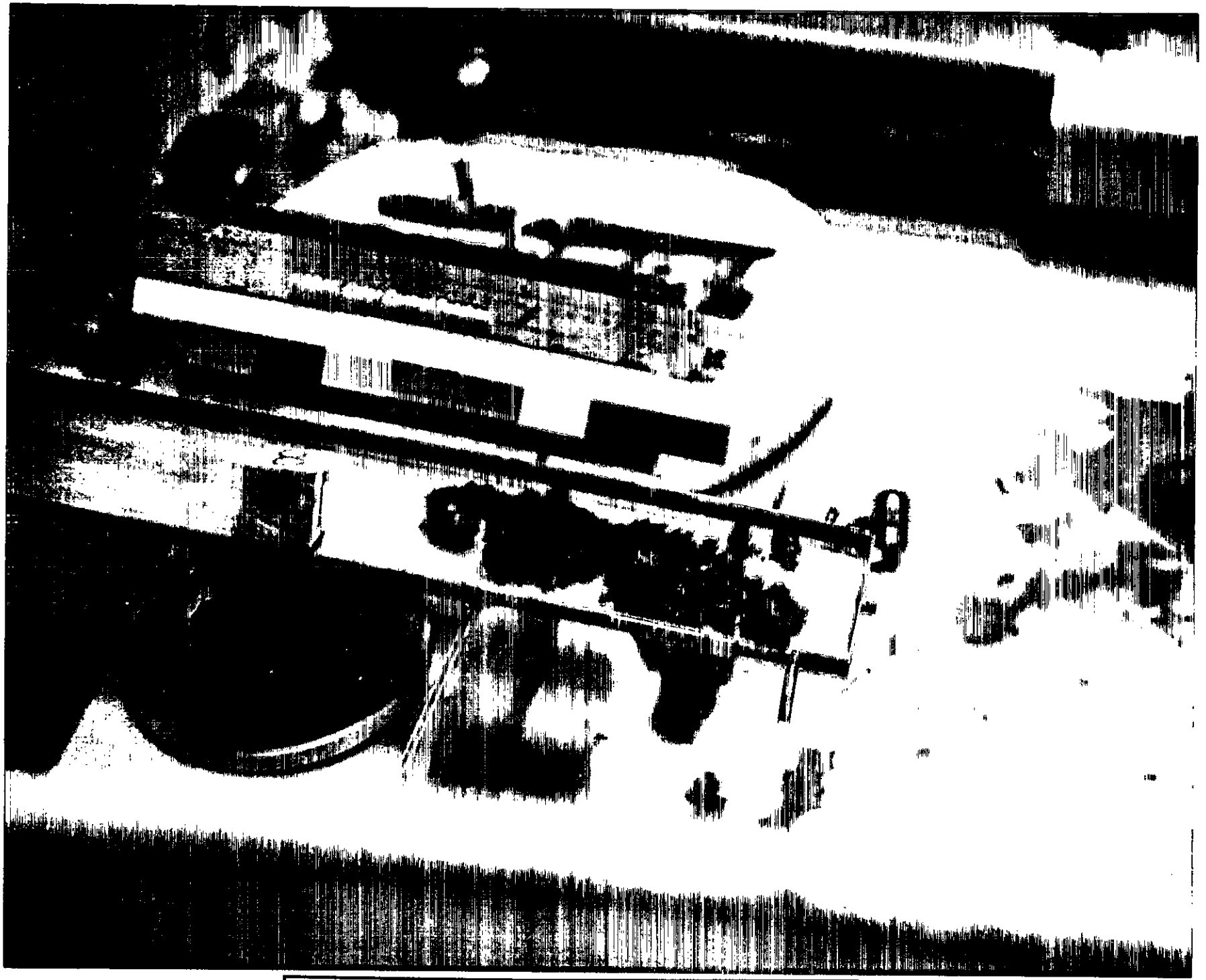
Laboratory Notebook Reference

WHC-N-313-4	13
Notebook No.	Page No.

Prepared by: Shirley Cervantes (Signature)	S. A. Cervantes (Printed Name)	Date: 06-06-90
Verified by: Carry M Siedel (Signature)	C. M. Siedel (Printed Name)	Date: 06-06-90
Approved by: L.H. Taylor (Signature)	L.H. Taylor (Printed Name)	Date: 08-30-90

SST-17 Rev.A 04/24/90

9112250191



TANK 241-U-110 CORE 6 SEGMENT 4

B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

STATISTICS

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.001

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 379228
TIME	: 08:14	ACQ. MODE	: SAMPLE	S.N.F.	: 0.72
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 1873 SEC	S.D.U.	: 4694
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 5	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 2.9E-03 %

	MEAN Diameter	S.D.
Number, Length :	1.17 µm	0.89 µm
Number, Area :	1.47 µm	0.94 µm
Number, Volume :	2.04 µm	1.25 µm
Length, Area :	1.85 µm	1.95 µm
Length, Volume :	2.69 µm	2.13 µm
Area, Volume :	3.91 µm	5.23 µm
Volume, Moment :	10.90 µm	14.11 µm

	MEDIAN Diameter	MODE	CONFIDENCE
Number :	0.90 µm	0.75 µm	100.00%
Area :	2.65 µm	4.75 µm	100.00%
Volume :	5.47 µm	4.75 µm	99.92%

Sample red-brown, mushy, with hard ~~lumps~~ lumps
Dispersed well in H_2O, nil agglomeration
Dispersed particles < 150 µ

B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.001

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 379228
TIME	: 08:14	ACQ. MODE	: SAMPLE	S.N.F.	: 0.72
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 1873 SEC	S.D.U.	: 4694
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 5	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 2.9E-03 %

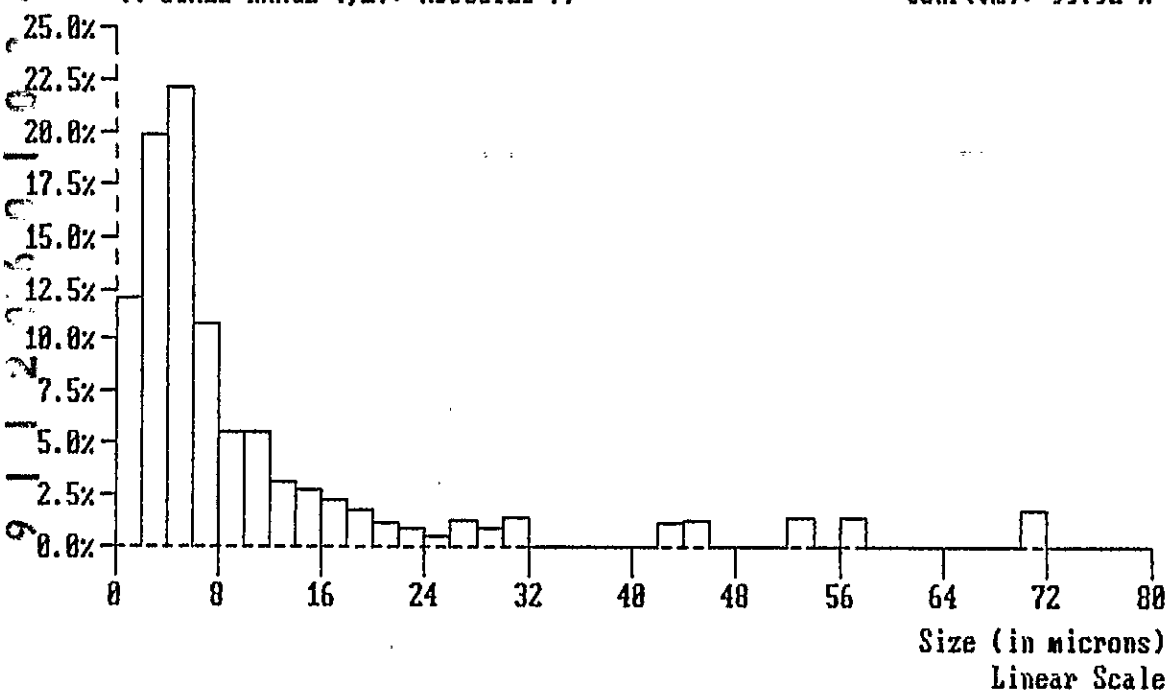
PROBABILITY VOLUME DENSITY GRAPH

Name: SST,B000029,F0101,H20.SBK
2.9E-05 cc/ml(100.0%)
Mode at 5.00 µm

Mean(nv): 2.04µm
S.D.(nv): 1.25µm

Median : 5.47µm
Mean(vm): 10.90µm
S.D.(vm): 14.11µm
Conf(vm): 99.92 %

<< SCALE RANGE (µm): ADJUSTED >>



B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.001

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 379228
TIME	: 08:14	ACQ. MODE	: SAMPLE	S.N.F.	: 0.72
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 1873 SEC	S.D.U.	: 4694
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 5	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 2.9E-03 %

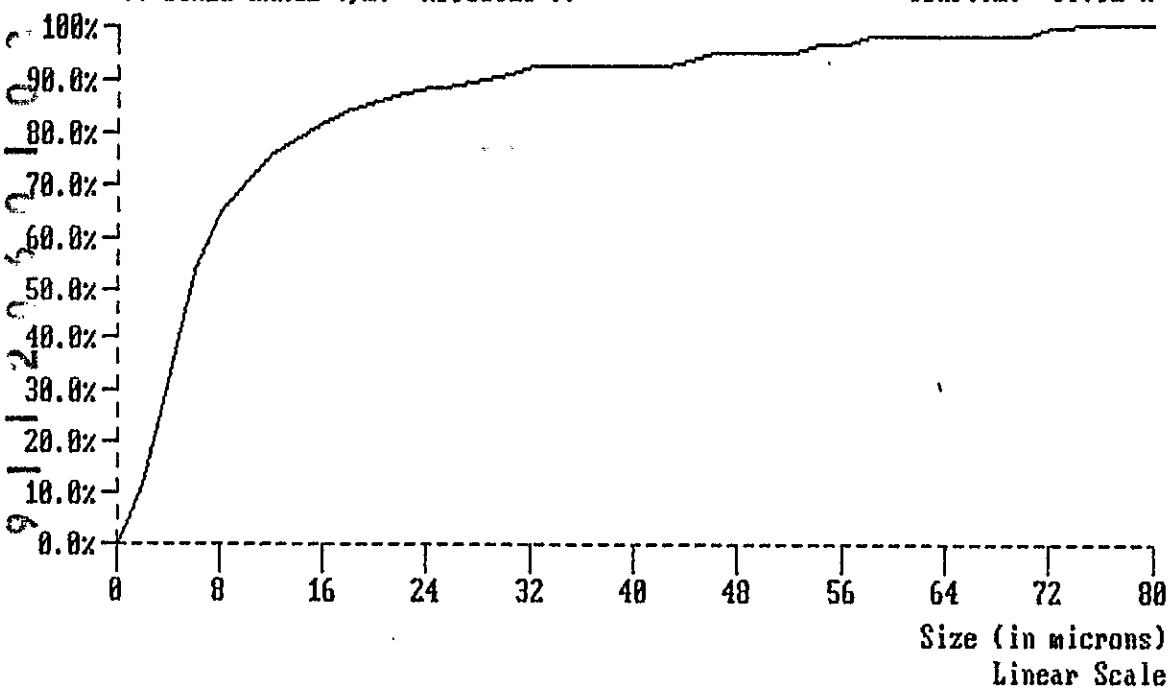
PROBABILITY VOLUME DISTRIBUTION GRAPH

Name: SST,B000029,F0101,H20.SBK
2.9E-05 cc/ml(100.0%)

Mean(nv): 2.04µm
S.D.(nv): 1.25µm

Median : 5.47µm
Mean(vm): 10.90µm
S.D.(vm): 14.11µm
Conf(vm): 99.92 %

<< SCALE RANGE (µm): ADJUSTED >>



B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.001

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 379228
TIME	: 08:14	ACQ. MODE	: SAMPLE	S.N.F.	: 0.72
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 1873 SEC	S.D.U.	: 4694
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 5	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 2.9E-03 %

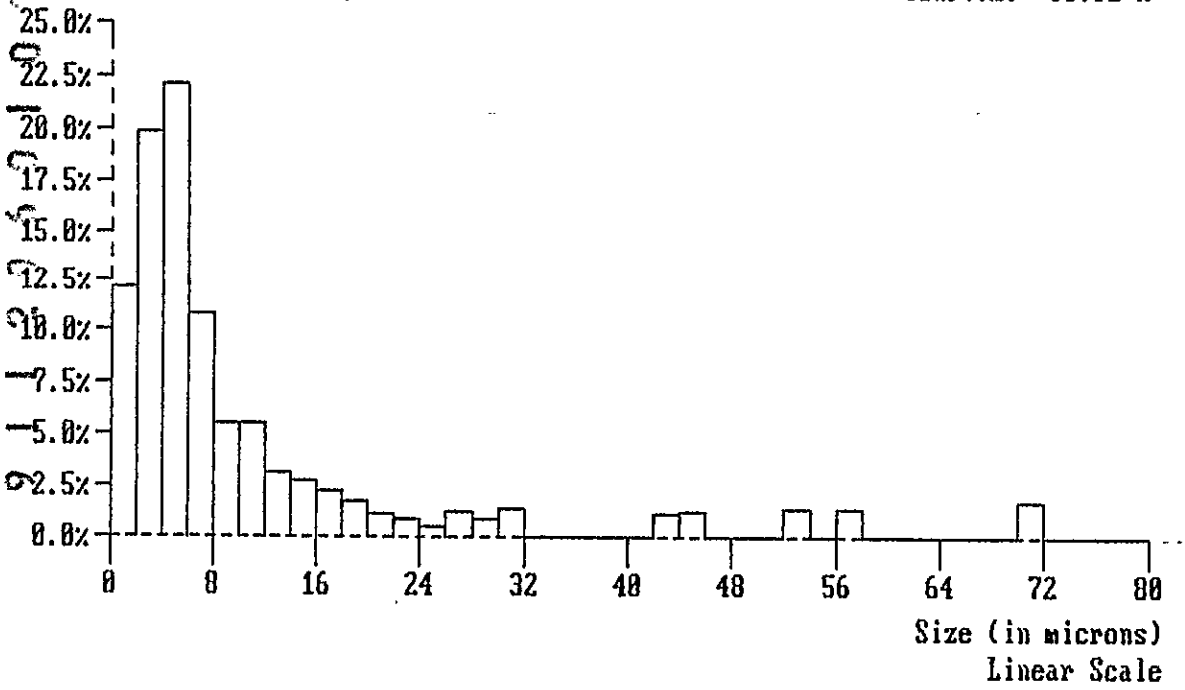
PROBABILITY VOLUME DENSITY GRAPH

Name: SST,B000029,F0101,H20.SBK
2.9E-05 cc/ml(100.0%)
Mode at 5.00 µm

Mean(nv): 2.04µm
S.D.(nv): 1.25µm

Median : 5.47µm
Mean(vm): 10.90µm
S.D.(vm): 14.11µm
Conf(vm): 99.92 %

<< SCALE RANGE (µm): ADJUSTED >>



B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.001

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 379228
TIME	: 08:14	ACQ. MODE	: SAMPLE	S.N.F.	: 0.72
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 1873 SEC	S.D.U.	: 4694
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 5	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 2.9E-03 %

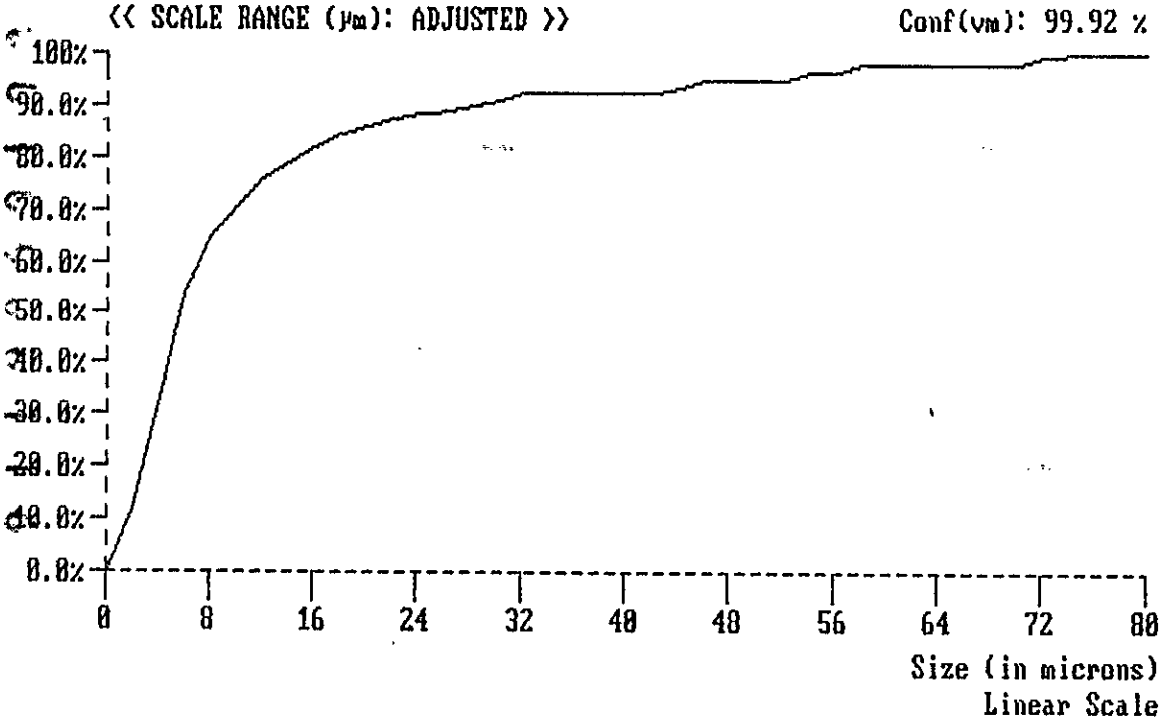
PROBABILITY VOLUME DISTRIBUTION GRAPH

Name: SST,B000029,F0101,H20.SBK
2.9E-05 cc/ml(100.0%)

Mean(nv): 2.04µm
S.D.(nv): 1.25µm

Median : 5.47µm
Mean(vm): 10.90µm
S.D.(vm): 14.11µm
Conf(vm): 99.92 %

<< SCALE RANGE (µm): ADJUSTED >>



B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

STATISTICS

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.002

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-60	COUNTS	: 96549
TIME	: 08:49	ACQ. MODE	: SAMPLE	S.N.F.	: 0.84
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 494 SEC	S.D.U.	: 5496
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 1.6E-03 %

		MEAN Diameter	S.D.
Number, Length	:	0.96 µm	0.75 µm
Number, Area	:	1.22 µm	0.80 µm
Number, Volume	:	1.69 µm	1.05 µm
Length, Area	:	1.55 µm	1.63 µm
Length, Volume	:	2.25 µm	1.78 µm
Area, Volume	:	3.27 µm	3.41 µm
Volume, Moment	:	6.83 µm	5.53 µm

		MEDIAN Diameter	MODE	CONFIDENCE
Number	:	0.75 µm	0.55 µm	100.00%
Area	:	2.13 µm	4.49 µm	98.89%
Volume	:	4.90 µm	18.88 µm	99.25%

B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

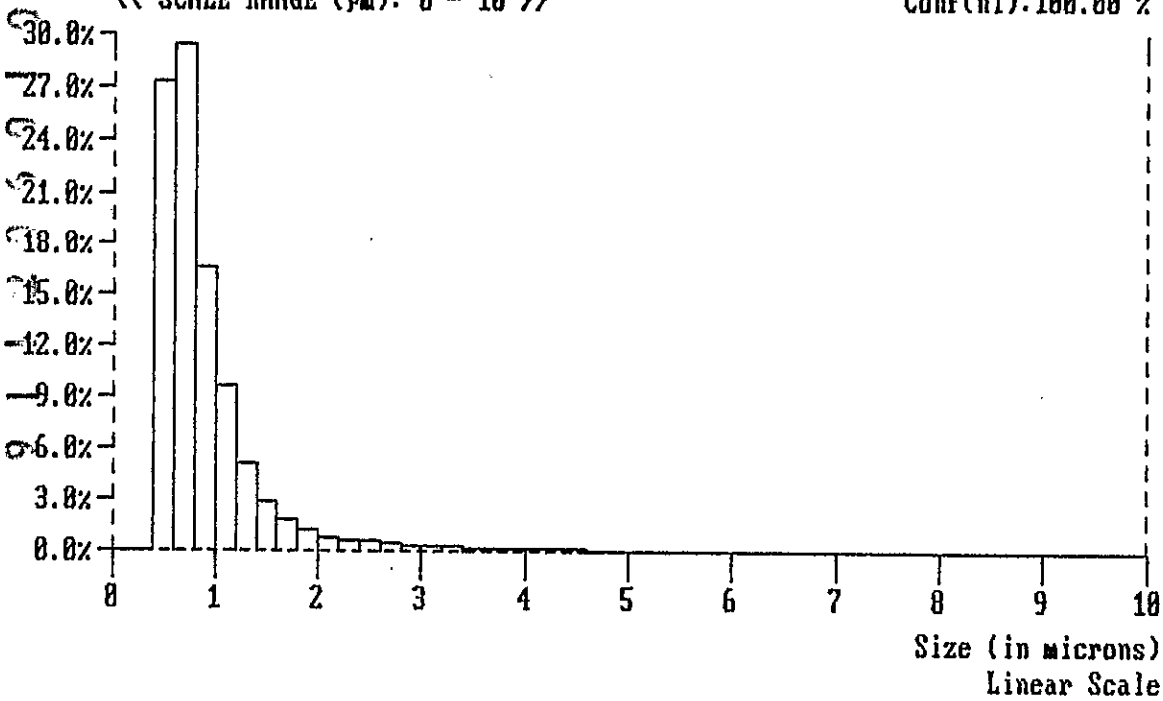
SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.002

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-60	COUNTS	: 96549
TIME	: 08:49	ACQ. MODE	: SAMPLE	S.N.F.	: 0.84
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 494 SEC	S.D.U.	: 5496
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 1.6E-03 %

PROBABILITY NUMBER DENSITY GRAPH

Name: SST,B000029,F0101,H20.SBK
6.5E+06 #/ml(100.0%)
Mode at 0.70 µm
<< SCALE RANGE (µm): 0 - 10 >>

Median : 0.75µm
Mean(nl): 0.95µm
S.D.(nl): 0.71µm
Conf(nl):100.00 %



B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.002

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-60	COUNTS	: 96549
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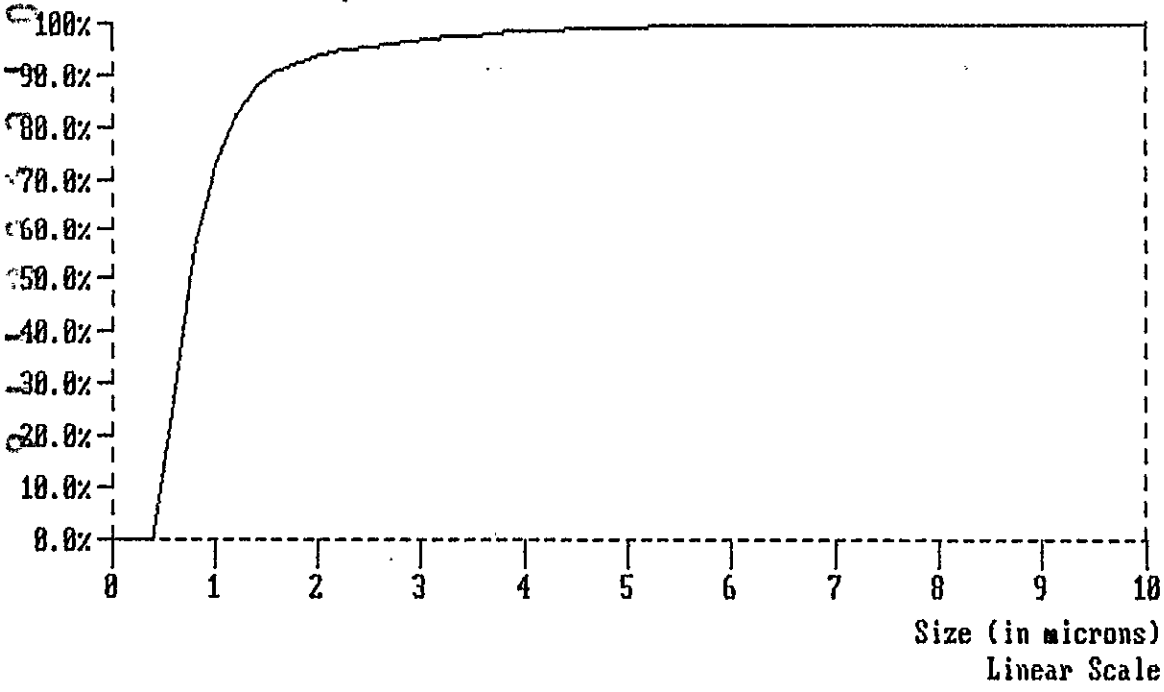
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 494 SEC	S.D.U.	: 5496
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 1.6E-03 %

PROBABILITY NUMBER DISTRIBUTION GRAPH

Name: SST,B000029,F0101,H20.SBK
6.5E+06 #/ml(100.0%)

Median : 0.75µm
Mean(nl): 0.95µm
S.D.(nl): 0.71µm
Conf(nl):100.00 %

<< SCALE RANGE (µm): 0 - 10 >>



B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS
VIA BRINKMANN 2010
STATISTICS

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.002

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-60	COUNTS	: 96549
TIME	: 08:49	ACQ. MODE	: SAMPLE	S.N.F.	: 0.84
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 494 SEC	S.D.U.	: 5496
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 1.6E-03 %

	MEAN Diameter	S.D.

B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS
VIA BRINKMANN 2010
STATISTICS

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.001

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 379228
TIME	: 08:14	ACQ. MODE	: SAMPLE	S.N.F.	: 0.72
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 1873 SEC	S.D.U.	: 4694
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 5	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 2.9E-03 %

		MEAN Diameter	S.D.
Number, Length	:	1.17 µm	0.89 µm
Number, Area	:	1.47 µm	0.94 µm
Number, Volume	:	2.04 µm	1.25 µm
Length, Area	:	1.85 µm	1.95 µm
Length, Volume	:	2.69 µm	2.13 µm
Area, Volume	:	3.91 µm	5.23 µm
Volume, Moment	:	10.90 µm	14.11 µm

		MEDIAN Diameter	MODE	CONFIDENCE
Number	:	0.90 µm	0.75 µm	100.00%
Area	:	2.65 µm	4.75 µm	100.00%
Volume	:	5.47 µm	4.75 µm	99.92%

23 Sample red-brown, mushy with bad lumps

B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS
VIA BRINKMANN 2010

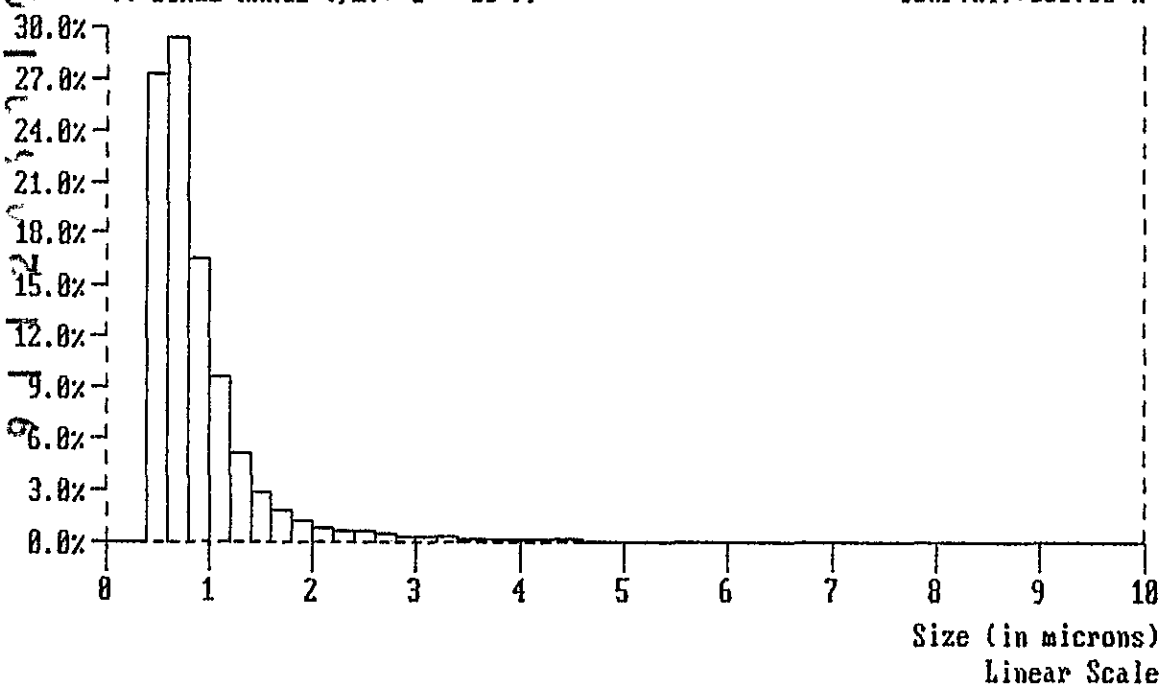
SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.002

DATE	: 04/12/1989	ACQ. RANGE	: 0.5-60	COUNTS	: 96549
TIME	: 08:49	ACQ. MODE	: SAMPLE	S.N.F.	: 0.84
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 494 SEC	S.D.U.	: 5496
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 1.6E-03 %

PROBABILITY NUMBER DENSITY GRAPH

Name: SST,B000029,F0101,H20.SBK
6.5E+06 #/ml(100.0%)
Mode at 0.70 µm
<< SCALE RANGE (µm): 0 - 10 >>

Median : 0.75µm
Mean(nl): 0.95µm
S.D.(nl): 0.71µm
Conf(nl):100.00 %



B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

SAMPLE NAME : SST,B000029,F0101,H20.SBK
FILE NAME : F0101.002

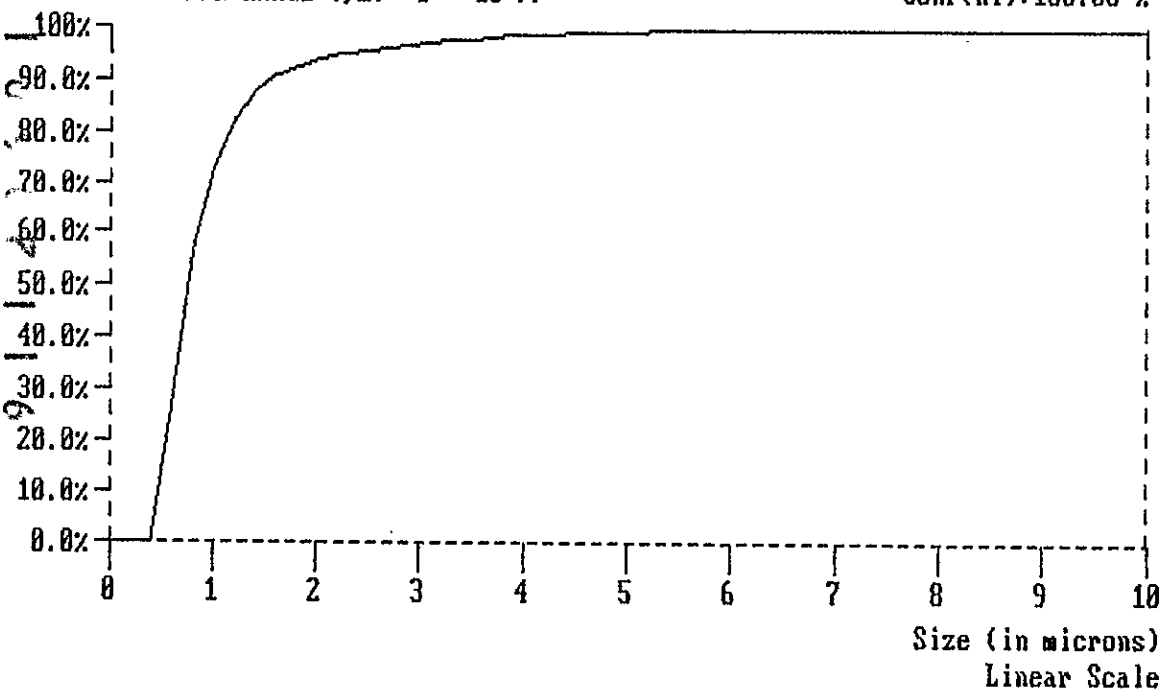
DATE	: 04/12/1989	ACQ. RANGE	: 0.5-60	COUNTS	: 96549
TIME	: 08:49	ACQ. MODE	: SAMPLE	S.N.F.	: 0.84
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 494 SEC	S.D.U.	: 5496
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.5E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 1.6E-03 %

PROBABILITY NUMBER DISTRIBUTION GRAPH

Name: SST,B000029,F0101,H20.SBK
6.5E+06 #/ml(100.0%)

Median : 0.75µm
Mean(nl): 0.95µm
S.D.(nl): 0.71µm
Conf(nl):100.00 %

<< SCALE RANGE (µm): 0 - 10 >>



UNDIGESTED SAMPLE ANALYSIS

9 1 1 2 0 5 0 1 0 2 4

Single Shell Tank Project

Untreated Sample Results

Tank: 241-U-110
Core: 6
Segment: 4
Customer ID: 89-045

	Check Standard	Blank	Sample	Sample Duplicate	Check Standard
Laboratory ID:	F0100	F0121	F0101	F0102	F0292
pH	101.00%	6.83	11.96	12.22	100.90%
Laboratory ID:	F0100	F0309	F0101	F0102	F0292
%Water	96.63%	N/A	38.50%	37.30%	96.80%

Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

pH Analysis of the Solid Sample.

Instrument	AL10653
Procedure / Rev	LA-212-103 / A-3
Technologist	M. Franz
Date	01-02-90
Temperature	23.6
Starting Time	15:30
Ending Time	20:00
Chemist	R. E. Brandt

	Description	Lab. Id.
1	Inital LMCS Check Std	F0100
2	Reagent Blank	F0121
3	Sample 89-045	F0101
4	Duplicate 89-045	F0102
5	Sample 89-047	F0125
6	Duplicate 89-047	F0126
7	Sample 89-048	F0149
8	Duplicate 89-048	F0150
9	Sample 89-050	F0289
10	Duplicate 89-050	F0290
11	Final LMCS Check Std	F0292

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std	72C11-A/5.0mL			5.0 mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 6-01-90

Verified by: Carry M Seidel (Signature) C. M. Seidel (Printed Name) Date: 6-01-90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim 4/04/90 Rev. E SST-102

Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Percent Water in Sample

Instrument	N/A
Procedure / Rev	LA-564-101 / D-1
Technologist	R. D. Hale
Date	01-03-90
Temperature	120 C
Starting Time	11:00; 01-02-90
Ending Time	11:00; 01-03-90
Chemist	R. E. Brandt

	Description	Lab. Id.
1	Initial LMCS Check Std	F0100
2	Reagent Blank	F0309
3	Sample 89-047	F0125
4	Duplicate 89-047	F0126
5	Sample 89-048	F0149
6	Duplicate 89-048	F0150
7	Sample 89-050	F0289
8	Duplicate 89-050	F0290
9	LMCS Check Std	F0292
10	Sample 89-045	F0101
11	Duplicate 89-045	F0102

	Description	Lab. Id.
12	Ending LMCS Check Std	F0292
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std	11C11AG/1.0g			1 gram

Prepared by: Sherley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 6-01-90

Verified by: Carry M Seidel (Signature) C. M. Seidel (Printed Name) Date: 6-01-90

Approved by: L. H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim 4/04/90 Rev. E SST-102

9 1 1 2 1 5 1 1 0 7

KOH FUSION ANALYSIS

Single Shell Tank Project

Fusion Analysis

Results On Laboratory Digestion

Tank: 241-U-110
Core: 6
Segment: 4
Customer ID: 89-045

	Check Standard	Blank	Sample		Sample Duplicate		Spike of Sample	Check Standard
Laboratory ID:	F0105	F0308	F0106		F0107		F0296	F0297
Fusion Digestion			2.40	g/L	2.29	g/L		.
Total Alpha	111.90%	<1.00E-04 uci/L	*	uci/L	<2.00	uci/L	98.00%	100.30%
Total Beta	98.80%	<2.58E-04 uci/L	*	uci/L	1.97E+02	uci/L	***	96.50%
Laboratory ID:	F0105	F0120	F0106		F0107		F0108	F0109
Total Alpha	113.70%	<1.79E-04 uci/L	<1.24	uci/L	**	uci/L	***	108.80%
Total Beta	105.20%	6.65E-04 uci/L	2.03E+02	uci/L	**	uci/L	***	100.40%
Laboratory ID:	F0081	F0192	F0106		F0107		F0084	F0181
GEA Cs-137	99.90%	<4.77E-02 uci/L	4.48E+01	uci/L	5.36E+01	uci/L	103.90%	96.00%
Laboratory ID:	F0105	F0120	F0106		F0107		F0108	F0297
Uranium (First Run)	98.70%	<1.04E+04 ug/L	3.34E-03	g/L	3.01E-03	g/L	***	108.30%
Uranium (Second Run)	90.30%	<1.34E+02 ug/L	2.59E-03	g/L	**		95.00%	92.30%

* Invalid Results Due To High Deviation.

** F0107 Not Rerun Due To Insufficient Quantity of Sample.

*** Ratio Of Spike To Sample Insufficient To Calculate Spike Recovery.

Single Shell Tank Project

Fusion Analysis
Laboratory Results of Solids
Units are Sample Wet Weight

Tank: 241-U-110
Core: 6
Segment: 4
Customer ID: 89-045

	Check Standard	Blank		Sample		Sample Duplicate		Spike of Sample	Check Standard
Laboratory ID:	F0105	F0308		F0106		F0107		F0296	F0297
Fusion Digestion				2.40	g/L	2.29	g/L		
Total Alpha	111.90%	<1.00E-04	uci/L	*	uci/g	<8.73E-01	uci/g	98.00%	100.30%
Total Beta	98.80%	<2.58E-04	uci/L	*	uci/g	8.60E+01	uci/g	***	96.50%
Laboratory ID:	F0105	F0120		F0106		F0107		F0108	F0109
Total Alpha	113.70%	<1.79E-04	uci/L	<5.17E-01	uci/g	**	uci/g	***	108.80%
Total Beta	105.20%	6.65E-04	uci/L	8.46E+01	uci/g	**	uci/g	***	100.40%
Laboratory ID:	F0081	F0192		F0106		F0107		F0084	F0181
GEA Cs-137	99.90%	<4.77E-02	uci/L	1.87E+01	uci/g	2.34E+01	uci/g	103.90%	96.00%
Laboratory ID:	F0105	F0120		F0106		F0107		F0108	F0297
Uranium (First Run)	98.70%	<1.04E+04	ug/L	1.39E+03	ug/g	1.31E+03	ug/g	***	108.30%
Uranium (Second Run)	90.30%	<1.34E+02	ug/L	1.08E+03	ug/g	**		95.00%	92.30%

* Invalid Due To high Deviation.

** F0107 Was Not Rerun Due To Insufficient Quantity of Sample.

*** Ratio Of Spike To Sample Insufficient to Calculate Spike Recovery.

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Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Fusion Dissolution

Instrument	N/A
Procedure / Rev	LA-549-141/A-0
Technologist	R. D. Hale
Date	01/03/90
Temperature	23 C
Starting Time	10:00
Ending Time	12:00
Chemist	S. A. Catlow

	Description		Lab. Id.
1	Reagent Blank		F0168
2	Sample	89-045	F0106
3	Duplicate	89-045	F0107
4	Sample	89-047	F0130
5	Duplicate	89-047	F0131
6	Sample	89-048	F0154
7	Duplicate	89-048	F0155
8	Sample	89-050	F0294
9	Dupicate	89-050	F0295
10			
11			

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
N/A				

Prepared by: Sherley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 06/01/90

Verified by: Carry M Seidel (Signature) C. M. Seidel (Printed Name) Date: 06/01/90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

SST-102 Rev.E 4/04/90 Interim

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Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Instrument	WA93415
Procedure / Rev	LA-508-101/C-2
Technologist	J. A. Hopkins
Date	01-05-90
Temperature	70 F
Starting Time	09:30
Ending Time	14:00
Chemist	S. A. Catlow

Total Alpha

Total Beta

Fusion Dissolution

Detector #18

	Description		Lab. Id.
1	Intial LMCS Check Std		F0105
2	Reagent Blank		F0308
3	Sample	89-045	F0106
4	Duplicate	89-045	F0107
5	Sample	89-047	F0130
6	Duplicate	89-047	F0131
7	Sample	89-048	F0154
8	Duplicate	89-048	F0155
9	Sample	89-050	F0294
10	Duplicate	89-050	F0295
11	Spike	89-050	F0296

	Description	Lab. Id.
12	Final LMCS Check Std	F0297
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std	83B44/10mL			10mL
Spike	83B44/10mL	F0296/0.100mL		10.1mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 06-01-90

Verified by: Cary M Seidel (Signature) C.M. Seidel (Printed Name) Date: 06-01-90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

SST-102 Rev.E 4/04/90 Interim
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Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Instrument	N/A
Procedure / Rev	LA-508-101
Technologist	M. Franz
Date	01/25/90
Temperature	N/A
Starting Time	08:00
Ending Time	09:00
Chemist	S. A. Catlow

Total Alpha

Total Beta

Fusion Dissolution

Detector #18

F0107 was not rerun because of insufficient amount of sample.

	Description	Lab. Id.
1	Initial LMCS Check Std	F0105
2	Reagent Blank	F0120
3	Sample 89-045	F0106
4	Spike 89-045	F0108
5	Final LMCS Check Std	F0109
6		
7		
8		
9		
10		
11		

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std	102B44/10 mL			10 mL
Spike	102B44/10 mL	F0108/200 uL		10.2 mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 07/07/90

Verified by: Carry M. Seidel (Signature) C. M. Seidel (Printed Name) Date: 07/07/90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim 4/04/90 Rev.E SST-102

Single Shell Tank Calibration Record

Phase I-A

Analyte:	Am^{241}		
Procedure	LO-508-002	Revision:	A-0
Instrument:	Detector #18	Property Number:	WA93415
Technologist:	R. A. Jones	Payroll Number:	65801
Date:	06/28/89		

Calibration Standard ID:	36B40A3; 36B40B3, 36B40C3
Analyte Concentration:	61800, 110700, 161400 cpm
Type of Calibration:	Efficiency

	Dilution	Concentration	Instrument Reading Units =
1			
2			
3			
4	SEE ATTACHED SHEETS		
5			
6			
7			
8			
9			
10			

Comments:

Prepared by: H. S. Rich (Signature) H. S. Rich (Printed Name) Date: 06-01-90

Verified by: Carry M Seidel (Signature) C. M. Seidel (Printed Name) Date: 6-27-90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim Rev. (Draft) 1/18/89 SST-103

CALIBRATION SHEET FOR ALPHA/BETA SYSTEMS: USING PROCEDURE LQ-508-002

DETECTOR No. 18

TIME ZERO DATE (HD): 15897

RADIONUCLIDE: Am-241
HALF LIFE: 154497
COUNT TIME: 5
CPM BKG: 0.2

DATE COUNTED (HD): 16347

CALIBRATED BY: RA JONES HD 0 = 09/25/44

STANDARD ID	SIZE	DATE	TIME	COUNTS @ 0 DEG.	COUNTS @ 90 DEG.	COUNTS @ 180 DEG.	COUNTS @ 270 DEG.
36B40A8	1						
36B40B7	1						
36B40C7	1						
36B40A3	2	06/28/80	1542	67207	66768	67025	66645
36B40B3	2	06/28/80	1547	115573	116337	116289	116143
36B40C3	2	06/28/80	1552	162269	162819	162370	161593
36B40A6	5	06/28/80	1558	61627	62404	61970	61272
36B40B6	5	06/28/80	1603	118582	119217	118566	119430
36B40C5	5	06/28/80	1608	164322	165699	166216	166176

STANDARD ID	SIZE	STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM		EFFICIENCY
36B40A8	1"	60570	-0	1.00	-0		-0.0000
36B40B7	1"	109900	-0	1.00	-0		-0.0000
36B40C7	1"	159700	-0	1.00	-0		-0.0000
AVERAGE, 1" =		-0.0000	+/- @95%	0.0000	-97.62 %	ON	06/28/89

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM		EFFICIENCY
36B40A3	2"	61800	13382	1.00	13409		0.2170
36B40B3	2"	110700	23217	1.00	23264		0.2102
36B40C3	2"	161400	32452	1.00	32518		0.2015
AVERAGE, 2" =		0.2095	+/- @95%	0.0152	7.27 %	ON	06/28/89

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM		EFFICIENCY
36B40A6	5"	59470	12363	1.00	12388		0.2083
36B40B6	5"	109800	23790	1.00	23838		0.2171
36B40C5	5"	160100	33120	1.00	33187		0.2073
AVERAGE, 5" =		0.2109	+/- @95%	0.0106	5.01 %	ON	06/28/89

NEW EFFS FOR DET 18 Am-241 1" = -0.0000 2" = 0.2095

5" = 0.2109

Single Shell Tank Calibration Record

Phase I-A

Analyte:	Co^{60}		
Procedure	LQ-508-002	Revision:	A-0
Instrument:	Detector #18	Property Number:	WA93415
Technologist:	R. A. Jones	Payroll Number:	65801
Date:	06/28/89		

Calibration Standard ID:	32B40A4, 32B40B3, 32B40C4
Analyte Concentration:	70480, 135100, 202400
Type of Calibration:	Efficiency

	Dilution	Concentration	Instrument Reading Units =
1			
2			
3			
4	SEE ATTACHED SHEETS		
5			
6			
7			
8			
9			
10			

Comments:

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: 06-01-90

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: 6-27-90

Approved by: [signature] Signature — L.H. Taylor Printed Name — Date: 08-30-90

Interim Rev. (Draft) 1/18/89 SST-103

CALIBRATION SHEET FOR ALPHA/BETA SYSTEMS: USING PROCEDURE LQ-508-002

DETECTOR No. 18

RADIONUCLIDE: Co-60
HALF LIFE: 1925
COUNT TIME: 5
CPM BKG: 5
CPM 1" BKG:

2",5" STD TIME ZERO DATE (HD): 15883
1" STD TIME ZERO DATE (HD): 16573
DATE COUNTED (HD): 16347
DATE COUNTED 1" (HD)

CALIBRATED BY: RA JONES HD 0 = 09/25/44

STANDARD ID	SIZE	DATE	TIME	COUNTS @ 0 DEG.	COUNTS @ 90 DEG.	COUNTS @ 180 DEG.	COUNTS @ 270 DEG.
100B40A2	1						
100B40B1	1						
100B40C1	1						
32B40A4	2	06/28/89	1510	95552	95030	96367	94943
32B40B3	2	06/28/89	1515	179993	179923	180564	179845
32B40C4	2	06/28/89	1521	266251	266109	266791	262848
32B40A5	5	06/28/89	1526	80056	79664	81559	79720
32B40B6	5	06/28/89	1531	159760	162820	161429	163674
32B40C5	5	06/28/89	1536	234482	235955	237348	236432

STANDARD ID	SIZE	STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
100B40A2	1"	67290	0	0.00	0	0.0000
100B40B1	1"	137800	0	0.00	0	0.0000
100B40C1	1"	199700	0	0.00	0	0.0000

AVERAGE, 1" = 0.0000 +/- @95% 0.0000 ERR % ON 06/28/89

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
32B40A4	2"	70480	19090	1.18	22561	0.3201
32B40B3	2"	135100	36011	1.18	42560	0.3150
32B40C4	2"	202400	53095	1.18	62750	0.3100

AVERAGE, 2" = 0.3151 +/- @95% 0.0099 3.13 % ON 06/28/89

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
32B40A5	5"	70160	16045	1.18	18963	0.2703
32B40B6	5"	135700	32379	1.18	38267	0.2820
32B40C5	5"	201900	47206	1.18	55790	0.2763

AVERAGE, 5" = 0.2762 +/- @95% 0.0115 4.16 % ON 06/28/89

NEW EFFS FOR DET 18 Co-60 1" = 0.0000 2" = 0.3151

5" = 0.2762

Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Instrument	WA
Procedure / Rev	LA-548-121/C-3
Technologist	D.M. Southwick
Date	01/09/90
Temperature	72 F
Starting Time	12:30
Ending Time	14:00
Chemist	S. A. Catlow

GEA Analysis
Fusion Dissolution

Samples were prepared in batch, but counted randomly.

Detectors 1, 2, and 4.

	Description	Lab. Id.
1	Initial LMCS Check Std.	F0081
2	Blank	F0192
3	Sample 89-044	F0082
4	Duplicate 89-044	F0083
5	Spike 89-044	F0084
6	Sample 89-045	F0106
7	Duplicate 89-045	F0107
8	Sample 89-049	F0178
9	Duplicate 89-049	F0179
10	Final LMCS Check Std.	F0181
11		

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std.	89B44/500 uL			22 mL
Spike	89B44/100 uL	F0084/100 uL		22 mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 07/07/90

Verified by: Carey M Seidel (Signature) C. M. Seidel (Printed Name) Date: 07/07/90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim Rev.E 4/04/90 SST-102

Single Shell Tank Calibration Record

Phase I-A

Analyte:	Isotope, Mixed Gamma		
Procedure	LQ-508-003	Revision:	A-0
Instrument:	GEA Detector #1	Property Number:	401934
Technologist:	JL Anderson	Payroll Number:	61413
Date:	3/2/89		

Calibration Standard ID: 56B40 D1

Analyte Concentration: N/A

Type of Calibration: Gamma Energy Analysis (Efficiency)

	Dilution	Concentration	Instrument Reading Units =
1			
2			
3	SEE ATTACHED		
4			
5			
6			
7			
8			
9			
10			

Comments:

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: 06-01-90

Verified by: Carry M Seidel Signature — C. M. Seidel Printed Name — Date: 6-27-90

Approved by: [signature] Signature — L.H. Taylor Printed Name — Date: 08-30-90

Interim Rev. (Draft) 1/18/89 SST-103

DETECTOR: 1
GEOMETRY CODE: 42
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 2
CALIBRATION DATE: 14-Feb-89
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56840 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	5.721347E-03
88.032	1.512568E-02
122.0614	2.041958E-02
165.853	1.856472E-02
279.1967	
391.668	1.042777E-02
513.99	7.856059E-03
661.65	6.838966E-03
898.021	5.300244E-03
1173.237	4.218416E-03
1332.501	3.785537E-03
1836.129	2.931033E-03

EQUATION 0-165 KEV

```
LOG(EFF) =    -5.343694E+01
          +    2.034704E+01 *LOG(ENERGY)
          +   -2.088264E+00 *LOG(ENERGY)^2
```

EQUATION 165-1836 KEV

```
LOG(EFF) =     8.372735E+00
          +   -7.762489E+00 *LOG(ENERGY)
          +    2.017698E+00 *LOG(ENERGY)^2
          +   -2.447560E-01 *LOG(ENERGY)^3
          +    1.067720E-02 *LOG(ENERGY)^4
```

GEA CALIBRATION RECORD PROCEDURE LQ-508-003

DETECTOR: 1
GEOMETRY CODE: 43
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 3
CALIBRATION DATE: 16-Feb-89
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56840 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	1.397695E-03
88.032	3.641448E-03
122.0614	5.035820E-03
165.853	4.620516E-03
279.1967	
391.668	2.619018E-03
513.99	1.890740E-03
661.65	1.782478E-02
898.021	1.392563E-03
1173.237	1.117189E-03
1332.501	1.007670E-03
1836.129	7.782502E-04

EQUATION 0-165 KEV

```
LOG(EFF) =    -5.354869E+01
```

```
                    +    1.975356E+01 *LOG(ENERGY)
                    +   -2.020858E+00 *LOG(ENERGY)^2
```

EQUATION 165-1836 KEV

```
          LOG(EFF) =     4.001880E+01
                    +   -2.857555E+01 *LOG(ENERGY)
                    +    6.748440E+00 *LOG(ENERGY)^2
                    +    7.173093E-01 *LOG(ENERGY)^3
                    +    2.821780E-02 *LOG(ENERGY)^4
```

GEA CALIBRATION RECORD PROCEDURE LQ-508-003

Single Shell Tank Calibration Record

Phase I-A

Analyte:	Mixed Isotope Standards		
Procedure	LQ-508-003	Revision:	A-0
Instrument:	GEA Detector #2	Property Number:	401934
Technologist:	JL Anderson	Payroll Number:	61413
Date:	9-1-88		

Calibration Standard ID:	56B40 D1
Analyte Concentration:	N/A
Type of Calibration:	Gamma Energy Analysis (Efficiency)

	Dilution	Concentration	Instrument Reading Units =
1			
2			
3	SEE ATTACHED		
4			
5			
6			
7			
8			
9			
10			

Comments:

Prepared by: H. S. Rich (Signature) H. S. Rich (Printed Name) Date: 06-01-90

Verified by: Carry M. Seidel (Signature) C. M. Seidel (Printed Name) Date: 6-27-90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

9112263116

DETECTOR: 2
GEOMETRY CODE: 42
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 2
CALIBRATION DATE: 21-Oct-88
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56B40 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	3.417000E-03
88.032	1.090000E-02
122.0614	1.408000E-02
165.853	1.516000E-02
279.1967	9.929000E-03
391.668	7.578000E-03
513.99	5.875000E-03
661.65	4.927000E-03
898.021	3.727000E-03
1173.237	3.085000E-03
1332.501	2.683000E-03
1836.129	2.102000E-03

EQUATION 0-122 KEV

```
LOG(EFF) =    -6.654070E+01
         +     2.583780E+01 *LOG(ENERGY)
         +    -2.677550E+00 *LOG(ENERGY)^2
```

EQUATION 122-1836 KEV

```
LOG(EFF) =    -1.050740E+02
         +     6.428950E+01 *LOG(ENERGY)
         +    -1.503170E+01 *LOG(ENERGY)^2
         +     1.533670E+00 *LOG(ENERGY)^3
         +    -5.838530E-02 *LOG(ENERGY)^4
```

GEA CALIBRATION RECORD PROCEDURE LQ-508-003

DETECTOR: 2
GEOMETRY CODE: 43
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 3
CALIBRATION DATE: 28-Sep-88
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56B40 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	1.476000E-03
88.032	4.721000E-03
122.0614	6.589000E-03
165.853	6.613000E-03
279.1967	4.692000E-03
391.668	3.542000E-03
513.99	2.810000E-03
661.65	2.327000E-03
898.021	1.790000E-03
1173.237	1.437000E-03
1332.501	1.277000E-03
1836.129	9.824000E-04

EQUATION 0-165 KEV

```
LOG(EFF) =    -5.826830E+01
          +    2.165450E+01 *LOG(ENERGY)
          +   -2.198930E+00 *LOG(ENERGY)^2
```

EQUATION 165-1836 KEV

```
LOG(EFF) =    -2.233890E+01
          +    1.174520E+01 *LOG(ENERGY)
          +   -2.739550E+00 *LOG(ENERGY)^2
          +    2.655450E-01 *LOG(ENERGY)^3
          +   -9.668420E-03 *LOG(ENERGY)^4
```

Single Shell Tank Calibration Record

Phase I-A

Analyte:	Mixed Isotope Standards		
Procedure	LO-508-003	Revision:	A-0
Instrument:	GEA Detector #4	Property Number:	401934
Technologist:	J. L. Anderson	Payroll Number:	61913
Date:	2-07-89		

Calibration Standard ID: 56B40 D1

Analyte Concentration: N/A

Type of Calibration: Gamma Energy Analysis (Efficiency)

	Dilution	Concentration	Instrument Reading Units =
1			
2			
3	SEE ATTACHED		
4			
5			
6			
7			
8			
9			
10			

Comments:

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: 06-01-90

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: 6-24-90

Approved by: [signature] Signature — L.H. Taylor Printed Name — Date: 08-30-90

SST-103 Rev. (Draft) 1/18/89 Interim

GEA CALIBRATION RECORD PROCEDURE LQ-508-003

DETECTOR: 4
GEOMETRY CODE: 41
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 1
CALIBRATION DATE: 1-Sep-89
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56B40 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	2.682446E-02
88.032	8.210956E-02
122.0614	1.118411E-01
165.853	1.066653E-01
279.1967	
391.668	5.704220E-02
513.99	
661.65	3.685958E-02
898.021	2.541629E-02
1173.237	2.161710E-02
1332.501	1.973393E-02
1836.129	1.484468E-02

EQUATION 0-165 KEV

```
LOG(EFF) =   -5.844056E+01
         +    2.310700E+01 *LOG(ENERGY)
         +    2.371355E+00 *LOG(ENERGY)^2
```

EQUATION 165-1836 KEV

```
LOG(EFF) =   -1.718967E+01
         +    8.164155E+00 *LOG(ENERGY)
         +   -1.384196E+00 *LOG(ENERGY)^2
         +    7.025985E-02 *LOG(ENERGY)^3
```

GEA CALIBRATION RECORD PROCEDURE LQ-508-003

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                   *
*          G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                   *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

CANBERRA SPECTRAN-F V2.06 SOFTWARE

222-S COUNTING ROOM 30-MAY-90 13:47:25

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
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

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD1998
ANALYZED BY: AJ

SAMPLE DESCRIPTION: ~~E81~~ [illegible] 5/30/90 F81
GEOMETRY DESCRIPTION:
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 9-JAN-90 AT 13:41:59

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3006. SECONDS
DEAD TIME: 0.20 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 23-NOV-89
EFFICIENCY CALIBRATION PERFORMED 2-MAR-89

SAMPLE: E81
DATA COLLECTED ON 9-JAN-90 AT 13:41:59 F-0081
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
AC-228	LLD<7.90E-01		LLD<7.90E-01		911.07	
AG-108M	LLD<2.25E-01		LLD<2.25E-01		433.94	
AG-110M	LLD<1.05E+00		LLD<1.05E+00		657.76	
AM-241	LLD<9.30E-01		LLD<9.30E-01		59.54	
AM-243	LLD<2.44E-01		LLD<2.44E-01		74.67	
AR-41	LLD<1.44E-01		LLD<1.44E-01		1293.64	
AU-198	LLD<2.00E-01		LLD<2.00E-01		411.80	
BA-133	LLD<3.00E-01		LLD<3.00E-01		356.02	
BA-139	LLD<5.85E-01		LLD<5.85E-01		165.85	
BA-140	LLD<7.76E-01		LLD<7.76E-01		537.27	
BA-141	LLD<6.03E-01		LLD<6.03E-01		190.23	
BE-7	LLD<2.07E+00		LLD<2.07E+00		477.59	
BI-207	LLD<1.98E-01		LLD<1.98E-01		569.70	
BI-212	LLD<2.58E+00		LLD<2.58E+00		727.27	
BI-214	LLD<8.68E-01		LLD<8.68E-01		609.32	
CD-109	LLD<3.47E+00		LLD<3.47E+00		88.03	
CE-139	LLD<1.32E-01		LLD<1.32E-01		165.85	
CE-141	LLD<2.02E-01		LLD<2.02E-01		145.44	
CERR144	LLD<1.75E+00		LLD<1.75E+00		133.51	
CO-56	LLD<1.93E-01		LLD<1.93E-01		846.76	
CO-57	LLD<1.08E-01		LLD<1.08E-01		122.06	
CO-58	LLD<1.86E-01		LLD<1.86E-01		810.75	
CO-60	2.34E+01	+-7.09E-01	2.34E+01	+-7.09E-01	1332.50	-0.53
					1173.24	-0.62
CR-51	LLD<1.51E+00		LLD<1.51E+00		320.09	
CS-134	2.11E+01	+-6.82E-01	2.11E+01	+-6.82E-01	795.84	-0.60
					604.70	-0.52
CS-136	LLD<1.85E-01		LLD<1.85E-01		818.51	
CS-137	3.81E+01	+-8.42E-01	3.81E+01	+-8.42E-01	661.65	-0.57
CS-138	LLD<1.83E-01		LLD<1.83E-01		1435.86	
EU-152	LLD<2.61E-01		LLD<2.61E-01		1408.01	
EU-154	LLD<3.59E-01		LLD<3.59E-01		1274.45	
EU-155	LLD<4.22E-01		LLD<4.22E-01		105.31	
FE-59	LLD<4.31E-01		LLD<4.31E-01		1099.25	
HF-181	LLD<2.29E-01		LLD<2.29E-01		482.20	
HG-203	LLD<1.81E-01		LLD<1.81E-01		279.20	
I-131	LLD<2.32E-01		LLD<2.32E-01		364.48	
I-132	LLD<2.14E-01		LLD<2.14E-01		667.69	
I-133	LLD<2.29E-01		LLD<2.29E-01		529.69	
I-134	LLD<2.70E-01		LLD<2.70E-01		847.03	
I-135	LLD<4.50E-01		LLD<4.50E-01		1260.41	
K-40	LLD<1.88E+00		LLD<1.88E+00		1460.75	
KR-85	LLD<4.52E+01		LLD<4.52E+01		513.99	
KR-85M	LLD<1.30E-01		LLD<1.30E-01		151.17	
KR-87	LLD<4.97E-01		LLD<4.97E-01		402.58	
KR-89	LLD<7.42E+00		LLD<7.42E+00		220.90	
LA-140	LLD<9.05E-02		LLD<9.05E-02		1596.20	

LA-142	LLD<4.45E-01	LLD<4.45E-01	641.83
MN-54	LLD<1.81E-01	LLD<1.81E-01	834.83
MN-56	LLD<2.17E-01	LLD<2.17E-01	846.76
NA-22	LLD<1.10E-01	LLD<1.10E-01	1274.55
NA-24	LLD<2.33E-01	LLD<2.33E-01	1368.60
NB-94	LLD<1.59E-01	LLD<1.59E-01	702.63
NB-95	LLD<1.57E-01	LLD<1.57E-01	765.78
NB-97	LLD<1.28E+00	LLD<1.28E+00	657.92
NP-238	LLD<8.29E-01	LLD<8.29E-01	984.45
NP-239	LLD<1.04E+00	LLD<1.04E+00	277.60
PA-233	LLD<4.70E-01	LLD<4.70E-01	311.98
PA-234M	LLD<3.78E+01	LLD<3.78E+01	1001.03
PB-210	LLD<5.44E+00	LLD<5.44E+00	465.03
PB-212	LLD<3.30E-01	LLD<3.30E-01	239.00
PB-214	LLD<5.01E-01	LLD<5.01E-01	351.92
PO-210	LLD<2.06E+04	LLD<2.06E+04	804.00
PO-214	LLD<8.05E+03	LLD<8.05E+03	799.70
PO-216	LLD<1.67E+04	LLD<1.67E+04	804.90
PU-239	LLD<1.45E+03	LLD<1.45E+03	129.30
PU-241	LLD<5.32E+04	LLD<5.32E+04	148.57
RA-224	LLD<3.57E+00	LLD<3.57E+00	240.99
RA-226	LLD<3.27E+00	LLD<3.27E+00	186.10
RB-88	LLD<6.33E-01	LLD<6.33E-01	1836.00
RB-89	LLD<1.04E+00	LLD<1.04E+00	1031.88
RN-220	LLD<1.69E+02	LLD<1.69E+02	549.73
RU-103	LLD<2.11E-01	LLD<2.11E-01	497.08
RURH106	LLD<3.62E+00	LLD<3.62E+00	621.80
SB-124	LLD<2.52E-01	LLD<2.52E-01	602.72
SB-125	LLD<1.70E+00	LLD<1.70E+00	176.33
SC-46	LLD<2.13E-01	LLD<2.13E-01	1120.45
SE-75	LLD<2.38E-01	LLD<2.38E-01	264.66
SN-113	LLD<2.89E-01	LLD<2.89E-01	391.67
SR-85	LLD<1.98E-01	LLD<1.98E-01	513.99
SR-91	LLD<3.54E-01	LLD<3.54E-01	555.60
SR-92	LLD<9.07E-02	LLD<9.07E-02	1383.94
TA-182	LLD<6.07E-01	LLD<6.07E-01	1121.30
TC-99M	LLD<1.16E-01	LLD<1.16E-01	140.51
TE-123M	LLD<1.25E-01	LLD<1.25E-01	159.00
TE-125M	LLD<3.28E+01	LLD<3.28E+01	109.27
TE-132	LLD<1.53E-01	LLD<1.53E-01	228.16
TH-228	LLD<1.09E+01	LLD<1.09E+01	84.37
TL-208	LLD<2.47E-01	LLD<2.47E-01	583.14
U-235	LLD<2.17E-01	LLD<2.17E-01	185.71
U-237	LLD<6.23E-01	LLD<6.23E-01	208.00
W-187	LLD<5.94E-01	LLD<5.94E-01	685.74
XE-131M	LLD<5.77E+00	LLD<5.77E+00	163.98
XE-133	LLD<3.81E-01	LLD<3.81E-01	81.00
XE-133M	LLD<1.35E+00	LLD<1.35E+00	233.21
XE-135	LLD<1.60E-01	LLD<1.60E-01	249.79
XE-138	LLD<1.21E+00	LLD<1.21E+00	258.41
Y-88	LLD<6.00E-02	LLD<6.00E-02	1836.06
Y-91	LLD<4.73E+01	LLD<4.73E+01	1204.90
Y-91M	LLD<2.68E-01	LLD<2.68E-01	555.60
ZN-65	LLD<5.03E-01	LLD<5.03E-01	1115.55
ZR-95	LLD<3.46E-01	LLD<3.46E-01	756.73
ZR-97	LLD<1.84E-01	LLD<1.84E-01	743.33
TOTAL	8.25E+01 +-1.29E+00	8.25E+01 +-1.29E+00	

STANDARD DEVIATION = 0.04

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
1C	1126.46	562.70	1.41	645.	764.	10.1	CS-134, EU-152
2C	1138.69	568.82	1.41	640.	1301.	9.0	CS-134, BI-207
3	1209.44	604.18	1.47	583.	8369.	2.3	SB-124, CS-134
4	1323.29	661.08	1.54	419.	12295.	1.8	CS-137
4B		661.82			35.	46.4	
5C	1591.64	795.25	1.56	321.	5855.	3.0	CS-134
6C	1603.76	801.31	1.56	274.	553.	9.3	CS-134
7	2346.14	1172.62	1.68	255.	5341.	2.8	CO-60
8	2664.59	1331.97	1.88	55.	4914.	2.8	CO-60
9	2729.47	1364.44	2.40	13.	144.	18.2	CS-134
10	2800.60	1400.04	1.92	13.	59.	32.1	I-132,BI-214
11	2921.54	1460.58	1.84	11.	172.	16.2	K-40
11B		1461.77			182.	11.2	

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 BK0011
BACKGROUND DESCRIPTION: BK0011
BACKGROUND COLLECT STARTED ON 10-JAN-85 AT 12:00:00
BACKGROUND LIVE TIME: 6000. SECONDS

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.45E-09 UC/LI
TOTAL MEASURED ACTIVITY = 8.25E+01 (+-1.29E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

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
1126.46	562.70	764.	10.1	3.27E+01
1138.69	568.82	1301.	9.0	5.62E+01
1603.76	801.31	553.	9.3	3.17E+01
2729.47	1364.44	144.	18.2	1.29E+01
2800.60	1400.04	59.	32.1	5.40E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.54	1460.58	172.	16.2	1.63E+01

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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

222-S COUNTING ROOM 22-MAY-90 12:38:39

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
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

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD1002
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F192
GEOMETRY DESCRIPTION:
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E+00
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 9-JAN-90 AT 19:58:58

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 23-NOV-89
EFFICIENCY CALIBRATION PERFORMED 2-MAR-89

222-S COUNTING ROOM 22-MAY-90 12:38:39 F-0192

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	1322.80	660.84	1.47	33.	33.	62.0	CS-137
1B		661.82			35.	46.4	
2	2921.42	1460.52	2.04	3.	146.	16.7	K-40
2B		1461.77			182.	11.2	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BK0011
BACKGROUND COLLECT STARTED ON 10-JAN-85 AT 12:00:00
BACKGROUND LIVE TIME: 6000. SECONDS

222-S COUNTING ROOM 22-MAY-90 12:38:39

SAMPLE: F192
DATA COLLECTED ON 9-JAN-90 AT 19:58:58
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
AC-228	LLD<1.03E-01		LLD<1.03E-01		911.07	
AG-108M	LLD<2.60E-02		LLD<2.60E-02		433.94	
AG-110M	LLD<3.82E-02		LLD<3.82E-02		657.76	
AM-241	LLD<1.54E-01		LLD<1.54E-01		59.54	
AM-243	LLD<4.29E-02		LLD<4.29E-02		74.67	
AR-41	LLD<3.48E-02		LLD<3.48E-02		1293.64	
AU-198	LLD<2.19E-02		LLD<2.19E-02		411.80	
BA-133	LLD<4.59E-02		LLD<4.59E-02		356.02	
BA-139	LLD<9.13E-02		LLD<9.13E-02		165.85	
BA-140	LLD<1.04E-01		LLD<1.04E-01		537.27	
BA-141	LLD<8.40E-02		LLD<8.40E-02		190.23	
BE-7	LLD<2.45E-01		LLD<2.45E-01		477.59	
BI-207	LLD<2.76E-02		LLD<2.76E-02		569.70	
BI-212	LLD<4.40E-01		LLD<4.40E-01		727.27	
BI-214	LLD<8.03E-02		LLD<8.03E-02		609.32	
CD-109	LLD<5.91E-01		LLD<5.91E-01		88.03	
CE-139	LLD<2.07E-02		LLD<2.07E-02		165.85	
CE-141	LLD<3.22E-02		LLD<3.22E-02		145.44	
CEPR144	LLD<2.84E-01		LLD<2.84E-01		133.51	
CO-56	LLD<2.34E-02		LLD<2.34E-02		846.76	
CO-57	LLD<1.83E-02		LLD<1.83E-02		122.06	
CO-58	LLD<2.81E-02		LLD<2.81E-02		810.75	
CO-60	LLD<1.31E-02		LLD<1.31E-02		1332.50	
CR-51	LLD<2.12E-01		LLD<2.12E-01		320.09	
CS-134	LLD<3.07E-02		LLD<3.07E-02		795.84	
CS-136	LLD<2.53E-02		LLD<2.53E-02		818.51	
CS-137	LLD<4.77E-02		LLD<4.77E-02		661.65	
CS-138	LLD<6.89E-02		LLD<6.89E-02		1435.86	
EU-152	LLD<1.30E-01		LLD<1.30E-01		1408.01	
EU-154	LLD<1.13E-01		LLD<1.13E-01		1274.45	
EU-155	LLD<6.59E-02		LLD<6.59E-02		105.31	
FE-59	LLD<5.71E-02		LLD<5.71E-02		1099.25	
HF-181	LLD<2.39E-02		LLD<2.39E-02		482.20	
HG-203	LLD<2.46E-02		LLD<2.46E-02		279.20	
I-131	LLD<2.90E-02		LLD<2.90E-02		364.48	
I-132	LLD<3.48E-02		LLD<3.48E-02		667.69	
I-133	LLD<2.85E-02		LLD<2.85E-02		529.69	
I-134	LLD<3.71E-02		LLD<3.71E-02		847.03	
I-135	LLD<1.29E-01		LLD<1.29E-01		1260.41	
K-40	LLD<9.20E-01		LLD<9.20E-01		1460.75	
KR-85	LLD<8.59E+00		LLD<8.59E+00		513.99	
KR-85M	LLD<2.16E-02		LLD<2.16E-02		151.17	
KR-87	LLD<6.41E-02		LLD<6.41E-02		402.58	
KR-89	LLD<1.09E+00		LLD<1.09E+00		220.90	
LA-140	LLD<3.16E-02		LLD<3.16E-02		1596.20	
LA-142	LLD<6.40E-02		LLD<6.40E-02		641.83	
MN-54	LLD<2.94E-02		LLD<2.94E-02		834.83	

LA-142	LLD<4.45E-01	LLD<4.45E-01	641.83
MN-54	LLD<1.81E-01	LLD<1.81E-01	834.83
MN-56	LLD<2.17E-01	LLD<2.17E-01	846.76
NA-22	LLD<1.10E-01	LLD<1.10E-01	1274.55
NA-24	LLD<2.33E-01	LLD<2.33E-01	1368.60
NB-94	LLD<1.59E-01	LLD<1.59E-01	702.63
NB-95	LLD<1.57E-01	LLD<1.57E-01	765.78
NB-97	LLD<1.28E+00	LLD<1.28E+00	657.92
NP-238	LLD<8.29E-01	LLD<8.29E-01	984.45
NP-239	LLD<1.04E+00	LLD<1.04E+00	277.60
PA-233	LLD<4.70E-01	LLD<4.70E-01	311.98
PA-234M	LLD<3.78E+01	LLD<3.78E+01	1001.03
PB-210	LLD<5.44E+00	LLD<5.44E+00	465.03
PB-212	LLD<3.30E-01	LLD<3.30E-01	239.00
PB-214	LLD<5.01E-01	LLD<5.01E-01	351.92
PO-210	LLD<2.06E+04	LLD<2.06E+04	804.00
PO-214	LLD<8.05E+03	LLD<8.05E+03	799.70
PO-216	LLD<1.67E+04	LLD<1.67E+04	804.90
PU-239	LLD<1.45E+03	LLD<1.45E+03	129.30
PU-241	LLD<5.32E+04	LLD<5.32E+04	148.57
RA-224	LLD<3.57E+00	LLD<3.57E+00	240.99
RA-226	LLD<3.27E+00	LLD<3.27E+00	186.10
RB-88	LLD<6.33E-01	LLD<6.33E-01	1836.00
RB-89	LLD<1.04E+00	LLD<1.04E+00	1031.88
RN-220	LLD<1.69E+02	LLD<1.69E+02	549.73
RU-103	LLD<2.11E-01	LLD<2.11E-01	497.08
RURH106	LLD<3.62E+00	LLD<3.62E+00	621.80
SB-124	LLD<2.52E-01	LLD<2.52E-01	602.72
SB-125	LLD<1.70E+00	LLD<1.70E+00	176.33
SC-46	LLD<2.13E-01	LLD<2.13E-01	1120.45
SE-75	LLD<2.38E-01	LLD<2.38E-01	264.66
SN-113	LLD<2.89E-01	LLD<2.89E-01	391.67
SR-85	LLD<1.98E-01	LLD<1.98E-01	513.99
SR-91	LLD<3.54E-01	LLD<3.54E-01	555.60
SR-92	LLD<9.07E-02	LLD<9.07E-02	1383.94
TA-182	LLD<6.07E-01	LLD<6.07E-01	1121.30
TC-99M	LLD<1.16E-01	LLD<1.16E-01	140.51
TE-123M	LLD<1.25E-01	LLD<1.25E-01	159.00
TE-125M	LLD<3.28E+01	LLD<3.28E+01	109.27
TE-132	LLD<1.53E-01	LLD<1.53E-01	228.16
TH-228	LLD<1.09E+01	LLD<1.09E+01	84.37
TL-208	LLD<2.47E-01	LLD<2.47E-01	583.14
U-235	LLD<2.17E-01	LLD<2.17E-01	185.71
U-237	LLD<6.23E-01	LLD<6.23E-01	208.00
W-187	LLD<5.94E-01	LLD<5.94E-01	685.74
XE-131M	LLD<5.77E+00	LLD<5.77E+00	163.98
XE-133	LLD<3.81E-01	LLD<3.81E-01	81.00
XE-133M	LLD<1.35E+00	LLD<1.35E+00	233.21
XE-135	LLD<1.60E-01	LLD<1.60E-01	249.79
XE-138	LLD<1.21E+00	LLD<1.21E+00	258.41
Y-88	LLD<6.00E-02	LLD<6.00E-02	1836.06
Y-91	LLD<4.73E+01	LLD<4.73E+01	1204.90
Y-91M	LLD<2.68E-01	LLD<2.68E-01	555.60
ZN-65	LLD<5.03E-01	LLD<5.03E-01	1115.55
ZR-95	LLD<3.46E-01	LLD<3.46E-01	756.73
ZR-97	LLD<1.84E-01	LLD<1.84E-01	743.33
TOTAL	8.25E+01 +-1.29E+00	8.25E+01 +-1.29E+00	

STANDARD DEVIATION = 0.04

MN-56	LLD<2.64E-02	LLD<2.64E-02	846.76
NA-22	LLD<3.52E-02	LLD<3.52E-02	1274.55
NA-24	LLD<2.71E-02	LLD<2.71E-02	1368.60
NB-94	LLD<2.93E-02	LLD<2.93E-02	702.63
NB-95	LLD<2.36E-02	LLD<2.36E-02	765.78
NB-97	LLD<4.63E-02	LLD<4.63E-02	657.92
NP-238	LLD<1.09E-01	LLD<1.09E-01	984.45
NP-239	LLD<1.43E-01	LLD<1.43E-01	277.60
PA-233	LLD<6.07E-02	LLD<6.07E-02	311.98
PA-234M	LLD<2.96E+00	LLD<2.96E+00	1001.03
PB-210	LLD<6.08E-01	LLD<6.08E-01	465.03
PB-212	LLD<4.85E-02	LLD<4.85E-02	239.00
PB-214	LLD<6.66E-02	LLD<6.66E-02	351.92
PO-210	LLD<2.43E+03	LLD<2.43E+03	804.00
PO-214	LLD<2.78E+02	LLD<2.78E+02	799.70
PO-216	LLD<1.27E+03	LLD<1.27E+03	804.90
PU-239	LLD<2.51E+02	LLD<2.51E+02	129.30
PU-241	LLD<9.09E+03	LLD<9.09E+03	148.57
RA-224	LLD<5.50E-01	LLD<5.50E-01	240.99
RA-226	LLD<4.77E-01	LLD<4.77E-01	186.10
RB-88	LLD<1.98E-01	LLD<1.98E-01	1836.00
RB-89	LLD<1.44E-01	LLD<1.44E-01	1031.88
RN-220	LLD<2.35E+01	LLD<2.35E+01	549.73
RU-103	LLD<2.63E-02	LLD<2.63E-02	497.08
RURH106	LLD<5.53E-01	LLD<5.53E-01	621.80
SB-124	LLD<2.50E-02	LLD<2.50E-02	602.72
SB-125	LLD<2.71E-01	LLD<2.71E-01	176.33
SC-46	LLD<3.04E-02	LLD<3.04E-02	1120.45
SE-75	LLD<3.41E-02	LLD<3.41E-02	264.66
SN-113	LLD<3.28E-02	LLD<3.28E-02	391.67
SR-85	LLD<3.77E-02	LLD<3.77E-02	513.99
SR-91	LLD<4.97E-02	LLD<4.97E-02	555.60
SR-92	LLD<2.99E-02	LLD<2.99E-02	1383.94
TA-182	LLD<9.06E-02	LLD<9.06E-02	1121.30
TC-99M	LLD<1.94E-02	LLD<1.94E-02	140.51
TE-123M	LLD<2.01E-02	LLD<2.01E-02	159.00
TE-125M	LLD<5.19E+00	LLD<5.19E+00	109.27
TE-132	LLD<2.28E-02	LLD<2.28E-02	228.16
TH-228	LLD<1.90E+00	LLD<1.90E+00	84.37
TL-208	LLD<2.89E-02	LLD<2.89E-02	583.14
U-235	LLD<3.28E-02	LLD<3.28E-02	185.71
U-237	LLD<8.54E-02	LLD<8.54E-02	208.00
W-187	LLD<7.53E-02	LLD<7.53E-02	685.74
XE-131M	LLD<8.52E-01	LLD<8.52E-01	163.98
XE-133	LLD<6.62E-02	LLD<6.62E-02	81.00
XE-133M	LLD<1.87E-01	LLD<1.87E-01	233.21
XE-135	LLD<2.24E-02	LLD<2.24E-02	249.79
XE-138	LLD<1.65E-01	LLD<1.65E-01	258.41
Y-88	LLD<1.88E-02	LLD<1.88E-02	1836.06
Y-91	LLD<1.28E+01	LLD<1.28E+01	1204.90
Y-91M	LLD<3.76E-02	LLD<3.76E-02	555.60
ZN-65	LLD<1.12E-01	LLD<1.12E-01	1115.55
ZR-95	LLD<4.95E-02	LLD<4.95E-02	756.73
ZR-97	LLD<2.33E-02	LLD<2.33E-02	743.33
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%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1322.80	660.84	33.	62.0	1.59E+00
2921.42	1460.52	146.	16.7	1.38E+01

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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

222-S COUNTING ROOM 22-MAY-90 12:57:40

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
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

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD1000
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F84
GEOMETRY DESCRIPTION:
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 9-JAN-90 AT 17:38:48

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 23-NOV-89
EFFICIENCY CALIBRATION PERFORMED 2-MAR-89

222-S COUNTING ROOM 22-MAY-90 12:57:40

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	93.93	46.86	1.14	351.	105.	53.0	
2C	1126.47	562.71	1.54	183.	186.	27.2	CS-134, EU-152
3C	1138.56	568.75	1.54	210.	285.	23.1	CS-134, BI-207
4	1209.44	604.18	1.49	221.	1797.	5.2	SB-124, CS-134
5	1323.32	661.10	1.47	149.	6884.	2.4	CS-137
5B		661.82			35.	46.4	
6C	1591.62	795.24	1.46	92.	1210.	7.1	CS-134
7C	1603.60	801.23	1.46	87.	134.	21.5	CS-134
8	2346.20	1172.65	1.87	56.	1128.	6.2	CO-60
9	2664.57	1331.96	1.86	13.	1060.	6.1	CO-60
10	2921.50	1460.56	1.63	5.	162.	16.0	K-40
10B		1461.77			182.	11.2	

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 BK0011
BACKGROUND DESCRIPTION: BK0011
BACKGROUND COLLECT STARTED ON 10-JAN-85 AT 12:00:00
BACKGROUND LIVE TIME: 6000. SECONDS

222-S COUNTING ROOM 22-MAY-90 12:57:40

SAMPLE: F84
DATA COLLECTED ON 9-JAN-90 AT 17:38:48
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
AC-228	LLD<2.06E+00		LLD<2.06E+00		911.07	
AG-108M	LLD<7.20E-01		LLD<7.20E-01		433.94	
AG-110M	LLD<3.92E+00		LLD<3.92E+00		657.76	
AM-241	LLD<3.84E+00		LLD<3.84E+00		59.54	
AM-243	LLD<1.05E+00		LLD<1.05E+00		74.67	
AR-41	LLD<4.93E-01		LLD<4.93E-01		1293.64	
AU-198	LLD<6.21E-01		LLD<6.21E-01		411.80	
BA-133	LLD<9.63E-01		LLD<9.63E-01		356.02	
BA-139	LLD<2.18E+00		LLD<2.18E+00		165.85	
BA-140	LLD<2.14E+00		LLD<2.14E+00		537.27	
BA-141	LLD<2.15E+00		LLD<2.15E+00		190.23	
BE-7	LLD<6.79E+00		LLD<6.79E+00		477.59	
BI-207	LLD<5.86E-01		LLD<5.86E-01		569.70	
BI-212	LLD<7.22E+00		LLD<7.22E+00		727.27	
BI-214	LLD<2.25E+00		LLD<2.25E+00		609.32	
CD-109	LLD<1.50E+01		LLD<1.50E+01		88.03	
CE-139	LLD<4.94E-01		LLD<4.94E-01		165.85	
CE-141	LLD<7.99E-01		LLD<7.99E-01		145.44	
CEPR144	LLD<6.74E+00		LLD<6.74E+00		133.51	
CO-56	LLD<5.21E-01		LLD<5.21E-01		846.76	
CO-57	LLD<4.35E-01		LLD<4.35E-01		122.06	
CO-58	LLD<4.57E-01		LLD<4.57E-01		810.75	
CO-60	2.52E+01	+-1.56E+00	2.52E+01	+-1.56E+00	1332.50	-0.54
					1173.24	-0.59
CR-51	LLD<5.03E+00		LLD<5.03E+00		320.09	
CS-134	2.18E+01	+-1.57E+00	2.18E+01	+-1.57E+00	795.84	-0.61
					604.70	-0.52
CS-136	LLD<4.96E-01		LLD<4.96E-01		818.51	
CS-137	1.06E+02	+-2.90E+00	1.06E+02	+-2.90E+00	661.65	-0.55
CS-138	LLD<6.89E-01		LLD<6.89E-01		1435.86	
EU-152	LLD<1.18E+00		LLD<1.18E+00		1408.01	
EU-154	LLD<9.67E-01		LLD<9.67E-01		1274.45	
EU-155	LLD<1.78E+00		LLD<1.78E+00		105.31	
FE-59	LLD<1.15E+00		LLD<1.15E+00		1099.25	
HF-181	LLD<7.35E-01		LLD<7.35E-01		482.20	
HG-203	LLD<6.16E-01		LLD<6.16E-01		279.20	
I-131	LLD<7.08E-01		LLD<7.08E-01		364.48	
I-132	LLD<6.05E-01		LLD<6.05E-01		667.69	
I-133	LLD<6.64E-01		LLD<6.64E-01		529.69	
I-134	LLD<7.39E-01		LLD<7.39E-01		847.03	
I-135	LLD<1.39E+00		LLD<1.39E+00		1260.41	
K-40	LLD<9.13E+00		LLD<9.13E+00		1460.75	
KR-85	LLD<1.52E+02		LLD<1.52E+02		513.99	
KR-85M	LLD<4.99E-01		LLD<4.99E-01		151.17	
KR-87	LLD<1.49E+00		LLD<1.49E+00		402.58	
KR-89	LLD<2.49E+01		LLD<2.49E+01		220.90	
LA-140	LLD<3.68E-01		LLD<3.68E-01		1596.20	

LA-142	LLD<1.38E+00	LLD<1.38E+00	641.83
MN-54	LLD<5.70E-01	LLD<5.70E-01	834.83
MN-56	LLD<5.87E-01	LLD<5.87E-01	846.76
NA-22	LLD<3.91E-01	LLD<3.91E-01	1274.55
NA-24	LLD<6.13E-01	LLD<6.13E-01	1368.60
NB-94	LLD<4.96E-01	LLD<4.96E-01	702.63
NB-95	LLD<5.02E-01	LLD<5.02E-01	765.78
NB-97	LLD<4.75E+00	LLD<4.75E+00	657.92
NP-238	LLD<2.24E+00	LLD<2.24E+00	984.45
NP-239	LLD<3.38E+00	LLD<3.38E+00	277.60
PA-233	LLD<1.48E+00	LLD<1.48E+00	311.98
PA-234M	LLD<9.84E+01	LLD<9.84E+01	1001.03
PB-210	LLD<1.76E+01	LLD<1.76E+01	465.03
PB-212	LLD<1.13E+00	LLD<1.13E+00	239.00
PB-214	LLD<1.59E+00	LLD<1.59E+00	351.92
PO-210	LLD<5.80E+04	LLD<5.80E+04	804.00
PO-214	LLD<1.89E+04	LLD<1.89E+04	799.70
PO-216	LLD<4.45E+04	LLD<4.45E+04	804.90
PU-239	LLD<5.92E+03	LLD<5.92E+03	129.30
PU-241	LLD<2.02E+05	LLD<2.02E+05	148.57
RA-224	LLD<1.21E+01	LLD<1.21E+01	240.99
RA-226	LLD<1.13E+01	LLD<1.13E+01	186.10
RB-88	LLD<3.16E+00	LLD<3.16E+00	1836.00
RB-89	LLD<2.42E+00	LLD<2.42E+00	1031.88
RN-220	LLD<4.89E+02	LLD<4.89E+02	549.73
RU-103	LLD<6.34E-01	LLD<6.34E-01	497.08
RURH106	LLD<1.04E+01	LLD<1.04E+01	621.80
SB-124	LLD<6.53E-01	LLD<6.53E-01	602.72
SB-125	LLD<5.89E+00	LLD<5.89E+00	176.33
SC-46	LLD<5.37E-01	LLD<5.37E-01	1120.45
SE-75	LLD<7.77E-01	LLD<7.77E-01	264.66
SN-113	LLD<8.83E-01	LLD<8.83E-01	391.67
SR-85	LLD<6.69E-01	LLD<6.69E-01	513.99
SR-91	LLD<9.44E-01	LLD<9.44E-01	555.60
SR-92	LLD<4.94E-01	LLD<4.94E-01	1383.94
TA-182	LLD<1.73E+00	LLD<1.73E+00	1121.30
TC-99M	LLD<4.47E-01	LLD<4.47E-01	140.51
TE-123M	LLD<4.48E-01	LLD<4.48E-01	159.00
TE-125M	LLD<1.36E+02	LLD<1.36E+02	109.27
TE-132	LLD<5.24E-01	LLD<5.24E-01	228.16
TH-228	LLD<4.75E+01	LLD<4.75E+01	84.37
TL-208	LLD<6.98E-01	LLD<6.98E-01	583.14
U-235	LLD<7.44E-01	LLD<7.44E-01	185.71
U-237	LLD<2.17E+00	LLD<2.17E+00	208.00
W-187	LLD<1.66E+00	LLD<1.66E+00	685.74
XE-131M	LLD<2.00E+01	LLD<2.00E+01	163.98
XE-133	LLD<1.72E+00	LLD<1.72E+00	81.00
XE-133M	LLD<4.69E+00	LLD<4.69E+00	233.21
XE-135	LLD<5.41E-01	LLD<5.41E-01	249.79
XE-138	LLD<4.03E+00	LLD<4.03E+00	258.41
Y-88	LLD<3.00E-01	LLD<3.00E-01	1836.06
Y-91	LLD<1.52E+02	LLD<1.52E+02	1204.90
Y-91M	LLD<7.14E-01	LLD<7.14E-01	555.60
ZN-65	LLD<1.31E+00	LLD<1.31E+00	1115.55
ZR-95	LLD<8.81E-01	LLD<8.81E-01	756.73
ZR-97	LLD<4.69E-01	LLD<4.69E-01	743.33
TOTAL	1.53E+02 +-3.65E+00	1.53E+02 +-3.65E+00	

STANDARD DEVIATION = 0.04

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 2.33E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.53E+02 (+-3.65E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

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
93.93	46.86	105.	53.0	1.51E+01
1126.47	562.71	186.	27.2	7.94E+00
1138.56	568.75	285.	23.1	1.23E+01
1603.60	801.23	134.	21.5	7.67E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.50	1460.56	162.	16.0	1.54E+01

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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

222-S COUNTING ROOM 22-MAY-90 13:13:25

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: 2.0
DETECTOR NUMBER: 2 / GEOMETRY NUMBER: 42
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

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD2742
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F106
GEOMETRY DESCRIPTION:
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 9-JAN-90 AT 17:40:21

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 17-MAR-89
EFFICIENCY CALIBRATION PERFORMED 21-OCT-88

222-S COUNTING ROOM 22-MAY-90 13:13:25

SAMPLE: F106
DATA COLLECTED ON 9-JAN-90 AT 17:40:21
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
AC-228	LLD<3.51E-01		LLD<3.51E-01		911.07	
AG-108M	LLD<2.03E-01		LLD<2.03E-01		433.94	
AG-110M	LLD<1.45E+00		LLD<1.45E+00		657.76	
AM-241	LLD<9.56E-01		LLD<9.56E-01		59.54	
AM-243	LLD<2.46E-01		LLD<2.46E-01		74.67	
AR-41	LLD<1.26E-01		LLD<1.26E-01		1293.64	
AU-198	LLD<1.75E-01		LLD<1.75E-01		411.80	
BA-133	LLD<2.31E-01		LLD<2.31E-01		356.02	
BA-139	LLD<4.90E-01		LLD<4.90E-01		165.85	
BA-140	LLD<5.28E-01		LLD<5.28E-01		537.27	
BA-141	LLD<5.18E-01		LLD<5.18E-01		190.23	
BE-7	LLD<1.79E+00		LLD<1.79E+00		477.59	
BI-207	LLD<1.36E-01		LLD<1.36E-01		569.70	
BI-212	LLD<1.38E+00		LLD<1.38E+00		727.27	
BI-214	LLD<3.05E-01		LLD<3.05E-01		609.32	
CD-109	LLD<3.12E+00		LLD<3.12E+00		88.03	
CE-139	LLD<1.11E-01		LLD<1.11E-01		165.85	
CE-141	LLD<1.83E-01		LLD<1.83E-01		145.44	
CEPR144	LLD<1.44E+00		LLD<1.44E+00		133.51	
CO-56	LLD<8.20E-02		LLD<8.20E-02		846.76	
CO-57	LLD<9.31E-02		LLD<9.31E-02		122.06	
CO-58	LLD<7.72E-02		LLD<7.72E-02		810.75	
CO-60	LLD<8.02E-02		LLD<8.02E-02		1332.50	
CR-51	LLD<1.23E+00		LLD<1.23E+00		320.09	
CS-134	LLD<9.59E-02		LLD<9.59E-02		795.84	
CS-136	LLD<6.92E-02		LLD<6.92E-02		818.51	
CS-137	4.48E+01	+-1.03E+00	4.48E+01	+-1.03E+00	661.65	0.13
CS-138	LLD<2.37E-01		LLD<2.37E-01		1435.86	
EU-152	LLD<6.05E-01		LLD<6.05E-01		1408.01	
EU-154	LLD<2.52E-01		LLD<2.52E-01		1274.45	
EU-155	LLD<4.35E-01		LLD<4.35E-01		105.31	
FE-59	LLD<1.84E-01		LLD<1.84E-01		1099.25	
HF-181	LLD<2.17E-01		LLD<2.17E-01		482.20	
HG-203	LLD<1.37E-01		LLD<1.37E-01		279.20	
I-131	LLD<1.72E-01		LLD<1.72E-01		364.48	
I-132	LLD<7.62E-01		LLD<7.62E-01		667.69	
I-133	LLD<1.48E-01		LLD<1.48E-01		529.69	
I-134	LLD<1.14E-01		LLD<1.14E-01		847.03	
I-135	LLD<3.96E-01		LLD<3.96E-01		1260.41	
K-40	LLD<2.04E+00		LLD<2.04E+00		1460.75	
KR-85	LLD<3.89E+01		LLD<3.89E+01		513.99	
KR-85M	LLD<1.11E-01		LLD<1.11E-01		151.17	
KR-87	LLD<3.88E-01		LLD<3.88E-01		402.58	
KR-89	LLD<5.86E+00		LLD<5.86E+00		220.90	
LA-140	LLD<8.48E-02		LLD<8.48E-02		1596.20	
LA-142	LLD<3.34E-01		LLD<3.34E-01		641.83	
MN-54	LLD<8.33E-02		LLD<8.33E-02		834.83	

MN-56	LLD<9.25E-02	LLD<9.25E-02	846.76
NA-22	LLD<8.97E-02	LLD<8.97E-02	1274.55
NA-24	LLD<6.61E-02	LLD<6.61E-02	1368.60
NB-94	LLD<8.40E-02	LLD<8.40E-02	702.63
NB-95	LLD<8.14E-02	LLD<8.14E-02	765.78
NB-97	LLD<1.65E+00	LLD<1.65E+00	657.92
NP-238	LLD<2.64E-01	LLD<2.64E-01	984.45
NP-239	LLD<8.51E-01	LLD<8.51E-01	277.60
PA-233	LLD<3.13E-01	LLD<3.13E-01	311.98
PA-234M	LLD<1.55E+01	LLD<1.55E+01	1001.03
PB-210	LLD<4.84E+00	LLD<4.84E+00	465.03
PB-212	LLD<2.61E-01	LLD<2.61E-01	239.00
PB-214	LLD<3.59E-01	LLD<3.59E-01	351.92
PO-210	LLD<8.20E+03	LLD<8.20E+03	804.00
PO-214	LLD<8.48E+02	LLD<8.48E+02	799.70
PO-216	LLD<5.56E+03	LLD<5.56E+03	804.90
PU-239	LLD<1.40E+03	LLD<1.40E+03	129.30
PU-241	LLD<4.31E+04	LLD<4.31E+04	148.57
RA-224	LLD<2.68E+00	LLD<2.68E+00	240.99
RA-226	LLD<2.60E+00	LLD<2.60E+00	186.10
RB-88	LLD<8.48E-01	LLD<8.48E-01	1836.00
RB-89	LLD<5.02E-01	LLD<5.02E-01	1031.88
RN-220	LLD<1.28E+02	LLD<1.28E+02	549.73
RU-103	LLD<1.67E-01	LLD<1.67E-01	497.08
RURH106	LLD<2.67E+00	LLD<2.67E+00	621.80
SB-124	LLD<1.29E-01	LLD<1.29E-01	602.72
SB-125	LLD<1.32E+00	LLD<1.32E+00	176.33
SC-46	LLD<1.00E-01	LLD<1.00E-01	1120.45
SE-75	LLD<1.99E-01	LLD<1.99E-01	264.66
SN-113	LLD<2.29E-01	LLD<2.29E-01	391.67
SR-85	LLD<1.71E-01	LLD<1.71E-01	513.99
SR-91	LLD<2.50E-01	LLD<2.50E-01	555.60
SR-92	LLD<1.47E-01	LLD<1.47E-01	1383.94
TA-182	LLD<3.17E-01	LLD<3.17E-01	1121.30
TC-99M	LLD<9.77E-02	LLD<9.77E-02	140.51
TE-123M	LLD<1.06E-01	LLD<1.06E-01	159.00
TE-125M	LLD<3.06E+01	LLD<3.06E+01	109.27
TE-132	LLD<1.24E-01	LLD<1.24E-01	228.16
TH-228	LLD<1.05E+01	LLD<1.05E+01	84.37
TL-208	LLD<1.63E-01	LLD<1.63E-01	583.14
U-235	LLD<1.71E-01	LLD<1.71E-01	185.71
U-237	LLD<4.87E-01	LLD<4.87E-01	208.00
W-187	LLD<2.83E-01	LLD<2.83E-01	685.74
XE-131M	LLD<4.75E+00	LLD<4.75E+00	163.98
XE-133	LLD<3.47E-01	LLD<3.47E-01	81.00
XE-133M	LLD<1.05E+00	LLD<1.05E+00	233.21
XE-135	LLD<1.24E-01	LLD<1.24E-01	249.79
XE-138	LLD<9.11E-01	LLD<9.11E-01	258.41
Y-88	LLD<8.05E-02	LLD<8.05E-02	1836.06
Y-91	LLD<2.71E+01	LLD<2.71E+01	1204.90
Y-91M	LLD<1.89E-01	LLD<1.89E-01	555.60
ZN-65	LLD<2.33E-01	LLD<2.33E-01	1115.55
ZR-95	LLD<1.44E-01	LLD<1.44E-01	756.73
ZR-97	LLD<9.09E-02	LLD<9.09E-02	743.33
TOTAL	4.48E+01 +-1.03E+00	4.48E+01 +-1.03E+00	

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.16E-08 UC/LI
TOTAL MEASURED ACTIVITY = 4.48E+01 (+-1.03E+00) UC/LI

% TECH. SPEC. = ****** (+-****)

F-0106

ERROR QUOTATION AT 1.96 SIGMA
LLD 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
2921.98	1460.53	130.	19.1	1.70E+01

222-S COUNTING ROOM 22-MAY-90 13:13:25

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	1324.33	661.78	1.63	84.	10396.	1.9	CS-137
1B		661.85			36.	13.9	
2	2921.98	1460.53	2.51	10.	130.	19.1	K-40
2B		1460.85			156.	3.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0012
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 30-AUG-88 AT 16:46:00
BACKGROUND LIVE TIME: 60000. SECONDS

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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

222-S COUNTING ROOM WESTINGHOUSE HANFORD 22-MAY-90 12:39:33

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

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD4880
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F107
GEOMETRY DESCRIPTION:
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 9-JAN-90 AT 17:37:32

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3015. SECONDS
DEAD TIME: 0.50 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 26-DEC-89
EFFICIENCY CALIBRATION PERFORMED 1-SEP-89

222-S COUNTING ROOM WESTINGHOUSE HANFORD 22-MAY-90 12:39:33 F-0107

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	53.60	26.98	1.09	1497.	794.	15.2	
1B		27.06			123.	34.3	
2	1219.03	609.41	2.29	715.	271.	31.4	BI-214,
2B		609.25			197.	22.8	RU-103
3	1323.70	661.74	1.63	641.	93246.	0.6	CS-137
3B		661.35			379.	12.7	
4	2241.14	1120.54	1.09	110.	42.	87.2	BI-214,SC-46, TA-182
5	2921.77	1461.06	2.33	38.	801.	7.4	K-40
5B		1460.80			854.	7.1	

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 8-SEP-89 AT 12:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

222-S COUNTING ROOM WESTINGHOUSE HANFORD 22-MAY-90 12:39:33

SAMPLE: F107
DATA COLLECTED ON 9-JAN-90 AT 17:37:32
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
AC-228	LLD<1.45E-01		LLD<1.45E-01		911.07	
AG-108M	LLD<6.67E-02		LLD<6.67E-02		433.94	
AG-110M	LLD<4.79E-01		LLD<4.79E-01		657.76	
AM-241	LLD<2.98E-01		LLD<2.98E-01		59.54	
AM-243	LLD<7.18E-02		LLD<7.18E-02		74.67	
AR-41	LLD<3.20E-02		LLD<3.20E-02		1293.64	
AU-198	LLD<6.29E-02		LLD<6.29E-02		411.80	
BA-133	LLD<7.58E-02		LLD<7.58E-02		356.02	
BA-139	LLD<1.61E-01		LLD<1.61E-01		165.85	
BA-140	LLD<1.91E-01		LLD<1.91E-01		537.27	
BA-141	LLD<1.60E-01		LLD<1.60E-01		190.23	
BE-7	LLD<6.59E-01		LLD<6.59E-01		477.59	
BI-207	LLD<3.93E-02		LLD<3.93E-02		569.70	
BI-212	LLD<3.28E-01		LLD<3.28E-01		727.27	
BI-214	LLD<1.05E-01		LLD<1.05E-01		609.32	
CD-109	LLD<1.02E+00		LLD<1.02E+00		88.03	
CE-139	LLD<3.63E-02		LLD<3.63E-02		165.85	
CE-141	LLD<5.39E-02		LLD<5.39E-02		145.44	
CEPR144	LLD<4.62E-01		LLD<4.62E-01		133.51	
CO-56	LLD<2.45E-02		LLD<2.45E-02		846.76	
CO-57	LLD<3.01E-02		LLD<3.01E-02		122.06	
CO-58	LLD<2.35E-02		LLD<2.35E-02		810.75	
CO-60	LLD<2.80E-02		LLD<2.80E-02		1332.50	
CR-51	LLD<4.26E-01		LLD<4.26E-01		320.09	
CS-134	LLD<2.69E-02		LLD<2.69E-02		795.84	
CS-136	LLD<2.19E-02		LLD<2.19E-02		818.51	
CS-137	5.36E+01	+-5.35E-01	5.36E+01	+-5.35E-01	661.65	0.09
CS-138	LLD<6.14E-02		LLD<6.14E-02		1435.86	
EU-152	LLD<1.36E-01		LLD<1.36E-01		1408.01	
EU-154	LLD<8.28E-02		LLD<8.28E-02		1274.45	
EU-155	LLD<1.27E-01		LLD<1.27E-01		105.31	
FE-59	LLD<5.04E-02		LLD<5.04E-02		1099.25	
HF-181	LLD<7.86E-02		LLD<7.86E-02		482.20	
HG-203	LLD<4.81E-02		LLD<4.81E-02		279.20	
I-131	LLD<5.87E-02		LLD<5.87E-02		364.48	
I-132	LLD<7.62E-02		LLD<7.62E-02		667.69	
I-133	LLD<5.56E-02		LLD<5.56E-02		529.69	
I-134	LLD<3.21E-02		LLD<3.21E-02		847.03	
I-135	LLD<1.09E-01		LLD<1.09E-01		1260.41	
K-40	LLD<8.78E-01		LLD<8.78E-01		1460.75	
KR-85	LLD<1.23E+01		LLD<1.23E+01		513.99	
KR-85M	LLD<3.75E-02		LLD<3.75E-02		151.17	
KR-87	LLD<1.33E-01		LLD<1.33E-01		402.58	
KR-89	LLD<1.89E+00		LLD<1.89E+00		220.90	
LA-140	LLD<2.46E-02		LLD<2.46E-02		1596.20	
LA-142	LLD<1.07E-01		LLD<1.07E-01		641.83	
MN-54	LLD<2.44E-02		LLD<2.44E-02		834.83	

MN-56	LLD<2.77E-02	LLD<2.77E-02	846.76
NA-22	LLD<2.85E-02	LLD<2.85E-02	1274.55
NA-24	LLD<2.66E-02	LLD<2.66E-02	1368.60
NB-94	LLD<2.15E-02	LLD<2.15E-02	702.63
NB-95	LLD<2.37E-02	LLD<2.37E-02	765.78
NB-97	LLD<6.84E-01	LLD<6.84E-01	657.92
NP-238	LLD<9.11E-02	LLD<9.11E-02	984.45
NP-239	LLD<2.79E-01	LLD<2.79E-01	277.60
PA-233	LLD<1.16E-01	LLD<1.16E-01	311.98
PA-234M	LLD<4.06E+00	LLD<4.06E+00	1001.03
PB-210	LLD<1.73E+00	LLD<1.73E+00	465.03
PB-212	LLD<9.83E-02	LLD<9.83E-02	239.00
PB-214	LLD<1.29E-01	LLD<1.29E-01	351.92
PO-210	LLD<1.87E+03	LLD<1.87E+03	804.00
PO-214	LLD<2.25E+02	LLD<2.25E+02	799.70
PO-216	LLD<1.13E+03	LLD<1.13E+03	804.90
PU-239	LLD<3.99E+02	LLD<3.99E+02	129.30
PU-241	LLD<1.41E+04	LLD<1.41E+04	148.57
RA-224	LLD<9.56E-01	LLD<9.56E-01	240.99
RA-226	LLD<1.01E+00	LLD<1.01E+00	186.10
RB-88	LLD<1.77E-01	LLD<1.77E-01	1836.00
RB-89	LLD<1.05E-01	LLD<1.05E-01	1031.88
RN-220	LLD<3.96E+01	LLD<3.96E+01	549.73
RU-103	LLD<6.35E-02	LLD<6.35E-02	497.08
RURH106	LLD<8.36E-01	LLD<8.36E-01	621.80
SB-124	LLD<4.06E-02	LLD<4.06E-02	602.72
SB-125	LLD<4.21E-01	LLD<4.21E-01	176.33
SC-46	LLD<3.03E-02	LLD<3.03E-02	1120.45
SE-75	LLD<6.55E-02	LLD<6.55E-02	264.66
SN-113	LLD<8.01E-02	LLD<8.01E-02	391.67
SR-85	LLD<5.42E-02	LLD<5.42E-02	513.99
SR-91	LLD<7.82E-02	LLD<7.82E-02	555.60
SR-92	LLD<3.56E-02	LLD<3.56E-02	1383.94
TA-182	LLD<7.60E-02	LLD<7.60E-02	1121.30
TC-99M	LLD<2.99E-02	LLD<2.99E-02	140.51
TE-123M	LLD<3.34E-02	LLD<3.34E-02	159.00
TE-125M	LLD<9.72E+00	LLD<9.72E+00	109.27
TE-132	LLD<4.28E-02	LLD<4.28E-02	228.16
TH-228	LLD<3.17E+00	LLD<3.17E+00	84.37
TL-208	LLD<5.68E-02	LLD<5.68E-02	583.14
U-235	LLD<5.60E-02	LLD<5.60E-02	185.71
U-237	LLD<1.75E-01	LLD<1.75E-01	208.00
W-187	LLD<7.05E-02	LLD<7.05E-02	685.74
XE-131M	LLD<1.52E+00	LLD<1.52E+00	163.98
XE-133	LLD<1.15E-01	LLD<1.15E-01	81.00
XE-133M	LLD<3.42E-01	LLD<3.42E-01	233.21
XE-135	LLD<3.98E-02	LLD<3.98E-02	249.79
XE-138	LLD<3.31E-01	LLD<3.31E-01	258.41
Y-88	LLD<1.67E-02	LLD<1.67E-02	1836.06
Y-91	LLD<9.71E+00	LLD<9.71E+00	1204.90
Y-91M	LLD<5.92E-02	LLD<5.92E-02	555.60
ZN-65	LLD<7.59E-02	LLD<7.59E-02	1115.55
ZR-95	LLD<3.77E-02	LLD<3.77E-02	756.73
ZR-97	LLD<2.02E-02	LLD<2.02E-02	743.33
TOTAL	5.36E+01 +-5.35E-01	5.36E+01 +-5.35E-01	

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.16E-08 UC/LI
TOTAL MEASURED ACTIVITY = 5.36E+01 (+-5.35E-01) UC/LI

% TECH. SPEC. = ****** (+-****)

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
53.60	26.98	671.	19.0	6.99E+02
2241.14	1120.54	42.	87.2	6.14E-01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1219.03	609.41	271.	31.4	2.28E+00
2921.77	1461.06	801.	7.4	1.48E+01

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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

222-S COUNTING ROOM WESTINGHOUSE HANFORD 22-MAY-90 12:58:18

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

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD4881
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F181
GEOMETRY DESCRIPTION:
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 9-JAN-90 AT 21:47:12

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3031. SECONDS
DEAD TIME: 1.02 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 26-DEC-89
EFFICIENCY CALIBRATION PERFORMED 1-SEP-89

222-S COUNTING ROOM WESTINGHOUSE HANFORD 22-MAY-90 12:58:18

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	53.52	26.94	1.09	2647.	1374.	11.6	
1B		27.06			123.	34.3	
2	951.30	475.58	1.50	4649.	925.	22.0	CS-134
3C	1126.85	563.33	1.57	3190.	3491.	6.5	CS-134, EU-152
4C	1138.98	569.39	1.57	3111.	6628.	4.7	CS-134, BI-207
5	1209.75	604.77	1.55	3004.	41038.	1.0	CS-134
6	1323.62	661.70	1.66	2076.	63912.	0.8	CS-137
6B		661.35			379.	12.7	
7C	1591.87	795.82	1.72	1666.	29757.	1.5	CS-134
8C	1604.14	801.96	1.72	1599.	2941.	7.8	CS-134
9	2077.47	1038.67	1.87	1554.	402.	32.7	CS-134
10C	2335.39	1167.68	2.06	968.	634.	19.9	CS-134
11C	2346.28	1173.13	2.06	950.	27131.	1.4	CO-60
12	2664.80	1332.48	2.26	274.	24465.	1.3	CO-60
13	2729.85	1365.03	2.22	113.	815.	8.1	CS-134
14	2801.21	1400.74	2.60	92.	374.	13.2	BI-214
15	2921.41	1460.88	2.44	62.	818.	7.6	K-40
15B		1460.80			854.	7.1	

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 8-SEP-89 AT 12:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

222-S COUNTING ROOM WESTINGHOUSE HANFORD 22-MAY-90 12:58:18

SAMPLE: F181
DATA COLLECTED ON 9-JAN-90 AT 21:47:12
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
AC-228	LLD<3.84E-01		LLD<3.84E-01		911.07	
AG-108M	LLD<8.23E-02		LLD<8.23E-02		433.94	
AG-110M	LLD<4.07E-01		LLD<4.07E-01		657.76	
AM-241	LLD<3.90E-01		LLD<3.90E-01		59.54	
AM-243	LLD<9.32E-02		LLD<9.32E-02		74.67	
AR-41	LLD<5.96E-02		LLD<5.96E-02		1293.64	
AU-198	LLD<8.38E-02		LLD<8.38E-02		411.80	
BA-133	LLD<1.06E-01		LLD<1.06E-01		356.02	
BA-139	LLD<2.11E-01		LLD<2.11E-01		165.85	
BA-140	LLD<3.10E-01		LLD<3.10E-01		537.27	
BA-141	LLD<2.06E-01		LLD<2.06E-01		190.23	
BE-7	LLD<8.20E-01		LLD<8.20E-01		477.59	
BI-207	LLD<7.94E-02		LLD<7.94E-02		569.70	
BI-212	LLD<1.10E+00		LLD<1.10E+00		727.27	
BI-214	LLD<5.84E-01		LLD<5.84E-01		609.32	
CD-109	LLD<1.27E+00		LLD<1.27E+00		88.03	
CE-139	LLD<4.76E-02		LLD<4.76E-02		165.85	
CE-141	LLD<7.06E-02		LLD<7.06E-02		145.44	
CEPR144	LLD<5.97E-01		LLD<5.97E-01		133.51	
CO-56	LLD<8.92E-02		LLD<8.92E-02		846.76	
CO-57	LLD<3.81E-02		LLD<3.81E-02		122.06	
CO-58	LLD<8.29E-02		LLD<8.29E-02		810.75	
CO-60	2.26E+01	+-3.28E-01	2.26E+01	+-3.28E-01	1332.50	-0.02
—					1173.24	-0.11
CR-51	LLD<5.75E-01		LLD<5.75E-01		320.09	
CS-134	2.03E+01	+-3.39E-01	2.03E+01	+-3.39E-01	795.84	-0.03
					604.70	0.07
CS-136	LLD<7.91E-02		LLD<7.91E-02		818.51	
CS-137	3.67E+01	+-4.07E-01	3.67E+01	+-4.07E-01	661.65	0.05
CS-138	LLD<8.67E-02		LLD<8.67E-02		1435.86	
EU-152	LLD<2.07E-01		LLD<2.07E-01		1408.01	
EU-154	LLD<1.65E-01		LLD<1.65E-01		1274.45	
EU-155	LLD<1.63E-01		LLD<1.63E-01		105.31	
FE-59	LLD<1.96E-01		LLD<1.96E-01		1099.25	
HF-181	LLD<9.90E-02		LLD<9.90E-02		482.20	
HG-203	LLD<6.64E-02		LLD<6.64E-02		279.20	
I-131	LLD<8.20E-02		LLD<8.20E-02		364.48	
I-132	LLD<9.17E-02		LLD<9.17E-02		667.69	
I-133	LLD<8.80E-02		LLD<8.80E-02		529.69	
I-134	LLD<1.18E-01		LLD<1.18E-01		847.03	
I-135	LLD<2.10E-01		LLD<2.10E-01		1260.41	
K-40	LLD<8.92E-01		LLD<8.92E-01		1460.75	
KR-85	LLD<1.69E+01		LLD<1.69E+01		513.99	
KR-85M	LLD<4.91E-02		LLD<4.91E-02		151.17	
KR-87	LLD<1.81E-01		LLD<1.81E-01		402.58	
KR-89	LLD<2.55E+00		LLD<2.55E+00		220.90	
LA-140	LLD<3.53E-02		LLD<3.53E-02		1596.20	

LA-142	LLD<1.83E-01	LLD<1.83E-01	641.83
MN-54	LLD<8.51E-02	LLD<8.51E-02	834.83
MN-56	LLD<1.01E-01	LLD<1.01E-01	846.76
NA-22	LLD<5.34E-02	LLD<5.34E-02	1274.55
NA-24	LLD<7.43E-02	LLD<7.43E-02	1368.60
NB-94	LLD<6.84E-02	LLD<6.84E-02	702.63
NB-95	LLD<8.00E-02	LLD<8.00E-02	765.78
NB-97	LLD<5.74E-01	LLD<5.74E-01	657.92
NP-238	LLD<3.59E-01	LLD<3.59E-01	984.45
NP-239	LLD<3.79E-01	LLD<3.79E-01	277.60
PA-233	LLD<1.60E-01	LLD<1.60E-01	311.98
PA-234M	LLD<1.81E+01	LLD<1.81E+01	1001.03
PB-210	LLD<1.97E+00	LLD<1.97E+00	465.03
PB-212	LLD<1.27E-01	LLD<1.27E-01	239.00
PB-214	LLD<1.76E-01	LLD<1.76E-01	351.92
PO-210	LLD<7.22E+03	LLD<7.22E+03	804.00
PO-214	LLD<3.73E+03	LLD<3.73E+03	799.70
PO-216	LLD<6.39E+03	LLD<6.39E+03	804.90
PU-239	LLD<5.10E+02	LLD<5.10E+02	129.30
PU-241	LLD<1.82E+04	LLD<1.82E+04	148.57
RA-224	LLD<1.29E+00	LLD<1.29E+00	240.99
RA-226	LLD<1.29E+00	LLD<1.29E+00	186.10
RB-88	LLD<3.41E-01	LLD<3.41E-01	1836.00
RB-89	LLD<4.32E-01	LLD<4.32E-01	1031.88
RN-220	LLD<6.96E+01	LLD<6.96E+01	549.73
RU-103	LLD<8.38E-02	LLD<8.38E-02	497.08
RURH106	LLD<1.46E+00	LLD<1.46E+00	621.80
SB-124	LLD<1.92E-01	LLD<1.92E-01	602.72
SB-125	LLD<5.59E-01	LLD<5.59E-01	176.33
SC-46	LLD<1.12E-01	LLD<1.12E-01	1120.45
SE-75	LLD<8.99E-02	LLD<8.99E-02	264.66
SN-113	LLD<1.10E-01	LLD<1.10E-01	391.67
SR-85	LLD<7.40E-02	LLD<7.40E-02	513.99
SR-91	LLD<1.40E-01	LLD<1.40E-01	555.60
SR-92	LLD<4.77E-02	LLD<4.77E-02	1383.94
TA-182	LLD<3.00E-01	LLD<3.00E-01	1121.30
TC-99M	LLD<3.90E-02	LLD<3.90E-02	140.51
TE-123M	LLD<4.36E-02	LLD<4.36E-02	159.00
TE-125M	LLD<1.21E+01	LLD<1.21E+01	109.27
TE-132	LLD<5.78E-02	LLD<5.78E-02	228.16
TH-228	LLD<3.95E+00	LLD<3.95E+00	84.37
TL-208	LLD<1.00E-01	LLD<1.00E-01	583.14
U-235	LLD<7.18E-02	LLD<7.18E-02	185.71
U-237	LLD<2.32E-01	LLD<2.32E-01	208.00
W-187	LLD<2.39E-01	LLD<2.39E-01	685.74
XE-131M	LLD<1.98E+00	LLD<1.98E+00	163.98
XE-133	LLD<1.45E-01	LLD<1.45E-01	81.00
XE-133M	LLD<4.62E-01	LLD<4.62E-01	233.21
XE-135	LLD<5.41E-02	LLD<5.41E-02	249.79
XE-138	LLD<4.54E-01	LLD<4.54E-01	258.41
Y-88	LLD<3.21E-02	LLD<3.21E-02	1836.06
Y-91	LLD<2.36E+01	LLD<2.36E+01	1204.90
Y-91M	LLD<1.06E-01	LLD<1.06E-01	555.60
ZN-65	LLD<2.27E-01	LLD<2.27E-01	1115.55
ZR-95	LLD<1.37E-01	LLD<1.37E-01	756.73
ZR-97	LLD<7.73E-02	LLD<7.73E-02	743.33
TOTAL	7.96E+01 +-6.23E-01	7.96E+01 +-6.23E-01	

STANDARD DEVIATION = 0.07

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.45E-09 UC/LI
TOTAL MEASURED ACTIVITY = 7.96E+01 (+-6.23E-01) UC/LI
% TECH. SPEC. = ****** (+-****)

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
53.52	26.94	1251.	13.2	1.32E+03
951.30	475.58	925.	22.0	6.21E+00
1126.85	563.33	3491.	6.5	2.73E+01
1138.98	569.39	6628.	4.7	5.24E+01
1604.14	801.96	2941.	7.8	3.19E+01
2077.47	1038.67	402.	32.7	5.52E+00
2335.39	1167.68	634.	19.9	9.66E+00
2729.85	1365.03	815.	8.1	1.42E+01
2801.21	1400.74	374.	13.2	6.66E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.41	1460.88	818.	7.6	1.51E+01

Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Uranium Analysis

Instrument	WA77344
Procedure / Rev	LA-925-106 / A-2
Technologist	M. Franz
Date	01-05-90
Temperature	N/A
Starting Time	08:00
Ending Time	15:00
Chemist	S. A. Catlow

	Description	Lab. Id.
1	Inital LMCS Check Std	F0105
2	Reagent Blank	F0120
3	Sample 89-045	F0106
4	Duplicate 89-045	F0107
5	Spike 89-045	F0108
6	Sample 89-047	F0130
7	Duplicate 89-047	F0131
8	Sample 89-048	F0154
9	Duplicate 89-048	F0155
10	Sample 89-050	F0294
11	Duplicate 89-050	F0295

	Description	Lab. Id.
12	Final LMCS Check Std	F0297
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std	58B38 / 1uL			5.7 mL
Spike	58B83 /100 uL	F0108 / 1 uL		5.80 mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 06-01-90

Verified by: Cary M Seidel (Signature) C.M. Seidel (Printed Name) Date: 06-01-90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim 4/04/90 Rev.E SST-102

9 1 1 2 7 5 1 1 2

Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Uranium Analysis

Instrument	WA77344
Procedure / Rev	LA-925-106 / A-2
Technologist	S. Lai
Date	07-12-90
Temperature	N/A
Starting Time	Not Reported.
Ending Time	Not Reported.
Chemist	S. A. Catlow

	Description	Lab. Id.
1	Intial LMCS Check Std	F0105
2	Reagent Blank	F0120
3	Sample 89-045	F0106
4	Duplicate 89-045	F0107
5	Spike 89-045	F0108
6	Final LMCS Check Std	F0297
7		
8		
9		
10		
11		

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std	58B38 / 1 uL			5.7 mL
Spike	54B38 / 100 uL	F0106 / 1 uL		5.8 mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 8-09-90

Verified by: Carry M Seidel (Signature) C. M. Seidel (Printed Name) Date: 8-09-90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

9 1 1 2 1 5 0 1 1 3

Interim

Rev.E 4/04/90

SST-102

WATER DIGESTION TEST ANALYSIS

9 1 1 2 2 5 0 1 1 4

Single Shell Tank Project

Water Digestion
Laboratory Results of Solids
Units are Sample Wet Weight

Tank 241-U-110
Core 6
Segment 4
Customer ID: 89-045

Laboratory Segment Serial No: F0101

	Check Standard	Blank		Sample		Sample Duplicate		Spike of Sample	Check Standard
Laboratory ID:	F0110	F0122		F0111		F0112		F0113	F0066
Water Digestion				10.6	g/L	10.32	g/L	10.05	g/L
Ion Chromatograph									
Fluoride	93.10%	<0.1	ppm	1.72E+04	ug/g	1.86E+04	ug/g	96.30%	93.10%
Chloride	97.90%	0.15	ppm	<9.53E+02	ug/g	<9.79E+02	ug/g	107.20%	96.30%
Nitrate	98.30%	<1.0	ppm	2.55E+04	ug/g	2.66E+04	ug/g	104.40%	105.20%
Sulfate	92.90%	<1.0	ppm	4.06E+03	ug/g	<9.79E+03	ug/g	101.30%	98.90%
Laboratory ID:	F0110	F0122		F0111		F0112		F0113	F0114
Phosphate	94.30%	<1.0	ppm	1.46E+05	ug/g	1.59E+05	ug/g	103.20%	101.00%
Laboratory ID:	F0110	F0122		F0111		F0112		F0113	F0114
Total Organic Carbon	97.40%	6.4	ug	7.26E+02	ug/g	6.93E+02	ug/g	94.50%	96.10%

Single Shell Tank Project

Water Digestion
Sample Results on Laboratory Digestion

Tank 241-U-110
Core 6
Segment 4
Customer ID: 89-045

Laboratory Segment Serial No. F0101

	Check Standard	Blank		Sample		Sample uplicate		Spike of Sample	Check Standard
Laboratory ID:	F0110	F0122		F0111		F0112		F0113	F0066
Water Digestion				10.60	g/L	10.32	g/L	10.05	g/L
Ion Chromatograph									
Fluoride	93.10%	<0.1	ppm	1.82E+02	ppm	1.92E+02	ppm	96.30%	93.10%
Chloride	97.90%	0.15	ppm	<10.1	ppm	<10.1	ppm	107.20%	96.30%
Nitrate	98.30%	<1.0	ppm	2.70E+02	ppm	2.74E+02	ppm	104.40%	105.20%
Sulfate	92.90%	<1.0	ppm	4.31E+01	ppm	1.01E+02	ppm	101.30%	98.90%
Laboratory ID:	F0110	F0122		F0111		F0112		F0113	F0114
Phosphate	94.30%	<1.0	ppm	1.55E+03	ppm	1.64E+03	ppm	103.20%	101.00%
Laboratory ID:	F0110	F0122		F0111		F0112		F0113	F0114
Total Organic Carbon	97.40%	6.4	ug	7.70E-03	g/L	7.15E-03	g/L	94.50%	96.10%

Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Instrument	N/A
Procedure / Rev	LA-504-101/A-2
Technologist	N.E. Wright
Date	01-09-90
Temperature	25 C
Starting Time	12:00; 01-08-90
Ending Time	09:00; 01-09-90
Chemist	H. S. Rich

Water Digestion

Note: Sample is not spiked prior to digestion.

This procedure provides a sample to be spiked later with the appropriate elements.

	Description	Lab. Id.
1	Reagent Blank	F0122
2	Sample 89-045	F0111
3	Duplicate 89-045	F0112
4	Spike 89-045	F0113
5		
6		
7		
8		
9		
10		
11		

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
N/A				
Spike (See Note)				

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 06-01-90

Verified by: Cary M Seidel (Signature) C. M. Seidel (Printed Name) Date: 06-01-90

Approved by: L. H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

SST-102 Rev.E 4/04/90 Interim

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Analytical Batch

Lab Segment Serial No.: .F0101

Customer ID.: 89-045

Ion Chromatograph Analysis

Water Digestion

*Chromatogram Only

Instrument	AL10653
Procedure / Rev	LA-533-105/A-3
Technologist	6B107/N.E. Wright
Date	02/16/90
Temperature	24 C
Starting Time	11:30
Ending Time	14:00
Chemist	H. S. Rich

	Description	Lab. Id.
1	Eluent Blank	*
2	Initial LMCS Check Std.	F0110
3	Reagent Blank 89-045	F0122
4	Sample 89-045	F0111
5	Duplicate 89-045	F0112
6	Spike 89-045	F0113
7	Sample 89-043	F0063
8	Duplicate 89-043	F0064
9	Final LMCS Check Std.	F0066
10		
11		

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std.	6C11H1/100ul			10.10mL
Spike	35C9-67/300uL	F0113/3.02mg		5.3mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 06/06/90

Verified by: Carey M Seidel (Signature) C.M. Seidel (Printed Name) Date: 06/06/90

Approved by: L. H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim 4/04/90 Rev.E SST-102

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9 1 1 2 7 5 0 1 1 7 8

Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Instrument	AL10653
Procedure / Rev	LA-533-105/A-3
Technologist	6B107/N.E. Wright
Date	02/22/90
Temperature	24 C
Starting Time	12:00
Ending Time	14:40
Chemist	H. S. Rich

Ion Chromatograph Analysis

Water Digestion

Re-Ran For Phosphate Only

*Chromatogram Only

	Description	Lab. Id.
1	Eluent Blank	*
2	Initial LMCS Check Std.	F0110
3	Reagent Blank 89-045	F0122
4	Sample 89-045	F0111
5	Duplicate 89-045	F0112
6	Spike 89-045	F0113
7	Sample 89-043	F0063
8	Duplicate 89-043	F0064
9	Final LMCS Check Std.	F0114
10		
11		

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std.	6C11HI/100ul			10.10mL
Spike	35C9-67/300uL	F0113/3.02mg		5.3mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 06/06/90

Verified by: Cary M Seidel (Signature) C.M. Seidel (Printed Name) Date: 06/06/90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim 4/04/90 Rev.E SST-102

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Single Shell Tank Calibration Record

Phase I-A

Analyte: Ion Chromatograph	
Procedure LA-533-105	Revision: A-3
Instrument: Dionex	Property Number: WB24721
Technologist: Nora Wright	Payroll Number: 6B107
Date: 2-15-90; 2-22-90	

Calibration Standard ID: 35C9-67 issued 02-06-90

Analyte Concentration: F=47; Cl=60.0; NO3=481.0; PO4=492.0; SO4=482.0 in ppm

Type of Calibration: Quadratic least squares

	Dilution	Concentration	Instrument Reading Units =
1			
2			
3			
4			
5	See Attached Calibration Sheets		
6			
7			
8			
9			
10			

Comments:

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 07-17-90

Verified by: Cary M Seidel (Signature) C. M. Seidel (Printed Name) Date: 07-17-90

Approved by: L.H. Taylor L.H. Taylor Date: 08-30-90

Interim Rev.(Draft) 1/18/89 ST-103

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DIONEX METHOD PARAMETERS - SST.MET

Detector Parameters

Number of Detectors	1
Detector 1 Type	CDM-1

Report Options

Run Time (minutes)	11.50
Detector 1 real time plot scale	20.00
Print Report	Yes
Print Replot	Yes
AutoScale Replot to Highest Peak	Yes
Print Retention Times on Chromatogram	Yes
List Peaks Not Found in this run	No
Report Unknowns found in run	No
Record Raw Data	Yes
Raw Data File Name: c:\WINDOWS\AI400\DATA\90021401.D08	
Record Result Data	No

Integration Parameters

Sampling Rate (seconds)	0.20
Peak Threshold (mV or uS/data pt interval)	0.400
Starting Peak Width (seconds)	10.0
Peak Area Reject	1000

Integration Timed Events

Time	Description

Calibration Parameters

External or Internal Calibration	External
Calibrate by Area or Height	Height
Replace Or Average Calibrations	Replace
Number Of Levels for Calibration	6
Calibration fit type	Quadratic
Response Factor for unknown peaks	0.0
Default Injection Volume	1.0
Default Dilution Factor	1.0
Area Reject for Reference Peaks	1000
Percent Retention Time Window for Reference Peaks	5.0

Component # 1 FLUORIDE Retention Time 0.97
Reference Peak FLUORIDE Window Size 2.00%
Least Squares Slope = 3.60283E-004
Least Squares Intercept = 1.37365E-002
Ka = -4.29870E-009

Level	Amount	Area	Height
1	9.38100E-002	1336	246
2	2.33800E-001	3478	616
3	4.65300E-001	7271	1226
4	9.21500E-001	15622	2625
5	1.80760E+000	37180	5315
6	3.48130E+000	74116	11092

Component # 2 CHLORIDE Retention Time 1.53
Reference Peak FLUORIDE Window Size 2.50%
Least Squares Slope = 6.25472E-004
Least Squares Intercept = -1.74138E-002
Ka = -1.51561E-008

Level	Amount	Area	Height
1	1.19800E-001	1267	200
2	2.98500E-001	2903	489
3	5.94100E-001	6430	1017
4	1.17650E+000	13713	2088
5	2.30760E+000	28370	4066
6	4.44430E+000	59291	9183

Component # 3 NITRITE Retention Time 1.90
Reference Peak FLUORIDE Window Size 5.00%
Least Squares Slope = 8.73497E-004
Least Squares Intercept = 5.05282E-001
Ka = 4.08720E-009

Level	Amount	Area	Height
1	1.28940E+000	8214	1202
2	3.21850E+000	20050	2969
3	6.39600E+000	43200	6258
4	1.26667E+001	91140	13081
5	2.48451E+001	181100	25092
6	4.78505E+001	353600	44776

Component # 4 NITRATE Retention Time 3.28
Reference Peak FLUORIDE Window Size 7.00%
Least Squares Slope = 1.95501E-003
Least Squares Intercept = -6.94769E-003
Ka = 4.87686E-009

Level	Amount	Area	Height
1	9.60100E-001	5253	468
2	2.39300E+000	15077	1234
3	4.76240E+000	30767	2460
4	9.43140E+000	63964	4753
5	1.84992E+001	132213	9250
6	3.56286E+001	274103	17468

Component # 5 PHOSPHATE Retention Time 5.10
Reference Peak FLUORIDE Window Size 7.00%
Least Squares Slope = 5.16373E-003
Least Squares Intercept = 1.15944E-001
Ka = -7.81115E-008

Level	Amount	Area	Height
1	9.82000E-001	2854	180
2	2.44770E+000	7216	437
3	4.87130E+000	16848	948
4	9.64710E+000	32539	1886
5	1.89223E+001	69406	3876
6	3.64434E+001	142872	8003

Component # 6 SULFATE Retention Time 6.43
Reference Peak FLUORIDE Window Size 5.00%
Least Squares Slope = 2.38873E-003
Least Squares Intercept = 2.12534E-001
Ka = -1.74248E-008

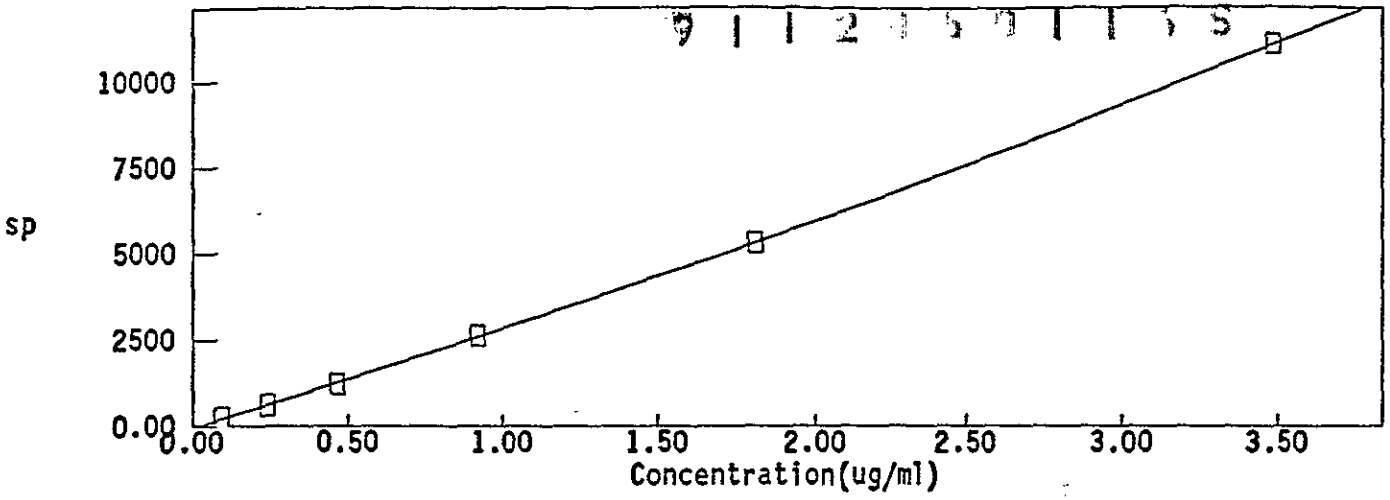
Level	Amount	Area	Height
1	9.62100E-001	6077	338
2	2.39800E+000	17483	922
3	4.77230E+000	36861	1890
4	9.45100E+000	79004	4005
5	1.85377E+001	163581	8158
6	3.57027E+001	343157	16953

IC Control File: C:\WINDOWS\AI400\METHOD\GROUT01.TE

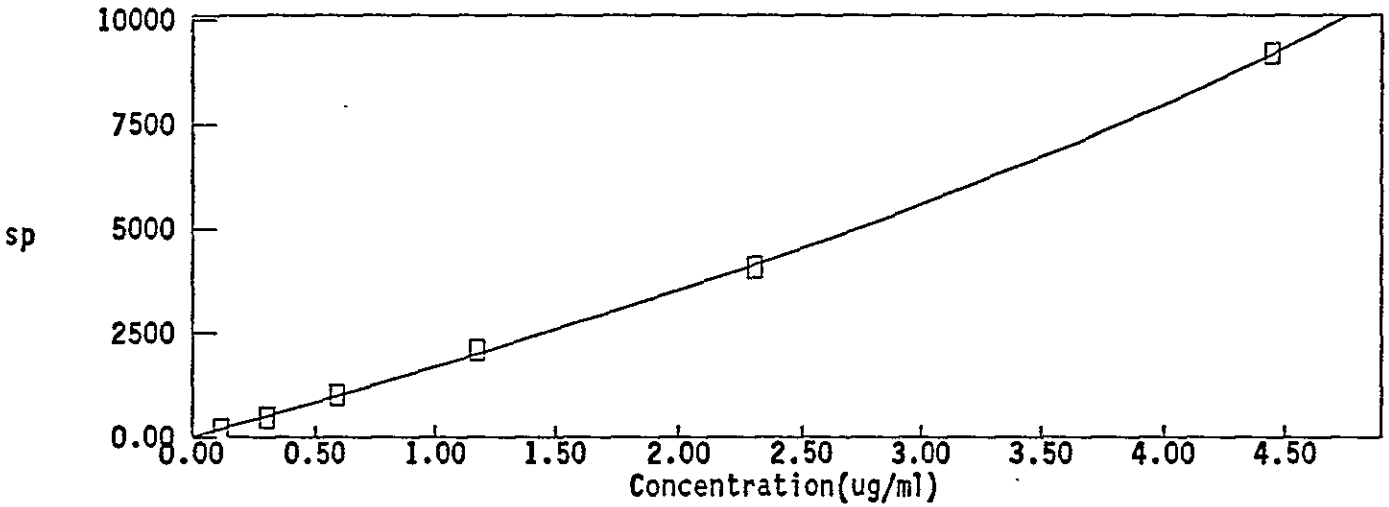
Step	Time	Description
Init		CDM AutoOffset Off
Init		CDM Recorder Mark OFF
Init		CDM Temp. Comp. = 1.7 / Deg C
Init		CDM Recorder Range = 1.000 uS
Init		CDM Cell ON
Init		CMA Heater = 25 Deg. C
Init		Valve A ON
Init		Valve B ON
Init		Inject Valve OFF
Init		CIM Relay 1 OFF
Init		CIM Relay 2 OFF
Init		CIM AC 1 OFF
Init		CIM AC 2 OFF
Init		GPM Start
Init		GPM Hold Gradient Clock
Init		GPM Reset ON
1	0.0	CDM AutoOffset ON
1	0.0	GPM Reset OFF
2	0.1	Inject Valve ON
2	0.1	GPM Run Gradient Clock
3	3.0	Inject Valve OFF
4	3.5	CIM Relay 1 ON
5	4.0	CIM Relay 1 OFF

GpmFile: C:\WINDOWS\AI400\METHOD\GROUT01.GPM
Lo Pressure Limit = 200
Hi Pressure Limit = 2000
Eluant 1 - DI WATER
Eluant 2 - BICARBONATE
Eluant 3 - CARBONATE
Eluant 4 -

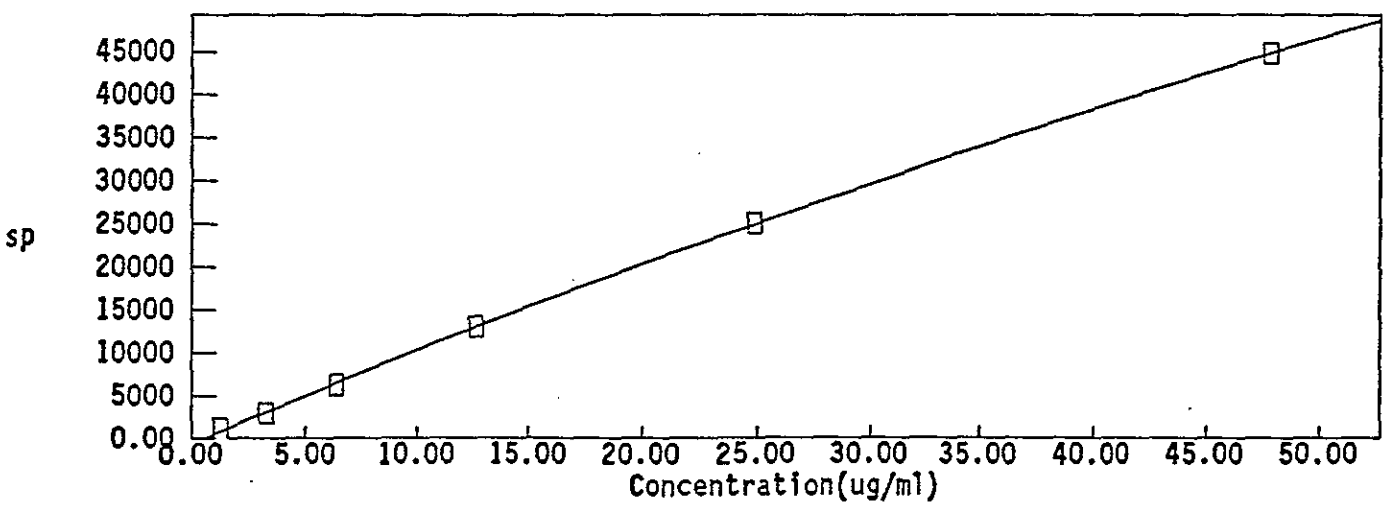
Time	Flow	%1	%2	%3	%4	Comment
0.0	2.0	84	8	8	0	
15.8	2.0	84	8	8	0	



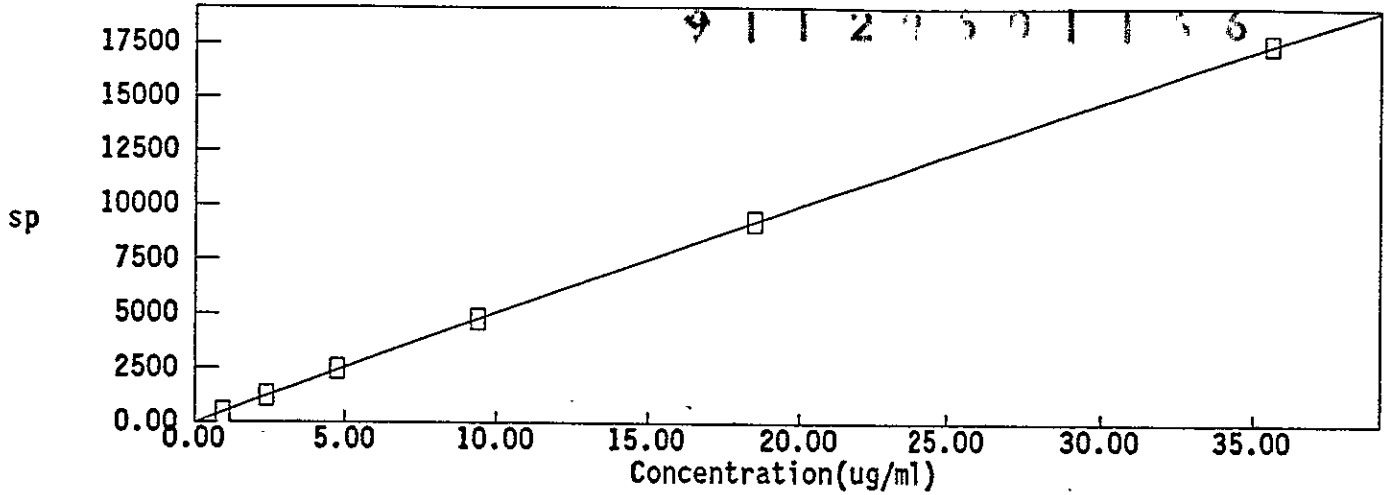
Component: FLUORIDE
Fit Type: Quadratic
Conc = (-4.298701e-009 * Resp*)
(3.602831e-004 * Resp)+ 0.0137
Standardization: Ext
Calibration: Height



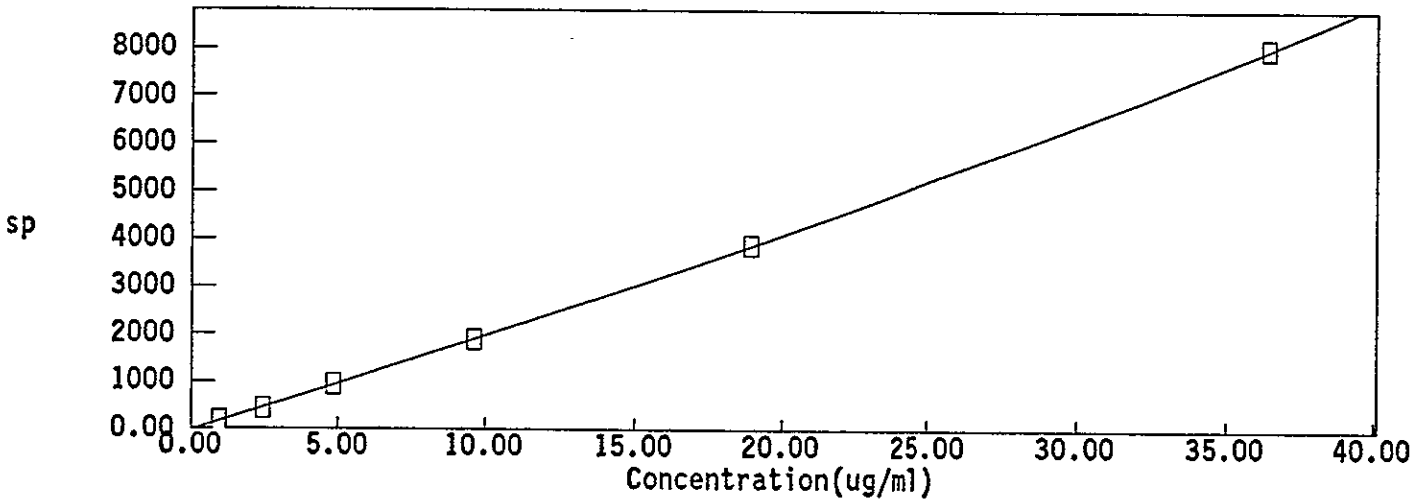
Component: CHLORIDE
Fit Type: Quadratic
Conc = (-1.515615e-008 * Resp*)
(6.254716e-004 * Resp)+ -0.0174
Standardization: Ext
Calibration: Height



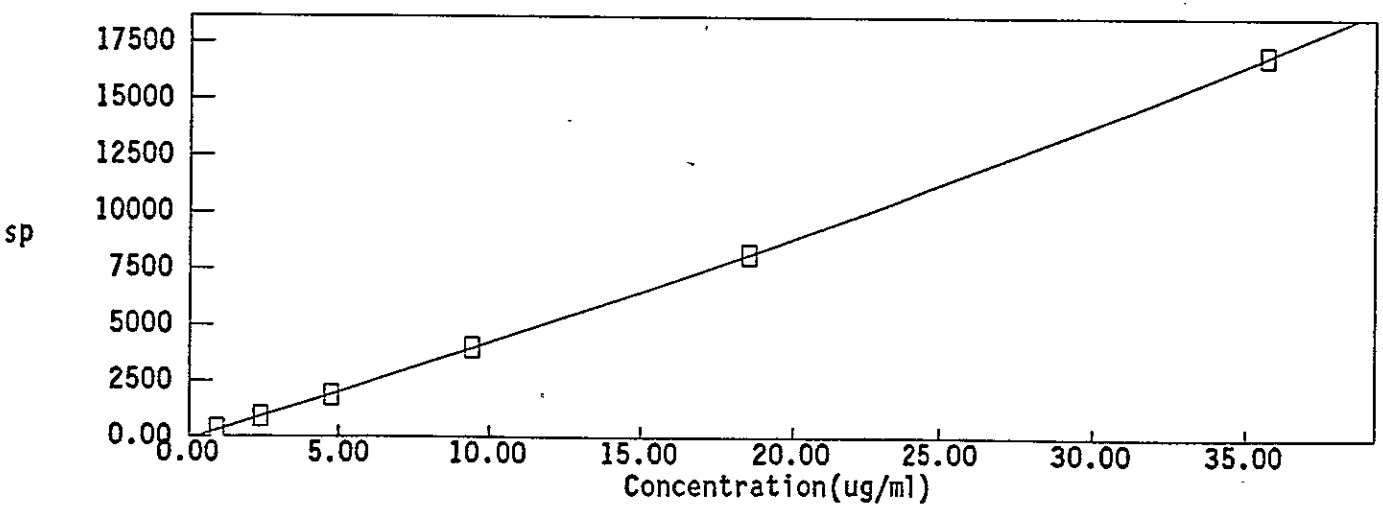
Component: NITRITE
Fit Type: Quadratic
Conc = (4.087201e-009 * Resp*)+
(8.734971e-004 * Resp)+ 0.5053
Standardization: Ext
Calibration: Height



Component: NITRATE
Fit Type: Quadratic
Conc = (4.876863e-009 * Resp*)+
(1.955009e-003 * Resp)+ -0.0069
Standardization: Ext
Calibration: Height



Component: PHOSPHATE
Fit Type: Quadratic
Conc = (-7.811152e-008 * Resp*)
(5.163732e-003 * Resp)+ 0.1159
Standardization: Ext
Calibration: Height



Component: SULFATE
Fit Type: Quadratic
Conc = (-1.742481e-008 * Resp*)
(2.388730e-003 * Resp)+ 0.2125
Standardization: Ext
Calibration: Height

DATA REPROCESSED ON Wed Jun 06 11:31:37 1990

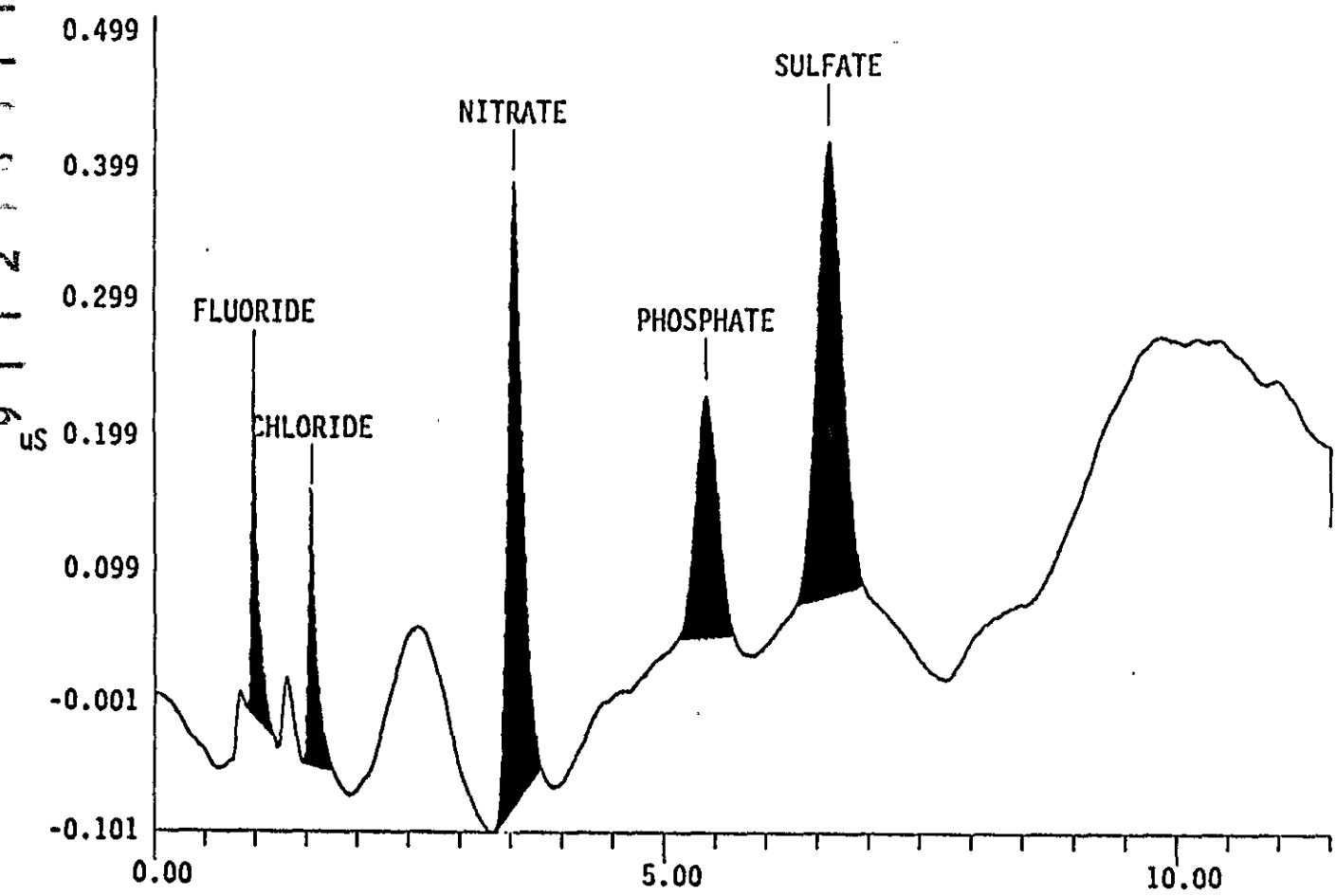
Sample Name: AUTOCAL1R	Date: Wed Feb 14 14:51:13 1990
Data File : A:\90021401.D03	
Method : c:\windows\ai400\method\SST.met	
ACI Address: 1 System : 1 Inject#: 3	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.98	FLUORIDE	9.381e-002	1.336e+003	246	1	0	0.00%
2	1.55	CHLORIDE	1.198e-001	1.267e+003	200	1	0	0.00%
3	3.52	NITRATE	9.601e-001	5.253e+003	468	1	0	0.00%
4	5.40	PHOSPHATE	9.820e-001	2.854e+003	180	1	0	0.00%
5	6.60	SULFATE	9.621e-001	6.077e+003	338	1	0	0.00%

File: A:\90021401.D03 Sample: AUTOCAL1R



DATA REPROCESSED ON Wed Jun 06 11:34:04 1990

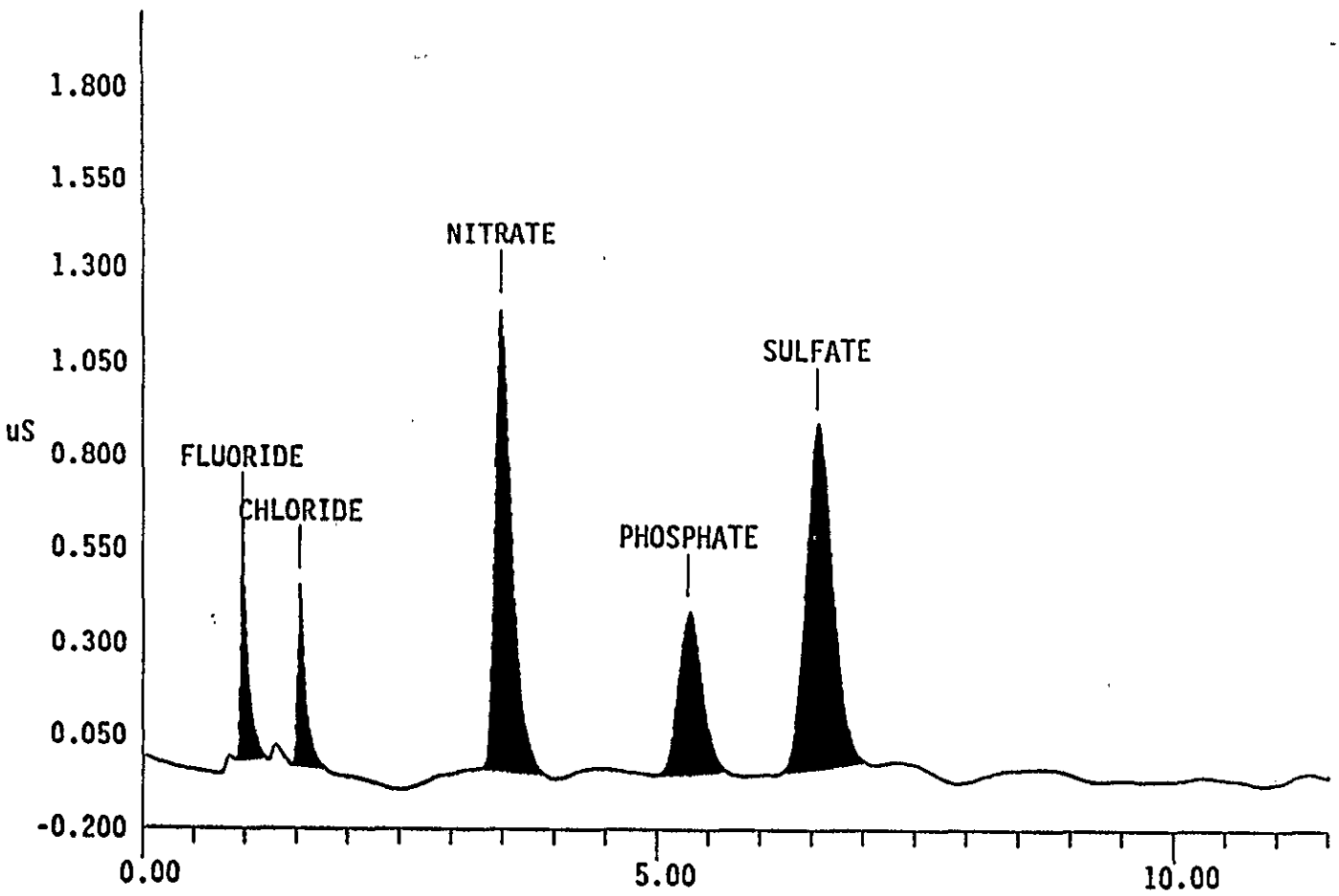
Sample Name: AUTOCAL2R	Date: Wed Feb 14 15:03:32 1990
Data File : A:\90021401.D04	
Method : c:\windows\ai400\method\SST.met	
ACI Address: 1 System : 1 Inject#: 4	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	2.338e-001	3.478e+003	616	1	0	0.00%
2	1.53	CHLORIDE	2.985e-001	2.903e+003	489	1	0	0.00%
3	3.48	NITRATE	2.393e+000	1.508e+004	1234	1	0	0.00%
4	5.30	PHOSPHATE	2.448e+000	7.216e+003	437	1	0	0.00%
5	6.55	SULFATE	2.398e+000	1.748e+004	922	1	0	0.00%

File: A:\90021401.D04 Sample: AUTOCAL2R



DATA REPROCESSED ON Wed Jun 06 11:36:14 1990

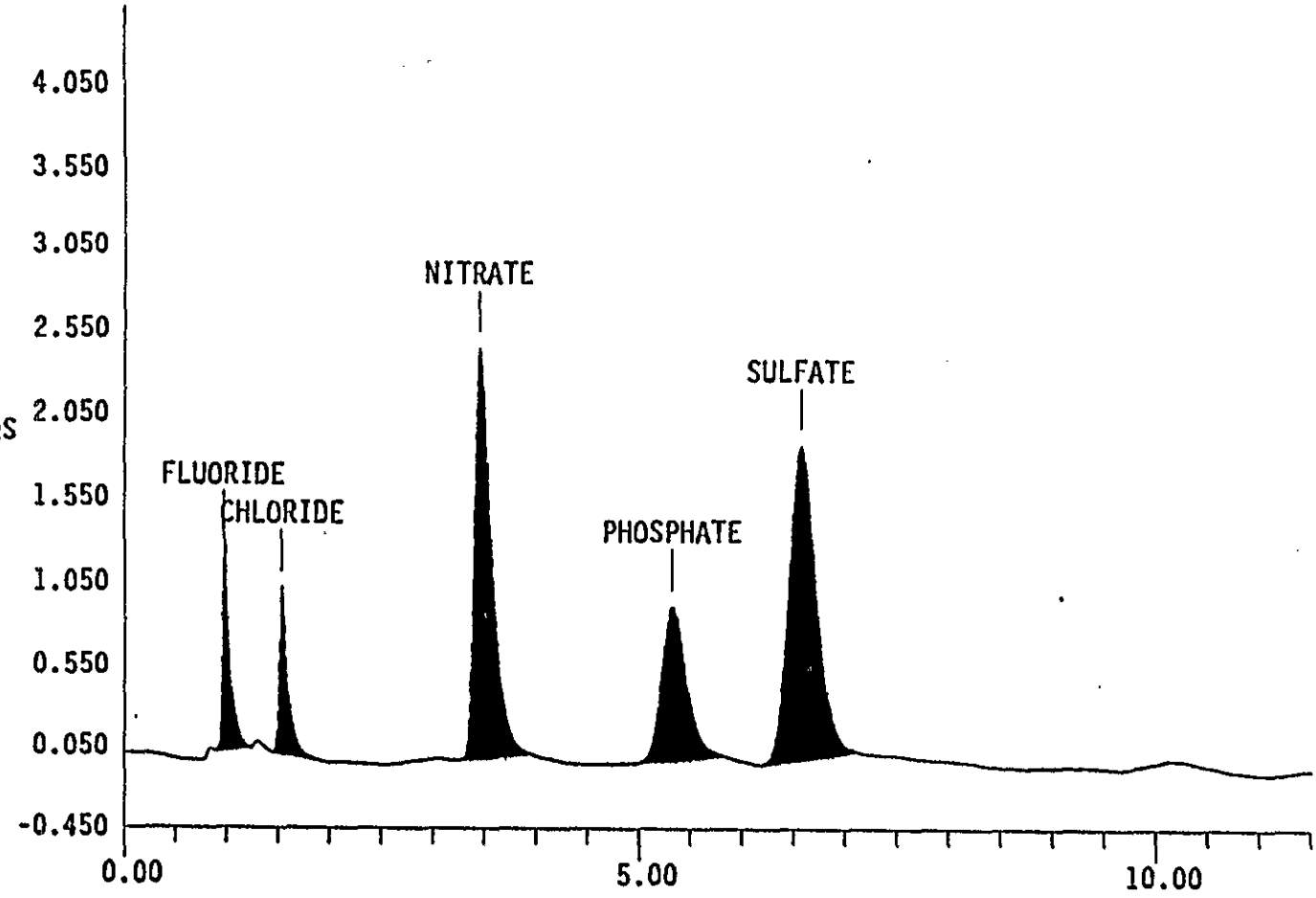
Sample Name: AUTOCAL3R	Date: Wed Feb 14 15:15:50 1990
Data File : A:\90021401.D05	
Method : c:\windows\ai400\method\SST.met	
ACI Address: 1 System : 1 Inject#: 5	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	4.653e-001	7.271e+003	1226	1	0	0.00%
2	1.53	CHLORIDE	5.941e-001	6.430e+003	1017	1	0	0.00%
3	3.45	NITRATE	4.762e+000	3.077e+004	2460	1	0	0.00%
4	5.32	PHOSPHATE	4.871e+000	1.685e+004	948	1	0	0.00%
5	6.57	SULFATE	4.772e+000	3.686e+004	1890	1	0	0.00%

File: A:\90021401.D05 Sample: AUTOCAL3R



DATA REPROCESSED ON Wed Jun 06 11:39:05 1990

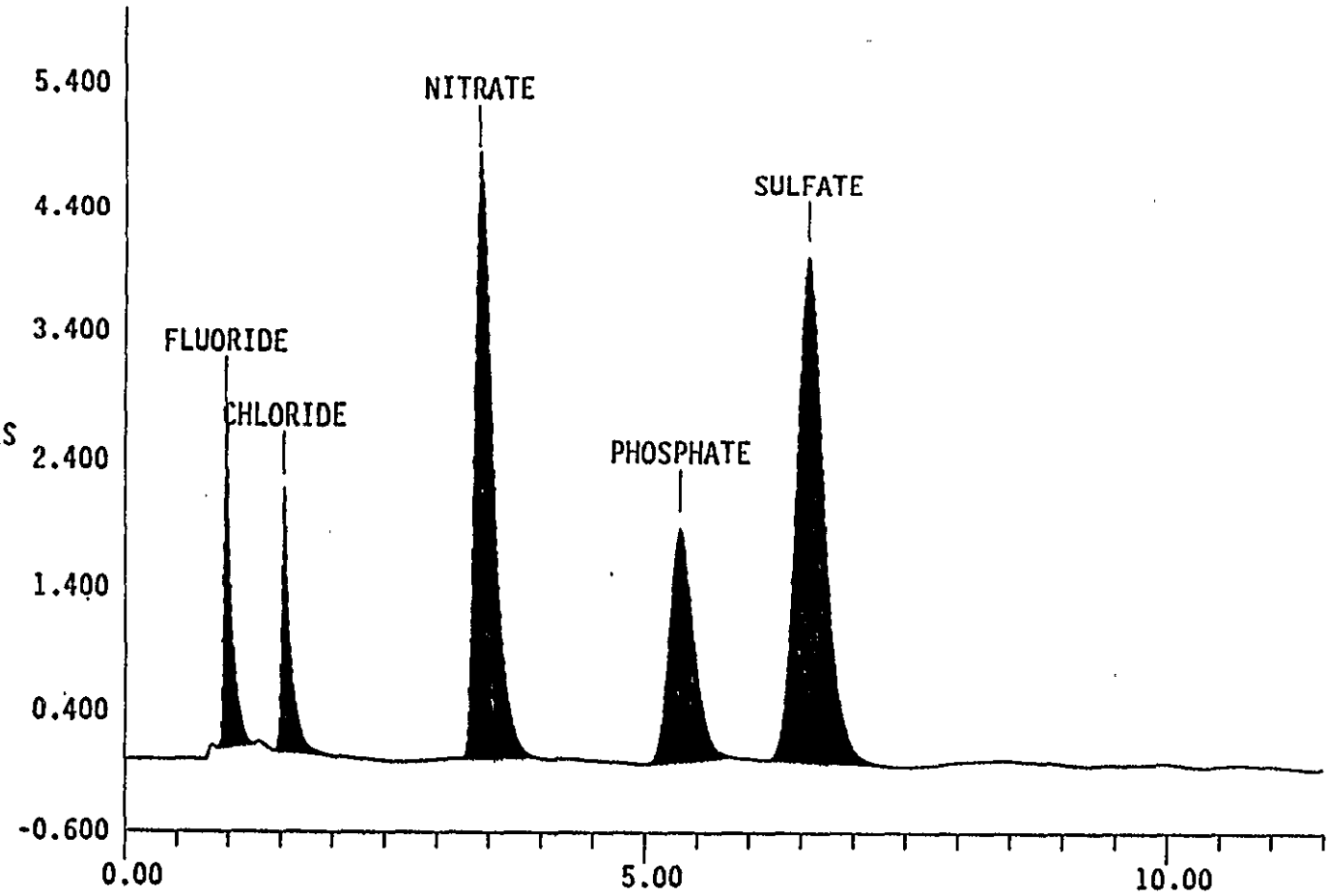
Sample Name: AUTOCAL4R Date: Wed Feb 14 15:28:08 1990
Data File : A:\90021401.D06
Method : c:\windows\ai400\method\SST.met
ACI Address: 1 System : 1 Inject#: 6 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	9.215e-001	1.562e+004	2625	1	0	0.00%
2	1.53	CHLORIDE	1.177e+000	1.371e+004	2088	1	0	0.00%
3	3.40	NITRATE	9.431e+000	6.396e+004	4753	1	0	0.00%
4	5.33	PHOSPHATE	9.647e+000	3.254e+004	1886	1	0	0.00%
5	6.57	SULFATE	9.451e+000	7.900e+004	4005	1	0	0.00%

File: A:\90021401.D06 Sample: AUTOCAL4R



DATA REPROCESSED ON Wed Jun 06 11:41:31 1990

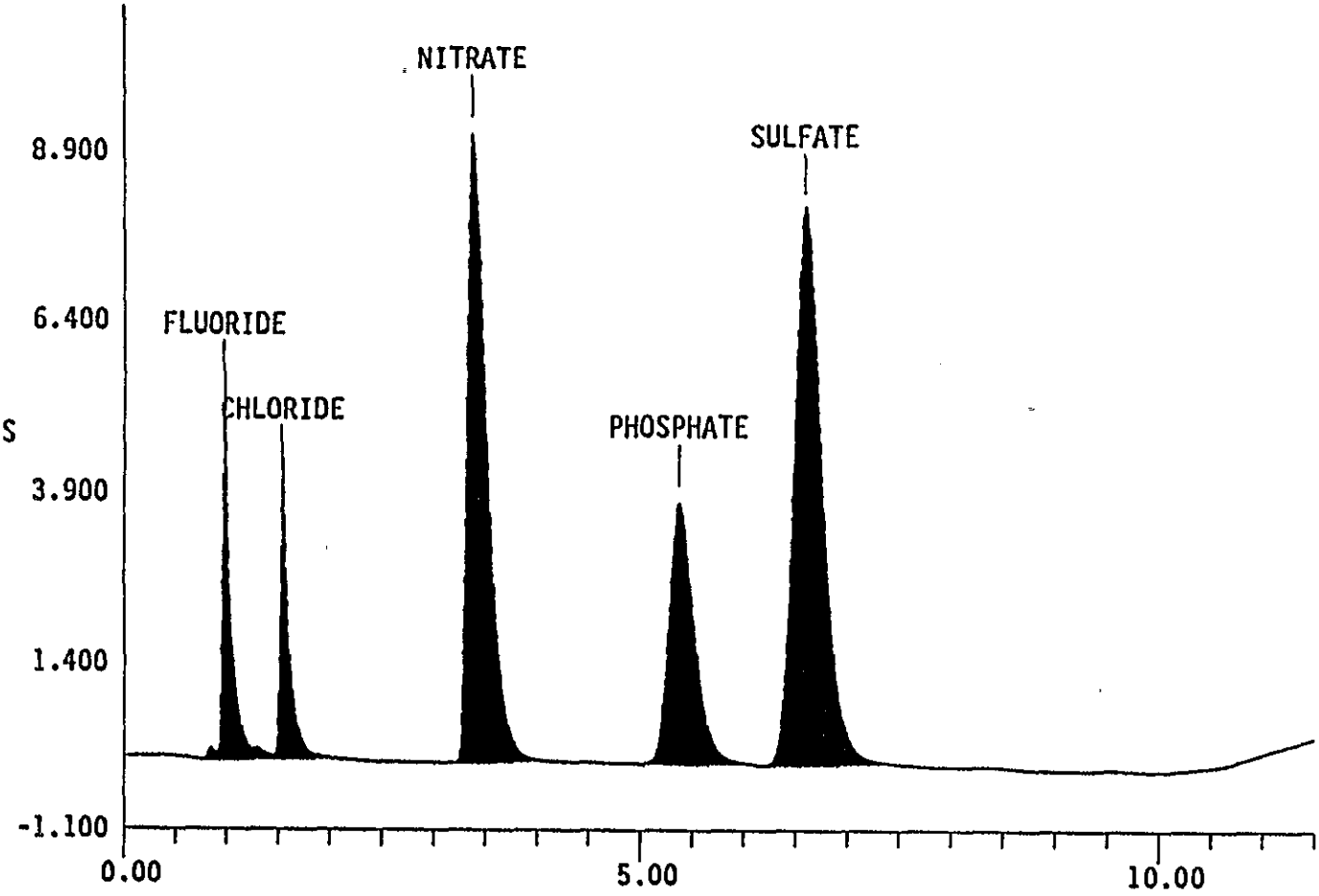
Sample Name: AUTOCAL5R Date: Wed Feb 14 15:40:27 1990
Data File : A:\90021401.D07
Method : c:\windows\ai400\method\SST.met
ACI Address: 1 System : 1 Inject#: 7 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	1.808e+000	3.718e+004	5315	2	0	0.00%
2	1.53	CHLORIDE	2.308e+000	2.837e+004	4066	2	0	0.00%
3	3.37	NITRATE	1.850e+001	1.322e+005	9250	1	0	0.00%
4	5.37	PHOSPHATE	1.892e+001	6.941e+004	3876	1	0	0.00%
5	6.58	SULFATE	1.854e+001	1.636e+005	8158	1	0	0.00%

File: A:\90021401.D07 Sample: AUTOCAL5R



DATA REPROCESSED ON Wed Jun 06 11:44:00 1990

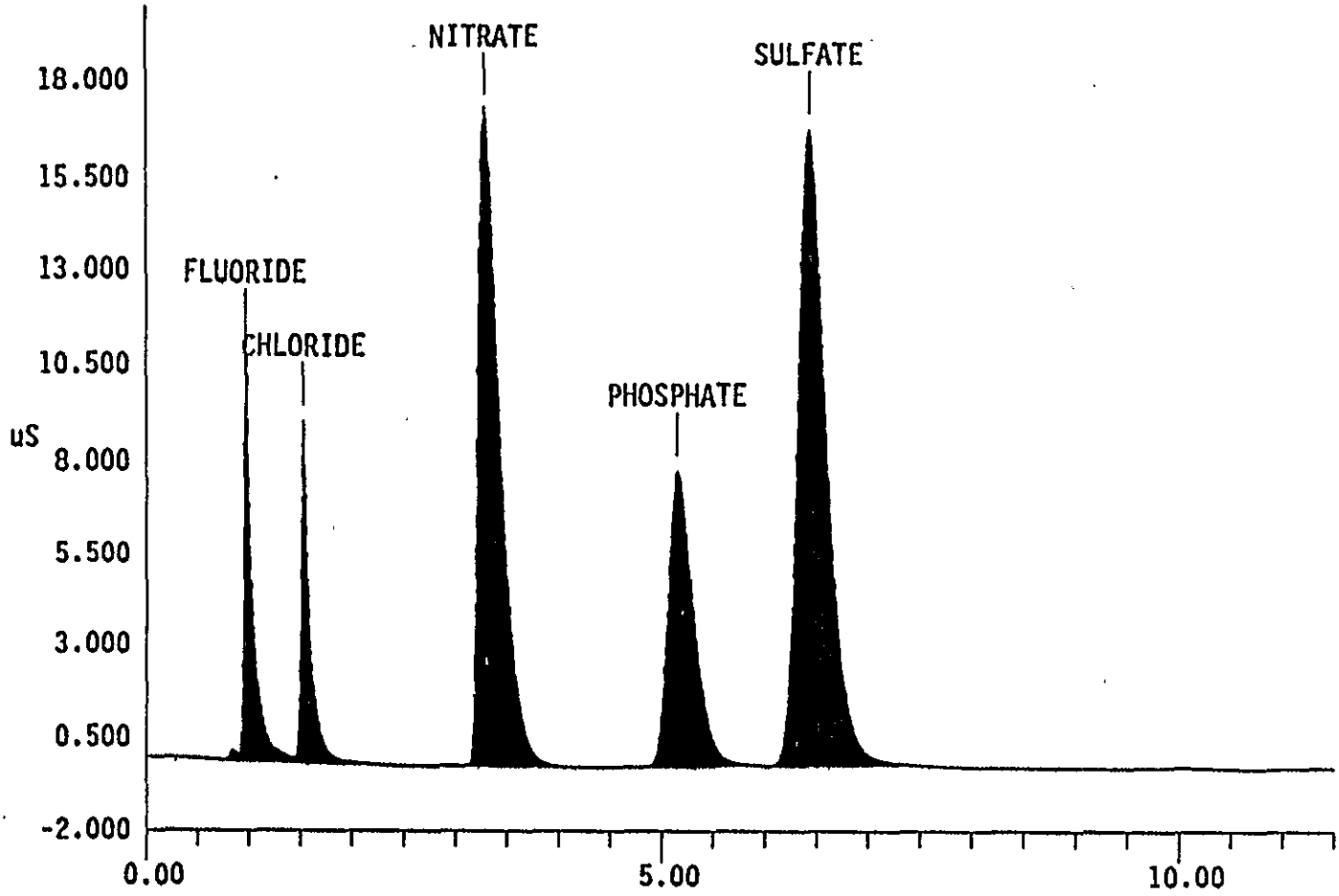
Sample Name: AUTOCAL6R Date: Wed Feb 14 15:52:46 1990
Data File : A:\90021401.D08
Method : c:\windows\ai400\method\SST.met
ACI Address: 1 System : 1 Inject#: 8 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	3.481e+000	7.412e+004	11092	2	0	0.00%
2	1.53	CHLORIDE	4.444e+000	5.927e+004	9183	2	0	0.00%
3	3.28	NITRATE	3.563e+001	2.741e+005	17468	1	0	0.00%
4	5.15	PHOSPHATE	3.644e+001	1.429e+005	8003	1	0	0.00%
5	6.43	SULFATE	3.570e+001	3.432e+005	16953	1	0	0.00%

File: A:\90021401.D08 Sample: AUTOCAL6R



DIONEX SCHEDULE - A:\90021500.SCH

Inj#	Sample Name	Method Name	Data File	Vol.	Dil.	Int.Std.
1	SETUP	...\sst	...\900215001		1	0
2	BLANK	...\sst	...\900215001		1	0
3	LMCS/6C11HI	...\sst	...\900215001		101	0
4	6294	...\sst	...\900215001		1111	0
5	LMCS/6C11HI	...\sst	...\900215001		101	0
6	LMCS/73C11J	...\sst	...\900215001		101	0
7	122B	...\sst	...\900215001		1	0
8	111	...\sst	...\900215001		101	0
9	112D	...\sst	...\900215001		101	0
10	113S	...\sst	...\900215001		101	0
11	63	...\sst	...\900215001		101	0
12	64D	...\sst	...\900215001		101	0
13	LMCS/6C11HI	...\sst	...\900215001		101	0
14	LMCS/73C11J	...\sst	...\900215001		101	0

DATA REPROCESSED ON Wed Jun 06 15:29:58 1990

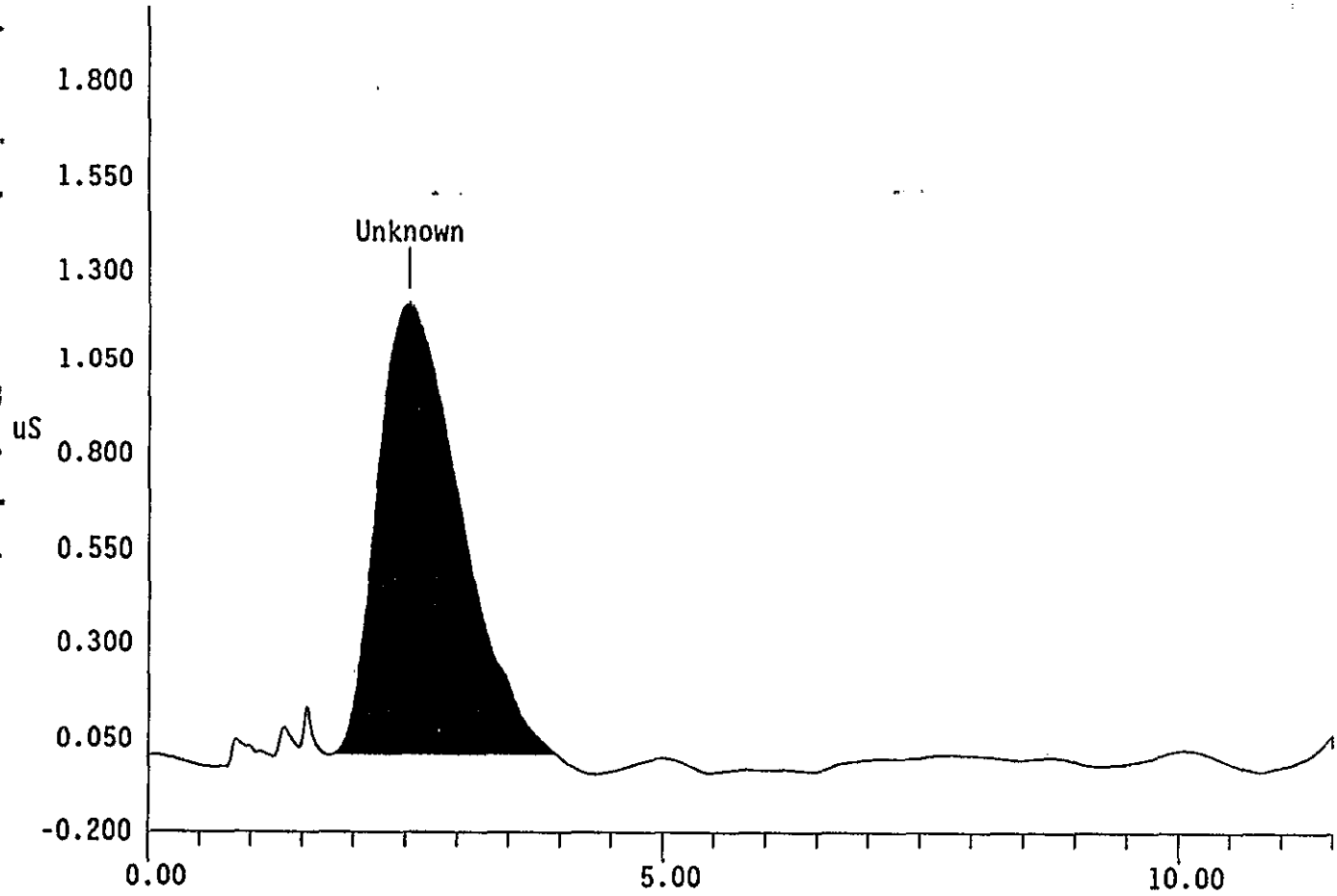
Sample Name: BLANK	Date: Thu Feb 15 11:42:40 1990
Data File : A:\90021500.D02	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 2	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	2.53		0.000e+000	6.737e+004	1200	1		

File: A:\90021500.D02 Sample: BLANK



DATA REPROCESSED ON Wed Jun 06 15:32:41 1990

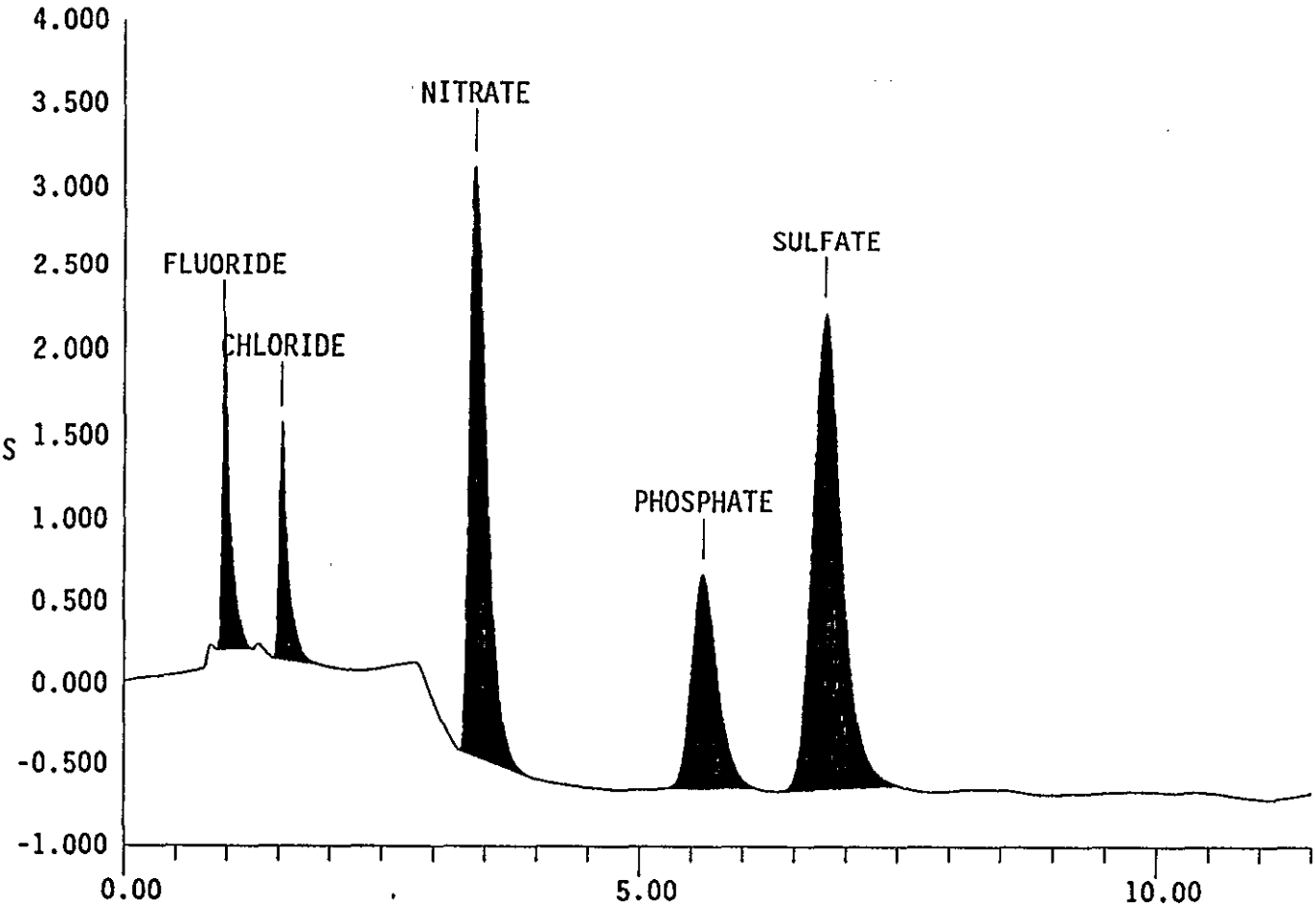
Sample Name: LMCS/6C11HI	Date: Thu Feb 15 12:19:28 1990
Data File : A:\90021500.D05	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 5	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	6.704e+001	1.122e+004	1845	1	0	0.00%
2	1.53	CHLORIDE	8.524e+001	9.110e+003	1426	1	0	0.00%
3	3.40	NITRATE	7.100e+002	4.452e+004	3567	1	0	0.00%
4	5.62	PHOSPHATE	6.809e+002	2.401e+004	1309	1	0	0.00%
5	6.80	SULFATE	6.960e+002	5.899e+004	2855	1	0	5.70%

File: A:\90021500.D05 Sample: LMCS/6C11HI



DATA REPROCESSED ON Wed Jun 06 15:35:12 1990

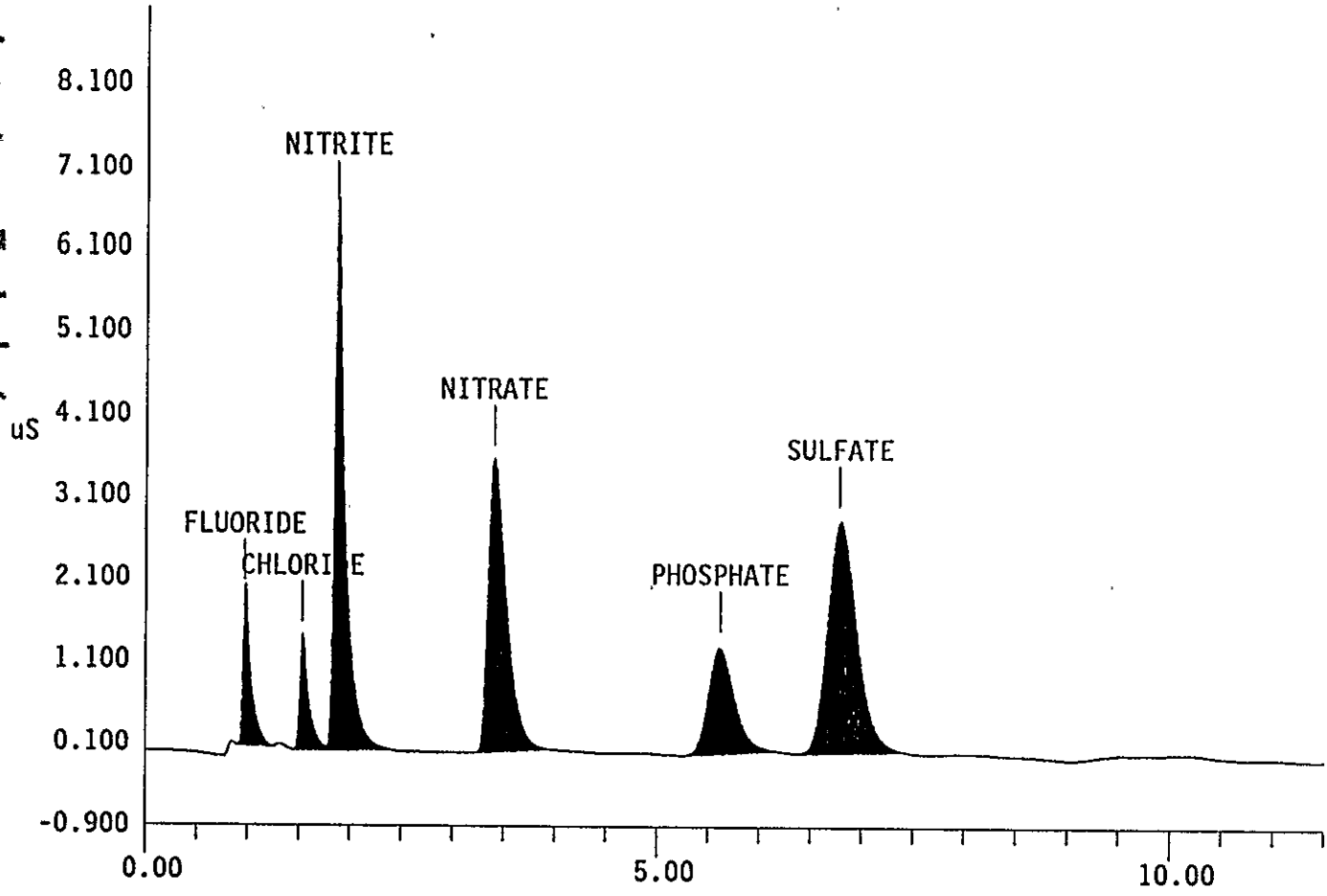
Sample Name: LMCS/73C11J	Date: Thu Feb 15 12:31:44 1990
Data File : A:\90021500.D06	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 6	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	6.607e+001	1.145e+004	1817	1	0	0.00%
2	1.53	CHLORIDE	8.177e+001	8.913e+003	1367	2	0	0.00%
3	1.87	NITRITE	6.406e+002	5.139e+004	6485	2	0	0.00%
4	3.40	NITRATE	7.045e+002	4.629e+004	3540	1	0	0.00%
5	5.62	PHOSPHATE	6.738e+002	2.391e+004	1295	1	0	0.00%
6	6.78	SULFATE	6.847e+002	5.741e+004	2806	1	0	5.44%

File: A:\90021500.D06 Sample: LMCS/73C11J



DATA REPROCESSED ON Wed Jun 06 15:39:12 1990

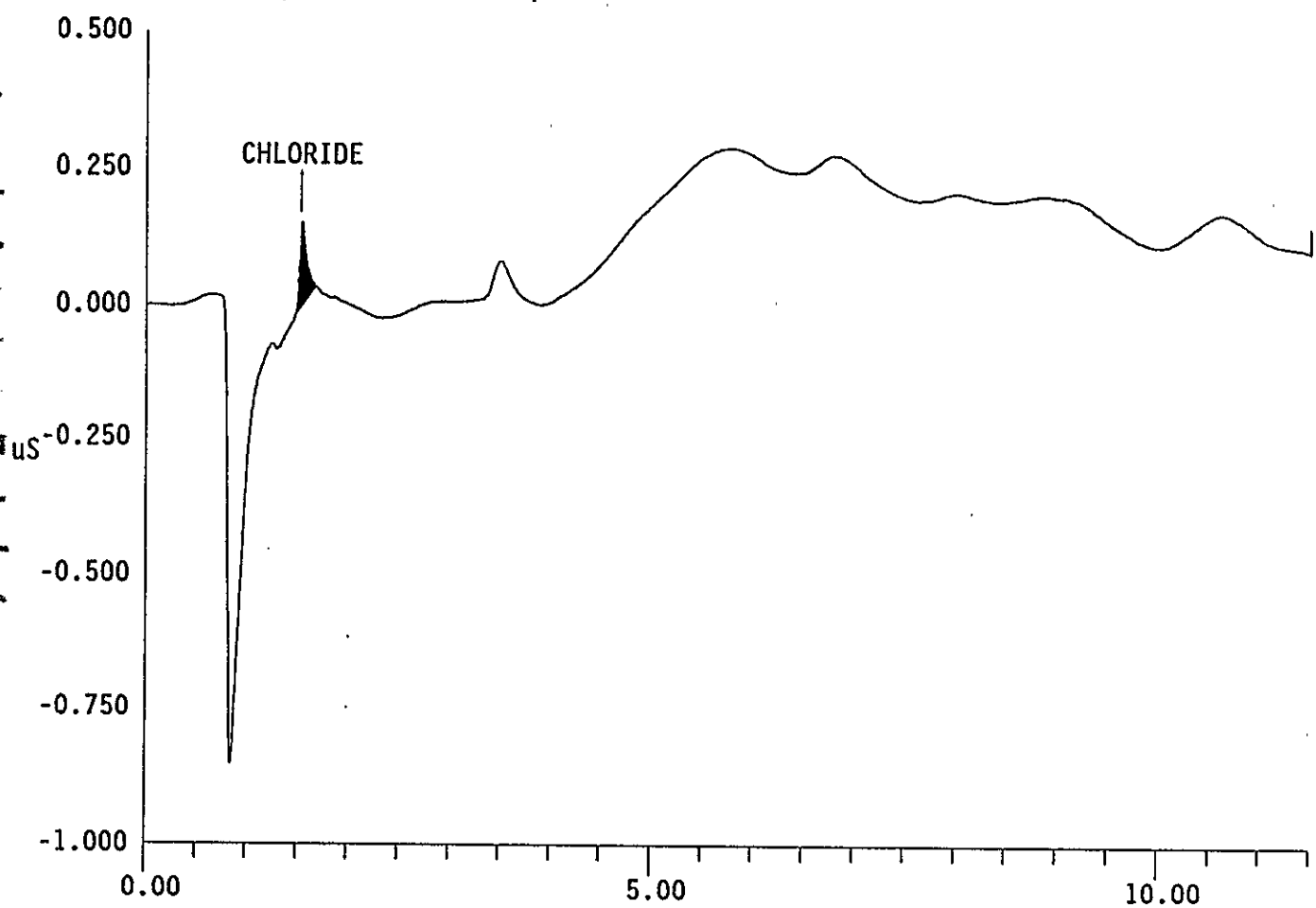
Sample Name: 122B	Date: Thu Feb 15 12:44:01 1990
Data File : A:\90021500.D07	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 7	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME

File: A:\90021500.D07 Sample: 122B



DATA REPROCESSED ON Wed Jun 06 15:41:55 1990

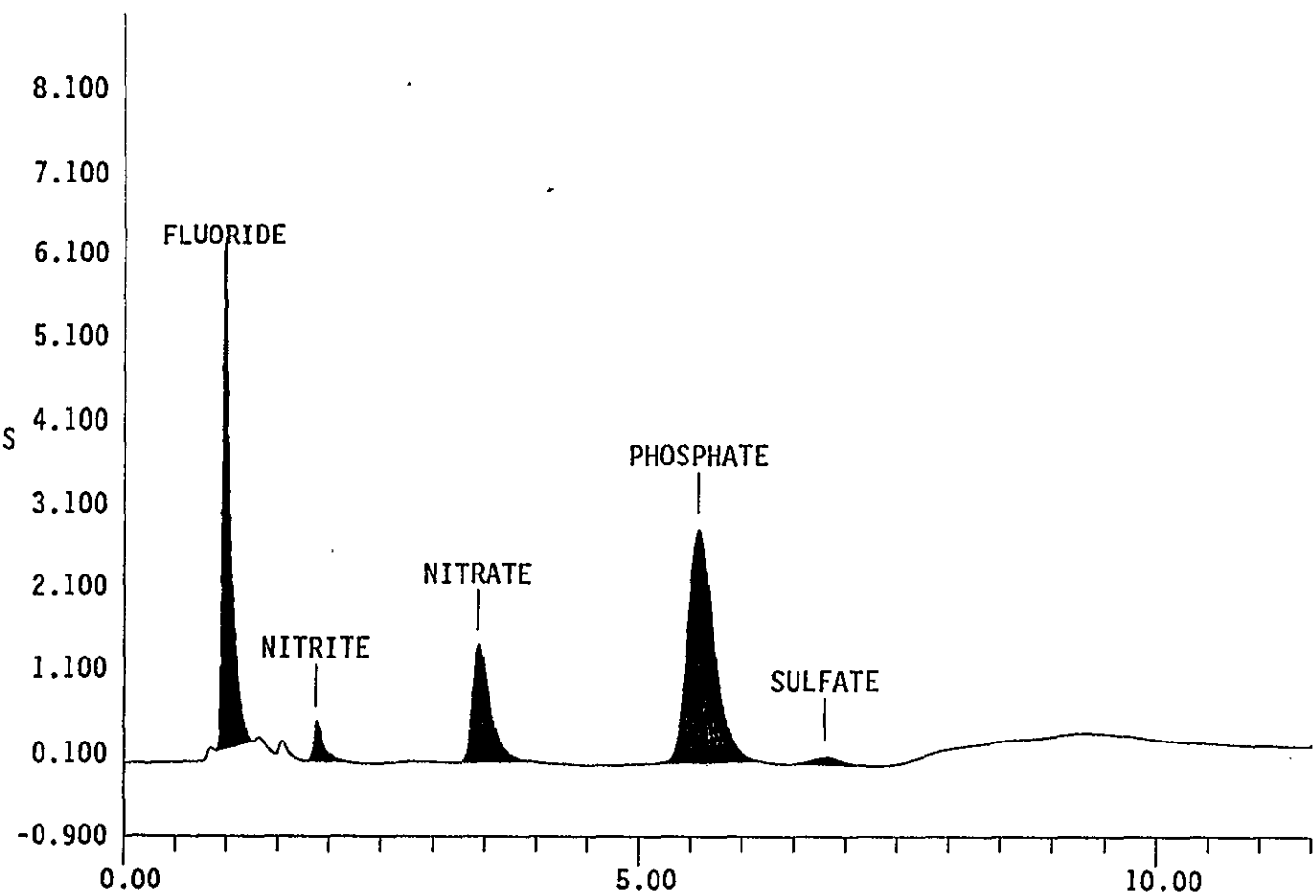
Sample Name: 111	Date: Thu Feb 15 12:56:16 1990
Data File : A:\90021500.D08	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 8	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	1.819e+002	3.635e+004	5295	1	0	0.00%
2	1.87	NITRITE	9.151e+001	3.375e+003	458	1	0	0.00%
3	3.43	NITRATE	2.703e+002	1.737e+004	1368	1	0	0.00%
4	5.57	PHOSPHATE	1.411e+003	5.179e+004	2803	1	0	0.00%
5	6.80	SULFATE	4.313e+001	1.605e+003	90	1	0	5.70%

File: A:\90021500.D08 Sample: 111



DATA REPROCESSED ON Wed Jun 06 15:44:44 1990

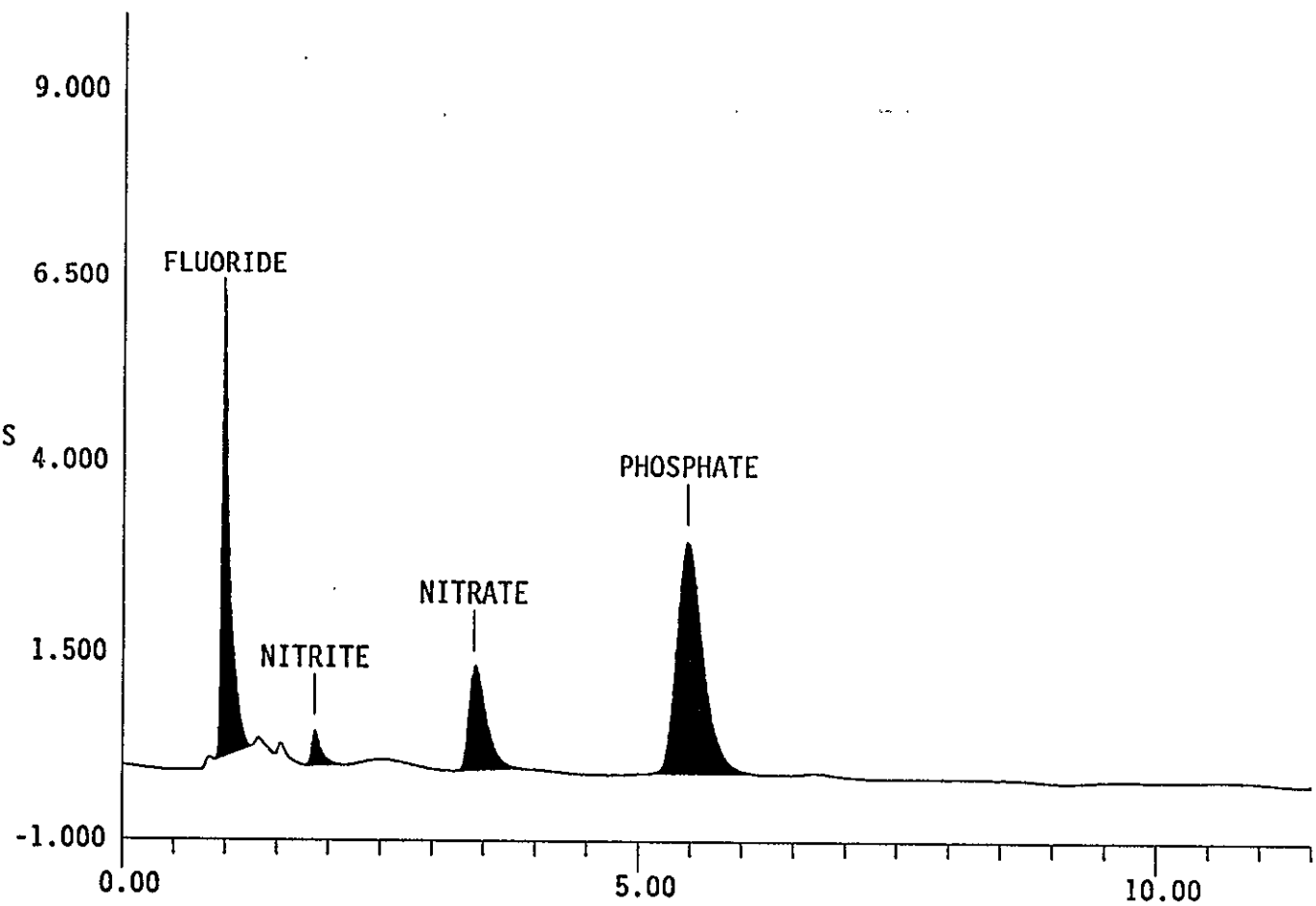
Sample Name: 112D Date: Thu Feb 15 13:08:33 1990
Data File : A:\90021500.D09
Method : c:\windows\ai400\method\sst.met
ACI Address: 1 System : 1 Inject#: 9 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	1.920e+002	3.594e+004	5614	1	0	0.00%
2	1.87	NITRITE	9.335e+001	3.123e+003	479	1	0	0.00%
3	3.40	NITRATE	2.740e+002	1.730e+004	1387	1	0	0.00%
4	5.47	PHOSPHATE	1.539e+003	5.677e+004	3071	1	0	0.00%

File: A:\90021500.D09 Sample: 112D



DATA REPROCESSED ON Fri Jun 08 15:46:32 1990

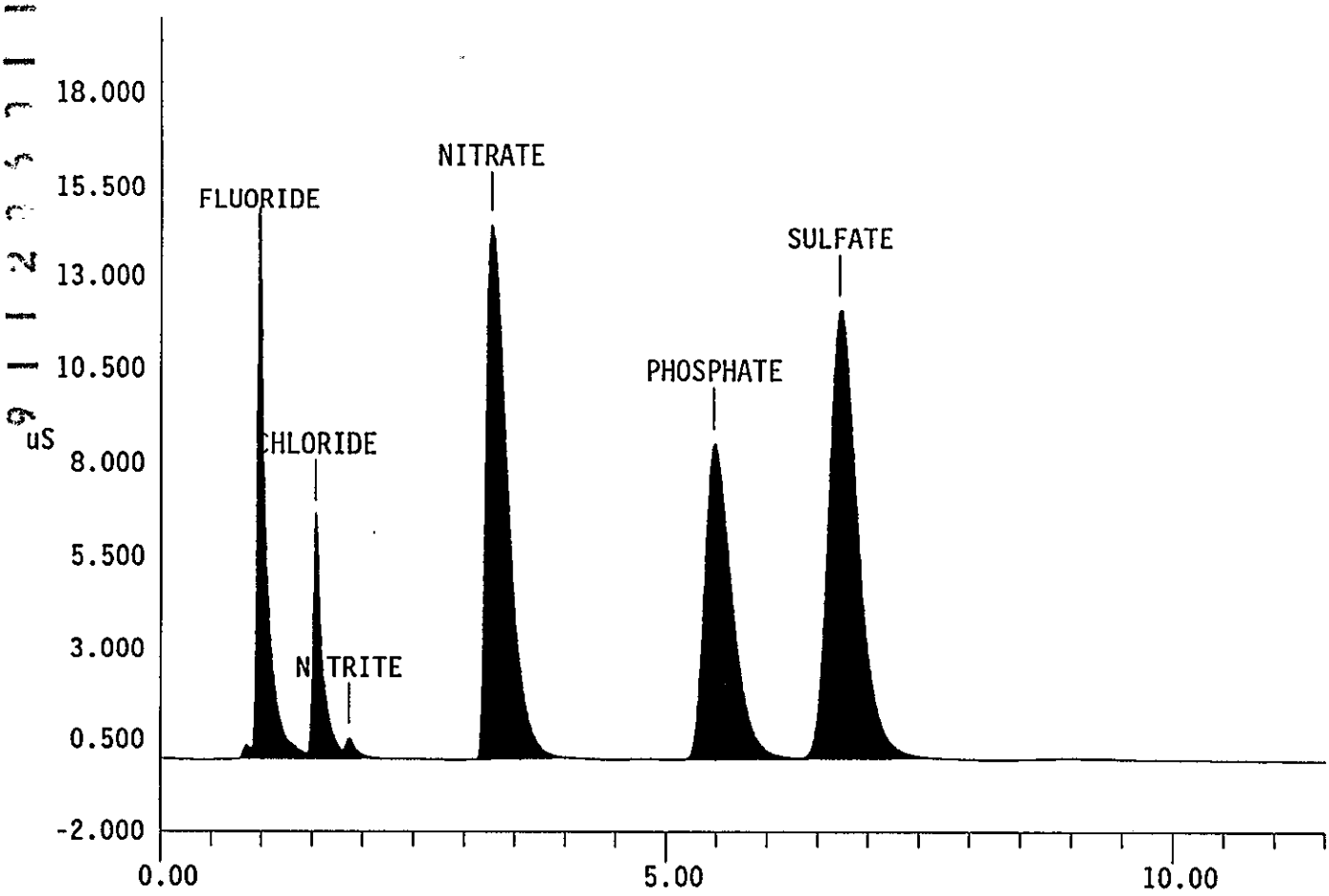
Sample Name: 113S Date: Thu Feb 15 13:20:49 1990
Data File : A:\90021500.D10
Method : c:\windows\ai400\method\sst.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	4.069e+002	1.000e+005	13231	2	0	0.00%
2	1.53	CHLORIDE	3.470e+002	4.432e+004	6565	3	0	0.00%
3	1.87	NITRITE	9.066e+001	3.394e+003	448	4	0	0.00%
4	3.27	NITRATE	2.951e+003	2.218e+005	14428	1	0	0.00%
5	5.47	PHOSPHATE	3.877e+003	1.676e+005	8506	2	0	0.00%
6	6.72	SULFATE	2.672e+003	2.529e+005	12046	2	0	0.00%

File: A:\90021500.D10 Sample: 113S



111.1

DATA REPROCESSED ON Wed Jun 06 15:52:24 1990

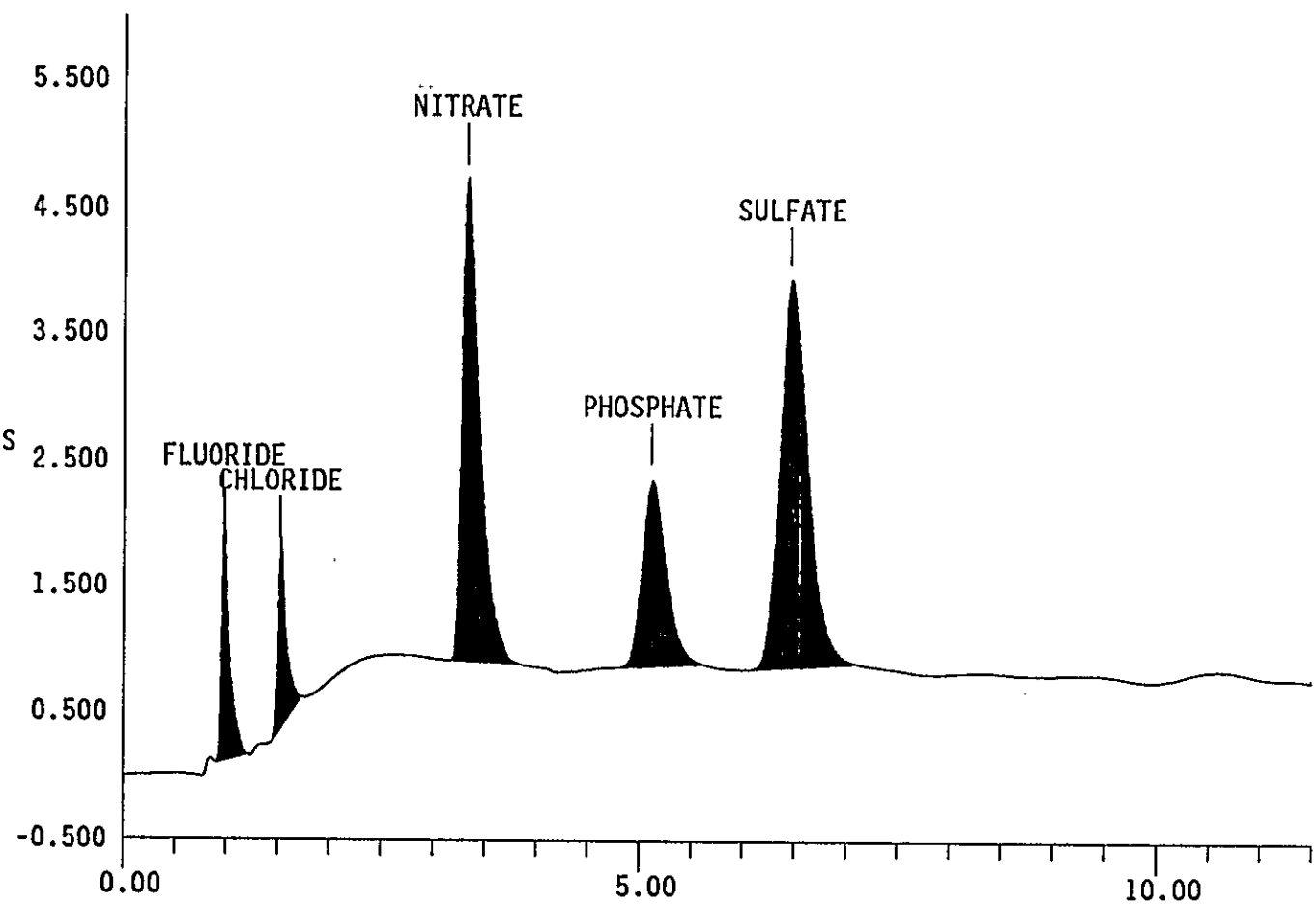
Sample Name: LMCS/6C11HI	Date: Thu Feb 15 13:57:37 1990
Data File : A:\90021500.D13	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 13	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	6.706e+001	1.166e+004	1845	1	0	0.00%
2	1.52	CHLORIDE	8.379e+001	8.963e+003	1402	1	0	0.00%
3	3.32	NITRATE	7.593e+002	4.930e+004	3813	1	0	0.00%
4	5.12	PHOSPHATE	7.649e+002	2.497e+004	1477	1	0	-6.97%
5	6.47	SULFATE	7.410e+002	5.990e+004	3050	1	0	0.00%

File: A:\90021500.D13 Sample: LMCS/6C11HI



DATA REPROCESSED ON Wed Jun 06 15:54:23 1990

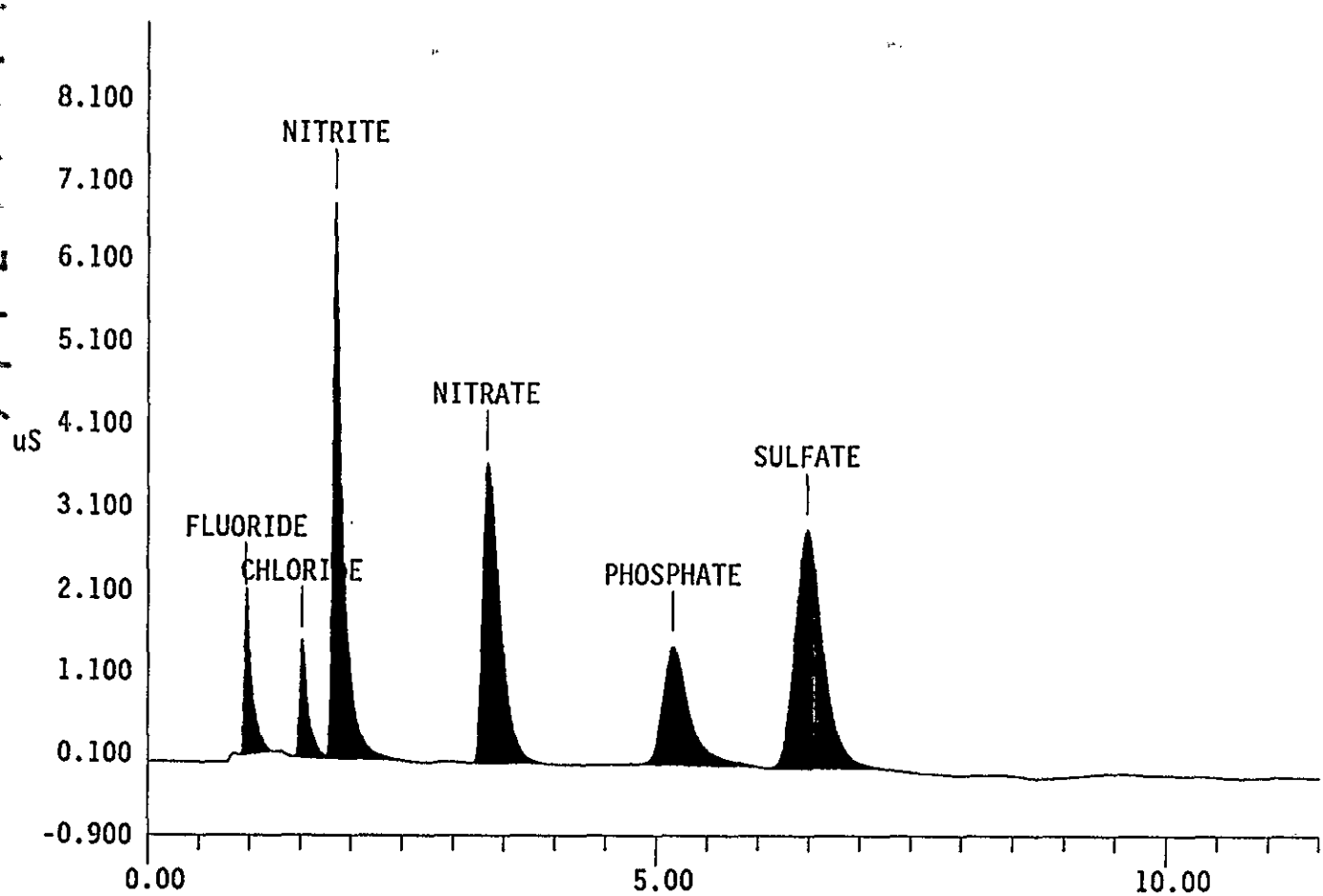
Sample Name: LMCS/73C11J	Date: Thu Feb 15 14:09:53 1990
Data File : A:\90021500.D14	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 14	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	6.845e+001	1.126e+004	1885	1	0	0.00%
2	1.52	CHLORIDE	8.427e+001	8.820e+003	1410	2	0	0.00%
3	1.85	NITRITE	6.674e+002	5.062e+004	6772	2	0	0.00%
4	3.33	NITRATE	7.171e+002	4.605e+004	3603	1	0	-0.00%
5	5.17	PHOSPHATE	7.487e+002	2.728e+004	1445	1	0	-6.06%
6	6.48	SULFATE	7.071e+002	5.762e+004	2903	1	0	0.00%

File: A:\90021500.D14 Sample: LMCS/73C11J



DIONEX SCHEDULE - A:\90022200.SCH

Inj#	Sample Name	Method Name	Data File	Vol.	Dil.	Int.Std.
1	SETUP	...\sst	...\900222001		1	0
2	BLANK	...\sst	...\900222001		1	0
3	LMCS/6C11HI	...\sst	...\900222001		101	0
4	LMCS/73C11J	...\sst	...\900222001		101	0
5	122B	...\sst	...\900222001		1	0
6	111	...\sst	...\900222001		101	0
7	112D	...\sst	...\900222001		101	0
8	113S	...\sst	...\900222001		101	0
9	63	...\sst	...\900222001		101	0
10	64D	...\sst	...\900222001		101	0
11	LMCS/6C11HI	...\sst	...\900222001		101	0
12	LMCS/73C11J	...\sst	...\900222001		101	0

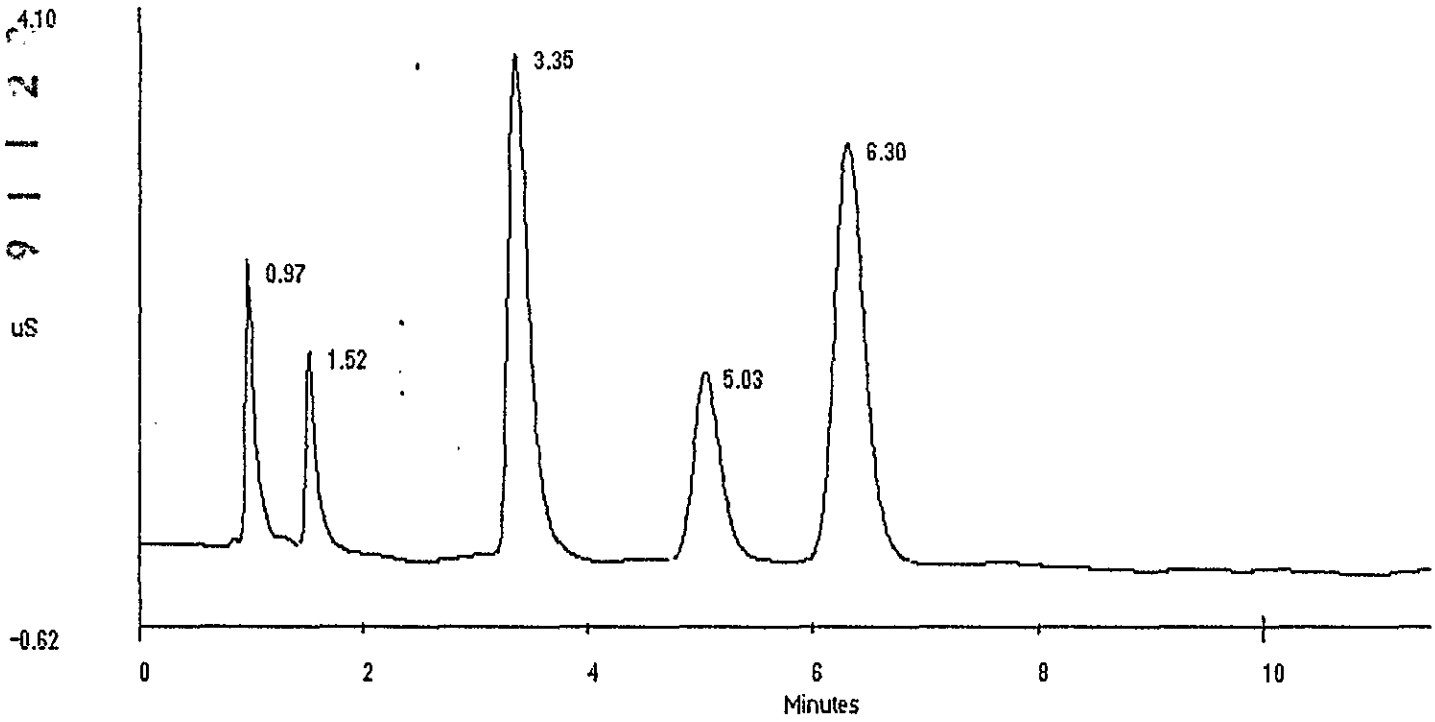
DATA REPROCESSED ON Thu Feb 22 14:46:32 1990

Sample Name: LMCS/6C11HI	Date: Thu Feb 22 12:00:58 1990
Data File : C:\WINDOWS\AI400\DATA\90-24263.D03	
Method : C:\WINDOWS\AI400\METHOD\SST.MET	
CIM Address: 1 System : 1 Cycle#: 3	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME		CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	103.7%	7.464e+001	1.175e+004	2064	1	0	-0.34%
2	1.52	CHLORIDE	100.1%	8.707e+001	9.453e+003	1457	1	0	-0.87%
3	3.35	NITRATE	104.3%	7.532e+002	4.905e+004	3782	1	0	2.13%
4	5.03	PHOSPHATE	102.1%	7.374e+002	2.374e+004	1422	1	0	-1.31%
5	6.30	SULFATE	101.9%	7.630e+002	6.028e+004	3146	1	0	-2.07%



DATA REPROCESSED ON Wed Jun 06 15:24:51 1990

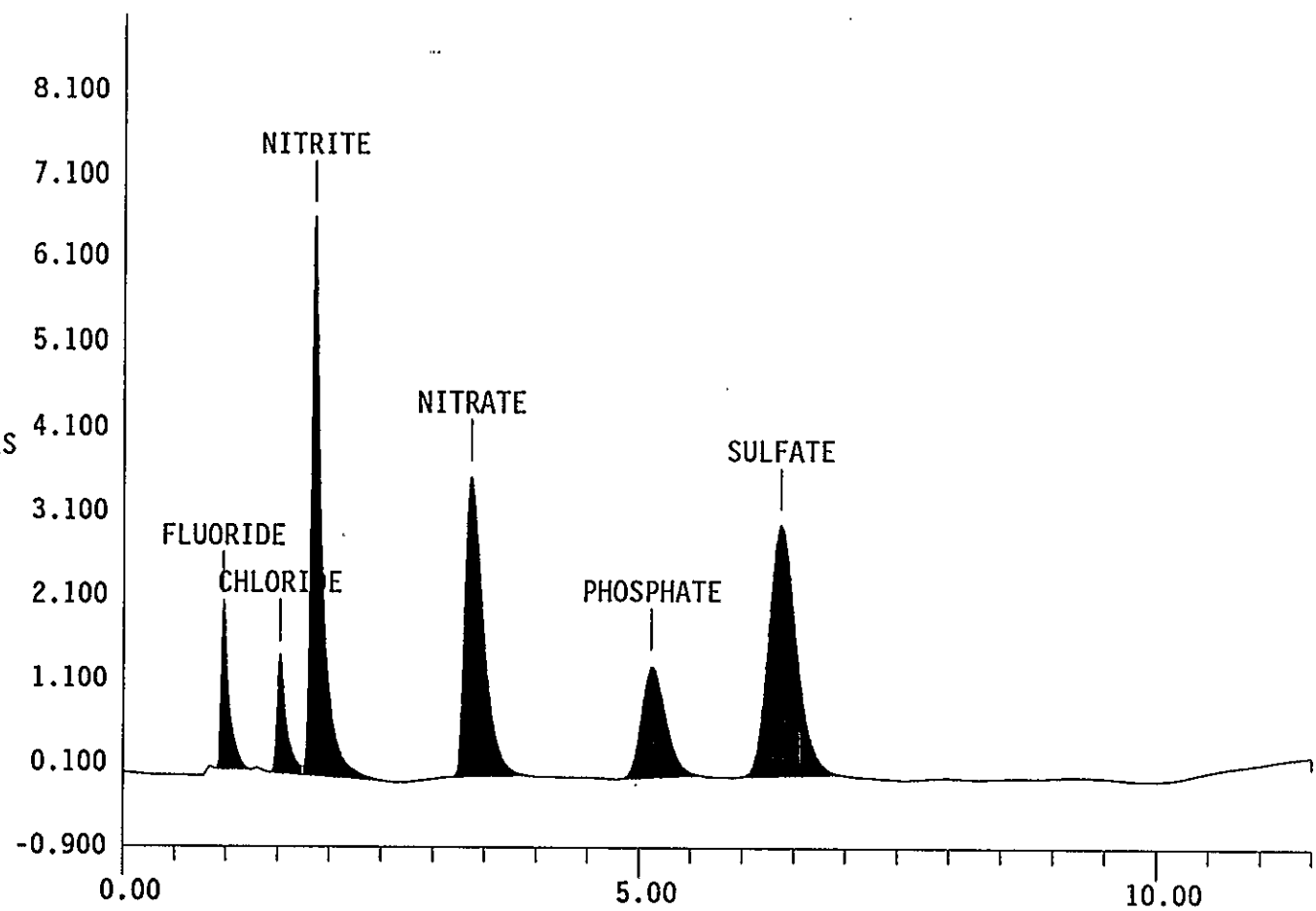
Sample Name: LMCS/73C11J Date: Thu Feb 22 12:13:15 1990
Data File : A:\90-24263.D04
Method : c:\windows\ai400\method\sst.met
ACI Address: 1 System : 1 Inject#: 4 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	6.938e+001	1.095e+004	1912	1	0	0.00%
2	1.52	CHLORIDE	8.285e+001	9.123e+003	1386	2	0	0.00%
3	1.85	NITRITE	6.540e+002	5.051e+004	6629	2	0	0.00%
4	3.37	NITRATE	7.114e+002	4.580e+004	3575	1	0	0.00%
5	5.12	PHOSPHATE	6.922e+002	2.241e+004	1331	1	0	-6.97%
6	6.37	SULFATE	7.285e+002	5.774e+004	2996	1	0	0.00%

File: A:\90-24263.D04 Sample: LMCS/73C11J



DATA REPROCESSED ON Wed Jun 06 15:01:10 1990

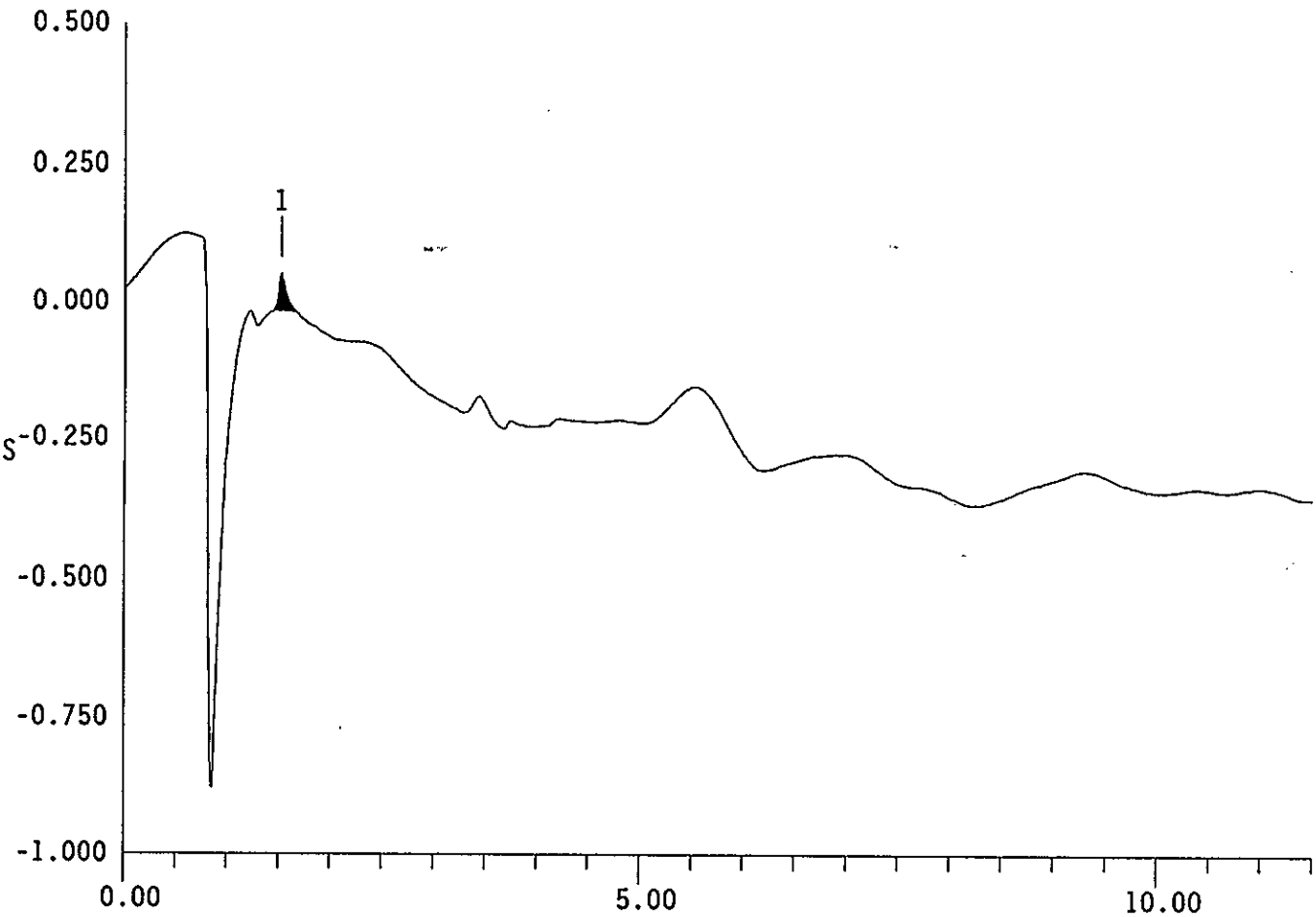
Sample Name: 122B	Date: Thu Feb 22 12:25:34 1990
Data File : A:\90022200.D05	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 5	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME

File: A:\90022200.D05 Sample: 122B



DATA REPROCESSED ON Thu Jun 07 10:43:16 1990

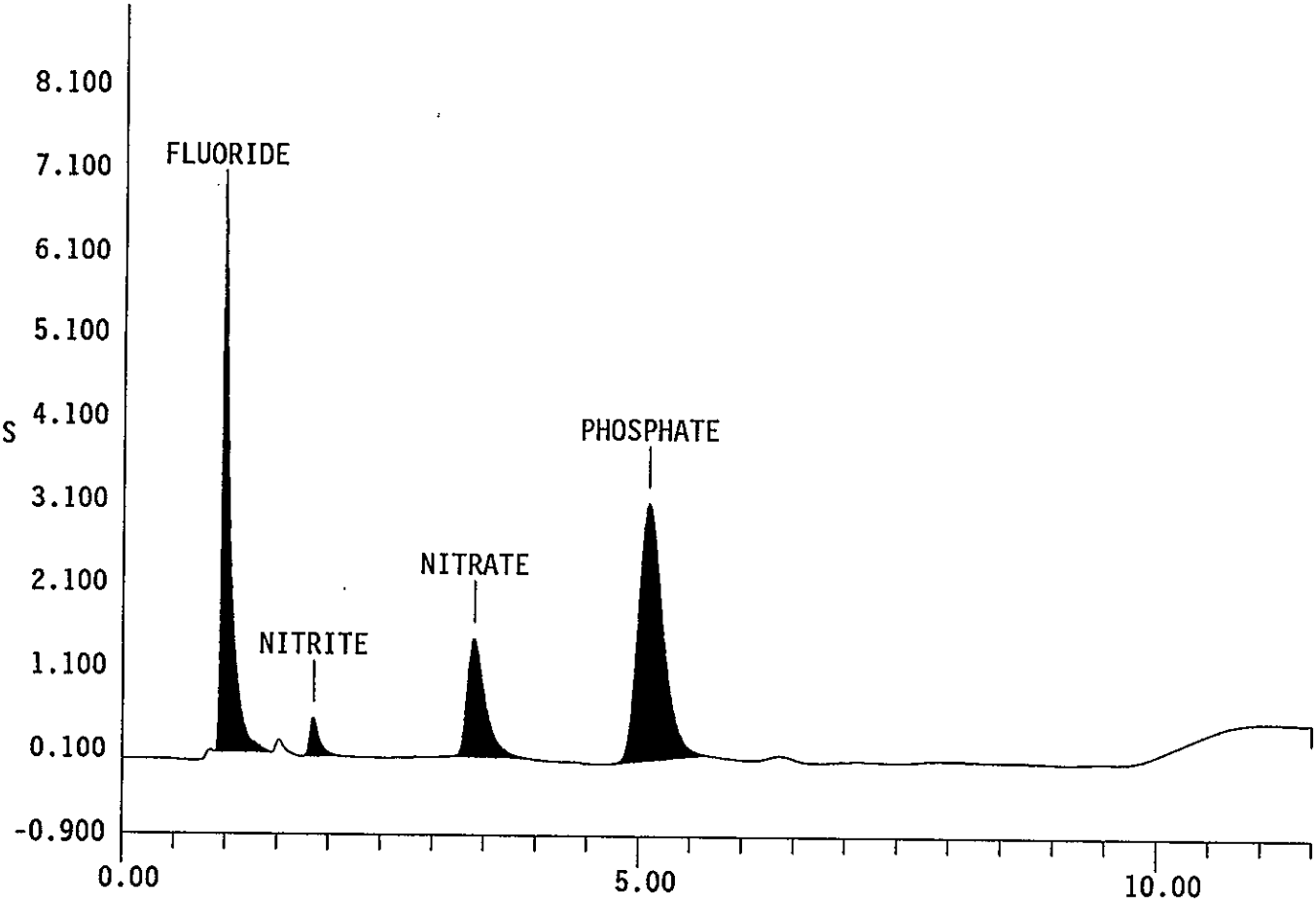
Sample Name: 111	Date: Thu Feb 22 12:37:50 1990
Data File : A:\90022200.D06	
Method : C:\WINDOWS\AI400\METHOD\SST.MET	
ACI Address: 1 System : 1 Inject#: 6	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	2.135e+002	3.996e+004	6302	1	0	0.00%
2	1.85	NITRITE	9.251e+001	3.218e+003	469	1	0	0.00%
3	3.40	NITRATE	2.813e+002	1.800e+004	1423	1	0	0.00%
4	5.08	PHOSPHATE	1.550e+003	5.343e+004	3095	1	0	0.00%

File: A:\90022200.D06 Sample: 111



DATA REPROCESSED ON Thu Jun 07 10:41:35 1990

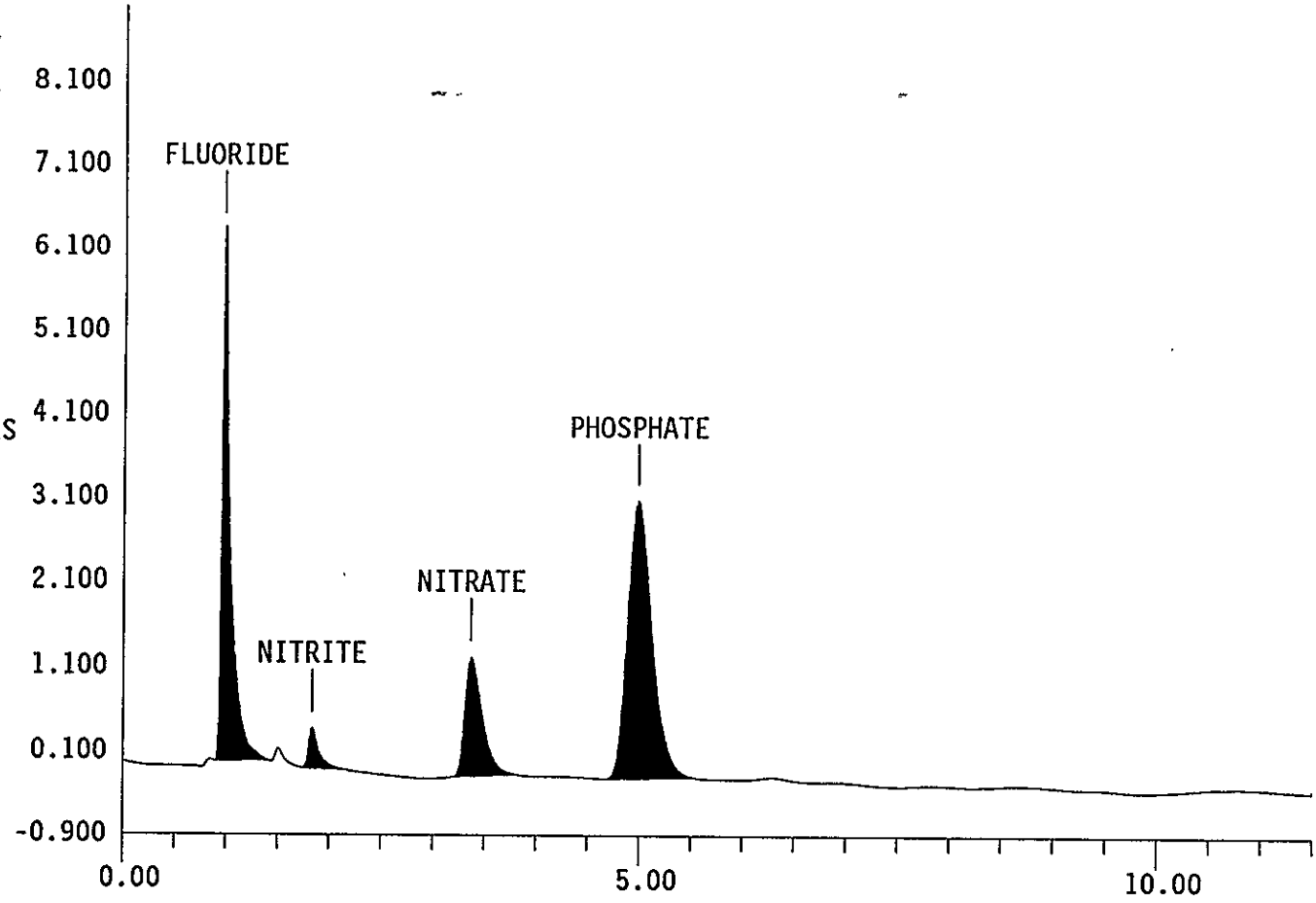
Sample Name: 112D	Date: Thu Feb 22 12:50:06 1990
Data File : A:\90022200.D07	
Method : C:\WINDOWS\AI400\METHOD\SST.MET	
ACI Address: 1 System : 1 Inject#: 7	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	2.148e+002	3.860e+004	6345	1	0	0.00%
2	1.83	NITRITE	9.352e+001	3.519e+003	480	1	0	0.00%
3	3.37	NITRATE	2.784e+002	1.712e+004	1408	1	0	0.00%
4	4.98	PHOSPHATE	1.639e+003	5.547e+004	3282	1	0	0.00%

File: A:\90022200.D07 Sample: 112D



DATA REPROCESSED ON Thu Jun 07 10:39:35 1990

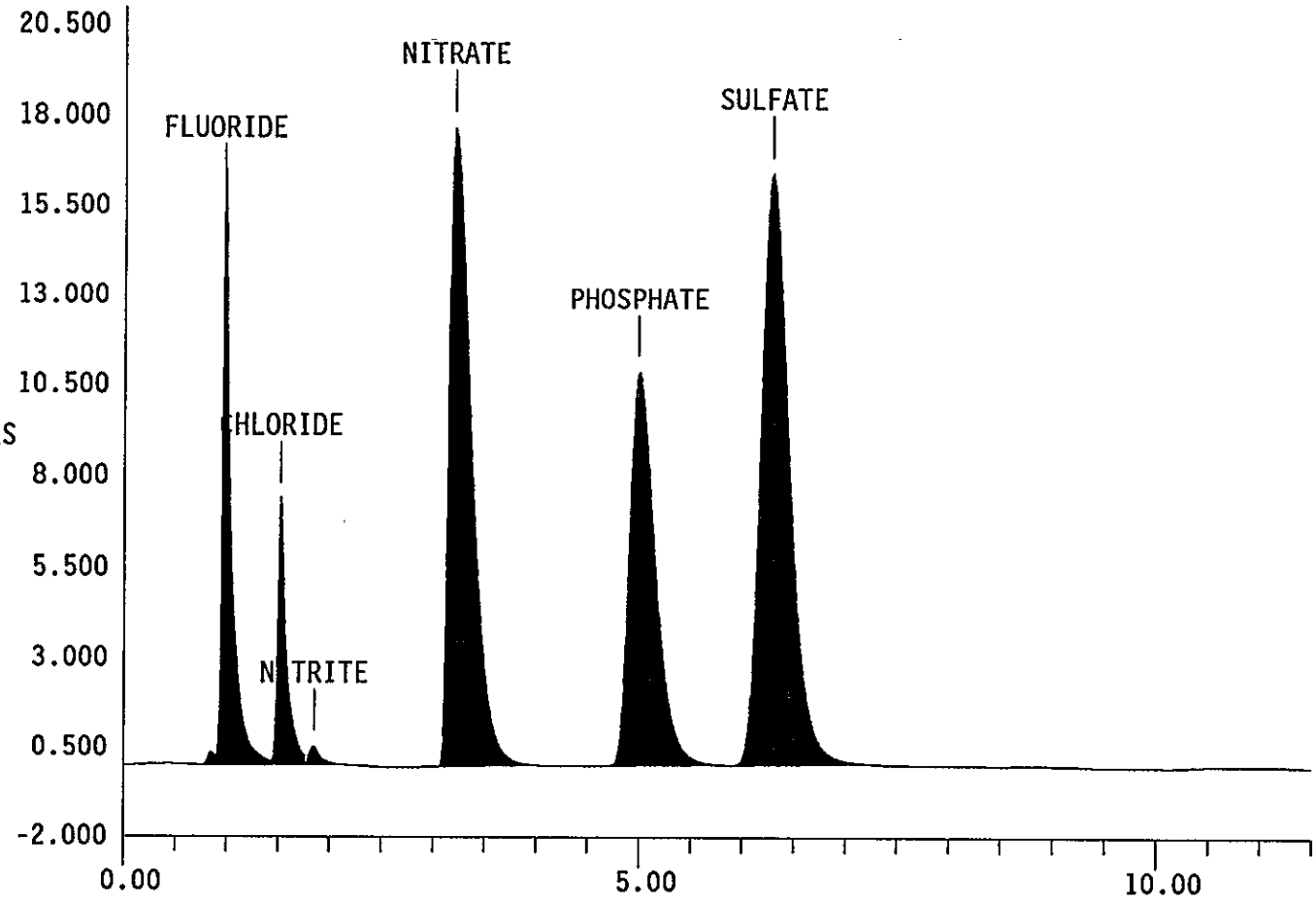
```
Sample Name: 113S                                  Date: Thu Feb 22 13:02:23 1990
Data File  : A:\90022200.D08
Method     : C:\WINDOWS\AI400\METHOD\SST.MET
ACI Address: 1        System : 1        Inject#:   8        Detector: CDM
```

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	4.640e+002	1.078e+005	15623	2	0	0.00%
2	1.52	CHLORIDE	3.794e+002	4.754e+004	7338	3	0	0.00%
3	1.85	NITRITE	9.137e+001	3.247e+003	456	4	0	0.00%
4	3.20	NITRATE	3.645e+003	2.721e+005	17684	1	0	0.00%
5	4.98	PHOSPHATE	4.739e+003	1.959e+005	10839	1	0	0.00%
6	6.28	SULFATE	3.501e+003	3.236e+005	16378	1	0	0.00%

File: A:\90022200.D08 Sample: 113S



DATA REPROCESSED ON Thu Jun 07 10:37:20 1990

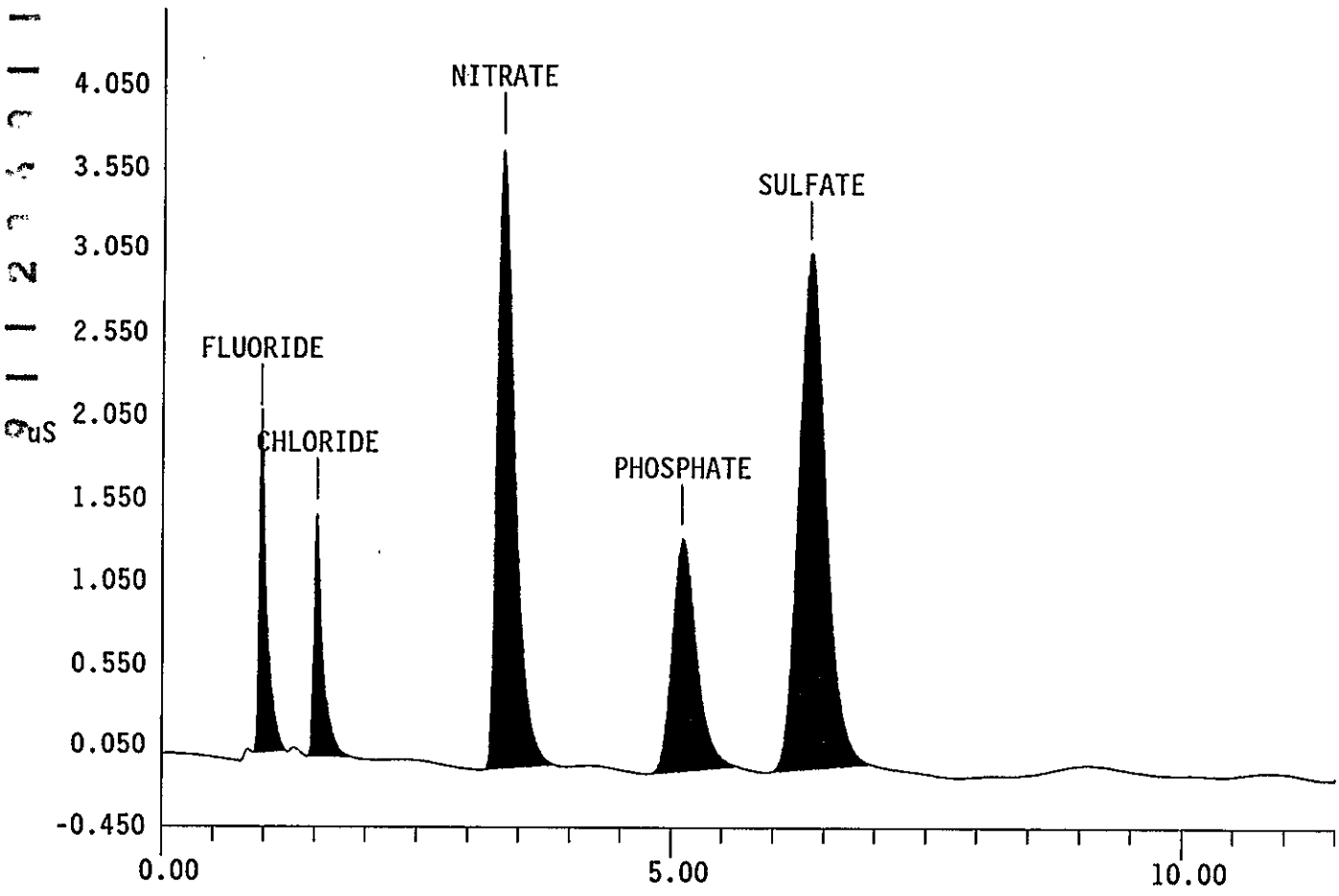
Sample Name: LMCS/6C11HI Date: Thu Feb 22 13:39:15 1990
Data File : A:\90022200.D11
Method : C:\WINDOWS\AI400\METHOD\SST.MET
ACI Address: 1 System : 1 Inject#: 11 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	7.285e+001	1.157e+004	2012	1	0	0.00%
2	1.52	CHLORIDE	8.801e+001	9.378e+003	1474	1	0	0.00%
3	3.33	NITRATE	7.474e+002	4.753e+004	3753	1	0	0.00%
4	5.10	PHOSPHATE	7.289e+002	2.432e+004	1405	1	0	0.00%
5	6.35	SULFATE	7.537e+002	5.982e+004	3105	1	0	0.00%

File: A:\90022200.D11 Sample: LMCS/6C11HI



DATA REPROCESSED ON Thu Jun 07 10:35:30 1990

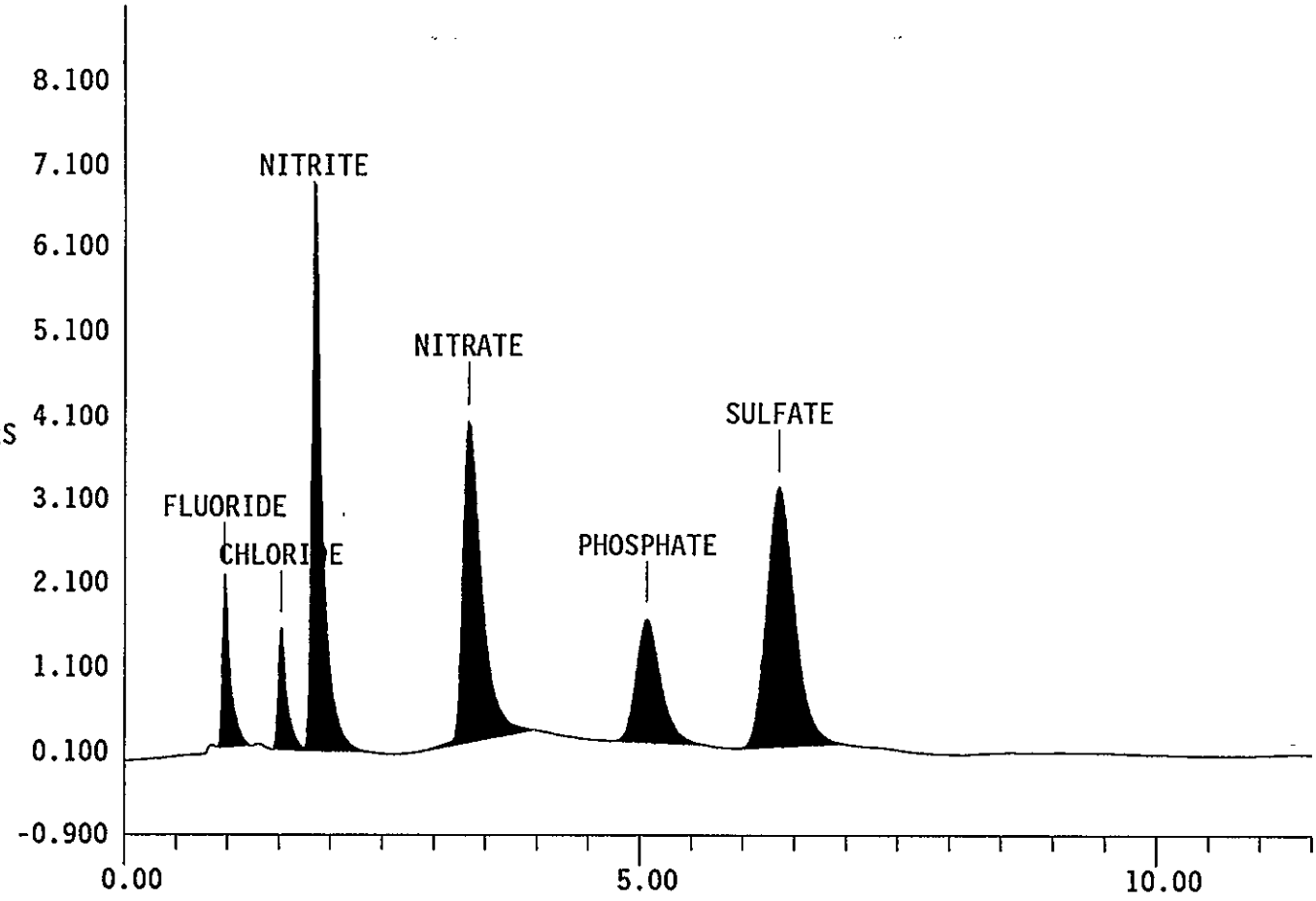
Sample Name: LMCS/73C11J Date: Thu Feb 22 13:51:32 1990
Data File : A:\90022200.D12
Method : C:\WINDOWS\AI400\METHOD\SST.MET
ACI Address: 1 System : 1 Inject#: 12 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	0.97	FLUORIDE	7.164e+001	1.124e+004	1977	1	0	0.00%
2	1.52	CHLORIDE	8.536e+001	8.720e+003	1428	2	0	0.00%
3	1.83	NITRITE	6.043e+002	4.953e+004	6097	2	0	0.00%
4	3.33	NITRATE	7.644e+002	5.078e+004	3838	1	0	0.00%
5	5.07	PHOSPHATE	7.552e+002	2.494e+004	1458	1	0	0.00%
6	6.35	SULFATE	7.506e+002	5.970e+004	3092	1	0	0.00%

File: A:\90022200.D12 Sample: LMCS/73C11J



Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Total Organic Carbon From Water Digestion

Instrument	WA399937
Procedure / Rev	LA-344-105/A-3
Technologist	E. Colvin
Date	05/30/90
Temperature	N/A
Starting Time	12:30
Ending Time	15:00
Chemist	R. E. Brandt

	Description	Lab. Id.
1	Reagent Blank	F0122
2	Initial LMCS Check Std	F0110
3	Sample 89-045	F0111
4	Duplicate 89-045	F0112
5	Spike 89-045	F0113
6	Final LMCS Check Std	F0114
7		
8		
9		
10		
11		

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std	80C11B/200uL			2.2 mL
Spike	80C11B/200uL	F0113/2.01mg		.5 mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 07/13/90

Verified by: Carry M Seidel (Signature) C. M. Seidel (Printed Name) Date: 07/13/90

Approved by: L. H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim Rev.E 4/04/90 SST-102

123

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-122 Date: 05-30-1990 Time: 09:42:54

Blank = N/A Sample Size = 200 Dilution Factor = 1
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading ====	Analysis Time ====	Coulometer ====	% Difference ==
1	1.01	0.00	0.00
2	2.01	2.00	100.00
3	3.01	2.90	31.03
4	4.01	3.80	23.68
5	5.01	4.70	19.15
6	6.01	5.40	12.96
7	7.01	6.40	15.63

BLANK VALUE = 6.4 / 7.005615 = .9135529 ug/minute

Sample Run By: 80028

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-110 Date: 05-30-1990 Time: 10:03:59

Blank = .9135529 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	46.70	100.00
3	3.01	52.60	11.22
4	4.01	55.40	5.05
5	5.01	57.20	3.15
6	6.01	58.40	2.05
7	7.01	59.50	1.85

(59.5 - 6.400056)(11)/(200) = 2.920497 g/L Carbon

(59.5 - 6.400056)(11)/(200)(12) = .2433747 Molar Carbon

Sample Run By: SOO28

COULOMETER ANALYSIS REPORT
UICTOC Rev. 0

Sample: F-111 Date: 05-30-1990 Time: 10:30:26

Blank = .91335329 Sample Size = 200 Dilution Factor = 1.1
% Difference = 10 Min Readings = 7 Max Readings = 7

Reading	Analysis Time	Coulometer	% Difference
1	1.01	0.00	0.00
2	2.01	3.00	100.00
3	3.01	4.20	28.57
4	4.01	5.00	16.00
5	5.01	6.10	18.03
6	6.01	6.90	11.59
7	7.01	7.80	11.54

(7.8 - 6.4)(1.1)/(200) = 7.700001E-03 g/L Carbon

(7.8 - 6.4)(1.1)/(200)(12) = 6.416667E-04 Molar Carbon

Sample Run By: 80028

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COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-112 Date: 05-30-1990 Time: 10:38:32

Blank = .9133529 Sample Size = 200 Dilution Factor = 1.1
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading ====	Analysis Time ====	Coulometer ====	% Difference ==
1	1.01	0.00	0.00
2	2.01	3.10	100.00
3	3.01	4.30	27.91
4	4.01	5.10	15.69
5	5.01	6.10	16.39
6	6.01	6.90	11.59
7	7.01	7.70	10.39

(7.7 - 6.400948)(1.1)/(200) = 7.144785E-03 g/L Carbon

(7.7 - 6.400948)(1.1)/(200)(12) = 5.953988E-04 Molar Carbon

Sample Run By: 80028

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COULOMETER ANALYSIS REPORT
TICIOC Rev. 0

Sample: F-113 Date: 05-30-1990 Time: 10:46:30

Blank = .9135529 Sample Size = 200 Dilution Factor = 1.1
% Difference = 10 Min Readings = 7 Max Readings = 7

Reading	Analysis Time	Coulometer	% Difference
1	1.01	0.00	0.00
2	2.01	89.80	100.00
3	3.01	106.40	15.60
4	4.01	113.70	6.42
5	5.01	117.50	3.23
6	6.01	119.60	1.76
7	7.01	121.10	1.24

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(121.1 - 6.400948)(1.1)/(200) = .6308448 g/L Carbon

(121.1 - 6.400948)(1.1)/(200)(12) = .0525704 Molar Carbon

Sample Run By: 90028

COULOMETER ANALYSIS REPORT
UCTOC Rev. 0

Sample: F-114 Date: 05-30-1990 Time: 10:54:54

Blank = .91355529 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 7

Reading	Analysis Time	Coulometer	% Difference
1	1.01	0.00	0.00
2	2.01	39.40	100.00
3	3.01	49.40	20.24
4	4.01	53.70	8.01
5	5.01	56.20	4.45
6	6.01	57.80	2.77
7	7.01	58.80	1.70

(58.8 - 6.400948)(11)/(200) = 2.881948 g/L Carbon

(58.8 - 6.400948)(11)/(200)(12) = .2401623 Molar Carbon

Sample Run By: 80028

ACID DIGESTION TEST ANALYSIS

9 1 1 2 0 6 0 1 1 0 9

ICP Results

ICP DATA SUMMARY

Date Analyzed:	March 12, 1990	Acid Digested Standard	F0115
Procedure:	LA-505-151/A-0	Reagent Blank	F0123
Analyst:	D. M. Southwick	Sample 89-045	F0116
Digestion	Acid Digestion	Duplicate 89-045	F0117
Procedure:	LA-505-159/A-0	Spike of F0116	F0118
		Acid Digested Standard	F0119

	Instrument Starting LMCS Standard %	Acid Digest. LMCS Standard %	Reagent BLANK ppm	Wet Weight Sample ug/g	Wet Weight Sample Duplicate ug/g	Spike Recovery %	LMCS ACID Digestion %	Closing LMCS Standard %
Aluminum	100.47%		-0.71 LT	45520	52568	NOT CALC.	95.63%	106.46%
Antimony	97.68%		-0.59 LT	-751 LT	10 LT			101.29%
Arsenic	104.97%		-0.14 LT	-172 LT	3 LT			103.90%
Barium	103.89%		-0.04 LT	-58 LT	-6 LT	NOT CALC.	87.43%	93.37%
Beryllium	100.50%		0.00 LT	-6 LT	-2 LT			105.22%
Bismuth	102.33%	83.52%	-0.66 LT	21590	26620	NOT CALC.		106.21%
Boron	99.53%	90.89%	-0.03 LT	-65 LT	14 LT	NOT CALC.		93.06%
Cadmium	96.13%	93.88%	-0.02 LT	-35 LT	-8 LT	NOT CALC.		98.54%
Calcium	105.75%	115.16%	0.19	295	1113	111.89%		95.68%
Cerium	93.76%		-1.74 LT	-2483 LT	-288 LT	NOT CALC.	83.71%	97.80%
Chromium	100.34%		-0.18 LT	119	188	98.46%	86.40%	97.42%
Copper	106.21%	97.85%	-0.08 LT	-112 LT	2 LT	NOT CALC.		98.57%
Iron	101.13%		0.02	14837	16885	NOT CALC.	95.97%	97.66%
Lanthanum	99.52%	95.72%	-0.13 LT	-193 LT	-40 LT	NOT CALC.		108.92%
Lead	102.54%	91.72%	-0.35 LT	-83 LT	602	NOT CALC.		100.30%
Magnesium	100.98%	96.86%	0.02	479	449	87.17%		98.04%
Manganese	101.63%		0.00 LT	156	269	107.06%	94.31%	97.98%
Mercury	104.69%		-0.05 LT	-47 LT	9 LT			99.42%
Molybdenum	101.07%	95.80%	-0.04 LT	-59 LT	3 LT	NOT CALC.		101.72%
Nickel	99.60%		-0.07 LT	-104 LT	-5 LT	NOT CALC.	95.42%	99.59%
Phosphorou	105.42%	97.37%	-0.06 LT	53626	47284	NOT CALC.		99.90%
Potassium	102.78%		-2.53 LT	-3986 LT	-1211 LT	NOT CALC.		101.04%
Samarium	102.38%		-1.95 LT	-3036 LT	-675 LT			104.47%
Selenium	104.47%		-0.62 LT	-609 LT	99 LT			103.29%
Silver	100.85%		-0.11 LT	-186 LT	-48 LT	NOT CALC.		98.23%
Sodium	108.57%	114.60%	-0.50 LT	187906	168975	NOT CALC.		101.63%
Strontium	103.85%	94.59%	-0.02 LT	120	106	95.52%		94.36%
Sulfur	102.58%		-0.05 LT	113	278			103.02%
Tantalum	95.45%		-0.28 LT	-417 LT	-73 LT	NOT CALC.	84.22%	93.36%
Thallium	101.40%		-2.02 LT	-3223 LT	-906 LT			104.50%
Thorium	97.10%		-1.11 LT	-1702 LT	-403 LT			104.62%
Tin	100.56%		-0.03 LT	-112 LT	-11 LT	NOT CALC.	101.08%	104.92%
Titanium	96.10%		0.03	-70 LT	8 LT	NOT CALC.	89.66%	101.92%
Uranium	98.51%		-10.90 LT	-15293 LT	-2485 LT			99.44%
Vanadium	102.61%		-0.09 LT	-128 LT	-46 LT			105.49%
Zinc	98.20%	94.36%	0.00	142	5380	98.35%		98.06%
Zirconium	96.38%		-0.19 LT	-276 LT	97	NOT CALC.	86.94%	101.68%

LT: Less Than
NC: Not Calibrated
NOT CALC: Not Calculated
Instrument Standards Outside Control Limits

Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Acid Digestion

Instrument	N/A
Procedure / Rev	LA-505-158/A-1
Technologist	D. Southwick
Date	01/31/90
Temperature	72 C
Starting Time	08:00
Ending Time	14:45
Chemist	S.A. Jones

	Description	Lab. Id.
1	Reagent Blank	F0075
2	Sample 89-043	F0068
3	Duplicate 89-043	F0069
4	Sample 89-045	F0116
5	Duplicate 89-045	F0117
6	Spike 89-045	F0118
7		
8		
9		
10		
11		

	Description	Lab. Id.
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
Spike	104C15B/5mL	103C15D/5mL		50 mL

Prepared by: Shirley Cervantes (Signature) S.A. Cervantes (Printed Name) Date: 07/13/90

Verified by: Carey M Seidel (Signature) C.M. Seidel (Printed Name) Date: 07/13/90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim 4/04/90 Rev. E SST-102

9 1 1 2 0 5 0 1 2 0 1

132

Analytical Batch

Lab Segment Serial No.: F0101

Customer ID.: 89-045

Instrument	Not reported.
Procedure / Rev	LA-505-151
Technologist	D. M. Southwick
Date	03-12-90
Temperature	70 F
Starting Time	12:30
Ending Time	15:11
Chemist	S. A. Jones

ICP Analysis of Sample 89-045.

Acid Digestion.

No inter-element corrections have been made on this data.

	Description	Lab. Id.
1	Intial LMCS Check Std	N/A
2	Reagent Blank	F0123
3	Digested LMCS Std	F0115
4	Sample 89-045	F0116
5	Duplicate 89-045	F0117
6	Spike 89-045	F0118
7	Sample 89-077	F0600
8	Duplicate 89-077	F0601
9	Sample 89-049	F0188
10	Duplicate 89-049	F0189
11	Final LMCS Check Std	N/A

	Description	Lab. Id.
12		
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Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
Spike 89-045	103C15C/5.mL	104CV15D/5.mL		50.0 mL
LMCS Check Std	78C11C/1.0 mL	82B38A/1.0mL	77C11C/1.0 mL	11.0 mL
Acid Digested Std	81C11A/5.0mL	82C11A/5.0mL		50.0 mL

Prepared by: Shirley Ceravntes (Signature) S. A. Ceravntes (Printed Name) Date: 08-05-90

Verified by: Carry M Seidel (Signature) C. M. Seidel (Printed Name) Date: 08-05-90

Approved by: L.H. Taylor (Signature) L.H. Taylor (Printed Name) Date: 08-30-90

Interim 4/04/90 Rev. E SST-102

9 1 1 2 3 0 1 2 0 2

ICP Results

RAW DATA SUMMARY

Date Analyzed:	March 12, 1990	Acid Digested Standard	F0115
Procedure:	LA-505-151/A-0	Reagent Blank	F0123
Analyst:	D. M. Southwick	Sample 89-045	F0116
Digestion	Acid Digestion	Duplicate 89-045	F0117
Procedure:	LA-505-159/A-0	Spike of F0116	F0118
		Acid Digested Standard	F0119

	Instrument Starting LMCS Standard %	Acid Digest. LMCS Standard %	Reagent BLANK ppm	Wet Weight Sample ug/g	Wet Weight Sample Duplicate ug/g	Spike Recovery %	LMCS ACID Digestion %	Closing LMCS Standard %
Aluminum	100.47%		-0.71 LT	45520	52568	NOT CALC.	95.63%	106.46%
Antimony	97.68%		-0.59 LT	-751 LT	10 LT			101.29%
Arsenic	104.97%		-0.14 LT	-172 LT	3 LT			103.90%
Barium	103.89%		-0.04 LT	-58 LT	-6 LT	NOT CALC.	87.43%	93.37%
Beryllium	100.50%		0.00 LT	-6 LT	-2 LT			105.22%
Bismuth	102.33%	83.52%	-0.66 LT	21590	26620	NOT CALC.		106.21%
Boron	99.53%	90.89%	-0.03 LT	-65 LT	14 LT	NOT CALC.		93.06%
Cadmium	96.13%	93.88%	-0.02 LT	-35 LT	-8 LT	NOT CALC.		98.54%
Calcium	105.75%	115.16%	0.19	295	1113	111.89%		95.68%
Cerium	93.76%		-1.74 LT	-2483 LT	-288 LT	NOT CALC.	83.71%	97.80%
Chromium	100.34%		-0.18 LT	119	188	98.46%	86.40%	97.42%
Cobalt	70.93%		-0.19 LT	-265 LT	-117 LT	NOT CALC.	72.36%	76.26%
Copper	106.21%	97.85%	-0.08 LT	-112 LT	2 LT	NOT CALC.		98.57%
Europium	99.63%		-0.03 LT	-49 LT	-18 LT			116.33%
Iron	101.13%		0.02	14837	16885	NOT CALC.	95.97%	97.66%
Lanthanum	99.52%	95.72%	-0.13 LT	-193 LT	-40 LT	NOT CALC.		108.92%
Lead	102.54%	91.72%	-0.35 LT	-83 LT	602	NOT CALC.		100.30%
Lithium	116.33%		-0.06 LT	-114 LT	-27 LT	NOT CALC.	105.88%	104.53%
Magnesium	100.98%	96.86%	0.02	479	449	87.17%		98.04%
Manganese	101.63%		0.00 LT	156	269	107.06%	94.31%	97.98%
Mercury	104.69%		-0.05 LT	-47 LT	9 LT			99.42%
Molybdenum	101.07%	95.80%	-0.04 LT	-59 LT	3 LT	NOT CALC.		101.72%
Neodymium	86.98%		-2.79 LT	-4417 LT	-3004 LT			85.68%
Nickel	99.60%		-0.07 LT	-104 LT	-5 LT	NOT CALC.	95.42%	99.59%
Phosphorou	105.42%	97.37%	-0.06 LT	53626	47284	NOT CALC.		99.90%
Potassium	102.78%		-2.53 LT	-3986 LT	-1211 LT	NOT CALC.		101.04%
Samarium	102.38%		-1.95 LT	-3036 LT	-675 LT			104.47%
Selenium	104.47%		-0.62 LT	-609 LT	99 LT			103.29%
Silicon	82.09%	86.92%	2.70	1369	3584	33.15%		84.14%
Silver	100.85%		-0.11 LT	-186 LT	-48 LT	NOT CALC.		98.23%
Sodium	108.57%	114.60%	-0.50 LT	187906	168975	NOT CALC.		101.63%
Strontium	103.85%	94.59%	-0.02 LT	120	106	95.52%		94.36%
Sulfur	102.58%		-0.05 LT	113	278			103.02%
Tantalum	95.45%		-0.28 LT	-417 LT	-73 LT	NOT CALC.	84.22%	93.36%
Thallium	101.40%		-2.02 LT	-3223 LT	-906 LT			104.50%
Thorium	97.10%		-1.11 LT	-1702 LT	-403 LT			104.62%
Tin	100.56%		-0.03 LT	-112 LT	-11 LT	NOT CALC.	101.08%	104.92%
Titanium	96.10%		0.03	-70 LT	8 LT	NOT CALC.	89.66%	101.92%
Tungsten	85.32%		-0.16 LT	-199 LT	30 LT			84.78%
Uranium	98.51%		-10.90 LT	-15293 LT	-2485 LT			99.44%
Vanadium	102.61%		-0.09 LT	-128 LT	-46 LT			105.49%
Zinc	98.20%	94.36%	0.00	142	5380	98.35%		98.06%
Zirconium	96.38%		-0.19 LT	-276 LT	97	NOT CALC.	86.94%	101.68%

LT: Less Than
NC: Not Calibrated
NOT CALC: Not Calculated
Instrument Standards Outside Control Limits

Raw Data Report

ICP Results

Date Analyzed:	March 12, 1990	Acid Digested Standard	F0115
Procedure:	LA-505-151/A-0	Reagent Blank	F0123
Analyst:	D. M. Southwick	Sample 89-045	F0116
Digestion	Acid Digestion	Duplicate 89-045	F0117
Procedure:	LA-505-159/A-0	Spike of F0116	F0118
		Acid Digested Standard	F0119

	Starting LMCS Standard Instrument Standard ppm	Recovery %		LMCS Acid Digestion Standard ppm	Acid Digestion Standard Recovery %	Reagent Blank ppm	Digestion Weight Volume Sample Dilution Three ppm	0.6503 g 50.00 mL Sample Dilution Two ppm	0.01301 Sample Dilution One ppm	Digestion Weight Volume Sample Duplicate Dilution Three ppm
Aluminum	50.24	100.47%				-0.71 LT		592.03	632.45	
Antimony	9.77	97.68%				-0.59 LT		-43.16	-9.77 LT	
Arsenic	52.48	104.97%				-0.14 LT		-9.29	-2.23 LT	
Barium	10.39	103.89%				-0.04 LT		-2.59	-0.75 LT	
Beryllium	10.05	100.50%				0.00 LT		-0.27	-0.08 LT	
Bismuth	51.27	102.33%		8.35	83.52%	-0.66 LT		280.80	315.97	
Boron	9.95	99.53%		9.09	90.89%	-0.03 LT		-2.66	-0.84 LT	
Cadmium	9.61	96.13%		9.39	93.88%	-0.02 LT		-1.82	-0.46 LT	
Calcium	10.58	105.75%		11.52	115.16%	0.19		3.84	2.90	
Cerium	9.38	93.76%				-1.74 LT		-118.80	-32.30 LT	
Chromium	10.03	100.34%				-0.18 LT		-12.25	1.55	
Cobalt	7.09	70.93%	#			-0.19 LT		-11.68	-3.45 LT	
Copper	10.62	106.21%		9.79	97.85%	-0.08 LT		-6.01	-1.45 LT	
Europium	9.96	99.63%				-0.03 LT		-2.22	-0.64 LT	
Iron	10.11	101.13%				0.02		192.97	192.07	
Lanthanum	49.86	99.52%		9.57	95.72%	-0.13 LT		-8.41	-2.51 LT	
Lead	51.37	102.54%		9.17	91.72%	-0.35 LT		-8.45	-1.08 LT	
Lithium	11.63	116.33%	#			-0.06 LT		-4.95	-1.48 LT	
Magnesium	10.10	100.98%		9.69	96.86%	0.02		6.23	2.68	
Manganese	10.16	101.63%				0.00 LT		2.03	2.35	
Mercury	26.17	104.69%				-0.05 LT		-2.75	-0.61 LT	
Molybdenum	50.54	101.07%		9.56	95.80%	-0.04 LT		-3.13	-0.77 LT	
Neodymium	8.70	86.98%	#			-2.79 LT		-227.00	-57.45 LT	
Nickel	9.96	99.60%				-0.07 LT		-5.21	-1.35 LT	
Phosphorou	52.71	105.42%		9.74	97.37%	-0.06 LT		697.46	671.68	
Potassium	25.70	102.78%				-2.53 LT		-182.60	-51.84 LT	
Samarium	10.24	102.38%				-1.95 LT		-135.00	-39.48 LT	
Selenium	52.24	104.47%				-0.62 LT		-41.70	-7.92 LT	
Silicon	41.04	82.09%	#	8.69	86.92%	2.70		8.72	17.80	
Silver	10.09	100.85%		9.42		-0.11 LT		-8.54	-2.42 LT	
Sodium	27.14	108.57%		11.46	114.60%	-0.50 LT		2443.90	2510.10	
Strontium	10.39	103.85%		9.46	94.59%	-0.02 LT		0.65	1.56	
Sulfur	51.29	102.58%				-0.05 LT		-1.78	1.48	
Tantalum	47.73	95.45%				-0.28 LT		-19.86	-5.43 LT	
Thallium	50.70	101.40%				-2.02 LT		-139.40	-41.92 LT	
Thorium	48.65	97.10%				-1.11 LT		-76.34	-22.13 LT	
Tin	50.28	100.56%				-0.03 LT		-6.21	-1.46 LT	
Titanium	48.05	96.10%				0.03		-3.59	-0.92 LT	
Tungsten	21.33	85.32%	#			-0.16 LT		-11.93	-2.58 LT	
Uranium	49.35	98.51%				-10.90 LT		-730.60	-198.90 LT	
Vanadium	10.26	102.61%				-0.09 LT		-6.38	-1.67 LT	
Zinc	9.82	98.20%		9.44	94.36%	0.00		1.85	2.20	
Zirconium	48.19	96.38%				-0.19 LT		-12.77	-3.59 LT	
Dilution Factor	1.00			10.00		1.00	1.00	101.00	21.00	1.00

	0.5054 g 50.00 mL Sample Duplicate Dilution Two ppm	0.01011 Sample Duplicate Dilution One ppm	Digestion Weight Volume Spike of Sample Dilution Three ppm	0.5033 g 50.00 mL Spike of Sample Dilution Two ppm	0.01007 Spike of Sample Dilution One ppm	Spike Recovery %	Standard LMCS Acid Digestion ppm	Acid Digestion Standard Recovery %	Ending LMCS Standard ppm	Standard Recovery %
Aluminum	531.36	531.78		493.71	529.23	NOT CALC.	9.56	95.63%	53.23	106.46%
Antimony	-21.58	0.10 LT		-51.80	2.49 LT				10.13	101.29%
Arsenic	-4.38	0.03 LT		-13.46	-0.84 LT				51.95	103.90%
Barium	-1.40	-0.07 LT		6.40	9.48	NOT CALC.	8.74	87.43%	9.34	93.37%
Beryllium	-0.13	-0.02 LT		-0.49	-0.06 LT				10.52	105.22%
Bismuth	269.08	282.99		234.64	287.99	NOT CALC.			53.21	106.21%
Boron	-0.95	0.14 LT		9.85	10.37	NOT CALC.			9.31	93.06%
Cadmium	-1.00	-0.08 LT		7.00	9.41	NOT CALC.			9.85	98.54%
Calcium	11.25	2.57		14.16	13.14	111.89%			9.57	95.68%
Cerium	-56.48	-2.91 LT		-195.10	-21.42 LT	NOT CALC.	8.37	83.71%	9.78	97.80%
Chromium	-10.87	1.90		-5.57	11.04	98.46%	8.72	86.40%	9.74	97.42%
Cobalt	-8.69	-1.19 LT		-13.31	4.52	NOT CALC.	7.24	72.36%	7.63	76.26%
Copper	-2.80	0.02 LT		1.69	9.71	NOT CALC.			9.86	98.57%
Europium	-1.11	-0.18 LT		-3.48	-0.42 LT				11.63	116.33%
Iron	170.67	164.51		170.47	166.29	NOT CALC.	9.60	95.97%	9.77	97.66%
Lanthanum	-4.46	-0.40 LT		-2.74	8.63	NOT CALC.			54.57	108.92%
Lead	-5.85	6.08		-24.05	9.46	NOT CALC.			50.25	100.30%
Lithium	-2.47	-0.27 LT		5.38	11.08	NOT CALC.	10.59	105.88%	10.45	104.53%
Magnesium	4.54	2.63		13.54	12.73	87.17%			9.80	98.04%
Manganese	2.72	2.56		12.28	12.10	107.06%	9.43	94.31%	9.80	97.98%
Mercury	-0.78	0.10 LT		-1.14	0.69	NOT CALC.			24.86	99.42%
Molybdenum	-1.52	0.03 LT		5.17	9.47	NOT CALC.			50.86	101.72%
Neodymium	-165.20	-30.36 LT		-293.60	-36.64 LT				8.57	85.68%
Nickel	-2.38	-0.05 LT		1.55	9.00	NOT CALC.	9.54	95.42%	9.96	99.59%
Phosphorou	477.95	467.13		512.80	507.61	NOT CALC.			49.95	99.90%
Potassium	-100.70	-12.24 LT		-272.20	-26.98 LT	NOT CALC.			25.26	101.04%
Samarium	-65.86	-6.83 LT		-217.00	-27.39 LT				10.45	104.47%
Selenium	-20.38	1.00 LT		-60.15	-1.63 LT				51.64	103.29%
Silicon	19.16	36.23		-12.79	17.09	33.15%			42.07	84.14%
Silver	-4.39	-0.48 LT		-12.17	-0.51 LT	NOT CALC.			9.82	98.23%
Sodium	1708.00	1630.80		1925.20	1840.90	NOT CALC.			25.41	101.63%
Strontium	1.07	1.52		10.76	11.47	95.52%			9.44	94.36%
Sulfur	1.19	2.81		-7.97	2.04				51.51	103.02%
Tantalum	-10.26	-0.74 LT		-30.01	-3.59 LT	NOT CALC.	8.38	84.22%	46.68	93.36%
Thallium	-60.70	-9.15 LT		-212.60	-25.67 LT				52.25	104.50%
Thorium	-37.29	-4.07 LT		-121.20	-14.94 LT				52.41	104.62%
Tin	-3.01	-0.11 LT		-0.87	8.29	NOT CALC.	10.11	101.08%	52.46	104.92%
Titanium	-1.64	0.08 LT		2.86	7.57	NOT CALC.	8.98	89.66%	50.96	101.92%
Tungsten	-5.34	0.30 LT		-18.45	-1.51 LT				21.20	84.78%
Uranium	-356.40	-25.12 LT		-1175.00	-135.20 LT				49.82	99.44%
Vanadium	-2.10	-0.46 LT		-9.22	-0.95 LT	NOT CALC.			10.55	105.49%
Zinc	54.38	2.32		11.26	11.96	98.35%			9.81	98.06%
Zirconium	-5.20	0.98		-20.23	-2.38 LT	NOT CALC.	8.68	86.94%	50.84	101.68%
Dilution Factor	101.00	21.00	1.00	101.00	21.00		10.00		1.00	

		Spike Standard LMCS ppm added	Spike Standard ID Book # 5.0 mL 103C15C +	LMCS Standards Values ppm	LMCS Standard IDs Book # 78C11C 82B38A 77C11C	ACID DIGESTION LMCS STANDARD VALUES ppm in Sample	ACID DIGEST. LMCS IDs Book # 81C11A 82C11A	Calc. Sample	Calc. Duplicate	Calc. Spike
Aluminum		10.00	5.0 mL	50.00		100.00		592	531	494
Antimony			104C15D	10.00				-10	0	2
Arsenic				50.00				-2	0	-1
Barium		10.00		10.00		100.00		-1	0	6
Beryllium				10.00				0	0	0
Bismuth		10.00		50.10		100.00		281	269	235
Boron		10.00		10.00		100.00		-1	0	10
Cadmium		10.00		10.00		100.00		0	0	7
Calcium		10.00		10.00		100.00		4	11	14
Cerium		10.00		10.00		100.00		-32	-3	-21
Chromium		10.00		10.00		100.90		2	2	11
Cobalt	#	10.00		10.00		100.00		-3	-1	5
Copper		10.00		10.00		100.00		-1	0	10
Europium	#			10.00				-1	0	0
Iron		10.00		10.00		100.00		193	171	170
Lanthanum		10.00		50.10		100.00		-3	0	9
Lead		10.00		50.10		100.00		-1	6	9
Lithium		10.00		10.00		100.00		-1	0	5
Magnesium		10.00		10.00		100.00		6	5	14
Manganese		10.00		10.00		100.00		2	3	12
Mercury				25.00				-1	0	1
Molybdenum		10.00		50.00		99.80		-1	0	5
Neodymium	#			10.00		100.00		-57	-30	-37
Nickel		10.00		10.00		100.00		-1	0	9
Phosphorou		10.00		50.00		100.00		697	478	513
Potassium		10.00		25.00		100.00		-52	-12	-27
Samarium				10.00				-39	-7	-27
Selenium				50.00				-8	1	-2
Silicon	#	10.00		50.00		100.00		18	36	17
Silver		10.00		10.00				-2	0	-1
Sodium		10.00		25.00		100.00		2444	1708	1925
Strontium		10.00		10.00		100.00		2	1	11
Sulfur				50.00				1	3	2
Tantalum		9.95		50.00		99.50		-5	-1	-4
Thallium				50.00				-42	-9	-26
Thorium				50.10				-22	-4	-15
Tin		10.00		50.00		100.00		-1	0	8
Titanium		10.00		50.00		100.10		-1	0	8
Tungsten	#			25.00				-3	0	-2
Uranium				50.10				-199	-25	-135
Vanadium				10.00				-2	0	-1
Zinc		10.00		10.00		100.00		2	54	11
Zirconium		9.98		50.00		99.80		-4	1	-2
Dilution Factor						10.00				

ICP Calibration Report

Procedure: LA-505-151 Revision: A-0
Instrument: WB39939
Technologist: D. M. Southwick
Date: March 12, 1990
Time: 08:36

Calibration Standards for ICP Program "SST"

Element	Standard	Element	Standard
Aluminum	SST-3	Antimony	SST-4
Arsenic	SST-4	Barium	SST-2
Beryllium	SST-2	Bismuth	SST-4
Boron	SST-3	Cadmium	SST-2
Calcium	SST-2	Cerium	SST-5
Chromium	SST-2	Cobalt	SST-2
Copper	SST-2	Europium	SST-5
Iron	SST-4	Lanthanum	SST-5
Lead	SST-4	Lithanum	SST-1
Magnesium	SST-2	Manganese	SST-2
Mercury	SST-2	Molybdenum	SST-3
Neodymium	SST-5	Nickel	SST-2
Phosphorous	SST-3	Potassium	SST-1
Samarium	SST-5	Selenium	SST-4
Silicon	SST-3	Silver	SST-2
Sodium	SST-1	Strontium	SST-2
Sulfur	SST-3	Tantalum	SST-3
Thallium	SST-4	Thorium	SST-4
Tin	SST-4	Titanium	SST-3
Tungsten	SST-3	Uranium	SST-4
Vanadium	SST-2	Zinc	SST-2
Zirconium	SST-3		

ICP Standard Formulations

SST-0:
Calibration blank, 1 M ultrx HNO_3.

12-Mar-90 08:36:20

Condition		Value	Min	/	Max
VACUUM	=	14.52	7.000	/	50.00
SPTEMP	=	38.75	37.00	/	39.00
MAINS	=	234.8	220.0	/	247.0
-1000V	=	-1004	-1010	/	-990
CTEMP	=	23.25	19.00	/	35.00
+5V	=	5.150	4.750	/	5.250
+12V	=	12.14	11.70	/	12.30
-12V	=	-12.2	-12.3	/	-11.7
+24V	=	23.12	22.50	/	26.50
-100V	=	-100	-101	/	-99.0
+5VSQ	=	5.146	4.750	/	5.250
+15VSQ	=	15.13	14.70	/	15.30
-15VSQ	=	-15.2	-15.3	/	-14.7

Position Calibration in Progress

	SLIT POS'N	PM	ALPHA SLIT	BETA SLIT	ALPHA LAMBDA1	BETA LAMBDA1	ALPHA LAMBDA2	BETA LAMBDA2
Previous data :								
INSTR	0.00000	586.625	1.00093	-0.2905	1.00009	-0.0682	0.00000	0.00000
Current data : .								
INSTR	0.00000	586.663	1.00092	-0.2222	1.00009	-0.0677	0.00000	0.00000

START THE PLASMA NOW, PLEASE.12-Mar-90 08:44:12

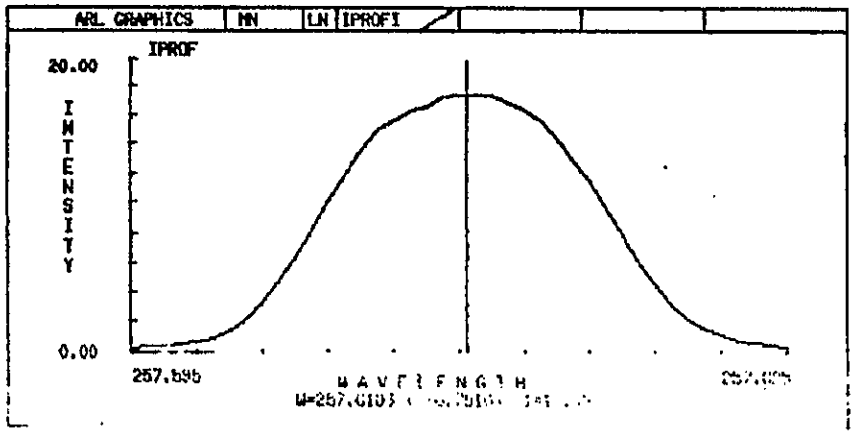

Figure 1ICP Calibration March 12, 1990

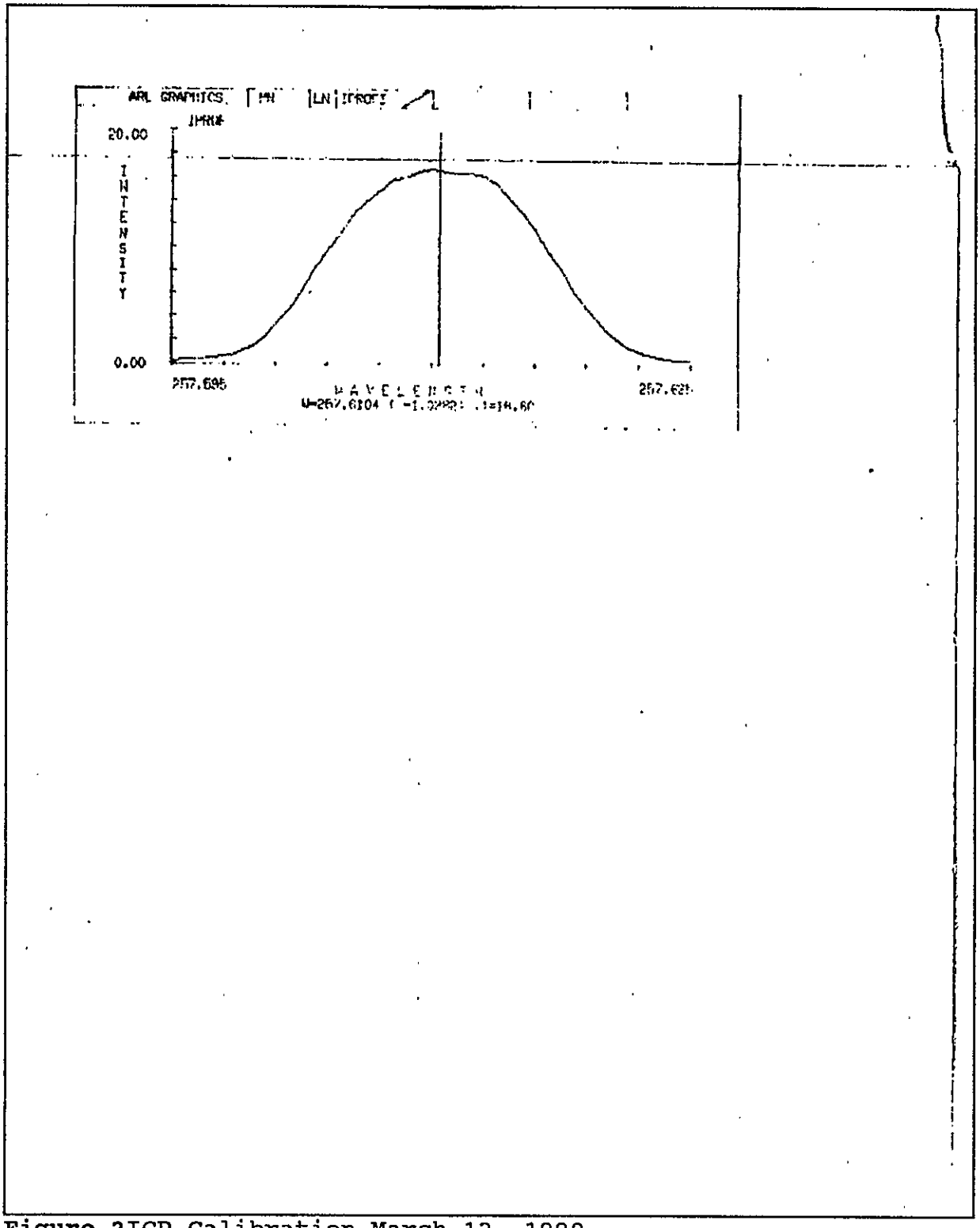

Figure 2ICP Calibration March 12, 1990

```
Profile position = -1.03

Option :

 1.  Accept new position
 2.  Re-run sample
 3.  Enter new profile position via keyboard
<CR> Exit


[******] Input not numeric - Please retype


Option = 1
SAMI positioning on profile
>
```


```
Profile position = -1.03

Option :

 1.  Accept new position
 2.  Re-run sample
 3.  Enter new profile position via keyboard
<CR> Exit


[******] Input not numeric - Please retype


Option = 1
SAMI positioning on profile
>
```



```
Profile position = -1.03

Option :

 1.  Accept new position
 2.  Re-run sample
 3.  Enter new profile position via keyboard
<CR> Exit


[******] Input not numeric - Please retype


Option = 1
SAMI positioning on profile
>
```


Figure 3ICP Analysis March 12, 1990

Sample name : SST0
Programme : SST 12-Mar-90 10:59:13

NAME	MV INT	RSD
AL	1.74	2.00
SB	0.40	1.48
AS	1.00	2.36
BA	3.12	1.99
BE	0.68	1.30
BI	3.72	1.54
B	3.92	1.28
CD	2.14	1.44
CA	0.51	0.56
CE	4.33	2.05
CR	1.62	35.05
CO	0.23	0.91
CU	2.49	1.79
EU	3.38	2.14
FE	1.48	0.98
LA	0.35	0.91
PB	0.26	1.09
LI	3.24	1.96
MG	0.40	1.03
MN	0.73	0.97
HG	3.46	1.54
MO	1.67	2.20
ND	4.85	10.38
NI	3.28	2.43
P	1.35	1.22
K	2.81	1.34
SM	4.15	2.08
SE	1.64	1.71
SI	2.79	1.97
AG	11.90	2.09
NA	4.19	2.27
SR	3.11	1.63
S	0.71	1.85
TA	3.20	1.76
TL	3.68	1.52
TH	1.29	1.78
SN	1.24	2.94
TI	3.09	1.74
W	1.31	2.24
U	4.11	2.07
V1	3.81	2.05
ZN	2.51	1.34
ZR	4.04	1.53

Sample name : SST1
Programme : SST 12-Mar-90 11:03:33

NAME	MV INT	RSD
LI	477.08	0.73
K	13.99	0.55

Figure 4ICP Calibration March 12, 1990

Sample name : SST1
Programme : SST 12-Mar-90 11:03:33

NAME	MV INT	RSD
LI	477.08	0.73
K	13.99	0.55
NA	60.88	0.70

Sample name : SST2
Programme : SST 12-Mar-90 11:05:42

NAME	MV INT	RSD
BA	348.09	1.28
BE	554.46	0.91
CD	333.58	0.45
CA	509.69	1.11
CR	70.72	1.60
CO	2.71	1.59
CU	112.27	1.45
FE	158.44	0.85
MG	493.87	0.62
MN	325.52	0.50
NI	178.09	0.47
AG	496.65	0.87
SR	624.33	1.23
V1	216.30	0.54
ZN	611.79	0.37

Sample name : SST3
Programme : SST 12-Mar-90 11:10:28

NAME	MV INT	RSD
AL	24.63	0.18
B	771.85	0.51
HG	671.49	0.18
MO	317.71	0.17
P	90.17	0.98
SI	91.60	0.23
S	48.86	0.81
TA	131.98	0.22
TI	567.83	0.24
W	72.55	0.34
ZR	185.89	0.21

Sample name : SST4
Programme : SST 12-Mar-90 11:15:15

NAME	MV INT	RSD
SB	7.42	0.79
AS	133.32	0.54
BI	113.47	0.43
PB	5.44	0.99
SE	52.01	0.11
TL	52.32	0.22

Figure 5ICP Analysis March 12, 1990

NA	60.88	0.70

Sample name : SST2
Programme : SST 12-Mar-90 11:05:42

NAME	MV INT	RSD
BA	348.09	1.28
BE	554.46	0.91
CD	333.58	0.45
CA	509.69	1.11
CR	70.72	1.60
CO	2.71	1.59
CU	112.27	1.45
FE	158.44	0.85
MG	493.87	0.62
MN	325.52	0.50
NI	178.09	0.47
AG	496.65	0.87
SR	624.33	1.23
VI	216.30	0.54
ZN	611.79	0.37

Sample name : SST3
Programme : SST 12-Mar-90 11:10:28

NAME	MV INT	RSD
AL	24.63	0.18
B	771.85	0.51
HG	671.49	0.18
MO	317.71	0.17
P	90.17	0.98
SI	91.60	0.23
S	48.86	0.81
TA	131.98	0.22
TI	567.83	0.24
W	72.55	0.34
ZR	185.89	0.21

Sample name : SST4
Programme : SST 12-Mar-90 11:15:15

NAME	MV INT	RSD
SB	7.42	0.79
AS	133.32	0.54
BI	113.47	0.43
PB	5.44	0.99
SE	52.01	0.11
TL	52.32	0.22
TH	26.03	0.54
SN	238.24	0.76
U	13.00	0.28

Sample name : SST5
Programme : SST 12-Mar-90 11:18:24

Figure 6ICP Calibration March 12, 1990

NAME	MV INT	RSD
CE	15.49	0.31
EU	513.43	0.37
LA	7.00	0.09
ND	15.22	0.68
SM	13.93	0.05

Programme name : SST Channel name : AL Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.6521	25.862	-0.379832E+01	0.218420E+01		

Programme name : SST Channel name : SB1 Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3768	7.7872	-0.565079E+01	0.142457E+02		

Programme name : SST Channel name : AS Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.9510	139.99	-0.756486E+00	0.755730E+00		

Programme name : SST Channel name : BA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.9640	365.49	-0.180888E+00	0.579768E-01		

Programme name : SST Channel name : BE1 Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.6489	582.18	-0.246672E-01	0.361159E-01		

Figure 7ICP Calibration March 12, 1990

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.5346	119.15	-0.339009E+01	0.911151E+00		

Programme name : SST Channel name : B Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.7243	810.44	-0.255254E+00	0.651102E-01		

Programme name : SST Channel name : CD Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.0286	350.25	-0.128852E+00	0.603427E-01		

Programme name : SST Channel name : CA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.4861	535.17	-0.200977E-01	0.392789E-01		

Programme name : SST Channel name : CE Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	4.1122	16.261	-0.775909E+01	0.179249E+01		

Programme name : SST Channel name : CR Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.5381	74.252	-0.468614E+00	0.289447E+00		

Programme name : SST Channel name : CO Polynomial type : CC

Figure 8ICP Calibration March 12, 1990

Programme name : SST Channel name : CU Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.2163	2.8413	-0.183726E+01	0.806994E+01		

Programme name : SST Channel name : CU Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.3608	117.88	-0.452699E+00	0.182173E+00		

Programme name : SST Channel name : EU Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.2116	539.10	-0.132562E+00	0.392118E-01		

Programme name : SST Channel name : FE Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.4082	166.36	-0.188884E+00	0.127423E+00		

Programme name : SST Channel name : LA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3338	7.3493	-0.105696E+01	0.300842E+01		

Programme name : SST Channel name : PB Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.2505	5.7144	-0.509140E+01	0.193100E+02		

Figure 9ICP Calibration March 12, 1990

Programme name : SST Channel name : LI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.0786	500.93	-0.341959E+00	0.105521E+00		

Programme name : SST Channel name : MG Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3841	518.56	-0.163876E-01	0.405298E-01		

Programme name : SST Channel name : MN Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.6919	341.80	-0.448494E-01	0.615781E-01		

Programme name : SST Channel name : HG Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.2899	705.07	-0.259196E+00	0.748472E-01		

Programme name : SST Channel name : MO Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.5881	333.59	-0.264476E+00	0.158211E+00		

Programme name : SST Channel name : ND Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	4.6046	15.979	-0.934691E+01	0.192839E+01		

Figure 10ICP Calibration March 12, 1990

Programme name : SST Channel name : NI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.1122	186.99	-0.374799E+00	0.114408E+00		

Programme name : SST Channel name : P Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.2796	94.683	-0.758210E+00	0.562888E+00		

Programme name : SST Channel name : K Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.6701	14.691	-0.125689E+02	0.447187E+01		

Programme name : SST Channel name : SM Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.9384	14.627	-0.847380E+01	0.204401E+01		

Programme name : SST Channel name : SE Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.5542	54.614	-0.324747E+01	0.198501E+01		

Programme name : SST Channel name : SI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.6521	96.182	-0.157171E+01	0.563000E+00		

Figure 11ICP Calibration March 12, 1990

Programme name : SST Channel name : AG Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	11.302	521.48	-0.490852E+00	0.412585E-01		

Programme name : SST Channel name : NA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.9786	63.921	-0.369384E+01	0.882006E+00		

Programme name : SST Channel name : SR Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.9551	655.55	-0.100146E+00	0.321945E-01		

Programme name : SST Channel name : S Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.6793	51.305	-0.742512E+00	0.103848E+01		

Programme name : SST Channel name : TA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.0416	138.58	-0.124308E+01	0.388260E+00		

Programme name : SST Channel name : TL2 Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.4969	54.936	-0.756795E+01	0.205595E+01		

Figure 12ICP Calibration March 12, 1990

Programme name : SST Channel name : TH Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.2223	27.328	-0.520068E+01	0.404198E+01		

Programme name : SST Channel name : SN Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.1745	250.15	-0.521655E+00	0.421937E+00		

Programme name : SST Channel name : TI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.9323	596.23	-0.273279E+00	0.885352E-01		

Programme name : SST Channel name : W Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.2458	76.178	-0.920380E+00	0.701866E+00		

Programme name : SST Channel name : U Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.9020	13.646	-0.462069E+02	0.112499E+02		

Programme name : SST Channel name : V1 Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.6208	227.12	-0.358727E+00	0.941210E-01		

Figure 13ICP Calibration March 12, 1990

Programme name : SSI Channel name : ZN Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.3886	642.38	-0.825355E-01	0.328260E-01		

Programme name : SSI Channel name : ZR Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.8367	195.19	-0.111041E+01	0.274945E+00		

Figure 14ICP Calibration March 12, 1990

Sample name : B1C11A
Sample code 1 : ICP-1B
Sample code 2 : MULTI
Sample code 3 : 1-10
Programme : SST 12-Mar-90 12:39:20

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.57	(-0.369	(-4.060	-19.95
Sb	0.38	-0.280	-3.082	-18.33
As	1.27	0.203	2.231	7.97
Ba	2.88	(-0.014	(-0.151	-29.52
Be	0.63	(-0.002	(-0.023	-23.73
Bi	13.79	9.170	100.87	0.41
B	137.40	8.691	95.603	0.97
Cd	150.36	8.944	98.386	0.51
Ca	231.19	9.061	99.669	1.66
Ce	3.96	(-0.655	(-7.203	-25.86
Cr	1.17	(-0.131	(-1.441	-3.38
Co	0.22	-0.089	-0.976	-10.50
Cu	52.86	9.176	100.94	1.14
Eu	3.06	(-0.013	(-0.139	-23.58
Fe	1.46	-0.002	-0.026	-179.79
La	3.40	9.186	101.04	1.29
Pb	0.74	9.166	100.82	1.20
Li	2.92	(-0.034	(-0.371	-21.54
Mg	221.00	8.941	98.346	0.74
Mn	0.73	0.000	0.001	793.68
Hg	3.35	-0.009	-0.094	-46.99
Mo	1.56	(-0.017	(-0.190	-25.19
Nd	4.24	(-1.176	(-12.93	-10.01
Ni	3.06	(-0.025	(-0.270	-42.23
P	18.23	9.500	104.50	0.67
K	4.67	8.325	91.576	1.61
Sm	3.72	(-0.878	(-9.661	-22.03
Se	1.50	(-0.261	(-2.868	-21.01
Si	2.58	(-0.121	(-1.329	-26.18
Ag	231.60	9.065	99.711	0.73
Na	14.56	9.149	100.64	0.47
Sr	280.11	8.918	98.097	1.54
S	0.83	0.122	1.344	12.90
Ta	2.90	(-0.119	(-1.304	-17.58
Tl	3.32	(-0.746	(-8.209	-6.20
Th	1.17	(-0.476	(-5.232	-21.45
Sn	1.44	0.086	0.948	12.42
Ti	2.81	(-0.025	(-0.270	-21.65
W	1.40	0.062	0.682	13.22
U	3.75	(-4.031	(-44.34	-25.01
V	3.45	(-0.034	(-0.378	-23.89
Zn	274.68	8.934	98.274	0.51
Zr	3.73	(-0.084	(-0.928	-21.73

Dilution factor : 11.0000

Figure 1ICP Analysis March 12, 1990

Sample name : 81C11A
Sample code 1 : ICP-1B
Sample code 2 : MO-8I
Sample code 3 : 1-10
Programme : SST 12-Mar-90 12:44:01

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.80	0.125	1.370	61.55
Sb	0.39	-0.043	-0.470	-258.91
As	1.05	0.036	0.391	52.68
Ba	3.10	-0.001	-0.013	-311.10
Be	0.68	-0.000	-0.002	-225.08
Bi	3.70	-0.019	-0.214	-297.06
B	4.24	0.021	0.228	18.41
Cd	2.09	-0.003	-0.028	-98.50
Ca	0.72	0.008	0.091	1.92
Ce	4.31	-0.034	-0.375	-501.37
Cr	1.17	(-0.129	(-1.415	-8.68
Co	0.23	-0.016	-0.178	-76.38
Cu	2.55	0.012	0.130	54.37
Eu	3.36	-0.001	-0.009	-362.90
Fe	1.54	0.007	0.077	89.19
La	0.35	-0.004	-0.044	-270.43
Pb	0.27	0.071	0.779	56.77
Li	3.23	-0.001	-0.014	-520.10
Mg	0.44	0.001	0.016	15.18
Mn	0.74	0.001	0.010	70.23
Hg	3.50	0.003	0.032	186.54
Mo	58.51	8.992	98.916	1.59
Nd	4.26	(-1.129	(-12.42	-11.11
Ni	3.28	0.000	0.005	1589.85
P	1.38	0.016	0.173	52.61
K	2.75	-0.258	-2.837	-87.53
Sm	4.13	-0.036	-0.397	-486.91
Se	1.63	-0.003	-0.036	-1317.7
Si	15.46	7.135	78.480	1.16
Ag	11.92	0.001	0.011	556.41
Na	4.20	0.010	0.107	771.49
Sr	3.11	-0.000	-0.001	-1726.2
S	0.76	0.050	0.548	20.83
Ta	3.17	-0.012	-0.131	-216.62
Tl	3.71	0.064	0.709	288.37
Th	1.29	0.027	0.296	334.50
Sn	1.30	0.025	0.277	24.69
Ti	3.07	-0.001	-0.015	-377.56
W	1.31	0.000	0.005	5338.04
U	4.08	-0.266	-2.929	-363.34
V	3.87	0.006	0.061	25.24
Zn	2.57	0.002	0.021	41.98
Zr	4.02	-0.005	-0.059	-309.41

Dilution factor : 11.0000

enter

Sample name : 82C11A
Sample code 1 : ICP-2B
Sample code 2 : 1-10
Programme : SST 12-Mar-90 12:48:22

NAME	MV INT	CONCEN	DILCOR	RSD
Al	5.85	8.974	98.716	0.60
Sb	0.38	-0.223	-2.455	-35.54

Figure 2ICP Analysis March 12, 1990

Sample name : 82C11A
Sample code 1 : ICP-2B
Sample code 2 : 1-10
Programme : SSI 12-Mar-90 12:48:22

NAME	MV INT	CONCEN	DILCOR	RSD
Al	5.85	8.974	98.716	0.60
Sb	0.38	-0.223	-2.455	-35.54
As	1.27	0.202	2.222	7.33
Ba	158.72	9.021	99.235	1.81
Be	0.70	0.001	0.008	64.38
Bi	3.52	(-0.186	(-2.041	-39.81
B	4.10	0.012	0.128	60.83
Cd	2.05	-0.005	-0.056	-23.31
Ca	4.76	0.167	1.837	1.76
Ce	9.25	8.830	97.128	1.23
Cr	32.77	9.016	99.175	0.90
Co	1.15	7.446	81.905	3.43
Cu	2.31	(-0.033	(-0.360	-32.94
Eu	3.66	0.011	0.121	24.36
Fe	74.02	9.243	101.67	0.67
La	0.36	0.015	0.165	70.24
Pb	0.26	0.019	0.212	288.67
Li	100.19	10.230	112.53	2.26
Mg	2.90	0.101	1.111	0.64
Mn	150.49	9.222	101.44	0.91
Hg	3.60	0.010	0.111	57.16
Mo	1.72	0.008	0.085	92.13
Nd	8.46	6.970	76.675	1.58
Ni	83.98	9.233	101.56	0.74
P	1.31	-0.022	-0.241	-119.75
K	2.50	(-1.397	(-15.36	-18.41
Sm	3.71	(-0.892	(-9.811	-23.53
Se	3.21	3.130	34.427	1.13
Si	3.43	0.358	3.941	8.72
Ag	11.85	-0.002	-0.020	-731.86
Na	3.84	(-0.305	(-3.350	-31.86
Sr	2.93	(-0.006	(-0.063	-34.55
S	0.82	0.109	1.196	19.52
Ta	25.66	8.718	95.902	1.36
Tl	3.44	(-0.491	(-5.405	-62.95
Th	1.24	-0.191	-2.105	-60.66
Sn	24.00	9.604	105.65	1.27
Ti	101.14	8.681	95.490	1.34
W	1.24	(-0.049	(-0.540	-49.12
U	4.16	0.540	5.940	176.85
V	3.37	(-0.042	(-0.460	-19.74
Zn	3.50	0.032	0.355	3.27
Zr	36.09	8.812	96.934	1.31

Dilution factor : 11.0000

Figure 3ICP Analysis March 12, 1990

Sample name : 78C11A
Sample code 1 : SST-1
Sample code 2 : DIRECT
Programme : SST 12-Mar-90 12:57:18

NAME	MV INT	CONCEN	RSD
Al	1.53	(-0.461	-15.36
Sb	1.08	9.768	1.22
As	1.01	0.004	320.00
Ba	182.31	10.389	1.85
Be	0.61	(-0.003	-27.05
Bi	3.18	(-0.489	-16.79
B	156.79	9.953	1.27
Cd	161.44	9.613	0.65
Ca	269.73	10.575	1.53
Ce	9.56	9.376	1.24
Cr	36.29	10.034	0.50
Co	1.11	7.093	3.41
Cu	60.79	10.621	1.48
Eu	3.50	0.005	48.13
Fe	80.84	10.113	0.36
La	0.34	-0.028	-21.43
Pb	0.25	-0.212	-13.89
Li	113.48	11.633	1.88
Mg	249.56	10.098	0.66
Mn	165.76	10.163	0.67
Hg	3.26	(-0.015	-22.00
Mo	1.54	(-0.020	-15.90
Nd	9.36	8.698	4.10
Ni	90.33	9.960	0.54
P	1.29	-0.034	-31.51
K	8.56	25.695	0.73
Sm	3.35	(-1.637	-11.90
Se	3.40	3.504	0.83
Si	2.39	(-0.225	-13.44
Ag	9.66	(-0.092	-11.49
Na	34.96	27.143	1.35
Sr	325.68	10.385	1.51
S	0.90	0.189	7.27
Ta	2.69	(-0.200	-16.78
Tl	3.07	(-1.263	-20.12
Th	1.13	(-0.632	-16.20
Sn	120.40	50.281	0.99
Ti	2.59	(-0.044	-11.48
W	1.36	0.031	62.67
U	3.72	(-4.395	-23.18
V	3.17	(-0.061	-7.41
Zn	301.67	9.820	0.61
Zr	3.54	(-0.138	-10.76

KAT 3/21

Figure 4ICP Analysis March 12, 1990

Sample name : 81B38A should be 82B38A
Sample code 1 : SST-2
Sample code 2 : DIRECT
Programme : SST 12-Mar-90 13:02:00

KAT 3/21

NAME	MV INT	CONCEN	RSD
Al	3.53	3.920	1.95
Sb	0.42	0.313	25.85
As	2.87	1.410	1.71
Ba	3.23	0.006	53.81
Be	0.67	-0.000	-100.00
Bi	59.99	51.265	1.04
B	4.69	0.050	7.98
Cd	2.15	0.001	137.94
Ca	1.17	0.026	1.52
Ce	4.43	0.182	78.46
Cr	1.45	(-0.050	-14.86
Co	0.22	-0.062	-13.04
Cu	3.71	0.223	2.78
Eu	269.99	10.454	1.22
Fe	1.76	0.036	7.21
La	16.93	)49.861	1.28
Pb	2.92	51.371	1.18
Li	3.10	-0.015	-42.15
Mg	0.60	0.008	2.89
Mn	0.87	0.009	7.74
Hg	3.91	0.033	15.63
Mo	1.73	0.009	51.17
Nd	4.60	(-0.471	-47.24
Ni	3.35	0.009	73.37
P	1.66	0.174	8.83
K	2.65	(-0.733	-24.70
Sm	9.15	10.238	1.26
Se	1.71	0.137	48.95
Si	3.65	0.483	5.62
Ag	256.34	10.085	0.85
Na	4.09	-0.084	-87.43
Sr	3.20	0.003	44.45
S	0.84	0.130	7.87
Ta	3.49	0.110	23.00
Tl	6.33	5.456	3.14
Th	13.32	48.649	1.00
Sn	1.41	0.071	5.03
Ti	3.50	0.037	12.36
W	1.29	-0.014	-76.33
U	8.49	49.353	1.39
V	6.06	0.212	2.50
Zn	2.70	0.006	17.17
Zr	4.31	0.075	17.68

Figure 5ICP Analysis March 12, 1990

Sample name -: 77C11C
Sample code 1 : SSI-3
Sample code 2 : DIRECT
Programme : SST 12-Mar-90 13:07:56

NAME	MV INT	CONCEN	RSD
Al	24.74	50.235	1.41
Sb	0.46	0.878	8.93
As	70.45	52.483	0.91
Ba	3.03	-0.005	-111.90
Be	278.97	10.050	1.06
Bi	4.29	0.514	32.36
B	4.36	0.029	29.22
Cd	2.16	0.001	292.09
Ca	0.81	0.012	1.22
Ce	3.86	(-0.836	-29.08
Cr	1.20	(-0.120	-10.47
Co	0.23	-0.019	-89.21
Cu	2.55	0.012	112.49
Eu	3.01	(-0.014	-33.68
Fe	1.72	0.031	17.18
La	0.33	(-0.058	-31.03
Pb	0.27	0.129	52.68
Li	2.95	(-0.030	-40.27
Mg	0.50	0.004	8.08
Mn	0.95	0.014	6.59
Hg	353.14	26.172	1.21
Mo	321.10	50.537	0.86
Nd	3.93	(-1.772	-12.11
Ni	7.11	0.439	2.42
P	94.99	)52.712	0.33
K	2.50	(-1.389	-24.44
Sm	3.73	(-0.856	-32.24
Se	27.95	52.236	0.69
Si	75.69	41.044	1.25
Ag	18.15	0.258	8.05
Na	4.02	-0.147	-81.63
Sr	2.93	(-0.006	-45.29
S	50.10	51.288	1.35
Ta	126.12	47.725	0.63
Tl	28.34	50.702	1.03
Th	1.34	0.209	74.97
Sn	1.67	0.184	16.00
Ti	545.83	48.051	1.29
W	31.70	21.330	1.59
U	4.78	7.541	22.62
V	112.83	10.261	2.34
Zn	3.45	0.031	9.14
Zr	179.31	48.190	1.20

Figure 6ICP Analysis March 12, 1990

Sample name : F123
Sample code 1 : REAGEN
Sample code 2 : DIRECT
Programme : SST 12-Mar-90 13:14:26

NAME	MV INT	CONCEN	RSD
Al	1.41	(-0.712	-19.22
Sb	0.36	(-0.594	-11.00
As	0.81	(-0.142	-27.54
Ba	2.44	(-0.040	-14.87
Be	0.59	(-0.004	-24.37
Bi	3.00	(-0.659	-17.79
B	3.53	(-0.025	-12.59
Cd	1.77	(-0.022	-7.66
Ca	5.23	0.186	86.27
Ce	3.36	(-1.736	-20.65
Cr	1.01	(-0.176	-12.77
Co	0.20	(-0.191	-7.32
Cu	2.06	(-0.078	-29.11
Eu	2.55	(-0.032	-14.81
Fe	1.61	0.017	199.07
La	0.31	(-0.132	-14.61
Pb	0.25	(-0.348	-12.83
Li	2.65	(-0.063	-19.62
Mg	0.84	0.018	90.26
Mn	0.69	(-0.003	-84.08
Hg	2.85	(-0.046	-22.13
Mo	1.41	(-0.042	-21.87
Nd	3.40	(-2.791	-10.24
Ni	2.70	(-0.066	-9.84
P	1.24	(-0.063	-159.67
K	2.24	(-2.531	-18.14
Sm	3.19	(-1.952	-16.81
Se	1.32	(-0.621	-18.96
Si	7.58	2.697	18.29
Ag	9.30	(-0.107	-19.31
Na	3.63	(-0.496	-46.42
Sr	2.59	(-0.017	-18.79
S	0.67	(-0.045	-110.12
Ta	2.47	(-0.284	-9.47
Tl	2.70	(-2.024	-13.62
Th	1.01	(-1.114	-12.13
Sn	1.16	(-0.033	-224.37
Ti	3.37	0.025	256.18
W	1.09	(-0.155	-25.36
U	3.14	(-10.90	-14.96
V	2.90	(-0.085	-15.27
Zn	2.63	0.004	281.98
Zr	3.36	(-0.186	-14.61

Figure 7ICP Analysis March 12, 1990

Sample name : 34C11C
Sample code 1 : ICP1
Sample code 2 : 5-25
Programme : SST 12-Mar-90 13:20:48

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.70	-0.095	-0.477	-92.75
Sb	0.38	-0.247	-1.235	-20.26
As	1.01	0.004	0.019	541.47
Ba	2.86	(-0.015	(-0.075	-32.37
Be	0.62	(-0.002	(-0.011	-11.04
Bi	5.55	1.670	8.352	6.91
B	31.84	1.818	9.089	1.39
Cd	33.25	1.878	9.388	1.50
Ca	59.15	2.303	11.516	0.19
Ce	3.85	(-0.858	(-4.290	-25.25
Cr	1.10	(-0.152	(-0.758	-4.58
Co	0.22	-0.086	-0.430	-9.38
Cu	13.23	1.957	9.785	1.09
Eu	2.97	(-0.016	(-0.080	-23.01
Fe	1.92	0.055	0.277	5.45
La	0.99	1.914	9.572	1.35
Pb	0.36	1.834	9.172	5.99
Li	2.97	(-0.028	(-0.142	-28.39
Mg	48.20	1.937	9.686	1.24
Mn	0.86	0.008	0.040	13.41
Hg	3.26	(-0.015	(-0.077	-20.97
Mo	13.76	1.912	9.561	1.98
Nd	3.92	(-1.795	(-8.973	-13.75
Ni	3.06	(-0.024	(-0.121	-42.52
P	4.81	1.947	9.737	1.94
K	2.96	0.660	3.302	45.97
Sm	3.67	(-0.975	(-4.875	-23.97
Se	1.49	(-0.295	(-1.476	-24.96
Si	5.88	1.738	8.692	3.54
Ag	57.58	1.885	9.424	1.56
Na	6.79	2.292	11.460	5.31
Sr	61.87	1.892	9.459	0.38
S	0.83	0.117	0.583	12.66
Ta	2.85	(-0.136	(-0.678	-21.37
Tl	3.25	(-0.879	(-4.396	-12.76
Th	1.16	(-0.524	(-2.621	-22.72
Sn	1.30	0.027	0.136	15.57
Ti	3.45	0.032	0.161	17.79
W	1.25	-0.044	-0.220	-41.65
U	3.64	(-5.272	(-26.36	-23.93
V	3.43	(-0.036	(-0.181	-18.65
Zn	60.00	1.887	9.436	1.85
Zr	3.70	(-0.092	(-0.461	-21.75

Dilution factor : 5.00000

Figure 8ICP Analysis March 12, 1990

Sample name : 35C11C
Sample code 1 : ICP2
Sample code 2 : 5-25
Programme : 88T 12-Mar-90 13:25:09

NAME	MV INT	CONCEN	DILCOR	RSD
Al	2.61	1.913	9.563	2.24
Sb	0.39	-0.057	-0.285	-125.83
As	1.06	0.047	0.236	13.64
Ba	33.28	1.749	8.743	0.53
Be	0.68	0.000	0.000	800.03
Bi	3.69	-0.023	-0.117	-174.06
B	4.66	0.048	0.240	7.30
Cd	2.14	0.000	0.001	497.81
Ca	11.04	0.414	2.068	5.16
Ce	5.26	1.674	8.371	5.41
Cr	7.64	1.744	8.718	0.58
Co	0.41	1.447	7.236	1.48
Cu	2.51	0.005	0.026	80.80
Eu	3.39	0.000	0.002	462.42
Fe	16.55	1.919	9.597	0.77
La	0.35	-0.002	-0.010	-86.61
Pb	0.28	0.225	1.126	21.57
Li	23.31	2.118	10.588	1.33
Mg	2.19	0.072	0.362	1.33
Mn	31.36	1.886	9.431	0.59
Hg	3.45	-0.001	-0.006	-100.66
Mo	1.70	0.005	0.024	80.58
Nd	5.11	0.514	2.568	8.33
Ni	19.96	1.908	9.542	1.37
P	1.49	0.078	0.388	27.18
K	2.70	-0.507	-2.534	-25.61
Sm	4.02	-0.253	-1.264	-41.79
Se	1.94	0.605	3.027	7.01
Si	3.56	0.433	2.163	4.62
Ag	11.80	-0.004	-0.021	-142.27
Na	4.80	0.543	2.717	7.63
Sr	3.16	0.001	0.007	74.46
S	0.85	0.135	0.677	14.88
Ta	7.52	1.676	8.380	2.05
Tl	3.55	-0.273	-1.364	-42.68
Th	1.27	-0.084	-0.418	-63.46
Sn	6.03	2.022	10.108	1.47
Ti	23.36	1.795	8.975	0.66
W	1.29	-0.013	-0.066	-46.19
U	4.07	-0.446	-2.231	-121.44
V	3.65	-0.015	-0.075	-15.94
Zn	3.56	0.034	0.171	2.11
Zr	10.35	1.735	8.677	1.15

Dilution factor : 5.00000

Figure 9ICP Analysis March 12, 1990

Sample name : E116
Sample code 1 : SAMPLE
Sample code 2 : 100-10
Programme : SST 12-Mar-90 13:29:28

NAME	MV INT	CONCEN	DILCOR	RSD
Al	4.42	5.862	592.03	0.51
Sb	0.37	(-0.427	(-43.16	-9.62
As	0.88	(-0.092	(-9.287	-8.27
Ba	2.68	(-0.026	(-2.588	-4.82
Be	0.61	(-0.003	(-0.271	-23.20
Bi	6.77	2.780	280.80	1.31
B	3.52	(-0.026	(-2.663	-12.24
Cd	1.84	(-0.018	(-1.816	-4.70
Ca	1.48	0.038	3.836	0.60
Ce	3.67	(-1.176	(-118.8	-3.72
Cr	1.20	(-0.121	(-12.25	-0.41
Co	0.21	(-0.116	(-11.68	-4.03
Cu	2.16	(-0.060	(-6.010	-4.30
Eu	2.82	(-0.022	(-2.222	-2.43
Fe	16.48	1.911	192.97	0.28
La	0.32	(-0.083	(-8.407	-7.52
Pb	0.26	-0.084	-8.451	-13.32
Li	2.78	(-0.049	(-4.949	-4.31
Mg	1.93	0.062	6.233	0.69
Mn	1.05	0.020	2.032	3.84
Hg	3.10	(-0.027	(-2.747	-4.46
Mo	1.48	(-0.031	(-3.132	-6.78
Nd	3.68	(-2.248	(-227.0	-2.14
Ni	2.83	(-0.052	(-5.211	-6.54
P	13.62	6.906	697.46	0.04
K	2.41	(-1.808	(-182.6	-4.10
Sm	3.49	(-1.337	(-135.0	-4.12
Se	1.43	(-0.413	(-41.70	-1.44
Si	2.94	0.086	8.719	5.09
Ag	9.85	(-0.085	(-8.537	-3.24
Na	31.62	24.197	2443.9	0.53
Sr	3.31	0.006	0.654	5.46
S	0.70	-0.018	-1.783	-31.13
Ta	2.70	(-0.197	(-19.86	-1.53
Ti	3.01	(-1.380	(-139.4	-6.26
Th	1.10	(-0.756	(-76.34	-4.85
Sn	1.09	(-0.061	(-6.208	-5.20
Ti	2.69	(-0.036	(-3.592	-3.73
W	1.14	(-0.118	(-11.93	-7.20
U	3.46	(-7.234	(-730.6	-3.41
V	3.14	(-0.063	(-6.376	-6.20
Zn	3.07	0.018	1.847	5.30
Zr	3.58	(-0.126	(-12.77	-4.24

Dilution factor : 101.000

Figure 10ICP Analysis March 12, 1990

Sample name : F116
Sample code 1 : SAMPLE
Sample code 2 : 500-10
Programme : SSI 12-Mar-90 13:33:45

NAME	MV INT	CONCEN	DILCOR	RSD
Al	15.53	30.116	632.45	0.17
Sb	0.36	(-0.465	(-9.773	-3.06
As	0.86	(-0.106	(-2.232	-12.80
Ba	2.50	(-0.036	(-0.752	-9.87
Be	0.58	(-0.004	(-0.080	-4.11
Bi	20.23	15.046	315.97	0.60
B	3.31	(-0.040	(-0.840	-9.90
Cd	1.77	(-0.022	(-0.461	-4.94
Ca	4.03	0.138	2.898	0.41
Ce	3.47	(-1.538	(-32.30	-9.97
Cr	1.87	0.074	1.548	6.92
Co	0.21	(-0.164	(-3.446	-2.84
Cu	2.11	(-0.069	(-1.452	-11.21
Eu	2.60	(-0.031	(-0.641	-8.97
Fe	73.26	9.146	192.07	0.62
La	0.31	(-0.119	(-2.506	-9.54
Pb	0.26	-0.051	-1.081	-99.22
Li	2.57	(-0.071	(-1.483	-9.03
Mg	3.56	0.128	2.684	0.84
Mn	2.55	0.112	2.351	0.72
Hg	3.07	(-0.029	(-0.612	-10.35
Mo	1.44	(-0.037	(-0.770	-10.48
Nd	3.43	(-2.736	(-57.45	-6.88
Ni	2.72	(-0.064	(-1.348	-9.28
P	58.17	31.985	671.68	1.30
K	2.26	(-2.468	(-51.84	-9.04
Sm	3.23	(-1.880	(-39.48	-9.08
Se	1.45	(-0.377	(-7.920	-19.64
Si	4.30	0.848	17.801	3.21
Ag	9.10	(-0.115	(-2.421	-8.99
Na	139.71	)119.53	)2510.1	0.42
Sr	5.41	0.074	1.555	1.71
S	0.78	0.070	1.476	6.66
Ta	2.54	(-0.258	(-5.425	-11.41
Tl	2.71	(-1.996	(-41.92	-6.42
Th	1.03	(-1.054	(-22.13	-8.36
Sn	1.07	(-0.069	(-1.459	-11.94
Ti	2.59	(-0.044	(-0.915	-9.68
W	1.14	(-0.123	(-2.584	-10.88
U	3.27	(-9.472	(-198.9	-9.50
V	2.97	(-0.080	(-1.670	-1.93
Zn	5.70	0.105	2.199	0.92
Zr	3.42	(-0.171	(-3.587	-9.47

Dilution factor : 21.0000

Figure 11ICP Analysis March 12, 1990

Sample name : 1MHNO3
Sample code 1 : DIRECT
Programme : SST 12-Mar-90 13:37:50

NAME	MV INT	CONCEN	RSD
Al	1.37	(-0.810	-8.81
Sb	0.35	(-0.627	-7.98
As	0.80	(-0.149	-7.86
Ba	2.38	(-0.043	-9.50
Be	0.56	(-0.004	-8.77
Bi	2.93	(-0.717	-9.94
B	3.14	(-0.051	-10.90
Cd	1.69	(-0.027	-8.62
Ca	0.49	-0.001	-24.72
Ce	3.31	(-1.831	-10.17
Cr	0.91	(-0.205	-2.36
Co	0.21	(-0.167	-9.68
Cu	1.96	(-0.096	-10.92
Eu	2.55	(-0.033	-9.90
Fe	1.15	(-0.042	-9.60
La	0.31	(-0.136	-11.46
Pb	0.24	(-0.399	-12.80
Li	2.53	(-0.075	-10.70
Mg	0.36	(-0.002	-16.60
Mn	0.60	(-0.008	-10.44
Hg	2.97	(-0.037	-12.40
Mo	1.36	(-0.050	-9.31
Nd	3.36	(-2.871	-6.05
Ni	2.57	(-0.080	-12.41
P	1.10	(-0.138	-12.61
K	2.22	(-2.655	-9.93
Sm	3.17	(-2.004	-10.46
Se	1.30	(-0.664	-7.80
Si	2.20	(-0.334	-10.22
Ag	8.88	(-0.125	-9.61
Na	3.22	(-0.850	-9.90
Sr	2.53	(-0.019	-10.03
S	0.61	(-0.107	-9.85
Ta	2.49	(-0.278	-11.59
Tl	2.82	(-1.780	-17.15
Th	1.01	(-1.120	-10.45
Sn	1.01	(-0.095	-12.30
Ti	2.45	(-0.057	-9.91
W	1.05	(-0.186	-7.65
U	3.12	(-11.07	-10.05
V	3.00	(-0.077	-13.74
Zn	2.08	(-0.014	-7.80
Zr	3.35	(-0.190	-10.71

Figure 12ICP Analysis March 12, 1990

Sample name : F117
Sample code 1 : SAM
Sample code 2 : 100-10
Sample code 3 : 089045
Programme : SST 12-Mar-90 13:42:45

NAME	MV INT	CONCEN	DILCOR	RSD
Al	4.15	5.261	531.36	0.25
Sb	0.38	-0.214	-21.58	-7.70
As	0.94	(-0.043	(-4.376	-15.63
Ba	2.88	(-0.014	(-1.398	-11.40
Be	0.65	(-0.001	(-0.130	-38.88
Bi	6.64	2.664	269.08	1.80
B	3.78	-0.009	-0.954	-15.43
Cd	1.97	(-0.010	(-1.004	-10.56
Ca	3.35	0.111	11.250	0.51
Ce	4.02	(-0.559	(-56.48	-14.39
Cr	1.25	(-0.108	(-10.87	-5.27
Co	0.22	-0.086	-8.694	-9.38
Cu	2.33	(-0.028	(-2.797	-12.60
Eu	3.10	(-0.011	(-1.109	-11.66
Fe	14.74	1.690	170.67	0.51
La	0.34	-0.044	-4.456	-10.41
Pb	0.26	-0.058	-5.851	-50.92
Li	3.01	(-0.024	(-2.465	-10.38
Mg	1.51	0.045	4.540	0.21
Mn	1.17	0.027	2.722	1.87
Hg	3.36	-0.008	-0.779	-6.06
Mo	1.58	(-0.015	(-1.523	-18.33
Nd	4.00	(-1.635	(-165.2	-10.32
Ni	3.07	(-0.024	(-2.384	-20.77
P	9.75	4.732	477.95	1.46
K	2.59	(-0.997	(-100.7	-7.53
Sm	3.83	(-0.652	(-65.86	-12.81
Se	1.53	(-0.202	(-20.38	-21.47
Si	3.13	0.190	19.163	4.76
Ag	10.84	(-0.044	(-4.394	-10.93
Na	23.36	16.911	1708.0	0.24
Sr	3.44	0.011	1.069	6.94
S	0.73	0.012	1.189	33.41
Ta	2.94	(-0.102	(-10.26	-14.34
Tl	3.39	(-0.601	(-60.70	-30.49
Th	1.20	(-0.369	(-37.29	-13.60
Sn	1.17	(-0.030	(-3.012	-28.60
Ti	2.90	(-0.016	(-1.642	-13.30
W	1.24	(-0.053	(-5.340	-25.43
U	3.79	(-3.529	(-356.4	-12.62
V	3.59	(-0.021	(-2.095	-25.31
Zn	18.92	0.538	54.380	0.06
Zr	3.85	-0.052	-5.202	-13.82

Dilution factor : 101.000

Figure 13ICP Analysis March 12, 1990

Sample name : F117
Sample code 1 : SAM
Sample code 2 : 500-10
Sample code 3 : 089045
Programme : SST 12-Mar-90 13:46:53

NAME	MV INT	CONCEN	DILCOR	RSD
Al	13.33	25.323	531.78	1.94
Sb	0.40	0.005	0.100	1039.39
As	1.00	0.001	0.026	330.45
Ba	3.07	-0.003	-0.065	-106.92
Be	0.66	-0.001	-0.017	-56.70
Bi	18.51	13.476	282.99	1.94
B	4.02	0.007	0.141	94.50
Cd	2.07	-0.004	-0.077	-43.12
Ca	3.63	0.122	2.568	2.55
Ce	4.25	-0.139	-2.911	-105.25
Cr	1.93	0.090	1.896	5.78
Co	0.22	-0.056	-1.186	-21.82
Cu	2.49	0.001	0.024	595.09
Eu	3.24	-0.006	-0.117	-41.07
Fe	62.96	7.834	164.51	2.12
La	0.35	-0.019	-0.400	-41.78
Pb	0.28	0.290	6.083	3.85
Li	3.12	-0.013	-0.270	-46.63
Mg	3.49	0.125	2.629	1.87
Mn	2.71	0.122	2.558	1.61
Hg	3.52	0.005	0.095	92.44
Mo	1.68	0.002	0.032	391.51
Nd	4.10	(-1.446	(-30.36	-15.11
Ni	3.26	-0.002	-0.047	-261.86
P	40.87	22.244	467.13	1.08
K	2.68	-0.583	-12.24	-29.56
Sm	3.99	-0.325	-6.825	-47.67
Se	1.66	0.048	1.000	64.95
Si	5.86	1.725	36.230	8.31
Ag	11.34	-0.023	-0.483	-40.09
Na	92.23	)77.655	)1630.8	2.18
Sr	5.36	0.072	1.518	0.59
S	0.84	0.134	2.806	1.19
Ta	3.11	-0.035	-0.737	-59.74
Tl	3.47	(-0.436	(-9.153	-74.44
Th	1.24	-0.194	-4.074	-41.16
Sn	1.22	-0.005	-0.112	-207.73
Ti	3.13	0.004	0.078	120.29
W	1.33	0.014	0.300	83.65
U	4.00	-1.196	-25.12	-72.38
V	3.58	(-0.022	(-0.461	-55.93
Zn	5.88	0.110	2.318	1.40
Zr	4.21	0.047	0.983	28.59

Dilution factor : 21.0000

Figure 14ICP Analysis March 12, 1990

Sample name : 1MHNO3
Sample code 1 : DIRECT
Programme : SBI 12-Mar-90 13:50:44

NAME	MV INT	CONCEN	RSD
Al	1.46	(-0.609	-7.88
Sb	0.36	(-0.470	-6.31
As	0.87	(-0.096	-12.79
Ba	2.56	(-0.032	-8.84
Be	0.58	(-0.004	-8.03
Bi	3.12	(-0.551	-1.90
B	3.38	(-0.035	-19.96
Cd	1.81	(-0.020	-7.34
Ca	0.51	-0.000	-57.28
Ce	3.57	(-1.363	-8.65
Cr	0.95	(-0.192	-1.08
Co	0.21	(-0.148	-11.35
Cu	2.09	(-0.072	-9.04
Eu	2.76	(-0.024	-8.40
Fe	1.24	(-0.031	-11.56
La	0.32	(-0.091	-6.59
Pb	0.25	-0.187	-17.92
Li	2.70	(-0.057	-9.29
Mg	0.38	-0.001	-17.92
Mn	0.63	(-0.006	-6.43
Hg	3.11	(-0.026	-16.05
Mo	1.43	(-0.038	-11.00
Nd	3.60	(-2.405	-6.67
Ni	2.75	(-0.060	-8.75
P	1.14	(-0.114	-20.71
K	2.36	(-2.035	-6.69
Sm	3.41	(-1.496	-9.05
Se	1.39	(-0.486	-7.05
Si	2.34	(-0.252	-9.19
Ag	9.62	(-0.094	-9.24
Na	3.47	(-0.629	-8.11
Sr	2.67	(-0.014	-8.96
S	0.65	(-0.067	-14.69
Ta	2.65	(-0.215	-7.99
Tl	2.82	(-1.775	-13.14
Th	1.08	(-0.843	-8.42
Sn	1.07	(-0.070	-0.92
Ti	2.61	(-0.043	-7.36
W	1.12	(-0.136	-10.33
U	3.37	(-8.284	-8.56
V	3.04	(-0.073	-11.84
Zn	2.17	(-0.011	-5.94
Zr	3.52	(-0.143	-8.37

Figure 15ICP Analysis March 12, 1990

Sample name : F118
Sample code 1 : SAM
Sample code 2 : 100-10
Sample code 3 : 089045
Programme : SST 12-Mar-90 13:55:27

NAME	MV INT	CONCEN	DILCOR	RSD
Al	3.98	4.888	493.71	1.59
Sb	0.36	(-0.513	(-51.80	-8.93
As	0.82	(-0.133	(-13.46	-8.79
Ba	4.21	0.063	6.400	3.87
Be	0.55	(-0.005	(-0.485	-6.68
Bi	6.27	2.323	234.64	2.86
B	5.42	0.098	9.853	41.01
Cd	3.28	0.069	6.995	4.14
Ca	4.08	0.140	14.158	0.58
Ce	3.25	(-1.932	(-195.1	-6.34
Cr	1.43	(-0.055	(-5.574	-9.84
Co	0.21	(-0.132	(-13.31	-7.07
Cu	2.58	0.017	1.693	30.95
Eu	2.50	(-0.034	(-3.481	-5.64
Fe	14.73	1.688	170.47	0.64
La	0.34	-0.027	-2.735	-44.91
Pb	0.25	-0.238	-24.05	-20.41
Li	3.75	0.053	5.379	8.96
Mg	3.71	0.134	13.541	1.01
Mn	2.70	0.122	12.279	1.46
Hg	3.31	-0.011	-1.144	-210.83
Mo	2.00	0.051	5.172	5.44
Nd	3.34	(-2.907	(-293.6	-4.07
Ni	3.41	0.015	1.545	37.21
P	10.37	5.077	512.80	2.84
K	2.21	(-2.695	(-272.2	-5.08
Sm	3.09	(-2.149	(-217.0	-5.17
Se	1.34	(-0.596	(-60.15	-6.57
Si	2.57	(-0.127	(-12.79	-15.66
Ag	8.98	(-0.121	(-12.17	-5.35
Na	25.80	19.062	1925.2	0.70
Sr	6.42	0.106	10.755	1.33
S	0.64	(-0.079	(-7.971	-6.96
Ta	2.44	(-0.297	(-30.01	-6.33
Tl	2.66	(-2.105	(-212.6	-11.68
Th	0.99	(-1.200	(-121.2	-5.44
Sn	1.22	-0.009	-0.867	-17.73
Ti	3.41	0.028	2.864	12.39
W	1.05	(-0.183	(-18.45	-5.20
U	3.07	(-11.63	(-1175	-5.60
V	2.84	(-0.091	(-9.218	-2.48
Zn	5.91	0.112	11.264	2.35
Zr	3.31	(-0.200	(-20.23	-5.16

Dilution factor : 101.000

Figure 16ICP Analysis March 12, 1990

Sample name : F118
Sample code 1 : SAM
Sample code 2 : 500-10
Sample code 3 : 089045
Programme : SST 12-Mar-90 13:59:44

NAME	MV INT	CONCEN	DILCOR	RSD
Al	13.28	25.201	529.23	1.31
Sb	0.41	0.119	2.493	63.50
As	0.95	(-0.040	(-0.841	-57.10
Ba	10.90	0.451	9.475	1.20
Be	0.61	(-0.003	(-0.058	-20.90
Bi	18.77	13.714	287.99	0.32
B	11.50	0.494	10.370	4.31
Cd	9.56	0.448	9.407	2.32
Ca	16.44	0.626	13.139	2.12
Ce	3.76	(-1.020	(-21.42	-25.20
Cr	3.44	0.526	11.044	1.26
Co	0.25	0.215	4.519	28.64
Cu	5.02	0.462	9.709	0.79
Eu	2.87	(-0.020	(-0.419	-22.63
Fe	63.63	7.919	166.29	0.54
La	0.49	0.411	8.634	2.64
Pb	0.29	0.451	9.462	15.45
Li	8.24	0.528	11.080	1.44
Mg	15.37	0.606	12.734	0.59
Mn	10.09	0.576	12.100	0.24
Hg	3.90	0.033	0.685	16.67
Mo	4.52	0.451	9.472	1.28
Nd	3.94	(-1.745	(-36.64	-18.85
Ni	7.02	0.429	9.003	3.14
P	44.29	24.172	507.61	0.90
K	2.52	(-1.285	(-26.98	-26.51
Sm	3.51	(-1.304	(-27.39	-22.16
Se	1.60	-0.077	-1.626	-105.69
Si	4.24	0.814	17.092	5.11
Ag	11.31	-0.024	-0.511	-69.94
Na	103.58	)87.663	)1840.9	2.11
Sr	20.07	0.546	11.468	1.71
S	0.81	0.097	2.035	15.61
Ta	2.76	(-0.171	(-3.585	-22.26
Tl	3.09	(-1.223	(-25.67	-22.26
Th	1.11	(-0.711	(-14.94	-23.59
Sn	2.17	0.395	8.291	7.09
Ti	7.16	0.361	7.573	0.84
W	1.21	(-0.072	(-1.508	-29.66
U	3.54	(-6.439	(-135.2	-23.62
V	3.33	(-0.045	(-0.947	-16.64
Zn	19.86	0.570	11.960	0.64
Zr	3.63	(-0.113	(-2.381	-24.15

Dilution factor : 21.0000

Figure 17ICP Analysis March 12, 1990

Sample name : 1MHNO3
Sample code 1 : DIRECT
Programme : SST 12-Mar-90 14:03:36

NAME	MV INT	CONCEN	RSD
Al	1.63	(-0.244	-20.86
Sb	0.38	-0.233	-24.74
As	0.94	(-0.048	-26.06
Ba	2.91	(-0.012	-21.67
Be	0.64	(-0.002	-5.00
Bi	3.51	(-0.194	-3.73
B	4.10	0.012	16.57
Cd	1.98	(-0.009	-10.60
Ca	0.52	0.000	26.02
Ce	4.06	(-0.480	-23.94
Cr	1.06	(-0.163	-2.53
Co	0.22	-0.059	-20.83
Cu	2.34	(-0.026	-21.04
Eu	3.15	(-0.009	-23.74
Fe	1.38	(-0.013	-23.55
La	0.34	-0.035	-13.09
Pb	0.26	-0.084	-81.04
Li	3.05	(-0.020	-21.42
Mg	0.41	0.000	48.50
Mn	0.69	-0.002	-27.52
Hg	3.88	0.031	4.77
Mo	1.58	(-0.015	-24.79
Nd	4.02	(-1.601	-7.56
Ni	3.09	(-0.021	-12.86
P	1.26	(-0.047	-28.49
K	2.62	(-0.854	-21.05
Sm	3.88	(-0.538	-24.36
Se	1.53	(-0.210	-28.43
Si	2.63	(-0.093	-19.02
Ag	11.00	(-0.037	-17.00
Na	3.94	(-0.220	-22.27
Sr	2.96	-0.005	-25.09
S	0.69	-0.029	-22.08
Ta	2.98	(-0.086	-21.10
Tl	3.35	(-0.678	-18.96
Th	1.21	(-0.317	-21.26
Sn	1.16	(-0.033	-25.17
Ti	2.90	(-0.016	-18.31
W	1.23	(-0.055	-29.64
U	3.84	(-3.022	-21.43
V	3.51	(-0.028	-36.20
Zn	2.37	(-0.005	-16.80
Zr	3.85	-0.053	-20.01

Figure 18ICP Analysis March 12, 1990

Sample name : FG00
Sample code 1 : SAM
Sample code 2 : 100-10
Programme : SST 12-Mar-90 14:09:12

NAME	MV INT	CONCEN	DILCOR	RSD
Al	5.02	7.164	723.58	0.93
Sb	0.38	-0.266	-26.86	-32.59
As	0.92	(-0.060	(-6.106	-47.15
Ba	2.81	(-0.018	(-1.805	-37.86
Be	0.62	(-0.002	(-0.224	-30.34
Bi	3.37	(-0.324	(-32.70	-34.25
B	3.87	-0.004	-0.357	-307.74
Cd	1.93	(-0.012	(-1.243	-27.44
Ca	0.86	0.014	1.382	1.04
Ce	3.91	(-0.752	(-75.98	-38.64
Cr	1.03	(-0.169	(-17.11	-5.31
Co	0.22	-0.081	-8.151	-35.12
Cu	2.26	(-0.041	(-4.152	-37.36
Eu	3.03	(-0.014	(-1.385	-35.19
Fe	1.62	0.017	1.725	36.46
La	0.34	-0.049	-4.963	-42.42
Pb	0.26	-0.064	-6.501	-86.60
Li	2.94	(-0.032	(-3.201	-37.05
Mg	0.83	0.017	1.752	1.29
Mn	0.69	(-0.002	(-0.236	-41.80
Hg	3.71	0.019	1.885	40.43
Mo	1.55	(-0.019	(-1.875	-35.98
Nd	3.89	(-1.848	(-186.7	-16.40
Ni	2.96	(-0.036	(-3.598	-43.14
P	1.25	(-0.057	(-5.723	-57.72
K	2.53	(-1.240	(-125.3	-29.99
Sm	3.74	(-0.839	(-84.71	-38.54
Se	1.51	(-0.252	(-25.46	-42.57
Si	2.70	-0.053	-5.402	-97.26
Ag	10.58	(-0.054	(-5.470	-35.61
Na	3.82	(-0.325	(-32.87	-43.23
Sr	2.88	(-0.007	(-0.755	-40.81
S	0.68	(-0.039	(-3.951	-49.41
Ta	2.89	(-0.123	(-12.39	-41.18
Tl	3.15	(-1.088	(-109.8	-35.76
Th	1.17	(-0.474	(-47.90	-38.82
Sn	1.13	(-0.044	(-4.418	-22.96
Ti	2.83	(-0.023	(-2.277	-37.44
W	1.21	(-0.069	(-6.971	-44.61
U	3.69	(-4.650	(-469.6	-36.96
V	3.34	(-0.044	(-4.436	-32.08
Zn	2.68	0.005	0.538	42.22
Zr	3.75	(-0.080	(-8.118	-37.49

Dilution factor : 101.000

Figure 19ICP Analysis March 12, 1990

Sample name : F600
Sample code 1 : SAM
Sample code 2 : 500-10
Programme : SST 12-Mar-90 14:13:20

NAME	MV INT	CONCEN	DILCOR	RSD
Al	19.04	37.794	793.67	0.66
Sb	0.36	(-0.480	(-10.07	-10.71
As	0.87	(-0.097	(-2.042	-11.24
Ba	2.46	(-0.038	(-0.801	-6.91
Be	0.57	(-0.004	(-0.083	-3.28
Bi	3.01	(-0.644	(-13.53	-5.74
B	3.48	(-0.029	(-0.604	-14.29
Cd	1.75	(-0.023	(-0.484	-3.71
Ca	1.20	0.027	0.571	1.06
Ce	3.42	(-1.638	(-34.39	-7.04
Cr	0.92	(-0.202	(-4.233	-1.82
Co	0.21	(-0.148	(-3.107	-3.15
Cu	2.02	(-0.085	(-1.789	-6.83
Eu	2.64	(-0.029	(-0.612	-6.82
Fe	2.54	0.134	2.821	1.86
La	0.31	(-0.113	(-2.380	-5.53
Pb	0.26	-0.129	-2.703	-25.98
Li	2.61	(-0.067	(-1.403	-7.44
Mg	0.60	0.008	0.165	3.02
Mn	0.72	-0.001	-0.013	-81.45
Hg	3.42	-0.004	-0.074	-129.03
Mo	1.46	(-0.034	(-0.707	-11.20
Nd	3.44	(-2.711	(-56.94	-4.69
Ni	2.65	(-0.072	(-1.503	-3.97
P	1.17	(-0.099	(-2.073	-15.57
K	2.28	(-2.376	(-49.90	-6.09
Sm	3.27	(-1.789	(-37.56	-7.20
Se	1.42	(-0.423	(-8.893	-8.82
Si	2.68	-0.060	-1.265	-34.77
Ag	9.20	(-0.111	(-2.335	-7.36
Na	3.43	(-0.667	(-14.02	-7.39
Sr	2.60	(-0.016	(-0.344	-7.40
S	0.64	(-0.077	(-1.614	-1.35
Ta	2.54	(-0.258	(-5.417	-9.70
Tl	2.74	(-1.934	(-40.61	-3.01
Th	1.04	(-1.005	(-21.11	-8.45
Sn	1.08	(-0.067	(-1.415	-16.09
Ti	2.60	(-0.043	(-0.900	-8.47
W	1.14	(-0.122	(-2.565	-10.29
U	3.23	(-9.859	(-207.0	-7.25
V	2.94	(-0.082	(-1.732	-3.07
Zn	2.67	0.005	0.109	14.77
Zr	3.42	(-0.169	(-3.557	-6.73

Dilution factor : 21.0000

Figure 20ICP Analysis March 12, 1990

Sample name : F601
Sample code 1 : SAM
Sample code 2 : 500-10
Programme : SST 12-Mar-90 14:18:34

NAME	MV INT	CONCEN	DILCOR	RSD
Al	15.82	30.750	645.75	1.84
Sb	0.35	(-0.627	(-13.16	-7.98
As	0.84	(-0.121	(-2.550	-17.39
Ba	2.37	(-0.044	(-0.918	-12.17
Be	0.56	(-0.005	(-0.096	-7.95
Bi	2.92	(-0.730	(-15.34	-13.86
B	3.39	(-0.035	(-0.726	-25.33
Cd	1.71	(-0.026	(-0.544	-10.69
Ca	1.33	0.032	0.674	2.06
Ce	3.28	(-1.880	(-39.49	-12.15
Cr	0.90	(-0.209	(-4.387	-2.99
Co	0.21	(-0.156	(-3.276	-11.95
Cu	1.94	(-0.099	(-2.072	-12.48
Eu	2.54	(-0.033	(-0.696	-12.32
Fe	3.96	0.315	6.619	3.55
La	0.31	(-0.139	(-2.927	-9.41
Pb	0.25	(-0.270	(-5.677	-22.96
Li	2.51	(-0.077	(-1.615	-11.93
Mg	0.58	0.007	0.150	5.12
Mn	0.69	(-0.002	(-0.050	-43.07
Hg	3.34	-0.009	-0.195	-86.40
Mo	1.41	(-0.041	(-0.870	-15.89
Nd	3.31	(-2.959	(-62.15	-6.60
Ni	2.60	(-0.077	(-1.627	-13.81
P	1.15	(-0.112	(-2.344	-21.25
K	2.20	(-2.713	(-56.97	-11.36
Sm	3.14	(-2.056	(-43.17	-12.11
Se	1.37	(-0.523	(-10.99	-13.26
Si	2.54	(-0.142	(-2.979	-30.13
Ag	8.82	(-0.127	(-2.665	-12.03
Na	3.30	(-0.783	(-16.44	-12.95
Sr	2.53	(-0.019	(-0.394	-12.67
S	0.62	(-0.094	(-1.970	-20.30
Ta	2.46	(-0.287	(-6.034	-10.95
Tl	2.73	(-1.950	(-40.96	-14.55
Th	1.00	(-1.147	(-24.08	-11.41
Sn	1.02	(-0.090	(-1.884	-12.24
Ti	2.51	(-0.051	(-1.073	-12.91
W	1.10	(-0.149	(-3.135	-16.04
U	3.10	(-11.33	(-237.9	-11.84
V	2.95	(-0.081	(-1.694	-17.71
Zn	2.28	(-0.008	(-0.164	-14.59
Zr	3.33	(-0.194	(-4.076	-12.37

Dilution factor : 21.0000

Figure 21ICP Analysis March 12, 1990

Sample name : F188
Sample code 1 : SAM
Sample code 2 : 100-10
Sample code 3 : 089049
Programme : SSI 12-Mar-90 14:23:10

NAME	MV INT	CONCEN	DILCOR	RSD
Al	5.06	7.256	732.85	0.34
Sb	0.37	(-0.328	(-33.09	-17.57
As	0.92	(-0.058	(-5.852	-19.10
Ba	2.82	(-0.017	(-1.729	-20.82
Be	0.62	(-0.002	(-0.226	-21.15
Bi	8.32	4.186	422.83	1.87
B	3.87	-0.003	-0.322	-110.06
Cd	1.93	(-0.013	(-1.282	-20.51
Ca	1.71	0.047	4.738	0.81
Ce	3.92	(-0.736	(-74.29	-20.59
Cr	1.23	(-0.113	(-11.38	-7.38
Co	0.22	-0.065	-6.521	-19.09
Cu	2.31	(-0.032	(-3.202	-25.00
Eu	3.02	(-0.014	(-1.430	-19.25
Fe	22.02	2.616	264.25	0.62
La	0.33	(-0.061	(-6.178	-22.54
Pb	0.26	-0.109	-11.05	-46.69
Li	2.94	(-0.032	(-3.254	-21.00
Mg	1.41	0.041	4.119	0.57
Mn	1.20	0.029	2.923	2.90
Hg	3.69	0.017	1.701	38.25
Mo	1.54	(-0.021	(-2.077	-21.13
Nd	3.86	(-1.913	(-193.2	-10.08
Ni	3.02	(-0.029	(-2.970	-21.96
P	11.32	5.612	566.81	0.98
K	2.54	(-1.233	(-124.5	-13.19
Sm	3.73	(-0.860	(-86.84	-20.10
Se	1.52	(-0.232	(-23.46	-22.66
Si	3.13	0.188	19.030	13.75
Ag	10.54	(-0.056	(-5.658	-19.24
Na	28.39	21.348	2156.1	0.68
Sr	3.89	0.025	2.520	5.14
S	0.69	-0.023	-2.307	-24.05
Ta	2.87	(-0.128	(-12.90	-23.30
Tl	3.24	(-0.898	(-90.74	-19.40
Th	1.16	(-0.497	(-50.21	-18.72
Sn	1.13	(-0.044	(-4.489	-17.58
Ti	2.83	(-0.022	(-2.253	-22.43
W	1.21	(-0.068	(-6.900	-13.36
U	3.70	(-4.616	(-466.2	-19.51
V	3.43	(-0.036	(-3.600	-11.59
Zn	3.05	0.018	1.780	9.90
Zr	3.74	(-0.082	(-8.322	-19.86

Dilution factor : 101.000

Figure 22ICP Analysis March 12, 1990

Sample name : F188
Sample code 1 : SAM
Sample code 2 : 500-10
Sample code 3 : 089049
Programme : SST 12-Mar-90 14:27:39

NAME	MV INT	CONCEN	DILCOR	RSD
Al	16.61	32.489	682.27	2.29
Sb	0.39	-0.066	-1.396	-119.31
As	1.00	0.000	0.000	8784300
Ba	3.08	-0.003	-0.054	-169.54
Be	0.66	-0.001	-0.017	-79.64
Bi	24.98	19.372	406.81	1.27
B	4.02	0.007	0.143	87.87
Cd	2.07	-0.004	-0.084	-63.15
Ca	4.92	0.173	3.636	2.91
Ce	4.22	-0.193	-4.053	-95.73
Cr	2.01	0.112	2.358	3.81
Co	0.22	-0.046	-0.960	-46.69
Cu	2.62	0.025	0.516	37.89
Eu	3.19	(-0.007	(-0.154	-43.19
Fe	90.40	11.331	237.95	1.98
La	0.34	-0.021	-0.442	-54.09
Pb	0.28	0.296	6.218	11.30
Li	3.08	(-0.017	(-0.363	-47.72
Mg	4.26	0.156	3.279	2.02
Mn	2.97	0.138	2.901	1.03
Hg	3.88	0.031	0.657	17.99
Mo	1.67	-0.000	-0.002	-5626.7
Nd	4.04	(-1.548	(-32.50	-14.09
Ni	3.24	-0.004	-0.077	-276.68
P	45.52	24.863	522.13	2.18
K	2.64	(-0.747	(-15.68	-40.28
Sm	3.92	(-0.454	(-9.543	-47.66
Se	1.66	0.047	0.987	143.56
Si	5.01	1.249	26.219	0.90
Ag	11.15	(-0.031	(-0.644	-41.15
Na	108.45	)91.955	)1931.1	2.61
Sr	7.34	0.136	2.861	1.55
S	0.80	0.084	1.766	17.15
Ta	3.06	-0.053	-1.122	-55.36
Tl	3.42	(-0.535	(-11.24	-34.86
Th	1.22	(-0.267	(-5.602	-41.56
Sn	1.23	-0.001	-0.027	-485.74
Ti	3.04	-0.004	-0.084	-142.04
W	1.38	0.050	1.056	54.38
U	3.96	-1.710	-35.91	-65.14
V	3.60	(-0.020	(-0.420	-39.56
Zn	5.69	0.104	2.190	0.75
Zr	3.88	-0.044	-0.918	-43.39

Dilution factor : 21.0000

Figure 23ICP Analysis March 12, 1990

Sample name : 1MHN03
Sample code 1 : DIRECT
Programme : SST 12-Mar-90 14:31:38

NAME	MV INT	CONCEN	RSD
Al	1.44	(-0.654	-14.42
Sb	0.36	(-0.494	-10.40
As	0.85	(-0.117	-13.27
Ba	2.51	(-0.036	-13.91
Be	0.58	(-0.004	-9.46
Bi	3.07	(-0.597	-14.92
B	3.47	(-0.030	-23.54
Cd	1.77	(-0.022	-11.47
Ca	0.51	-0.000	-118.88
Ce	3.50	(-1.492	-13.92
Cr	0.93	(-0.199	-4.53
Co	0.21	(-0.121	-7.70
Cu	2.05	(-0.080	-13.69
Eu	2.70	(-0.027	-14.08
Fe	1.21	(-0.035	-15.86
La	0.32	(-0.099	-14.95
Pb	0.25	(-0.270	-10.91
Li	2.66	(-0.062	-14.31
Mg	0.38	(-0.001	-21.82
Mn	0.62	(-0.006	-10.49
Hg	3.43	-0.002	-266.04
Mo	1.42	(-0.040	-13.87
Nd	3.48	(-2.633	-12.17
Ni	2.70	(-0.066	-12.84
P	1.14	(-0.117	-13.94
K	2.31	(-2.220	-11.56
Sm	3.34	(-1.642	-13.84
Se	1.37	(-0.524	-11.97
Si	2.30	(-0.279	-13.09
Ag	9.39	(-0.103	-13.08
Na	3.40	(-0.697	-15.15
Sr	2.63	(-0.016	-14.21
S	0.63	(-0.090	-5.92
Ta	2.60	(-0.232	-13.16
Tl	2.81	(-1.787	-16.24
Th	1.06	(-0.923	-13.97
Sn	1.03	(-0.089	-15.78
Ti	2.56	(-0.046	-13.43
W	1.08	(-0.161	-12.63
U	3.30	(-9.049	-13.83
V	3.01	(-0.075	-8.17
Zn	2.13	(-0.013	-10.55
Zr	3.47	(-0.156	-13.92

Figure 24ICP Analysis March 12, 1990

Sample name : F189
Sample code 1 : SAM
Sample code 2 : 100-10
Sample code 3 : 089049
Programme : SST 12-Mar-90 14:35:30

NAME	MV INT	CONCEN	DILCOR	RSD
Al	4.24	5.461	551.58	1.30
Sb	0.35	(-0.627	(-63.31	-2.62
As	0.81	(-0.145	(-14.63	-2.63
Ba	2.36	(-0.044	(-4.433	-1.21
Be	0.55	(-0.005	(-0.490	-3.01
Bi	7.22	3.191	322.25	0.90
B	3.29	(-0.041	(-4.154	-4.70
Cd	1.69	(-0.027	(-2.734	-2.51
Ca	2.19	0.066	6.664	0.70
Ce	3.27	(-1.904	(-192.3	-0.89
Cr	1.09	(-0.154	(-15.57	-2.02
Co	0.21	(-0.156	(-15.76	-5.97
Cu	2.36	(-0.023	(-2.349	-4.59
Eu	2.50	(-0.034	(-3.469	-1.43
Fe	17.75	2.073	209.38	0.72
La	0.31	(-0.137	(-13.88	-1.26
Pb	0.25	(-0.341	(-34.46	-11.32
Li	2.49	(-0.080	(-8.043	-1.82
Mg	1.31	0.037	3.710	0.96
Mn	1.60	0.054	5.413	0.78
Hg	3.33	-0.010	-1.031	-34.59
Mo	1.35	(-0.050	(-5.081	-4.04
Nd	3.28	(-3.015	(-304.6	-3.49
Ni	2.57	(-0.081	(-8.139	-1.94
P	11.33	5.620	567.63	0.93
K	2.18	(-2.808	(-283.6	-1.04
Sm	3.11	(-2.121	(-214.2	-1.06
Se	1.31	(-0.645	(-65.16	-3.93
Si	2.77	-0.010	-1.005	-59.64
Ag	8.71	(-0.131	(-13.28	-1.60
Na	27.77	20.804	2101.2	0.68
Sr	3.38	0.009	0.864	4.36
S	0.62	(-0.097	(-9.789	-2.23
Ta	2.43	(-0.298	(-30.12	-1.91
Tl	2.55	(-2.329	(-235.3	-3.59
Th	0.99	(-1.186	(-119.8	-1.10
Sn	1.00	(-0.102	(-10.26	-5.73
Ti	2.44	(-0.057	(-5.756	-1.33
W	1.06	(-0.173	(-17.51	-8.80
U	3.09	(-11.50	(-1161	-1.18
V	2.86	(-0.090	(-9.059	-2.38
Zn	2.75	0.008	0.768	7.07
Zr	3.30	(-0.202	(-20.45	-1.26

Dilution factor : 101.000

Figure 25ICP Analysis March 12, 1990

Sample name : F189
Sample code 1 : SAM
Sample code 2 : 500-10
Sample code 3 : 089049
Programme : SST 12-Mar-90 14:39:48

NAME	MV INT	CONCEN	DILCOR	RSD
Al	14.61	28.115	590.42	1.67
Sb	0.36	(-0.465	(-9.773	-20.07
As	0.87	(-0.095	(-2.005	-24.71
Ba	2.67	(-0.026	(-0.545	-25.57
Be	0.60	(-0.003	(-0.064	-21.52
Bi	23.24	17.789	373.58	0.50
B	3.59	(-0.022	(-0.453	-34.56
Cd	1.82	(-0.019	(-0.403	-15.60
Ca	7.42	0.271	5.696	2.49
Ce	3.62	(-1.271	(-26.70	-22.81
Cr	1.88	0.076	1.591	17.61
Co	0.21	(-0.126	(-2.655	-12.77
Cu	4.05	0.284	5.971	2.24
Eu	2.73	(-0.025	(-0.532	-19.64
Fe	78.18	9.773	205.24	0.64
La	0.32	(-0.105	(-2.211	-17.22
Pb	0.26	-0.097	-2.028	-50.33
Li	2.68	(-0.060	(-1.251	-20.75
Mg	4.00	0.146	3.062	0.57
Mn	5.30	0.281	5.908	0.50
Hg	3.59	0.010	0.200	94.18
Mo	1.48	(-0.030	(-0.627	-24.75
Nd	3.56	(-2.475	(-51.98	-9.93
Ni	2.96	(-0.037	(-0.769	-35.06
P	49.70	27.220	571.62	0.31
K	2.33	(-2.142	(-44.98	-20.15
Sm	3.38	(-1.575	(-33.07	-20.37
Se	1.47	(-0.321	(-6.739	-18.83
Si	4.90	1.188	24.947	3.75
Ag	9.55	(-0.097	(-2.036	-19.02
Na	114.60	)97.385	)2045.1	2.57
Sr	6.65	0.114	2.396	0.35
S	0.73	0.017	0.363	143.16
Ta	2.67	(-0.207	(-4.351	-23.15
Tl	2.99	(-1.420	(-29.82	-10.18
Th	1.07	(-0.884	(-18.56	-19.47
Sn	1.12	(-0.051	(-1.072	-32.67
Ti	2.73	(-0.032	(-0.671	-27.09
W	1.24	(-0.050	(-1.046	-44.68
U	3.42	(-7.770	(-163.2	-22.26
V	3.25	(-0.053	(-1.118	-20.06
Zn	5.50	0.098	2.056	1.25
Zr	3.50	(-0.149	(-3.126	-19.49

Dilution factor : 21.0000

Figure 26ICP Analysis March 12, 1990

Sample name : 1MHNO3
Sample code 1 : DIRECT
Programme : 8ST 12-Mar-90 14:43:37

NAME	MV INT	CONCEN	RSD
Al	1.58	(-0.347	-14.21
Sb	0.37	(-0.313	-6.94
As	0.92	(-0.064	-10.91
Ba	2.81	(-0.018	-13.45
Be	0.62	(-0.002	-14.01
Bi	3.40	(-0.294	-9.80
B	3.85	-0.005	-81.17
Cd	1.92	(-0.013	-11.99
Ca	0.52	0.000	43.27
Ce	3.93	(-0.719	-14.70
Cr	1.02	(-0.174	-2.31
Co	0.22	-0.075	-22.30
Cu	2.27	(-0.039	-13.51
Eu	3.05	(-0.013	-13.02
Fe	1.34	(-0.018	-11.27
La	0.33	(-0.055	-23.78
Pb	0.26	-0.161	-18.33
Li	2.96	(-0.030	-15.87
Mg	0.40	-0.000	-150.31
Mn	0.67	(-0.004	-10.43
Hg	3.81	0.026	5.46
Mo	1.54	(-0.021	-14.05
Nd	3.88	(-1.858	-4.17
Ni	3.00	(-0.031	-11.55
P	1.23	(-0.067	-16.31
K	2.55	(-1.170	-13.22
Sm	3.76	(-0.788	-14.29
Se	1.50	(-0.278	-12.64
Si	2.54	(-0.142	-12.44
Ag	10.63	(-0.052	-14.32
Na	3.81	(-0.332	-12.71
Sr	2.88	(-0.007	-13.70
S	0.68	-0.036	-15.89
Ta	2.90	(-0.119	-11.59
Tl	3.24	(-0.914	-15.76
Th	1.17	(-0.454	-13.51
Sn	1.13	(-0.047	-11.79
Ti	2.82	(-0.023	-12.16
W	1.19	(-0.084	-1.94
U	3.71	(-4.477	-13.25
V	3.45	(-0.034	-24.03
Zn	2.30	(-0.007	-7.62
Zr	3.76	(-0.077	-11.61

Figure 27ICP Analysis March 12, 1990

Sample name : 1MHNO3
Sample code 1 : DIRECT
Programme : SST 12-Mar-90 14:43:37

NAME	MV INT	CONCEN	RSD
Al	1.58	(-0.347	-14.21
Sb	0.37	(-0.313	-6.94
As	0.92	(-0.064	-10.91
Ba	2.81	(-0.018	-13.45
Be	0.62	(-0.002	-14.01
Bi	3.40	(-0.294	-9.80
B	3.85	-0.005	-81.17
Cd	1.92	(-0.013	-11.99
Ca	0.52	0.000	43.27
Ce	3.93	(-0.719	-14.70
Cr	1.02	(-0.174	-2.31
Co	0.22	-0.075	-22.30
Cu	2.27	(-0.039	-13.51
Eu	3.05	(-0.013	-13.02
Fe	1.34	(-0.018	-11.27
La	0.33	(-0.055	-23.78
Pb	0.26	-0.161	-18.33
Li	2.96	(-0.030	-15.87
Mg	0.40	-0.000	-150.31
Mn	0.67	(-0.004	-10.43
Hg	3.81	0.026	5.46
Mo	1.54	(-0.021	-14.05
Nd	3.88	(-1.858	-4.17
Ni	3.00	(-0.031	-11.55
P	1.23	(-0.067	-16.31
K	2.55	(-1.170	-13.22
Sm	3.76	(-0.788	-14.29
Se	1.50	(-0.278	-12.64
Si	2.54	(-0.142	-12.44
Ag	10.63	(-0.052	-14.32
Na	3.81	(-0.332	-12.71
Sr	2.88	(-0.007	-13.70
S	0.68	-0.036	-15.89
Ta	2.90	(-0.119	-11.59
Tl	3.24	(-0.914	-15.76
Th	1.17	(-0.454	-13.51
Sn	1.13	(-0.047	-11.79
Ti	2.82	(-0.023	-12.16
W	1.19	(-0.084	-1.94
U	3.71	(-4.477	-13.25
V	3.45	(-0.034	-24.03
Zn	2.30	(-0.007	-7.62
Zr	3.76	(-0.077	-11.61

Figure 27ICP Analysis March 12, 1990

Sample name : 78C11C
Sample code 1 : SST1
Sample code 2 : DIRECT
Programme : SST

16:00

12-Mar-90 ~~14:47:43~~

NAME	MV INT	CONCEN	RSD
Al	1.76	0.046	139.56
Sb	1.11	10.129	1.63
As	1.11	0.083	6.42
Ba	164.17	9.337	2.69
Be	0.68	-0.000	-346.41
Bi	3.70	-0.015	-483.10
B	146.85	9.306	2.70
Cd	165.44	9.854	1.21
Ca	244.10	9.568	2.68
Ce	9.78	9.780	0.44
Cr	35.27	9.742	2.00
Co	1.17	7.626	4.35
Cu	56.59	9.857	2.47
Eu	3.96	0.023	7.83
Fe	78.13	9.766	1.80
La	0.37	0.060	14.43
Pb	0.27	0.122	27.35
Li	102.30	10.453	2.73
Mg	242.31	9.804	1.72
Mn	159.84	9.798	1.94
Hg	3.77	0.023	31.33
Mo	1.74	0.011	39.70
Nd	9.29	8.568	2.70
Ni	90.33	9.959	1.43
P	1.45	0.057	18.18
K	8.46	25.260	1.29
Sm	4.00	-0.289	-66.99
Se	3.52	3.730	0.98
Si	2.78	-0.008	-347.93
Ag	11.50	-0.016	-66.14
Na	32.99	25.407	1.98
Sr	296.21	9.436	2.61
S	0.95	0.246	2.72
Ta	3.15	-0.019	-150.23
Tl	3.68	-0.006	-3906.7
Th	1.31	0.098	103.72
Sn	125.57	52.459	1.12
Ti	3.00	-0.007	-62.07
W	1.55	0.169	14.24
U	4.33	2.501	36.13
V	3.62	(-0.018	-58.25
Zn	301.23	9.806	1.54
Zr	3.99	-0.014	-114.13

Figure 28ICP Analysis March 12, 1990

Sample name : B1B38C
Sample code 1 : SST2
Sample code 2 : DIRECT
Programme : SST 12-Mar-90 14:52:12

NAME	MV INT	CONCEN	RSD
Al	3.43	3.691	1.73
Sb	0.40	0.043	183.59
As	2.74	1.317	2.72
Ba	2.86	(-0.015	-26.08
Be	0.61	(-0.003	-9.04
Bi	62.12	53.211	0.44
B	4.44	0.034	24.42
Cd	1.91	(-0.014	-15.03
Ca	1.26	0.029	2.55
Ce	3.87	(-0.817	-24.22
Cr	1.31	(-0.090	-5.86
Co	0.22	-0.073	-50.10
Cu	3.46	0.178	5.50
Eu	300.04	11.633	1.33
Fe	1.69	0.026	13.22
La	18.49	)54.571	1.03
Pb	2.87	50.251	1.24
Li	2.70	(-0.057	-13.49
Mg	0.63	0.009	2.73
Mn	0.81	0.005	2.84
Hg	3.79	0.025	29.59
Mo	1.53	(-0.022	-30.50
Nd	4.07	(-1.500	-13.46
Ni	2.96	(-0.037	-27.78
P	1.48	0.075	21.93
K	2.34	(-2.118	-11.26
Sm	9.26	10.447	0.23
Se	1.54	(-0.189	-45.12
Si	3.39	0.337	7.66
Ag	249.98	9.823	5.98
Na	3.56	(-0.555	-16.43
Sr	2.91	(-0.007	-26.54
S	0.77	0.060	20.10
Ta	3.08	-0.046	-74.08
Tl	5.88	4.524	2.49
Th	14.25	52.414	0.89
Sn	1.29	0.022	58.65
Ti	3.16	0.007	84.41
W	1.13	(-0.126	-24.82
U	8.54	49.818	0.18
V	5.67	0.175	2.11
Zn	2.51	-0.000	-314.77
Zr	3.95	-0.023	-88.48

Figure 29ICP Analysis March 12, 1990

Sample name : 77C11C
Sample code 1 : SST3
Sample code 2 : DIRECT
Programme : SST 12-Mar-90 14:56:16

14.56

NAME	MV INT	CONCEN	RSD
Al	26.11	)53.231	1.20
Sb	0.44	0.584	18.31
As	69.75	51.952	1.17
Ba	2.67	(-0.026	-9.14
Be	292.02	10.522	0.36
Bi	3.85	0.118	40.39
B	4.15	0.015	26.36
Cd	1.93	(-0.012	-14.57
Ca	0.81	0.012	1.84
Ce	3.30	(-1.846	-5.58
Cr	1.07	(-0.160	-4.14
Co	0.23	-0.016	-57.73
Cu	2.26	(-0.041	-15.07
Eu	2.57	(-0.032	-6.17
Fe	1.57	0.012	8.82
La	0.31	(-0.128	-7.16
Pb	0.26	-0.148	0.00
Li	2.52	(-0.076	-7.00
Mg	0.47	0.003	3.63
Mn	0.88	0.009	5.08
Hg	335.55	24.856	1.13
Mo	323.15	50.861	1.20
Nd	3.40	(-2.790	-3.25
Ni	6.65	0.386	2.68
P	90.09	49.952	1.09
K	2.19	(-2.774	-5.69
Sm	3.19	(-1.949	-5.99
Se	27.65	51.643	1.18
Si	77.51	42.068	1.77
Ag	34.57	0.936	22.99
Na	3.51	(-0.595	-6.87
Sr	2.62	(-0.016	-6.88
S	50.32	51.509	1.88
Ta	123.44	46.682	1.35
Tl	29.09	52.249	0.19
Th	1.20	(-0.368	-20.39
Sn	1.52	0.120	5.59
Ti	578.70	50.962	1.36
W	31.51	21.196	2.87
U	4.41	3.349	31.44
V	115.89	10.549	1.00
Zn	3.17	0.022	5.73
Zr	188.94	50.839	1.45

Figure 30ICP Analysis March 12, 1990

APPENDIX A
ANALYTICAL ANALYSIS CARDS

9 1 1 2 3 5 7 1 2 3 4

Physical Analysis Sample 89-045

Serial No.	Sample Point	Date	Time Issued	Priority
F 101.-5000	~~SEGMENT-2~~	11-15-89	10:55	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
APPR/OTR	LI-000-200	NONE	WB75L	0

Sample Size	Customer ID
? 104C N 3133	89 045

Remarks, Calculations, Results:
Rerun temperature = 160 (Raw)
10 Adjusted
A. JAR ID# 051
B. JAR TARE WT. 22.1.45
C. JAR TOTAL WT. 36640
D. C-B= 134.9
E. EST. VOL./LENGTH ~ 5 inches of solids
F. VISUAL REMARKS Cables loose again. Contamination on inside on crackout on outside of Valve body. SAMPLE: Dark Brown grading to Medium Brown in color. Consistency lacking throughout. moist and sticky at bottom grading up to crumbly at Top.

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
RLW KJP DTS	6A297 6B300 1628/0			
Hrs 11-16-89	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr

54-8800-061 (R-10-82)

Serial No.	Sample Point	Date	Time Issued	Priority
F 101.-5001	~~SEGMENT-2~~	11-15-89	10:55	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
VOA SAMP	LI-000-200	NONE	WB75L	0

Sample Size	Customer ID
? 2.59g	89-045

Remarks, Calculations, Results: Bottle 36
DUPLICATE SAMPLE
Total wt. 25.08g
TARE wt. 22.49g
sampled. 2.59g
Sent to DNL
104C N 313 3

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
RLW KJP DTS				
Hrs 11-16-89	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr

54-8800-061 (R-10-82)

Serial No	Sample Point	Date	Time Issued	Priority
F 101.-5003	~~SEGMENT-2~~	11-15-89	10:55	16

Determination	Method/Standard	Result Units	Charge Code	Reruns
HOMOG7T	LI-000-200	NONE	WB75L	0

Sample Size	Customer ID
?	89-045

Remarks, Calculations, Results.
Homogenization Jar# 135
Complete 12-29-89
104C N 313 4 of 13

Analyst - 1	Analyst - 2	Analyst 3	Analyst - 4	Analyst - 5
RLW KJP FHS	6A297 6B300 1628/0			
Hrs 12-29-89	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr

54-8800-061 (R-10-82)

1

9 1 1 2 9 6 9 1 2 5

pH Analysis of Solid Sample

Serial No.	Sample Point	Date	Time Issued	Priority
F 100.-5515	SEGMENT-1	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
pH	LA-212-103	% RECOVERY	WB75L	0

Sample Size: ?
Customer ID: 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
pH FOUND 10.10
STD ID 72C11-A
SAMPLE TEMP 23.6
10.10/10.00 101.0%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC269				
Hrs	Hrs	Hrs	Hrs	Hrs
1-2-90	Time Completed	Lab Unit Mgr		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 102.-5115	SEGMENT-3	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
pH	LA-212-103	NONE	WB75L	0

Sample Size: ? 2.581g/2.581 ml
Customer ID: 089045

Remarks, Calculations, Results:
pH 12.22
SAMPLE TEMP 23.7

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC269				
Hrs	Hrs	Hrs	Hrs	Hrs
1-2-90	Time Completed	Lab Unit Mgr		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 101.-5015	SEGMENT-2	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
pH	LA-212-103	NONE	WB75L	0

Sample Size: ? 2.5000g/2.5000 ml
Customer ID: 089045

Remarks, Calculations, Results:
pH 11.96 #216
SAMPLE TEMP 23.7
8.13 grams
WHC. N 3134

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC269				
Hrs	Hrs	Hrs	Hrs	Hrs
1-2-90	Time Completed	Lab Unit Mgr		

54-6600-061 (R-10-83)

F944

Serial No.	Sample Point	Date	Time Issued	Priority
F 292.-5515	SEGMENT-E	11-21-89	8:30	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
pH	LA-212-103	% RECOVERY	WB75L	0

Sample Size: ?
Customer ID: 089050

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
pH FOUND 10.09
STD ID 72C11-A
SAMPLE TEMP 23.8
10.09/10.0 100.9%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC269				
Hrs	Hrs	Hrs	Hrs	Hrs
1-2-90	Time Completed	Lab Unit Mgr		

54-6600-061 (R-10-83)

9 1 1 2 0 6 0 1 2 7 6

pH Analysis of Solid Sample

Serial No.	Sample Point	Date	Time Issued	Priority
F 121.-5315	SEGMENT-22	11-15-89	10:58	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
pH	LA-212-103	NONE	WB75L	0

Sample Size	Customer ID
?	089045

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
pH FOUND _____
STD ~~NO~~
SAMPLE TEMP _____

Reagent Blank = 6.83

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 1-2-90	Time Completed	Lab Unit Mgr		

34-6600-061 (R-10-83)

3

9 1 1 2 2 5 0 1 2 7 7

Percent Water Analysis

Really F940 Seg Comp #8

Serial No	Sample Point	Date	Time Issued	Priority
F 309.-5310	SEGMENT-V	11-21-89	8:32	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H2O	LA-564-101	X	WB75L	0

Sample Size: ?

Customer ID: 089050

Remarks, Calculations, Results:

REAGENT BLANK

① 22.0121 G ② 21.4901

22.0121 T. 21.4901

22.0054 W1 21.4836

22.0051 W2 21.4836

~~.67~~ ~~.65%~~ 6.5 -3

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-3-90		[signature]

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

Serial No	Sample Point	Date	Time Issued	Priority
F 101.-5010	SEGMENT-2	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H2O	LA-564-101	%	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:

#225 5.86 grams

G. 22.7747

T. 21.7273

W1 22.3713

W2 22.3715

~~3.85%~~ 38.5%

WHC N 3134

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-3-90		[signature]

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 100.-5510	SEGMENT-1	11-15-89	10:54	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H2O	LA-564-101	% RECOVERY	WB75L	0

Sample Size: ? 1mL

Customer ID: 089045

Remarks, Calculations, Results:

LMCS CHECK SAMPLE

LMCS ID 11C11AG

57.59%

96.63% recov

① 23.1834 G. ② 23.2273

21.8182 T. 21.8485

57.6% 22.3970 W1 22.4333

22.3860 W2 22.4227

57.6% / 59.61

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-3-90	20:03	[signature]

1-5-90

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

Really F939 Seg Comp

Serial No.	Sample Point	Date	Time Issued	Priority
F 292.-5510	SEGMENT-E	11-21-89	8:29	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H2O	LA-564-101	% RECOVERY	WB75L	0

Sample Size: ? 1mL

Customer ID: 089050

Remarks, Calculations, Results:

LMCS CHECK SAMPLE

LMCS ID 11C11AG

57.2%

96.80% recov

58.2% ① 22.9125 G. ② 23.2933

21.5294 T. 21.9143

22.1071 W1 22.5044

22.1011 W2 22.4941

57.7% / 59.61

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-3-90	19:59	[signature]

1-5-90

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

9 1 1 2 0 6 0 1 2 7 8

Percent Water Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 102.-5110	SEGMENT-3	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H2O	LA-564-101	%	WB75L	0

Sample Size	Customer ID
?	089045

Remarks, Calculations, Results:
DUPLICATE SAMPLE

G 22.8091
T. 21.6142
W1 22.3629
W2 22.3623

37.38

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6359 8/21				R E Arnold
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-3-90		[signature]

84-9800-061 (R-10-93)

Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 106.-6000	SEGMENT-7	11-15-89	10:55	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
FUSION	LA-549-141	G/L	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:
GRAMS SAMPLE .5995
VOLUME ON COMPLETION 250 mL
2.40^{-3} g/ml
2.40 g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 B598				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-3-90		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 168.-6300	SEGMENT-U	11-17-89	10:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
FUSION	LA-549-141	G/L	WB75L	0

Sample Size: ? 250 mL

Customer ID: 089048

Remarks, Calculations, Results:
REAGENT BLANK

Complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-3-90		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 107.-6100	SEGMENT-8	11-15-89	10:55	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
FUSION	LA-549-141	G/L	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE ANALYSIS #2:
GRAMS SAMPLE .5731
VOLUME ON COMPLETION 250 mL
2.29^{-3} g/ml
2.29 g/l

WHC N 212 T

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-3-90		

54-6600-061 (R-10-83)

9 1 1 2 ? 5 ? 1 2 ? 0

Total Alpha Analysis on the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 107.-6120	SEGMENT-8	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	uCI/L	WB75L	0

Sample Size	Customer ID
? 100-10-100	0890[illegible]

Remarks, Calculations, Results:
DUPLICATE SAMPLE

<2.00 -0 uci/l

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	gm 8

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 105.-6520	SEGMENT-6	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-~~548~~ 508-101	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 10ml	83B44 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID_____

111.9%

1.119-2 / ~~1.119-2~~ 1.001-2

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	gm 8

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 106.-6020	SEGMENT-7	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	uCI/L	WB75L	0

Sample Size	Customer ID
? 100-10-100	089045

Remarks, Calculations, Results:

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90			

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 296.-6220	SEGMENT-I	11-21-89	8:30	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-~~548~~ 508-101	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 100λ	089050

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 83B44
SPIKE VOLUME 10ml

~~97.1%~~ 98.0% cmb 9.71-3 / 1.0001-2

~~9.901-1 - 1.935-2 = 9.708-1/100~~

See back of card [illegible] over →

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	gm 8

54-6600-061 (R-10-83)

18/2

$$\frac{[(9.901^{-1})(.0001)-(1.935^{-2})(.0001)](108)}{(.010)(1.001^{-2})} = 97.0\%$$

482/10 - .3

445/10

Alpha Calculation by AJ on 01-05-1990 at 18:21:53
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : .1 mL Dilution : 1

Mount # 1

482 / 10 - 0.3 = 1.0299E+00 uCi/L alpha

Mount # 2

445 / 10 - 0.3 = 9.5035E-01 uCi/L alpha

18/2

17/10 - 3

09/10

Alpha Calculation by AJ on 01-05-1990 at 18:17:07
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : .1 mL Dilution : 101

Mount # 1

17 / 10 - 0.3 = 3.0403E+00 uCi/L alpha

Mount # 2

9 / 10 - 0.3 = 1.3030E+00 uCi/L alpha

F 106.-6020

F 296.-6220 AT

18 2" 1-6-90 VR

500/10 - .3

547/10

Alpha Calculation by VR on 01-06-1990 at 00:41:44
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : 10 mL Dilution : 1

Mount # 1

500 / 10 - 0.3 = 1.0686E-02 uCi/L alpha

Mount # 2

547 / 10 - 0.3 = 1.1697E-02 uCi/L alpha

F 105.-6520

18 2" 1-6-90 VR

7/10 - .3

2/10 -

Alpha Calculation by VR on 01-06-1990 at 00:47:16
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : 1 mL Dilution : 1010

Mount # 1

7 / 10 - 0.3 < 2.0017E+00 uCi/L alpha

Mount # 2

7 / 10 - 0.3 < 2.0017E+00 uCi/L alpha

F 107.-6120

9 1 1 2 3 5 9 1 2 4 1

9 1 1 2 0 6 7 1 2 5 2

Total Alpha Analysis on the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 308.-6320	SEGMENT-U	11-21-89	8:32	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	uCI/L	WB75L	0

Sample Size	Customer ID
? 10ml	089050

Remarks, Calculations, Results:

REAGENT BLANK

<.100 -4 uCi/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	[signature]

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 297.-6520	SEGMENT-J	11-21-89	8:30	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 10ml	089050

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID_____

100.3%

1.003 -2 / 1.0001 -2

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	[signature]

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

Total Alpha Analysis on the Fusion Dissolution

8 2" 1-6-90 VR

$\frac{473}{10} - .3$

$\frac{466}{10} -$

Alpha Calculation by VR on 01-06-1990 at 00:46:14
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : 10 mL Dilution : 1

Mount # 1

$\frac{473}{10} - 0.3 = 1.0106E-02$ uCi/L alpha

Mount # 2

$\frac{466}{10} - 0.3 = 9.9551E-03$ uCi/L alpha

297.-6520 AT

18 2" 1-6-90 VR

$\frac{4}{10} - .4$

$\frac{1}{10} -$

Alpha Calculation by VR on 01-06-1990 at 02:38:47
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : 1 ea Dilution : 1

Mount # 1

$\frac{4}{10} - 0.4 < 1.0034E-06$ uCi/ea alpha

/100

Mount # 2

$\frac{1}{10} - 0.4 < 1.0020E-06$ uCi/ea alpha

/100

F 308.-6320 AT

9 1 1 2 ? 5 ? 1 2 ? 4

Total Alpha Analysis on the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 108.-6220	SEGMENT-I	11-15-89	10:56	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	% RECOVERY	F215C	0

Sample Size: ? 100-10-200

Customer ID:

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 102B44
SPIKE VOLUME 10 ml

To Low

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-25-90		[signature]	DMS

54-5600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 109.-6520	SEGMENT-J	11-15-89	10:56	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	% RECOVERY	F215C	0

Sample Size: ? 10 ml

Customer ID:

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 102B44

108.8%

1.09-2 / 1.0022-2

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-25-90		[signature]	DMS

54-5600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 105.-6520	SEGMENT-6	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	% RECOVERY	WB75L	1

Sample Size: ? 10 ml

Customer ID:

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 102B44

113.7%

1.14-2 / 1.0022-2

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-25-90		[signature]	DMS

54-5600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 106.-6020	SEGMENT-7	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	uCI/L	WB75L	0

Sample Size: ? 100-10-200

Customer ID: 089045

Remarks, Calculations, Results:

RERUN

<1.24 ucil

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-25-90		[signature]	DMS

54-5600-061 (R-10-83)

18 2" 1-25-90 VR

10/10 - .5

10/10 -

Alpha Calculation by VR on 01-25-1990 at 18:40:25
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : 1 mL Dilution : 505

Mount # 1

10/10 - 0.5 < 1.2368E+00 uCi/L alpha

Mount # 2

10/10 - 0.5 < 1.2368E+00 uCi/L alpha

F 106.-6020

18 2" 1-25-90 VR

540/10 - .5

527/10 -

Alpha Calculation by VR on 01-25-1990 at 19:14:10
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : 10 mL Dilution : 1

Mount # 1

540/10 - 0.5 = 1.1503E-02 uCi/L alpha

Mount # 2

527/10 - 0.5 = 1.1224E-02 uCi/L alpha

F 105.6520

18 2" 1-25-90 VR

538/10 - .5

489/10 -

Alpha Calculation by VR on 01-25-1990 at 18:43:00
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : 10 mL Dilution : 1

Mount # 1

538/10 - 0.5 = 1.1460E-02 uCi/L alpha

Mount # 2

489/10 - 0.5 = 1.0407E-02 uCi/L alpha

F 109.-6520

18 2" 1-25-90 VR

506/10 - .5

551/10

Alpha Calculation by VR on 01-25-1990 at 18:41:18
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : 1 mL Dilution : 505

Mount # 1

506/10 - 0.5 = 5.4399E+01 uCi/L alpha

Mount # 2

551/10 - 0.5 = 5.9285E+01 uCi/L alpha

F 108.-6220

9 1 1 2 0 6 0 1 2 4 5

Total Alpha Analysis on the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 120.-6320	SEGMFNT-11	11-15-89	10:58	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCI/L	F215C	0

Sample Size	Customer ID
? 10 ml	

Remarks, Calculations, Results:

REAGENT BLANK

<1.786-4 uCi/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC269				
Mary Francis	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-25-90			DMS

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

18 2" 1-25-90 VR

$\frac{10}{10} = .5$

$\frac{5}{10} =$

Alpha Calculation by VR on 01-25-1990 at 18:42:15
Det #18 2 -inch mount Alpha eff. : .2095
Sample size : 10 mL Dilution : 1

Mount # 1

$$\frac{10}{10} = 0.5 \times 2.4491E\text{-}04 \text{ uCi/L alpha}$$

Mount # 2

$$\frac{5}{10} = 0.5 \times 1.1219E\text{-}04 \text{ uCi/L alpha}$$

F 120.-6320

9 1 1 2 0 5 1 1 2 5 7

9 1 1 2 0 6 0 1 2 5 3

Total Beta Analysis on the Fusion Dissolution

7-8 F948 Seg Comp 8

Serial No.	Sample Point	Date	Time Issued	Priority
F 308.-6325	SEGMENT-U	11-21-89	8:32	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-~~548~~ 508-101	uCI/L	WB75L	0

Sample Size: ? 10ml

Customer ID: 089050

Remarks, Calculations, Results:
REAGENT BLANK

<2.58-4 well

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	gm's

54-6600-061 (R-10-83)

9 & 10

Serial No.	Sample Point	Date	Time Issued	Priority
F 105.-6525	SEGMENT-6	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-~~548~~ 508-101	% RECOVERY	WB75L	0

Sample Size: ? 10 ml

Customer ID: 089045 83B44 End Cap

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 83B44

98.8%

1.376-1 / 1.3923-1

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	lm's

54-6600-061 (R-10-83)

7, 8 F949 Seg Comp 8

Serial No.	Sample Point	Date	Time Issued	Priority
F 296.-6225	SEGMENT-I	11-21-89	8:30	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-~~548~~ 508-101	% RECOVERY	WB75L	0

Sample Size: ? 100λ

Customer ID: 089050

Remarks, Calculations, Results:
SPIKE SAMPLE F294
SPIKE ID 83B44
SPIKE VOLUME 10ml

~~115%~~

2.154' - 5.493 = 1.60' / 100 = 1.60-1 / 1.3904-1

See back of card

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	gm's

54-6600-061 (R-10-83)

1, 2

Serial No.	Sample Point	Date	Time Issued	Priority
F 106.-6025	SEGMENT-7	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-~~548~~ 508-101	uCI/L	WB75L	0

Sample Size: ? 100-10-100

Customer ID: 089045

Remarks, Calculations, Results:

bad checks

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90			

54-6600-061 (R-10-83)

1X 2" 1-6-90 VR

56/10 - 6

50/10 -

Beta Calculation by VR on 01-06-1990 at 02:38:45
Det #18 2 -inch mount Beta eff. : .3151
Sample size : 1 ea Dilution : 1

Mount # 1

56
---------- - 6.0 (2.5801E-06 uCi/ea beta
10

100

Mount # 2

50
---------- - 6.0 (2.5801E-06 uCi/ea beta
10

100

F 308.-6325 TB

16 2" 1-6-90 VR

9489/10

9879/10

Beta Calculation by VR on 01-06-1990 at 00:41:41
Det #18 2 -inch mount Beta eff. : .3151
Sample size : 10 mL Dilution : 1

Mount # 1

9489
---------- - 6.0 = 1.3479E-01 uCi/L beta
10

Mount # 2

9879
---------- - 6.0 = 1.4037E-01 uCi/L beta
10

F 105.-6525

16/2

15124/10 - 6

14892/10

Spike too low to calculate

.100

Beta Calculation by AJ on 01-05-1990 at 18:21:51
Det #18 2 -inch mount Beta eff. : .3151
Sample size : .1 mL Dilution : 1

Mount # 1

15124
---------- - 6.0 = 2.1535E+01 uCi/L beta
10

Mount # 2

14892
---------- - 6.0 = 2.1205E+01 uCi/L beta
10

F 296.-6225 TB

18/2

3660/10 - 6

1595/10

DF 101

.100

Beta Calculation by AJ on 01-05-1990 at 18:17:05
Det #18 2 -inch mount Beta eff. : .3151
Sample size : .1 mL Dilution : 101

Mount # 1

3660
---------- - 6.0 = 5.1978E+02 uCi/L beta
10

Mount # 2

1595
---------- - 6.0 = 2.2163E+02 uCi/L beta
10

F 106.-6025

9 1 1 2 0 6 0 1 2 7 0

Total Beta Analysis on the Fusion Dissolution

3 x 4

Serial No.	Sample Point	Date	Time Issued	Priority
F 107.-6125	SEGMENT-8	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-~~548~~ 508-101	uCI/L	WB75L	0

Sample Size	Customer ID
? 100-10-100	089045

Remarks, Calculations, Results:
DUPLICATE SAMPLE

1.97 ² uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	[signature]

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

Total Beta Analysis on the Fusion Dissolution

18 2" 1-6-90 VR

1.01 E3

$\frac{1432}{10} = 6$

$\frac{1421}{10}$

Beta Calculation by VR on 01-06-1990 at 00:47:14
Det #18 2 -inch mount Beta eff. : .3151
Sample size : 1 mL Dilution : 1010

Mount # 1

$$\frac{1432}{10} - 6.0 = 1.9810E+02 \text{ uCi/L beta}$$

Mount # 2

$$\frac{1421}{10} - 6.0 = 1.9651E+02 \text{ uCi/L beta}$$

F 107-6125

9 1 1 2 [illegible] 1 2 7 2

Total Beta Analysis on the Fusion Dissolution

1 x 2 F950 See Com 8

Serial No.	Sample Point	Date	Time Issued	Priority
F 297.-6525	SEGMENT-J	11-21-89	8:30	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
TB	LA-~~548~~-101 508	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 10 ml	83B44 089050

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID_____

96.5%

1.344-1 / 1.3923-1

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6A543				
Hrs	Hrs	Hrs	Hrs	Hrs
J. Hopkins				

Date	Time Completed	Lab Unit Mgr	
1-5-90		[signature]	DM

84-8800-061 (R-10-83)

Total Beta Analysis on the Fusion Dissolution

18 2" 1-6-90 VR

$\frac{9410}{10} - 6$

$\frac{9517}{10}$ -

Beta Calculation by VR on 01-06-1990 at 00:46:12
Bet #18 2 -inch mount Beta eff. : .3151
Sample size : 10 mL Dilution : 1

Mount # 1

$$\frac{9410}{10} - 6.0 = 1.3366E-01 \text{ uCi/L beta}$$

Mount # 2

$$\frac{9517}{10} - 6.0 = 1.3519E-01 \text{ uCi/L beta}$$

F 297.-6525 TB

9 1 1 2 [illegible] 1 2 7 4

Total Beta Analysis on the Fusion Dissolution

9-10

Serial No.	Sample Point	Date	Time Issued	Priority
F 106.-6025	SEGMENT-7	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
TB	LA-~~548~~ 508-101	uCI/L	WB75L	0

Sample Size	Customer ID
? 100-10-200	089045

Remarks, Calculations, Results:

2.03 2 uCi/l

RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Francy	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-25-90		[signature]	DMS

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

3-4

Serial No.	Sample Point	Date	Time Issued	Priority
F 105.-6525	SEGMENT-6	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
TB	LA-548-101	% RECOVERY	WB75L	1

Sample Size	Customer ID
? 10 ml	

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 102.B44

1.457 -1 / 1.3851 -1 105.2%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Francy	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-25-90		[signature]	DMS

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

7-8

Serial No.	Sample Point	Date	Time Issued	Priority
F 108.-6225	SEGMENT-I	11-15-89	10:56	26

Determination	Method/Standard	Result Units	Charge Code	Rerune
TB	LA-508-101	% RECOVERY	F215C	0

Sample Size	Customer ID
? 100-10-200	

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 102B44
SPIKE VOLUME 10 ml

To Low

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Francy	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-25-90		[signature]	DMS

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

5-6

Serial No.	Sample Point	Date	Time Issued	Priority
F 120.-6325	SEGMENT-U	11-15-89	10:58	26

Determination	Method/Standard	Result Units	Charge Code	Rerune
TB	LA-508-101	uCI/L	F215C	0

Sample Size	Customer ID
? 10 ml	

Remarks, Calculations, Results:

REAGENT BLANK

6.65 -4

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Francy	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-25-90		[signature]	DMS

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

9 1 1 2 3 5 3 1 2 7 5

Total Beta Analysis on the Fusion Dissolution

18 2" 1-25-90 VR D.F. 505

$\frac{2922}{10} - 13$

$\frac{2958}{10} -$

Beta Calculation by VR on 01-25-1990 at 18:40:22
Det #18 2 -inch mount Beta eff. : .3151
Sample size : 1 mL Dilution : 505

Mount # 1

$\frac{2922}{10} - 13.0 = 2.0156E+02$ uCi/L beta

2.03²

Mount # 2

$\frac{2958}{10} - 13.0 = 2.0416E+02$ uCi/L beta

F 106.-6025

18 2" 1-25-90 VR

$\frac{10362}{10} - 13$

$\frac{10276}{10} -$

Beta Calculation by VR on 01-25-1990 at 19:13:07
Det #18 2 -inch mount Beta eff. : .3151
Sample size : 10 mL Dilution : 1

Mount # 1

$\frac{10362}{10} - 13.0 = 1.4627E-01$ uCi/L beta

Mount # 2

$\frac{10276}{10} - 13.0 = 1.4504E-01$ uCi/L beta

F 105.-6525

18 2" 1-25-90 VR D.F. 505

$\frac{12652}{10} - 13$

$\frac{13054}{10} -$

Beta Calculation by VR on 01-25-1990 at 18:41:16
Det #18 2 -inch mount Beta eff. : .3151
Sample size : 1 mL Dilution : 505

Mount # 1

$\frac{12652}{10} - 13.0 = 9.0399E+02$ uCi/L beta

Mount # 2

$\frac{13054}{10} - 13.0 = 9.3301E+02$ uCi/L beta

F 108.-6225

18 2" 1-25-90 VR

$\frac{187}{10} - 13$

$\frac{139}{10} -$

Beta Calculation by VR on 01-25-1990 at 18:42:12
Det #18 2 -inch mount Beta eff. : .3151
Sample size : 10 mL Dilution : 1

Mount # 1

$\frac{187}{10} - 13.0 = 8.1484E-04$ uCi/L beta

Mount # 2

$\frac{139}{10} - 13.0 < 5.1552E-04$ uCi/L beta

F 120.-6325

3-4

Serial No.	Sample Point	Date	Time Issued	Priority
F 109.-6525	SEGMENT-J	11-15-89	10:56	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	% RECOVERY	F215C	0

Sample Size	Customer ID
? 10 ml	

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 102844

1.391^{-1} / 1.3851^{-1} 100.48

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
[illegible]	Hrs	Hrs	Hrs	Hrs
Date 1-25-90	Time Completed	Lab Unit Mgr [illegible]	DMS	

54-6600-051 (R-10-83)

Total Beta Analysis on the Fusion Dissolution

18 2" 1-25-90 VR

$\frac{9824}{10}$ -13

$\frac{9902}{10}$

Beta Calculation by VR on 01-25-1990 at 10:42:57
Det #18 2 -inch mount Beta eff. : .3151
Sample size : 10 mL Dilution : 1

Mount # 1

$$\frac{9824}{10} - 13.0 = 1.3858E\text{-}01 \text{ uCi/L beta}$$

Mount # 2

$$\frac{9902}{10} - 13.0 = 1.3970E\text{-}01 \text{ uCi/L beta}$$

F 109.-6525

Serial No.	Sample Point	Date	Time Issued	Priority
F 81.-6530	SEGMENT-6	11-15-89	10:22	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	WB75L	0

Sample Size: ? 500 λ
Customer ID: Std 89844

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 89844
Co^{60} 2.34'/2.2255' 105.1%
Cs^{137} 3.81'/3.813' 99.9%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
DMS/69769				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-9-90		

S4-5800-081 (R-10-83)

4880

Serial No.	Sample Point	Date	Time Issued	Priority
F 107.-6130	SEGMENT-8	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCI/L	WB75L	0

Sample Size: ? 500 λ
Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE SAMPLE
Cs^{137} 5.36' nci/l or 2.34' nci/g

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
69769 DMS				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-9-90		

S4-5800-081 (R-10-83)

2742

Serial No.	Sample Point	Date	Time Issued	Priority
F 106.-6030	SEGMENT-7	11-15-89	10:55	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCI/L	WB75L	0

Sample Size: ? 500 λ
Customer ID: 089045

Remarks, Calculations, Results:
Cs^{137} 4.48' nci/l or 1.87' nci/g

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
DMS/69769				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-9-90		

S4-5800-081 (R-10-83)

1002

Serial No.	Sample Point	Date	Time Issued	Priority
F 192.-6330	SEGMENT-U	11-17-89	10:34	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCI/L	WB75L	0

Sample Size: ? 1 ml
Customer ID: 089049

Remarks, Calculations, Results:
REAGENT BLANK
Cs^{137} <4.77^{-2} nci/l

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
DMS/69769				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-9-90		

S4-5800-081 (R-10-83)

1000

Serial No.	Sample Point	Date	Time Issued	Priority
F 84.-6230	SEGMENT-9	11-15-89	10:23	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	WB75L	0

Sample Size	Customer ID
? ~~500~~ 100 λ	089044

Remarks, Calculations, Results:
SPIKE SAMPLE ~~#88~~ F82
SPIKE ID 89B44
SPIKE VOLUME 100 λ

~~104~~ 103.9 % Hdr 5/15/90

1.06² - 6.64' = 3.96'/3.813'

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
DMS/69765				GC
Hrs	Hrs	Hrs	Hrs	Hrs
			5/15/90	

Date	Time Completed	Lab Unit Mgr
1-9-90		

84-6600-061 (R-10-83)

#881

Serial No.	Sample Point	Date	Time Issued	Priority
F 181.-6330	SEGMENT-J	11-17-89	10:32	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 500 λ	Slot 89B44

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID_____

Co^{60} 2.26' wt/l / 2.2255' 101.6%

Cs^{137} 3.66' wt/l / 3.813' 96.0%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
DMS/69765				GC
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-9-90		

84-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 120.-6340	SEGMENT-21	11-15-89	10:58	1B

Determination	Method/Standard	Result Units	Charge Code	Rerun
U	LA-925-106	G/L	WB75L	0

Sample Size: .100ml - 10ml - .100 ml
Customer ID: 089045

Remarks, Calculations, Results:
REAGENT BLANK Spike 54B38 Value $5.62E^{-4}$ g/l
Volume .100 ml

.06
.38

$$\frac{(.982)(.06)(5.62E^{-4})(.1)(1010)}{.38 - [(.982)(.06)]} = 1.04E^{-2}\ g/l$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Mary Fraty	Hrs	Hrs	Hrs	Hrs
Date: 1-5-90	Time Completed	Lab Unit Mgr		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 105.-6540	SEGMENT-6	11-15-89	10:55	23

Determination	Method/Standard	Result Units	Charge Code	Rerun
U	LA-925-106	% RECOVERY	WB75L	0

Sample Size: ? 100-10-100
Customer ID: 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 54B38
Spk Vol: 100λ
Spk ID: 5.62-4
Sample: .16
Samp + Spk: .46

$$\frac{(.16)(5.62^{-4})(.1)(1010)}{.30} = 2.91E^{-2}$$

(over for recalculation)

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Mary Fraty	Hrs	Hrs	Hrs	Hrs
Date: 1-5-90	Time Completed	Lab Unit Mgr		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 107.-6140	SEGMENT-8	11-15-89	10:56	23

Determination	Method/Standard	Result Units	Charge Code	Rerun
U	LA-925-106	G/L	WB75L	0

Sample Size: ? 100-10-100
Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE SAMPLE
Spk Vol: 100λ
Spk ID: 5.113-5
Sampl: .18
Sampl + Spk: .48

$$\frac{(.18)(5.113^{-5})(.1)(1010)}{.30} = 3.01\times10^{-3}\ g/L$$

(over for recalculation)

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Mary Fraty	Hrs	Hrs	Hrs	Hrs
Date: 1-5-90	Time Completed	Lab Unit Mgr		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 106.-6040	SEGMENT-7	11-15-89	10:55	23

Determination	Method/Standard	Result Units	Charge Code	Rerun
U	LA-925-106	G/L	WB75L	0

Sample Size: ? 100-10-100
Customer ID: 089045

Remarks, Calculations, Results:
Spk Vol: 100λ
Spk ID: 5.113-5
Sample: .20
Sampl + Spk: .50

$$\frac{(.20)(5.113^{-5})(.1)(1010)}{.3} = 3.34\times10^{-3}\ g/L$$

(over for recalculation)

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Mary Fraty	Hrs	Hrs	Hrs	Hrs
Date: 1-5-90	Time Completed	Lab Unit Mgr		

54-6600-061 (R-10-83)

$$\frac{(.00099)(.00516)(.18)}{(.00099)\left[.48\left(\frac{5.7}{5.6}\right)-.18\right]} = \frac{.0009288}{.3086} =$$

$$= 3.01\ E\text{-}03\ g/\ell$$

F 107.-6140

$$\frac{(.00099)(5.676\ E\text{-}02)(.16)}{(.00099)\left[\left[(.46)\left(\frac{5.7}{5.6}\right)\right]-.16\right]} = 2.95\ E\text{-}02$$

$$\frac{2.95\ E\text{-}02}{2.99\ E\text{-}02} = 98.7\%$$

F 105.-6540

$$\frac{(.00099)(.00516)(.20)}{(.00099)\left[.50\left(\frac{5.7}{5.6}\right)-.20\right]} = \frac{.001032}{.3089} =$$

$$3.34\ E\text{-}03\ g/\ell$$

F 106.-6040

Uranium Analysis of the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 297.-6540	SEGMENT-J	11-21-89	8:30	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	0

Sample Size: ? 100-10-100

Customer ID: 089050

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 58B38

Spk Vol: 100λ
Spk ID: 5.62-4

~~111.4%~~ 108.3

Sample: 17
Sample+Spk: 46

(.17)(5.624)(.1)(1010) = 3.33-2

(over for recalculation) .46-.17

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-5-90		

54-5800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 108.-6240	SEGMENT-9	11-15-89	10:56	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	0

Sample Size: ? 100-10-100

Customer ID: 089015

Remarks, Calculations, Results:

SPIKE SAMPLE F106
SPIKE ID 58B38
SPIKE VOLUME 100-10-100

Spk Vol: 100λ
Spk ID: 5.[illegible]-5

(.20)(5.113-5)(.1)(1010) .46-.20 = 3.97-3 -3.44-3

Sample: .20
Sample+Spk: .46

(over for recalculation) 5.3-4

Spike To Low To Calculate

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-5-90		

54-5800-061 (R-10-83)

$$\frac{(.00099)(5.676E\text{-}02)(.17)}{(.00099)\left[.46\left(\frac{5.7}{5.6}\right)-.17\right]} = 3.24E\text{-}02$$

$$\frac{3.24E\text{-}02}{2.99E\text{-}02} = 108.30\%$$

$$\frac{(.00099)(.00516)(.20)}{(.00099)\left[.46\left(\frac{5.8}{5.7}\right)-.20\right]} = \frac{.001032}{.268} - \frac{(.00099)(.3349)}{(.00099)}$$

$$3.85E\text{-}03 - 3.34E\text{-}03 = 5.11E\text{-}4$$

$$\frac{5.11E\text{-}04}{2.99E\text{-}02} = 1.71\%$$

F 297.6540

F 108.-6240

Serial No.	Sample Point	Date	Time Issued	Priority
F 106.-6040	SEGMENT-7	11-15-89	10:55	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/L	WB75L	1

Sample Size: 100-10-500 (5.6) ~~100-10ml-.100~~

Customer ID: 089045

Remarks, Calculations, Results:

spike ID/vol: 54838 2.59E-3 g/l **RERUN**

5.62-4 0.050

spike vol: 100λ $\frac{(\frac{6.0}{6.1})(.05)(5.62E-4)(.1)(\frac{5}{202})}{.265-[(\frac{6.0}{6.1})(.05)]}$ =

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
Sue Lai				
Hrs 6c916	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
7-12-90		

54-6600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 105.-6540	SEGMENT-6	11-15-89	10:55	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	1

Sample Size: .100-10ml-.100

Customer ID: 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 58838

RERUN

spike ID/vol: 54838 $\frac{(\frac{5.6}{5.7})(.110)(5.62E-4)(.1)(\frac{100}{.110})}{.335-[(\frac{5.6}{5.7})(.110)]}$ = 2.7E-2/ 2.99E-2

5.62-4 0.335

spike vol: 100λ 90.3%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
Sue Lai				
Hrs 6c916	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
7-12-90		

54-6600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 108.-6240	SEGMENT-9	11-15-89	10:56	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	1

Sample Size: .100-10ml-.100

Customer ID: 089045

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 54838 F106 Sample
SPIKE VOLUME 100λ

RERUN

0.125

$\frac{(\frac{5.6}{5.7})(.125)(5.62E-4)(.1)(1020)}{.350-[(\frac{5.6}{5.7})(.125)]}$ = 3.10E-2 - 2.59E-3 = 2.84E-2/2.99E-2 = 95.0%

0.350

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
Sue Lai				
Hrs 6c916	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
7-12-90		

54-6600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 297.-6540	SEGMENT-J	11-21-89	8:30	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	1

Sample Size: .100ml-10ml-.100ml

Customer ID: 089050

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 58838 3.10E-2 - 2.59E-3 = **RERUN**

spike ID/vol: 54838 2.84E-2/2.99E-2 92.8%

5.62-4 $\frac{(\frac{5.6}{5.7})(.125)(5.62E-4)(.1)(1020)}{.350-[(\frac{5.6}{5.7})(.125)]}$ 0.335

spike vol: 100λ

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
Sue Lai				
Hrs 6c916	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
7-12-90		

54-6600-081 (R-10-83)

Uranium Analysis of the Fusion Dissolution

$$\frac{\left(\frac{5.6}{5.7}\right)(.110)(5.62E\text{-}4)(.1)(1010)}{.330-\left[\left(\frac{5.6}{5.7}\right)(.110)\right]} = 2.76E\text{-}2/2.99E\text{-}2 =$$

92.3%

Serial No.	Sample Point	Date	Time Issued	Priority
F 120.-6340	SEGMENT-21	11-15-89	10:58	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/L	WB75L	1

Sample Size: 50λ (5L) ~~.100-16 ml .100~~

Customer ID: 089045

Remarks, Calculations, Results:
REAGENT BLANK

F168 blank

RERUN 1.34E-4

spike: 54B38

5.62-4

0.000 < DMS

0.185 20 g/l

100λ $\frac{\left(\frac{5.55}{5.65}\right)(.02)(5.62E\text{-}4)(.1)(1010)}{.185-\left[\left(\frac{5.55}{5.65}\right)(.02)\right]}$ =

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
Sue Lai			[signature]	
Hrs	Hrs	Hrs	Hrs	Hrs
60916				

Date	Time Completed	Lab Unit Mgr.
7-12-90		[signature] [signature]

54-6830-061 (R-10-83)

F297.-6540

Water Digestion

Serial No	Sample Point	Date	Time Issued	Priority
F 111.-7000	SEGMENT-12	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:
GRAMS SAMPLE .5307 #233 2.92 grams
VOLUME ON
COMPLETION 50 mL
1.06 -2 g/ml
~~1.06 -5 g/l~~ 5/30/90 10.6 ~~1.6~~ g/L
WHC N 313 4

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemical
81098	6B107			94171
Hrs 20 min	Hrs 10 min	Hrs	Hrs 5/30/90	Hrs
Date 1/8/90	Time Completed 0900	Lab Unit Mgr		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 113.-7200	SEGMENT-14	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	% RECOVERY	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:
SPIKED ANALYSIS
GRAMS SAMPLE .5024
VOLUME ON
COMPLETION 50 mL
VOLUME SPIKE
SPIKE ID
1.005 -2 g/ml
~~1.005 -5 g/l~~ 5/30/90 10.05 ~~1.67~~ g/L

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemical
81098	6B107			94171
Hrs 20 min	Hrs 10 min	Hrs	Hrs 5/30/90	Hrs
Date 1/8/90	Time Completed 0900	Lab Unit Mgr		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 112.-7100	SEGMENT-13	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE ANALYSIS
GRAMS SAMPLE .5161
VOLUME ON
COMPLETION 50 mL
1.032 -2 g/ml
~~1.032 -5 g/l~~ 5/30/90 10.32 ~~1.03~~ g/L

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemical
81098	6B107			94171
Hrs 20 min	Hrs 10 min.	Hrs	Hrs 5/30/90	Hrs
Date 1/8/90	Time Completed 0900	Lab Unit Mgr		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 122.-7300	SEGMENT-23	11-15-89	10:58	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:
REAGENT BLANK

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemical
81098	6B107			94171
Hrs 20 min	Hrs 10 min	Hrs	Hrs	Hrs
Date 1/8/90	Time Completed 0900	Lab Unit Mgr		

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

Water Digestion

SEQUENCE # : 100
WT 1: 129.5140
WT 2: 130.0453

NET WEIGHT:

---> 0.5287 GRAMS

01/08/90 @ 11:53:34

SAMPLE

WT 1: 130.7653

WT 2: 131.2660

NET WEIGHT:

---> 0.5024 GRAMS

01/08/90 @ 10:08:32

SPIKE

SEQUENCE # 99
WT 1: 129.1260
WT 2: 129.6420

NET WEIGHT:

---> 0.5161 GRAMS

01/08/90 @ 11:43:08

DUPLICATE

Ion Chromatographic Analysis of the Water Digestion - Floride

Serial No.	Sample Point	Date	Time Issued	Priority
F 122.-7371	SEGMENT-23	11-15-89	10:58	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	PPM	WB75L	0

Sample Size: ? ~~100-10~~ Direct

Customer ID: 089045

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemist [signature] 94171
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90		[signature]	SEH

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 110.-7571	SEGMENT-11	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10 ~~6C11HI~~

Customer ID: 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11HI

67.04

$\left(\frac{67}{72}\right)100 = 93.1\%$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemist [signature] 94171
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90		[signature]	SEH

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 112.-7171	SEGMENT-13	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE SAMPLE

1.92 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemist [signature] 94171
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90		[signature]	SEH

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 111.-7071	SEGMENT-12	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089045

Remarks, Calculations, Results:

1.82

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemist [signature] 94171
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90		[signature]	SH

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 66.-7571	SEGMENT-15	11-15-89	10:21	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
100-10	

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11A1

$100\left(\frac{47.06}{72}\right) = 93.1\%$

pms

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 113.-7271	SEGMENT-14	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 100 µL - 10 ml	89-045

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 3509-67
SPIKE VOLUME .300/5mL

$\frac{\left(\frac{5.3\,mL}{5.0\,mL}\right)(406.0\,ppm) - (181.9\,ppm)\left(\frac{10.05\,g}{10.6\,g}\right)}{\frac{(.30\,mL)(47\,ppm)}{5.3\,mL}\,(101)} \times 100 = 96.3\%$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6B107				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		

54-6600-061 (R-10-83)

Ion Chromatographic Analysis of the Water Digestion - Chloride

Serial No.	Sample Point	Date	Time Issued	Priority
F 122.-7372	SEGMENT-23	11-15-89	10:58	18

Determination	Method/Standard	Result Units	Charge Code	Rerune
CL	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: 089045

Remarks, Calculations, Results:
REAGENT BLANK

~~2.1 ppm~~ .15 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 110.-7572	SEGMENT-11	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
CL	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID GC1/R1

~~98.0% HIR~~

$\left(\frac{85.2}{87}\right) 100 = 97.9$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 112.-7172	SEGMENT-13	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
CL	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE SAMPLE

<10.1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 111.-7072	SEGMENT-12	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
CL	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089045

Remarks, Calculations, Results:

<10.1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		

54-6600-061 (R-10-83)

Ion Chromatographic Analysis of the Water Digestion - Chloride

Serial No.	Sample Point	Date	Time Issued	Priority
F 66.-7572	SEGMENT-15	11-15-89	10:21	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
CL	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID:

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 6C11H3

$\left(\frac{83.8}{87}\right)100 = 96.3\%$

AMS

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/MEW				Chemist
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		KSH

54-6600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 113.-7272	SEGMENT-14	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
CL	LA-533-105	% RECOVERY	WB75L	0

Sample Size: ? 100 µL - 10 mL

Customer ID: 89-045

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 3509-67
SPIKE VOLUME .300/5mL

$$\frac{(1.06)(347)-(0)(.948)}{\frac{(.300)(60)}{5.3}(101)} \times 100 = 107.2\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		

54-6600-081 (R-10-83)

Ion Chromatographic Analysis of the Water Digestion - Nitrate

Serial No.	Sample Point	Date	Time Issued	Priority
F 122.-7373	SEGMENT-23	11-15-89	10:58	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: 089045

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/MEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90			SEH

54-5600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 110.-7573	SEGMENT-11	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C1A2

$\left(\frac{710}{722}\right)100 = 98.3\%$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/MEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90			SEH

54-5600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 112.-7173	SEGMENT-13	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE SAMPLE

2.74 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/MEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90			SEH

54-5600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 111.-7073	SEGMENT-12	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089045

Remarks, Calculations, Results:

2.70 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/MEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90			SEH

54-5600-061 (R-10-83)

Ion Chromatographic Analysis of the Water Digestion - Nitrate

Serial No.	Sample Point	Date	Time Issued	Priority
F 66.-7573	SEGMENT-15	11-15-89	10:21	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
NO3	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
100-10	

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11H1

$\left(\frac{759.3}{722}\right)100 = 105.2\%$

gm 8

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B/07/				94171
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90			

54-9600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 113.-7273	SEGMENT-14	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
NO3	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 100µL - 10 mL	89-C45

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 35C9-67
SPIKE VOLUME .300/5mL

$\frac{(1.06)(2951) - (270.3)(.948)}{\frac{(.300)(481)}{5.3}} \times 100 = 104.4\%$ (101)

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2-15-90			

54-9600-061 (R-10-83)

Ion Chromatographic Analysis of the Water Digestion - Phosphate

Serial No	Sample Point	Date	Time Issued	Priority
F 122.-7374	SEGMENT-23	11-15-89	10:58	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	PPM	WB75L	1

Sample Size: ? Direct

Customer ID:

Remarks, Calculations, Results: REAGENT BLANK

RERUN

<1ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemist [signature] 7/1/71
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/22/90		[signature]	

54-6600-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 110.-7574	SEGMENT-11	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	% RECOVERY	WB75L	1

Sample Size: 100-10

Customer ID:

Remarks, Calculations, Results: LMCS CHECK SAMPLE
LMCS ID 6C1A2

RERUN

$\left(\frac{680.9}{722}\right)100 = 94.3\%$

~~737.4~~ / ~~722.0~~ ~~102.1%~~ HLK 5/14/90

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemist [signature] 7/1/71
Hrs .5	Hrs	Hrs [signature]	Hrs 5/14/90	Hrs

Date	Time Completed	Lab Unit Mgr	
2/22/90		[signature]	RMS

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 112.-7174	SEGMENT-13	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	PPM	WB75L	1

Sample Size: ? 100-10

Customer ID:

Remarks, Calculations, Results: DUPLICATE SAMPLE

RERUN

1.64^3 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemist [signature] 7/1/71
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/22/90		[signature]	RMS

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 111.-7074	SEGMENT-12	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	PPM	WB75L	1

Sample Size: ? 100-10

Customer ID:

Remarks, Calculations, Results:

RERUN

1.55^3 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemist [signature] 7/1/71
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/22/90		[signature]	RMS

54-6600-061 (R-10-83)

9 1 1 2 0 5 0 1 2 0 5

Ion Chromatographic Analysis of the Water Digestion - Phosphate

Serial No.	Sample Point	Date	Time Issued	Priority
F 114.-7574	SEGMENT-0	11-15-89	10:57	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	% RECOVERY	E21D1	0

Sample Size: ?

Customer ID:

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11AI

101.0 %

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107			[signature]	[signature]
Hrs	Hrs	Hrs	Hrs	Hrs
[signature]				[signature]

Date	Time Completed	Lab Unit Mgr
2-22-90		[signature]

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 113.-7274	SEGMENT-14	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	% RECOVERY	WB75L	1

Sample Size: ? 100-10

Customer ID:

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 35C9-69
SPIKE VOLUME .300/5ml

RERUN

~~173.4%~~

$4.738^3 - 1.55^3 = 3188/2812$ 103.2%

(over)

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/KEW				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs
.5				

Date	Time Completed	Lab Unit Mgr	
2/22/90		[signature]	DMS

54-6600-061 (R-10-83)

Ion Chromatographic Analysis of the Water Digestion - Phosphate

$$\frac{\left(\frac{5.3}{5}\right)(4.738) - (1553)\left(\frac{10.005}{10.6}\right)}{\frac{(.300)(601)}{5.3}(101)} \times 100 = 103.2\%$$

F 113.-7274

9 1 1 2 0 6 0 1 2 0 7

Ion Chromatographic Analysis of the Water Digestion - Sulfate

Serial No.	Sample Point	Date	Time Issued	Priority
F 122.-7375	SEGMENT-23	11-15-89	10:58	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: 089045

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemical 94171
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90			SEH

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 110.-7575	SEGMENT-11	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11H1

$\frac{\cancel{.96}\ \text{HSA}}{\left(\frac{696}{749}\right)100} = 92.9\%$ DMS

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemical 94171
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90			SEH

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 112.-7175	SEGMENT-13	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE SAMPLE

< 10.1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemical 94171
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90			SEH

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 111.-7075	SEGMENT-12	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089045

Remarks, Calculations, Results:

4.31 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				Chemical 94171
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2/15/90			SEH

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 113.-7275	SEGMENT-14	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: ? 100 µL - 10 mL

Customer ID: 089045

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 35C9-67
SPIKE VOLUME .300/5 mL

$$\frac{(1.06)(2672)-(431)(.948)}{\frac{(.300)(482)}{5.3}(101)} \times 100 = 101.3\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		

54-5800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 66.-7575	SEGMENT-15	11-15-89	10:21	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID:

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C1142

$$\left(\frac{741}{749}\right)100 = 98.9\%$$

pms

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2/15/90		

54-5800-061 (R-10-83)

Total Organic Carbon Analysis of the Water Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 113.-7226	SEGMENT-14	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	1

Sample Size: ? 200 uL + 100 uL .5m H_2SO_4 - 200 uL

Customer ID: 89045

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 70C11
SPIKE VOLUME 200 uL

$$\frac{(121.1-6.4)_{ug} - (7.8-6.4)_{ug}}{119.9_{ug}} \times 100 = 94.5\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohen				
Date	Time Completed	Lab Unit Mgr		
5-30-90				

54-8600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 114.-7526	SEGMENT-15	11-15-89	10:57	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	1

Sample Size: ? 200 uL - 2 mL - 200 uL

Customer ID: 89045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 70C11D

$$\frac{2.882\ g/l}{3.00\ g/l} \quad 96.1\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohen				
Date	Time Completed	Lab Unit Mgr		
5-30-90				

54-8600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 111.-7026	SEGMENT-12	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	1

Sample Size: ? 1 mL + 100 uL .5m H_2SO_4 - 200 uL

Customer ID: 89045

Remarks, Calculations, Results:

$7.7E^{-3}$ g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohen				
Date	Time Completed	Lab Unit Mgr		
5-30-90				

54-8600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 112.-7126	SEGMENT-13	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	1

Sample Size: ? 1 mL + 100 uL .5m H_2SO_4 - 200 uL

Customer ID: 89045

Remarks, Calculations, Results:
DUPLICATE SAMPLE

$7.15E^{-3}$ g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohen				
Date	Time Completed	Lab Unit Mgr		
5-30-90				

54-8600-081 (R-10-83)

Total Organic Carbon Analysis of the Water Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 110.-7526	SEGMENT-11	11-15-89	10:56	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	1

Sample Size: ? 200uL-2mL-200uL

Customer ID: 89045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 70C11D

97.4%

2.9205/3.00

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Chin				
Date	Time Completed	Lab Unit Mgr		
5-30-90				

54-8800-081 (R-10-89)

Serial No.	Sample Point	Date	Time Issued	Priority
F: 122.-7326	SEGMENT-23	11-15-89	10:58	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	~~D/C~~ ug	WB75L	1

Sample Size: ? 200uL

Customer ID: 89045

Remarks, Calculations, Results:
REAGENT BLANK

.9126 ug/min

6.4 ug

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Chin				
Date	Time Completed	Lab Unit Mgr		
5-30-90				

54-8800-081 (R-10-89)

9 1 1 2 0 6 9 1 3 0 1

Acid Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 117.-8100	SEGMENT-18	11-15-89	10:57	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	~~G/L~~ g/mL sj	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE ANALYSIS
GRAMS SAMPLE_____
VOLUME ON COMPLETION 52mL
1.01 -2 g/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
K. Sauchuck				

Date: 1/31/90 | Time Completed: | Lab Unit Mgr: [signature] [signature] [signature]

54-6808-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 75.-8300	SEGMENT-24	11-15-89	10:22	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	~~G/L~~ g/mL sj	WB75L	0

Sample Size: ?

Customer ID: 089043

Remarks, Calculations, Results:
REAGENT BLANK
VOLUME ON COMPLETION 52mL

Stds-34C11Co
35C11CK

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
K. Sauchuck			[signature]	

Date: 1/31/90 | Time Completed: | Lab Unit Mgr: [signature] [signature]

54-6808-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 118.-8200	SEGMENT-19	11-15-89	10:57	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-158	~~% RECOVERY~~ g/mL sj	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:
GRAMS SAMPLE_____
VOLUME ON COMPLETION 52m
1.01 -2 g/ml

Spiked F116

104C15 B
103C15 D

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
K. Sauchuck				

Date: 1/31/90 | Time Completed: | Lab Unit Mgr: [signature] [signature] [signature]

54-6808-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 116.-8000	SEGMENT-17	11-15-89	10:57	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	~~G/L~~ g/mL sj	WB75L	0

Sample Size: ?

Customer ID: 089045

Remarks, Calculations, Results:
GRAMS SAMPLE_____
VOLUME ON COMPLETION 52mL
1.30 -2 g/ml

10HC N 3157

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
K. Sauchuck				

Date: 1/31/90 | Time Completed: | Lab Unit Mgr: [signature] [signature] [signature]

54-6808-061 (R-10-83)

9 1 1 2 [illegible] 1 3 0 2

ICP Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 123.-8350	SEGMENT-24	11-15-89	10:58	13

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: 089045

Remarks, Calculations, Results:
REAGENT BLANK

Complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
D. Southwick				

Date	Time Completed	Lab Unit Mgr
3/12/90		AP

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 115.-8550	SEGMENT-16	11-15-89	10:57	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	WB75L	0

Sample Size: ? Direct

Customer ID: 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID ~~81C11A Mo, Si~~ } ICP1B
~~81C11A Multi~~
~~82C11A - ICP 2B~~
78C11C SST 1
77C11C SST 3
81B38 SST 2 spike

Complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
D. Southwick				

Date	Time Completed	Lab Unit Mgr
3/12/90		AP

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 116.-8050	SEGMENT-17	11-15-89	10:57	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	PPM	WB75L	0

Sample Size: ? 100-10 500-10

Customer ID: 089045

Remarks, Calculations, Results:

Complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
D. Southwick				

Date	Time Completed	Lab Unit Mgr
3/12/90		AP

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 117.-8150	SEGMENT-18	11-15-89	10:57	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	PPM	WB75L	0

Sample Size: ? 100-10 500-10

Customer ID: 089045

Remarks, Calculations, Results:
DUPLICATE SAMPLE

Complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
D. Southwick				

Date	Time Completed	Lab Unit Mgr
3/12/90		AP

54-6600-061 (R-10-83)

ICP Analysis

Serial No	Sample Point	Date	Time Issued	Priority
F 119.-8550	SEGMENT-20	11-15-89	10:58	23

Determination	Method/Standard	Result Units	Charge Code	Rerun
ICP	LA-505-151	% RECOVERY	WB75L	0

Sample Size: ? Direct

Customer ID: 089045

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 78811C SST 1
77411C SST 3
81638A SST 2

Complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
D. Southwick				
Date	Time Completed	Lab Unit Mgr		
3/12/90		QP		

54-6600-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 118.-8250	SEGMENT-19	11-15-89	10:57	23

Determination	Method/Standard	Result Units	Charge Code	Rerun
ICP	LA-505-151	PPM	WB75L	0

Sample Size: ? 100-10 500-10

Customer ID: 089045

Remarks, Calculations, Results:
~~DUPLICATE SAMPLE~~
Spike Sample

Complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
D. Southwick				
Date	Time Completed	Lab Unit Mgr		
3/12/90		QP		

54-6600-061 (R-10-83)