012192 211

2 of 5

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

JAN 1991
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222-S/RCRA ANALYTICAL LABORATORIES

9112590613

PROJECT:	SINGLE-SHELL TANK WASTE CHARACTERIZATION
TANK:	241-U-110
CORE:	5
SEGMENT:	4
CUSTOMER ID. NUMBER:	89-041

BEST AVAILABLE COPY

REPORT REVISION:	2
DATE PRINTED:	AUGUST 27, 1990

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Appendix A Analytical Analysis Cards

9 1 1 2 0 5 9 0 6 1 4

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 A. Cervantes — Date August 13, 1990
Shirley A. Cervantes
Data Coordinator

Cary M. Seidel — Date August 13, 1990
Cary M. Seidel
Unit Manager

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

9112250615

INTRODUCTION

9 1 1 2 1 5 9 0 6 1 6

INTRODUCTION

Westinghouse Hanford Company 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.

The 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 performed 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 5 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 analyses are subject to interpretation. The Total Organic Carbon procedure was corrected and these analyses were repeated and

results are reported in this package.

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. The percent moisture was determined at the earliest opportunity to minimize any errors introduced by the loss of moisture. Drying samples before analysis resulted in radiation exposure increases of about a factor of ten. In order to reduce and control radiation exposure to laboratory personnel, the samples were not dried before aliqouting and digestion. This policy 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.

9112159061 8

SAMPLING AND CUSTODY DATA

9 1 1 2 7 5 3 0 6 1 9

5

9 1 1 2 ? 5 ? 0 5 ? 0

CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number S-022-89 (2) Sample Number 89-041 (3) Supervisor Blinn L Hall

(4) Tank 241-U-110 (5) Riser 19 (6) Segment 4 (7) Cask Serial Number 1009C

Radiation Survey Data:	(8) FIELD	(20) LABORATORY
Over Top Dose Rate	.5 mr/hr	NA
Side Dose Rate	7 mr/hr	10 mR/h
Bottom Dose Rate	2.5 mr/hr	3.5 mR/h
Smearable Contamination	<Det (alpha)	<Det (alpha)
	<Det (beta gamma)	<Det (beta-gamma)
	RPT R Reid (Signature)	RPT [signature] (Signature)

(9) Shipment Description:

A. Work Package Number	2W-89-00957/W
B. Cask Seal Number	For Future Use
C. Sampler Number Used	48
D. Date and Time Sampler Unseated	11-3-89 2:26 PM
E. Expected Liquid Content	0-20%
F. Expected Solid Content	80-100%
G. Dose Rate Through Drill String	100 mr/hr
H. Expected Sample Length	19"

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

Characterize segment according to WHC-EP-0210

*Reference laboratory work request, if available.

Comments: Core #5

(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-110 200W Area	Blinn L. Hall / Blinn L Hall	11-7-89 10:00 AM	222S Lab 200W Area	VIDA Boyle / Vida Boyle	11/7/89 1040

(15) Seal Intact Upon Release? ☒ Yes ☐ No

(18) Seal Intact Upon Receipt? ☒ Yes ☐ No

(19) Seal Data Consistent with this Record?
Shipment No. ☒ Yes ☐ No
Sample No. ☒ Yes ☐ No

Single Shell Tank Waste Characterization
Summary of Core Sample

Phase I-A

Tank ID:	241-U-110
Riser ID:	19
Core ID:	5

Date Sampling Initiated:	9/19/89
Date Sampling Completed:	11/7/89

Segment 1	Lab Serial No.	F0003
	Customer ID. No.	89-038
	Last Segment?	No
Segment 2	Lab Serial No.	F0027
	Customer ID. No.	89-039
	Last Segment?	No
Segment 3	Lab Serial No.	F5001
	Customer ID. No.	89-040
	Last Segment?	No
Segment 4	Lab Serial No.	F5033
	Customer ID. No.	89-041
	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?	

Prepared by: _____ (Signature) H. S. Rich (Printed Name) Date: 4/2/90

Verified by: _____ (Signature) C. M. Seidel (Printed Name) Date: 4/2/90

Approved by: _____ (Signature) L. H. Taylor (Printed Name) Date: 5/9/90

Interim

SST-1 Rev. B 3/27/90

SAMPLE DATA SUMMARY

9 1 1 2 5 9 0 6 2 2

SUMMARY DATA REPORT

Tank	241-U-110
Core	5
Segment	4
Customer Id.	89-041

Untreated Sample

	Sample	Duplicate
pH	12.71	12.92
Percent Water	38.80%	39.10%

Fusion Analysis

Total Alpha	0.36 uci/g	0.44 uci/g
Total Beta	1080 uci/g	1140 uci/g
GEA		
Cs-137	48.40 uci/g	42.90 uci/g
Uranium	2200 ug/g	2900 ug/g

Water Digestion

Fluoride	23200 ug/g	20400 ug/g
Chloride	<1050 ug/g	<1120 ug/g
Nitrate	64900 ug/g	60500 ug/g
Phosphate	4980 ug/g	39600 ug/g
Sulfate	5610 ug/g	5110 ug/g

Total Organic Carbon/Carbonate

4710 ug/g	5030 ug/g

Samples were not acidified before analysis

Total Organic Carbon (Second analysis)

859 ug/g	1100 ug/g

Samples were acidified before analysis

Acid Digestion Results

	Sample	Duplicate
Aluminum	34730 ug/g	37858 ug/g
Barium	22 ug/g	16 ug/g
Bismuth	20942 ug/g	19470 ug/g
Boron	LT	LT
Cadmium	LT	LT
Calcium	155 ug/g	152 ug/g
Chromium	446 ug/g	429 ug/g
Copper	27 ug/g	15 ug/g
Iron	7927 ug/g	8145 ug/g
Lanthanum	LT	LT
Lead	131 ug/g	LT
Lithium	4 ug/g	LT
Magnesium	103 ug/g	116 ug/g
Manganese	1993 ug/g	2048 ug/g
Molybdenum	20 ug/g	11 ug/g
Nickel	59 ug/g	44 ug/g
Phosphorous	9243 ug/g	9534 ug/g
Potassium	198 ug/g	LT
Silver	LT	LT
Sodium	65496 ug/g	65413 ug/g
Strontium	243 ug/g	245 ug/g
Tantalum	63 ug/g	13 ug/g
Tin	31 ug/g	17 ug/g
Titanium	11 ug/g	LT
Zinc	57 ug/g	LT
Zirconium	44 ug/g	LT

LT: Less Than

PHYSICAL TEST RESULTS

Single Shell Tank
Extrusion of Segment -- Physical Tests

Phase I-A

Lab Segment Serial No.: F5033 Customer ID: 89-041

Analyst: Rich L. Weiss Date Extruded: 11-07-89

Drainable Liquid Liquid Submitted for Segment Analysis? -- No

Gross <10 ml	Tare	Net
Serial	Date/Time_____/_____	Estimated
Specific	Calculated	

Appearance of Liquid:

N/A

Dimensions of Segment

Complete Segment Obtained? No	Length: 16 inches	Calculated Volume: 12.57 cubic in
Remarks None		

Appearance of Solid:

Bottom 4" very soft, runny, light to medium brown; Middle, firmer, medium brown; Top 5" rubbery firm (very cohesive), black in color. Small hard chunks (possibly crystals) of approximately 1/8" in diameter.

Penetrometer 3.8 lbs/sq in Remarks: None

Homogenization

Procedure: T038A-00712 Revision: F	Quantity of Material not recorded grams
Date Homogenized: 11-09-89	Time Homogenized: 5.0 Minutes
Opperator: John R. Smith	

Laboratory Notebook Reference WHC-N-313-4 (Notebook No.) 3 (Page No.)

Prepared by: [signature] Signature H.S. Rich Printed Name Date: 04-02-90

Verified by: Cary M Seidel Signature C.M. Seidel Printed Name Date: 04-02-90

Approved by: L. H. Taylor [signature] Signature L.H. Taylor Printed Name Date: 5/9/90

Interim 3/27/90 Rev. C SST-3

9 1 1 2 5 0 6 2 5

Single Shell Tank Segment -- Subsamples	Phase 1A

Customer ID: 89-041 Lab Segment Serial No. F5033

Volatile Organic Analysis		
VOA Sample	Laboratory Serial Number: 89-041-30	Date Sampled: 11-07-89
Sample shipped to PNL for analysis		

Particle Size Distribution Analysis		
Particle Size Sample	Laboratory Serial Number: F5033	Date Sampled: 11-07-89
Sample analysis performed at 222-S		

Homogenized Solids

Undigested Solids Analysis	
Laboratory Serial Number for Sample: F5033	Date Sampled: 11/09/89
Laboratory Serial Number of Duplicate Sample: F5034	

Fusion Analysis of Solids	
Laboratory Serial Number for Sample: F5038	Date Sampled: 11/09/89
Laboratory Serial Number of Duplicate Sample:: F5039	
Laboratory Serial Number of Spiked Sample: N/A	

Acid Digestion Analysis of Solids	
Laboratory Serial Number for Sample: F5048	Date Sampled: 11/09/89
Laboratory Serial Number of Duplicate Sample: F5049	
Laboratory Serial Number of Spiked Sample: F5050	

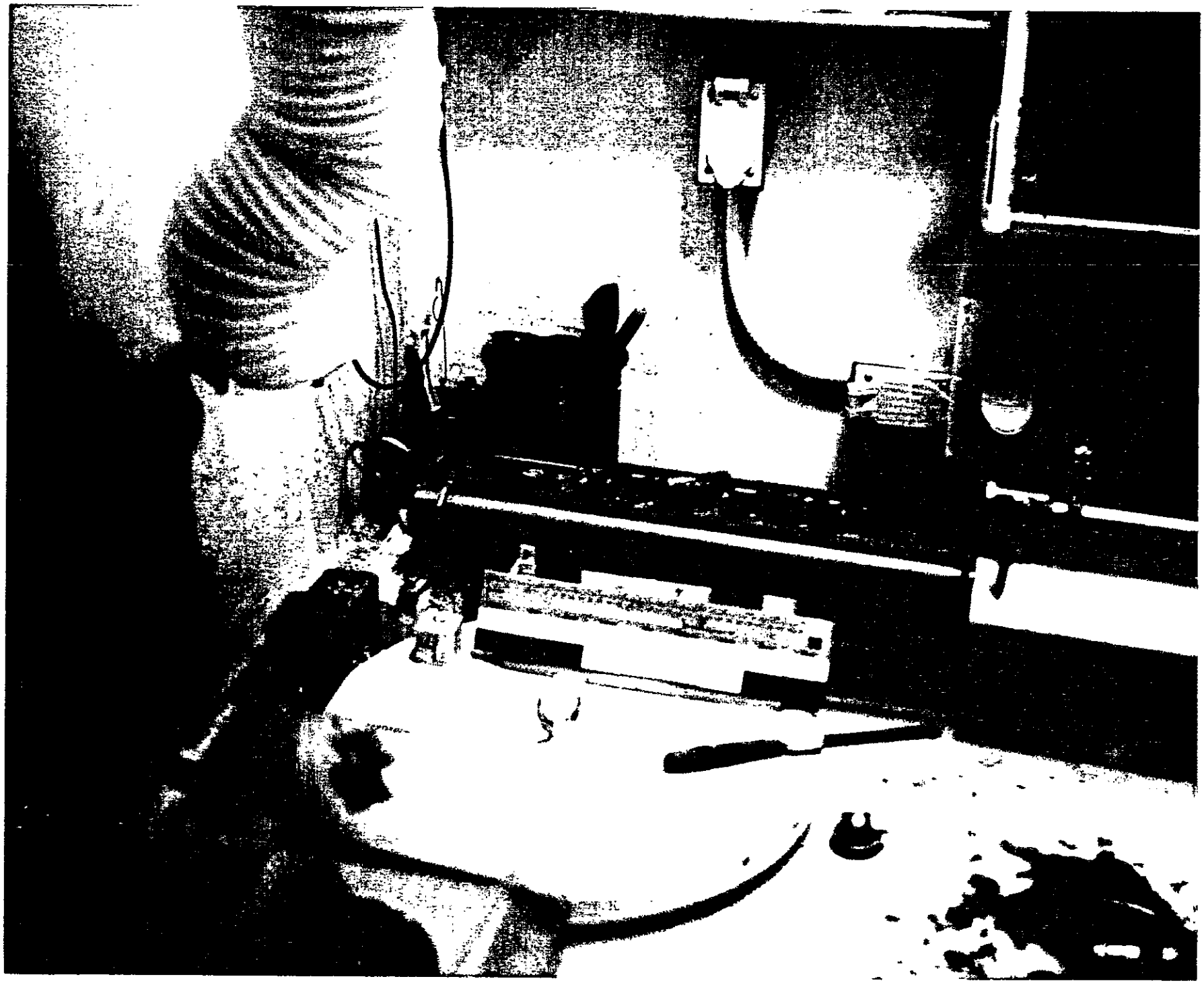
Water Digestion Analysis of Solids	
Laboratory Serial Number for Sample: F5043	Date Sampled 11/09/89
Laboratory Serial Number of Duplicate Sample: F5044	
Laboratory Serial Number of Spiked Sample: F5045	

Laboratory Notebook Reference

WHC-W-313-4 Notebook No.	3 Page No.

Prepared by: H. S. Rich Signature	H. S. Rich Printed Name	Date: 04/04/90
Verified by: Carry M Seidel Signature	C. M. Seidel Printed Name	Date: 04-06-90
Approved by: L. H. Taylor Signature	L. H. Taylor Printed Name	Date: 5/9/90

SST-5 Rev.C 3/28/90



TANK 241-U-110, CORE 5, 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,B000033,F5033,H20,DBB/SBK
FILE NAME : A:\SST\F5033.002

DATE	: 15/11/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 86935
TIME	: 11:40	ACQ. MODE	: SAMPLE	S.N.F.	: 0.85
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 410 SEC	S.D.U.	: 4559
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.8E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 8.9E-03 %

	MEAN Diameter	S.D.
Number, Length :	1.17 µm	1.14 µm
Number, Area :	1.63 µm	1.23 µm
Number, Volume :	2.92 µm	2.09 µm
Length, Area :	2.28 µm	4.01 µm
Length, Volume :	4.61 µm	4.64 µm
Area, Volume :	9.35 µm	14.65 µm
Volume, Moment :	32.30 µm	25.66 µm

	MEDIAN Diameter	MODE	CONFIDENCE
Number :	0.88 µm	0.75 µm	100.00%
Area :	3.94 µm	4.75 µm	86.06%
Volume :	27.98 µm	37.84 µm	99.36%

particle diameter < 150µ DBB 11/15/89

9 1 1 2 1 5 9 0 6 2 3

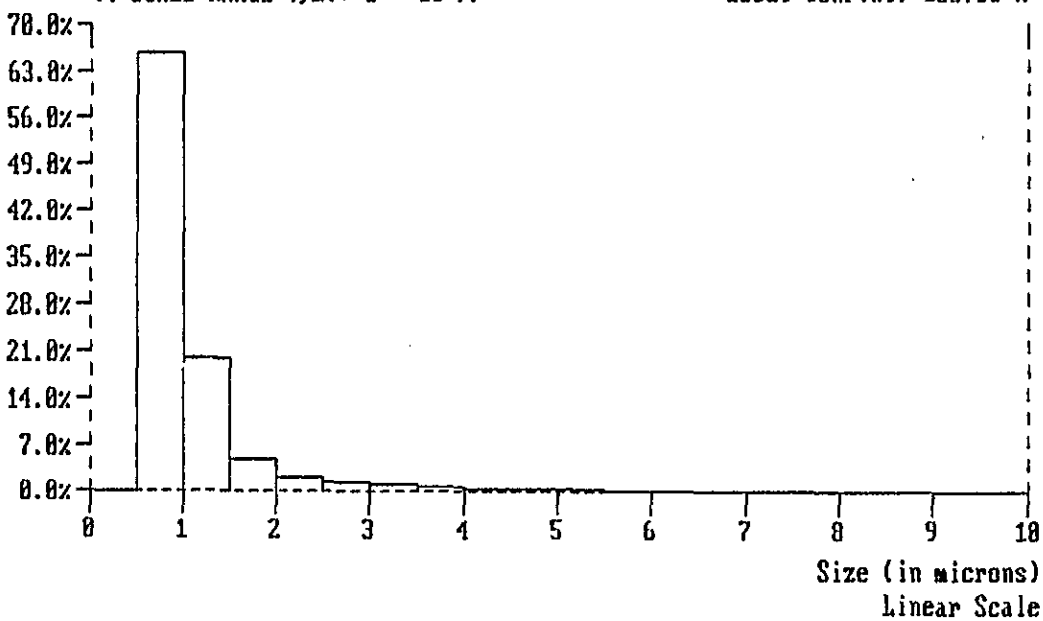
SAMPLE NAME : SST,B000033,F5033,H20,DBB/SBK
FILE NAME : A:\SST\F5033.002

DATE	: 15/11/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 86935
TIME	: 11:40	ACQ. MODE	: SAMPLE	S.N.F.	: 0.85
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 410 SEC	S.D.U.	: 4559
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.8E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 8.9E-03 %

PROBABILITY NUMBER DENSITY GRAPH

Name: SST,B000033,F5033,H20,DBB/SBK
6.8E+06 #/ml(99.9%)
Mode at 0.75 µm
<< SCALE RANGE (µm): 0 - 10 >>

Local Median : 0.80µm
Local Mean(nl): 1.14µm
Local S.D.(nl): 0.88µm
Local Conf(nl):100.00 %



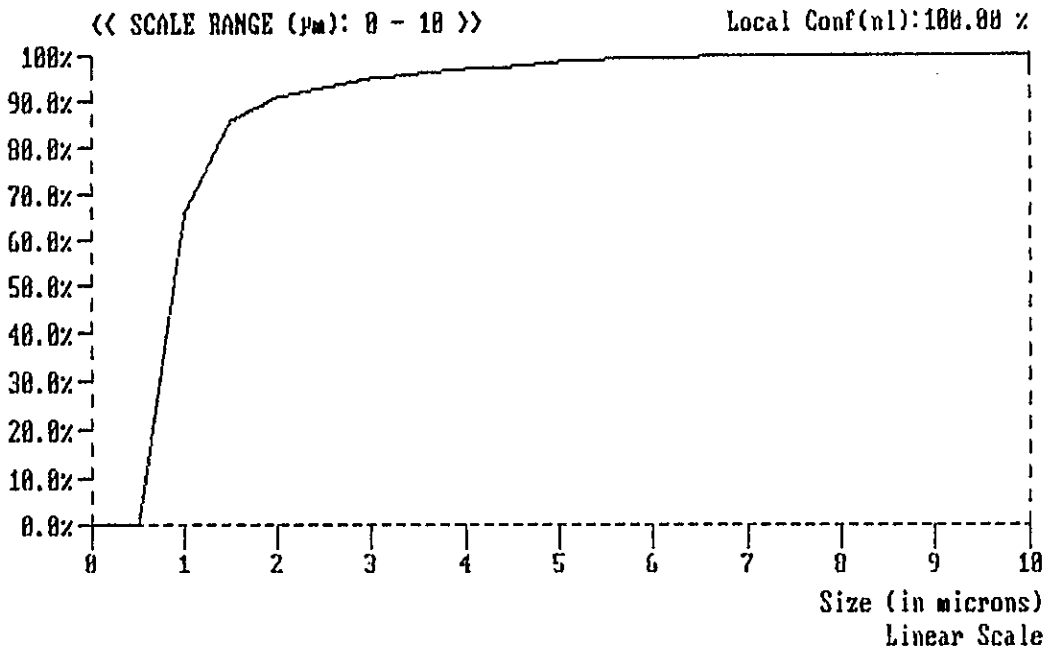
SAMPLE NAME : SST,B000033,F5033,H20,DBB/SDK
FILE NAME : A:\SST\F5033.002

DATE	: 15/11/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 86935
TIME	: 11:40	ACQ. MODE	: SAMPLE	S.N.F.	: 0.85
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 410 SEC	S.D.U.	: 4559
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.8E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 8.9E-03 %

PROBABILITY NUMBER DISTRIBUTION GRAPH

Name: SST,B000033,F5033,H20,DBB/SDK
6.8E+06 #/ml(99.9%)

Local Median : 0.88µm
Local Mean(nl): 1.14µm
Local S.D.(nl): 0.88µm
Local Conf(nl):100.00 %



SAMPLE NAME : SST,B000033,F5033,H2O,DBB/SBK
FILE NAME : A:\SST\F5033.002

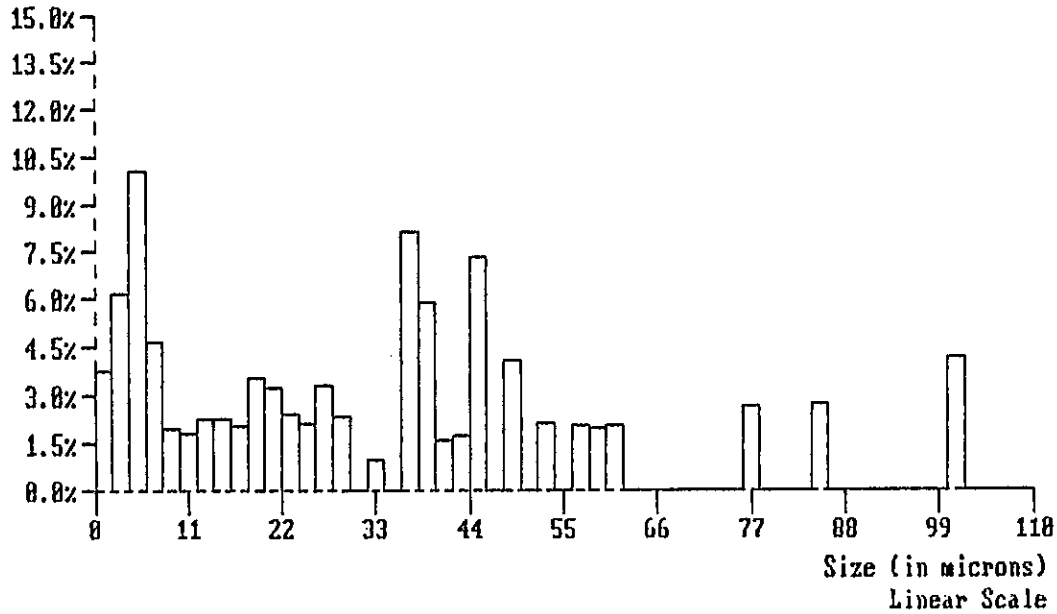
DATE	: 15/11/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 86935
TIME	: 11:40	ACQ. MODE	: SAMPLE	S.N.F.	: 0.85
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 410 SEC	S.D.U.	: 4559
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.8E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 8.9E-03 %

PROBABILITY VOLUME DENSITY GRAPH

Name: SST,B000033,F5033,H2O,DBB/SBK
8.9E-05 cc/ml(100.0%)
Mode at 5.00 µm
<< SCALE RANGE (µm): ADJUSTED >>

Mean(nv): 2.92µm
S.D.(nv): 2.09µm

Median : 27.98µm
Mean(vm): 32.30µm
S.D.(vm): 25.66µm
Conf(vm): 99.36 %



SAMPLE NAME : SST,B000033,F5033,H20,DBB/SBK
FILE NAME : A:\SST\F5033.002

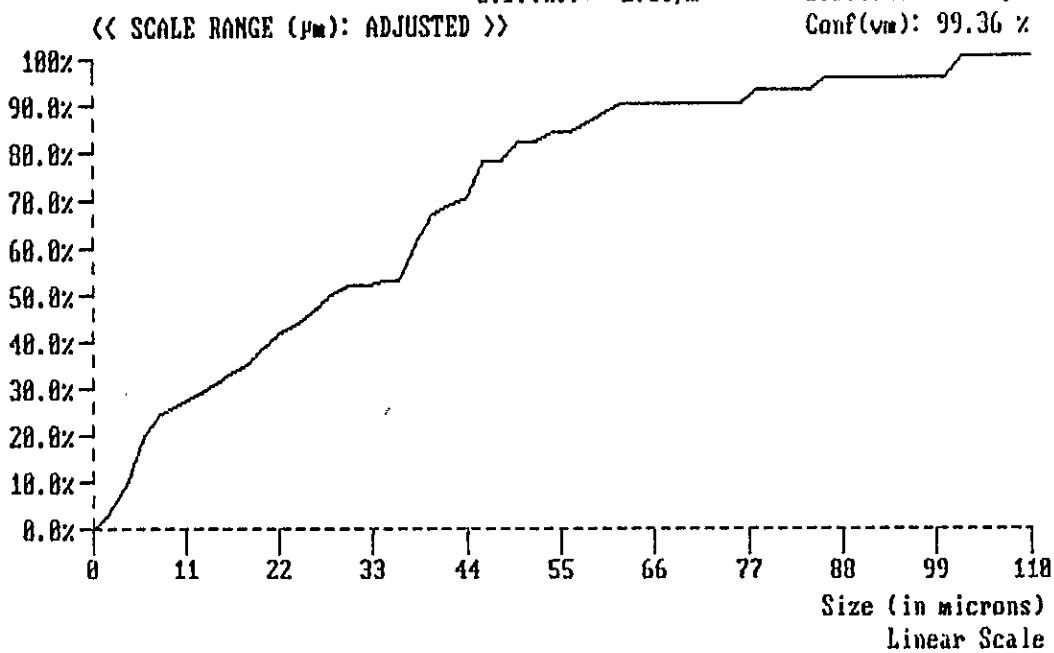
DATE	: 15/11/1989	ACQ. RANGE	: 0.5-150	COUNTS	: 86935
TIME	: 11:40	ACQ. MODE	: SAMPLE	S.N.F.	: 0.85
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 410 SEC	S.D.U.	: 4559
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 6.8E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 8.9E-03 %

PROBABILITY VOLUME DISTRIBUTION GRAPH

Name: SST,B000033,F5033,H20,DBB/SBK
8.9E-05 cc/ml(100.0%)

Mean(nv): 2.92µm
S.D.(nv): 2.09µm

Median : 27.98µm
Mean(vm): 32.30µm
S.D.(vm): 25.66µm
Conf(vm): 99.36 %



UNDIGESTED SAMPLE ANALYSIS

9 1 1 2 0 5 9 0 6 7 3

9 1 1 2 9 5 9 0 6 7 4

Single Shell Tank Project — Untreated Sample Results — 4/03/90

Tank: 241-U-110
Core: 5
Segment: 4
Customer ID: 89-041

	Check Standard	Blank	Sample	Sample Duplicate	Check Standard
Laboratory ID:	F5032	F5053	F5033	F5034	F5036
pH	100.30%	5.67	12.71	12.92	100.00%
%Water	99.10%	8.8 mg	38.80%	39.10%	95.00%

Approved by: H.S. Rich — H.S. Rich — Date: 04/01/90

Verified by: Carry M Seidel — C.M. Seidel — Date: 5/2/90

Approved by: L. H. Taylor — L.H. Taylor — Date: 5/9/90

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

pH of the solid sample

Instrument	AL10653
Procedure / Rev	LA-212-103/A-3
Technologist	6C269 M. Franz
Date	11/22/89
Temperature	24.7
Starting Time	13:00
Ending Time	15:30
Chemist	R. E. Brandt

	Description	Lab. Id.
1	Initial Check Standard	F5032
2	Blank	F5053
3	Sample of 89-041	F5033
4	Duplicate of 89-041	F5034
5	Final Check Standard	F5036
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 Standard	72C11/5.0 ml			5.0 ml

Prepared by: H. S. Rich (Signature) — H. S. Rich (Printed Name) — Date: 04/06/90

Verified by: Carry M. Seidel (Signature) — C. M. Seidel (Printed Name) — Date: 04/06/90

Approved by: L. H. Taylor (Signature) — L.H. Taylor (Printed Name) — Date: 5/9/90

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

9112059035

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

% Water in Sample 89-041

Instrument	N/A
Procedure / Rev	LA-564-101/D-1
Technologist	6B598 R.D. Hale
Date	11/28/89
Temperature	120 C
Starting Time	10:00 11/27/89
Ending Time	10:00 11/28/89
Chemist	R.E. Brandt

	Description	Lab. Id.
1	Initial Check Standard	F5032
2	Reagent Blank	F5053
3	Sample 89-041	F5033
4	Duplicate of 89-041	F5034
5	Final Check Standard	F5036
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 Standard	11C11AG/1.0g.			1.0 gram

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: May 4, 1990

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: May 4, 1990

Approved by: [signature] Signature — L.H. Taylor Printed Name — Date: 5/9/90

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

9 1 1 2 0 5 9 0 6 3 6

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9 1 1 2 5 9 0 6 3 7

KOH FUSION ANALYSIS

9 1 1 2 7 5 9 0 6 7 3

Single Shell Tank Project

Fusion Analsysis
Laboratory Results of Solids
Units are Sample Wet Weight

Tank: 241-U-110
Core: 5
Segment: 4
Customer ID: 89-041

Laboratory ID:	Check Standard F5037	Blank F5052	Sample F5038	Sample Duplicate F5039	Spike of Sample F5040	Check Standard F5041
Fusion Digestion (First Digestion)			3.03 g/L	3.4 g/L		
Total Alpha	95.10%	<2.42E-04 uci/L	3.63E-01 uci/g	4.38E-01 uci/g	*	86.40%
Total Beta	95.40%	<5.58E-04 uci/L	1.08E+03 uci/g	1.14E+03 uci/g	*	94.80%
Uranium	108.30%	0.359 ug/L	2.16E+03 ug/g	2.89E+03 ug/g	113.30%	98.60%
Fusion Digestion (Second Digestion)			1.92 g/L	1.73 g/L		
GEA						
Cs-137	102.80%	<6.32E-02 uci/L	4.84E+01 uci/g	4.29E+01 uci/g	106.00%	102.10%

* Ratio of Standard To Spike Insufficient To Calculate Spike Recovery.

Single Shell Tank Project

Fusion Analysis

Sample Results on Laboratory Digestions

Tank: 241-U-110
Core: 5
Segment: 4
Customer ID: 89-041

Laboratory ID:	Check Standard F5037	Blank F5052	Sample F5038	Sample Duplicate F5039	Spike of Sample F5040	Check Standard F5041
Fusion Digestion (First Digestion)			3.03 g/L	3.4 g/L		
Total Alpha	95.10%	<2.42E-04 uci/L	1.10E+00 uci/L	1.49E+00 uci/L	*	86.40%
Total Beta	95.40%	<5.58E-04 uci/L	3.28E+03 uci/L	3.88E+03 uci/L	*	94.80%
Uranium	108.30%	0.359 ug/L	6.55E-03 ug/L	9.82E-03 ug/L	113.30%	98.60%
Fusion Digestion (Second Digestion)			1.92 g/L	1.73 g/L		
GEA						
Cs-137	102.80%	<6.32E-02 uci/L	9.29E+01 uci/L	7.42E+01 uci/L	106.00%	102.10%

* Ratio of Standard to Sample was insufficient to calculate the spike recovery.

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Fusion Dissolution

Instrument	N/A
Procedure / Rev	LA-549-141/A-0
Technologist	6B598 R. D. Hale
Date	11/22/89
Temperature	450 C
Starting Time	10:30
Ending Time	2:30
Chemist	S. A. Catlow

	Description	Lab. Id.
1	Reagent Blank	F5052
2	Sample 89-041	F5038
3	Duplicate 89-041	F5039
4		
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				

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: 04/06/90

Verified by: Carry M Seidel Signature — C. M. Seidel Printed Name — Date: 04/06/90

Approved by: [signature] Signature — L. H. Taylor Printed Name — Date: 8/30/90

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

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Second Fusion Dissolution

Instrument	N/A
Procedure / Rev	LA-549-141/A-0
Technologist	6B598 R. D. Hale
Date	4-30-90
Temperature	450 C
Starting Time	08:30
Ending Time	10:00
Chemist	S. A. Catlow

	Description	Lab. Id.
1	Reagent Blank	F5052
2	Sample 89-041	F5038
3	Duplicate of 89-041	F5039
4		
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				

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: May 4, 1990

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: May 4, 1990

Approved by: [signature] Signature — L. H. Taylor Printed Name — Date: 5/9/90

Interim

Rev. E 4/04/90

SST-102

9 1 1 2 5 9 0 6 1 2

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Instrument	WA57277
Procedure / Rev	LA-548-101/A-2
Technologist	6C269 M. Franz
Date	11/29/89
Temperature	N/A
Starting Time	07:30
Ending Time	14:30
Chemist	S. A. Catlow

Total Alpha + Total Beta
Fusion Dissolution
Detector 16
Samples were prepared in batch, but counted randomly.

	Description	Lab. Id.
1	Initial Check Standard	F5037
2	Reagent Blank	F5052
3	Sample 89-041	F5038
4	Duplicate of 89-041	F5039
5	Spike of 89-041	F5040
6	Final Check Standard	F5041
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 Standard	83B44/10 mL			10 mL
Spike	83B44/10 mL	Sample/5 ul		10.005 mL

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: May 4, 1990

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: May 4, 1990

Approved by: [signature] Signature — L. H. Taylor Printed Name — Date: 5/9/90

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

9 1 1 2 5 9 0 5 1 3

Single Shell Tank Calibration Record

Phase I-A

Analyte: Am^{241}; Co^{60}

Procedure LQ-508-002	Revision: A-0
Instrument: Detector #16	Property Number: WA63999
Technologist: R. A. Jones	Payroll Number: 65801
Date: 2-27-88	

Calibration Standard ID: 36B40A4; 36B40B4; 36B40C4

Analyte Concentration: N/A

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: May 4, 1990

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: May 4, 1990

Approved by: [signature] Signature — L. H. Taylor Printed Name — Date: May 9, 1990

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

9 1 1 2 7 5 7 0 5 1 4

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

DETECTOR No. 16

		TIME ZERO DATE (HD):	15883
RADIONUCLIDE:	Co-60	DATE COUNTED 5" (HD)	15954
HALF LIFE:	1925	DATE COUNTED 2" (HD)	16298
COUNT TIME:	5	DATE COUNTED 1" (HD)	15917
CPM BKG:	8		
CPM 1" BKG:	8	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.
32B40A8	1	04/24/88	1200	113109	111016	110133	111447
32B40B7	1	04/24/88	1200	204475	206864	207083	206310
32B40C7	1	04/24/88	1200	300283	298335	294777	296162
32B40A4	2	05/31/88	1200	90965	89136	88796	88938
32B40B3	2	05/31/88	1200	168475	166598	166421	168782
32B40C4	2	05/31/88	1200	254942	252194	253139	256756
32B40A5	5	06/17/88	1200	81186	80053	81855	80106
32B40B6	5	06/17/88	1200	158490	161830	157312	163104
32B40C5	5	06/17/88	1200	228479	233088	233428	231241

9 1 1 2 5 9 0 6 1 5

STANDARD ID	SIZE	STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
32B40A8	1"	69550	22272	1.01	22547	0.3242
32B40B7	1"	134700	41224	1.01	41731	0.3098
32B40C7	1"	201000	59465	1.01	60197	0.2995

AVERAGE, 1" = 0.3112 +/- @95% 0.0243 7.81 % ON 04/24/88

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
32B40A3	2"	71060	17873	1.16	20753	0.2921
32B40B3	2"	135500	33495	1.16	38893	0.2870
32B40C4	2"	200800	50833	1.16	59025	0.2940

AVERAGE, 2" = 0.2910 +/- @95% 0.0070 2.41 % ON 05/10/89

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
32B40A5	5"	70160	16141	1.03	16559	0.2360
32B40B6	5"	135700	32018	1.03	32847	0.2421
32B40C5	5"	201900	46293	1.03	47492	0.2352

AVERAGE, 5" = 0.2378 +/- @95% 0.0073 3.08 % ON 05/31/88

NEW EFFS FOR DET 16 Co-60 1" = 0.3112 2" = 0.2910

5" = 0.2378

---

9 1 1 2 0 5 9 0 6 1 6

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

DETECTOR No. 16 5" STD

RADIONUCLIDE: Am-241
HALF LIFE: 157800
COUNT TIME: 5
CPM BKG: 0.5
CPM 1" BKG: 0.5

TIME ZERO DATE (HD): 13367
TIME ZERO DATE (HD): 15883
DATE COUNTED 5" (HD) 15860
DATE COUNTED 2" (HD) 16298
DATE COUNTED 1" (HD) 15917

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.
36B40A7	1	04/25/88	1200	88249	88650	88197	88524
36B40A8	1	04/25/88	1200	87657	86696	87396	87208
36B40B7	1	04/25/88	1200	153949	153455	153519	153879
36B40B8	1	04/25/88	1200	159185	159612	159046	158672
36B40C7	1	04/25/88	1200	224092	223920	224469	225263
36B40C8	1	04/25/88	1200	219897	221702	221080	220950
36B40A4	2	05/10/89	1200	66063	66703	66300	66314
36B40B4	2	05/10/89	1200	122898	122457	122769	122929
36B40C4	2	05/10/89	1200	178443	179133	178587	177410
43B16N	5	02/27/88	1200	67302	66084	69151	70103
43B16O	5	02/27/88	1200	112955	117083	116239	116860
43B16Q	5	02/27/88	1200	185670	190640	192034	187717

STANDARD ID	SIZE	STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM		EFFICIENCY
36B40A7	1"	62710	17681	1.00	17683		0.2820
36B40A8	1"	60570	17447	1.00	17450		0.2881
36B40B7	1"	109900	30740	1.00	30744		0.2797
36B40B8	1"	109800	31825	1.00	31830		0.2899
36B40C7	1"	159700	44887	1.00	44893		0.2811
36B40C8	1"	159800	44181	1.00	44188		0.2765
AVERAGE, 1" =		0.2829 +/- @95%		0.0100	3.54 %	ON	04/24/88

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM		EFFICIENCY
36B40A4	2"	61210	13268	1.00	13292		0.2172
36B40B4	2"	111700	24552	1.00	24596		0.2202
36B40C4	2"	160600	35678	1.00	35743		0.2226
AVERAGE, 2" =		0.2200 +/- @95%		0.0053	2.41 %	ON	05/10/89

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM		EFFICIENCY
43B16N	5"	62090	13632	1.01	13782		0.2220
43B16O	5"	106400	23157	1.01	23412		0.2200
43B16Q	5"	181900	37803	1.01	38219		0.2101
AVERAGE, 5" =		0.2174 +/- @95%		0.0125	5.74 %	ON	02/27/88

NEW EFFS FOR DET 16 Am-241 1" = 0.2829 2" = 0.2200

5" = 0.2174

ALPHA BETA EFF. DETECTOR #16

ISOTOPE	1"	2"	5"	DATE1"	DATE2"	DATE5"
AM241	.2861	.2211	.2107	022290	022290	022290
CO60	.2991	.2877	.2502	022290	022290	022290
SR85	.	.				
Y88	.	.				
SR89	.	.				
SR90	.	.				
Y90	.	.				
SRY90	.	.				
TC99	.	.				
RU103	.	.				
RURH106	.	.				
SB125	.	.				
CS134	.	.				
CS137	.4316	.		032489		
CEPR144	.	.				
PM147	.2117	.		032489		
SM151	.	.				
SN113	.	.				
ZRNB95	.	.				

B/A

ALPHA BETA EFF. DETECTOR #16

ISOTOPE	1"	2"	5"	DATE1"	DATE2"	DATE5"
AM241	.2829	.2200	.2174	042688	051289	022988
CO60	.3112	.2910	.2378	060188	051289	061688
SR85	.	.				
Y88	.	.				
SR89	.	.				
SR90	.	.				
Y90	.	.				
SRY90	.	.				
TC99	.	.				
RU103	.	.				
RURH106	.	.				
SB125	.	.				
CS134	.	.				
CS137	.4316	.		032489		
CEPR144	.	.				
PM147	.2117	.		032489		
SM151	.	.				
SN113	.	.				
ZRNB95	.	.				

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Instrument	401934
Procedure / Rev	LA-548-121/C-2
Technologist	6B598 R. D. Hale
Date	5/2/90
Temperature	N/A
Starting Time	13:00
Ending Time	14:00
Chemist	S. A. Catlow

GEA Analysis

Second Fusion Dissolution

Samples are prepared in batch, but counted randomly.

	Description	Lab. Id.
1	Initial Check Standard	F5037
2	Reagent Blank	F5052
3	Sample of 89-041	F5038
4	Duplicate of 89-041	F5039
5	Spike 89-041	F5040
6	Ending Check Standard	F5041
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 Standard	122B44/500uL			22 mL
Spike	122B44/500uL	Sample/100uL		22 mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 8-10-90

Verified by: Cary M. Seidel (Signature) C. M. Seidel (Printed Name) Date: 8-10-90

Approved by: R. H. Taylor (Signature) R. H. Taylor (Printed Name) Date: 8-30-90

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

Single Shell Tank Calibration Record

Phase I-A

Analyte:	Mixed Isotope Standards		
Procedure	LQ-508-003	Revision:	A-0
Instrument:	GEA Detector #3	Property Number:	WA-77228
Technologist:	J. L. Anderson	Payroll Number:	61413
Date:	02/07/89		

Calibration Standard ID: 56B40D1

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: May 4, 1990

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: May 4, 1990

Approved by: [signature] Signature — L. H. Taylor Printed Name — Date: May 9, 1990

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

9112150652

DETECTOR: 3
GEOMETRY CODE: 41
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 1
CALIBRATION DATE: 2-Jul-89
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56B40 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	2.833765E-02
88.032	2.881764E-02
122.0614	2.756557E-02
165.853	2.270614E-02
279.1967	
391.668	1.285730E-02
513.99	
661.65	7.841011E-03
898.021	5.779292E-03
1173.237	4.773005E-03
1332.501	4.278530E-03
1836.129	3.371238E-03

EQUATION 0-165 KEV

```
LOG(EFF) =    -1.113845E+01
         +     3.484260E+00 *LOG(ENERGY)
         +    -3.990659E-01 *LOG(ENERGY)^2
```

EQUATION 165-1836 KEV

```
LOG(EFF) =    -2.052334E+01
         +     9.121738E+00 *LOG(ENERGY)
         +    -1.553578E+00 *LOG(ENERGY)^2
         +     8.018036E-02 *LOG(ENERGY)^3
```

GEA CALIBRATION RECORD PROCEDURE LQ-508-003

DETECTOR: 3
GEOMETRY CODE: 42
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 2
CALIBRATION DATE: 2-Jul-89
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56B40 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	7.455306E-03
88.032	7.462748E-03
122.0614	7.578302E-03
165.853	6.965814E-03
279.1967	
391.668	3.596591E-03
513.99	
661.65	2.318396E-03
898.021	1.824191E-03
1173.237	1.461179E-03
1332.501	1.321243E-03
1836.129	1.011332E-03

EQUATION 0-165 KEV

```
LOG(EFF) =    -6.838496E+00
         +     8.819509E-01 *LOG(ENERGY)
         +    -9.970528E-02 *LOG(ENERGY)^2
```

EQUATION 165-1836 KEV

```
LOG(EFF) =     3.082260E-01
         +    -1.410839E+00 *LOG(ENERGY)
         +     1.042898E-01 *LOG(ENERGY)^2
         +    -5.874725E-03 *LOG(ENERGY)^3
```

GEA CALIBRATION RECORD PROCEDURE LQ-508-003

DETECTOR: 3
GEOMETRY CODE: 43
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 3
CALIBRATION DATE: 2-Jul-89
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56B40 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	2.020462E-03
88.032	1.924344E-03
122.0614	2.027231E-03
165.853	1.712371E-03
279.1967	
391.668	1.056509E-03
513.99	
661.65	7.115743E-04
898.021	5.243928E-04
1173.237	4.551585E-04
1332.501	4.223636E-04
1836.129	3.139091E-04

EQUATION 0-165 KEV

```
LOG(EFF) =    -5.300788E+00
         +    -3.550643E-01 *LOG(ENERGY)
         +     3.272635E-02 *LOG(ENERGY)^2
```

EQUATION 165-1836 KEV

```
LOG(EFF) =    -9.815549E+00
         +     2.402920E+00 *LOG(ENERGY)
         +    -4.428877E-01 *LOG(ENERGY)^2
         +     2.059131E-02 *LOG(ENERGY)^3
```

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                     *
*          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 WESTINGHOUSE HANFORD 04-MAY-90 12:32:12

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: 3.0
DETECTOR NUMBER: 3 / 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: 1.00 SIGMA UNCERTAINTY

LLD CALCULATION PERFORMED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD3615
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F5037-6530
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 2-MAY-90 AT 16:49:10

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3008. SECONDS
DEAD TIME: 0.27 %

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

ENERGY CALIBRATION PERFORMED 17-OCT-89
EFFICIENCY CALIBRATION PERFORMED 31-JUL-89

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:32:12

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	59.59	30.38	1.34	1659.	387.	14.9	
2C	63.96	32.56	1.34	1598.	2579.	4.8	CE-144
3C	73.00	37.08	1.34	1471.	616.	9.9	I-129
4C	1126.58	563.34	1.45	689.	428.	9.2	CS-134, EU-152
5C	1138.93	569.51	1.45	731.	851.	7.5	CS-134, BI-207
6	1209.70	604.88	1.60	778.	5902.	1.5	CS-134
7	1323.58	661.79	1.69	569.	11089.	1.0	CS-137
8C	1591.91	795.90	1.66	533.	3952.	2.4	CS-134
9C	1604.02	801.96	1.66	497.	357.	12.0	CS-134
10	2346.60	1173.25	1.98	405.	5529.	1.5	CO-60
11	2665.04	1332.54	1.92	115.	5058.	1.5	CO-60
12	2730.71	1365.39	1.82	45.	120.	13.4	CS-134
13	2921.99	1461.09	2.01	32.	677.	4.1	K-40

ERROR QUOTATION AT 1.00 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:32:12

SAMPLE: F5037-6530
DATA COLLECTED ON 2-MAY-90 AT 16:49:10
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
AC-228	LLD<8.95E-01		LLD<8.95E-01	
AG-108M	LLD<1.81E-01		LLD<1.81E-01	
AG-110M	LLD<8.65E-01		LLD<8.65E-01	
AM-241	LLD<1.77E-01		LLD<1.77E-01	
AM-243	LLD<9.61E-02		LLD<9.61E-02	
AR-41	LLD<1.83E-01		LLD<1.83E-01	
AU-198	LLD<1.65E-01		LLD<1.65E-01	
BA-133	LLD<2.15E-01		LLD<2.15E-01	
BA-139	LLD<4.61E-01		LLD<4.61E-01	
BA-140	LLD<7.33E-01		LLD<7.33E-01	
BA-141	LLD<5.00E-01		LLD<5.00E-01	
BE-7	LLD<1.76E+00		LLD<1.76E+00	
BI-207	LLD<1.93E-01		LLD<1.93E-01	
BI-212	LLD<2.76E+00		LLD<2.76E+00	
BI-214	LLD<1.32E+00		LLD<1.32E+00	
CD-109	LLD<1.92E+00		LLD<1.92E+00	
CE-139	LLD<1.04E-01		LLD<1.04E-01	
CE-141	LLD<1.66E-01		LLD<1.66E-01	
CEPR144	LLD<1.42E+00		LLD<1.42E+00	
CO-56	LLD<1.96E-01		LLD<1.96E-01	
CO-57	LLD<8.91E-02		LLD<8.91E-02	
CO-58	LLD<2.00E-01		LLD<2.00E-01	
CO-60	2.13E+01	+-3.39E-01	2.13E+01	+-3.39E-01
CR-51	LLD<1.25E+00		LLD<1.25E+00	
CS-134	1.25E+01	+-3.15E-01	1.25E+01	+-3.15E-01
CS-136	LLD<1.98E-01		LLD<1.98E-01	
CS-137	2.99E+01	+-3.70E-01	2.99E+01	+-3.70E-01
CS-138	LLD<2.61E-01		LLD<2.61E-01	
EU-152	LLD<9.68E-01		LLD<9.68E-01	
EU-154	LLD<4.34E-01		LLD<4.34E-01	
EU-155	LLD<3.17E-01		LLD<3.17E-01	
FE-59	LLD<5.07E-01		LLD<5.07E-01	
HF-181	LLD<2.18E-01		LLD<2.18E-01	
HG-203	LLD<1.40E-01		LLD<1.40E-01	
I-131	LLD<1.78E-01		LLD<1.78E-01	
I-132	LLD<3.32E-01		LLD<3.32E-01	
I-133	LLD<1.91E-01		LLD<1.91E-01	
I-134	LLD<3.07E-01		LLD<3.07E-01	
I-135	LLD<4.89E-01		LLD<4.89E-01	
K-40	2.85E+01	+-1.20E+00	2.85E+01	+-1.20E+00
KR-85	LLD<4.11E+01		LLD<4.11E+01	
KR-85M	LLD<1.27E-01		LLD<1.27E-01	
KR-87	LLD<3.96E-01		LLD<3.96E-01	
KR-89	LLD<5.47E+00		LLD<5.47E+00	
LA-140	LLD<1.15E-01		LLD<1.15E-01	
LA-142	LLD<4.30E-01		LLD<4.30E-01	
MN-54	LLD<2.18E-01		LLD<2.18E-01	

MN-56	LLD<2.22E-01	LLD<2.22E-01
NA-22	LLD<1.68E-01	LLD<1.68E-01
NA-24	LLD<1.20E-01	LLD<1.20E-01
NB-94	LLD<1.84E-01	LLD<1.84E-01
NB-95	LLD<1.88E-01	LLD<1.88E-01
NB-97	LLD<1.05E+00	LLD<1.05E+00
NP-238	LLD<9.51E-01	LLD<9.51E-01
NP-239	LLD<7.97E-01	LLD<7.97E-01
PA-233	LLD<3.29E-01	LLD<3.29E-01
PA-234M	LLD<4.32E+01	LLD<4.32E+01
PB-210	LLD<4.53E+00	LLD<4.53E+00
PB-212	LLD<2.70E-01	LLD<2.70E-01
PB-214	LLD<3.89E-01	LLD<3.89E-01
PO-210	LLD<1.56E+04	LLD<1.56E+04
PO-214	LLD<6.00E+03	LLD<6.00E+03
PO-216	LLD<1.18E+04	LLD<1.18E+04
PU-239	LLD<1.22E+03	LLD<1.22E+03
PU-241	LLD<4.42E+04	LLD<4.42E+04
RA-224	LLD<2.85E+00	LLD<2.85E+00
RA-226	LLD<2.97E+00	LLD<2.97E+00
RB-88	LLD<1.23E+00	LLD<1.23E+00
RB-89	LLD<1.17E+00	LLD<1.17E+00
RN-220	LLD<1.59E+02	LLD<1.59E+02
RU-103	LLD<1.85E-01	LLD<1.85E-01
RURH106	LLD<3.52E+00	LLD<3.52E+00
SB-124	LLD<3.79E-01	LLD<3.79E-01
SB-125	LLD<1.30E+00	LLD<1.30E+00
SC-46	LLD<2.49E-01	LLD<2.49E-01
SE-75	LLD<1.94E-01	LLD<1.94E-01
SN-113	LLD<2.40E-01	LLD<2.40E-01
SR-85	LLD<1.80E-01	LLD<1.80E-01
SR-91	LLD<2.96E-01	LLD<2.96E-01
SR-92	LLD<1.79E-01	LLD<1.79E-01
TA-182	LLD<7.30E-01	LLD<7.30E-01
TC-99M	LLD<9.31E-02	LLD<9.31E-02
TE-123M	LLD<1.00E-01	LLD<1.00E-01
TE-125M	LLD<2.50E+01	LLD<2.50E+01
TE-132	LLD<1.29E-01	LLD<1.29E-01
TH-228	LLD<5.15E+00	LLD<5.15E+00
TL-208	LLD<1.99E-01	LLD<1.99E-01
U-235	LLD<1.80E-01	LLD<1.80E-01
U-237	LLD<5.22E-01	LLD<5.22E-01
W-187	LLD<6.08E-01	LLD<6.08E-01
XE-131M	LLD<4.39E+00	LLD<4.39E+00
XE-133	LLD<1.72E-01	LLD<1.72E-01
XE-133M	LLD<1.10E+00	LLD<1.10E+00
XE-135	LLD<1.27E-01	LLD<1.27E-01
XE-138	LLD<9.73E-01	LLD<9.73E-01
Y-88	LLD<1.17E-01	LLD<1.17E-01
Y-91	LLD<6.81E+01	LLD<6.81E+01
Y-91M	LLD<2.24E-01	LLD<2.24E-01
ZN-65	LLD<5.35E-01	LLD<5.35E-01
ZR-95	LLD<3.28E-01	LLD<3.28E-01
ZR-97	LLD<1.78E-01	LLD<1.78E-01
TOTAL	9.23E+01 +-1.34E+00	9.23E+01 +-1.34E+00

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 2.15E-09 UC/LI
TOTAL MEASURED ACTIVITY = 9.23E+01 (+-1.34E+00) UC/LI

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

ERROR QUOTATION AT 1.00 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
59.59	30.38	387.	14.9	6.34E+00
63.96	32.56	2579.	4.8	4.01E+01
73.00	37.08	616.	9.9	8.81E+00
1126.58	563.34	428.	9.2	1.57E+01
1138.93	569.51	851.	7.5	3.15E+01
1604.02	801.96	357.	12.0	1.81E+01
2730.71	1365.39	120.	13.4	9.55E+00

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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 04-MAY-90 12:36:32

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: 3.0
DETECTOR NUMBER: 3 / 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: 1.00 SIGMA UNCERTAINTY

LLD CALCULATION PERFORMED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD3616
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F5052
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 2-MAY-90 AT 17:59:04

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-OCT-89
EFFICIENCY CALIBRATION PERFORMED 31-JUL-89

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:36:32

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	704.00	352.21	1.37	218.	119.	20.3	PB-214
2	1021.91	511.04	1.73	145.	129.	16.5	RN-222,I-133, TL-208,NA-22, ZN-65,RH-106
3	1166.98	583.53	1.92	119.	110.	17.6	TL-208
4	1218.83	609.44	1.57	95.	161.	12.2	BI-214, RU-103
5	1323.96	661.98	1.40	102.	89.	20.4	CS-137
6	1822.73	911.29	1.66	72.	82.	20.1	
7	2921.84	1461.02	2.09	16.	657.	4.0	K-40

ERROR QUOTATION AT 1.00 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:36:32

SAMPLE: F5052
DATA COLLECTED ON 2-MAY-90 AT 17:59:04
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
AC-228	LLD<1.50E-01		LLD<1.50E-01	
AG-108M	LLD<3.49E-02		LLD<3.49E-02	
AG-110M	LLD<5.72E-02		LLD<5.72E-02	
AM-241	LLD<5.04E-02		LLD<5.04E-02	
AM-243	LLD<3.04E-02		LLD<3.04E-02	
AR-41	LLD<6.76E-02		LLD<6.76E-02	
AU-198	LLD<3.17E-02		LLD<3.17E-02	
BA-133	LLD<5.48E-02		LLD<5.48E-02	
BA-139	LLD<1.47E-01		LLD<1.47E-01	
BA-140	LLD<1.45E-01		LLD<1.45E-01	
BA-141	LLD<1.42E-01		LLD<1.42E-01	
BE-7	LLD<3.45E-01		LLD<3.45E-01	
BI-207	LLD<3.61E-02		LLD<3.61E-02	
BI-212	LLD<6.39E-01		LLD<6.39E-01	
BI-214	3.83E-01	+-4.68E-02	3.83E-01	+-4.68E-02
CD-109	LLD<6.11E-01		LLD<6.11E-01	
CE-139	LLD<3.32E-02		LLD<3.32E-02	
CE-141	LLD<5.49E-02		LLD<5.49E-02	
CEPR144	LLD<4.61E-01		LLD<4.61E-01	
CO-56	LLD<4.42E-02		LLD<4.42E-02	
CO-57	LLD<2.94E-02		LLD<2.94E-02	
CO-58	LLD<4.79E-02		LLD<4.79E-02	
CO-60	LLD<5.12E-02		LLD<5.12E-02	
CR-51	LLD<2.96E-01		LLD<2.96E-01	
CS-134	LLD<5.57E-02		LLD<5.57E-02	
CS-136	LLD<4.60E-02		LLD<4.60E-02	
CS-137	1.20E-01	+-2.46E-02	1.20E-01	+-2.46E-02
CS-138	LLD<1.06E-01		LLD<1.06E-01	
EU-152	LLD<2.75E-01		LLD<2.75E-01	
EU-154	LLD<1.52E-01		LLD<1.52E-01	
EU-155	LLD<1.06E-01		LLD<1.06E-01	
FE-59	LLD<1.05E-01		LLD<1.05E-01	
HF-181	LLD<3.92E-02		LLD<3.92E-02	
HG-203	LLD<3.60E-02		LLD<3.60E-02	
I-131	LLD<3.68E-02		LLD<3.68E-02	
I-132	LLD<4.25E-02		LLD<4.25E-02	
I-133	LLD<3.60E-02		LLD<3.60E-02	
I-134	LLD<6.60E-02		LLD<6.60E-02	
I-135	LLD<2.35E-01		LLD<2.35E-01	
K-40	1.39E+01	+-5.74E-01	1.39E+01	+-5.74E-01
KR-85	LLD<1.05E+01		LLD<1.05E+01	
KR-85M	LLD<4.11E-02		LLD<4.11E-02	
KR-87	LLD<8.08E-02		LLD<8.08E-02	
KR-89	LLD<1.46E+00		LLD<1.46E+00	
LA-140	LLD<4.30E-02		LLD<4.30E-02	
LA-142	LLD<8.92E-02		LLD<8.92E-02	
MN-54	LLD<4.60E-02		LLD<4.60E-02	

MN-56	LLD<4.98E-02		LLD<4.98E-02	
NA-22	LLD<5.90E-02		LLD<5.90E-02	
NA-24	LLD<5.61E-02		LLD<5.61E-02	
NB-94	LLD<4.21E-02		LLD<4.21E-02	
NB-95	LLD<4.19E-02		LLD<4.19E-02	
NB-97	LLD<6.94E-02		LLD<6.94E-02	
NP-238	LLD<1.67E-01		LLD<1.67E-01	
NP-239	LLD<2.15E-01		LLD<2.15E-01	
PA-233	LLD<8.11E-02		LLD<8.11E-02	
PA-234M	LLD<7.26E+00		LLD<7.26E+00	
PB-210	LLD<9.15E-01		LLD<9.15E-01	
PB-212	LLD<7.15E-02		LLD<7.15E-02	
PB-214	LLD<8.71E-02		LLD<8.71E-02	
PO-210	LLD<3.90E+03		LLD<3.90E+03	
PO-214	LLD<4.46E+02		LLD<4.46E+02	
PO-216	LLD<2.34E+03		LLD<2.34E+03	
PU-239	LLD<4.06E+02		LLD<4.06E+02	
PU-241	LLD<1.40E+04		LLD<1.40E+04	
RA-224	LLD<7.74E-01		LLD<7.74E-01	
RA-226	LLD<8.18E-01		LLD<8.18E-01	
RB-88	LLD<4.00E-01		LLD<4.00E-01	
RB-89	LLD<2.03E-01		LLD<2.03E-01	
RN-220	LLD<3.23E+01		LLD<3.23E+01	
RU-103	LLD<3.71E-02		LLD<3.71E-02	
RURH106	LLD<7.30E-01		LLD<7.30E-01	
SB-124	LLD<3.75E-02		LLD<3.75E-02	
SB-125	LLD<4.06E-01		LLD<4.06E-01	
SC-46	LLD<5.69E-02		LLD<5.69E-02	
SE-75	LLD<4.96E-02		LLD<4.96E-02	
SN-113	LLD<4.72E-02		LLD<4.72E-02	
SR-85	LLD<4.59E-02		LLD<4.59E-02	
SR-91	LLD<6.24E-02		LLD<6.24E-02	
SR-92	LLD<7.00E-02		LLD<7.00E-02	
TA-182	LLD<1.69E-01		LLD<1.69E-01	
TC-99M	LLD<3.10E-02		LLD<3.10E-02	
TE-123M	LLD<3.25E-02		LLD<3.25E-02	
TE-125M	LLD<8.51E+00		LLD<8.51E+00	
TE-132	LLD<3.47E-02		LLD<3.47E-02	
TH-228	LLD<1.67E+00		LLD<1.67E+00	
TL-208	1.35E-01	+-2.37E-02	1.35E-01	+-2.37E-02
U-235	LLD<5.01E-02		LLD<5.01E-02	
U-237	LLD<1.53E-01		LLD<1.53E-01	
W-187	LLD<1.39E-01		LLD<1.39E-01	
XE-131M	LLD<1.41E+00		LLD<1.41E+00	
XE-133	LLD<5.40E-02		LLD<5.40E-02	
XE-133M	LLD<2.94E-01		LLD<2.94E-01	
XE-135	LLD<3.43E-02		LLD<3.43E-02	
XE-138	LLD<2.48E-01		LLD<2.48E-01	
Y-88	LLD<3.80E-02		LLD<3.80E-02	
Y-91	LLD<2.46E+01		LLD<2.46E+01	
Y-91M	LLD<4.72E-02		LLD<4.72E-02	
ZN-65	LLD<1.36E-01		LLD<1.36E-01	
ZR-95	LLD<7.71E-02		LLD<7.71E-02	
ZR-97	LLD<4.36E-02		LLD<4.36E-02	
TOTAL	1.45E+01	+-5.77E-01	1.45E+01	+-5.77E-01

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 3.64E-13 UC/LI
TOTAL MEASURED ACTIVITY = 1.45E+01 (+-5.77E-01) UC/LI

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

ERROR QUOTATION AT 1.00 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
704.00	352.21	119.	20.3	2.88E+00
1021.91	511.04	129.	16.5	4.33E+00
1822.73	911.29	82.	20.1	4.61E+00

9 1 1 2 0 5 9 0 6 4

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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 04-MAY-90 12:40:00

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: 3.0
DETECTOR NUMBER: 3 / 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: 1.00 SIGMA UNCERTAINTY

LLD CALCULATION PERFORMED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD3617
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F5038
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 2-MAY-90 AT 18:59:52

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3004. SECONDS
DEAD TIME: 0.13 %

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

ENERGY CALIBRATION PERFORMED 17-OCT-89
EFFICIENCY CALIBRATION PERFORMED 31-JUL-89

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:40:00

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	64.04	32.60	1.27	2136.	1267.	8.9	CE-144
2C	72.97	37.06	1.27	1830.	292.	17.1	I-129
3	1218.88	609.46	1.17	159.	161.	14.1	BI-214, RU-103
4	1323.57	661.78	1.65	179.	6970.	1.2	CS-137
5	2921.82	1461.01	1.79	27.	631.	4.2	K-40

ERROR QUOTATION AT 1.00 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY

9112059056

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:40:00

SAMPLE: F5038
DATA COLLECTED ON 2-MAY-90 AT 18:59:52
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
AC-228	LLD<1.69E+00		LLD<1.69E+00	
AG-108M	LLD<5.52E-01		LLD<5.52E-01	
AG-110M	LLD<3.39E+00		LLD<3.39E+00	
AM-241	LLD<8.83E-01		LLD<8.83E-01	
AM-243	LLD<4.56E-01		LLD<4.56E-01	
AR-41	LLD<5.57E-01		LLD<5.57E-01	
AU-198	LLD<5.21E-01		LLD<5.21E-01	
BA-133	LLD<6.94E-01		LLD<6.94E-01	
BA-139	LLD<1.82E+00		LLD<1.82E+00	
BA-140	LLD<1.90E+00		LLD<1.90E+00	
BA-141	LLD<1.87E+00		LLD<1.87E+00	
BE-7	LLD<5.26E+00		LLD<5.26E+00	
BI-207	LLD<4.81E-01		LLD<4.81E-01	
BI-212	LLD<6.64E+00		LLD<6.64E+00	
BI-214	3.83E+00	+-5.41E-01	3.83E+00	+-5.41E-01
CD-109	LLD<8.47E+00		LLD<8.47E+00	
CE-139	LLD<4.12E-01		LLD<4.12E-01	
CE-141	LLD<6.69E-01		LLD<6.69E-01	
CEPR144	LLD<5.79E+00		LLD<5.79E+00	
CO-56	LLD<4.50E-01		LLD<4.50E-01	
CO-57	LLD<3.66E-01		LLD<3.66E-01	
CO-58	LLD<4.15E-01		LLD<4.15E-01	
CO-60	LLD<5.51E-01		LLD<5.51E-01	
CR-51	LLD<3.83E+00		LLD<3.83E+00	
CS-134	LLD<5.43E-01		LLD<5.43E-01	
CS-136	LLD<4.09E-01		LLD<4.09E-01	
CS-137	9.40E+01	+-1.34E+00	9.40E+01	+-1.34E+00
CS-138	LLD<9.58E-01		LLD<9.58E-01	
EU-152	LLD<2.75E+00		LLD<2.75E+00	
EU-154	LLD<1.75E+00		LLD<1.75E+00	
EU-155	LLD<1.41E+00		LLD<1.41E+00	
FE-59	LLD<1.05E+00		LLD<1.05E+00	
HF-181	LLD<6.55E-01		LLD<6.55E-01	
HG-203	LLD<4.72E-01		LLD<4.72E-01	
I-131	LLD<5.36E-01		LLD<5.36E-01	
I-132	LLD<1.18E+00		LLD<1.18E+00	
I-133	LLD<5.21E-01		LLD<5.21E-01	
I-134	LLD<7.03E-01		LLD<7.03E-01	
I-135	LLD<2.09E+00		LLD<2.09E+00	
K-40	1.33E+02	+-5.77E+00	1.33E+02	+-5.77E+00
KR-85	LLD<1.33E+02		LLD<1.33E+02	
KR-85M	LLD<5.15E-01		LLD<5.15E-01	
KR-87	LLD<1.22E+00		LLD<1.22E+00	
KR-89	LLD<1.91E+01		LLD<1.91E+01	
LA-140	LLD<5.08E-01		LLD<5.08E-01	
LA-142	LLD<1.18E+00		LLD<1.18E+00	
MN-54	LLD<4.52E-01		LLD<4.52E-01	

MN-56	LLD<5.07E-01	LLD<5.07E-01
NA-22	LLD<6.32E-01	LLD<6.32E-01
NA-24	LLD<5.04E-01	LLD<5.04E-01
NB-94	LLD<4.21E-01	LLD<4.21E-01
NB-95	LLD<4.63E-01	LLD<4.63E-01
NB-97	LLD<4.11E+00	LLD<4.11E+00
NP-238	LLD<1.76E+00	LLD<1.76E+00
NP-239	LLD<2.66E+00	LLD<2.66E+00
PA-233	LLD<1.08E+00	LLD<1.08E+00
PA-234M	LLD<8.92E+01	LLD<8.92E+01
PB-210	LLD<1.53E+01	LLD<1.53E+01
PB-212	LLD<9.61E-01	LLD<9.61E-01
PB-214	LLD<1.21E+00	LLD<1.21E+00
PO-210	LLD<3.67E+04	LLD<3.67E+04
PO-214	LLD<4.75E+03	LLD<4.75E+03
PO-216	LLD<2.61E+04	LLD<2.61E+04
PU-239	LLD<5.12E+03	LLD<5.12E+03
PU-241	LLD<1.71E+05	LLD<1.71E+05
RA-224	LLD<1.01E+01	LLD<1.01E+01
RA-226	LLD<1.12E+01	LLD<1.12E+01
RB-88	LLD<4.00E+00	LLD<4.00E+00
RB-89	LLD<2.53E+00	LLD<2.53E+00
RN-220	LLD<4.11E+02	LLD<4.11E+02
RU-103	LLD<5.46E-01	LLD<5.46E-01
RURH106	LLD<8.90E+00	LLD<8.90E+00
SB-124	LLD<5.15E-01	LLD<5.15E-01
SB-125	LLD<4.87E+00	LLD<4.87E+00
SC-46	LLD<5.84E-01	LLD<5.84E-01
SE-75	LLD<6.28E-01	LLD<6.28E-01
SN-113	LLD<7.58E-01	LLD<7.58E-01
SR-85	LLD<5.82E-01	LLD<5.82E-01
SR-91	LLD<8.35E-01	LLD<8.35E-01
SR-92	LLD<6.68E-01	LLD<6.68E-01
TA-182	LLD<1.83E+00	LLD<1.83E+00
TC-99M	LLD<3.80E-01	LLD<3.80E-01
TE-123M	LLD<4.03E-01	LLD<4.03E-01
TE-125M	LLD<1.11E+02	LLD<1.11E+02
TE-132	LLD<4.48E-01	LLD<4.48E-01
TH-228	LLD<2.39E+01	LLD<2.39E+01
TL-208	LLD<5.23E-01	LLD<5.23E-01
U-235	LLD<6.85E-01	LLD<6.85E-01
U-237	LLD<1.83E+00	LLD<1.83E+00
W-187	LLD<1.56E+00	LLD<1.56E+00
XE-131M	LLD<1.76E+01	LLD<1.76E+01
XE-133	LLD<8.16E-01	LLD<8.16E-01
XE-133M	LLD<3.89E+00	LLD<3.89E+00
XE-135	LLD<4.38E-01	LLD<4.38E-01
XE-138	LLD<3.24E+00	LLD<3.24E+00
Y-88	LLD<3.80E-01	LLD<3.80E-01
Y-91	LLD<1.88E+02	LLD<1.88E+02
Y-91M	LLD<6.31E-01	LLD<6.31E-01
ZN-65	LLD<1.25E+00	LLD<1.25E+00
ZR-95	LLD<7.90E-01	LLD<7.90E-01
ZR-97	LLD<4.05E-01	LLD<4.05E-01
TOTAL	2.31E+02 +-5.95E+00	2.31E+02 +-5.95E+00

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 2.81E-08 UC/LI
TOTAL MEASURED ACTIVITY = 2.31E+02 (+-5.95E+00) UC/LI

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

ERROR QUOTATION AT 1.00 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
64.04	32.60	1267.	8.9	1.97E+01
72.97	37.06	292.	17.1	4.18E+00

9 1 1 2 1 5 0 5 6 9

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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 04-MAY-90 12:44:48

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: 3.0
DETECTOR NUMBER: 3 / 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: 1.00 SIGMA UNCERTAINTY

LLD CALCULATION PERFORMED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD3618
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F5039
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 2-MAY-90 AT 20:02:57

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3004. SECONDS
DEAD TIME: 0.13 %

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

ENERGY CALIBRATION PERFORMED 17-OCT-89
EFFICIENCY CALIBRATION PERFORMED 31-JUL-89

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:44:48

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	64.17	32.67	1.30	1797.	1154.	5.8	CE-144
2	1219.12	609.58	1.22	154.	150.	14.8	BI-214, RU-103
3	1323.58	661.79	1.74	132.	5581.	1.4	CS-137
4	1822.90	911.38	2.13	63.	95.	17.1	
5	2921.93	1461.07	2.33	14.	669.	4.0	K-40
6	3528.93	1764.85	1.56	8.	56.	16.4	BI-214

ERROR QUOTATION AT 1.00 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

9 1 1 2 1 5 9 0 6 7 1

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:44:48

SAMPLE: F5039
DATA COLLECTED ON 2-MAY-90 AT 20:02:57
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
AC-228	LLD<1.39E+00		LLD<1.39E+00	
AG-108M	LLD<5.26E-01		LLD<5.26E-01	
AG-110M	LLD<3.01E+00		LLD<3.01E+00	
AM-241	LLD<8.97E-01		LLD<8.97E-01	
AM-243	LLD<4.58E-01		LLD<4.58E-01	
AR-41	LLD<6.04E-01		LLD<6.04E-01	
AU-198	LLD<4.93E-01		LLD<4.93E-01	
BA-133	LLD<6.83E-01		LLD<6.83E-01	
BA-139	LLD<1.79E+00		LLD<1.79E+00	
BA-140	LLD<1.91E+00		LLD<1.91E+00	
BA-141	LLD<1.81E+00		LLD<1.81E+00	
BE-7	LLD<5.20E+00		LLD<5.20E+00	
BI-207	LLD<4.31E-01		LLD<4.31E-01	
BI-212	LLD<6.59E+00		LLD<6.59E+00	
BI-214	3.57E+00	+-5.30E-01	3.57E+00	+-5.30E-01
CD-109	LLD<8.47E+00		LLD<8.47E+00	
CE-139	LLD<4.04E-01		LLD<4.04E-01	
CE-141	LLD<6.72E-01		LLD<6.72E-01	
CEPR144	LLD<5.64E+00		LLD<5.64E+00	
CO-56	LLD<4.42E-01		LLD<4.42E-01	
CO-57	LLD<3.60E-01		LLD<3.60E-01	
CO-58	LLD<3.85E-01		LLD<3.85E-01	
CO-60	LLD<5.12E-01		LLD<5.12E-01	
CR-51	LLD<3.76E+00		LLD<3.76E+00	
CS-134	LLD<5.10E-01		LLD<5.10E-01	
CS-136	LLD<3.83E-01		LLD<3.83E-01	
CS-137	7.53E+01	+-1.17E+00	7.53E+01	+-1.17E+00
CS-138	LLD<1.10E+00		LLD<1.10E+00	
EU-152	LLD<2.75E+00		LLD<2.75E+00	
EU-154	LLD<1.52E+00		LLD<1.52E+00	
EU-155	LLD<1.41E+00		LLD<1.41E+00	
FE-59	LLD<1.07E+00		LLD<1.07E+00	
HF-181	LLD<6.35E-01		LLD<6.35E-01	
HG-203	LLD<4.82E-01		LLD<4.82E-01	
I-131	LLD<5.46E-01		LLD<5.46E-01	
I-132	LLD<1.11E+00		LLD<1.11E+00	
I-133	LLD<4.72E-01		LLD<4.72E-01	
I-134	LLD<6.60E-01		LLD<6.60E-01	
I-135	LLD<2.09E+00		LLD<2.09E+00	
K-40	1.41E+02	+-5.76E+00	1.41E+02	+-5.76E+00
KR-85	LLD<1.22E+02		LLD<1.22E+02	
KR-85M	LLD<5.09E-01		LLD<5.09E-01	
KR-87	LLD<1.17E+00		LLD<1.17E+00	
KR-89	LLD<1.87E+01		LLD<1.87E+01	
LA-140	LLD<6.35E-01		LLD<6.35E-01	
LA-142	LLD<1.07E+00		LLD<1.07E+00	
MN-54	LLD<5.33E-01		LLD<5.33E-01	

MN-56	LLD<4.98E-01	LLD<4.98E-01
NA-22	LLD<5.45E-01	LLD<5.45E-01
NA-24	LLD<5.04E-01	LLD<5.04E-01
NB-94	LLD<4.36E-01	LLD<4.36E-01
NB-95	LLD<4.70E-01	LLD<4.70E-01
NB-97	LLD<3.65E+00	LLD<3.65E+00
NP-238	LLD<1.57E+00	LLD<1.57E+00
NP-239	LLD<2.56E+00	LLD<2.56E+00
PA-233	LLD<1.07E+00	LLD<1.07E+00
PA-234M	LLD<8.40E+01	LLD<8.40E+01
PB-210	LLD<1.43E+01	LLD<1.43E+01
PB-212	LLD<9.31E-01	LLD<9.31E-01
PB-214	LLD<1.19E+00	LLD<1.19E+00
PO-210	LLD<3.52E+04	LLD<3.52E+04
PO-214	LLD<4.11E+03	LLD<4.11E+03
PO-216	LLD<2.38E+04	LLD<2.38E+04
PU-239	LLD<4.97E+03	LLD<4.97E+03
PU-241	LLD<1.71E+05	LLD<1.71E+05
RA-224	LLD<9.91E+00	LLD<9.91E+00
RA-226	LLD<1.08E+01	LLD<1.08E+01
RB-88	LLD<5.19E+00	LLD<5.19E+00
RB-89	LLD<2.37E+00	LLD<2.37E+00
RN-220	LLD<4.03E+02	LLD<4.03E+02
RU-103	LLD<5.18E-01	LLD<5.18E-01
RURH106	LLD<8.48E+00	LLD<8.48E+00
SB-124	LLD<4.42E-01	LLD<4.42E-01
SB-125	LLD<4.91E+00	LLD<4.91E+00
SC-46	LLD<5.54E-01	LLD<5.54E-01
SE-75	LLD<6.25E-01	LLD<6.25E-01
SN-113	LLD<7.08E-01	LLD<7.08E-01
SR-85	LLD<5.36E-01	LLD<5.36E-01
SR-91	LLD<8.07E-01	LLD<8.07E-01
SR-92	LLD<7.00E-01	LLD<7.00E-01
TA-182	LLD<1.69E+00	LLD<1.69E+00
TC-99M	LLD<3.74E-01	LLD<3.74E-01
TE-123M	LLD<3.78E-01	LLD<3.78E-01
TE-125M	LLD<1.10E+02	LLD<1.10E+02
TE-132	LLD<4.29E-01	LLD<4.29E-01
TH-228	LLD<2.42E+01	LLD<2.42E+01
TL-208	LLD<4.92E-01	LLD<4.92E-01
U-235	LLD<6.56E-01	LLD<6.56E-01
U-237	LLD<1.77E+00	LLD<1.77E+00
W-187	LLD<1.60E+00	LLD<1.60E+00
XE-131M	LLD<1.69E+01	LLD<1.69E+01
XE-133	LLD<7.93E-01	LLD<7.93E-01
XE-133M	LLD<3.81E+00	LLD<3.81E+00
XE-135	LLD<4.27E-01	LLD<4.27E-01
XE-138	LLD<3.15E+00	LLD<3.15E+00
Y-88	LLD<4.92E-01	LLD<4.92E-01
Y-91	LLD<1.96E+02	LLD<1.96E+02
Y-91M	LLD<6.10E-01	LLD<6.10E-01
ZN-65	LLD<1.34E+00	LLD<1.34E+00
ZR-95	LLD<8.39E-01	LLD<8.39E-01
ZR-97	LLD<3.91E-01	LLD<3.91E-01
TOTAL	2.20E+02 +-5.90E+00	2.20E+02 +-5.90E+00

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 3.33E-08 UC/LI
TOTAL MEASURED ACTIVITY = 2.20E+02 (+-5.90E+00) UC/LI

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

ERROR QUOTATION AT 1.00 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
64.17	32.67	1154.	5.8	1.79E+01
1822.90	911.38	95.	17.1	5.36E+00
3528.93	1764.85	56.	16.4	5.36E+00

9 1 1 2 5 9 0 5 7 4

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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 04-MAY-90 12:48:52

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: 3.0
DETECTOR NUMBER: 3 / 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: 1.00 SIGMA UNCERTAINTY

LLD CALCULATION PERFORMED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD3619
ANALYZED BY: AJ

SAMPLE DESCRIPTION: F5040
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 2-MAY-90 AT 21:09:01

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3011. SECONDS
DEAD TIME: 0.37 %

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

ENERGY CALIBRATION PERFORMED 17-OCT-89
EFFICIENCY CALIBRATION PERFORMED 31-JUL-89

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:48:52

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	59.12	30.15	1.39	3364.	655.	14.5	
2C	63.96	32.56	1.39	3218.	4583.	4.0	CE-144
3C	72.71	36.93	1.39	2952.	980.	9.9	TE-125M, I-129
4C	1127.03	563.57	1.52	806.	504.	8.4	CS-134, EU-152
5C	1139.02	569.56	1.52	746.	902.	7.2	CS-134, BI-207
6	1209.73	604.89	1.56	807.	5620.	1.5	CS-134
7	1323.63	661.82	1.64	655.	18292.	0.8	CS-137
8C	1591.96	795.93	1.65	513.	3898.	2.3	CS-134
9C	1604.25	802.07	1.65	467.	411.	7.6	CS-134
10	2346.74	1173.33	1.92	375.	5356.	1.5	CO-60
11	2665.32	1332.68	1.98	94.	5056.	1.4	CO-60
12	2729.84	1364.96	2.00	40.	115.	13.5	CS-134
13	2922.05	1461.13	2.16	36.	654.	4.2	K-40

ERROR QUOTATION AT 1.00 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:48:52

SAMPLE: F5040
DATA COLLECTED ON 2-MAY-90 AT 21:09:01
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
AC-228	LLD<4.41E+00		LLD<4.41E+00	
AG-108M	LLD<9.99E-01		LLD<9.99E-01	
AG-110M	LLD<5.48E+00		LLD<5.48E+00	
AM-241	LLD<1.14E+00		LLD<1.14E+00	
AM-243	LLD<5.95E-01		LLD<5.95E-01	
AR-41	LLD<9.25E-01		LLD<9.25E-01	
AU-198	LLD<9.08E-01		LLD<9.08E-01	
BA-133	LLD<1.18E+00		LLD<1.18E+00	
BA-139	LLD<2.57E+00		LLD<2.57E+00	
BA-140	LLD<3.95E+00		LLD<3.95E+00	
BA-141	LLD<2.81E+00		LLD<2.81E+00	
BE-7	LLD<9.44E+00		LLD<9.44E+00	
BI-207	LLD<9.69E-01		LLD<9.69E-01	
BI-212	LLD<1.47E+01		LLD<1.47E+01	
BI-214	LLD<6.53E+00		LLD<6.53E+00	
CD-109	LLD<1.11E+01		LLD<1.11E+01	
CE-139	LLD<5.83E-01		LLD<5.83E-01	
CE-141	LLD<9.23E-01		LLD<9.23E-01	
CEPR144	LLD<7.85E+00		LLD<7.85E+00	
CO-56	LLD<1.02E+00		LLD<1.02E+00	
CO-57	LLD<4.96E-01		LLD<4.96E-01	
CO-58	LLD<1.00E+00		LLD<1.00E+00	
CO-60	1.06E+02	+-1.69E+00	1.06E+02	+-1.69E+00
CR-51	LLD<6.68E+00		LLD<6.68E+00	
CS-134	6.19E+01	+-1.47E+00	6.19E+01	+-1.47E+00
CS-136	LLD<1.04E+00		LLD<1.04E+00	
CS-137	2.47E+02	+-2.60E+00	2.47E+02	+-2.60E+00
CS-138	LLD<1.10E+00		LLD<1.10E+00	
EU-152	LLD<4.64E+00		LLD<4.64E+00	
EU-154	LLD<2.04E+00		LLD<2.04E+00	
EU-155	LLD<1.86E+00		LLD<1.86E+00	
FE-59	LLD<2.50E+00		LLD<2.50E+00	
HF-181	LLD<1.21E+00		LLD<1.21E+00	
HG-203	LLD<7.72E-01		LLD<7.72E-01	
I-131	LLD<9.80E-01		LLD<9.80E-01	
I-132	LLD<2.05E+00		LLD<2.05E+00	
I-133	LLD<1.04E+00		LLD<1.04E+00	
I-134	LLD<1.53E+00		LLD<1.53E+00	
I-135	LLD<2.81E+00		LLD<2.81E+00	
K-40	1.38E+02	+-5.97E+00	1.38E+02	+-5.97E+00
KR-85	LLD<2.12E+02		LLD<2.12E+02	
KR-85M	LLD<7.10E-01		LLD<7.10E-01	
KR-87	LLD<2.14E+00		LLD<2.14E+00	
KR-89	LLD<3.00E+01		LLD<3.00E+01	
LA-140	LLD<6.16E-01		LLD<6.16E-01	
LA-142	LLD<2.29E+00		LLD<2.29E+00	
MN-54	LLD<1.05E+00		LLD<1.05E+00	

MN-56	LLD<1.15E+00	LLD<1.15E+00
NA-22	LLD<7.85E-01	LLD<7.85E-01
NA-24	LLD<5.61E-01	LLD<5.61E-01
NB-94	LLD<9.13E-01	LLD<9.13E-01
NB-95	LLD<9.64E-01	LLD<9.64E-01
NB-97	LLD<6.64E+00	LLD<6.64E+00
NP-238	LLD<4.88E+00	LLD<4.88E+00
NP-239	LLD<4.46E+00	LLD<4.46E+00
PA-233	LLD<1.83E+00	LLD<1.83E+00
PA-234M	LLD<2.24E+02	LLD<2.24E+02
PB-210	LLD<2.56E+01	LLD<2.56E+01
PB-212	LLD<1.48E+00	LLD<1.48E+00
PB-214	LLD<2.14E+00	LLD<2.14E+00
PO-210	LLD<7.90E+04	LLD<7.90E+04
PO-214	LLD<2.98E+04	LLD<2.98E+04
PO-216	LLD<5.66E+04	LLD<5.66E+04
PU-239	LLD<6.70E+03	LLD<6.70E+03
PU-241	LLD<2.44E+05	LLD<2.44E+05
RA-224	LLD<1.57E+01	LLD<1.57E+01
RA-226	LLD<1.62E+01	LLD<1.62E+01
RB-88	LLD<5.20E+00	LLD<5.20E+00
RB-89	LLD<5.74E+00	LLD<5.74E+00
RN-220	LLD<8.43E+02	LLD<8.43E+02
RU-103	LLD<9.98E-01	LLD<9.98E-01
RURH106	LLD<1.79E+01	LLD<1.79E+01
SB-124	LLD<1.88E+00	LLD<1.88E+00
SB-125	LLD<7.19E+00	LLD<7.19E+00
SC-46	LLD<1.30E+00	LLD<1.30E+00
SE-75	LLD<1.06E+00	LLD<1.06E+00
SN-113	LLD<1.31E+00	LLD<1.31E+00
SR-85	LLD<9.30E-01	LLD<9.30E-01
SR-91	LLD<1.60E+00	LLD<1.60E+00
SR-92	LLD<7.32E-01	LLD<7.32E-01
TA-182	LLD<3.70E+00	LLD<3.70E+00
TC-99M	LLD<5.18E-01	LLD<5.18E-01
TE-123M	LLD<5.54E-01	LLD<5.54E-01
TE-125M	LLD<1.46E+02	LLD<1.46E+02
TE-132	LLD<6.82E-01	LLD<6.82E-01
TH-228	LLD<3.15E+01	LLD<3.15E+01
TL-208	LLD<1.06E+00	LLD<1.06E+00
U-235	LLD<9.87E-01	LLD<9.87E-01
U-237	LLD<2.77E+00	LLD<2.77E+00
W-187	LLD<3.11E+00	LLD<3.11E+00
XE-131M	LLD<2.44E+01	LLD<2.44E+01
XE-133	LLD<1.04E+00	LLD<1.04E+00
XE-133M	LLD<6.09E+00	LLD<6.09E+00
XE-135	LLD<7.04E-01	LLD<7.04E-01
XE-138	LLD<5.28E+00	LLD<5.28E+00
Y-88	LLD<4.92E-01	LLD<4.92E-01
Y-91	LLD<3.23E+02	LLD<3.23E+02
Y-91M	LLD<1.21E+00	LLD<1.21E+00
ZN-65	LLD<2.69E+00	LLD<2.69E+00
ZR-95	LLD<1.74E+00	LLD<1.74E+00
ZR-97	LLD<9.05E-01	LLD<9.05E-01
TOTAL	5.53E+02 +-6.89E+00	5.53E+02 +-6.89E+00

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 2.49E-09 UC/LI
TOTAL MEASURED ACTIVITY = 5.53E+02 (+-6.89E+00) UC/LI

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

ERROR QUOTATION AT 1.00 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
59.12	30.15	655.	14.5	1.08E+01
63.96	32.56	4583.	4.0	7.13E+01
72.71	36.93	980.	9.9	1.41E+01
1127.03	563.57	504.	8.4	1.85E+01
1139.02	569.56	902.	7.2	3.34E+01
1604.25	802.07	411.	7.6	2.07E+01
2729.84	1364.96	115.	13.5	9.09E+00

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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              *
*                                                                     *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM WESTINGHOUSE HANFORD          04-MAY-90  12:53:26


                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: 3.0
DETECTOR NUMBER:    3    /     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: 1.00 SIGMA UNCERTAINTY

LLD CALCULATION PERFORMED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD3621
ANALYZED BY:        AJ

SAMPLE DESCRIPTION: F5041
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  2-MAY-90 AT 22:21:39

COLLECT LIVE TIME:    3000. SECONDS
        REAL TIME:    3009. SECONDS
        DEAD TIME:     0.30 %

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

ENERGY CALIBRATION PERFORMED 17-OCT-89
EFFICIENCY CALIBRATION PERFORMED 31-JUL-89
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222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:53:26

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	59.59	30.38	1.38	1712.	423.	14.2	
2C	64.05	32.61	1.38	1627.	2771.	4.5	CE-144
3C	72.76	36.95	1.38	1459.	712.	8.9	TE-125M, I-129
4C	1126.84	563.47	1.47	671.	493.	6.9	CS-134, EU-152
5C	1138.95	569.52	1.47	674.	905.	6.4	CS-134, BI-207
6C	1209.75	604.90	1.49	651.	5777.	1.8	CS-134
7C	1218.81	609.43	1.49	591.	148.	22.6	BI-214, RU-103
8	1323.65	661.83	1.61	532.	11013.	1.0	CS-137
9C	1592.02	795.96	1.66	514.	3990.	2.2	CS-134
10C	1604.31	802.10	1.66	460.	402.	5.3	CS-134
11	2346.65	1173.28	1.98	375.	5600.	1.5	CO-60
12	2665.29	1332.67	2.18	104.	5175.	1.4	CO-60
13	2731.09	1365.59	2.08	49.	107.	15.0	CS-134
14	2921.95	1461.07	1.87	47.	638.	4.4	K-40

ERROR QUOTATION AT 1.00 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C -- MULTIPLET ANALYSIS CONVERGED NORMALLY

222-S COUNTING ROOM WESTINGHOUSE HANFORD 04-MAY-90 12:53:26

SAMPLE: F5041
DATA COLLECTED ON 2-MAY-90 AT 22:21:39
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
AC-228	LLD<9.05E-01		LLD<9.05E-01	
AG-108M	LLD<1.79E-01		LLD<1.79E-01	
AG-110M	LLD<8.55E-01		LLD<8.55E-01	
AM-241	LLD<1.73E-01		LLD<1.73E-01	
AM-243	LLD<9.41E-02		LLD<9.41E-02	
AR-41	LLD<1.87E-01		LLD<1.87E-01	
AU-198	LLD<1.70E-01		LLD<1.70E-01	
BA-133	LLD<2.18E-01		LLD<2.18E-01	
BA-139	LLD<4.64E-01		LLD<4.64E-01	
BA-140	LLD<7.22E-01		LLD<7.22E-01	
BA-141	LLD<5.00E-01		LLD<5.00E-01	
BE-7	LLD<1.76E+00		LLD<1.76E+00	
BI-207	LLD<1.85E-01		LLD<1.85E-01	
BI-212	LLD<2.85E+00		LLD<2.85E+00	
BI-214	7.02E-01	+-1.59E-01	7.02E-01	+-1.59E-01
CD-109	LLD<1.93E+00		LLD<1.93E+00	
CE-139	LLD<1.05E-01		LLD<1.05E-01	
CE-141	LLD<1.70E-01		LLD<1.70E-01	
CEPR144	LLD<1.43E+00		LLD<1.43E+00	
CO-56	LLD<2.05E-01		LLD<2.05E-01	
CO-57	LLD<8.78E-02		LLD<8.78E-02	
CO-58	LLD<2.03E-01		LLD<2.03E-01	
CO-60	2.18E+01	+-3.43E-01	2.18E+01	+-3.43E-01
CR-51	LLD<1.21E+00		LLD<1.21E+00	
CS-134	1.27E+01	+-2.87E-01	1.27E+01	+-2.87E-01
CS-136	LLD<2.00E-01		LLD<2.00E-01	
CS-137	2.97E+01	+-3.67E-01	2.97E+01	+-3.67E-01
CS-138	LLD<2.06E-01		LLD<2.06E-01	
EU-152	LLD<8.62E-01		LLD<8.62E-01	
EU-154	LLD<3.80E-01		LLD<3.80E-01	
EU-155	LLD<3.20E-01		LLD<3.20E-01	
FE-59	LLD<4.93E-01		LLD<4.93E-01	
HF-181	LLD<2.24E-01		LLD<2.24E-01	
HG-203	LLD<1.44E-01		LLD<1.44E-01	
I-131	LLD<1.74E-01		LLD<1.74E-01	
I-132	LLD<3.45E-01		LLD<3.45E-01	
I-133	LLD<1.85E-01		LLD<1.85E-01	
I-134	LLD<3.09E-01		LLD<3.09E-01	
I-135	LLD<5.30E-01		LLD<5.30E-01	
K-40	2.69E+01	+-1.21E+00	2.69E+01	+-1.21E+00
KR-85	LLD<3.95E+01		LLD<3.95E+01	
KR-85M	LLD<1.27E-01		LLD<1.27E-01	
KR-87	LLD<3.85E-01		LLD<3.85E-01	
KR-89	LLD<5.57E+00		LLD<5.57E+00	
LA-140	LLD<1.54E-01		LLD<1.54E-01	
LA-142	LLD<4.18E-01		LLD<4.18E-01	
MN-54	LLD<2.11E-01		LLD<2.11E-01	

MN-56	LLD<2.32E-01	LLD<2.32E-01
NA-22	LLD<1.50E-01	LLD<1.50E-01
NA-24	LLD<1.27E-01	LLD<1.27E-01
NB-94	LLD<1.74E-01	LLD<1.74E-01
NB-95	LLD<1.83E-01	LLD<1.83E-01
NB-97	LLD<1.04E+00	LLD<1.04E+00
NP-238	LLD<9.40E-01	LLD<9.40E-01
NP-239	LLD<8.24E-01	LLD<8.24E-01
PA-233	LLD<3.33E-01	LLD<3.33E-01
PA-234M	LLD<4.46E+01	LLD<4.46E+01
PB-210	LLD<4.57E+00	LLD<4.57E+00
PB-212	LLD<2.71E-01	LLD<2.71E-01
PB-214	LLD<3.98E-01	LLD<3.98E-01
PO-210	LLD<1.60E+04	LLD<1.60E+04
PO-214	LLD<5.94E+03	LLD<5.94E+03
PO-216	LLD<1.16E+04	LLD<1.16E+04
PU-239	LLD<1.21E+03	LLD<1.21E+03
PU-241	LLD<4.31E+04	LLD<4.31E+04
RA-224	LLD<2.85E+00	LLD<2.85E+00
RA-226	LLD<2.89E+00	LLD<2.89E+00
RB-88	LLD<1.34E+00	LLD<1.34E+00
RB-89	LLD<1.12E+00	LLD<1.12E+00
RN-220	LLD<1.63E+02	LLD<1.63E+02
RU-103	LLD<1.88E-01	LLD<1.88E-01
RURH106	LLD<3.47E+00	LLD<3.47E+00
SB-124	LLD<3.74E-01	LLD<3.74E-01
SB-125	LLD<1.30E+00	LLD<1.30E+00
SC-46	LLD<2.65E-01	LLD<2.65E-01
SE-75	LLD<1.95E-01	LLD<1.95E-01
SN-113	LLD<2.42E-01	LLD<2.42E-01
SR-85	LLD<1.73E-01	LLD<1.73E-01
SR-91	LLD<3.00E-01	LLD<3.00E-01
SR-92	LLD<1.55E-01	LLD<1.55E-01
TA-182	LLD<7.55E-01	LLD<7.55E-01
TC-99M	LLD<9.45E-02	LLD<9.45E-02
TE-123M	LLD<9.92E-02	LLD<9.92E-02
TE-125M	LLD<2.55E+01	LLD<2.55E+01
TE-132	LLD<1.25E-01	LLD<1.25E-01
TH-228	LLD<5.21E+00	LLD<5.21E+00
TL-208	LLD<2.11E-01	LLD<2.11E-01
U-235	LLD<1.78E-01	LLD<1.78E-01
U-237	LLD<5.14E-01	LLD<5.14E-01
W-187	LLD<5.65E-01	LLD<5.65E-01
XE-131M	LLD<4.46E+00	LLD<4.46E+00
XE-133	LLD<1.68E-01	LLD<1.68E-01
XE-133M	LLD<1.14E+00	LLD<1.14E+00
XE-135	LLD<1.29E-01	LLD<1.29E-01
XE-138	LLD<9.81E-01	LLD<9.81E-01
Y-88	LLD<1.27E-01	LLD<1.27E-01
Y-91	LLD<6.30E+01	LLD<6.30E+01
Y-91M	LLD<2.27E-01	LLD<2.27E-01
ZN-65	LLD<5.23E-01	LLD<5.23E-01
ZR-95	LLD<3.35E-01	LLD<3.35E-01
ZR-97	LLD<1.81E-01	LLD<1.81E-01
TOTAL	9.18E+01 +-1.35E+00	9.18E+01 +-1.35E+00

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 2.10E-09 UC/LI
TOTAL MEASURED ACTIVITY = 9.18E+01 (+-1.35E+00) UC/LI

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

ERROR QUOTATION AT 1.00 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
59.59	30.38	423.	14.2	6.93E+00
64.05	32.61	2771.	4.5	4.31E+01
72.76	36.95	712.	8.9	1.02E+01
1126.84	563.47	493.	6.9	1.81E+01
1138.95	569.52	905.	6.4	3.35E+01
1604.31	802.10	402.	5.3	2.03E+01
2731.09	1365.59	107.	15.0	8.50E+00

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

ERROR QUOTATION AT 1.00 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
59.59	30.38	423.	14.2	6.93E+00
64.05	32.61	2771.	4.5	4.31E+01
72.76	36.95	712.	8.9	1.02E+01
1126.84	563.47	493.	6.9	1.81E+01
1138.95	569.52	905.	6.4	3.35E+01
1604.31	802.10	402.	5.3	2.03E+01
2731.09	1365.59	107.	15.0	8.50E+00

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Uranium Analysis on the Fusion Dissolution

Instrument	WA77344
Procedure / Rev	LA-925-106/A-2
Technologist	6C269
Date	11/28/89
Temperature	N/A
Starting Time	08:00
Ending Time	14:30
Chemist	S. A. Catlow

	Description	Lab. Id.
1	Initial Check Standard	F5037
2	Reagent Blank	F5052
3	Sample 89-041	F5038
4	Duplicate of 89-041	F5039
5	Spike of 89-041	F5040
6	Final Check Standard	F5041
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 Standard	58B38/1 ul			5.7 ml
Spike	58B38/1 ul	Sample/10 ul		5.8 ml

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: May 4, 1990

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: May 4, 1990

Approved by: [signature] Signature — L. H. Taylor Printed Name — Date: May 9, 1990

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

9 1 1 2 3 5 9 0 6 7 6

WATER DIGESTION TEST ANALYSIS

9 1 1 2 7 5 9 0 6 7

Single Shell Tank Project

WATER DIGESTION
Laboratory Results of Solids
Units are Sample Wet Weight

Tank 241-U-110
Core 5
Segment 4
Customer ID: 89-041

Laboratory Segment Serial No.: F5033

Laboratory ID:	Check Standard F5042	Blank F5054	Sample F5043	Sample Duplicate F5044	Spike of Sample F5045	Check Standard F5046
Water Digestion I			9.59 g/L	8.97 g/L	8.73 g/L	
Ion Chromatograph						
Fluoride	101.60%	<0.1 ppm	2.31E+04 ug/g	2.04E+04 ug/g	N.C.	87.70%
Chloride	98.40%	<0.1 ppm	<1.05E+03 ug/g	<1.12E+03 ug/g	115.90%	102.00%
Nitrate	98.00%	<1.0 ppm	6.49E+04 ug/g	6.05E+04 ug/g	94.25%	95.40%
Phosphate	94.60%	<1.0 ppm	4.97E+04 ug/g	3.96E+04 ug/g	67.60%	95.40%
Sulfate	92.70%	<1.0 ppm	5.60E+03 ug/g	5.11E+03 ug/g	89.80%	96.00%
Total Organic Carbon/ Carbonate (Not Acidified)	98.50%	2.25E-02 g/L	4.70E+03 ug/g	5.03E+03 ug/g	95.20%	102.30%
Water Digestion II			9.6 g/L	12.03 g/L	10.43 g/L	
Total Organic Carbon/ Carbonate (Acidified)	98.30%	3.5 ug	8.59E+02 ug/g	1.10E+03 ug/g	100.90%	97.30%

N.C. = Not Calculated

Single Shell Tank Project

Water Digestion
Sample Results on Laboratory Digestion

Tank 241-U-110
Core 5
Segment 4
Customer ID: 89-041 Laboratory Segment Serial No.: F5033

	Check Standard	Blank	Sample	Sample Duplicate	Spike of Sample	Check Standard
Laborator ID:	F5042	F5054	F5043	F5044	F5045	F5046
Water Digestion I			9.59 g/L	8.97 g/L	8.73 g/L	
Ion Chromatograph						
Fluoride	101.60%	<0.1 ppm	222 ppm	183 ppm	N.C.	87.70%
Chloride	98.40%	<0.1 ppm	<10.1 ppm	<10.1 ppm	115.90%	102.00%
Nitrate	98.00%	<1.0 ppm	622 ppm	543 ppm	94.25%	95.40%
Phosphate	94.60%	<1.0 ppm	477 ppm	355 ppm	67.60%	95.40%
Sulfate	92.70%	<1.0 ppm	53.7 ppm	45.8 ppm	89.80%	96.00%
Total Organic Carbon/ Carbonate (Not Acidified)	98.50%	2.25E-02 g/L	4.51E-02 g/L	4.51E-02 g/L	95.20%	102.30%
Water Digestion II			9.6 g/L	12.03 g/L	10.43 g/L	
Total Organic Carbon/ Carbonate (Acidified)	98.30%	3.5 ug	8.25E-03 g/L	1.32E-02 g/L	100.90%	97.30%

N.C.= Not Calculated

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Instrument	N/A
Procedure / Rev	LA-504-101/A-2
Technologist	80725
Date	12/04/89
Temperature	25 C
Starting Time	12/01/89 13:30 hours
Ending Time	12/04/89 08:45 hours
Chemist	H. S. Rich

Water Digestion of sample 89-041.
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	F5054
2	Sample 89-041	F5043
3	Duplicate of 89-041	F5044
4	Spike of 89-041	F5045
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: [signature] Signature — H. S. Rich Printed Name — Date: May 4, 1990

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: May 4, 1990

Approved by: [signature] Signature — L.H. Taylor Printed Name — Date: May 9, 1990

Interim

Rev. E 4/04/90

SST-102

9 1 1 2 1 5 7 0 5 7 0

Analytical Batch

Lab Segment Serial No.: F5026

Customer ID.: 89-041

Instrument	N/A
Procedure / Rev	LA-504-101 / A-2
Technologist	E. Colvin
Date	06/29/90
Temperature	Not Reported.
Starting Time	06/27/90: 08:00
Ending Time	06/29/90; 11:30
Chemist	H. Rich

Water Digestion - Second Leach.

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	Blank	89-041	F5054
2	Sample	89-040	F5011
3	Duplicate	89-040	F5012
4	Spike	89-040	F5013
5	Sample	89-041	F5043
6	Duplicate	89-041	F5044
7	Spike	89-041	F5045
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				

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

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

Approved by: L. H. Taylor (Signature) L. H. Taylor (Printed Name) Date: 8-30-90

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Instrument	WB24721
Procedure / Rev	LA-533-105/A-3
Technologist	6B107 N. E. Wright
Date	12/05/89
Temperature	26 C
Starting Time	10:30
Ending Time	14:30
Chemist	H. S. Rich

Ion Chromatograph Analysis
Water Digestion
Note: Ion chromatograph was not calibrated for nitrite. Nitrite results are not reported.

	Description	Lab. Id.
1	Initial Check Standard	F5042
2	Reagent Blank	F5054
3	Sample 89-041	F5043
4	Duplicate of 89-041	F5044
5	Spike of 89-041	F5045
6	Ending Check Standard	F5046
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 Standard	6C11HC/100uL			10.1 mL
Spike	40C9-A/50 uL	Sample/10 uL		5.06 mL

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: May 4, 1990

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: May 4, 1990

Approved by: [signature] Signature — L. H. Taylor Printed Name — Date: May 9, 1990

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

9 1 1 2 3 5 9 0 6 9 2

Single Shell Tank Calibration Record

Phase I-A

Analyte:	Ion Chromatograph		
Procedure	LA-533-105	Revision:	A-3
Instrument:	Dionex 4000	Property Number:	WB24721
Technologist:	Nora Wright	Payroll Number:	6B107
Date:	Dec. 1, 1989		

Calibration Standard ID: Book number 35C9-60 issued 11-22-89

Analyte Concentration: F=49.6; Cl=61.0; NO3=500.5; PO4=500.6; SO4=500.5 (in ppm)

Type of Calibration: Quadratic least squares

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

Comments:

Prepared by: _____ Signature H. S. Rich Printed Name Date: 5-08-90

Verified by: _____ Signature C. M. Seidel Printed Name Date: 5-08-90

Approved by: _____ Signature L. H. Taylor Printed Name Date: 5/9/90

Interim Rev. (Draft) 1/18/89 SST-105

DIONEX METHOD PARAMETERS - GROUT01.MET

Detector Parameters

Number of Detectors	1
Detector 1 Type	CDM-1

Report Options

Run Time (minutes)	10.00
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	Yes
Record Raw Data	Yes
Raw Data File Name: c:\dx\data\89120102.d09	
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 0.98
Reference Peak FLUORIDE Window Size 5.00%
Least Squares Slope = 3.04147E-004
Least Squares Intercept = 3.47570E-002
Ka = -7.20865E-010

Level	Amount	Area	Height
1	9.90000E-002	1547	292
2	2.46800E-001	3814	699
3	4.91900E-001	8014	1443
4	9.72600E-001	18242	3026
5	1.90760E+000	37268	6331
6	3.67410E+000	82101	12310

Component # 2 CHLORIDE Retention Time 1.62
Reference Peak FLUORIDE Window Size 7.00%
Least Squares Slope = 5.28644E-004
Least Squares Intercept = 2.16858E-002
Ka = -4.60695E-009

Level	Amount	Area	Height
1	1.21800E-001	1174	211
2	3.03500E-001	3127	534
3	6.03960E-001	6384	1090
4	1.19610E+000	13048	2257
5	2.34610E+000	26949	4596
6	4.51840E+000	56310	9249

Component # 3 NITRITE Retention Time 2.00
Reference Peak FLUORIDE Window Size 7.00%
Least Squares Slope = 8.73191E-004
Least Squares Intercept = 4.13109E-001
Ka = 4.52304E-009

Level	Amount	Area	Height
1	1.06600E+000	6728	955
2	2.65700E+000	17398	2609
3	5.28700E+000	36144	5455
4	1.04706E+001	72479	10242
5	2.05385E+001	156757	21248
6	3.95550E+001	299406	37444

Component # 4 NITRATE Retention Time 3.72
Reference Peak FLUORIDE Window Size 10.00%
Least Squares Slope = 1.94357E-003
Least Squares Intercept = -1.10952E-001
Ka = 1.78504E-008

Level	Amount	Area	Height
1	9.99000E-001	5537	519
2	2.49000E+000	15382	1323
3	4.95550E+000	33066	2632
4	9.81380E+000	67697	4864
5	1.92492E+001	142777	9168
6	3.70730E+001	296013	16606

Component # 5 PHOSPHATE Retention Time 5.22
Reference Peak FLUORIDE Window Size 7.00%
Least Squares Slope = 4.25699E-003
Least Squares Intercept = 1.29081E-001
Ka = -2.86430E-008

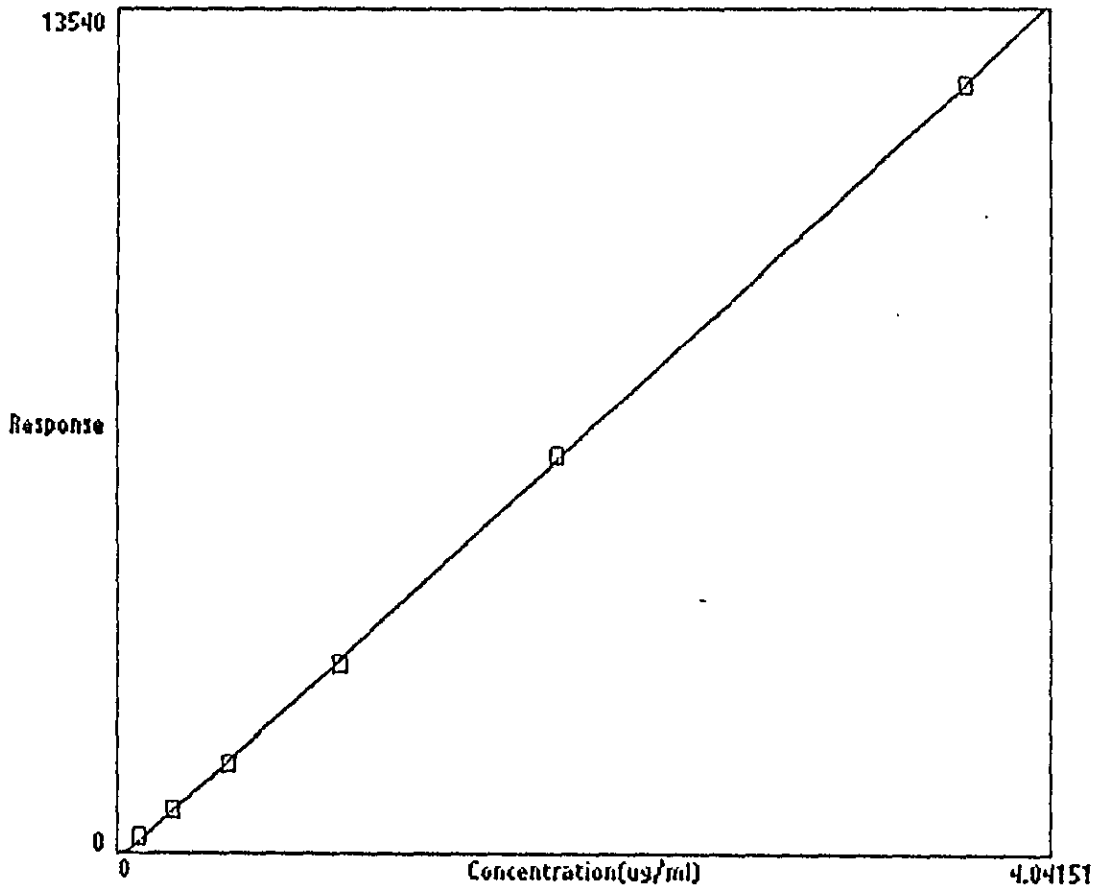
Level	Amount	Area	Height
1	9.99200E-001	2588	195
2	2.49050E+000	11460	648
3	4.95640E+000	16063	1091
4	9.81580E+000	33316	2235
5	1.92531E+001	72002	4693
6	3.70804E+001	149467	9246

Component # 6 SULFATE Retention Time 7.10
Reference Peak FLUORIDE Window Size 10.00%
Least Squares Slope = 2.01226E-003
Least Squares Intercept = 2.11736E-001
Ka = -1.25909E-009

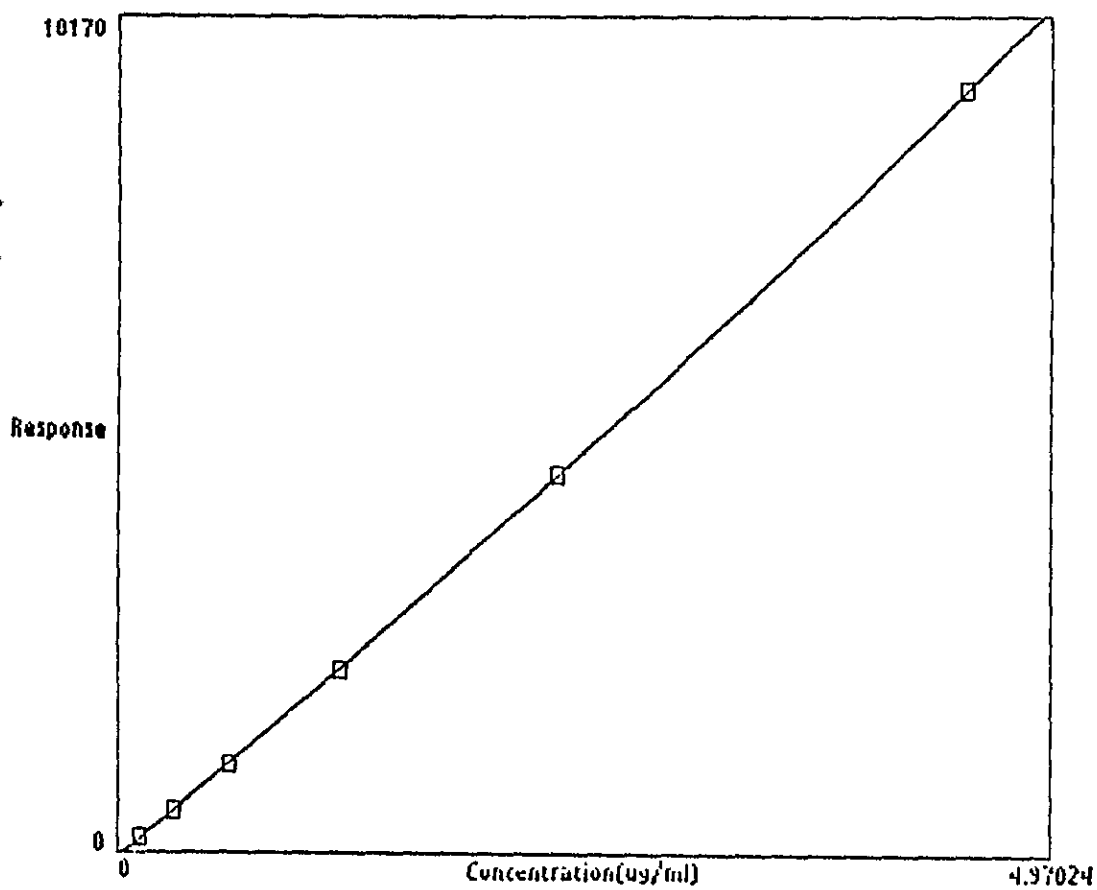
Level	Amount	Area	Height
1	9.99000E-001	8490	472
2	2.49000E+000	20937	1134
3	4.95550E+000	42330	2329
4	9.81380E+000	84876	4644
5	1.92492E+001	182078	9631
6	3.70730E+001	373505	18512

Component # 7 Oxalate Retention Time 9.77
Reference Peak FLUORIDE Window Size 10.00%
Least Squares Slope = 0.00000E+000
Least Squares Intercept = 0.00000E+000
Ka = 0.00000E+000

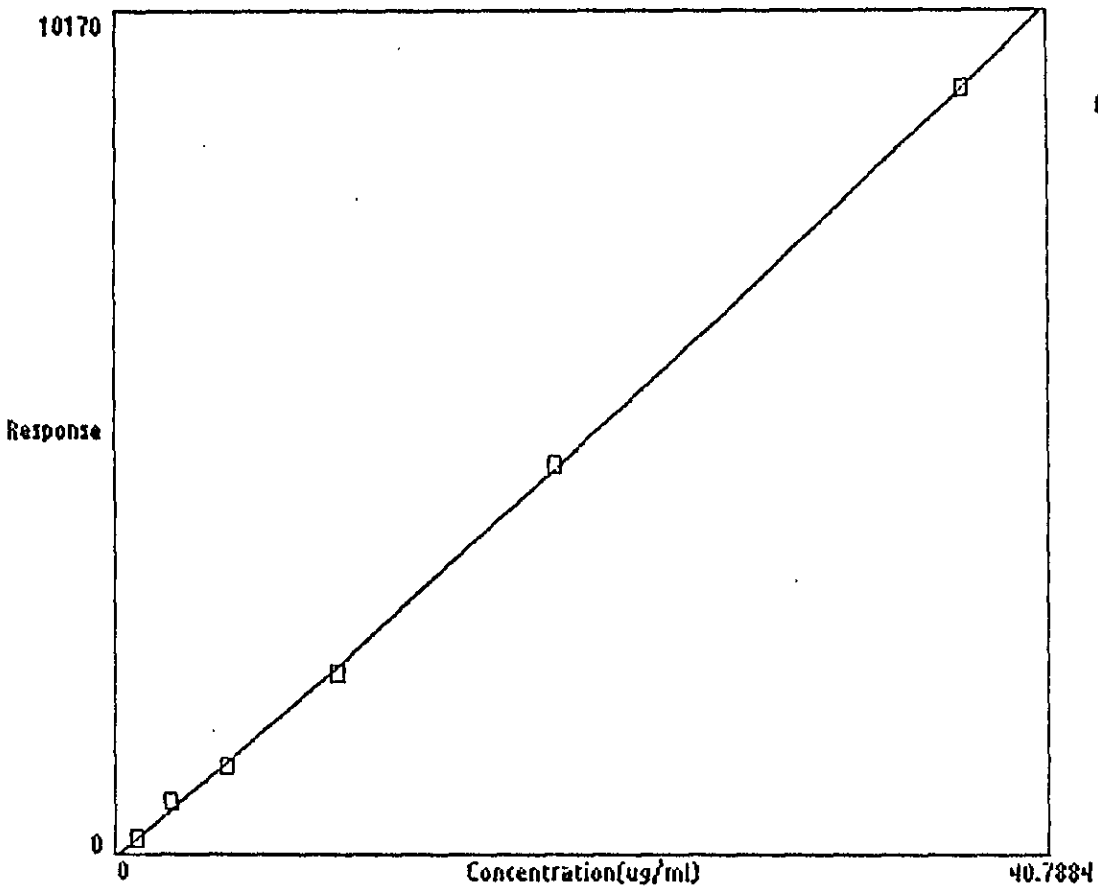
Level	Amount	Area	Height
1	0.00000E+000	0	0
2	0.00000E+000	0	0
3	0.00000E+000	0	0
4	0.00000E+000	0	0
5	0.00000E+000	0	0
6	0.00000E+000	98993	5848



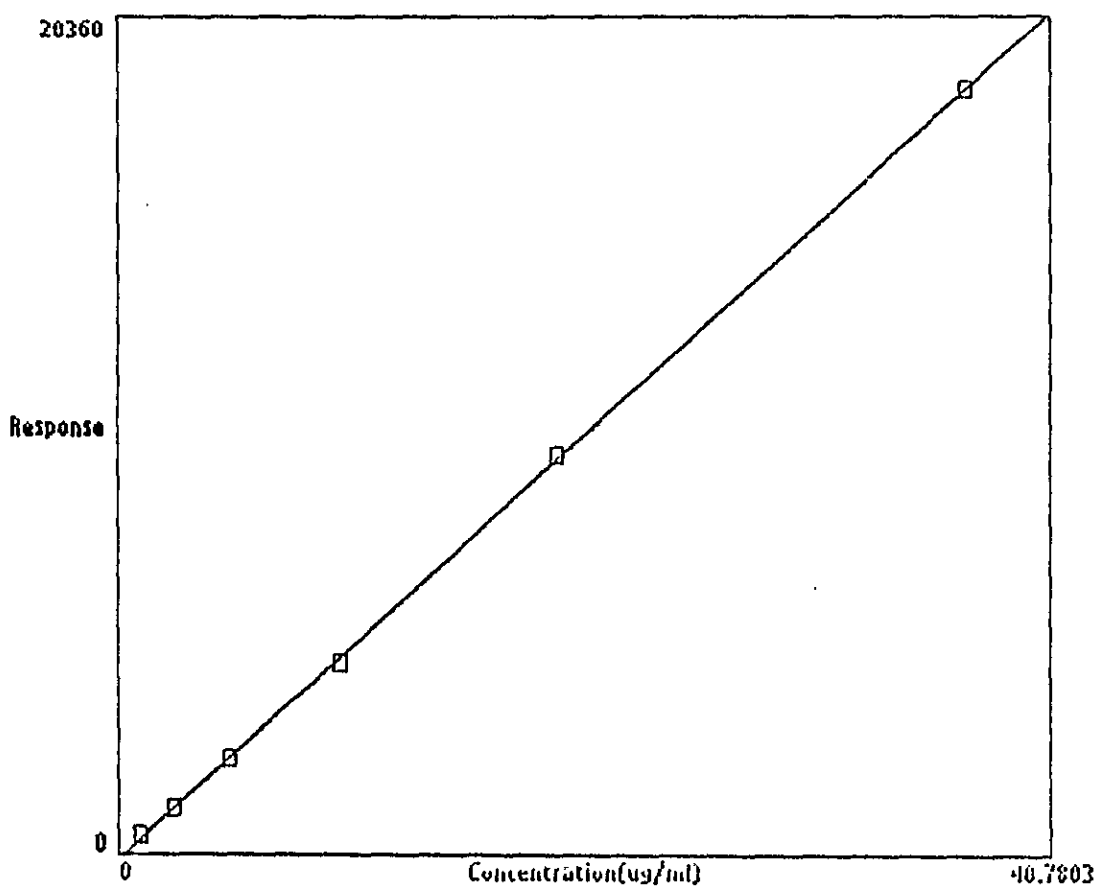
Component: FLUORIDE
Fit Type: Quadratic
Conc = (−7.208646e−010 * Resp²)+
(3.041466e−004 * Resp)+ 0.0348



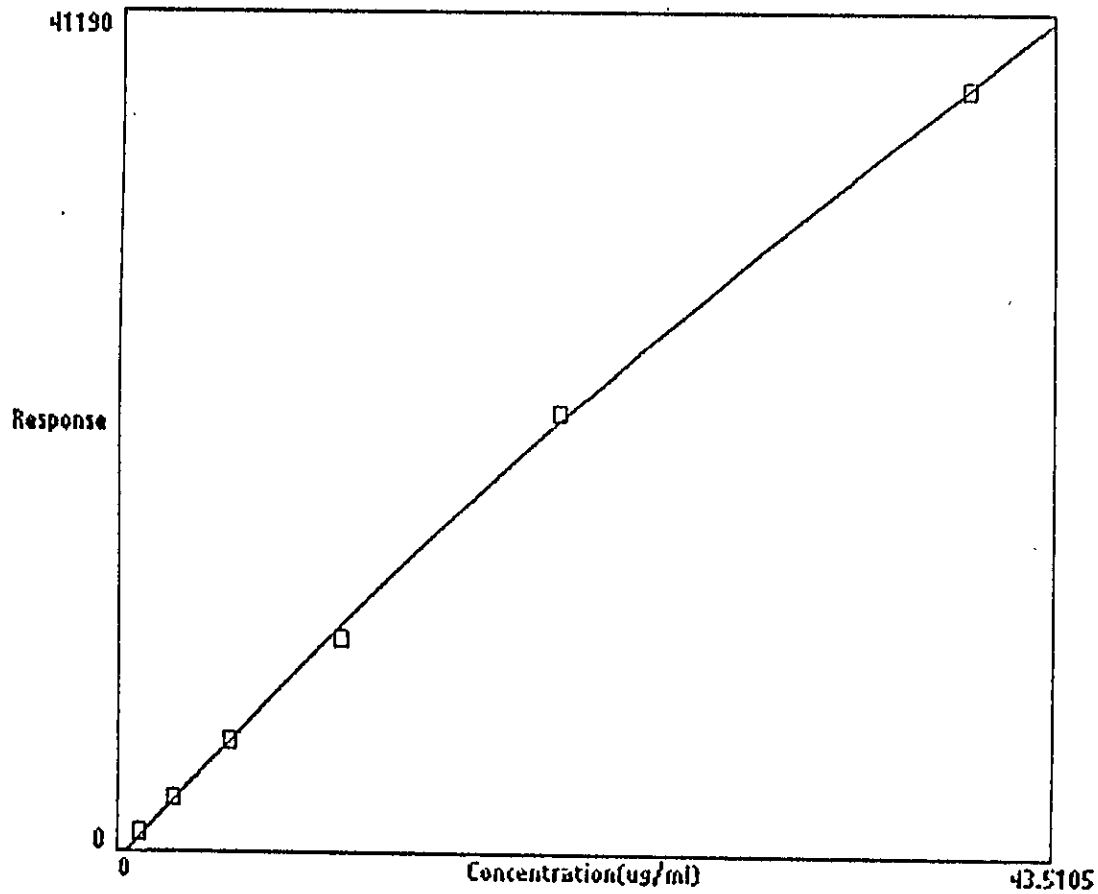
Component: CHLORIDE
Fit Type: Quadratic
Conc = (−4.606947e−009 * Resp²)+
(5.286441e−004 * Resp)+ 0.0217



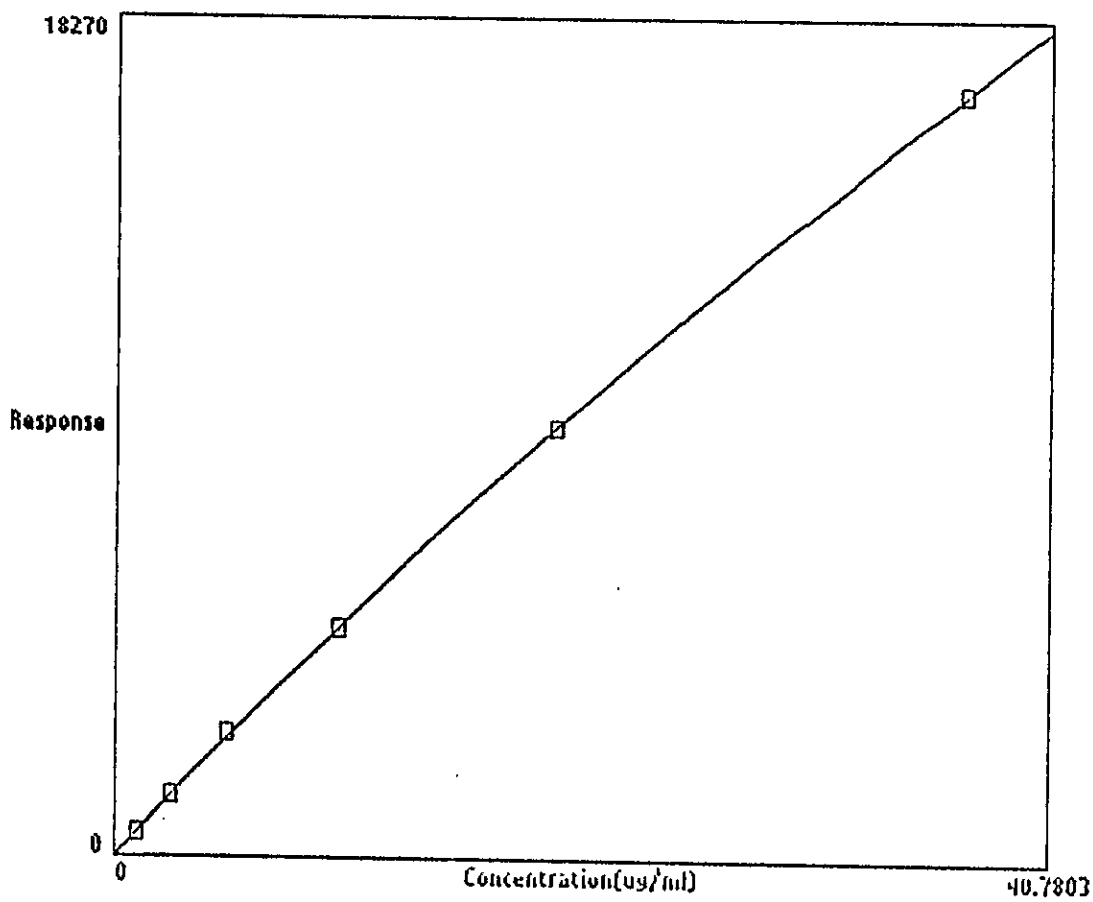
Component: PHOSPHATE
Fit Type: Quadratic
Conc = (−2.864303e−008 * Resp²)+
(4.256992e−003 * Resp)+ 0.1291



Component: SULFATE
Fit Type: Quadratic
Conc = (−1.259086e−009 * Resp²)+
(2.012255e−003 * Resp)+ 0.2117



Component: NITRITE
Fit Type: Quadratic
Conc = (4.523044e−009 * Resp²)+
(8.731912e−004 * Resp)+ 0.4131



Component: NITRATE
Fit Type: Quadratic
Conc = (1.785043e−008 * Resp²)+
(1.943571e−003 * Resp)+ −0.1110

********** AUTOMATIC CALIBRATION UPDATE **********
Method File: C:\DX\METHOD\Grout01.met
Calibration Level : 1
********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	1.00	1.00	1.00	2.917e+002	2.917e+002	2.917e+002
2	CHLORIDE	1.63	1.63	1.63	2.108e+002	2.108e+002	2.108e+002
3	NITRITE	2.00	2.00	2.00	9.545e+002	9.545e+002	9.545e+002
4	NITRATE	4.03	4.03	4.03	5.186e+002	5.186e+002	5.186e+002
5	PHOSPHATE	5.35	5.35	5.35	1.954e+002	1.954e+002	1.954e+002
6	SULFATE	7.13	7.13	7.13	4.723e+002	4.723e+002	4.723e+002

DATA REPROCESSED ON Wed Mar 21 13:29:28 1990

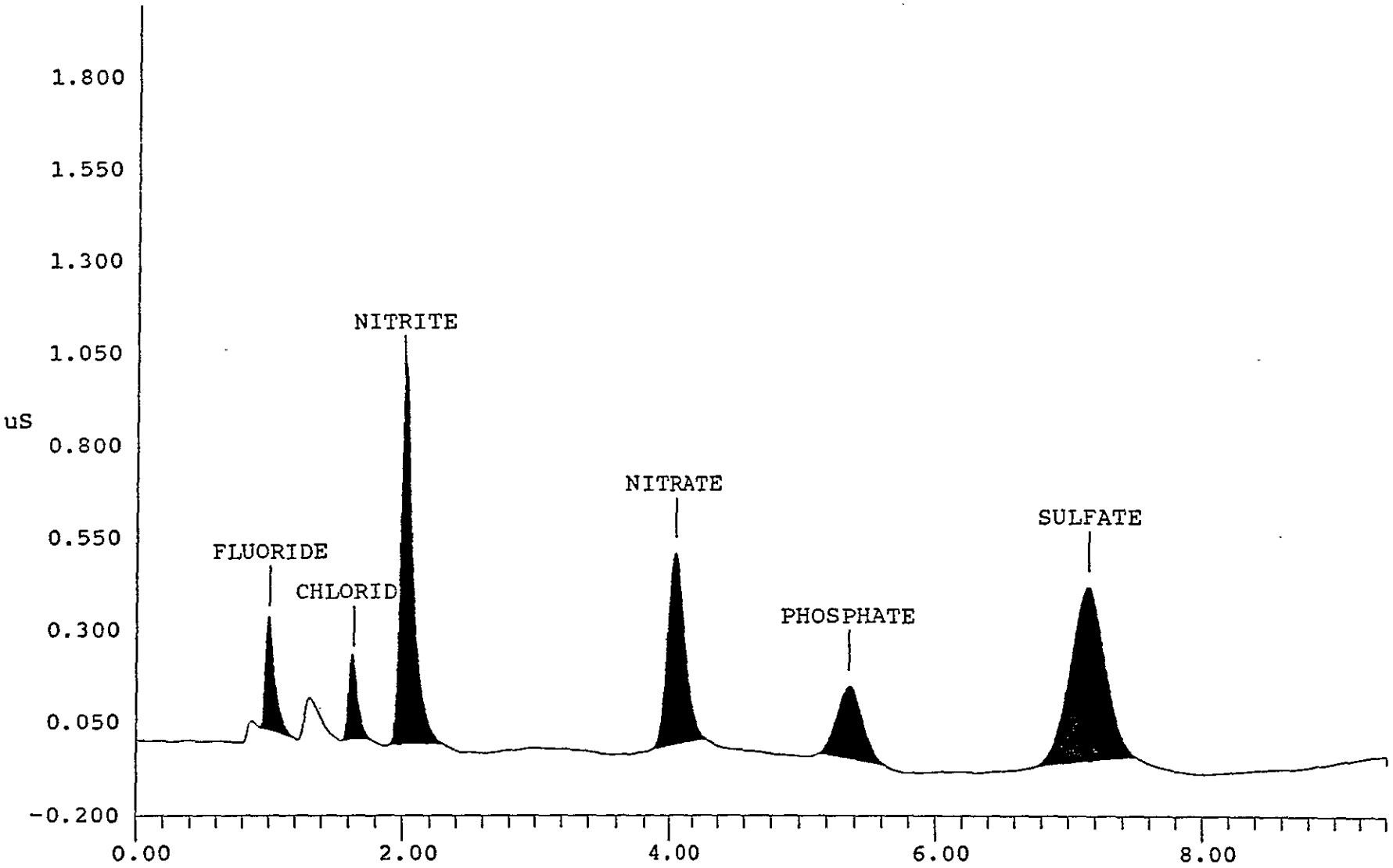
Sample Name: autocal1R Date: Fri Dec 01 12:44:23 1989
Data File : c:\dx\data\89120102.d04
Method : C:\DX\METHOD\Grout01.met
Interface : 1 System : 1 Inject#: 4 Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2821
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	1.00	FLUORIDE	9.900e-002	1.547e+003	292	1	0	0.00%
2	1.63	CHLORIDE	1.218e-001	1.174e+003	211	1	0	0.00%
3	2.00	NITRITE	1.066e+000	6.728e+003	955	1	0	0.00%
4	4.03	NITRATE	9.990e-001	5.537e+003	519	1	0	0.00%
5	5.35	PHOSPHATE	9.992e-001	2.588e+003	195	1	0	0.00%
6	7.13	SULFATE	9.990e-001	8.490e+003	472	1	0	0.00%

File: C:\DX\DATA\89120102.D04 Sample: AUTOCAL1R



********** AUTOMATIC CALIBRATION UPDATE **********
Method File: C:\DX\METHOD\Grout01.met
Calibration Level : 2
********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.61	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	1.00	0.98	0.98	2.917e+002	6.990e+002	6.990e+002
2	CHLORIDE	1.63	1.62	1.62	2.108e+002	5.339e+002	5.339e+002
3	NITRITE	2.00	2.02	2.02	9.545e+002	2.609e+003	2.609e+003
4	NITRATE	4.03	4.02	4.02	5.186e+002	1.323e+003	1.323e+003
5	PHOSPHATE	5.35	5.40	5.40	1.954e+002	6.483e+002	6.483e+002
6	SULFATE	7.13	7.22	7.22	4.723e+002	1.134e+003	1.134e+003

DATA REPROCESSED ON Wed Mar 21 13:29:56 1990

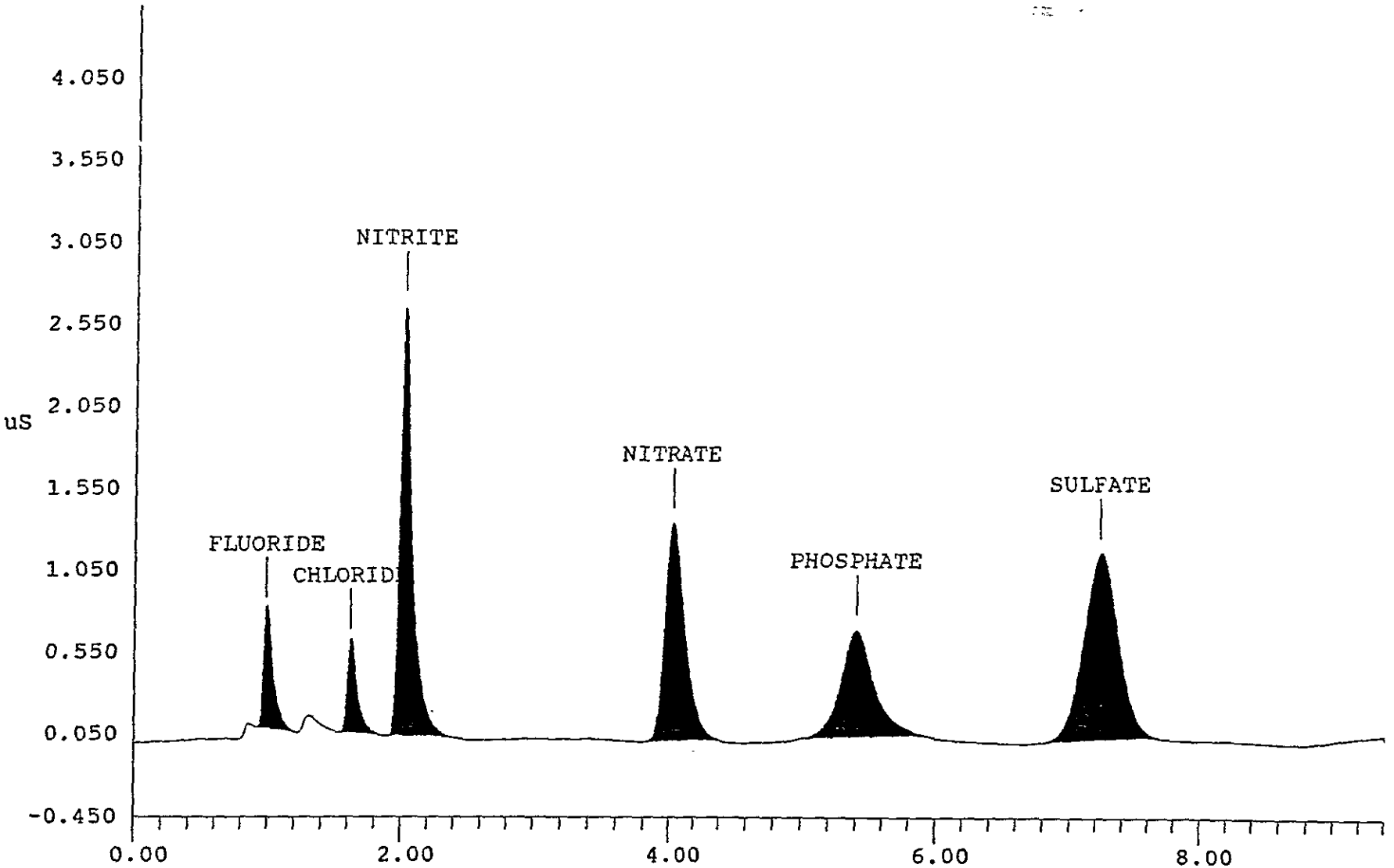
Sample Name: autocal2R Date: Fri Dec 01 12:54:32 1989
Data File : c:\dx\data\89120102.d05
Method : C:\DX\METHOD\Grout01.met
Interface : 1 System : 1 Inject#: 5 Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2821
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	2.468e-001	3.814e+003	699	1	0	0.00%
2	1.62	CHLORIDE	3.035e-001	3.127e+003	534	1	0	0.00%
3	2.02	NITRITE	2.657e+000	1.740e+004	2609	1	0	0.00%
4	4.02	NITRATE	2.490e+000	1.538e+004	1323	1	0	0.00%
5	5.40	PHOSPHATE	2.491e+000	1.146e+004	648	1	0	0.00%
6	7.22	SULFATE	2.490e+000	2.094e+004	1134	1	0	0.00%

File: C:\DX\DATA\89120102.D05 Sample: AUTOCAL2R



********** AUTOMATIC CALIBRATION UPDATE **********
Method File: C:\DX\METHOD\Grout01.met
Calibration Level : 3
********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	0.98	0.98	0.98	2.917e+002	1.443e+003	1.443e+003
2	CHLORIDE	1.62	1.62	1.62	2.108e+002	1.090e+003	1.090e+003
3	NITRITE	2.02	2.02	2.02	9.545e+002	5.455e+003	5.455e+003
4	NITRATE	4.02	3.97	3.97	5.186e+002	2.632e+003	2.632e+003
5	PHOSPHATE	5.40	5.35	5.35	1.954e+002	1.091e+003	1.091e+003
6	SULFATE	7.22	7.22	7.22	4.723e+002	2.329e+003	2.329e+003

DATA REPROCESSED ON Wed Mar 21 13:30:26 1990

Sample Name: autocal3r Date: Fri Dec 01 13:04:42 1989
Data File : c:\dx\data\89120102.d06
Method : C:\DX\METHOD\Grout01.met
Interface : 1 System : 1 Inject#: 6 Detector: CDM

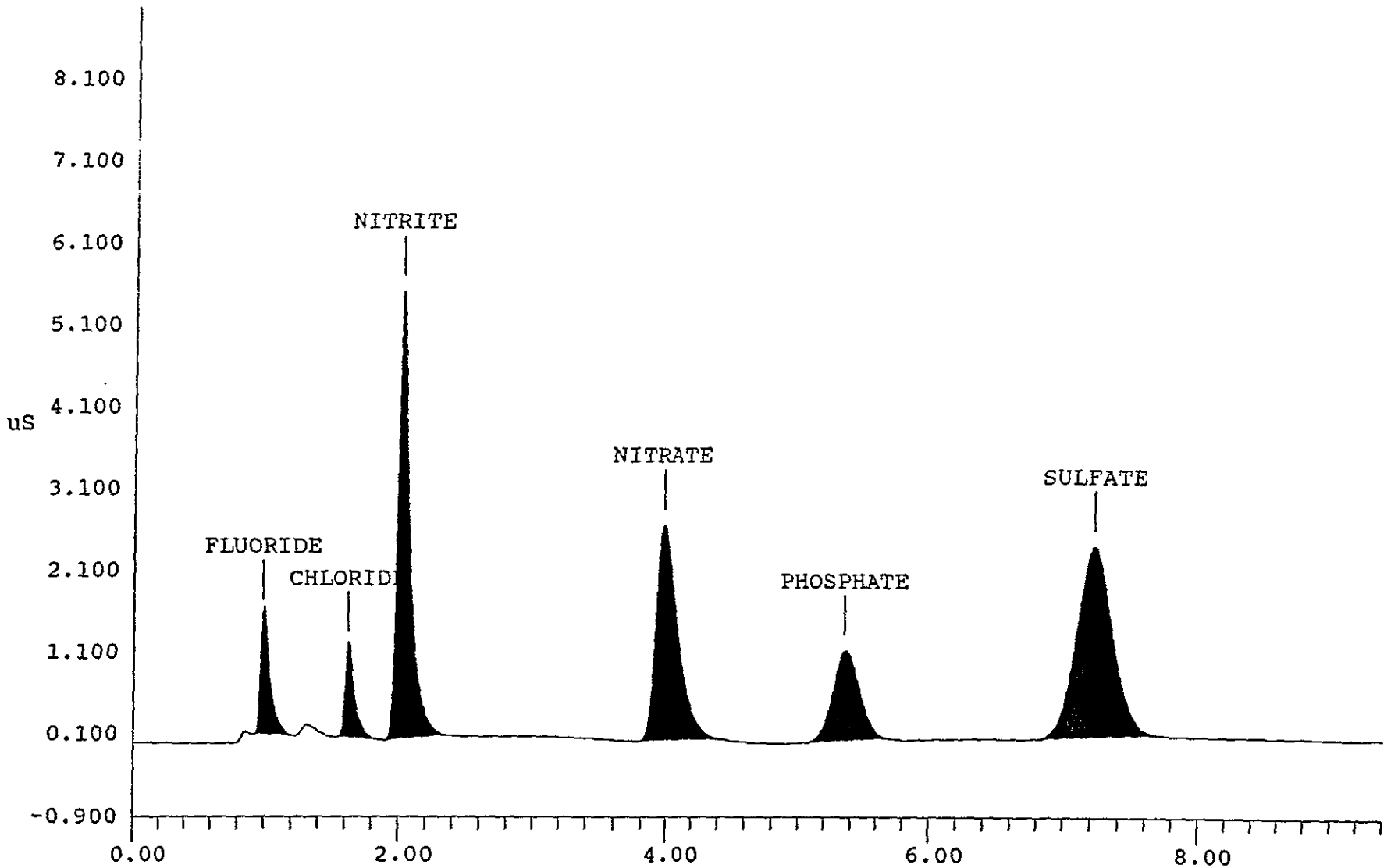
********** EXTERNAL STANDARD REPORT **********

Stop time = 9.40 Minutes Number of Data Points = 2821
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	4.919e-001	8.014e+003	1443	1	0	0.00%
2	1.62	CHLORIDE	6.040e-001	6.384e+003	1090	1	0	0.00%
3	2.02	NITRITE	5.287e+000	3.614e+004	5455	1	0	0.00%
4	3.97	NITRATE	4.956e+000	3.307e+004	2632	1	0	0.00%
5	5.35	PHOSPHATE	4.956e+000	1.606e+004	1091	1	0	0.00%
6	7.22	SULFATE	4.955e+000	4.233e+004	2329	1	0	0.00%

9 1 1 2 7 5 9 0 7 0 5

File: C:\DX\DATA\89120102.D06 Sample: AUTOCAL3R



********** AUTOMATIC CALIBRATION UPDATE **********
Method File: C:\DX\METHOD\Grout01.met
Calibration Level : 4
********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	0.98	0.98	0.98	2.917e+002	3.026e+003	3.026e+003
2	CHLORIDE	1.62	1.62	1.62	2.108e+002	2.257e+003	2.257e+003
3	NITRITE	2.02	2.00	2.00	9.545e+002	1.024e+004	1.024e+004
4	NITRATE	3.97	3.88	3.88	5.186e+002	4.864e+003	4.864e+003
5	PHOSPHATE	5.35	5.28	5.28	1.954e+002	2.235e+003	2.235e+003
6	SULFATE	7.22	7.13	7.13	4.723e+002	4.644e+003	4.644e+003

DATA REPROCESSED ON Wed Mar 21 13:31:01 1990

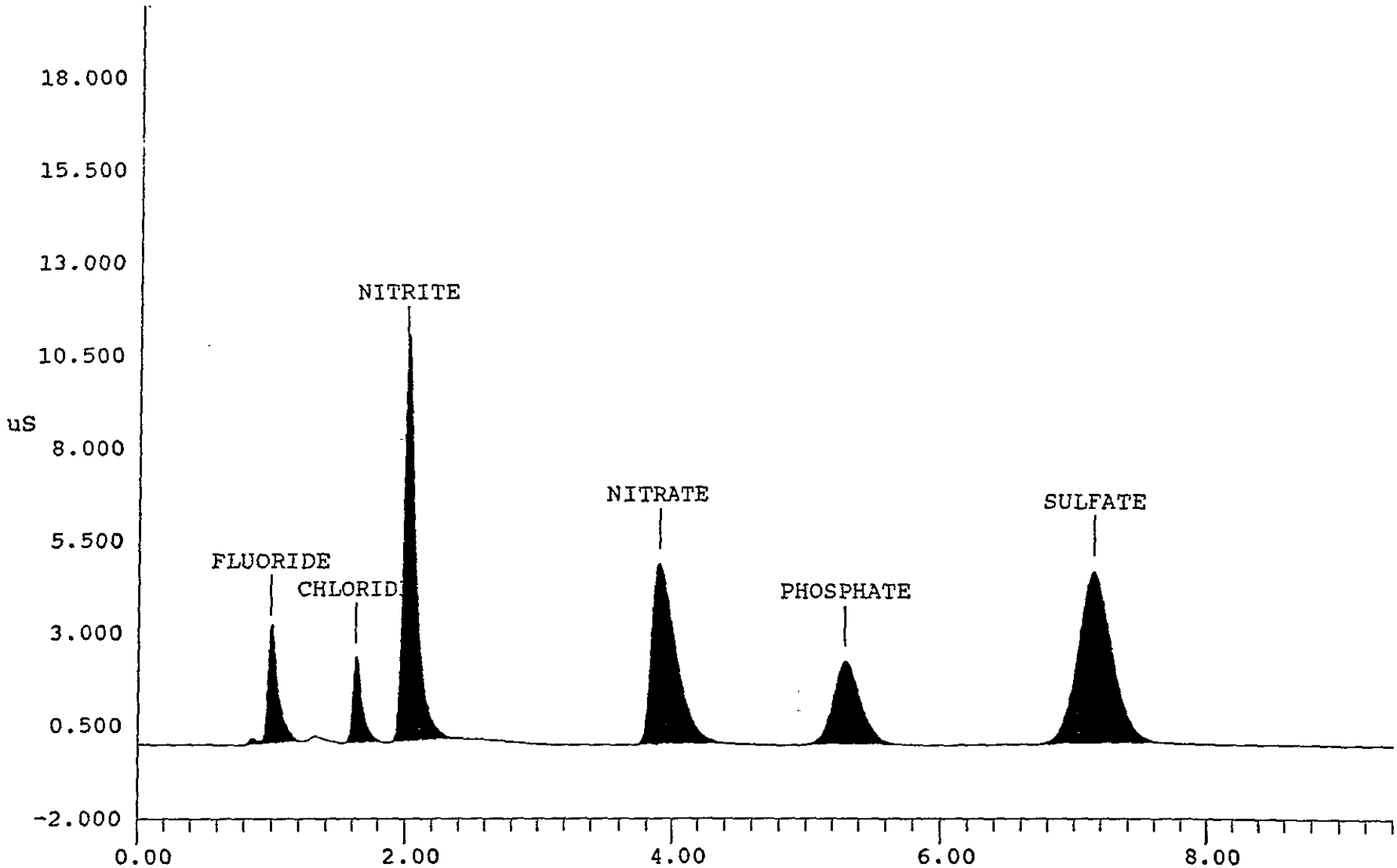
Sample Name: Autocal4r Date: Fri Dec 01 13:14:52 1989
Data File : c:\dx\data\89120102.d07
Method : C:\DX\METHOD\Grout01.met
Interface : 1 System : 1 Inject#: 7 Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2820
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	9.726e-001	1.824e+004	3026	1	0	0.00%
2	1.62	CHLORIDE	1.196e+000	1.305e+004	2257	1	0	0.00%
3	2.00	NITRITE	1.047e+001	7.248e+004	10242	1	0	0.00%
4	3.88	NITRATE	9.814e+000	6.770e+004	4864	1	0	0.00%
5	5.28	PHOSPHATE	9.816e+000	3.332e+004	2235	1	0	0.00%
6	7.13	SULFATE	9.814e+000	8.488e+004	4644	1	0	0.00%

File: C:\DX\DATA\89120102.D07 Sample: AUTOCAL4R



********** AUTOMATIC CALIBRATION UPDATE **********
Method File: C:\DX\METHOD\Grout01.met
Calibration Level : 5
********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	0.98	0.98	0.98	2.917e+002	6.331e+003	6.331e+003
2	CHLORIDE	1.62	1.62	1.62	2.108e+002	4.596e+003	4.596e+003
3	NITRITE	2.00	2.00	2.00	9.545e+002	2.125e+004	2.125e+004
4	NITRATE	3.88	3.82	3.82	5.186e+002	9.168e+003	9.168e+003
5	PHOSPHATE	5.28	5.27	5.27	1.954e+002	4.693e+003	4.693e+003
6	SULFATE	7.13	7.15	7.15	4.723e+002	9.631e+003	9.631e+003

DATA REPROCESSED ON Wed Mar 21 13:31:36 1990

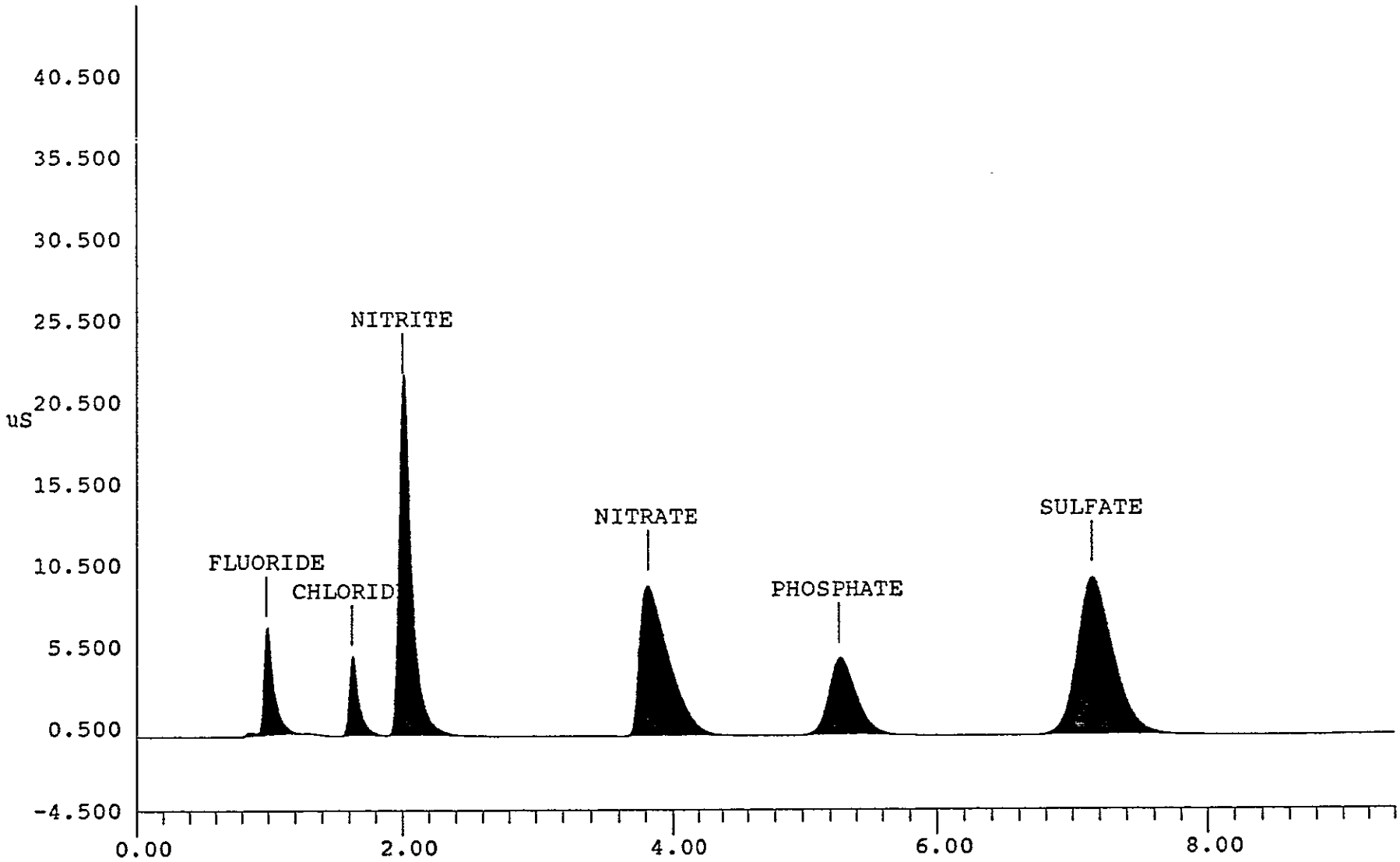
Sample Name: Autocal5r Date: Fri Dec 01 13:25:03 1989
Data File : c:\dx\data\89120102.d08
Method : C:\DX\METHOD\Grout01.met
Interface : 1 System : 1 Inject#: 8 Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2820
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	1.908e+000	3.727e+004	6331	1	0	0.00%
2	1.62	CHLORIDE	2.346e+000	2.695e+004	4596	2	0	0.00%
3	2.00	NITRITE	2.054e+001	1.568e+005	21248	2	0	0.00%
4	3.82	NITRATE	1.925e+001	1.428e+005	9168	1	0	0.00%
5	5.27	PHOSPHATE	1.925e+001	7.200e+004	4693	1	0	0.00%
6	7.15	SULFATE	1.925e+001	1.821e+005	9631	1	0	0.00%

File: C:\DX\DATA\89120102.D08 Sample: AUTOCAL5R



********** AUTOMATIC CALIBRATION UPDATE **********
Method File: C:\DX\METHOD\Grout01.met
Calibration Level : 6
********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	0.98	0.98	0.98	2.917e+002	1.231e+004	1.231e+004
2	CHLORIDE	1.62	1.62	1.62	2.108e+002	9.249e+003	9.249e+003
3	NITRITE	2.00	2.00	2.00	9.545e+002	3.744e+004	3.744e+004
4	NITRATE	3.82	3.72	3.72	5.186e+002	1.661e+004	1.661e+004
5	PHOSPHATE	5.27	5.22	5.22	1.954e+002	9.246e+003	9.246e+003
6	SULFATE	7.15	7.10	7.10	4.723e+002	1.851e+004	1.851e+004

DATA REPROCESSED ON Wed Mar 21 13:32:10 1990

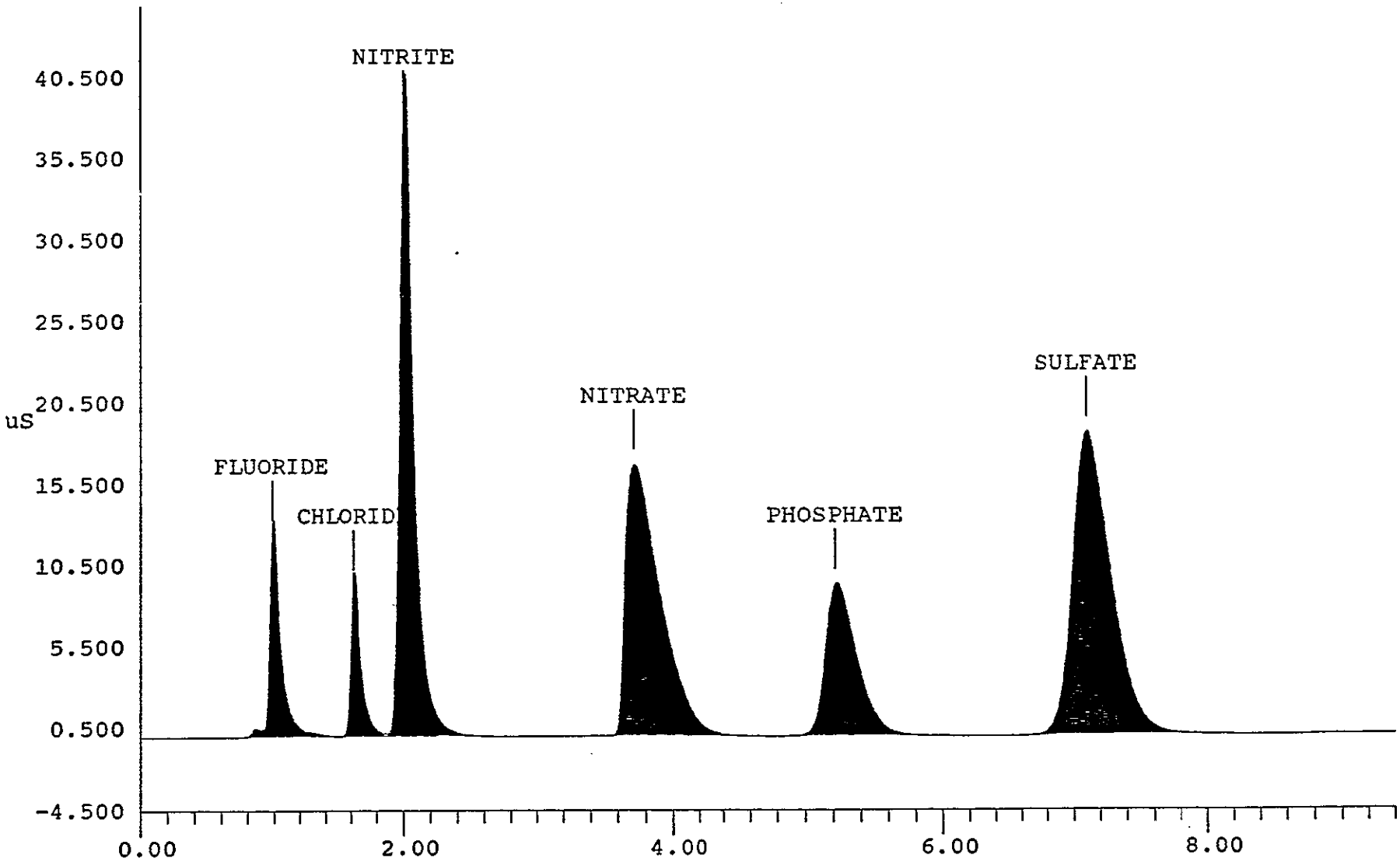
Sample Name: Autocal6r Date: Fri Dec 01 13:35:14 1989
Data File : c:\dx\data\89120102.d09
Method : C:\DX\METHOD\Grout01.met
Interface : 1 System : 1 Inject#: 9 Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2821
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	3.674e+000	8.210e+004	12310	2	0	0.00%
2	1.62	CHLORIDE	4.518e+000	5.631e+004	9249	2	0	0.00%
3	2.00	NITRITE	3.956e+001	2.994e+005	37444	2	0	0.00%
4	3.72	NITRATE	3.707e+001	2.960e+005	16606	1	0	0.00%
5	5.22	PHOSPHATE	3.708e+001	1.495e+005	9246	1	0	0.00%
6	7.10	SULFATE	3.707e+001	3.735e+005	18512	1	0	0.00%

File: C:\DX\DATA\89120102.D09 Sample: AUTOCAL6R



DIONEX SCHEDULE - C:\DX\SCHEDULE\89120401.SCH

Inj#	Sample Name	Method Name	Data File	Vol.	Dil.	Int.Std.
1	SETUP	...\GROUT01	...\891204011		1	0
2	BLANK	...\GROUT01	...\891204011		1	0
3	LMCS/6C11HC	...\GROUT01	...\891204011		101	0
4	5054b	...\GROUT01	...\891204011		1	0
5	5043	...\GROUT01	...\891204011		101	0
6	5044d	...\GROUT01	...\891204011		101	0
7	5045s	...\GROUT01	...\891204011		101	0
8	LMCS/6C11HC	...\GROUT01	...\891204011		101	0

9 1 1 2 0 5 0 7 1 2

DATA REPROCESSED ON Mon Mar 26 14:33:50 1990

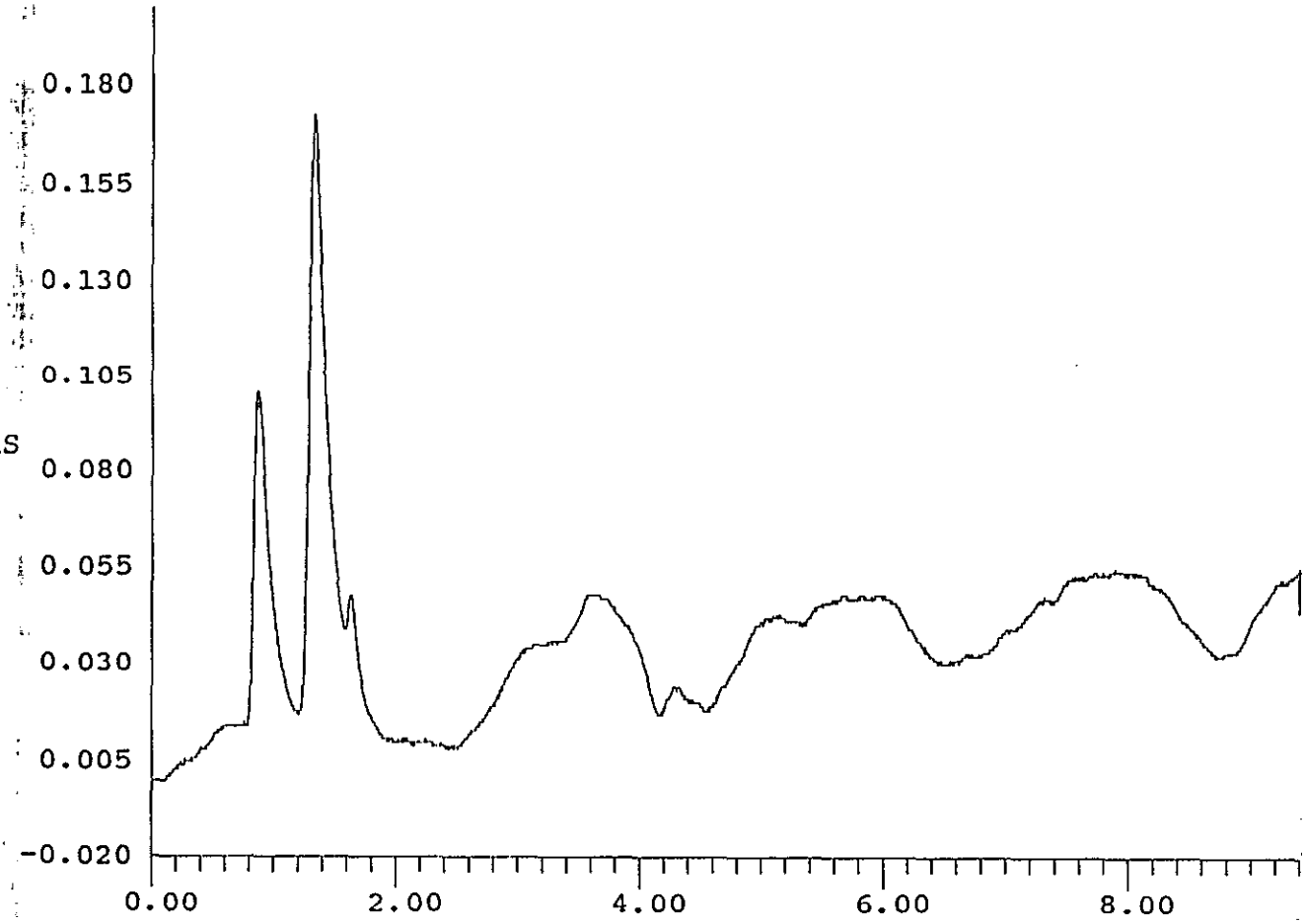
Sample Name: BLANK	Date: Mon Dec 04 14:55:38 1989
Data File : C:\DX\DATA\89120401.D02	
Method : c:\windows\ai400\method\GROUT01.met	
ACI Address: 1 System : 1 Inject#: 2	Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2821
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: C:\DX\DATA\89120401.D02 Sample: BLANK



DATA REPROCESSED ON Mon Mar 26 14:56:13 1990

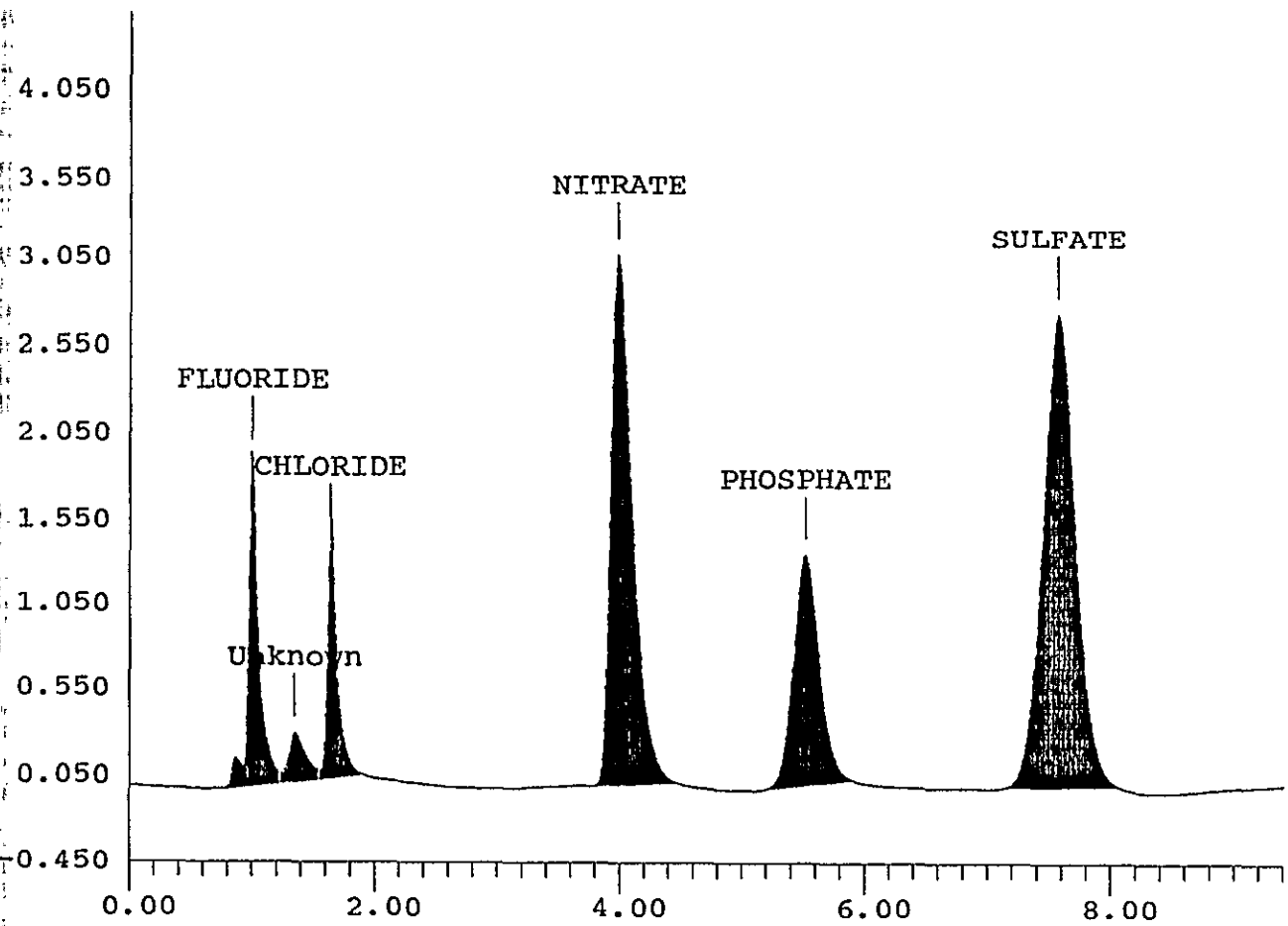
Sample Name: LMCS/6C11HC	Date: Mon Dec 04 15:05:40 1989
Data File : C:\DX\DATA\89120401.D03	
Method : c:\windows\ai400\method\GROUT01.met	
ACI Address: 1 System : 1 Inject#: 3	Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2821
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	1.00	FLUORIDE	6.298e+001	1.241e+004	1924	2	0	0.00%
2	1.35		0.000e+000	2.758e+003	277	2		
3	1.63	CHLORIDE	7.381e+001	8.452e+003	1378	2	0	0.00%
4	3.98	NITRATE	6.085e+002	3.925e+004	3068	1	0	7.17%
5	5.52	PHOSPHATE	5.873e+002	1.996e+004	1343	1	0	5.75%
6	7.57	SULFATE	5.759e+002	5.145e+004	2728	1	0	6.57%

File: C:\DX\DATA\89120401.D03 Sample: LMCS/6C11HC



DATA REPROCESSED ON Mon Mar 26 14:36:45 1990

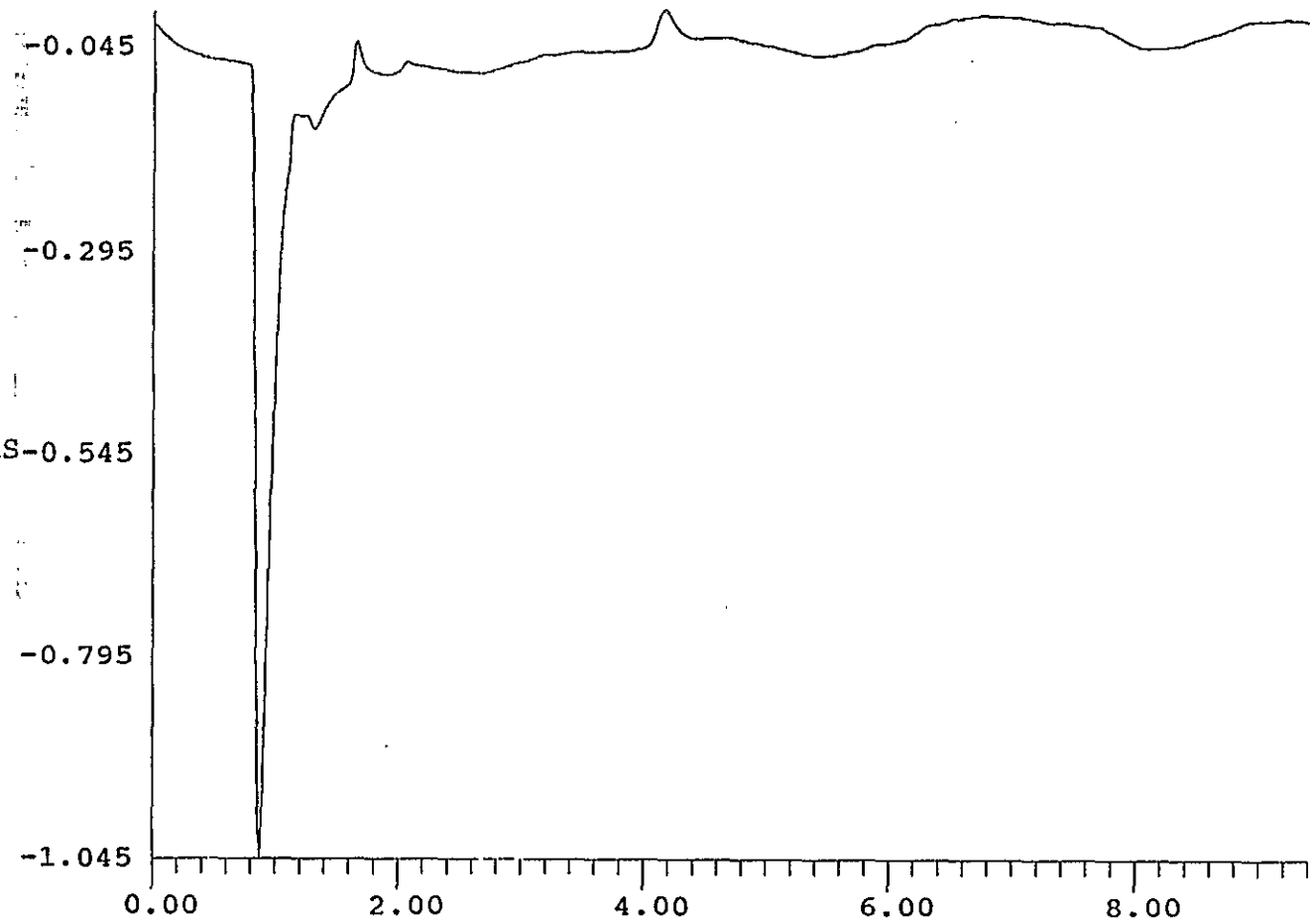
Sample Name: 5054B	Date: Mon Dec 04 15:15:46 1989
Data File : C:\DX\DATA\89120401.D04	
Method : c:\windows\ai400\method\GROUT01.met	
ACI Address: 1 System : 1 Inject#: 4	Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2820
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: C:\DX\DATA\89120401.D04 Sample: 5054B



9 1 1 2 0 5 9 0 7 1 5

DATA REPROCESSED ON Mon Mar 26 15:01:14 1990

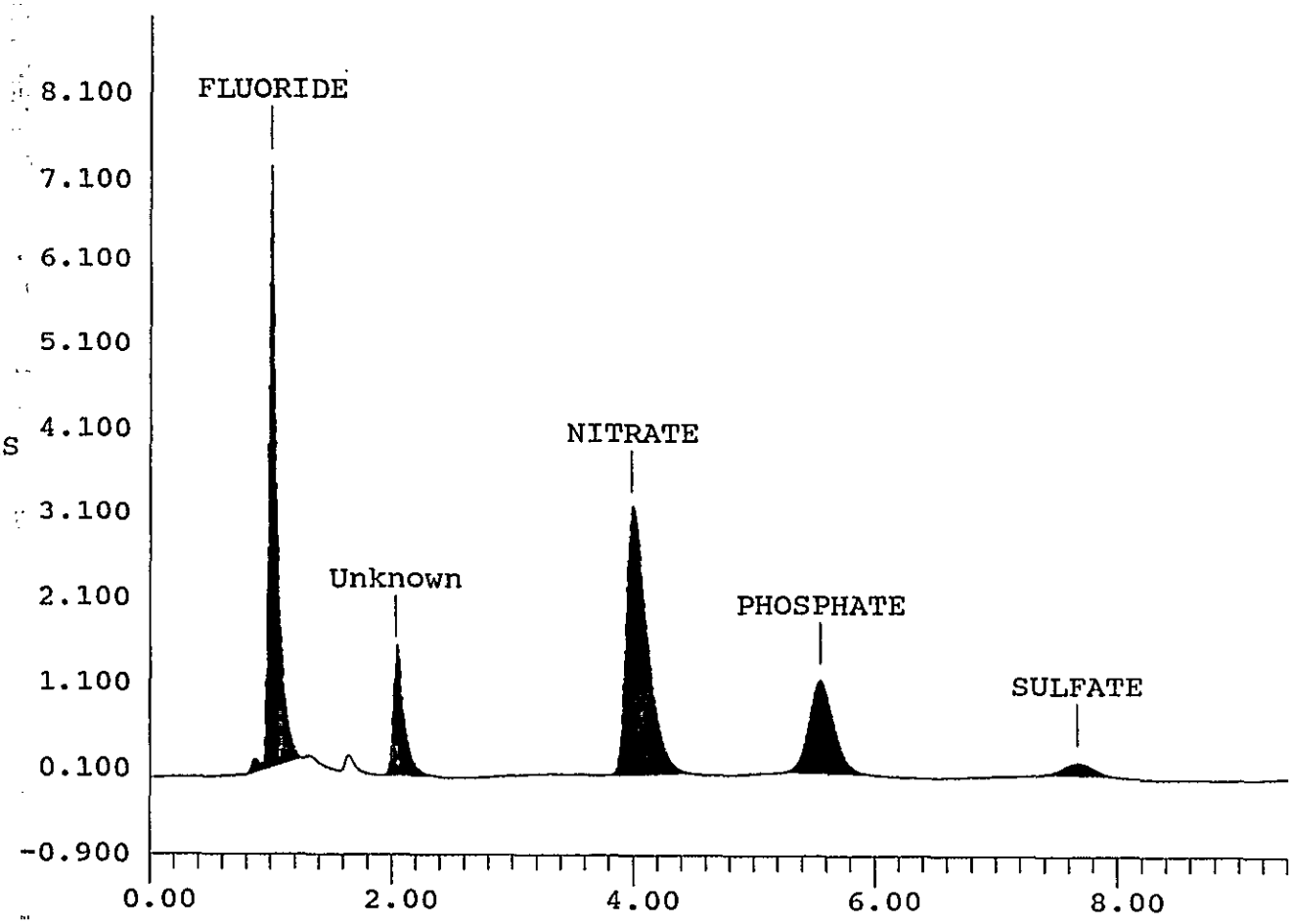
Sample Name: 5043	Date: Mon Dec 04 15:25:50 1989
Data File : C:\DX\DATA\89120401.D05	
Method : c:\windows\ai400\method\GROUT01.met	
ACI Address: 1 System : 1 Inject#: 5	Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2821
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	1.00	FLUORIDE	2.218e+002	3.814e+004	7153	1	0	0.00%
2	2.03		0.000e+000	1.004e+004	1419	1		
3	3.98	NITRATE	6.225e+002	4.016e+004	3135	1	0	7.17%
4	5.55	PHOSPHATE	4.773e+002	1.624e+004	1083	1	0	6.39%
5	7.67	SULFATE	5.367e+001	2.528e+003	151	1	0	7.98%

File: C:\DX\DATA\89120401.D05 Sample: 5043



DATA REPROCESSED ON Mon Mar 26 15:02:25 1990

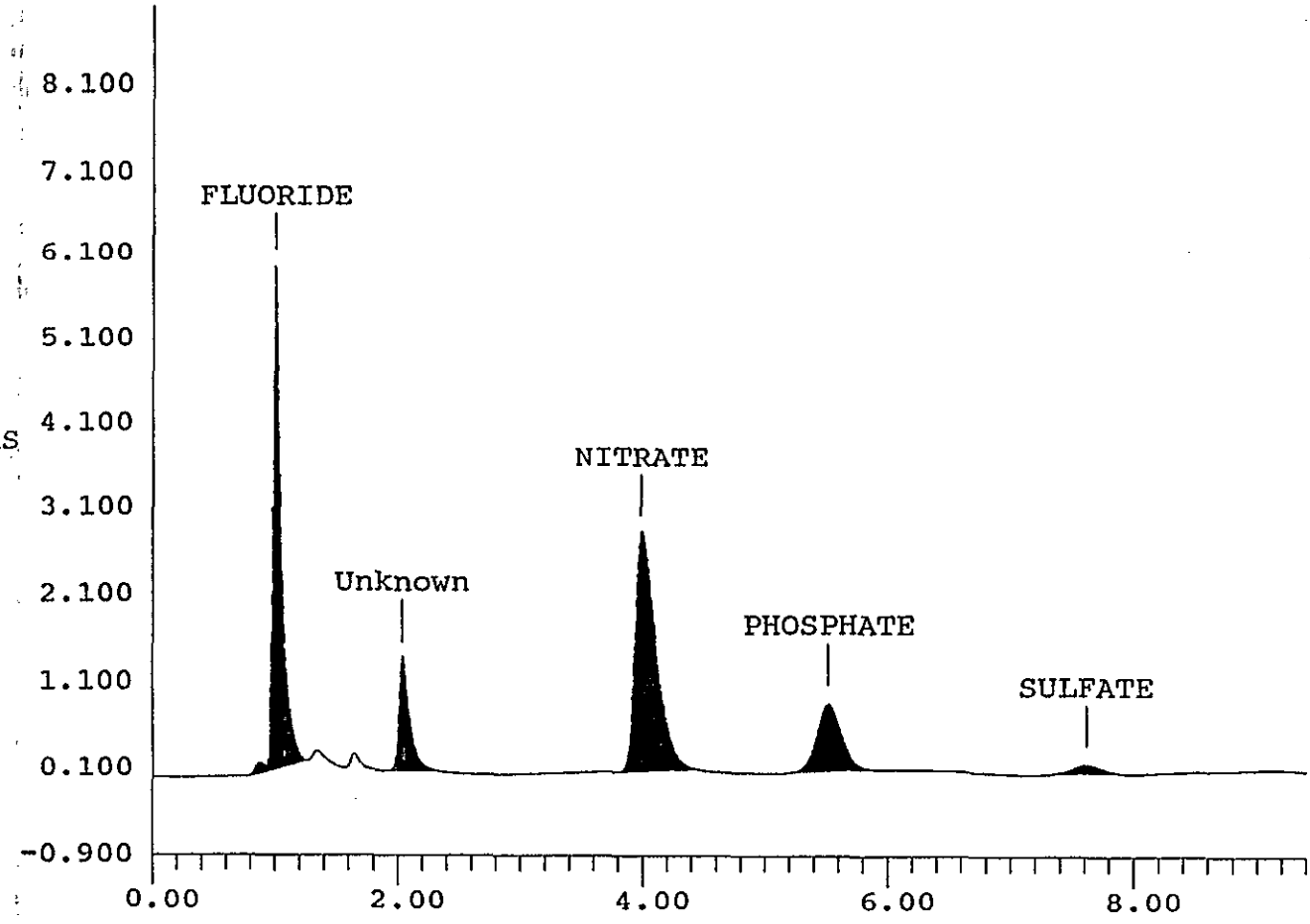
Sample Name: 5044D	Date: Mon Dec 04 15:35:54 1989
Data File : C:\DX\DATA\89120401.D06	
Method : c:\windows\ai400\method\GROUT01.met	
ACI Address: 1 System : 1 Inject#: 6	Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2821
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	1.00	FLUORIDE	1.830e+002	3.166e+004	5863	1	0	0.00%
2	2.03		0.000e+000	8.677e+003	1287	1		
3	3.98	NITRATE	5.427e+002	3.459e+004	2750	1	0	7.17%
4	5.52	PHOSPHATE	3.551e+002	1.151e+004	795	1	0	5.75%
5	7.62	SULFATE	4.576e+001	1.737e+003	112	1	0	7.28%

File: C:\DX\DATA\89120401.D06 Sample: 5044D



DATA REPROCESSED ON Mon Mar 26 15:03:39 1990

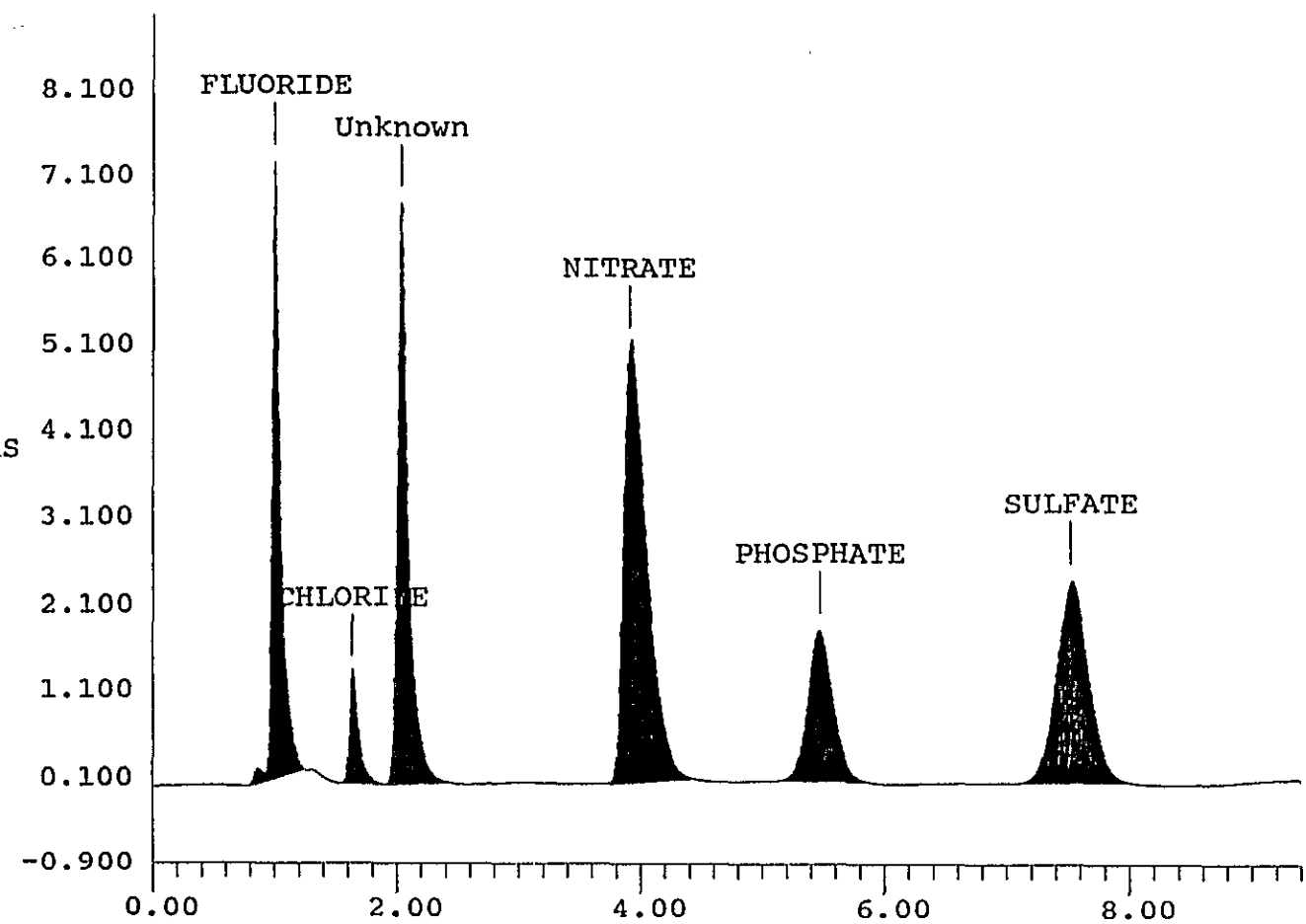
Sample Name: 5045S Date: Mon Dec 04 15:45:59 1989
Data File : C:\DX\DATA\89120401.D07
Method : c:\windows\ai400\method\GROUT01.met
ACI Address: 1 System : 1 Inject#: 7 Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2820
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	1.00	FLUORIDE	2.226e+002	3.912e+004	7181	1	0	0.00%
2	1.63	CHLORIDE	6.858e+001	7.304e+003	1276	1	0	0.00%
3	2.03		0.000e+000	4.559e+004	6752	1		
4	3.90	NITRATE	1.027e+003	7.074e+004	5053	1	0	0.00%
5	5.47	PHOSPHATE	7.565e+002	2.582e+004	1746	1	0	0.00%
6	7.52	SULFATE	4.939e+002	4.362e+004	2322	1	0	5.87%

File: C:\DX\DATA\89120401.D07 Sample: 5045S



DATA REPROCESSED ON Mon Mar 26 15:05:05 1990

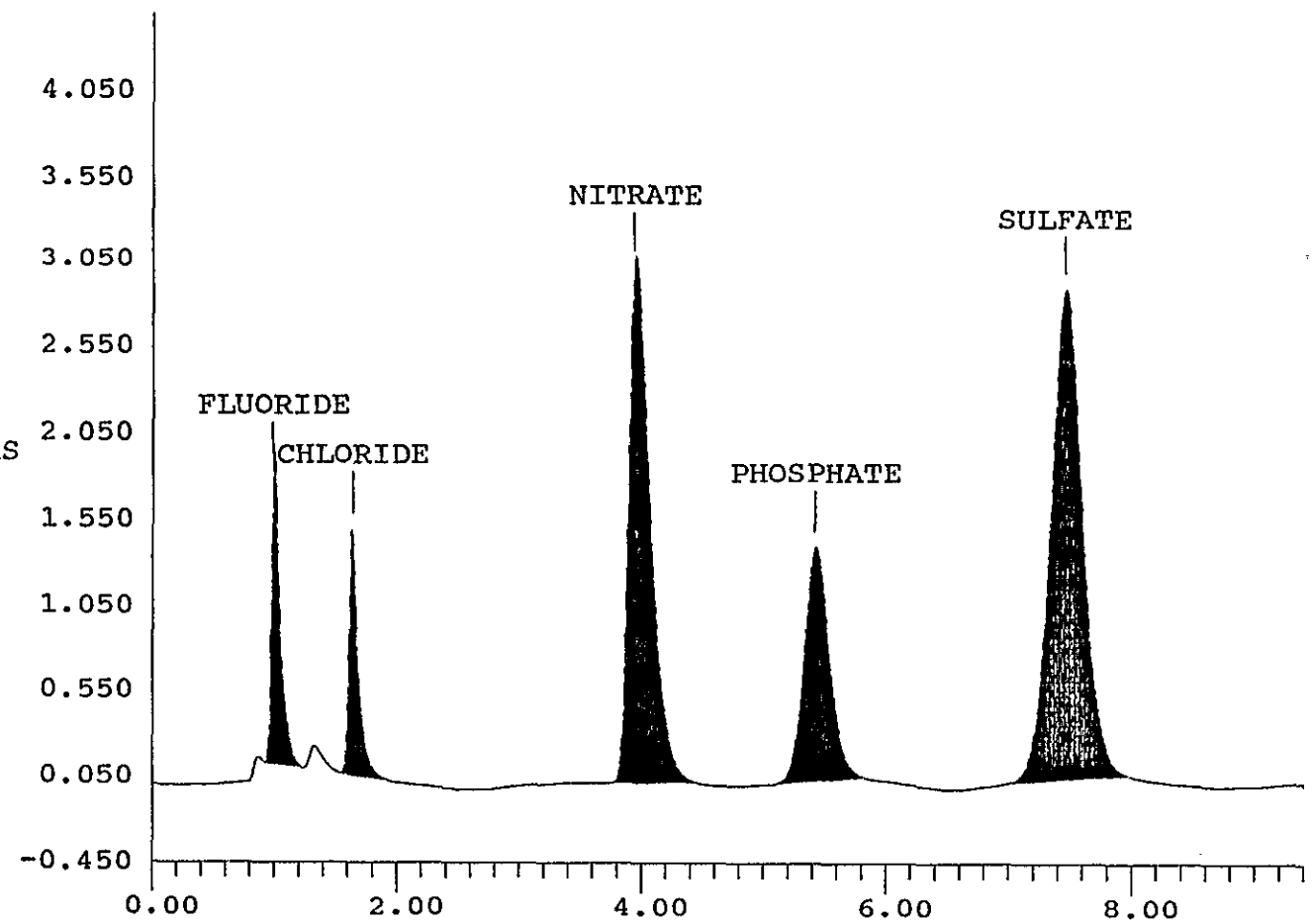
Sample Name: LMCS/6C11HC Date: Mon Dec 04 15:56:04 1989
Data File : C:\DX\DATA\89120401.D08
Method : c:\windows\ai400\method\GROUT01.met
ACI Address: 1 System : 1 Inject#: 8 Detector: CDM

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

Stop time = 9.40 Minutes Number of Data Points = 2820
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	0.98	FLUORIDE	5.439e+001	9.682e+003	1645	1	0	0.00%
2	1.63	CHLORIDE	7.652e+001	7.955e+003	1431	1	0	0.00%
3	3.93	NITRATE	5.927e+002	3.897e+004	2992	1	0	5.83%
4	5.42	PHOSPHATE	5.922e+002	2.019e+004	1355	1	0	0.00%
5	7.45	SULFATE	5.959e+002	5.281e+004	2826	1	0	0.00%

File: C:\DX\DATA\89120401.D08 Sample: LMCS/6C11HC



Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Instrument	WB39937
Procedure / Rev	LA-344-105/A-3
Technologist	80725 S. Cervantes
Date	12-4-89
Temperature	25 C
Starting Time	12-4-89/11:00
Ending Time	12-4-89/14:00
Chemist	R. E. Brandt

Total Organic Carbon

Water Digestion

Samples were not acidified prior to analysis. Results reported as Total Organic Carbon and Carbonate combined.

	Description	Lab. Id.
1	Reagent Blank	F5054
2	Initial Check Std	F5042
3	Sample 89-041	F5043
4	Duplicate 89-041	F5044
5	Spike 89-041	F5045
6	Final LMCS Check Std	F5046
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 Standard	70C11B/11 uL			2.2 mL
Spike	70C11B/50 ug	Sample/200 uL		2.4 mL

Prepared by: Helene S. Rich (Signature) H. S. Rich (Printed Name) Date: May 4, 1990

Verified by: Carry M Seidel (Signature) C. M. Seidel (Printed Name) Date: May 4, 1990

Approved by: _____ (Signature) _____ (Printed Name) Date: _____

Interim

Rev.E 4/04/90

SST-102

9112150720

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COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: BLK Date: 12-04-1989 Time: 10:32:41

Blank = N/A Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	1.10	100.00
3	3.01	1.50	26.67
4	4.01	1.90	21.05
5	5.01	2.20	13.64
6	6.01	2.60	15.38
7	7.01	2.90	10.34
8	8.01	3.40	14.71
9	9.01	3.80	10.53
10	10.01	4.10	7.32

BLANK VALUE = 4.1 / 10.00653 = .4097324 g/L/minute

Sample Run By: 80725 V.C.

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: STD 15042 Date: 12-04-1989 Time: 11:08:15

Blank = .4097324 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	49.00	100.00
3	3.01	53.60	8.58
4	4.01	54.80	2.19
5	5.01	55.50	1.26
6	6.01	56.10	1.07
7	7.01	56.60	0.88

(56.6 - 2.870828)(11)/(200) = 2.955104 g/L Carbon

(56.6 - 2.870828)(11)/(200)(12) = .2462587 Molar Carbon

Sample Run By: 80725 J.C.

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: 5043 Date: 12-04-1989 Time: 11:57:24

Blank = .4097324 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	1.30	100.00
3	3.01	1.80	27.78
4	4.01	2.20	18.18
5	5.01	2.70	18.52
6	6.01	3.20	15.63
7	7.01	3.70	13.51
8	8.01	4.10	9.76

(4.1 - 3.280035)(11)/(200) = 4.509807E-02 g/L Carbon

(4.1 - 3.280035)(11)/(200)(12) = 3.758172E-03 Molar Carbon

Sample Run By: 80725 S.C.

9 1 1 2 5 9 0 7 4

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: 5044 Date: 12-04-1989 Time: 13:40:45

Blank = .4097324 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	1.60	100.00
3	3.01	2.00	20.00
4	4.01	2.50	20.00
5	5.01	2.90	13.79
6	6.01	3.30	12.12
7	7.01	3.70	10.81
8	8.01	4.10	9.76

(4.1 - 3.28046)(11)/(200) = 4.507469E-02 g/L Carbon

(4.1 - 3.28046)(11)/(200)(12) = 3.756224E-03 Molar Carbon

Sample Run By: 80725 J.C.

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: 5045 Date: 12-04-1989 Time: 13:52:28

Blank = .4097324 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	47.50	100.00
3	3.01	49.40	3.85
4	4.01	50.30	1.79
5	5.01	50.70	0.79
6	6.01	51.20	0.98
7	7.01	51.70	0.97

(51.7 - 2.870453)(11)/(200) = 2.685625 g/L Carbon

(51.7 - 2.870453)(11)/(200)(12) = .2238021 Molar Carbon

Sample Run By: 80725 A.C.

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: 5046 Date: 12-04-1989 Time: 14:03:49

Blank = .4097324 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	53.30	100.00
3	3.01	56.20	5.16
4	4.01	57.20	1.75
5	5.01	57.80	1.04
6	6.01	58.20	0.69
7	7.01	58.70	0.85

(58.7 - 2.870528)(11)/(200) = 3.070621 g/L Carbon

(58.7 - 2.870528)(11)/(200)(12) = .2558851 Molar Carbon

Sample Run By: 80725 S.C.

9112152072 7

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Total Organic Carbon from Water Digestion II.

Sample was acidified prior to analysis.

Instrument	WB39937
Procedure / Rev	LA-344-105/A-3
Technologist	E. Colvin
Date	06-29-90
Temperature	N/A
Starting Time	12:30
Ending Time	15:00
Chemist	R. Brandt

	Description	Lab. Id.
1	Reagent Blank	F5054
2	Initial LMCS Check Std	F5042
3	Sample 89-041	F5043
4	Duplicate 89-041	F5044
5	Spike 89-041	F5045
6	Final LMCS Check Std	F5046
7		
8		
9		
10		
11		

	Description	Lab. Id.
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22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std	70C11D /200uL			2.2 mL
Spike	80C11A /200uL	Sample/200 uL		.5 mL

Prepared by: Shirley Cervantes (Signature) S. A. Cervantes (Printed Name) Date: 08/09/90

Verified by: Carry M Seidel (Signature) C. M. Seidel (Printed Name) Date: 08/09/90

Approved by: L. H. Taylor (Signature) L. H. Taylor (Printed Name) Date: 8/30/90

Interim

SST-102 Rev.E 4/04/90

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-C054 Date: 06-29-1990 Time: 12:43:26

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	1.00	100.00
3	3.01	1.60	37.50
4	4.01	2.10	23.81
5	5.01	2.60	19.23
6	6.01	3.00	13.33
7	7.01	3.50	14.29

BLANK VALUE = 3.5 / 7.0066553 = .4995253 ug/minute

Sample Run By: 80028

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COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-5042 Date: 06-29-1990 Time: 12:51:19

Blank = .4995253 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	35.10	100.00
3	3.01	47.80	26.57
4	4.01	52.70	9.30
5	5.01	54.90	4.01
6	6.01	56.20	2.31
7	7.01	57.10	1.58

(57.1 - 3.500001)(11)/(200) = 2.948 g/L Carbon

(57.1 - 3.500001)(11)/(200)(12) = .2456667 Molar Carbon

Sample Run By: 80028 _____

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9112150730

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-5043 Date: 06-29-1990 Time: 14:59:53

Blank = .49952253 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	1.90	100.00
3	3.01	2.80	52.14
4	4.01	3.50	20.00
5	5.01	4.10	14.63
6	6.01	4.50	8.89
7	7.01	5.00	10.00

(5 - 3.499604)(1.1)/(200) = 8.252178E-03 g/l Carbon

(5 - 3.499604)(1.1)/(200)(12) = 6.876816E-04 Molar Carbon

Sample Run By: 80028

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COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: K-5044 Date: 06-29-1990 Time: 13:08:04

Blank = .4995253 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	2.60	100.00
3	3.01	3.70	29.73
4	4.01	4.30	13.95
5	5.01	4.90	12.24
6	6.01	5.40	9.26
7	7.01	5.90	8.47

(5.9 - 3.500001)(1.1)/(200) = .0132 g/L Carbon

(5.9 - 3.500001)(1.1)/(200)(12) = .0011 Molar Carbon

Sample Run By: BUOZB

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COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-5045 Date: 06-29-1990 Time: 13:16:48

Blank = .4995253 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	80.10	100.00
3	3.01	108.10	25.90
4	4.01	118.70	8.93
5	5.01	122.80	3.34
6	6.01	124.70	1.52
7	7.01	126.00	1.03

(126 - 3.500001)(1.1)/(200) = .67375 g/L Carbon

(126 - 3.500001)(1.1)/(200)(12) = 5.614583E-02 Molar Carbon

Sample Run By: 80028

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9112059073

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-5046 Date: 06-29-1990 Time: 13:25:08

Blank = .4995253 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	36.40	100.00
3	3.01	48.20	24.48
4	4.01	52.70	8.54
5	5.01	54.60	3.48
6	6.01	55.80	2.15
7	7.01	56.60	1.41

(56.6 - 3.500031)(11)/(200) = 2.920498 g/l Carbon

(56.6 - 3.500031)(11)/(200)(12) = .2433749 Molar Carbon

Sample Run By: 80028

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ACID DIGESTION TEST ANALYSIS

9 1 1 2 5 9 0 7 7 5

ICP Results Data Summary

Date Analyzed:	February 22, 1990	Acid Digested Standard	F5047
Procedure:	LA-505-151/A-0	Sample 89-041	F5048
Analyst:	D. M. Southwick	Duplicate of 89-041	F5049
Digestion Procedure:	Acid Digestion LA-505-159/A-0	Spike of 89-041	F5050

	Instrument Starting LMCS Standard %	Acid Digest. LMCS Standard %	Wet Weight Sample ug/g	Wet Weight Sample Duplicate ug/g	Spike Recovery %	Closing LMCS Standard %
Aluminum	103.92%		34730	37858	NOT CALC.	109.27%
Barium	97.78%		22	16	94.30%	102.20%
Bismuth	100.00%	92.25%	20942	19470	NOT CALC.	96.06%
Boron	107.54%	101.60%	5 LT	-8 LT	53.64%	103.98%
Cadmium	103.12%	96.85%	3 LT	-3 LT	76.13%	99.23%
Calcium	104.97%	113.20%	155	152	7.28%	102.15%
Chromium	93.60%		446	429	53.42%	99.46%
Copper	104.29%	104.65%	27	15	75.98%	101.92%
Iron	96.80%		7927	8145	NOT CALC.	103.53%
Lanthanum	93.57%	90.75%	10 LT	-15 LT	55.81%	90.76%
Lead	93.02%	83.85%	131	-40 LT	87.36%	90.04%
Lithium	104.96%		4	-2 LT	101.89%	107.85%
Magnesium	103.54%	102.20%	103	116	99.67%	99.90%
Manganese	97.11%		1993	2048	58.27%	103.56%
Molybdenum	105.61%	106.45%	20	11	80.73%	114.90%
Nickel	96.54%		59	44	64.14%	103.22%
Phosphorou	108.41%	108.45%	9243	9534	NOT CALC.	101.74%
Potassium	99.29%	90.15%	198	-53 LT	43.29%	94.82%
Silver	105.57%	101.15%	-9 LT	-21 LT	NOT CALC.	103.69%
Sodium	99.57%	110.45%	65496	65413	NOT CALC.	97.18%
Strontium	104.12%	102.45%	243	245	94.41%	101.31%
Tantalum	100.59%		63	13 LT	3.48%	106.69%
Tin	90.31%		31	17	47.32%	97.19%
Titanium	104.73%		11	2 LT	77.34%	110.47%
Zinc	102.20%	100.00%	57	50	94.70%	99.54%
Zirconium	102.37%		44	7 LT	-5.36%	108.13%

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

Prepared by: H. S. Rich Date: May 2, 1990

Verified by: C. M. Seidel Date: May 2, 1990

Approved by: L. H. Tayh Date: May 9, 1990

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

Acid Digestion

Instrument	N/A
Procedure / Rev	LA-505-159/A-0
Technologist	D.M. Southwick/69769
Date	12-6-89
Temperature	72 F
Starting Time	08:20
Ending Time	14:00
Chemist	S. A. Jones

Note: A reagent blank was not prepared.

*LMCS Check Standard was digested, but not used in the analysis.

	Description	Lab. Id.
1	LMCS Check Standard	F5047
2	Sample of 89-041	F5048
3	Duplicate of 89-041	F5049
4	Spike of 89-041	F5050
5	LMCS Check Standard	F5051*
6		
7		
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11		

	Description	Lab. Id.
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21		
22		

Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std.	34C11CM/5mL			25 mL
Spike	103C15C/5mL	104C15D/5mL		25 mL

Prepared by: [signature] Signature — H.S. Rich Printed Name — Date: May 04, 1990

Verified by: [signature] Signature — C.M. Seidel Printed Name — Date: May 04, 1990

Approved by: [signature] Signature — L.H. Taylor Printed Name — Date: May 9, 1990

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9 1 1 2 1 5 9 0 7 1 7

Analytical Batch

Lab Segment Serial No.: F5033

Customer ID.: 89-041

ICP analysis of sample 89-041.
No reagent blank was analyzed in this batch.

Instrument	WB39939
Procedure / Rev	LA-505-151/A-0
Technologist	D. M. Southwick
Date	Feb. 22, 1990
Temperature	70 F
Starting Time	16:00
Ending Time	21:30
Chemist	S. A. Jones

	Description	Lab. Id.
1	Initial LMCS Check Std.	na
2	Digested Standard 34C11C	F5047
3	Sample 89-041	F5048
4	Duplicate of 89-041	F5049
5	Spike of 89-041	F5050
6	Ending LMCS Check Std.	na
7		
8		
9		
10		
11		

	Description	Lab. Id.
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Standard Type	Primary Book No. & Aliquot	Second Book No. & Aliquot	Third Book No. & Aliquot	Final Volume of Standard
LMCS Check Std.	81C11A/1.0 mL	82C11A/1.0 mL		11.0 mL
Digested LMCS Std.	34C11C/5.0 mL			50.0 mL
Spike of Sample	103C15C/5.mL	104C15D/5.0mL	Sample/.5838g	25.0 mL

Prepared by: [signature] Signature — H. S. Rich Printed Name — Date: May 4, 1990

Verified by: [signature] Signature — C. M. Seidel Printed Name — Date: May 4, 1990

Approved by: [signature] Signature — L. H. Taylor Printed Name — Date: May 9, 1990

Interim

Rev E 4/04/90

SST-102

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9 1 1 2 1 5 9 0 7 7 3

ICP Results Raw Data Summary

Date Analyzed:	February 22, 1990	Acid Digested Standard	F5047
Procedure:	LA-505-151/A-0	Reagent Blank	F5055
Analyst:	D. M. Southwick	Sample 89-041	F5048
Digestion	Acid Digestion	Duplicate of 89-041	F5049
Procedure:	LA-505-159/A-0	Spike of 89-041	F5050
		Acid Digested Standard	F5051

	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	103.92%		NOT RUN	34730	37858	NOT CALC.		109.27%
Antimony				73	-2 LT		Not Run	
Arsenic				47	26			
Barium	97.78%			22	16	94.30%		102.20%
Beryllium				1	0 LT			
Bismuth	100.00%	92.25%		20942	19470	NOT CALC.		96.06%
Boron	107.54%	101.60%		5 LT	-8 LT	53.64%		103.98%
Cadmium	103.12%	96.85%		3 LT	-3 LT	76.13%		99.23%
Calcium	104.97%	113.20%		155	152	7.28%		102.15%
Cerium	86.74%			203	10 LT	1.66%		91.59%
Chromium	93.60%			446	429	53.42%		99.46%
Cobalt	78.65%			-76 LT	-96 LT	NOT CALC.		89.73%
Copper	104.29%	104.65%		27	15	75.98%		101.92%
Europium				3	-1 LT			
Iron	96.80%			7927	8145	NOT CALC.		103.53%
Lanthanum	93.57%	90.75%		10 LT	-15 LT	55.81%		90.76%
Lead	93.02%	83.85%		131	-40 LT	87.36%		90.04%
Lithium	104.96%			4	-2 LT	101.89%		107.85%
Magnesium	103.54%	102.20%		103	116	99.67%		99.90%
Manganese	97.11%			1993	2048	58.27%		103.56%
Mercury				18	8			
Molybdenum	105.61%	106.45%		20	11	80.73%		114.90%
Neodymium	88.30%			84 LT	-44 LT	68.73%		91.77%
Nickel	96.54%			59	44	64.14%		103.22%
Phosphorou	108.41%	108.45%		9243	9534	NOT CALC.		101.74%
Potassium	99.29%	90.15%		198	-53 LT	43.29%		94.82%
Samarium				119	-62 LT			
Selenium				448	337			
Silicon	78.22%	81.60%		707	961	42.33%		83.71%
Silver	105.57%	101.15%		-9 LT	-21 LT	NOT CALC.		103.69%
Sodium	99.57%	110.45%		65496	65413	NOT CALC.		97.18%
Strontium	104.12%	102.45%		243	245	94.41%		101.31%
Sulfur				921	707			
Tantalum	100.59%			63	13 LT	3.48%		106.69%
Thallium				266	16 LT			
Thorium				76	-62 LT			
Tin	90.31%			31	17	47.32%		97.19%
Titanium	104.73%			11	2 LT	77.34%		110.47%
Tungsten				100	58			
Uranium				2116	1025			
Vanadium				25	3 LT			
Zinc	102.20%	100.00%		57	50	94.70%		99.54%
Zirconium	102.37%			44	7 LT	-5.36%		108.13%

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

ICP Results Raw Data

Date Analyzed: February 22, 1990
Procedure: LA-505-151/A-0
Analyst: D. M. Southwick
Digestion Procedure: Acid Digestion LA-505-159/A-0

Acid Digested Standard	F5047
Reagent Blank	F5055
Sample 89-041	F5048
Duplicate of 89-041	F5049
Spike of 89-041	F5050
Acid Digested Standard	F5051

	Starting Instrument Standard ppm	LMCS Standard Recovery %		LMCS Acid Digestion Standard ppm	Acid Digestion Standard Recovery %	Reagent Blank ppm	Digestion Weight Volume Sample Dilution Three ppm	0.5432 g 25.00 mL Sample Dilution Two ppm	0.02173 Sample Dilution One ppm	Digestion Weight Volume Sample Duplicate Dilution Three ppm
Aluminum	103.92	103.92%				NOT RUN		754.61	765.73	
Antimony								0.00	1.58	
Arsenic								-0.70	1.03	
Barium	97.78	97.78%						0.02	0.48	
Beryllium								-0.03	0.01	
Bismuth	100.00	100.00%		9.23	92.25%			455.03	470.49	
Boron	107.54	107.54%		10.16	101.60%			-1.40	0.11 LT	
Cadmium	103.12	103.12%		9.69	96.85%			-1.05	0.06 LT	
Calcium	104.97	104.97%		11.32	113.20%			-6.00	3.37	
Cerium	86.74	86.74%	#					-10.48	4.40	
Chromium	94.45	93.60%						9.69	11.99	
Cobalt	78.65	78.65%	#					-6.70	-1.64 LT	
Copper	104.29	104.29%		10.47	104.65%			-0.53	0.59	
Europium								-0.24	0.06	
Iron	96.80	96.80%						172.23	183.77	
Lanthanum	93.57	93.57%		9.08	90.75%			-0.91	0.22 LT	
Lead	93.02	93.02%		8.39	83.85%			-3.74	2.85	
Lithium	104.96	104.96%						-0.38	0.09	
Magnesium	103.54	103.54%		10.22	102.20%			2.25	2.79	
Manganese	97.11	97.11%						43.31	45.06	
Mercury								-0.47	0.38	
Molybdenum	105.40	105.61%		10.65	106.45%			-0.29	0.43	
Neodymium	88.30	88.30%	#					-1.47	1.83 LT	
Nickel	96.54	96.54%						-0.12	1.27	
Phosphorou	108.41	108.41%		10.85	108.45%			200.83	209.40	
Potassium	99.29	99.29%		9.02	90.15%			-6.85	4.30	
Samarium								-13.63	2.58	
Selenium								-4.73	9.72	
Silicon	78.22	78.22%	#	8.16	81.60%			12.93	15.37	
Silver	105.57	105.57%		10.12	101.15%			-5.20	-0.20 LT	
Sodium	99.57	99.57%		11.05	110.45%			1423.10	1403.50	
Strontium	104.12	104.12%		10.25	102.45%			5.27	5.49	
Sulfur								20.02	18.73	
Tantalum	100.09	100.59%						-3.63	1.38	
Thallium								-20.50	5.78	
Thorium								-11.30	1.65	
Tin	90.31	90.31%						-2.19	0.67	
Titanium	104.83	104.73%						-0.58	0.24	
Tungsten								-1.64	2.17	
Uranium								-56.10	45.98	
Vanadium								-1.28	0.54	
Zinc	102.20	102.20%		10.00	100.00%			0.50	1.24	
Zirconium	102.17	102.37%						-1.11	0.96	
Dilution Factor	11.00			10.00		1.00	1.00	101.00	11.00	1.00

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

	Sample Duplicate Dilution Two ppm	Sample Duplicate Dilution One ppm	Spike of Sample Dilution Three ppm	Spike of Sample Dilution Two ppm	Spike of Sample Dilution One ppm	Spike Recovery %	Standard LMCS Acid Digestion ppm	Acid Digestion Standard Recovery %	Ending LMCS Standard ppm	Standard Recovery %
Digestion Weight	0.5922 g	0.02369		0.5838 g	0.02335					
Volume	25.00 mL			25.00 mL						
Aluminum	896.77	883.47		818.09	880.31	NOT CALC.			109.27	109.27%
Antimony	-8.00	-0.05 LT		1.00	11.06					
Arsenic	1.64	0.61		-3.82	1.07		NOT RUN			
Barium	0.25	0.39		9.45	10.89	94.30%			102.20	102.20%
Beryllium	-0.03	0.00 LT		-0.07	0.00 LT					
Bismuth	461.21	447.03		427.80	469.40	NOT CALC.			96.06	96.06%
Boron	-1.94	-0.20 LT		5.48	9.93	53.64%			103.98	103.98%
Cadmium	-0.92	-0.06 LT		7.68	10.02	76.13%			99.23	99.23%
Calcium	-5.76	3.60		4.35	14.70	7.28%			102.15	102.15%
Cerium	-2.96	0.23 LT		-28.65	0.17 LT	1.66%			91.59	91.59%
Chromium	10.16	11.78		15.76	22.03	53.42%			100.36	99.46%
Cobalt	-19.26	-2.28 LT		1.68	7.30	NOT CALC.			89.73	89.73%
Copper	0.16	0.35		8.23	11.00	75.98%			101.92	101.92%
Europium	-0.06	-0.02 LT		-0.58	0.00 LT					
Iron	192.94	184.98		178.96	195.55	NOT CALC.			103.53	103.53%
Lanthanum	-2.73	-0.36 LT		5.82	9.52	55.81%			90.76	90.76%
Lead	-31.13	-0.95 LT		-24.90	11.80	87.36%			90.04	90.04%
Lithium	-0.30	-0.06 LT		10.29	11.68	101.89%			107.85	107.85%
Magnesium	2.74	2.89		12.38	13.76	99.67%			99.90	99.90%
Manganese	48.50	46.23		52.37	56.34	58.27%			103.56	103.56%
Mercury	1.08	0.19		-1.55	0.17					
Molybdenum	0.01	0.26		8.54	11.23	80.73%			114.67	114.90%
Neodymium	2.24	-1.05 LT		-10.43	8.84	68.73%			91.77	91.77%
Nickel	1.42	1.04		7.78	11.15	64.14%			103.22	103.22%
Phosphorou	225.84	208.40		227.65	251.76	NOT CALC.			101.74	101.74%
Potassium	-12.08	-1.25 LT		-28.40	8.95	43.29%			94.82	94.82%
Samarium	-6.69	-1.48 LT		-31.96	-1.77 LT					
Selenium	3.63	7.98		-10.54	12.31					
Silicon	29.42	22.77		18.13	18.50	42.33%			83.71	83.71%
Silver	-4.39	-0.51 LT		3.61	10.28	NOT CALC.			103.69	103.69%
Sodium	1549.50	1534.90		1558.70	1642.10	NOT CALC.			97.18	97.18%
Strontium	5.81	5.67		15.11	16.36	94.41%			101.31	101.31%
Sulfur	16.76	19.02		16.18	21.26					
Tantalum	0.03	0.31 LT		-8.67	0.35 LT	3.48%			106.16	106.69%
Thallium	-6.68	0.37 LT		-58.85	-0.58 LT					
Thorium	-8.81	-1.48 LT		-21.01	-0.86 LT					
Tin	-0.53	0.40		5.45	9.93	47.32%			97.19	97.19%
Titanium	-0.13	0.05 LT		7.99	10.33	77.34%			110.58	110.47%
Tungsten	1.44	1.37		-4.78	1.56					
Uranium	-0.97	24.28		-166.80	24.81					
Vanadium	-0.39	0.06 LT		-3.73	0.06 LT					
Zinc	0.59	1.19		10.01	11.72	94.70%			99.54	99.54%
Zirconium	0.14	0.16 LT		-3.53	0.50	-5.36%			107.91	108.13%
Dilution Factor	101.00	11.00	1.00	101.00	11.00		10.00		11.00	

		Spike Standard LMCS ppm added	Spike Standard ID Book # 5.0 mL 103C15C + 5.0 mL 104C15D	LMCS Standards Values ppm	LMCS Standard IDs Book # 81C11A 82C11A	ACID DIGESTION LMCS STANDARD VALUES ppm in Sample	ACID DIGEST. LMCS IDs Book # 34C11C
Aluminum		10.00		100.00			
Antimony							
Arsenic							
Barium		10.00		100.00			
Beryllium							
Bismuth		10.00		100.00		100.00	
Boron		10.00		100.00		100.00	
Cadmium		10.00		100.00		100.00	
Calcium		10.00		100.00		100.00	
Cerium		10.00		100.00			
Chromium		10.00		100.90			
Cobalt	#	10.00		100.00			
Copper		10.00		100.00		100.00	
Europium							
Iron		10.00		100.00			
Lanthanum		10.00		100.00		100.00	
Lead		10.00		100.00		100.00	
Lithium		10.00		100.00			
Magnesium		10.00		100.00		100.00	
Manganese		10.00		100.00			
Mercury							
Molybdenum	#	10.00		99.80		99.80	
Neodymium		10.00		100.00			
Nickel		10.00		100.00			
Phosphorou		10.00		100.00		100.00	
Potassium		10.00		100.00		100.00	
Samarium							
Selenium							
Silicon	#	10.00		100.00		100.00	
Silver		10.00		100.00		100.00	
Sodium		10.00		100.00		100.00	
Strontium		10.00		100.00		100.00	
Sulfur							
Tantalum		9.95		99.50			
Thallium							
Thorium							
Tin		10.00		100.00			
Titanium	#	10.00		100.10			
Tungsten							
Uranium							
Vanadium							
Zinc		10.00		100.00		100.00	
Zirconium		9.98		99.80			
Dilution Factor							

ICP Calibration Report

Procedure: LA-505-151 Revision: A-0
Instrument: WB39939
Technologist: D.M. Southwick
Date: Feb. 22, 1990
Time: 16:28

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-2	Lanthanum	SST-5
Lead	SST-4	Lithium	SST-1
Magnesium	SST-2	Manganese	SST-2
Mercury	SST-3	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 ultrex HNO_3.

SST-1:
Stock solutions from AESAR/John Mathey Inc., Seabrook, NH 03874. Individual element solutions as follows:

Li $LiCO_3$ 10,000 ppm in 5% HNO_3 Lot# 14394A
K KNO_3 10,000 ppm in 5% HNO_3 Lot# 14379A
Na $NaCO_3$ 10,000 ppm in 5% HNO_3 Lot# 14400A

200 mL of standard made by combining 25 mL HCl/HNO_3 mixed acid, 1 mL each single element standards, and water.

SST-2:
Stock solutions from VHG labs, Inc., 180 Zachary Rd. #5, Manchester, NH 03103. Mixed element standards as follows:

SM-10 Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, & Ba 100 ppm Lot# 0-119A
SM-20 V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ag, & Cd 100 ppm Lot# 0-119B

50 mL of each mixed standard are added to a 250 mL volumetric flask and diluted to volume with 1 M HNO3.

SST-3:
Stock solutions from AESAR/John Mathey Inc., Seabrook, NH 03874. Individual element solutions as follows:

Al Al 10,000 ppm in 10% HCl Lot# 9-053A
B H_3BO_3 10,000 ppm in 1% NH_4OH Lot# 9-335A
Hg Hg 10,000 ppm in 5% HNO_3 Lot# 8-656S
Mo Mo 10,000 ppm in 5% HCl Lot# 9-159T
P P 10,000 ppm in 5% HNO3 Lot# 9-160A
Si Si 1000 ppm in KOH Lot# 086DM Spex Industries, Edison, NJ
S $(NH_4)_2SO_4$ in H_2O Lot# 9-231M
Ta TaCl5 10,000 ppm in 5% HCl/tr HF Lot# 9-335M
Ti Ti 10,000 ppm in 5% HF Lot# 9-079EE
W W 10,000 ppm in 5% HF/tr HNO_3 Lot# 8-685L
Zr $ZrCl_2O$ 10,100 ppm in 5% HCl Lot# 9-078G

50 mL of each mixed standard are added to a 250 mL volumetric flask and diluted to volume with 1 M HNO33.

SST-4:
Stock solution from VHG labs, Inc., 180 Zachary Rd. #5, Manchester, NH 03103. Mixed element standard as follows:

SM-50 Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Se, Te, Th, & U 100 ppm Lot# 0-119D

Solution is used directly for calibration.

SST-5:
Stock solution from VHG labs, Inc., 180 Zachary Rd. #5, Manchester, NH 03103. Mixed element standard as follows:

SM-60 Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, & Lu 100 ppm Lot# 7-165F

50 mL of SM-60 is added to a 250 mL volumetric flask and diluted to volume with 1 M HNO_3.

Sample name : SST0
Programme : SST 22-Feb-90 16:05:28

NAME	MV INT	RSD
AL	1.34	0.74
SB	0.33	0.35
AS	0.72	0.92
BA	2.57	0.82
BE	0.51	0.60
BI	2.48	1.49
B	2.07	1.30
CD	1.52	1.33
CA	2.20	0.98
CE	3.51	0.69
CR	1.01	3.31
CO	0.23	0.43
CU	2.00	0.77
EU	2.71	0.95
FE	1.14	0.82
LA	0.32	0.18
PB	0.25	0.00
LI	2.77	0.63
MG	0.43	0.48
MN	0.56	0.31
HG	2.52	0.94
MO	1.13	0.37
ND	3.92	1.63
NI	2.25	0.53
P	1.00	2.26
K	2.46	0.44
SM	3.45	0.76
SE	1.16	1.64
SI	2.19	0.54
AG	9.52	0.77
NA	3.43	0.63
SR	2.68	0.70
S	0.58	1.04
TA	2.34	1.06
TL	2.73	0.59
TH	1.04	0.64
SN	0.86	0.58
TI	2.42	0.64
U	0.89	0.67
U	3.31	0.78
VI	2.99	0.24
ZN	1.66	0.47
ZR	3.44	0.50

Sample name : SST1
Programme : SST 22-Feb-90 16:09:21

NAME	MV INT	RSD
LI	411.60	0.42
K	10.83	0.51
NA	47.15	0.43

Sample name : SST2

Programme : SST 22-Feb-90 16:11:24

NAME	MV INT	RSD
BA	227.52	0.94
BE	421.85	0.93
CD	150.82	1.17
CA	310.01	0.93
CR	40.19	2.35
CO	1.84	1.63
CU	77.67	0.84
FE	65.49	1.07
MG	301.74	0.95
MN	164.73	1.12
NI	88.33	0.95
AG	321.64	0.85
SR	418.65	0.85
V1	70.03	2.63
ZN	334.50	1.04

Sample name : SST3
Programme : SST 22-Feb-90 16:14:33

NAME	MV INT	RSD
AL	17.25	7.35
[illegible]	534.70	7.85
HG	383.52	9.48
MO	174.65	9.26
[illegible]	52.47	8.97
SI	67.59	8.73
[illegible]	30.20	8.83
TA	79.02	9.33
[illegible]	344.49	8.56
W	39.17	9.42
ZR	135.18	8.30

Sample name : SST4
Programme : SST 22-Feb-90 16:16:46

NAME	MV INT	RSD
SB	7.06	2.54
AS	82.74	2.94
BI	88.03	2.55
PB	2.95	2.77
SE	28.95	2.58
TL	24.41	1.60
TH	15.94	2.71
SN	122.55	2.79
U	10.28	1.81

Sample name : SST5
Programme : SST 22-Feb-90 16:19:17

NAME	MV INT	RSD
[illegible]	11.93	1.44

Sample name : SST5
Programme : SST 22-Feb-90 16:19:17

NAME	MV INT	RSD
CE	11.93	1.44
EU	357.24	2.01
LA	4.03	1.84
ND	23.16	1.62
SM	11.61	1.43

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.2768	18.115	-0.422429E+01	0.314307E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3091	7.4113	-0.483192E+01	0.148522E+02		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.6802	86.877	-0.872919E+00	0.121916E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.4399	238.90	-0.228345E+00	0.889080E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.4848	442.95	-0.242241E-01	0.474673E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	[illegible]	[illegible]	[illegible]	[illegible]		

CRV1	2.3538	92.431	-0.289610E+01	0.116888E+01

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.9178	561.44	-0.288859E+00	0.940502E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.4434	158.36	-0.203531E+00	0.133961E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.0925	325.51	-0.143118E+00	0.649749E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.3358	12.522	-0.834575E+01	0.237680E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.9560	42.201	-0.513632E+00	0.510399E+00		

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

Curve	Min Int	Max Int	Curve Coefficients

CRV1 0.2185 1.9303 -0.286010E+01 0.124353E+02

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.9041	81.555	-0.529777E+00	0.264316E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5713	375.10	-0.152690E+00	0.564125E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.0798	68.763	-0.353265E+00	0.310791E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3037	4.2263	-0.172544E+01	0.539763E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.2366	3.1007	-0.920858E+01	0.369823E+02		

Programme name : SST Channel name : L1 Polynomial type : CC

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.9178	561.44	-0.288859E+00	0.940502E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.4434	158.36	-0.203531E+00	0.133961E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.0925	325.51	-0.143118E+00	0.649749E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.3358	12.522	-0.834575E+01	0.237680E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.9560	42.201	-0.513632E+00	0.510399E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.131[illegible]	1.9303	-0.[illegible]E+01	0.[illegible]		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.9041	81.555	-0.529777E+00	0.264316E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5713	375.10	-0.152690E+00	0.564125E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.0798	68.763	-0.353265E+00	0.310791E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3037	4.2263	-0.172544E+01	0.539763E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.2366	3.1007	-0.920858E+01	0.369823E+02		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.4126	316.82	-0.288306E-01	0.663789E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.5330	172.97	-0.683423E-01	0.121823E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.3959	402.70	-0.330974E+00	0.131235E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.0757	183.38	-0.326289E+00	0.288157E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.7246	24.319	-0.407554E+01	0.103950E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	[illegible]	[illegible]	[illegible]	[illegible]		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.9459	55.093	-0.967154E+00	0.971364E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.3414	11.365	-0.147432E+02	0.598182E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.2819	12.189	-0.847356E+01	0.245279E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.1007	30.396	-0.416942E+01	0.359846E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.0849	70.968	-0.167803E+01	0.764596E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	9.0437	337.22	[illegible]	[illegible]		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.3028	49.506	-0.398040E+01	0.114489E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5498	439.59	-0.129049E+00	0.480805E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.5516	31.710	-0.980227E+00	0.168811E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.2205	82.970	-0.152405E+01	0.652046E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5916	25.632	-0.125813E+02	0.461191E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	[illegible]	[illegible]	[illegible]	[illegible]		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.8211	128.67	-0.710316E+00	0.821807E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.2946	361.71	-0.353046E+00	0.146169E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.8474	41.128	-0.116518E+01	0.120626E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.1483	10.790	-0.476013E+02	0.143637E+02		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.8383	73.530	-0.891291E+00	0.298324E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.2680	141.94	-0.130561E+01	0.379538E+00		

Sample name : SST3
Programme : SST 22-Feb-90 16:28:22

NAME	MV INT	RSD
AL	15.96	0.30
B	486.20	0.39
MG	338.57	0.19
MO	154.52	0.24
P	47.31	0.46
SI	62.10	0.33
S	26.90	0.89
TA	70.07	0.13
TI	309.66	0.46
W	34.70	0.82
ZR	122.07	0.48

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.2768	16.753	-0.459917E+01	0.342200E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3091	7.4113	-0.483192E+01	0.148522E+02		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.6802	86.877	-0.872919E+00	0.121916E+01		

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.4399	238.90	-0.228345E+00	0.889080E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.4848	442.95	-0.242241E-01	0.474673E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.3538	92.431	-0.289610E+01	0.116888E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.9178	510.51	-0.317860E+00	0.103492E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.4434	158.36	-0.203531E+00	0.133961E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.0925	325.51	-0.143118E+00	0.649749E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.3358	12.522	-0.834575E+01	0.237680E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.9560	42.201	-0.513632E+00	0.510399E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.2185	1.9303	-0.286010E+01	0.124352E+02		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.9041	81.555	-0.529777E+00	0.264316E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5713	375.10	-0.152690E+00	0.564125E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.0798	68.763	-0.353265E+00	0.310791E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3037	4.2263	-0.172544E+01	0.539763E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.2366	3.1007	-0.920858E+01	0.369823E+02		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.6337	432.18	-0.339059E+00	0.122301E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.4126	316.82	-0.288306E-01	0.663789E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.5330	172.97	-0.683423E-01	0.121822E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.3959	355.50	-0.375247E+00	0.140789E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.0757	162.24	-0.369118E+00	0.325980E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.7246	24.319	-0.407554E+01	0.103950E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.1343	92.746	-0.521979E+00	0.232335E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.9459	49.679	-0.107482E+01	0.107950E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.3414	11.365	-0.147432E+02	0.598182E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.2819	12.189	-0.847356E+01	0.245279E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.1007	30.396	-0.416942E+01	0.359846E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.0849	65.200	-0.183192E+01	0.834715E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	9.0437	337.72	-0.609998E+00	0.640776E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.3028	49.506	-0.398040E+01	0.114489E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5498	439.59	-0.129048E+00	0.480805E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.5516	28.249	-0.110296E+01	0.189948E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.2205	73.578	-0.172529E+01	0.728145E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5916	25.632	-0.125813E+02	0.461191E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.9896	16.741	-0.699011E+01	0.671051E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.8211	128.67	-0.710316E+00	0.821807E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.2946	325.15	-0.393059E+00	0.162735E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.8474	36.431	-0.131936E+01	0.147910E+01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.1483	10.790	-0.476013E+02	0.143637E+02		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.8383	73.530	-0.891291E+00	0.298324E+00		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.5723	351.23	-0.994446E-01	0.600874E-01		

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

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.2680	128.17	-0.144987E+01	0.421475E+00		

Sample name : 81C11A
Programme : SST 22-Feb-90 16:43:59

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.30	-0.153	-1.631	-10.58
Sb	0.32	-0.084	-0.926	-44.41
As	0.89	0.212	2.333	11.74
Ba	2.57	0.001	0.006	131.47
Be	0.50	-0.000	-0.005	-32.08
Bi	10.26	9.091	100.00	2.37
B	97.53	9.776	107.54	1.70
Cd	71.50	9.375	103.12	2.90
Ca	149.07	9.542	104.97	2.37
Ce	3.49	-0.047	-0.514	-60.66
Cr	1.12	0.059	0.646	22.68
Co	0.21	(-0.203	(-2.234	-12.74
Cu	37.87	9.481	104.29	2.27
Eu	2.68	-0.001	-0.016	-35.29
Fe	1.11	-0.008	-0.093	-79.51
La	1.90	8.507	93.573	2.63
Pb	0.48	8.457	93.023	3.07
Li	2.71	-0.007	-0.079	-18.12
Mg	142.24	9.413	103.54	2.76
Mn	0.59	0.004	0.045	22.52
Hg	3.24	0.107	1.173	12.72
Mo	1.12	-0.003	-0.032	-138.92
Nd	4.25	0.345	3.792	22.09
Ni	2.23	-0.004	-0.043	-127.70
P	10.13	9.855	108.41	2.80
K	3.97	9.027	99.292	2.88
Sm	3.37	-0.210	-2.311	-9.55
Se	1.14	-0.073	-0.805	-36.25
Si	2.25	0.043	0.468	38.74
Ag	159.29	9.597	105.57	2.17
Na	11.38	9.052	99.571	2.85
Sr	199.55	9.465	104.12	2.56
S	0.63	0.099	1.087	15.54
Ta	2.30	-0.030	-0.330	-39.83
Tl	2.68	-0.209	-2.300	-32.29
Th	1.01	-0.183	-2.018	-5.59
Sn	0.98	0.098	1.079	7.92
Ti	2.36	-0.009	-0.097	-22.40
W	0.97	0.120	1.318	7.41
U	3.29	-0.393	-4.319	-47.18
V	2.95	-0.011	-0.123	-33.92
Zn	156.28	9.291	102.20	2.58
Zr	3.39	-0.020	-0.216	-18.22

Dilution factor : 11.0000

Not OK

Sample name : 81C11A
Programme : SST 22-Feb-90 16:48:03

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.35	0.032	0.351	368.42
Sb	0.31	-0.168	-1.852	-55.10
As	0.74	0.028	0.313	128.74
Ba	2.54	-0.002	-0.024	-313.64
Be	0.50	-0.001	-0.006	-52.92
Bi	2.43	-0.056	-0.617	-151.79
B	3.64	0.059	0.647	65.45
Cd	1.44	-0.010	-0.110	-47.36
Ca	0.85	(-0.088	(-0.968	-0.60
Ce	3.48	-0.075	-0.828	-350.97
Cr	1.02	0.009	0.103	237.09
Co	0.21	(-0.191	(-2.097	-13.58
Cu	2.02	0.004	0.045	408.54
Eu	2.68	-0.002	-0.018	-282.49
Fe	1.10	-0.010	-0.113	-81.39
La	0.31	-0.036	-0.396	-68.74
Pb	0.24	-0.419	-4.610	-5.09
Li	2.75	-0.003	-0.035	-258.76
Mg	0.53	0.006	0.071	11.81
Mn	0.57	0.002	0.018	85.75
Hg	2.86	0.050	0.553	40.73
Mo	30.53	9.582	105.40	2.25
Nd	3.96	0.039	0.427	379.65
Ni	2.23	-0.004	-0.048	-461.18
P	0.98	-0.021	-0.234	-105.07
K	2.45	-0.088	-0.965	-413.37
Sm	3.41	-0.098	-1.079	-254.04
Se	1.14	-0.053	-0.581	-226.03
Si	10.71	7.111	78.217	2.00
Ag	8.81	(-0.045	(-0.499	-45.28
Na	3.47	-0.010	-0.109	-1102.2
Sr	2.67	-0.001	-0.007	-521.97
S	0.59	0.018	0.195	130.35
Ta	2.31	-0.022	-0.241	-228.87
Tl	2.65	-0.347	-3.822	-8.84
Th	1.03	-0.049	-0.541	-338.82
Sn	0.84	-0.019	-0.211	-55.71
Ti	2.38	-0.005	-0.060	-213.23
W	0.88	-0.016	-0.174	-200.49
U	3.27	-0.608	-6.689	-242.14
V	2.92	-0.021	-0.230	-15.28
Zn	1.52	(-0.008	(-0.086	-37.76
Zr	3.42	-0.007	-0.082	-405.39

Dilution factor : 11.0000

Sample name : 82C11A
Programme : SST 22-Feb-90 16:52:38

NAME	MV INT	CONCEN	DILCOR	RSD
Al	4.10	9.447	103.92	1.14
Sb	0.32	-0.045	-0.490	-19.25
As	0.90	0.226	2.490	0.31
Ba	102.55	8.889	97.778	1.07
Be	0.55	0.002	0.021	8.73
Bi	2.52	0.044	0.484	38.50
B	3.13	0.006	0.069	76.55
Cd	1.48	-0.005	-0.055	-44.76
Ca	3.01	0.052	0.575	3.62
Ce	6.83	7.885	86.740	1.61
Cr	17.83	8.586	94.445	1.24
Co	0.81	7.150	78.653	1.25
Cu	1.98	-0.005	-0.060	-55.03
Eu	3.06	0.020	0.222	3.66
Fe	29.45	8.800	96.802	1.31
La	0.32	0.018	0.198	30.00
Pb	0.24	-0.357	-3.932	-15.80
Li	80.79	9.542	104.96	0.65
Mg	1.44	0.067	0.732	1.44
Mn	73.02	8.828	97.105	1.25
Hg	2.79	0.039	0.432	27.90
Mo	1.19	0.020	0.218	21.04
Nd	11.64	8.027	88.301	1.70
Ni	40.02	8.776	96.540	1.20
P	0.98	-0.019	-0.214	-128.66
K	2.43	-0.217	-2.391	-29.69
Sm	3.39	-0.161	-1.772	-21.16
Se	2.16	3.612	39.728	0.40
Si	2.65	0.379	4.166	2.87
Ag	9.43	-0.006	-0.062	-67.00
Na	3.46	-0.019	-0.214	-55.91
Sr	2.70	0.001	0.009	51.28
S	0.66	0.141	1.553	14.98
Ta	14.66	9.099	100.09	1.56
Tl	2.74	0.043	0.473	356.70
Th	1.07	0.183	2.018	6.34
Sn	10.86	8.210	90.314	1.86
Ti	60.98	9.530	104.83	1.10
W	0.89	0.000	0.005	2551.40
U	3.63	4.606	50.665	5.66
V	2.92	-0.020	-0.217	-15.33
Zn	2.03	0.022	0.246	5.04
Zr	25.48	9.288	102.17	1.01

Dilution factor : 11.0000

9 1 1 2 1 5 9 0 7 1 7

Sample name : 34C11C
Sample code 1 : DIGEST
Programme : SST 22-Feb-90 16:56:57

F5047

NAME	MV INT	CONCEN	RSD
Al	1.35	0.022	221.82
Sb	0.32	-0.069	-49.49
As	0.74	0.025	31.62
Ba	2.59	0.002	177.62
Be	0.50	-0.001	-19.81
Bi	4.06	1.845	8.54
B	22.71	2.032	8.09
Cd	15.98	1.937	8.90
Ca	37.05	2.264	8.58
Ce	3.44	-0.166	-78.49
Cr	1.04	0.020	12.33
Co	0.23	-0.012	-199.99
Cu	9.92	2.093	7.63
Eu	2.64	-0.004	-70.20
Fe	1.47	0.103	9.46
La	0.66	1.815	8.58
Pb	0.29	1.677	12.93
Li	2.73	-0.005	-92.54
Mg	31.22	2.044	8.44
Mn	0.59	0.004	22.53
Hg	2.49	-0.004	-151.82
Mo	7.66	2.129	8.80
Nd	3.92	0.000	
Ni	2.21	-0.008	-117.26
P	3.01	2.169	9.21
K	2.77	1.803	8.80
Sm	3.37	-0.203	-70.91
Se	1.13	-0.114	-79.45
Si	4.15	1.632	7.23
Ag	41.08	2.023	7.63
Na	5.41	2.209	6.33
Sr	45.31	2.049	8.08
S	0.67	0.172	6.91
Ta	2.28	-0.041	-75.01
Tl	2.62	-0.517	-7.94
Th	1.03	-0.110	-84.47
Sn	0.88	0.010	81.22
Ti	3.24	0.134	7.77
W	0.89	0.004	836.28
U	3.24	-1.125	-71.96
V	2.89	-0.030	-15.61
Zn	34.93	2.000	7.85
Zr	3.38	-0.026	-69.89

Sample name : F5048
Sample code 1 : 100-10
Programme : SST 22-Feb-90 17:01:02

NAME	MV INT	CONCEN	DILCOR	RSD
Al	3.53	7.471	754.61	1.39
Sb	0.33	-0.000	-0.000	*******
As	0.71	-0.007	-0.698	-36.74
Ba	2.57	0.000	0.021	173.20
Be	0.50	-0.000	-0.034	-8.25
Bi	6.33	4.505	455.03	1.84
B	2.94	-0.014	-1.401	-36.96
Cd	1.44	(-0.010	(-1.051	-15.36
Ca	1.29	(-0.059	(-6.002	-1.29
Ce	3.47	-0.104	-10.48	-4.77
Cr	1.19	0.096	9.691	7.38
Co	0.22	-0.066	-6.699	-39.03
Cu	1.98	-0.005	-0.525	-11.74
Eu	2.66	-0.002	-0.239	-4.96
Fe	6.62	1.705	172.23	1.82
La	0.32	-0.009	-0.909	-60.00
Pb	0.25	-0.037	-3.735	-100.00
Li	2.74	-0.004	-0.375	-25.75
Mg	0.77	0.022	2.246	1.41
Mn	4.08	0.429	43.306	0.70
Hg	2.49	-0.005	-0.471	-100.54
Mo	1.12	-0.003	-0.285	-58.07
Nd	3.91	-0.015	-1.470	-536.30
Ni	2.24	-0.001	-0.117	-406.12
P	2.84	1.988	200.83	1.79
K	2.45	-0.068	-6.847	-22.21
Sm	3.40	-0.135	-13.63	-2.10
Se	1.15	-0.047	-4.725	-42.36
Si	2.35	0.128	12.927	1.73
Ag	8.72	(-0.051	(-5.199	-0.76
Na	15.78	14.090	1423.1	1.79
Sr	3.77	0.052	5.271	1.48
S	0.69	0.198	20.016	5.34
Ta	2.29	-0.036	-3.628	-43.89
Tl	2.68	-0.203	-20.50	-55.30
Th	1.03	-0.112	-11.30	-6.00
Sn	0.84	-0.022	-2.186	-53.16
Ti	2.38	-0.006	-0.581	-14.98
W	0.88	-0.016	-1.643	-39.63
U	3.28	-0.555	-56.10	-10.45
V	2.95	-0.013	-1.276	-27.98
Zn	1.74	0.005	0.500	25.02
Zr	3.41	-0.011	-1.107	-7.69

Dilution factor : 101.000

Sample name : F5048
Sample code 1 : 1-10
Programme : SST 22-Feb-90 17:06:14

NAME	MV INT	CONCEN	DILCOR	RSD
Al	21.69	)69.612	)765.73	1.10
Sb	0.34	0.144	1.579	98.68
As	0.79	0.093	1.028	51.14
Ba	3.06	0.044	0.481	27.58
Be	0.53	0.001	0.011	88.03
Bi	39.07	42.772	470.49	0.86
B	3.16	0.010	0.105	201.65
Cd	1.56	0.005	0.059	212.87
Ca	6.92	0.307	3.373	2.19
Ce	3.68	0.400	4.401	122.19
Cr	3.14	1.090	11.987	5.10
Co	0.22	(-0.149	(-1.641	-8.33
Cu	2.21	0.054	0.599	47.86
Eu	2.80	0.005	0.058	168.43
Fe	54.39	16.706	183.77	1.94
La	0.32	0.020	0.218	193.49
Pb	0.26	0.259	2.848	42.86
Li	2.84	0.008	0.089	209.98
Mg	4.25	0.254	2.789	1.30
Mn	34.19	4.097	45.062	2.10
Hg	2.76	0.035	0.384	47.41
Mo	1.25	0.039	0.433	46.78
Nd	4.08	0.167	1.833	137.53
Ni	2.74	0.116	1.274	29.75
P	18.63	19.037	209.40	1.50
K	2.53	0.391	4.299	153.01
Sm	3.55	0.235	2.581	198.07
Se	1.40	0.884	9.724	22.24
Si	3.87	1.397	15.370	8.19
Ag	9.23	-0.019	-0.204	-183.93
Na	114.92	)127.59	)1403.5	3.24
Sr	13.06	0.499	5.486	0.90
S	1.48	1.703	18.728	0.78
Ta	2.51	0.125	1.375	80.52
Tl	2.84	0.526	5.783	141.36
Th	1.06	0.150	1.649	211.16
Sn	0.94	0.061	0.669	44.70
Ti	2.55	0.021	0.236	90.25
W	1.03	0.197	2.169	30.06
U	3.61	4.180	45.978	62.46
V	3.15	0.049	0.537	72.40
Zn	3.53	0.113	1.238	4.10
Zr	3.65	0.087	0.961	64.85

Dilution factor : 11.0000

9 1 1 2 0 3 2 0 7 7 0

Sample name : F5049
Sample code 1 : 100-10
Programme : SST 22-Feb-90 17:11:01

NAME	MV INT	CONCEN	DILCOR	RSD
Al	3.94	8.879	896.77	2.61
Sb	0.32	-0.079	-8.000	-18.75
As	0.73	0.016	1.642	56.79
Ba	2.60	0.003	0.254	45.52
Be	0.50	-0.000	-0.034	-21.82
Bi	6.38	4.566	461.21	2.38
B	2.89	(-0.019	(-1.937	-7.48
Cd	1.45	-0.009	-0.920	-6.12
Ca	1.32	(-0.057	(-5.760	-2.63
Ce	3.50	-0.029	-2.961	-135.43
Cr	1.20	0.101	10.155	19.69
Co	0.21	(-0.191	(-19.26	-9.96
Cu	2.01	0.002	0.160	201.60
Eu	2.70	-0.001	-0.055	-145.94
Fe	7.28	1.910	192.94	3.71
La	0.31	-0.027	-2.726	-23.09
Pb	0.24	-0.308	-31.13	-6.93
Li	2.75	-0.003	-0.296	-52.10
Mg	0.84	0.027	2.742	3.73
Mn	4.50	0.480	48.503	2.34
Hg	2.59	0.011	1.077	10.66
Mo	1.13	0.000	0.011	3036.50
Nd	3.94	0.022	2.240	245.90
Ni	2.31	0.014	1.424	17.16
P	3.07	2.236	325.84	4.94
K	2.44	-0.120	-12.08	-28.43
Sm	3.43	-0.066	-6.689	-57.65
Se	1.17	0.036	3.634	101.16
Si	2.54	0.291	29.423	4.81
Ag	8.84	(-0.043	(-4.388	-5.02
Na	16.88	15.342	1549.5	2.76
Sr	3.88	0.058	5.810	2.98
S	0.67	0.166	16.755	8.02
Ta	2.34	0.000	0.025	2787.50
Tl	2.71	-0.066	-6.677	-59.34
Th	1.03	-0.087	-8.811	-39.47
Sn	0.86	-0.005	-0.526	-98.61
Ti	2.41	-0.001	-0.126	-126.68
W	0.90	0.014	1.444	68.89
U	3.31	-0.010	-0.969	-2471.7
V	2.97	-0.004	-0.392	-169.64
Zn	1.75	0.006	0.587	11.06
Zr	3.44	0.001	0.142	467.07

Dilution factor : 101.000

9112159077

Sample name : F5049
Sample code 1 : 1-10
Programme : SST 22-Feb-90 17:15:40

NAME	MV INT	CONCEN	DILCOR	RSD
Al	24.81	)80.316	)883.47	2.01
Sb	0.33	-0.005	-0.054	-793.69
As	0.76	0.056	0.612	20.23
Ba	2.97	0.035	0.389	6.46
Be	0.52	0.000	0.004	67.51
Bi	37.24	40.639	447.03	2.26
B	2.90	(-0.018	(-0.198	-43.33
Cd	1.48	-0.005	-0.060	-50.65
Ca	7.23	0.327	3.595	3.17
Ce	3.52	0.021	0.227	375.14
Cr	3.10	1.070	11.775	4.22
Co	0.21	(-0.207	(-2.280	-9.17
Cu	2.12	0.032	0.349	19.55
Eu	2.67	-0.002	-0.023	-59.81
Fe	55.24	16.816	184.98	3.09
La	0.31	-0.032	-0.356	-41.94
Pb	0.25	-0.086	-0.949	-24.74
Li	2.73	-0.005	-0.058	-44.03
Mg	4.39	0.262	2.887	3.08
Mn	35.06	4.203	46.229	3.01
Hg	2.64	0.017	0.192	27.70
Mo	1.21	0.024	0.263	19.11
Nd	3.83	-0.095	-1.048	-18.55
Ni	2.65	0.095	1.041	11.51
P	18.55	18.946	208.40	3.69
K	2.45	-0.114	-1.250	-56.27
Sm	3.40	-0.134	-1.475	-43.71
Se	1.36	0.726	7.983	8.45
Si	4.67	2.070	22.765	3.19
Ag	8.80	(-0.046	(-0.505	-13.45
Na	125.36	)139.54	)1534.9	1.95
Sr	13.41	0.516	5.674	2.46
S	1.49	1.729	19.021	3.95
Ta	2.38	0.028	0.309	94.01
Tl	2.74	0.034	0.372	493.63
Th	1.02	-0.134	-1.476	-30.55
Sn	0.91	0.036	0.401	40.37
Ti	2.45	0.005	0.054	73.51
W	0.98	0.125	1.372	25.61
U	3.47	2.207	24.279	19.75
V	3.01	0.005	0.060	203.80
Zn	3.46	0.108	1.193	4.20
Zr	3.48	0.015	0.163	66.58

Dilution factor : 11.0000

Sample name : HNO3
Programme : SST 22-Feb-90 17:19:54

NAME	MV INT	CONCEN	RSD
Al	1.29	-0.194	-2.70
Sb	0.31	-0.158	-5.41
As	0.69	-0.036	-7.78
Ba	2.50	-0.006	-8.41
Be	0.50	-0.001	-19.24
Bi	2.34	(-0.162	-7.31
B	2.72	(-0.036	-2.74
Cd	1.41	(-0.015	-6.97
Ca	0.47	(-0.113	-0.12
Ce	3.42	-0.211	-4.56
Cr	0.92	(-0.045	-13.35
Co	0.22	-0.112	-11.11
Cu	1.94	-0.018	-12.21
Eu	2.63	-0.005	-7.74
Fe	1.09	-0.016	-36.28
La	0.31	-0.038	-16.50
Pb	0.24	(-0.493	-8.66
Li	2.70	-0.008	-21.25
Mg	0.34	(-0.006	-0.60
Mn	0.55	-0.002	-18.41
Hg	2.43	-0.013	-13.07
Mo	1.09	-0.013	-15.86
Nd	3.80	-0.126	-16.94
Ni	2.17	-0.017	-30.38
P	0.95	-0.049	-23.17
K	2.42	-0.277	-7.58
Sm	3.36	-0.230	-6.67
Se	1.10	(-0.209	-5.54
Si	2.09	-0.092	-5.55
Ag	8.59	(-0.060	-3.07
Na	3.36	-0.136	-5.26
Sr	2.63	-0.003	-10.91
S	0.56	-0.038	-48.56
Ta	2.25	-0.068	-15.95
Tl	2.62	-0.489	-11.59
Th	1.02	-0.172	0.00
Sn	0.82	(-0.039	-5.24
Ti	2.33	-0.013	-6.04
W	0.86	-0.048	-22.98
U	3.22	-1.422	-7.07
V	2.89	-0.031	-11.45
Zn	1.49	(-0.010	-3.19
Zr	3.37	-0.028	-9.08

9112520773

Sample name : F5050
Sample code 1 : 100-10
Programme : SST 22-Feb-90 17:23:49

NAME	MV INT	CONCEN	DILCOR	RSD
Al	3.71	8.100	818.09	1.65
Sb	0.33	0.010	1.000	150.01
As	0.69	-0.038	-3.817	-16.13
Ba	3.62	0.094	9.453	1.38
Be	0.50	-0.001	-0.067	-16.50
Bi	6.10	4.236	427.80	0.99
B	3.60	0.054	5.477	5.02
Cd	2.09	0.076	7.676	2.27
Ca	2.87	0.043	4.353	7.02
Ce	3.39	-0.284	-28.65	-6.54
Cr	1.31	0.156	15.757	12.73
Co	0.23	0.017	1.675	86.60
Cu	2.31	0.081	8.231	3.50
Eu	2.60	-0.006	-0.583	-6.86
Fe	6.84	1.772	178.96	2.70
La	0.33	0.058	5.815	10.83
Pb	0.24	-0.247	-24.90	-22.91
Li	3.60	0.102	10.285	1.56
Mg	2.28	0.123	12.381	2.20
Mn	4.82	0.519	52.370	2.13
Hg	2.42	-0.015	-1.549	-17.80
Mo	1.39	0.085	8.538	2.57
Nd	3.82	-0.103	-10.43	-18.90
Ni	2.58	0.077	7.783	5.73
P	3.08	2.254	227.65	4.32
K	2.42	-0.281	-28.40	-13.00
Sm	3.33	-0.316	-31.96	-10.29
Se	1.13	-0.104	-10.54	-24.95
Si	2.41	0.179	18.126	3.10
Ag	10.08	0.036	3.609	4.22
Na	16.96	15.433	1558.7	1.93
Sr	5.79	0.150	15.106	1.73
S	0.67	0.160	16.179	8.55
Ta	2.22	-0.086	-8.673	-7.49
Tl	2.60	-0.583	-58.85	-11.53
Th	1.01	-0.208	-21.01	-6.72
Sn	0.93	0.054	5.451	24.93
Ti	2.90	0.079	7.988	1.60
W	0.86	-0.047	-4.780	-17.40
U	3.20	-1.652	-166.8	-7.12
V	2.86	-0.037	-3.726	-5.66
Zn	3.30	0.099	10.007	3.10
Zr	3.36	-0.035	-3.533	-2.41

Dilution factor : 101.000

9 1 1 2 1 5 3 0 7 7 4

Sample name : F5050
Sample code 1 : 1-10
Programme : SST 22-Feb-90 17:27:43

NAME	MV INT	CONCEN	DILCOR	RSD
Al	24.73	)80.028	)880.31	1.87
Sb	0.39	1.005	11.055	5.33
As	0.80	0.098	1.073	3.31
Ba	13.70	0.990	10.885	1.90
Be	0.52	0.000	0.004	68.84
Bi	38.99	42.673	469.40	1.84
B	11.80	0.903	9.934	1.59
Cd	8.32	0.911	10.020	2.24
Ca	22.78	1.337	14.704	2.05
Ce	3.52	0.015	0.166	114.22
Cr	4.93	2.002	22.025	3.41
Co	0.28	0.663	7.295	4.72
Cu	5.79	1.000	10.998	1.95
Eu	2.71	0.000	0.001	196.39
Fe	58.34	17.777	195.55	1.95
La	0.48	0.865	9.520	3.30
Pb	0.29	1.072	11.797	6.90
Li	11.45	1.061	11.675	2.00
Mg	19.28	1.251	13.758	1.84
Mn	42.60	5.121	56.336	1.96
Hg	2.63	0.016	0.171	7.72
Mo	4.26	1.021	11.233	1.57
Nd	4.69	0.804	8.843	10.84
Ni	6.61	1.014	11.151	1.55
P	22.20	22.888	251.76	3.36
K	2.60	0.814	8.949	0.42
Sm	3.39	-0.161	-1.772	-5.28
Se	1.47	1.119	12.310	3.73
Si	4.21	1.681	18.495	1.16
Ag	24.11	0.935	10.283	1.99
Na	133.87	)149.28	)1642.1	2.00
Sr	33.61	1.487	16.358	1.81
S	1.60	1.933	21.263	1.92
Ta	2.38	0.031	0.346	16.24
Tl	2.72	-0.052	-0.575	-89.26
Th	1.03	-0.078	-0.861	-22.68
Sn	1.96	0.902	9.926	2.51
Ti	8.19	0.939	10.332	1.91
W	0.99	0.142	1.562	10.05
U	3.47	2.255	24.806	3.31
V	3.01	0.005	0.057	5.77
Zn	19.39	1.065	11.720	1.70
Zr	3.55	0.045	0.498	3.77

Dilution factor : 11.0000

Sample name : HNO3
Programme : SST 22-Feb-90 17:31:35

NAME	MV INT	CONCEN	RSD
Al	1.36	0.062	270.52
Sb	0.32	-0.025	-150.99
As	0.73	0.014	261.44
Ba	2.63	0.005	169.88
Be	0.51	0.000	414.31
Bi	2.48	0.008	1629.55
B	2.92	-0.016	-66.33
Cd	1.49	-0.004	-169.22
Ca	0.49	(-0.111	-0.33
Ce	3.60	0.215	150.33
Cr	0.95	(-0.026	-39.96
Co	0.22	-0.120	-11.95
Cu	2.05	0.011	178.60
Eu	2.78	0.004	154.68
Fe	1.13	-0.001	-469.98
La	0.32	0.004	606.19
Pb	0.25	-0.111	-66.67
Li	2.82	0.006	191.52
Mg	0.35	(-0.005	-8.82
Mn	0.57	0.001	182.48
Hg	2.58	0.009	143.04
Mo	1.15	0.005	297.34
Nd	3.96	0.039	459.61
Ni	2.30	0.011	158.53
P	1.00	0.000	10446.8
K	2.51	0.263	169.66
Sm	3.53	0.196	168.62
Se	1.16	0.012	1218.98
Si	2.22	0.018	357.81
Ag	9.11	-0.026	-97.83
Na	3.54	0.068	215.22
Sr	2.73	0.002	177.97
S	0.59	0.014	98.33
Ta	2.39	0.038	173.59
Tl	2.76	0.125	510.00
Th	1.06	0.105	227.50
Sn	0.87	0.005	495.63
Ti	2.46	0.008	182.69
W	0.91	0.028	188.37
U	3.39	1.135	164.23
V	3.09	0.030	130.45
Zn	1.55	(-0.006	-32.57
Zr	3.50	0.026	167.75

Sample name : 81C11A
Sample code 1 : 1-10
Programme : SST 22-Feb-90 17:35:45

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.37	0.079	0.866	8.70
Sb	0.32	-0.089	-0.980	-34.69
As	0.74	0.030	0.331	33.76
Ba	2.54	-0.003	-0.030	-37.67
Be	0.51	-0.000	-0.001	-34.64
Bi	2.42	-0.062	-0.681	-13.90
B	2.85	(-0.023	(-0.252	-14.48
Cd	1.45	-0.009	-0.097	-5.35
Ca	0.89	(-0.085	(-0.940	-1.68
Ce	3.47	-0.101	-1.116	-32.84
Cr	0.96	-0.023	-0.251	-79.16
Co	0.22	(-0.178	(-1.961	-4.03
Cu	2.01	0.001	0.010	217.01
Eu	2.67	-0.002	-0.021	-34.09
Fe	1.11	-0.007	-0.076	-37.55
La	0.31	-0.036	-0.396	-39.69
Pb	0.24	-0.284	-3.119	-7.53
Li	2.73	-0.005	-0.052	-24.64
Mg	0.55	0.008	0.086	7.87
Mn	0.58	0.002	0.019	10.66
Hg	2.57	0.007	0.079	22.32
Mo	33.11	10.424	114.67	4.32
Na	3.89	-0.035	-0.389	-237.74
Ni	2.24	-0.002	-0.026	-159.70
P	0.98	-0.021	-0.234	-98.07
K	2.44	-0.164	-1.799	-27.46
Sm	3.41	-0.115	-1.268	-36.69
Se	1.14	-0.059	-0.647	-45.13
Si	11.31	7.610	83.714	3.83
Ag	8.79	(-0.047	(-0.514	-5.23
Na	3.46	-0.018	-0.202	-39.69
Sr	2.66	-0.001	-0.011	-31.48
S	0.61	0.046	0.508	26.95
Ta	2.31	-0.018	-0.195	-86.44
Tl	2.71	-0.105	-1.150	-135.07
Th	1.03	-0.063	-0.689	-26.96
Sn	0.85	-0.015	-0.169	-34.02
Ti	2.39	-0.005	-0.053	-26.62
W	0.89	-0.008	-0.092	-257.15
U	3.27	-0.642	-7.057	-34.71
V	3.01	0.007	0.079	243.33
Zn	1.53	(-0.007	(-0.082	-3.60
Zr	3.42	-0.008	-0.087	-41.61

Dilution factor : 11.0000

Sample name : 81C11A
Programme : SST 22-Feb-90 17:40:41

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.29	-0.201	-2.208	-8.59
Sb	0.32	-0.144	-1.579	-15.80
As	0.87	0.193	2.119	2.76
Ba	2.55	-0.002	-0.023	-33.47
Be	0.50	-0.001	-0.008	-16.78
Bi	9.95	8.733	96.060	0.92
B	94.41	9.453	103.98	0.52
Cd	68.86	9.021	99.234	1.43
Ca	145.12	9.286	102.15	1.27
Ce	3.45	-0.145	-1.595	-17.68
Cr	0.94	(-0.032	(-0.352	-23.36
Co	0.21	(-0.207	(-2.280	-9.17
Cu	37.06	9.265	101.92	1.09
Eu	2.65	-0.003	-0.036	-14.04
Fe	1.09	-0.015	-0.163	-31.68
La	1.85	8.251	90.763	1.13
Pb	0.47	8.185	90.039	1.38
Li	2.68	-0.011	-0.126	-12.33
Mg	137.25	9.081	99.896	1.36
Mn	0.58	0.002	0.026	13.02
Hg	2.55	0.004	0.040	182.76
Mo	1.11	-0.008	-0.090	-11.55
Nd	3.99	0.074	0.812	35.22
Ni	2.20	-0.010	-0.113	-81.09
P	9.56	9.250	101.74	5.69
K	3.91	8.620	94.818	1.18
Sm	3.33	-0.301	-3.310	-7.78
Se	1.12	-0.151	-1.662	-19.10
Si	2.18	-0.014	-0.156	-88.30
Ag	156.62	9.426	103.69	0.91
Na	11.19	8.835	97.182	1.67
Sr	194.23	9.210	101.31	1.27
S	0.62	0.084	0.919	22.77
Ta	2.28	-0.039	-0.430	-20.78
Tl	2.63	-0.435	-4.786	-18.95
Th	1.00	-0.257	-2.830	-9.16
Sn	0.96	0.076	0.841	4.35
Ti	2.34	-0.013	-0.143	-10.97
W	0.95	0.092	1.009	7.39
U	3.24	-1.029	-11.32	-15.68
V	2.90	-0.027	-0.292	-6.77
Zn	152.26	9.049	99.544	1.22
Zr	3.36	-0.032	-0.352	-12.69

Dilution factor : 11.0000

9112050778

Sample name : 82C11A
Sample code 1 : 1-10
Programme : SST 22-Feb-90 17:44:52

NAME	MV INT	CONCEN	DILCOR	RSD
Al	4.25	9.934	109.27	1.79
Sb	0.32	-0.054	-0.599	-155.08
As	0.92	0.252	2.767	18.90
Ba	107.07	9.291	102.20	1.67
Be	0.55	0.002	0.022	30.25
Bi	2.55	0.080	0.883	194.95
B	3.41	0.035	0.389	55.20
Cd	1.50	-0.002	-0.027	-335.48
Ca	3.23	0.067	0.733	3.77
Ce	7.01	8.326	91.585	4.95
Cr	18.88	9.124	100.36	3.03
Co	0.89	8.158	89.733	6.92
Cu	2.02	0.004	0.043	573.25
Eu	3.12	0.023	0.256	30.59
Fe	31.42	9.412	103.53	3.19
La	0.33	0.029	0.317	117.09
Pb	0.24	-0.308	-3.390	-36.66
Li	82.94	9.804	107.85	3.75
Mg	1.56	0.075	0.822	3.20
Mn	77.84	9.415	103.56	2.62
Hg	2.70	0.027	0.296	48.96
Mo	1.21	0.025	0.275	47.94
Nd	11.95	8.342	91.766	1.37
Ni	42.64	9.384	103.22	3.65
P	0.99	-0.001	-0.008	-6300.0
K	2.44	-0.156	-1.711	-384.33
Sm	3.43	-0.066	-0.728	-605.57
Se	2.25	3.943	43.370	5.52
Si	2.70	0.425	4.671	20.04
Ag	9.61	0.006	0.067	500.33
Na	3.50	0.023	0.248	769.75
Sr	2.73	0.002	0.026	198.30
S	0.66	0.153	1.679	28.14
Ta	15.41	9.651	106.16	4.15
Tl	2.87	0.670	7.373	102.78
Th	1.08	0.248	2.731	108.66
Sn	11.62	8.835	97.185	5.21
Ti	64.19	10.053	110.58	1.46
W	0.90	0.016	0.179	387.94
U	3.70	5.554	61.093	41.07
V	3.02	0.009	0.098	406.78
Zn	2.11	0.027	0.299	15.97
Zr	26.72	9.810	107.91	1.43

Dilution factor : 11.0000

Sample name : 81C11A
Programme : SST 22-Feb-90 18:59:33

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.29	-0.175	-1.920	-15.31
Sb	0.31	-0.233	-2.560	-3.69
As	0.70	-0.017	-0.183	-59.59
Ba	2.42	(-0.013	(-0.144	-6.78
Be	0.49	-0.001	-0.012	-10.94
Bi	2.26	(-0.259	(-2.854	-16.35
B	2.71	(-0.037	(-0.408	-14.59
Cd	1.37	(-0.020	(-0.224	-7.39
Ca	1.10	(-0.072	(-0.787	-0.82
Ce	3.30	(-0.494	(-5.429	-7.83
Cr	0.93	(-0.041	(-0.449	-56.25
Co	0.22	(-0.178	(-1.961	-4.03
Cu	1.92	-0.023	-0.256	-23.30
Eu	2.54	(-0.009	(-0.102	-8.87
Fe	1.06	(-0.025	(-0.276	-15.03
La	0.31	-0.074	-0.811	0.00
Pb	0.23	(-0.579	(-6.373	-9.75
Li	2.62	(-0.018	(-0.203	-3.88
Mg	0.67	0.016	0.171	2.02
Mn	0.58	0.002	0.021	101.79
Hg	2.46	-0.010	-0.109	-127.32
Mo	28.94	9.065	99.719	0.93
Nd	3.69	(-0.236	(-2.592	-37.56
Ni	2.10	(-0.033	(-0.368	-9.76
P	0.90	(-0.099	(-1.088	-12.58
K	2.35	-0.708	-7.786	-6.23
Sm	3.25	(-0.504	(-5.549	-8.31
Se	1.10	(-0.211	(-2.322	-18.98
Si	10.27	6.740	74.144	0.48
Ag	8.32	(-0.077	(-0.844	-5.93
Na	3.29	(-0.210	(-2.313	-11.64
Sr	2.57	-0.005	-0.060	-9.27
S	0.55	-0.049	-0.543	-32.03
Ta	2.20	(-0.103	(-1.134	-16.78
Tl	2.57	(-0.723	(-7.948	-15.60
Th	0.99	-0.336	-3.691	-7.57
Sn	0.60	(-0.054	(-0.591	-16.20
Ti	2.27	(-0.024	(-0.261	-9.60
W	0.84	(-0.077	(-0.846	-28.46
U	3.10	(-3.021	(-33.23	-8.10
V	2.83	(-0.047	(-0.522	-7.37
Zn	1.43	(-0.013	(-0.147	-6.54
Zr	3.31	-0.057	-0.624	-12.30

Dilution factor : 11.0000

Sample name : 81C11A
Programme : SST 22-Feb-90 19:03:42

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.28	-0.226	-2.484	-27.81
Sb	0.32	-0.099	-1.089	-31.22
As	0.88	0.194	2.132	10.39
Ba	2.54	-0.003	-0.029	-133.87
Be	0.49	-0.001	-0.011	-7.27
Bi	10.11	8.921	98.134	2.96
B	95.29	9.544	104.98	1.84
Cd	68.28	8.943	98.369	3.75
Ca	146.80	9.395	103.35	2.51
Ce	3.44	-0.166	-1.821	-78.65
Cr	1.01	0.004	0.041	618.98
Co	0.22	-0.083	-0.912	-31.22
Cu	37.73	9.442	103.87	2.27
Eu	2.64	-0.004	-0.042	-57.60
Fe	1.09	-0.016	-0.177	-35.21
La	1.87	8.343	91.772	2.79
Pb	0.47	8.173	89.904	3.70
Li	2.67	-0.012	-0.134	-32.67
Mg	138.01	9.132	100.45	2.78
Mn	0.59	0.004	0.044	3.03
Hg	2.46	-0.009	-0.104	-81.70
Mo	1.10	-0.012	-0.133	-45.25
Nd	4.03	0.116	1.277	117.43
Ni	2.17	-0.018	-0.199	-52.27
P	9.98	9.702	106.72	3.76
K	3.96	8.973	98.700	2.94
Sm	3.33	-0.312	-3.436	-40.43
Se	1.11	-0.193	-2.124	-6.45
Si	2.16	-0.027	-0.300	-122.56
Ag	159.92	9.638	106.01	2.53
Na	11.44	9.121	100.33	2.36
Sr	197.49	9.366	103.03	2.40
S	0.63	0.101	1.107	10.39
Ta	2.24	-0.068	-0.752	-28.68
Tl	2.58	(-0.664	(-7.305	-8.01
Th	1.01	-0.226	-2.485	-38.84
Sn	0.94	0.066	0.726	22.28
Ti	2.31	-0.016	-0.181	-34.14
W	0.95	0.085	0.933	9.61
U	3.23	-1.207	-13.27	-61.58
V	2.84	(-0.045	(-0.491	-4.17
Zn	153.78	9.141	100.55	2.89
Zr	3.35	-0.039	-0.427	-40.22

Dilution factor : 11.0000

Sample name : 82C11A
Programme : SSI 22-Feb-90 19:07:53

NAME	MV INT	CONCEN	DILCOR	RSD
Al	4.09	9.385	103.24	4.09
Sb	0.32	-0.010	-0.109	-624.49
As	0.88	0.200	2.195	11.44
Ba	102.65	8.898	97.876	3.35
Be	0.54	0.002	0.017	28.64
Bi	2.44	-0.039	-0.429	-174.47
B	3.22	0.015	0.169	72.22
Cd	1.44	(-0.010	(-0.112	-35.34
Ca	3.00	0.052	0.567	11.97
Ce	6.78	7.776	85.537	5.64
Cr	17.39	8.363	91.992	4.30
Co	0.83	7.523	82.756	5.37
Cu	1.95	-0.016	-0.173	-36.46
Eu	3.00	0.016	0.180	13.47
Fe	29.07	8.683	95.513	4.26
La	0.33	0.031	0.336	56.73
Pb	0.24	-0.160	-1.763	-26.65
Li	81.37	9.613	105.74	2.69
Mg	1.42	0.065	0.718	5.16
Mn	71.83	8.683	95.509	4.14
Hg	2.56	0.006	0.069	82.79
Mo	1.17	0.012	0.137	50.88
Nd	11.31	7.678	84.463	2.59
Ni	39.11	8.564	94.200	4.65
P	0.97	-0.029	-0.317	-77.94
K	2.38	-0.495	-5.440	-23.61
Sm	3.31	-0.343	-3.777	-25.58
Se	2.10	3.379	37.169	5.75
Si	2.59	0.331	3.636	12.60
	9.20	-0.021	-0.226	-45.08
20.45				
V	2.88	-0.034	-0.370	-27.34
Zn	2.01	0.021	0.232	17.13
Zr	25.35	9.194	101.14	3.92

Dilution factor : 11.0000

APPENDIX A
ANALYTICAL ANALYSIS CARDS

9 1 1 2 7 5 9 0 7 3

9 1 1 2 ? 5 ? 0 7 ? 4

Physical Properties

Serial No	Sample Point	Date	Time Issued	Priority
F 5035.-5201	~~SEGMENT-4~~	11- 7-89	11:16	18

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

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results

THIRD SAMPLE Bottle ID # 030

GROSS 21.82

TARE 17.43

SAMPLE WT 4.39g

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
SRS 11 8 89	RLW 12-14-89			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
		[signature]	KJ

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5033.-5000	SEGMENT-2	11- 7-89	11:15	18

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

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

Penetrometer 60

A. JAR ID# 004 liq/002 Solids
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-B=
E. EST. VOL./LENGTH 16" + Liquid
F. VISUAL REMARKS

Bottom 4" very soft Brown - Running Free running
Middle Firmer Brown clear liquid
Top 5" firm Black during extrusion

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
SRS 11-8-89 66931	RLW 12-14-89			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
		[signature]	KJ

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5033.-5003	SEGMENT-2	11- 7-89	11:15	16

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

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

Homogenization Complete

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
DJH 12-14-89	RLW 12-14-89			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
		[signature]	KJ

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5033.-5002	~~SEGMENT-2~~	11- 7-89	11:15	24

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

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

Bottle ID# 033

PARTICLE SIZE DISTRIBUTION

results:
1) particles dia. < 150μ
2) 5 sheets attached

GROSS 18.63

TARE 17.85

SAMPLE WT 0.78g

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
SRS 11-8-89	SBK 11-15-89	JSB 11-15-89		
Hrs	Hrs	Hrs	Hrs	Hrs

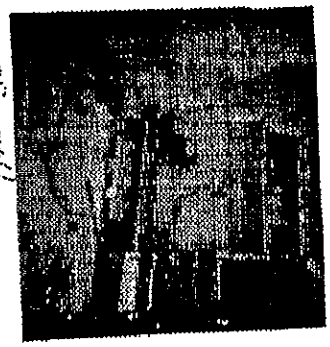
Date	Time Completed	Lab Unit Mgr	
			KJ

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

Physical Properties

LIQUID SAL 004	SOLIDS SAL 002
239.50	527.90
222.73	222.87
16.77 g	305.03 g

F 5033.-5000



9 1 1 2 7 5 9 0 7 3 6

pH Analysis of Solid Sample

Serial No	Sample Point	Date	Time Issued	Priority
F 5033 -5015	SEGMENT-2	11- 7-89	11:15	19

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

Sample Size: ? 2.938g / 2.938 ml

Customer ID: 89-041

Remarks, Calculations, Results:

pH 12.71
SAMPLE TEMP 24.6

Bottle # 44 SOUND

[redacted] 2.938

36.19
22.29
13.90g

WHL-N-313-4 Pg 3

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
JR Smith 65186	6C269			R E Bennett
Hrs	Hrs M.J.	Hrs	Hrs	Hrs
DL Herring 66431	11-22-89			

Date 11-22-89 | Time Completed | Lab Unit Mgr [signature] KP

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 50[illegible]-5015	SEGMENT-1	11- 7-89	11:15	19

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

Sample Size: ?

Customer ID: Std

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
pH FOUND 10.03
STD ID 72C11
SAMPLE TEMP 24.7

KT

100.3%

10.03/10.00

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				R E Bennett
Hrs M.J.	Hrs	Hrs	Hrs	Hrs

Date 11-22-89 | Time Completed | Lab Unit Mgr [signature] KP

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5036 -5515	SEGMENT-5	11- 7-89	11:16	19

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

Sample Size: ?

Customer ID: Std

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
pH FOUND 10.00
STD ID 72C11
SAMPLE TEMP 24.6

KT

100.0%

10.00/10.00

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				R E Bennett
Hrs M.J.	Hrs	Hrs	Hrs	Hrs

Date 11-22-89 | Time Completed | Lab Unit Mgr [signature] KP

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5034 -5115	SEGMENT-3	11- 7-89	11:15	19

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

Sample Size: ? 2.102g / 2.102 ml

Customer ID: 89-041

Remarks, Calculations, Results:

pH 12.92
SAMPLE TEMP 24.6

Bottle # 44

Duplicate

2.1014

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				R E Bennett
Hrs M.J.	Hrs	Hrs	Hrs	Hrs

Date 11-22-89 | Time Completed | Lab Unit Mgr KP

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

pH Analysis of Solid Sample

Serial No.	Sample Point	Date	Time Issued	Priority
F 5053.-5315	SEGMENT-22	11- 7-89	11:18	18

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

Sample Size	Customer ID
?	

Remarks, Calculations, Results:

LMCS CHECK SAMPLE "Q"
pH FOUND 5.67
~~STD ID~~ H_2O H_2O Blank
SAMPLE TEMP 24.1

5.67 OK

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
60269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
11-22-89		

S4-8800-081 (R-10-83)

Percent Water Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 5033.-5010	SEGMENT-2	11- 7-89	11:15	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H20	LA-564-101	%	WB75L	0

Sample Size: ?
Customer ID: 89-041

Remarks, Calculations, Results:
350 mrad
Bottle # 47
24.5416 G
23.5805 T
24.1682 W1
24.1678 W2
~~61.276~~ KT
~~38.8%~~ KT
38.8%
28.80
22.~~#~~50
6.309
WAC-N-313-~~4~~ Pg 3

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
JR Smith 65286	68598			RL Brunk
DL Hartling 66931	R.D. Hale			
Date 11-22-89	Time Completed 11-28	Lab Unit Mgr		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5032.-5110	SEGMENT-1	11- 7-89	11:15	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H20	LA-564-101	% RECOVERY	WB75L	0

Sample Size: ? 1mL
Customer ID: 11C11AG KT

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID
① 99.1%
24.7941 G
23.4130 T
23.9785 W1
23.9760 W2
59.05%/59.610

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
68598				RL Brunk
R.D. Hale				
Date 11-28	Time Completed	Lab Unit Mgr		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5036.-5510	SEGMENT-5	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H20	LA-564-101	% RECOVERY	WB75L	0

Sample Size: ? 1mL
Customer ID: 11C11AG

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID
② KT
95.0%
25.3256 G
23.9514 T
24.5430 W1
24.5343 W2
56.66/59.61

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
68598				RL Brunk
R.D. Hale				
Date 11-28	Time Completed	Lab Unit Mgr		

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5034.-5110	SEGMENT-3	11- 7-89	11:15	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H20	LA-564-101	%	WB75L	0

Sample Size: ?
Customer ID: 89-041

Remarks, Calculations, Results:
Bottle # 47
DUPLICATE SAMPLE
24.5378 G
23.7367 T
24.2248 W1
24.2247 W2
~~60.9%~~ KT
39.1%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
68598				RL Brunk
R.D. Hale				
Date 11-28	Time Completed	Lab Unit Mgr		

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

9 1 1 2 3 5 9 0 7 3 9

Percent Water Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 5053.-5310	SEGMENT-22	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H20	LA-564-101	%	WB75L	0

Sample Size	Customer ID
?	

Remarks, Calculations, Results:

REAGENT BLANK

23.5575 G

23.5575 T -.0088

23.5487 W1

23.5488 W2

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GB598				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs
R.O. Hale				

Date	Time Completed	Lab Unit Mgr
11-28		[signature] [signature]

54-8800-061 (R-10-83)

9 1 1 2 1 5 9 0 7 1 0

Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 5039.-6100	SEGMENT-8	11- 7-89	11:16	18

Determination	Method/Standard	Result Units	Charge Code	Rerune
FUSION	LA-549-141	G/L	WB75L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

DUPLICATE ANALYSIS
GRAMS SAMPLE .6810
VOLUME ON
COMPLETION 200 mL

SEQUENCE # : 7
WT 1: 36.5211
WT 2: 37.2021

NET WEIGHT:
---> 0.6810 GRAMS

11/27/89 @ 12:19:48

$.6810/200 = 3.40^{-3}$ g/ml

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
JR Smith 65286	DL Herting 66931	6B598		[illegible]
Hrs	Hrs	Hrs	Hrs	Hrs
11-22-89		R.D. Hale		

Date	Time Completed	Lab Unit Mgr
		[illegible]

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5038.-6000	SEGMENT-7	11- 7-89	11:16	18

Determination	Method/Standard	Result Units	Charge Code	Rerune
FUSION	LA-549-141	G/L	WB75L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

GRAMS SAMPLE .6059
VOLUME ON
COMPLETION 200 mL

SEQUENCE # : 6
WT 1: 34.0407
WT 2: 34.6466

NET WEIGHT:
---> 0.6059 GRAMS

11/27/89 @ 12:17:32

$.6059/200 = 3.03^{-3}$ g/ml

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
JR Smith	DL Herting 66931	6B598		[illegible]
Hrs	Hrs	Hrs	Hrs	Hrs
11-22-89		R.D. Hale		

Date	Time Completed	Lab Unit Mgr
		[illegible]

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5052.-6300	SEGMENT-21	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Rerune
FUSION	LA-549-141	G/L	WB75L	0

Sample Size	Customer ID
?	

Remarks, Calculations, Results:

REAGENT BLANK

Complete

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6B598				[illegible]
Hrs	Hrs	Hrs	Hrs	Hrs
R.D. Hale				

Date	Time Completed	Lab Unit Mgr
11-20		[illegible]

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

9 1 1 2 3 5 9 0 7 1

Fusion Dissolution (second dissolution) Used for GEA Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 5039.-6100	SEGMENT-H	11- 7-89	11:16	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
FUSION	LA-549-141	G/L	E21D1	0

Sample Size: ?

Customer ID:

Remarks, Calculations, Results:

DUPLICATE ANALYSIS
GRAMS SAMPLE .4314
VOLUME ON
COMPLETION 250 mL

1.73×10^{-3} g/ml

1.73 g/l

SEQUENCE # : 138
WT 1: 41.7630
WT 2: 42.1944
NET WEIGHT:
0.4314 GRAMS
04/30/90 @ 07:40:35

F5033

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 B598/KH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4-30-90		[signature] [signature]

54-8800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5038.-6000	SEGMENT-G	11- 7-89	11:16	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
FUSION	LA-549-141	G/L	E21D1	0

Sample Size: ?

Customer ID:

Remarks, Calculations, Results:

GRAMS SAMPLE .4796
VOLUME ON
COMPLETION 250 mL

1.918×10^{-3} g/ml

1.918 g/L

SEQUENCE # : 137
WT 1: 42.8147
WT 2: 43.2943
NET WEIGHT:
0.4796 GRAMS
04/30/90 @ 07:36:49

F5033

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 B598/KH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4-30-90		[signature] [signature]

54-8800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5052.-6300	SEGMENT-U	11- 7-89	11:18	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
FUSION	LA-549-141	G/L	E21D1	0

Sample Size: ? 250 mL

Customer ID:

Remarks, Calculations, Results:

REAGENT BLANK

complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 B598/KH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4-30-90		[signature] [signature]

54-8800-081 (R-10-83)

Total Alpha Analysis on the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 5038.-6020	SEGMENT-7	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCI/L	WB75L	0

Sample Size: ?100-10 - 500

Customer ID:

Remarks, Calculations, Results:

1.10 uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC269				GW
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date: 11-28-89 | Time Completed: | Lab Unit Mgr:

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5037.-6520	SEGMENT-6	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	% RECOVERY	WB75L	0

Sample Size: ?10ml

Customer ID: STD

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 83B44

K1

95.1%

$9.511^{-3} / 1.0003^{-2}$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC269				GW
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date: 11-29-89 | Time Completed: | Lab Unit Mgr:

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5040.-6220	SEGMENT-9	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	% RECOVERY	WB75L	0

Sample Size: ?100-10 - 500

Customer ID:

Remarks, Calculations, Results:

SPIKE SAMPLE 5038
SPIKE ID 83B44
SPIKE VOLUME 10ml

Ratio of std to sample insuff.

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC269				GW
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date: 11-29-89 | Time Completed: | Lab Unit Mgr:

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5039.-6120	SEGMENT-8	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCI/L	WB75L	0

Sample Size: ?100-10 - 500

Customer ID: GW

Remarks, Calculations, Results:

DUPLICATE SAMPLE

1.489 uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC269				
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date: 11-29-89 | Time Completed: | Lab Unit Mgr:

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

Total Alpha Analysis on the Fusion Dissolution

16/2

28/16 _.2

Alpha Calculation by EMB on 11-30-1989 at 03:05:21
Det #16 2 -inch mount Alpha eff. : .22
Sample size : 1 mL Dilution : 202

29/16

Mount # 1

$$\frac{28}{10} - 0.2 = 1.0753E+00 \text{ uCi/L alpha}$$

Mount # 2

$$\frac{29}{10} - 0.2 = 1.1167E+00 \text{ uCi/L alpha}$$

F 5038.-6020

16/2

454/16

Alpha Calculation by EMB on 11-30-1989 at 01:02:33
Det #16 2 -inch mount Alpha eff. : .22
Sample size : 10 mL Dilution : 1

479/16

Mount # 1

$$\frac{454}{10} - 0.2 = 9.2547E-03 \text{ uCi/L alpha}$$

Mount # 2

$$\frac{479}{10} - 0.2 = 9.7666E-03 \text{ uCi/L alpha}$$

F 5037.-6520

16/2

236/5 _.2

Alpha Calculation by EMB on 11-30-1989 at 03:50:51
Det #16 2 -inch mount Alpha eff. : .22
Sample size : 1 mL Dilution : 202

244/5

Mount # 1

$$\frac{236}{5} - 0.2 = 1.9439E+01 \text{ uCi/L alpha}$$

Mount # 2

$$\frac{244}{5} - 0.2 = 2.0101E+01 \text{ uCi/L alpha}$$

F 5040.-6220

16/2

18/5 _.2

Alpha Calculation by EMB on 11-30-1989 at 03:51:36
Det #16 2 -inch mount Alpha eff. : .22
Sample size : 1 mL Dilution : 202

20/5

Mount # 1

$$\frac{18}{5} - 0.2 = 1.4062E+00 \text{ uCi/L alpha}$$

Mount # 2

$$\frac{20}{5} - 0.2 = 1.5717E+00 \text{ uCi/L alpha}$$

F 5039.-6120

9 1 1 2 ? 5 ? 0 7 ? 4

Total Alpha Analysis on the Fusion Dissolution

Serial No	Sample Point	Date	Time Issued	Priority
F 5052.-6320	SEGMENT-21	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCI/L	WB75L	0

Sample Size	Customer ID
?	

Remarks Calculations, Results:
REAGENT BLANK

$< 2.42^{-4}$ uci/l

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

Date	Time Completed	Lab Unit Mgr
11-29-89		[illegible]

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5041.-6520	SEGMENT 10	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 10 ml	

Remarks Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 83B44

86.4%

2.64^{-3} uci/l / 1.0003^{-2}

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

Date	Time Completed	Lab Unit Mgr
11-29-89		[illegible]

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

Total Alpha Analysis on the Fusion Dissolution

16/2

8/10 - .6

5/10

Alpha Calculation by DK on 11-29-1989 at 21:53:41
Det #16 2 -inch mount Alpha eff. : .22
Sample size : 1 ea Dilution : 1

Mount # 1

8/10 - 0.6 (1.6736E-06 uCi/ea alpha

Mount # 2

5/10 - 0.6 (1.1686E-06 uCi/ea alpha

F 5052.-6320

16/2

434/10 - .2

Alpha Calculation by EMB on 11-30-1989 at 02:52:09
Det #16 2 -inch mount Alpha eff. : .22
Sample size : 10 mL Dilution : 1

Mount # 1

434/10 - 0.2 = 8.8452E-03 uCi/L alpha

414/10

Mount # 2

414/10 - 0.2 = 8.4357E-03 uCi/L alpha

F 5041.-6520

9 1 1 2 5 9 0 7 2 6

Total Beta Analysis on the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 5038.-6025	SEGMENT-7	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-548-101	uCI/L	WB75L	0

Sample Size	Customer ID
? 100-10-500	89-041

Remarks, Calculations, Results:

3.283 3 uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				[illegible]
[illegible]	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
11-29-89		[illegible]

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5037.-6525	SEGMENT-6	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-548-101	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 10 ml	STD 89-041

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 83B44

95.4%

1.346 -1 / 1.411 -1

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				[illegible]
[illegible]	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
11-29-89		[illegible]

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5040.-6225	SEGMENT-9	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-548-101	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 100-10-500	89-041

Remarks, Calculations, Results:

SPIKE SAMPLE F5038
SPIKE ID 83B44
SPIKE VOLUME 10 ml

~~3.0976 3~~ ratio of std to sample [illegible]

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				[illegible]
[illegible]	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
11-29-89		[illegible]

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5039.-6125	SEGMENT-8	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-548-101	uCI/L	WB75L	0

Sample Size	Customer ID
? 100-10-500	89-041

Remarks, Calculations, Results:

DUPLICATE SAMPLE

3.88 3 uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				[illegible]
[illegible]	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
11-29-89		[illegible]

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

Total Beta Analysis on the Fusion Dissolution

16/2

106821 / 10

Beta Calculation by EMB on 11-30-1989 at 03:05:19
Det #16 2 -inch mount Beta eff. : .291
Sample size : 1 mL Dilution : 202

103512 / 10

Mount # 1

$$\frac{106821}{10} - 17.0 = 3.3348E+03 \text{ uCi/L beta}$$

3.28 3

Mount # 2

$$\frac{103512}{10} - 17.0 = 3.2313E+03 \text{ uCi/L beta}$$

F 5038.-6025

16/2

61969 / 5

Beta Calculation by EMB on 11-30-1989 at 03:51:34
Det #16 2 -inch mount Beta eff. : .291
Sample size : 1 mL Dilution : 202

62275 / 5

Mount # 1

$$\frac{61969}{5} - 17.0 = 3.8700E+03 \text{ uCi/L beta}$$

Mount # 2

$$\frac{62275}{5} - 17.0 = 3.8892E+03 \text{ uCi/L beta}$$

F 5039.-6125

16/2

49492 / 5

Beta Calculation by EMB on 11-30-1989 at 03:50:49
Det #16 2 -inch mount Beta eff. : .291
Sample size : 1 mL Dilution : 202

49742 / 5

Mount # 1

$$\frac{49492}{5} - 17.0 = 3.0898E+03 \text{ uCi/L beta}$$

Mount # 2

$$\frac{49742}{5} - 17.0 = 3.1054E+03 \text{ uCi/L beta}$$

F 5040.-6225

16/2

8856 / 10

Beta Calculation by EMB on 11-30-1989 at 01:02:31
Det #16 2 -inch mount Beta eff. : .291
Sample size : 10 mL Dilution : 1

8879 / 10

Mount # 1

$$\frac{8856}{10} - 17.0 = 1.3445E-01 \text{ uCi/L beta}$$

Mount # 2

$$\frac{8879}{10} - 17.0 = 1.3481E-01 \text{ uCi/L beta}$$

F 5037.-6525

Total Beta Analysis on the Fusion Dissolution

5-6

Serial No.	Sample Point	Date	Time Issued	Priority
F 5052.-6325	SEGMENT-21	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-505-101	uCI/L	WB75L	0

Sample Size: ?

Customer ID: 89-041

Remarks, Calculations, Results:
REAGENT BLANK

$< 5.58^{-4}$ uci/l ~~56.97~~ uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 11-29-89 | Time Completed: | Lab Unit Mgr:

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5041.-6525	SEGMENT-10	11- 7-89	[illegible]	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-548-101	% RECOVERY	WB75L	0

Sample Size: ? 10ml

Customer ID: 89-041

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 83R44

KT

1.338^{-1} uci/l 94.8%

1.411-1

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 11-29-89 | Time Completed: | Lab Unit Mgr:

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

9 1 1 2 ? 5 9 0 7 ? 9

Total Beta Analysis on the Fusion Dissolution

6/2

$\frac{189}{10}$ - 16

$\frac{180}{10}$

Beta Calculation by DM on 11-29-1989 at 21:53:39
Det #16 2 -inch mount Beta eff. : .291
Sample size : 1 ea Dilution : 1

Mount # 1

$\frac{189}{10}$ - 18.0 < 6.2994E-06 uCi/ea beta

Mount # 2

$\frac{180}{10}$ - 18.0 < 4.8461E-06 uCi/ea beta

~~<6.97 uCi/L~~ -5 KP

F 5052.-6325

6/2

$\frac{8760}{10}$ - 16

$\frac{8863}{10}$

Beta Calculation by EMB on 11-30-1989 at 02:52:07
Det #16 2 -inch mount Beta eff. : .291
Sample size : 10 mL Dilution : 1

Mount # 1

$\frac{8760}{10}$ - 17.0 = 1.3297E-01 uCi/L beta

Mount # 2

$\frac{8863}{10}$ - 17.0 = 1.3456E-01 uCi/L beta

F 5041.-...

9 1 1 2 ? 5 9 0 3 ? 0

Gamma Engery Analysis of the Fusion Dissolution

3617

Serial No.	Sample Point	Date	Time Issued	Priority
F 5038.-6030	SEGMENT-7	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
GEA	LA-548-121	uCI/L	WB75L	0

Sample Size: ? 200 λ RH 100 λ — Customer ID:

Remarks, Calculations, Results: Second fusion

Cs^{137} 9.29 x 10¹ uci/l

RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 B598/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
5-2-90		Paul M. Pool / Kathy Mondike

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

3615

Serial No.	Sample Point	Date	Time Issued	Priority
F 5037.-6530	SEGMENT-6	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
GEA	LA-548-121	% RECOVERY	WB75L	0

Sample Size: ? 500 λ — Customer ID:

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 122844

103.6%

RERUN

Co^{60} 2.13 x 10¹ / 2.0566 x 10¹

Cs^{137} 2.97 x 10¹ / 2.889 x 10¹ 102.8%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 B598/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
5-2-90		Paul M. Pool / Kathy Mondike

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

3619

Serial No.	Sample Point	Date	Time Issued	Priority
F 5040.-6230	SEGMENT-9	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
GEA	LA-548-121	% RECOVERY	WB75L	0

Sample Size: ? ~~200 λ~~ 100 λ RH & 500 λ spike — Customer ID:

Remarks, Calculations, Results: Second fusion

SPIKE SAMPLE F5038
SPIKE ID 122844
SPIKE VOLUME 500

RERUN

$Co^{60}\left(\frac{1.06 \times 10^2}{10} - 0\right) \times 2 = 2.12 \times 10^1 / 2.0566 \times 10^1$ 103.1%

106.0%

$Cs^{137}\left(\frac{2.46 \times 10^2}{10}\right) - \left(\frac{9.29 \times 10^1}{10}\right) = 15.31 \times 2 = 3.062 \times 10^1 / 2.855 \times 10^1$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 B598/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
5-2-90		Kathy Mondike

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

3618

Serial No.	Sample Point	Date	Time Issued	Priority
F 5039.-6130	SEGMENT-8	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Rerune
GEA	LA-543-121	uCI/L	WB75L	0

Sample Size: ? ~~200 λ~~ RH 100 λ — Customer ID:

Remarks, Calculations, Results: Second fusion

DUPLICATE SAMPLE

RERUN

Cs^{137} 7.42 x 10¹ uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 B598/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
5-2-90		Paul M. Pool / Kathy Mondike

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

9 1 1 2 0 5 9 0 3 0 1

Gamma Engery Analysis of the Fusion Dissolution

3621

Serial No.	Sample Point	Date	Time Issued	Priority
F 5041.-6330	SEGMENT-10	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	WB75L	0

Sample Size: ? 500λ

Customer ID:

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 122844

RERUN

Co^{60} $2.18 \times 10^1 / 2.0566 \times 10^1$ 106.0%

Cs^{137} $2.95 \times 10^1 / 2.8888 \times 10^1$ 102.1%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 8598/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 5-2-90

Time Completed:

Lab Unit Mgr: [signature] [signature]

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

3616

Serial No	Sample Point	Date	Time Issued	Priority
F 5052.-6330	SEGMENT-21	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCI/L	WB75L	0

Sample Size: ? 1 ml

Customer ID:

Remarks, Calculations, Results

Second fusion

REAGENT BLANK

RERUN

$Cs^{137} < 6.32 \times 10^{-2}$ uCi/L

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 8598/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 5-2-90

Time Completed:

Lab Unit Mgr: [signature] [signature]

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

Uranium Analysis of the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 5038.-6040	SEGMENT-7	11- 7-89	11:16	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/L	WB75L	0

Sample Size: ? 100-10-100
Customer ID: 89-041

Remarks, Calculations, Results:

Sample: .04
Smpl+spk: .38
Spk vol: 100λ
↑Spk ID: 5.62^{-4}

$$\frac{(.04)(5.62^{-4})(.1)(1010)}{.38-.04} = 6.68^{-3}$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
11-28-89		

S4-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5037.-6540	SEGMENT-6	11- 7-89	11:16	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	0

Sample Size: ? 100-10-100 58B38
Customer ID: Std

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 58B38

Std: .17
Std+Spk: .46
Spk vol: 100λ
↑Spk ID: 5.62^{-4}

$$\frac{(.17)(5.62^{-4})(.1)(1010)}{.46-.17} = 3.33^{-2}$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Hrs 20	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
11-28-89		

S4-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5040.-6240	SEGMENT-9	11- 7-89	11:16	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	0

Sample Size: ? 100-10-100
Customer ID:

Remarks, Calculations, Results:

SPIKE SAMPLE R5038
SPIKE ID 58B38
SPIKE VOLUME 100x10-100

Sample: .22
Smpl+Spk: .52
Spk vol: 100λ
↑Spk ID: 5.62^{-4}

$$\frac{(.22)(5.62^{-4})(.1)(1010)}{.52-.22} = 4.16^{-2}$$

$4.16^{-2} / 6.68^{-3} = 3.49^{-2}$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
11-28-89		

S4-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5039.-6140	SEGMENT-8	11- 7-89	11:16	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/L	WB75L	0

Sample Size: ? 100-10-100
Customer ID: 89-041

Remarks, Calculations, Results:

DUPLICATE SAMPLE

Sample: .06
Smpl+Spk: .40
Spike Vol: 100λ
↑Spike ID: 5.62^{-4}

$$\frac{(.06)(5.62^{-4})(.1)(1010)}{.40-.06} = 1.06^{-2}$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
11-28-89		

S4-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5052.-6340	SEGMENT-21	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/L	WB7SL	0

Sample Size: ? direct

Customer ID:

Remarks, Calculations, Results:

REAGENT BLANK

3.1 × 10^-5 81 l

Blk: .02

Blk+Spk: .30

Spk Vol: 100 λ

Spk ID: 5.113^-5

$$\frac{(.02)(5.113^{-5})(.1)(1)}{.30-.02} = 1.83^{-5}\ g/l$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Hrs 20	Hrs	Hrs	Hrs	Hrs

Date: 11-28-89 | Time Completed: | Lab Unit Mgr:

54-6600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5041.-6540	SEGMENT-10	11- 7-89	11:16	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB7SL	0

Sample Size: ? 100-10-100 58B38

Customer ID: STD

Remarks, Calculations, Results:

LMCS CHECK SAMELE

LMCS ID 58B38

10 × .306

Std: .16

Std+Spk: .46

Spk Vol: 100 λ

Spk Val: 5.62-4

$$\frac{(.46)(5.62^{-4})(.1)(1010)}{.46-.16} = 3.03^{-2}\ 2.9^{-2}$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 11-28-89 | Time Completed: | Lab Unit Mgr:

54-6600-081 (R-10-83)

Uranium Analysis of the Fusion Dissolution

$$\frac{(.16)(9.9^{-4})(5.68^{-2})}{(9.9^{-4})[(.46)(\frac{5.7}{5.6})-(.16)]} = 2.95 \times 10^{-2}\ g/\ell$$

$$2.95 \times 10^{-2} / 2.99 \times 10^{-2} = 98.6\%\ \text{rec.}$$

F 5041.-6540

$$\frac{(.22)(9.9^{-4})(5.68^{-2})}{[(.52)(\frac{5.8}{5.7})-(.22)](9.9^{-4})} - \frac{(9.9^{-4})(6.55^{-3})}{(9.9^{-4})} =$$

$$3.39 \times 10^{-2}\ g/\ell / 2.99 \times 10^{-2}\ g/\ell = 113.3\%\ \text{rec.}$$

F 5040.-6240

$$\frac{(.17)(9.9^{-4})(5.68^{-2})}{(9.9^{-4})[(.46)(\frac{5.7}{5.6})-(.17)]} = 3.24 \times 10^{-2}\ g$$

$$3.24 \times 10^{-2} / 2.99 \times 10^{-2} = 108.3\%\ \text{rec.}$$

F 5037.-6540

$$\frac{(.02)(9.0^{-5})(5.68^{-2})}{(1.0)[(.30)(\frac{6.6}{65})-(.02)]} = 3.59 \times 10^{-7}\ g/\ell$$

F 5052.-6340

$$\frac{(.06)(9.9^{-4})(5.68^{-2})}{(9.9^{-4})[(.40)(\frac{5.7}{5.6})-(.06)]} = 9.82\times10^{-3}\ g/\ell$$

F 5039.-6140

$$\frac{(.04)(9.9^{-4})(5.68^{-2})}{(9.9^{-4})[(.38)(\frac{5.7}{5.6})-(.04)]} = 6.55\times10^{-3}\ g/\ell$$

F 5038.-6040

9 1 1 2 ? 5 9 0 3 7 6

Water Digestion 1

Serial No.	Sample Point	Date	Time Issued	Priority
F 5044.-7100	SEGMENT-13	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	WB75L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

Bottle # 080

DUPLICATE ANALYSIS
GRAMS SAMPLE .8971
VOLUME ON
COMPLETION 100 ml

8.97 -3 g/ml

DF 111.47

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
80725 S.C.				94171
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12-4-89		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5043.-7000	SEGMENT-12	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	WB75L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

Bottle # 080
350 ml
29.98
22.35
7.63 g

GRAMS SAMPLE .9587
VOLUME ON
COMPLETION 100 ml

9.587 -3 g/ml

DF 104.31

WHC-N-313-4 Pg 3

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
J R Smith 65286	D L Herting 66731			94171
Hrs 11-22-89	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12-4-89		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5054.-7300	SEGMENT-23	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	WB75L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

REAGENT BLANK

Complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
80725 S.C.				94171
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12-4-89		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5045.-7200	SEGMENT-14	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	% RECOVERY	WB75L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

SPIKED ANALYSIS
GRAMS SAMPLE .8731
VOLUME ON
COMPLETION 100 ml
VOLUME SPIKE
SPIKE ID

8.73 -3 g/ml

DF 114.53

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
80725 S.C.				94171
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12-4-89		

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

Water Digestion

```
**********************
** JET_WT  **  REV 0 **
**********************

SEQUENCE #  : 6
WT 1:  100.0650
WT 2:  100.9380

NET WEIGHT:

--->    0.8731 GRAMS

12/01/89  @  14:51:13
**********************
```

F 5045.-7200

```
**********************
** JET_WT  **  REV 0 **
**********************

SEQUENCE #  : 5
WT 1:   98.8131
WT 2:   99.7102

NET WEIGHT:

--->    0.8971 GRAMS

12/01/89  @  14:43:06
**********************
```

F 5054.-7300

```
**********************
** JET_WT  **  REV 0 **
**********************

SEQUENCE #  : 4
WT 1:   98.9723
WT 2:   99.9310

NET WEIGHT:

--->    0.9587 GRAMS

12/01/89  @  14:33:14
**********************
```

F 5043.-7000

```
**********************
** JET_WT  **  REV 0 **
**********************

SEQUENCE #  : 5
WT 1:   98.8131
WT 2:   99.7102

NET WEIGHT:

--->    0.8971 GRAMS

12/01/89  @  14:43:06
**********************
```

F 5044.-7100

Serial No.	Sample Point	Date	Time Issued	Priority
F 5044.-7100	SEGMENT-M	11- 7-89	11:17	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	E21D1	0

Sample Size	Customer ID
DIRECT	2nd Leach

Remarks, Calculations, Results:

DUPLICATE ANALYSIS
GRAMS SAMPLE .6013 g
VOLUME ON
COMPLETION 50 mL

1.203 E $^{-2}$ g/ml

1.203 E ^{1} g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cole				

Date	Time Completed	Lab Unit Mgr
6-27-90		

54-8800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5043.-7000	SEGMENT-L	11- 7-89	11:17	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	E21D1	0

Sample Size	Customer ID
DIRECT	2nd Leach

Remarks, Calculations, Results:

GRAMS SAMPLE .4802 g
VOLUME ON
COMPLETION 50 mL

9.604 E $^{-3}$ g/ml

9.604 g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cole				

Date	Time Completed	Lab Unit Mgr
6-27-90		

54-8800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5045.-7200	SEGMENT-N	11- 7-89	11:17	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	% RECOVERY	E21D1	0

Sample Size	Customer ID
?	2nd Leach

Remarks, Calculations, Results:

SPIKED ANALYSIS
GRAMS SAMPLE .5213 g
VOLUME ON
COMPLETION 50 mL
VOLUME SPIKE
SPIKE ID

1.043 E $^{-2}$ g/ml

1.043 E ^{1} g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cole				

Date	Time Completed	Lab Unit Mgr
6-27-90		

54-8800-081 (R-10-83)

Ion Chromatographic Analysis of the Water Digestion

Serial No	Sample Point	Date	Time Issued	Priority
F 5045.-7271	SEGMENT-14	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	% RECOVERY	WB75L	0

Sample Size: ? 100-10 ml
Customer ID: 89-041

Remarks, Calculations, Results: SPIKE SAMPLE R5043 F-49.79 ppm
SPIKE ID 4009-A
SPIKE VOLUME 50 µL

$$\frac{\left(\frac{5.05}{5.00}\right)(222.6\text{ppm}) - (221.8)\left(\frac{1.73}{9.58}\right)}{\frac{(.050)(49.79)}{5.05}(101)} \times 100 = 45.6\%$$

Spike < 20% Not calculated

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs: 14:30	Hrs	Hrs	Hrs	Hrs
Date: 12-5-89	Time Completed	Lab Unit Mgr		

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5044.-7171	SEGMENT-13	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10
Customer ID: 89-041

Remarks, Calculations, Results: DUPLICATE SAMPLE

1.83 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs: 1430	Hrs	Hrs	Hrs	Hrs
Date: 12/5/89	Time Completed	Lab Unit Mgr		

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5042.-7571	SEGMENT-11	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10
Customer ID: 89-041

Remarks, Calculations, Results: LMCS CHECK SAMPLE
LMCS ID 6C11HC

62.98/62.0

101.6%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs: 1430	Hrs	Hrs	Hrs	Hrs
Date: 12/5/89	Time Completed	Lab Unit Mgr		

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5043.-7071	SEGMENT-12	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10
Customer ID: 89-041

Remarks, Calculations, Results:

2.22 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs: 1430	Hrs	Hrs	Hrs	Hrs
Date: 12/5/89	Time Completed	Lab Unit Mgr		

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

9 1 1 2 ? 5 9 0 3 1 0

Ion Chromatographic Analysis of the Water Digestion

Serial No	Sample Point	Date	Time Issued	Priority
F 5054.-7371	SEGMENT-23	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	PPM	WB75L	0

Sample Size	Customer ID
? Direct	89-041

Remarks, Calculations, Results:

REAGENT BLANK

<.1ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	~~Analyst - 5~~ Chem+
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/5/89		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5046.-7571	SEGMENT-15	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
100-10	89-041

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 6C11HC

54.39 / 62 87.7%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	~~Analyst - 5~~ Chem+
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/5/89		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5043.-7072	SEGMENT-12	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	PPM	WB75L	0

Sample Size	Customer ID
? 100-10	89-041

Remarks, Calculations, Results:

<1.01ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	~~Analyst - 5~~ Chem+
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/5/89		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5042.-7572	SEGMENT-11	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
100-10	89-041

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 6C11HC

73.81 / 75 98.4%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	~~Analyst - 5~~ Chem+
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/5/89		

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

9 1 1 2 0 5 9 0 8 1 1

Ion Chromatograhic Analysis of the Water Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 5045.-7272	SEGMENT-14	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	% RECOVERY	WB75L	0

Sample Size: ? 100 ml - 10ml

Customer ID: 89-041

Remarks, Calculations, Results:
SPIKE SAMPLE R5043 Cl -59.78ppm.
SPIKE ID 40C9-A
SPIKE VOLUME 50µL

$$\frac{(1.01)(68.58)-(0.0)(.91)}{\frac{(.050)(59.78)}{5.05}(101)} \times 100 = 115.9\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs 14:30	Hrs	Hrs	Hrs	Hrs

Date: 12-5-89 | Time Completed: | Lab Unit Mgr: [signature] Kathy Mondelke

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5054.-7372	SEGMENT-23	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: 89-041

Remarks, Calculations, Results:
REAGENT BLANK

<.1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed: | Lab Unit Mgr: [signature]

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5044.-7172	SEGMENT-13	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID:

Remarks, Calculations, Results:
DUPLICATE SAMPLE

<1.01X10¹ ppm

Ira E. Wright

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107				
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed: | Lab Unit Mgr: [signature] Kathy Mondelke

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5046.-7572	SEGMENT-15	11- 7-89	11:18	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID:

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11 HC

$$\frac{7.65\cancel{X}^{1}}{75} \quad 102\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed: | Lab Unit Mgr: [signature]

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

Ion Chromatographic Analysis of the Water Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 5043.-7073	SEGMENT-12	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10
Customer ID: 89-041

Remarks, Calculations, Results:

6.22² ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6B107				
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed: | Lab Unit Mgr:

54-6600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5042.-7573	SEGMENT-11	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10
Customer ID: 89-041

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 6C11HC

608.5/621 98.0%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6B107				
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12-5/89 | Time Completed: | Lab Unit Mgr:

54-6600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5045.-7273	SEGMENT-14	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	% RECOVERY	WB75L	0

Sample Size: ? 100μL-10mL
Customer ID: 89-041

Remarks, Calculations, Results:
SPIKE SAMPLE R5043 NO_3-500ppm
SPIKE ID 4DC9-A
SPIKE VOLUME 50μL

$$\frac{(1.01)(1027)-(622)(.91)}{\frac{(.050)(500)}{5.05}(101)} \times 100 = 94.25\%$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6B107				
Hrs 14:30	Hrs	Hrs	Hrs	Hrs

Date: 12-5-89 | Time Completed: | Lab Unit Mgr:

54-6600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5044.-7173	SEGMENT-13	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10
Customer ID: 89-041

Remarks, Calculations, Results:

DUPLICATE SAMPLE

5.43² ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6B107				
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed: | Lab Unit Mgr:

54-6600-081 (R-10-83)

Ion Chromatographic Analysis of the Water Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 5054.-7373	SEGMENT-23	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct
Customer ID: 89-041

Remarks, Calculations, Results:
REAGENT BLANK
<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed | Lab Unit Mgr

S4-8600-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 5046.-7573	SEGMENT-15	11- 7-89	11:18	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10
Customer ID: 89-041

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11HC
95.4%
592.7

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed | Lab Unit Mgr

S4-8600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5043.-7074	SEGMENT-12	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-D
Customer ID: 89-041

Remarks, Calculations, Results:
4.77 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed | Lab Unit Mgr

S4-8600-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 5042.-7574	SEGMENT-11	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10
Customer ID: 89-041

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11HC
94.6%
587.3/621

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
6B107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed | Lab Unit Mgr

S4-8600-081 (R-10-83)

Ion Chromatographic Analysis of the Water Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 5054.-7374	SEGMENT-23	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: 89-041

Remarks, Calculations, Results:

REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs: 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed | Lab Unit Mgr

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5045.-7274	SEGMENT-14	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: ? 100µl - 10mL

Customer ID: 89-041

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 4009-A
SPIKE VOLUME 50µL

PO_4 - 501.69 ppm

$$\frac{(1.01)\,765.5-(477)(.91)}{\frac{(.050)(501.69)}{5.05}\,(101)} \times 100 = 67.6\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs: 14:30	Hrs	Hrs	Hrs	Hrs

Date: 12-5-89 | Time Completed | Lab Unit Mgr

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5044.-7174	SEGMENT-13	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 89-041

Remarks, Calculations, Results:

DUPLICATE SAMPLE

3.55 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs: 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed | Lab Unit Mgr

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5046.-7574	SEGMENT-15	11- 7-89	11:18	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: 89-041

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 6C11HC

592.2 95.4

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs: 1430	Hrs	Hrs	Hrs	Hrs

Date: 12/5/89 | Time Completed | Lab Unit Mgr

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

Ion Chromatographic Analysis of the Water Digestion

Serial No	Sample Point	Date	Time Issued	Priority
F 5042.-7575	SEGMENT-11	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
SO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
100-10	89-041

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID GCRHC

575.9/621 92.7%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
66107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/5/89		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5054.-7375	SEGMENT-23	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Rerun
SO4	LA-533-105	PPM	WB75L	0

Sample Size	Customer ID
? Direct	89-041

Remarks, Calculations, Results:

REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
66107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/5/89		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5044.-7175	SEGMENT-13	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
SO4	LA-533-105	PPM	WB75L	0

Sample Size	Customer ID
? 100-10	89-041

Remarks, Calculations, Results:

DUPLICATE SAMPLE

4.58' ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
66107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/5/89		

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5043.-7075	SEGMENT-12	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
SO4	LA-533-105	PPM	WB75L	0

Sample Size	Customer ID
100-10	89-041

Remarks, Calculations, Results:

5.37' ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5 Chemist
66107				94171
Hrs 1430	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/5/89		

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

Ion Chromatographic Analysis of the Water Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 5045.-7275	SEGMENT-14	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: ? 100 µL - 10 mL

Customer ID: 89-041

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 40C9-A
SPIKE VOLUME 50µL

SO_4 - 501.03

$$\frac{(1.01)(493.9)-(53.7)(.5)}{(1.050)(501.03)} \times 100 = 89.8\%$$

(101
5.05

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs	Hrs	Hrs	Hrs	Hrs
14:30				
Date	Time Completed	Lab Unit Mgr		
12-5-89				

54-8600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5046.-7275	SEGMENT-15	11- 7-89	11:18	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: 89-041

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 6C11AC

5959 96.0%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107				
Hrs	Hrs	Hrs	Hrs	Hrs
14:30				
Date	Time Completed	Lab Unit Mgr		
12/5/89				

54-8600-081 (R-10-83)

Total Organic Carbon Analysis of the Water Digestion I - Not Acidified

Serial No.	Sample Point	Date	Time Issued	Priority
F 5042.-7526	SEGMENT-11	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	0

Sample Size: ? 200-2-200
Customer ID: 89-041

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 70C11B
2.96 g/L / 3.03 98.5%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725 d.c.				R Blanchett
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 12-4-89 | Time Completed: | Lab Unit Mgr:

54-0800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5044.-7126	SEGMENT-13	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	0

Sample Size: ? 200-2-200
Customer ID: 89041

Remarks, Calculations, Results:
DUPLICATE SAMPLE
~~4.50-2 g/L~~
4.51-2 g/L

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725 d.c.				R Blanchett
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 12-4-89 | Time Completed: | Lab Unit Mgr:

54-0800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5043.-7026	SEGMENT-12	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	0

Sample Size: ? 200-2-200
Customer ID: 89-041

Remarks, Calculations, Results:
~~4.50-2 g/L~~
4.51-2 g/L

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725 d.c.				R Blanchett
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 12-4-89 | Time Completed: | Lab Unit Mgr:

54-0800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5045.-7226	SEGMENT-14	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	0

Sample Size: ? 200-2-200 + 200 spike
Customer ID: 89-041

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 70C11B
SPIKE VOLUME 200ml

$$\%\,spike = \frac{(51.7\,ppm - 4.19\,ppm)(4.10\,ppm - 4.18\,ppm)/91}{\left(\frac{(3000\,ppm)(.2\,ml)}{20\,ml + .2\,ml + .2\,ml}\right)(.2\,ml)\left(\frac{\cancel{2.68\,g/L}}{2.69\,g/L}\right)} \times 100$$

~~83.0%~~ HLP 04/09/90
~~2.68 g/L~~
2.69 g/L
%spike = ~~86.69%~~ HLP OK
95.2%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725 d.c.				R Blanchett
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 12-4-89 | Time Completed: | Lab Unit Mgr:

54-0800-081 (R-10-83)

Total Organic Carbon Analysis of the Water Digestion I - Not Acidified

Serial No.	Sample Point	Date	Time Issued	Priority
F 5046.-7526	SEGMENT-15	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
TOC	LA-344-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 70C11B

3.07 g/l / 3.00 102.3%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725 J.C.				R. Brunette
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12-4-89		

54-6603-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 5054.-7326	SEGMENT-23	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Rerun
TOC	LA-344-105	G/L	WB75L	0

Sample Size	Customer ID
? 200-2-200	89-041

Remarks, Calculations, Results:

REAGENT BLANK

2.25^{-2} g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725 J.C.				R. Brunette
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12-4-89		

54-6603-081 (R-10-83)

9 1 1 2 7 5 7 0 8 1 9

Total Organic Carbon Analysis of the Water Digestion II- Acidified

Serial No.	Sample Point	Date	Time Issued	Priority
F 5043.-7026	SEGMENT-12	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	1

Sample Size: ? 1ml + 100ul .5m H_2SO_4 - 200ul

Customer ID: 89041

Remarks, Calculations, Results: Second leach

~~8.25E-3 g/l~~

8.25E-3 g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R Bramatt
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs

Date: 6-29-90 | Time Completed: | Lab Unit Mgr: Ted M. Pool, Kathy Homdeke

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5042.-7526	SEGMENT-11	11- 7-89	11:16	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	1

Sample Size: ? 200ul - 2ml - 200ul

Customer ID: 89041

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 70C11D

98.3%

2.948 / 3.00

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R Bramatt
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs

Date: 6-29-90 | Time Completed: | Lab Unit Mgr: Ted M. Pool, Kathy Homdeke

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5045.-7226	SEGMENT-14	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	1

Sample Size: ? 200ul + 100ul .5m H_2SO_4 - 200ul

Customer ID: 89041

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 70C11A
SPIKE VOLUME 200ul

Second leach

$$\frac{(126-3.5)-(50-3.5)}{119.9\mu g} \times 100 = 100.9\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R Bramatt
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs

Date: 6-29-90 | Time Completed: | Lab Unit Mgr: Ted M. Pool, Kathy Homdeke

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5044.-7126	SEGMENT-13	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	1

Sample Size: ? 1ml + 100ul .5m H_2SO_4 - 200ul

Customer ID: 89041

Remarks, Calculations, Results:
DUPLICATE SAMPLE

Second leach

1.32E-2 g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R Bramatt
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs

Date: 6-29-90 | Time Completed: | Lab Unit Mgr: Ted M. Pool, Kathy Homdeke

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

9 1 1 2 [illegible] 5 9 0 3 2 0

Total Organic Carbon Analysis of the Water Digestion II - Acidified

Serial No.	Sample Point	Date	Time Issued	Priority
F 5054.-7326	SEGMENT-23	11- 7-89	11:18	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	1

Sample Size: ? 200uL

Customer ID: 89041

Remarks, Calculations, Results:
REAGENT BLANK

Second leach

3.5ug
.4995ug/min

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R E Bramatt
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs

Date: 6-29-90

Time Completed:

Lab Unit Mgr: [signature] Kathy Hondeko

SL-6500-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5046.-7526	SEGMENT-15	11- 7-89	11:17	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	1

Sample Size: ? 200uL-2ml -200uL

Customer ID: 89041

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 70C11D

2nd leach

2.920 gpl/3.00sll 97.30%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R E Bramatt
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs: Kathy Hondeko

Date: 6-29-90

Time Completed:

Lab Unit Mgr: [signature] Kathy Hondeko

SL-6500-061 (R-10-83)

9 1 1 2 0 5 9 0 9 2 1

Acid Digestion

Serial No	Sample Point	Date	Time Issued	Priority
F [illegible]	SEGMENT-[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD DGST	LA 505 159	~~[illegible]~~ g/ml 8	W875L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

GRAMS SAMPLE .5432
VOLUME ON
COMPLETION ~~50~~ ml
25

1.09 -2 g/ml

86
500 ml
18
.7
1 g
-4 Pg 3

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
JR Smith 65286	DG Hartung 66431	69769/EMS		[signature]
Hrs	Hrs	Hrs	Hrs	Hrs
N-22-89				

Date	Time Completed	Lab Unit Mgr
12/6/89		[signature]

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5047.-8500	SEGMENT-P	11- 7-89	11:18	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	G/L	E21D1	0

Sample Size	Customer ID
? 5ml	[illegible]

Remarks, Calculations, Results

GRAMS SAMPLE _____
VOLUME ON
COMPLETION ~~50~~ ml
25

BUCHER

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
69769/EMS				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/6/89		[signature]

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

Serial No.	Sample Point	Date	Time Issued	Priority
F 5050.-8500	SEGMENT-19	11- 7-89	11:18	25

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	~~[illegible]~~ g/ml 8	W875L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results:

GRAMS SAMPLE .5838
VOLUME ON
COMPLETION ~~50~~ ml 25
103C15C + 104C15D
5 ml each

1.17 -2 g/ml

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
69769/EMS				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/6/89		[signature]

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

Serial No	Sample Point	Date	Time Issued	Priority
F 5049.-8100	SEGMENT 18	11- 7-89	11:18	27

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	~~[illegible]~~ g/ml 8	W875L	0

Sample Size	Customer ID
?	89-041

Remarks, Calculations, Results

86

DUPLICATE ANALYSIS
GRAMS SAMPLE .5922
VOLUME ON
COMPLETION ~~50~~ ml
25

1.18 -2 g/ml

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
69769/EMS				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/6/89		[signature]

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

ICP Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 7048.-5050	SEGMENT-17	11- 7-89	11:18	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	PPM	WB75L	0

Sample Size	Customer ID
? 100-10 1-10	89-041

Remarks, Calculations, Results:

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
R. Southwick				

Date	Time Completed	Lab Unit Mgr	
2/22/90			DMS

34-6800-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 5047.-8050	SEGMENT-16	11- 7-89	11:18	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 1-10	89-041

Remarks, Calculations, Results:

LMCS CHECK SAMPLE Check Standards
LMCS ID 2 ICIC 1 IB (2)
EOCIIA 2B
34CIIC = digested LMCS

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
R. Southwick				

Date	Time Completed	Lab Unit Mgr	
2/22/90			DMS

34-6800-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 5050.-8250	SEGMENT-19	11- 7-89	11:18	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	PPM	WB75L	0

Sample Size	Customer ID
? 100-10 1-10	89-041

Remarks, Calculations, Results

~~MATRIX SPIKE SAMPLE~~
Spike

103C15C & 104C15D
5.0 ml each
Completion 50.0 ml
1.17 g/ml Sample
89-041

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
R. Southwick				

Date	Time Completed	Lab Unit Mgr	
2/22/90			DMS

34-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 5049.-8150	SEGMENT-18	11- 7-89	11:18	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	PPM	WB75L	0

Sample Size	Customer ID
? 100-10 1-10	89-041

Remarks, Calculations, Results:

DUPLICATE SAMPLE

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769				
Hrs	Hrs	Hrs	Hrs	Hrs
[illegible]	[illegible]			

Date	Time Completed	Lab Unit Mgr	
2/22/90			DMS

34-6800-081 (R-10-83)

9 1 1 2 ? 5 9 0 3 ? 3

Acid Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 5051.-8500	SEGMENT-T	11- 7-89	11:18	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	G/L	E21D1	0

Sample Size	Customer ID
? 5mL	ICP 2

Remarks, Calculations, Results:

GRAMS SAMPLE _____
VOLUME ON
COMPLETION 5mL

35 CIICJ

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
69769/SMS			[signature]	[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/6/89		[signature]

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