Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

222-S RCRA Analytical Laboratory

Project: 242-A EVAPORATOR FEED CHARACTERIZATION

Tank: 102AW

Customer Id. Number: 2291-1-3, 2291-2-3, 2291-3-3, 2291-4-3

Report Revision: 0

Date Printed: May 27, 1992

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Hanford Operations and Engineering Contractor for the US Department of Energy

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This report consists of pages 1 through 321, plus pages 3.1, 6.1-6.21, 7.1-7.3, 8.1-8.2, 12.1-12.20, 141.1, and 242.1.

S I G N A T U R E P A G E

I have reviewed the Inorganic and Radiochemistry results reported in this data package (when applicable). The results meet the requirements of "242-A Evaporator Feed Characterization Project - Statement of Work" - WHC-SOW-91-0002. This data is an accurate representation of the data generated for the requested laboratory analyses performed.

J. W. Tillman — 7/29/92
J. W. Tillman — Date
242-A Evaporator Project Manager

I have reviewed the compiled report and certify that this data package meets the document standards of the RCRA Data Packaging Procedure LO-150-151. This data package is complete and contains the data generated from the requested laboratory analysis performed on this sample.

L. R. Webb — 7/30/92
L. R. Webb — Date
Records Management Specialist
Data Coordinator

I have reviewed this report and certify that this data package meets the requirements of "Quality Assurance Project Plan for the Chemical Analysis of Highly Radioactive Samples in Support of Environmental Activities on the Hanford Site" - WHC-SD-CP-QAPP-002, unless superseded by the Statement of Work or Waste Characterization Plan. This data package is a complete and accurate representation of the data generated from the requested laboratory analyses performed on this sample based on the QA Review Process.

L. P. Markel — 8/12/92
L. P. Markel — Date
Laboratory Q.A. Officer

The data contained in this hardcopy data package has been approved and authorized for release by the Laboratory Manager or Manager's designee as verified by the following signature.

M. A. Bell — 9-14-92
M. A. Bell — Date
Manager
Processing and Analytical Laboratories

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NARRATIVE

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

242-EVAPORATOR FEED CHARACTERIZATION

INORGANIC CASE NARRATIVE

Introduction

The analysis of samples in support of the 242-A Evaporator Feed Characterization Project for Fiscal Year 1991, was performed by the 222-S Laboratory during the last quarter of 1991 and completed during the first quarter of 1992. Samples received and analyzed for the inorganic and conventional parameters were performed using methods specified in the Statement of Work (SOW), WHC-SOW-91-0002 Westinghouse Hanford Company, 242-A Evaporator Feed Characterization Project Fiscal Year 1991, September 1991.

Samples submitted to the laboratory were identified as:

1. TK-102-AW (referred to as 102AW in the remainder of this report) the feed tank prior to the evaporator.

2. TK-106-AW (referred to as 106AW in the remainder of this report) one of the candidate feed tanks into 102AW.

3. TK-103-AP (referred to as 103AP in the remainder of this report) the other candidate feed tank into 102AW.

The inorganic constituents requested for analysis on the three tanks were divided into the following categories; metals by Inductively Coupled Plasma (ICP), metals by Atomic Absorption Spectroscopy (AAS), and conventional parameters by specified methods. The results were obtained using approved methods as specified in Table I of the SOW. Quality analyses, including number and frequency, were performed in accordance to guidance found in Table 2 of the SOW. The parameters analyzed for from the three tanks are:

Metals by ICP

Silver	Ag
Aluminum	Al
Barium	Ba
Cadmium	Cd
Chromium	Cr
Iron	Fe
Magnesium	Mg
Manganese	Mn
Sodium	Na
Lead	Pb
Zinc	Zn

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242-EVAPORATOR FEED CHARACTERIZATION

INORGANICS CASE NARRATIVE

Problems encountered:

Samples from the two candidate and one feed tank into the evaporator were received into the 222-S laboratory during the laboratory's transition period from process to environmental analysis. This transition period signaled a change in the analytical protocols required to meet different, and in some cases, more stringent conditions. Most of the problems encountered during this work effort can be attributed to the response of the laboratory to these changing requirements. Nevertheless, the data generated for these samples was obtained using the best available laboratory practice at the time of sample analysis. The following problems were observed to have occurred throughout the samples submitted from tanks 102AW, 103AP, and 106AW:

(1) In a few cases, the analytical data cards are not corrected with one line, an initial and a date. Also, due to insufficient training, the chemists signed the analytical data card in the incorrect location. Though the analytical data cards were signed by the cognizant chemists, they were often signed in the inappropriate location on the card. This indicated the need for appropriate training to address this problem. This training effort has begun.

The Extension "1621" on the data cards represent an old extension which specifically denotes "TOC" analysis.

(2) Instrument Detection Limits (IDL). Detection limits for the parameters determined were obtained using the method prescribed by the US EPA. The instrument detection limits for the metals determined by Inductively Coupled Plasma (ICP), Atomic Absorption (AA), Ion Chromatograph (IC) and classical methods are obtained from an aqueous matrix. The instrument detection limits for the analytes on actual evaporator feed or candidate tanks would probably be higher due to matrix efforts. The standards used to prepare the solutions for the detection limit determinations were obtained from bonifide and reliable sources. The procedure basically requires the analysis of seven replicates of the analyte at a concentration two times the noise level for the instrument. Following this protocol, the instrument detection limits were met or exceeded when compared to the IDC's in the Request for Special Analyses (RSA). Typical instrument detection limits obtained during this work effort are listed below:

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Hanford Company

P.O. Box 1970 Richland, WA 99352

242-EVAPORATOR FEED CHARACTERIZATION

INORGANICS CASE NARRATIVE

TANK: 102AW

Metals, anion, inorganic, and radionuclides data review for the 242-A Evaporator Feed Characterization Project Fiscal Year 1991.

Tank: 102AW (referred to as 102AW in the remainder of this report)

These samples appeared aqueous with no visible organic layer. All samples had a light yellow tint and 2291-4-3 (R9411) had solids present. Most check standards were within control limits except for some metals; i.e., aluminum, iron, and sodium. Also some of the radionuclides in the check standards were outside the control limits.

Ion Chromatography (IC) Anions and Conventional Parameters

Customer Sample #	Lab. I.D. #
2291-1-3	R9408
2291-2-3	R9409
2291-3-3	R9410
2291-4-3	R9411

Anions are determined on the undigested samples that are diluted if necessary. IC is used to determine fluoride, chloride, nitrate, nitrite, phosphate, and sulfate anions. All duplicates were within the control limits of 20% relative percent difference (RPD). The results were consistent over all samples analyzed for this batch of samples. The sulfate spike recovery data was biased high due to matrix interferences and the high ion content of the sample. The spike recovery data was bracketed by check standards that were within the limits. Some of the parameters for sample 2291-1-3 (R9408) were run in duplicate as a quality check of the method. The RPD for sulfate, phosphate, nitrate, and nitrite were within the defined control limits.

Duplicate cyanide analyses were run on sample 2291-1-3 (R9408). The RPD for this sample was within the control limit and the spike recovery value was about 95%. The results of the check standards run before and after the sample were 100.5 and 99.1% respectively. The check standards run before and after Total Inorganic Carbon (TIC) and Total Organic Carbon (TOC) indicate good accuracy for these analytes. No exotherm was detected for this batch of samples. The check standards run for this batch of samples for the Differential Scanning Calorimetry (DSC) indicate good reproducibility.

The dates on the analytical cards for Fluoride and Chloride results are the dates the data for these analytes was regenerated. The actual analysis date is 09/25/91.

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These samples were used to determine americium 241 and several other radionuclides because of concern for criticality. Isotopic analysis for uranium was accomplished using Alpha Total/Alpha Energy Analysis.

The sample was run in duplicate except for the isotopic uranium. The precision and accuracy data were within the limits of control. An additive of the isotopic uranium data agrees well with the total uranium results.

For no apparent reason, the spikes were not run for Tritium with this batch of samples.

John H. Tillman 9/9/92

John H. Tillman, Manager
Inorganic Chemistry PAL

compliance. While it is expected that in most cases specific needs will be more stringent, if less stringent requirements are appropriate, these should also be defined in the WAP. This could significantly reduce analytical costs and turnaround times.

Characterization of Waste Streams Discharged to Double Shell Tanks (DSTs):

These streams are from ongoing operations of the site and will need analysis for two requirements; verification of compliance to tank farm storage specifications (processing parameters), and determination of composition for regulatory based designation of the waste (hazardous waste designation). Processing parameter based analysis will be equivalent to current practice and should be predefined using laboratory "routine set" analysis. The analysis will be performed under the quality assurance requirements of NQA-1 with typical result turnarounds of 1 to 5 days. Results will be available via the laboratory reporting system (LCCS).

Analysis of the samples to meet the needs for hazardous waste designation will require more stringent quality assurance than for processing parameters. Those components that fall under both needs will likely be required to be analyzed by both protocols. Unfortunately, analysis turnaround times for designation will likely exceed needs for normal processing parameters. If processing parameter analysis results show a component to significantly exceed a hazardous waste designation limit (e.g., a sample is sufficiently caustic to qualify as a extremely hazardous waste based on corrosiveness) reanalysis of the sample under the more stringent protocols would not be necessary. In no case will analysis performed to processing parameter protocols be suitable for designation as an intermediate level or as nonhazardous waste.

DST Characterization Analysis:

All of these analyses will be required to be performed to hazardous waste designation protocols. Currently, no analytical capacity exists to perform Nb^{94} analysis. This long lived ($2x10^4$ y) beta emitter is not expected to be present in significant quantities and will require development efforts to analyze for. Addition of total beta (TB) analysis to the analysis request should allow for screening for significant levels of unaccounted for beta activity and assessment of the needs for additional specific beta emitting radionuclide component quantification.

Analysis for Pu^{238} at the 222-S Laboratory is complicated by the presence of this isotope in the spike (Pu^{236}) added to the analysis to allow correction for overall yield in the procedure. For most expected samples, Pu^{238} activity will be only a small fraction of the $Pu^{239/240}$ activity and may be approximated using isotopic ratios based on historical irradiated uranium processing.

16500-90-090

If you need any additional information or have any questions, please call me on 3-3869.

Richard L. Weiss

R. L. Weiss, Principal Scientist
Office of Sample Management

jmd

Attachments - 7

CONCURRENCE:

Curtis R. Stroup Date 11/28/90
C. R. Stroup, Manager
Analytical Laboratories

J. D. Briggs for Date 11/29/90
J. D. Briggs, Manager
222-S Analytical Laboratory Complex

TABLE 2
RECOMMENDED ANALYSIS MINIMUM QUANTITATION LEVELS
for TANK FARM WASTE ANALYSES

Analyte	Solid/Slurry	High Salt Liquid	Low Salt Liquid
Alpha Total	100	1	0.01
Beta Total	350	3.5	0.035
Radionuclides Analyzed by Gamma Energy Analysis			
Co^{60}	4	4	0.04
Cs^{137}	5	5	0.05
$RuRh^{106}$	50	50	0.5
Radionuclides Analyzed by Separation with Beta Counting			
H^{3}	75	1.5	1.5
C^{14}	50	0.5	0.25
Nb^{94}	*	*	*
Se^{79}	50	0.5	0.25
Sr^{90}	150	1.5	0.015
Tc^{99}	250	2.5	0.025
I^{129}	900	9	0.09
Radionuclides Analyzed by Separation with Alpha Counting/Alpha Energy Analysis			
Pu^{238}	200[1]	2[1]	0.02[1]
$Pu^{239/240}$	50	0.5	0.005
Am^{241}	100	1	0.01
Cm^{244}	100	1	0.01

Values for solids are as pCi/g
Values for liquids are as pCi/ml

* No current analysis capacity for Nb^{94}
[1]Potential interferrence on Pu^{238} analysis from contamination in Pu^{236} spike added to the analysis

TABLE 3 (cont)

(continued)

Semivolatiles	CAS Number	Quantitation Limits* Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
69. Dibenzofuran	132-64-9	10	330	10000	(20)
70. 2,4-Dinitrotoluene	121-14-2	10	330	10000	(20)
71. Diethylphthalate	84-66-2	10	330	10000	(20)
72. 4-Chlorophenyl-phenyl ether	7005-72-3	10	330	10000	(20)
73. Fluorene	86-73-7	10	330	10000	(20)
74. 4-Nitroaniline	100-01-6	50	1700	50000	(100)
75. 4,6-Dinitro-2-methylphenol	534-52-1	50	1700	50000	(100)
76. N-nitrosodiphenylamine	86-30-6	10	330	10000	(20)
77. 4-Bromophenyl-phenylether	101-55-3	10	330	10000	(20)
78. Hexachlorobenzene	118-74-1	10	330	10000	(20)
79. Pentachlorophenol	87-86-5	50	1700	50000	(100)
80. Phenanthrene	85-01-8	10	330	10000	(20)
81. Anthracene	120-12-7	10	330	10000	(20)
82. Carbazole	86-74-8	10	330	10000	(20)
83. Di-n-butylphthalate	84-74-2	10	330	10000	(20)
84. Fluoranthene	206-44-0	10	330	10000	(20)
85. Pyrene	129-00-0	10	330	10000	(20)
86. Butylbenzylphthalate	85-68-7	10	330	10000	(20)
87. 3,3'-Dichlorobenzidine	91-94-1	10	330	10000	(20)
88. Benzo(a)anthracene	56-55-3	10	330	10000	(20)
89. Chrysene	218-01-9	10	330	10000	(20)
90. bis(2-Ethylhexyl)phthalate	117-81-7	10	330	10000	(20)
91. Di-n-octylphthalate	117-84-0	10	330	10000	(20)
92. Benzo(b)fluoranthene	205-99-2	10	330	10000	(20)
93. Benzo(k)fluoranthene	207-08-9	10	330	10000	(20)
94. Benzo(a)pyrene	50-32-8	10	330	10000	(20)
95. Indeno(1,2,3-cd)pyrene	193-39-5	10	330	10000	(20)
96. Dibenz(a,h)anthracene	53-70-3	10	330	10000	(20)
97. Benzo(g,h,i)perylene	191-24-2	10	330	10000	(20)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

TABLE 3 (cont)

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Volatiles	CAS Number	Quantitation Limits* Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
1. Chloromethane	74-87-3	10	10	1200	(50)
2. Bromomethane	74-83-9	10	10	1200	(50)
3. Vinyl Chloride	75-01-4	10	10	1200	(50)
4. Chloroethane	75-00-3	10	10	1200	(50)
5. Methylene Chloride	75-09-2	10	10	1200	(50)
6. Acetone	67-64-1	10	10	1200	(50)
7. Carbon Disulfide	75-15-0	10	10	1200	(50)
8. 1,1-Dichloroethene	75-35-4	10	10	1200	(50)
9. 1,1-Dichloroethane	75-34-3	10	10	1200	(50)
10. 1,2-Dichloroethene (total)	540-59-0	10	10	1200	(50)
11. Chloroform	67-66-3	10	10	1200	(50)
12. 1,2-Dichloroethane	107-06-2	10	10	1200	(50)
13. 2-Butanone	78-93-3	10	10	1200	(50)
14. 1,1,1-Trichloroethane	71-55-6	10	10	1200	(50)
15. Carbon Tetrachloride	56-23-5	10	10	1200	(50)
16. Bromodichloromethane	75-27-4	10	10	1200	(50)
17. 1,2-Dichloropropane	78-87-5	10	10	1200	(50)
18. cis-1,3-Dichloropropene	10061-01-5	10	10	1200	(50)
19. Trichloroethene	79-01-6	10	10	1200	(50)
20. Dibromochloromethane	124-48-1	10	10	1200	(50)
21. 1,1,2-Trichloroethane	79-00-5	10	10	1200	(50)
22. Benzene	71-43-2	10	10	1200	(50)
23. trans-1,3-Dichloropropene	10061-02-6	10	10	1200	(50)
24. Bromoform	75-25-2	10	10	1200	(50)
25. 4-Methyl-2-pentanone	108-10-1	10	10	1200	(50)
26. 2-Hexanone	591-78-6	10	10	1200	(50)
27. Tetrachloroethene	127-18-4	10	10	1200	(50)
28. Toluene	108-88-3	10	10	1200	(50)
29. 1,1,2,2-Tetrachloroethane	79-34-5	10	10	1200	(50)
30. Chlorobenzene	108-90-7	10	10	1200	(50)
31. Ethyl Benzene	100-41-4	10	10	1200	(50)
32. Styrene	100-42-5	10	10	1200	(50)
33. Xylenes (Total)	1330-20-7	10	10	1200	(50)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

TABLE 5
RESULT REPORTING/VALIDATION

The RCRA validation documentation package consists of the Office of Sample Management Data Validation cover sheet (different sheets for Level A, B, or C validation), supplemental Quality Control (QC) attachment pages, a copy of the Chain of Custody, and all sample data. One documentation package is completed for each sample or delivery group.

Three levels of validation are offered:

Level A The minimum requirement for all RCRA data. The primary application is for data used in waste designation/disposal. The additional QC required by SW-846 will be assessed through laboratory audits and Performance Evaluation (PE) samples.

Review Requirements:

- o Requested Versus Reported Analyses
- o Analysis Holding Times

Level B Provides a more in-depth review for programs whose data are compiled for use in later reports.

Review Requirements in Addition to Those Listed for Level A:

- o Matrix Spike/Matrix Spike Duplicate Analysis
- o Surrogate Recoveries
- o Duplicate Analysis
- o Analytical Blank Analysis

Level C Requires that the data be reported in Sample Delivery Group (SDG) data packages and is applicable to RCRA governed programs requiring Contract Laboratory Program (CLP) quality data from analytical work done in non-CLP laboratories

Review Requirements in Addition to Those Above:

- o Initial and Continuing Instrument Calibrations
- o Gas Chromatography - Mass Spectrograph (GC/MS) Tune Criteria
- o Internal Standards for Gas Chromatograph Analysis
- o Laboratory Control Samples
- o Interference Check Samples (for ICP analysis)
- o Any Other QC Checks Performed or Required by the Methods of Analysis

TABLE 6 (cont)

10. LABORATORY CONTROL SAMPLE

All Laboratory Control Sample recoveries must be within 80-120% for all sample matrices.

11. INTERFERENCE CHECK SAMPLE

Frequency of analysis and all Interference Check Sample solution results must meet the requirements specified in the procedure used.

12. OTHER QUALITY CONTROL CHECKS

As specified in project specific documentation.

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Procedure LA-533-105
Anion Analysis on Dionex Model 40001

Typical sample dilution was 0.000099g/mL

Fluoride
Detection Limit in solution = 0.09 ppm.

Chloride
Detection Limit in solution = 0.04 ppm.

Nitrate
Detection Limit in solution = 0.24 ppm.

Phosphate
Detection Limit in solution = 0.13 ppm.

Sulfate
Detection Limit in solution = 0.13 ppm.

Procedure LA-622-102
Determination of Carbonate in Solutions by Coulometry

Detection Limit = 5 ppm in solution
Typical sample dilution was 0.01g/mL

Procedure LA-344-105
Total Organic Carbon
Determination of Carbon Insolation by Combustion and Coulometry

Detection Limit = 5.5 ppm in solution
Typical sample dilution was 0.01 g/mL

Procedure LA-695-101
Cyanide = 0.1 ppm CN in solution
Spectrophotometric Determination of Cyanide

Procedure LA-634-102
Ammonia = 0.1 ppm NH_4^+ in solution
Ammonia by Kjeldahl

Procedure LA-645-001
Nitrite = 0.184 ppm NO_2 in solution
Spectrophotometric Determination of Nitrite

Procedure LA-265-101
Chromium VI = 0.1004 ppm Cr^{6+} in solution
Spectrophotometric Determination of Hexavalent Chromium

SINGLE SHELL TANK PROJECT
Analytical Detection Limits
October 12, 1990

The following detection limits are derived on ideal matrices. These values were derived by using either calibration standards or pure matrix standards. Detection limits on actual single shell tank samples are likely to be much higher. No information regarding procedure detection limits is available for procedures not listed in this report.

Procedure LA-355-131
Arsenic Analysis by Hydride Generation Atomic Absorption

Detection Limit = 0.005 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.

Procedure LA-325-102
Mercury Analysis by Atomic Absorption Manual Cold Vapor Technique

Detection Limit = 0.002 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.
Solids were analyzed directly.

Procedure LA-362-131
Selenium Analysis by Hydride Generation Atomic Absorption

Detection Limit = 0.005 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.

Procedure: LA-505-151 (Nominal Detection Limits)

Inductively Coupled Plasma (ICP) Emission Spectrometer Operations and Analysis.

Typical sample dilution for the Fusion Dissolution was 0.00019 g/mL.

Typical sample dilution for the Water Digestion was 0.000476 g/mL.

Typical sample dilution for the Acid Digestion was 0.000476 g/mL

Instrument Detection Limit ppm.

Aluminum	0.0745	Antimony	0.1424
Arsenic	0.0223	Barium	0.0026
Beryllium	0.0006	Bismuth	0.0839
Boron	0.0083	Cadmium	0.0039
Calcium	0.0002	Cerium	0.1359
Chromium	0.0039	Cobalt	0.0246
Copper	0.0158	Europium	0.0024
Iron	0.0073	Lanthanum	0.0141
Lead	0.0273	Lithium	0.0032
Magnesium	0.0001	Manganese	0.0011
Mercury	0.0036	Molybdenum	0.0049
Neodymium	0.2130	Nickel	0.0147
Phosphorous	0.0308	Potassium	0.2122
Samarium	0.1525	Selenium	0.0631
Silicon	0.0314	Silver	0.0183
Sodium	0.0483	Strontium	0.0010
Sulfur	0.0163	Tantalum	0.0273
Thallium	0.0646	Thorium	0.0122
Tin	0.0144	Titanium	0.0035
Tungsten	0.0273	Uranium	1.1405
Vanadium	0.0186	Zinc	0.0017
Zirconium	0.0141		

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	CL Gerrung	Date 6-5-91		Time	1545
Sample Locations	241-AW - TANK 102-AW RISER # 22A				
Remarks	N/A				
Ice Chest or Sample Pig No.	B-18 ~~2AW52291-1~~	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW52291-1	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: Chris Dinkler CL Dink	Received by: John J. Ursic	Date/Time: 6-7-91/0115
Relinquished by: John J. Ursic	Received by: J.A. Ursic	Date/Time: 6/7/91 0215
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Ship # R9227

Document No.	Rev/Mod	Page
TO-080-030	C-1	15

9 3 1 2 3 3 0 5 7 1

Date/Time Received 6-7-91 / 0210 hrs Client Name C.C. Pitkoff

Project/Client # 241-AW-TANK Batch or Case # 102-AW RISER #22A

Company Contact: C.C. Pitkoff Sample No. 2AW52291-1

PIG
Cooler ID (if noted on outside of cooler) B-18

1. Condition of shipping container? Good
2. Custody Seals on ~~cooler~~ Pig intact? Yes [ ] No [ ] none
3. Custody Seals dated and signed? Yes [ ] No [ ] none
4. Chain of Custody record is ~~taped on inside of cooler lid?~~ hand carried Yes [✓] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have: NA clips (in cans) NA tape
   NO custody seals ✓ appropriate sample labels
   ✓ hazard labels
9. Samples are: ✓ in good condition NO leaking
   NA broken NA have air bubbles
   NA other
10. Samples received at NA °C. Coolant type NA
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) C of C present
    Request for Analysis #(s) yes
    Airbill # NA Carrier Truck
12. Have any anomalies been identified above? Yes [ ] No [✓]
13. Memos have been initiated for all anomalies identified above? Yes [NA]

Printed Name/Signature DOT Honaker / Dot Honaker for J.A. Querin Date/Time 6-7-91

Page 1 of 2

9312830573

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	CL Kearney	Date 6-5-91		Time	1545
Sample Locations	241-AW - TANK 102-AW Riser # 22A				
Remarks	N/A				
Ice Chest or Sample Pig No.	B-7B ~~2AW52291-1~~	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW52291-1	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: Chris Winkler CL Wk	Received by: John J Uroic	Date/Time: 6-7-91/0115
Relinquished by: John J Uroic	Received by: J.A. Duri	Date/Time: 6/7/91 0215
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Ship# 9277
DyB 7/11/91

9 3 1 2 3 3 0 5 7 5

SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
R 9227 DYB 7/11/91	2AW 52291-1 DYB 7/11/91		

9 3 1 2 9 3 0 5 7 7

9402 9409 9416
9422 9423

LABORATORY ID	Date Sampled	Time Sampled

Sample Site or Sampling ID	Date Received at 222-S	Time Received at 222-S
102-AW 152291-2 (R9229)	6/13/91	1315

Receiver (Signature)	RPT Release (Signature)	Dose Rate
[signature]	[signature]	200 mrad/hr

Custodian (Signature)	Date Analysis Complete	Disposal Date
Vida Johansen		

Comments: Stored in QA vaf. #1,2,3

Roll No.	Tech/Receiver (Signature)	Date	Entry Code	Comments
	INORGANIC 1	R9395		
	2	R9402		
	3	R9409		
	4	R9416		
	SVOA 1	R9423		
	2	R		
	VOA 1	~~R9423~~		
	2	R9422		

BD-6000-347 (10/89)

SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
R 9229	2AW52291-2		yes
INORGANIC 1	R9395		
2	9402		
3	9409		
4	9416		
SEMI VOA			
1 and 2	R 9423		
VOA			
1 and	R9422		

(1 Per Shipping Container)
WHC-SD-WM-DP-025
Addendum 3 Rev 0

242-A Evaporator

Date/Time Received 6/10/91 Client Name Hand Farm

Project/Client # 241-AW-102AW Batch or Case # Riser 22-A 102-AW

Cooler ID (if noted on outside of cooler) G Seal 4210

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [ ] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - ___ clips (in cans)
   - X custody seals
   - ___ hazard labels
   - ___ tape
   - X appropriate sample labels
9. Samples are:
   - ___ in good condition
   - ___ broken
   - ___ other
   - ___ leaking
   - ___ have air bubbles
10. Samples received at N/A °C. Coolant type ___
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) Yes —
    Request for Analysis #(s) —
    Airbill # N/A Carrier Hand carried
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Vida Johansen [signature] Date/Time 6/10/91 1530

Page 1 of 2

12.10

9 3 1 2 9 3 0 5 0 3

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	B.C. Wyer	Date 6-12-91		Time	0930
Sample Locations	241-AW, Tank 102-AW, Riser # 22A				
Remarks	Seal #4215				
Ice Chest ~~or Sample~~ Pkg No.	TF-1	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW61191-3	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: BC Wyer	Received by: [signature]	Date/Time: 6-12-91 / 1310
Relinquished by: [signature]	Received by: Vida Johansen	Date/Time: 6-12-91 / 1410
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

(1 Per Shipping Container)
WHC-SD-WM-DP-025
Addendum 3 Rev 0

Date/Time Received 6/12/91 1100 Client Name Carl Jones

2AW61191-3

Project/Client # 241-102-AW Batch or Case # RISER 22A

Cooler ID (if noted on outside of cooler) TF-1

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [✓] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - ___ clips (in cans)
   - X custody seals
   - ___ hazard labels
   - ___ tape
   - X appropriate sample labels
9. Samples are:
   - ___ in good condition
   - ___ broken
   - ___ other
   - ___ leaking
   - ___ have air bubbles
10. Samples received at N/A °C. Coolant type ___
11. The following paperwork should be accounted for (N/A if not applicable):
    - Chain of Custody #(s) yes
    - Request for Analysis #(s) yes
    - Airbill # N/A Carrier hand carried
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Vida Johansen / Vida Johansen Date/Time 6/12/91 1445

Page 1 of 2

BEST AVAILABLE COPY

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	BCWyn	Date 6-12-91		Time	0745
Sample Locations	241-AW, 102-AW, Riser # 22A				
Remarks					Seal #4214
Ice Chest or Sample Pig No.	TF-11	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW61191-4	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: BCWyn	Received by: [illegible]	Date/Time: 6-12-91 / 1310
Relinquished by: [illegible]	Received by: [illegible]	Date/Time: 6-12-91 / 1410
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

9312333539

Date/Time Received 6/12/91 1400 Client Name Tank farms

2AW61191-4

Project/Client # 241-102 AW Batch or Case # RISER 22A

Cooler ID (if noted on outside of cooler) TF-11 seal 4214

1. Condition of shipping container? Good
2. Custody Seals on ~~cooler~~ intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [ ] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] N/A
6. Each sample is in a plastic bag? Yes [ ] No [ ] N/A
7. Number of sample containers in cooler: 1
8. Samples have:
   - ____ clips (in cans)
   - X custody seals
   - ____ hazard labels
   - ____ tape
   - ____ appropriate sample labels
9. Samples are:
   - ____ in good condition
   - ____ broken
   - ____ other
   - ____ leaking
   - ____ have air bubbles
10. Samples received at N/A °C. Coolant type ____
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) yes
    Request for Analysis #(s) yes
    Airbill # N/A Carrier hand carried
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Vida Johansen Vida Johansen Date/Time 6/12/91 1445

Page 1 of 2

12.18

COPY

SAMPLE CHECKOUT LIST

Sample ID	TEch.sign./pyrl	Sample out	Sample in	Date/Time	Custodian/ date time
R9415,11,18,16,09 R9410,17,08,	Mary Franz 6C269	1100	1115	6-18-91	Vida Johanson 6/18/91 1115
9391-9401 9395-9402 9397-9404 9396-9403	M. Brown 6C559	1100	1115	6/18/91	Vida Johanson 6/18/91 1115
R9415,16,17,18	6C269 Mary Franz	115	1350	6/18·91	Vida Johanson 6/18/91 1350
R9417	6C275 Dave R Johnson	14:10	14:30	6-18-91	Vida Johanson 6/19/91 0800
R-9408-11	80028 Ed Colm	0830	1330	6-19-91	Vida Johanson 6/19/91 1045
					12.20

9312930593

SUMMARY DATA REPORT

Project: 242-A EVAPORATOR FEED CHARACTERIZATION
Tank: 102AW
Customer ID: 2291-1-3

Undigested Sample Results

	Sample R9408		Sample Duplicate R9408	
Specific Gravity	1.024		NA	
Differential Thermal	No Exotherm		No Exotherm	
Total Organic Carbon	4.12E-1	g/L	4.02E-1	g/L
Total Inorganic Carbon	6.84E-1	g/L	NA	
Ammonia	1.38E+2	ppm	NA	
Determination of Hydroxide Ion	3.01E+3	ppm	NA	
Cyanide	1.27E+0	ppm	1.17E+0	ppm
Ion Chromatographic				
Chloride	6.23E+2	ppm	NA	
Fluoride	4.28E+3	ppm	NA	
Nitrate	1.44E+4	ppm	1.41E+4	ppm
Nitrite	2.53E+3	ppm	2.51E+3	ppm
Phosphate	1.79E+2	ppm	1.77E+2	ppm
Sulfate	2.26E+3	ppm	2.12E+3	ppm

Note: pH analysis not run.

9312305995

SUMMARY DATA REPORT

Project: 242-A EVAPORATOR FEED CHARACTERIZATION
Tank: 102AW
Customer ID: 2291-3-3

Undigested Sample Results

	Sample R9410		Sample Duplicate R9410	
Specific Gravity	1.027		1.027	
Differential Thermal	No Exotherm		NA	
Total Organic Carbon	5.17E-1	g/L	NA	
Total Inorganic Carbon	1.07E+0	g/L	1.07E+0	g/L
Ammonia	5.72E+1	ppm	6.80E+1	ppm
Determination of Hydroxide Ion	2.99E+3	ppm	3.09E+3	ppm
Cyanide	1.21E+0	ppm	NA	
Ion Chromatographic				
Chloride	5.82E+2	ppm	NA	
Fluoride	4.09E+3	ppm	NA	
Nitrate	1.41E+4	ppm	NA	
Nitrite	2.54E+3	ppm	NA	
Phosphate	1.74E+2	ppm	NA	
Sulfate	2.55E+3	ppm	NA	

Note: pH analysis not run.

UNDIGESTED SAMPLE ANALYSIS RESULTS

9 3 1 2 3 3 0 5 9 9

UNDIGESTED SAMPLE RESULTS

Tank: 102AW
Core: NA
Segment: R9409
Customer ID: 2291-2-3

	Check Standard		Blank		Sample		Duplicate Sample		Spike of Sample		Check Standard	
Lab ID:	R9409		R9409		R9409		R9409		R9409		R9411	
Lab ID: Cyanide (06-27-91)	100	%	<0.50E+0	ppm	R9409-5778 1.31E+0	ppm	R9409-5878 1.33E+0	ppm			97.9	%
Lab ID:	R9406		R9407		R9409		R9409		R9409		R9412	
Lab ID: Differential Thermal (09-15-91)	100	%	No Exotherm		R9409-5711 No Exotherm		NA		NA		100	%
Ion Chromatographic												
Lab ID: Fluoride (05-18-92)	96.4	%	<1.11E+2	ppm	R9409-5771 3.87E+3	ppm	NA		NA		95.5	%
Lab ID: Chloride (05-18-92)	95.7	%	<1.11E+2	ppm	R9409-5772 1.75E+2	ppm	NA		NA		94.6	%
Lab ID: Sulfate (09-25-91)	96.8	%	<1.00E+0	ppm	R9409-5775 2.62E+3	ppm	NA		R9409-5975 147.3	%	96.3	%
Lab ID: Phosphate (09-23-91)	103.7	%	<1.00E+0	ppm	R9409-5774 1.79E+2	ppm	NA		R9409-5974 93.6	%	101.5	%
Lab ID: Nitrate (09-25-91)	95.7	%	<1.00E+0	ppm	R9409-5773 1.44E+4	ppm	NA		R9409-5973 101.2	%	95.9	%
Lab ID: Nitrite (09-25-91)	100.96	%	<1.00E+0	ppm	R9409-5776 2.64E+3	ppm	NA		R9409-5976 114	%	99.4	%
Lab ID: Ammonia (08-23-91)	96.8	%	<1.79E+1	ppm	R9409-5728 1.27E+2	ppm	NA		NA		95.3	%
Lab ID: Determination of Hydroxide Ions (09-10-91)	99.7	%	6.64E+0	ppm	R9409-5729 2.62E+3	ppm	NA		NA		99.7	%
Lab ID: Total Inorganic Carbon (09-04-91)	102.2	%	3.80E+0	ug	R9409-5727 6.56E-1	g/L	NA		NA		102.8	%
Lab ID: Total Organic Carbon (06-27-91)	101.8	%	4.70E+0	ug	R9409-5726 6.16E-1	g/L	NA		NA		101.9	%
Lab ID: Specific Gravity (06-12-91)	99.2	%	9.90E-1		R9409-5706 1.024		NA		NA		98.8	%
pH - NOT RUN												

UNDIGESTED SAMPLE RESULTS

Tank: 102AW
Core: NA
Segment: R9411
Customer ID: 2291-4-3

	Check Standard		Blank		Sample		Duplicate Sample		Spike of Sample		Check Standard	
Lab ID:	R9409		R9409		R9411		R9411		R9411		R9411	
Lab ID: Cyanide (06-27-91)	100	%	<0.50E+0	ppm	R9411-5778 1.38E+0	ppm	NA		NA		97.9	%
Lab ID:	R9406		R9407		R9411		R9411		R9411		R9412	
Lab ID: Differential Thermal (09-15-91)	100	%	No Exotherm		R9411-5711 No Exotherm		NA		NA		100	%
Ion Chromatographic												
Lab ID: Fluoride (05-18-92)	96.4	%	<1.11E+2	ppm	R9411-5771 3.90E+3	ppm	NA		NA		95.5	%
Lab ID: Chloride (05-18-92)	95.7	%	<1.11E+2	ppm	R9411-5772 4.81E+2	ppm	NA		NA		94.8	%
Lab ID: Phosphate (09-23-91)	103.7	%	<1.00E+0	ppm	R9411-5774 1.67E+2	ppm	NA		NA		101.5	%
Lab ID: Nitrate (09-25-91)	95.7	%	<1.00E+0	ppm	R9411-5773 1.46E+4	ppm	NA		NA		95.9	%
Lab ID: Nitrite (09-25-91)	100.96	%	<1.00E+0	ppm	R9411-5776 2.58E+3	ppm	NA		NA		99.4	%
Lab ID: Ammonia (08-23-91)	96.8	%	<1.79E+1	ppm	R9411-5728 <4.1 E+2	ppm	NA		R9411-5927 87.7	%	95.3	%
Lab ID: Total Inorganic Carbon (09-04-91)	102.2	%	3.80E+0	ug	R9411-5727 7.58E-1	g/L	NA		R9411-5928 118.8	%	102.8	%
Lab ID: Total Organic Carbon (06-27-91)	101.8	%	4.70E+0	ug	R9411-5726 4.24E-1	g/L	NA		NA		101.9	%
Lab ID: Specific Gravity (08-12-91)	99.2	%	9.90E-1		R9411-5706 1.026		NA		NA		98.8	%
pH - NOT RUN												

VISUAL CHECK AND OVER-THE-TOP READING ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9408.-5000	102AW	6-14-91	12:43	26

Determination	Method Standard	Result Units	Charge Code	Rerun
APPEAR	LA-519-151		W1BEO	0

Sample Size	Customer ID
?	2291-1-3

Remarks, Calculations, Results

A. JAR ID#
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-B=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
some solids settled
on bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Last Order Date
6/14/91		[signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5000	102AW	6-14-91	12:48	26

Determination	Method Standard	Result Units	Charge Code	Rerun
APPEAR	LA-519-151		W1BEO	0

Sample Size	Customer ID
?	2291-2-3

Remarks, Calculations, Results

A. JAR ID#
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-B=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
no solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Last Order Date
6/14/91		[signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9410.-5000	102AW	6-14-91	12:52	26

Determination	Method Standard	Result Units	Charge Code	Rerun
APPEAR	LA-519-151 5-14-92		W1BEO	0

Sample Size	Customer ID
?	2291-3-3

Remarks, Calculations, Results

A. JAR ID#
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-B=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
aqueous solution
light tint yellow
clarity-clear
solid settled on
bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Last Order Date
6/14/91		[signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-5000	102AW	6-14-91	12:57	26

Determination	Method Standard	Result Units	Charge Code	Rerun
APPEAR	LA-519-151 5-14-92		W1BEO	0

Sample Size	Customer ID
?	2291-4-3

Remarks, Calculations, Results

A. JAR ID#
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-B=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
solids-present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Last Order Date
6/14/91		[signature]

9 3 1 2 3 3 0 6 0 5

SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

Sample No.	Sample Point	Date	Time Sampled	Priority
R 9406-5506	102AW	6-14-91	12:37A	2A

Contaminants	Method Standard	Result Units	Charge Code	Results
SPG	LA-510-112	% RECOVERY	WIBED	1

Sample Size	Customer ID
100 100.32 L	STD

Remarks, Calculations, Results

S332 ZNCL2

STDN 15211-85 RESULT 1.4270

STD VAL 1.4386 %REC 99.2%

RERUN

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

Date	Time Completed	Analyst Sign	
6-12-91			

R9406-5506

G - 2.0110

A - 1.8678

N - .1432

G - 2.0530

A - 1.9098

N - .1432

Sample No.	Sample Point	Date	Time Sampled	Priority
R 9407-5506	102AW	6-14-91	12:39	2A

Contaminants	Method Standard	Result Units	Charge Code	Results
SPG	LA-510-112	% RECOVERY	WIBED	1

Sample Size	Customer ID
100.32 L	REG. IN

Remarks, Calculations, Results

2.0604T 61.0ML

~~S332 ZNCL2~~

STDN RESULT 9.9032E-1 **RERUN**

STD VAL %REC

T.L. 5.14.91

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

Date	Time Completed	Analyst Sign	
8-12-91			

R9407-5506

G - 2.0005

A - 1.9012

N - .0993

G - 1.9915

A - 1.8921

N - .0994

Sample No.	Sample Point	Date	Time Sampled	Priority
R 9408-5706	102AW	6-14-91	12:43	2A

Contaminants	Method Standard	Result Units	Charge Code	Results
SPG	LA-510		WIBED	1

Sample Size	Customer ID
100.32 L	2291-1-3

Remarks, Calculations, Results

1.0237

RERUN

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

Date	Time Completed	Analyst Sign	
8-12-91			

R9408-5706

G - 2.0059

A - 1.9031

N - .1029

G - 1.9440

A - 1.8414

N - .1026

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

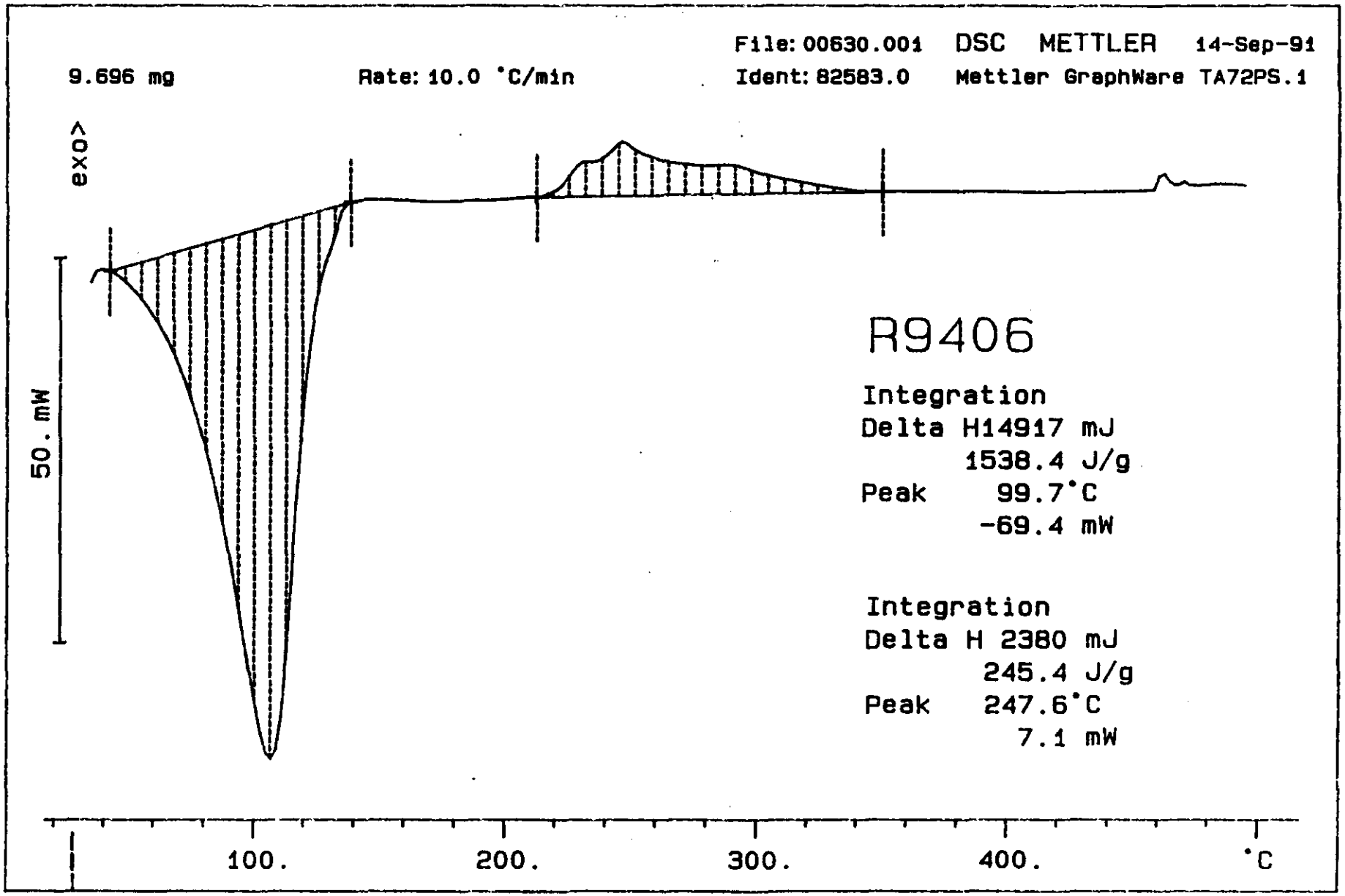
Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: DIFFERENTIAL THERMAL	Sample Prep: UNDIGESTED

Instrument: WC16134, WC16129	Procedure/Rev: LA-514-113/A-0
Technologist: S. COBB	Date: 09-15-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5511	11		
2	REAGENT BLANK	R9407-5611	12		
3	SAMPLE 2291-1-3	R9408-5711	13		
4	SAM DUP 2291-1-3	R9408-5811	14		
5	FINAL LMCS CHECK STD	R9412-5511	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	27C11-AZ/.10 mL			NA

A-6000-881 (03/92)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Rate: 10.0 °C/min
Ident: 82583.0 Mettler GraphWare TA72PS.1
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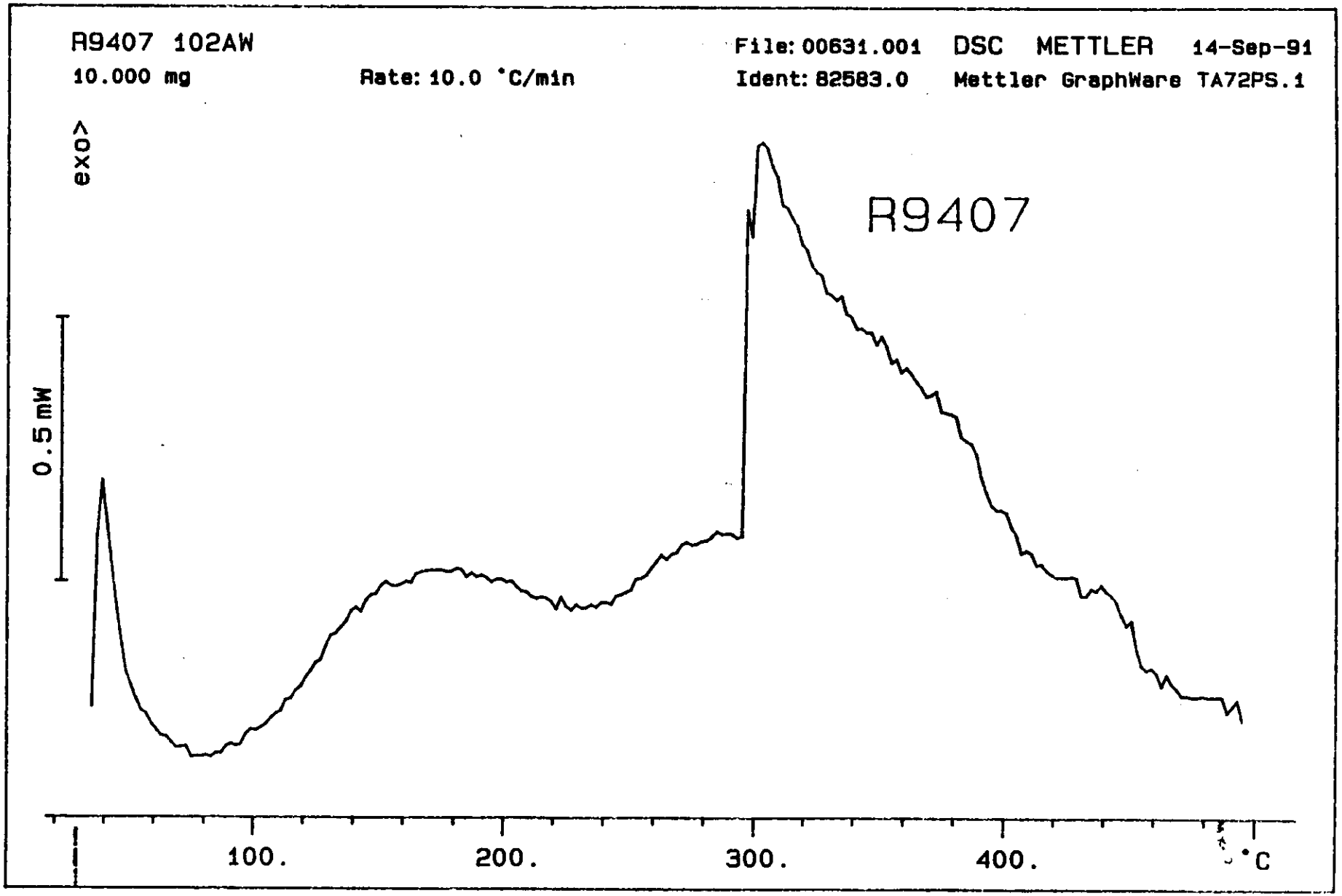
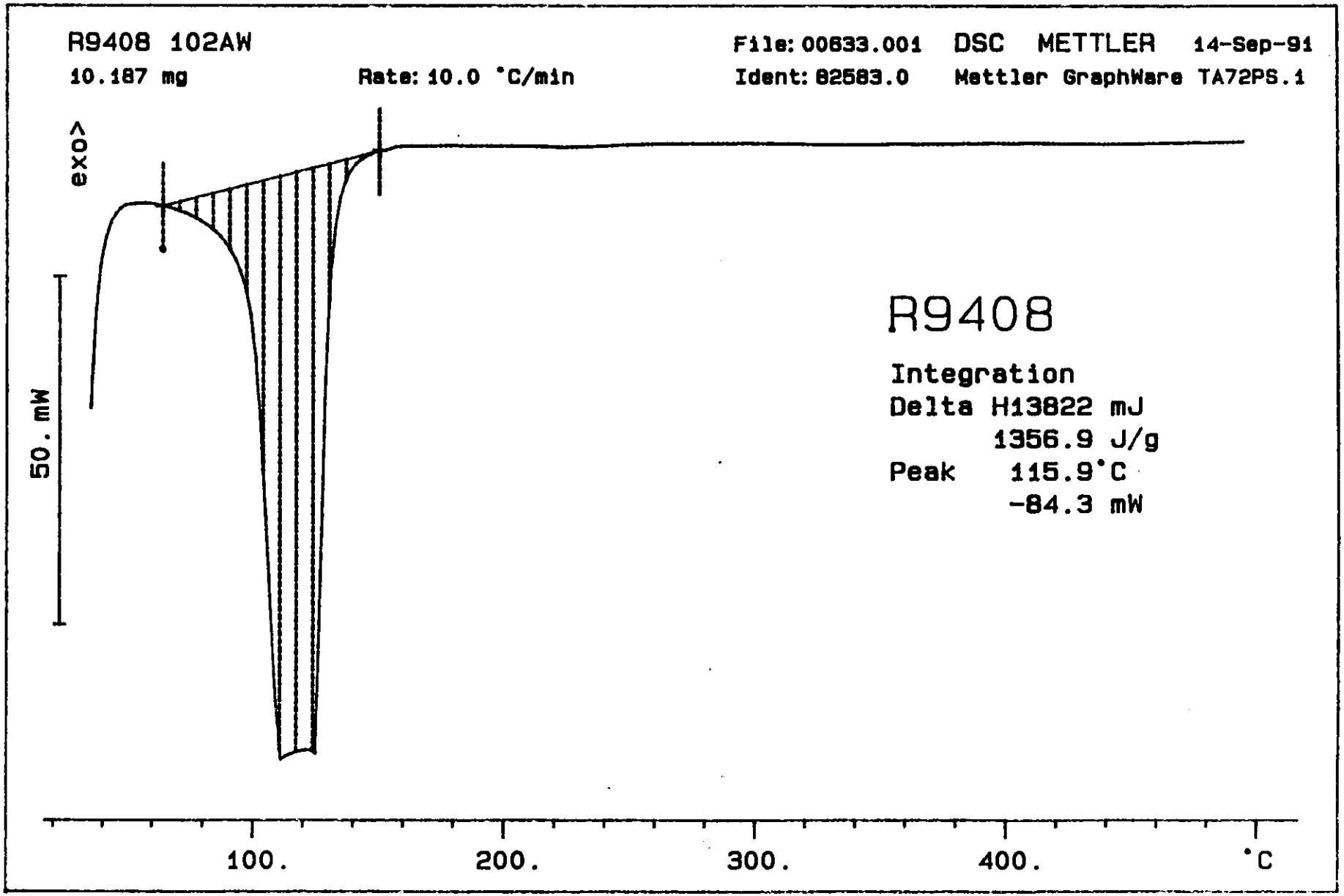
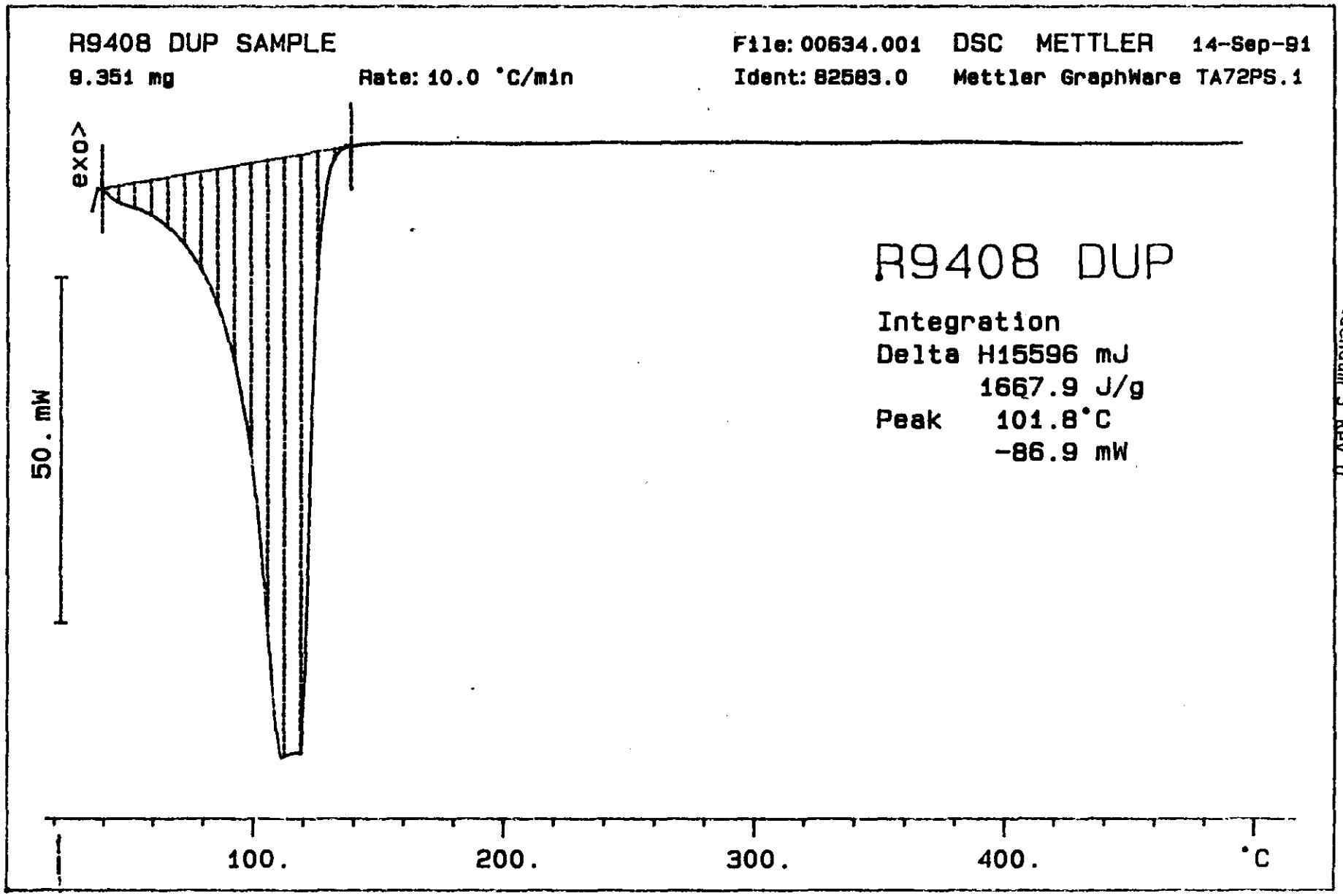
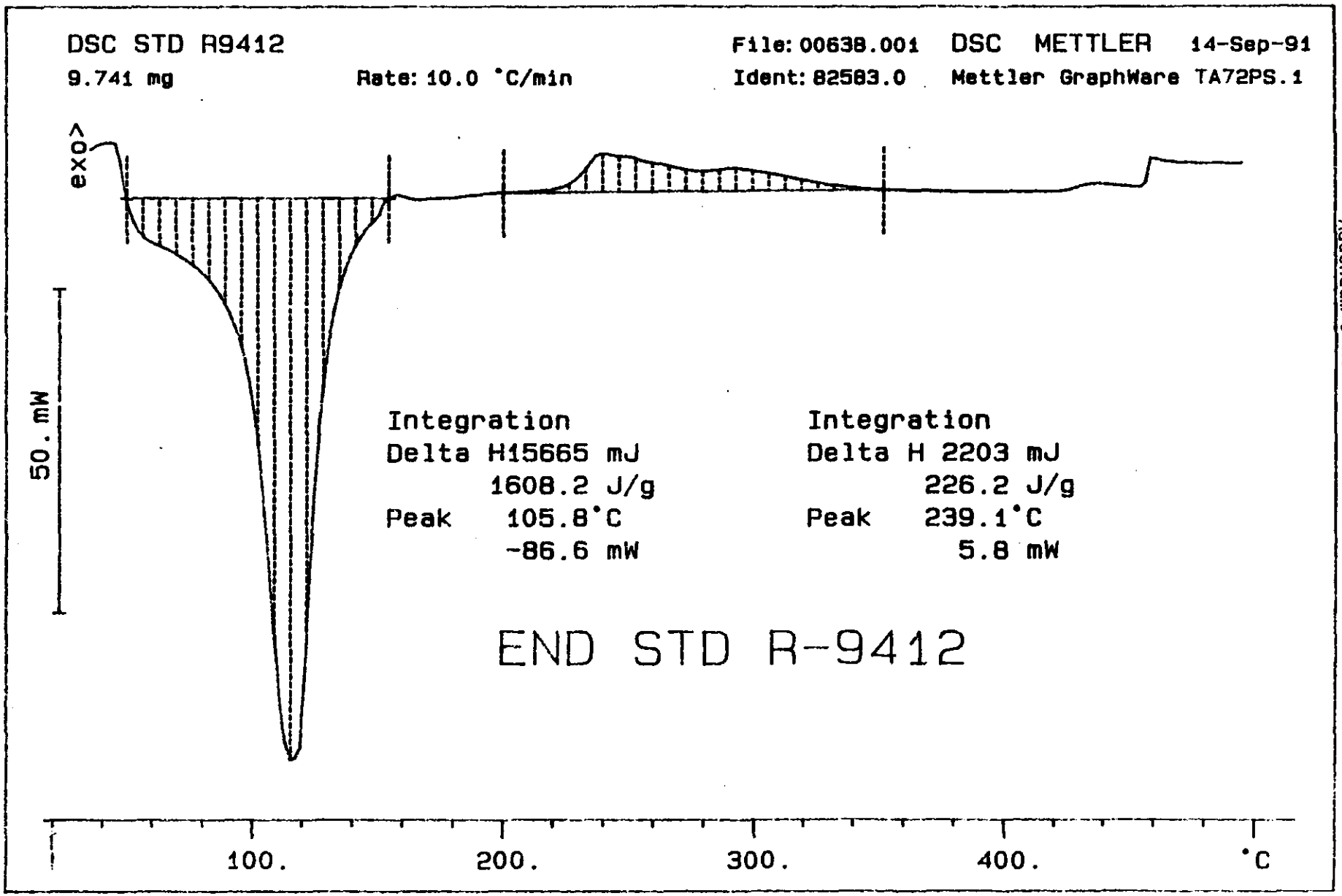
50. mW
R9406
Integration
Delta H14917 mJ
1538.4 J/g
Peak 99.7°C
-69.4 mW
Integration
Delta H 2380 mJ
245.4 J/g
Peak 247.6°C
7.1 mW
100.
200.
300.
400.
°C


R9407 102AW
10.000 mg
Rate: 10.0 °C/min
File: 00631.001
Ident: 82583.0
DSC METTLER 14-Sep-91
Mettler GraphWare TA72PS.1
exo>
0.5 mW
R9407
100.
200.
300.
400.
°C


R9408 102AW
10.187 mg
Rate: 10.0 °C/min
File: 00633.001
Ident: 82583.0
DSC METTLER 14-Sep-91
Mettler GraphWare TA72PS.1
<exo
50. mW
R9408
Integration
Delta H13822 mJ
1356.9 J/g
Peak 115.9°C
-84.3 mW
100.
200.
300.
400.
°C


R9408 DUP SAMPLE
9.351 mg
Rate: 10.0 °C/min
File: 00634.001
Ident: 82583.0
DSC METTLER
Mettler GraphWare TA72PS.1
14-Sep-91
exo>
50. mW
R9408 DUP
Integration
Delta H15596 mJ
1667.9 J/g
Peak 101.8°C
-86.9 mW
100.
200.
300.
400.
°C


DSC STD R9412
9.741 mg
Rate: 10.0 °C/min
File: 00638.001
Ident: 82583.0
DSC METTLER
Mettler GraphWare TA72PS.1
14-Sep-91
exo>
50. mW
Integration
Delta H15665 mJ
1608.2 J/g
Peak 105.8°C
-86.6 mW
Integration
Delta H 2203 mJ
226.2 J/g
Peak 239.1°C
5.8 mW
END STD R-9412
100.
200.
300.
400.
°C

26. Nov. 91
Denise J Hart

DSC

Calibrated Nov 26, 91

INFIGURATION

26-NOV-91 11:24

E INDIUM	255
DSC SIGN ICTA	1
TAU LAG	12
TAU SIGNAL	0
E DIMIN. FACT.	.93
S	2400
TAU LAG 2	16
TAU SIGNAL 2	0
E DIMIN. F. 2	.93
S 2	1850
TEMP.	600.
MIN. TEMP.	-50.
A PT100	.21437
B PT100	.74509
C PT100	-.10370
HEAT P	3000
HEAT I	250
HEAT D	30
COOL 1	0
COOL 2	0
COOL 3	0
A1	10773
B1	58.121
C1	.14689
T1	-100
A2	8940
B2	17.884
C2	-.072
T2	363
A3	9360.3
B3	-15.043
C3	.01538

******** METTLER TA4000 SYSTEM *********

DSC

CONFIGURATION

20-JUL-91 19:16

E INDIUM	250.8
DSC SIGN ICTA	1
TAU LAG	9
TAU SIGNAL	0
E DIMIN. FACT.	1
S	2400
TAU LAG 2	13
TAU SIGNAL 2	0
E DIMIN. F. 2	0.88
S 2	2200
MAX. TEMP.	600.
MIN. TEMP.	-50.
A PT100	.21409
B PT100	.74787
C PT100	-.10809
HEAT P	3000
HEAT I	250
HEAT D	30
COOL 1	0
COOL 2	0
COOL 3	0
A1	10773
B1	58.121
C1	.14689
T1	-100
A2	8940
B2	17.884
C2	-.072
T2	363
A3	9360.3
B3	-15.043
C3	.01538

******** METTLER TA4000 SYSTEM *********

TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-5526	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Results
TOC	LA-344-105	% RECOVERY	WIBEU	0

Sample Size: ? 200uL-2mL-200uL — Customer ID: STD

Remarks Calculations, Results:
S356 CO3TOC
STDN 70C11 M RESULT 3.0525g/l
STD VAL 3.00g/l %REC 101.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Chi				

Date: 6-27-91 — Time Completed: — Lab Unit Mgr: [signature] — [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-5626	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Results
TOC	LA-344-105	G/G	WIBEU	0

Sample Size: ? 200uL — Customer ID: REG. BL.

Remarks Calculations, Results:
REAGENT BLANK SKM 12-2-91
4.70 ug
~~6.71E-1 g/l/minute~~

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Chi				

Date: 6-27-91 — Time Completed: — Lab Unit Mgr: [signature] — [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-5726	102AW	6-14-91	12:43	26

Determination	Method/Standard	Result Units	Charge Code	Results
TOC	LA-344-105	G/G	WIBEU	0

Sample Size: ? 200uL-2mL-200uL — Customer ID: 2291-1-3

Remarks Calculations, Results:
4.125E-1 g/l

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Chi				

Date: 6-27-91 — Time Completed: — Lab Unit Mgr: [signature] — [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-5826	102AW	6-14-91	12:47	26

Determination	Method/Standard	Result Units	Charge Code	Results
TOC	LA-344-105	G/G	[illegible]	0

Sample Size: ? — Customer ID: 2291-1-3

Remarks Calculations, Results:
DUPLICATE SAMPLE
See attached card (information placed on wrong card) SKM 12-2-91

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Ed Chi				

Date: 6-27-91 — Time Completed: — Lab Unit Mgr: [signature] — [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-5926	102AW	6-14-91	12:47	26

Determination	Method/Standard	Result Units	Charge Code	Results
TOC	LA-344-105	% RECOVERY	WIBEU	0

Sample Size: 200uL+100uL 5mH2SO4-200uL — Customer ID: 2291-1-3
? ~~200ml-2ml-200uL~~ 5/26/91

Remarks Calculations, Results:
SAMPLE SPIKED ID
SPIKE ID 70C11E
SPIKE VOLUME 200ul
8-13-92
[(2.5)(148.4-4.7)]-[(122-4.7)(11)]
(1499)(.2)(11)
117.3% (AP)
106.7% 5/26/92

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Chi				

Date: 6-27-91 — Time Completed: — Lab Unit Mgr: [signature] — [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-5526	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Results
TOC	LA-344-105	% RECOVERY	WIBEU	0

Sample Size: ? 200uL-2mL-200uL — Customer ID: STD

Remarks Calculations, Results:
S356 CO3TOC
STDN 70C11 M RESULT ~~3.00g/l~~ 3.058g/l 6-17-91
STD VAL 3.00g/l %REC 101.9%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Chi				

Date: 6-27-91 — Time Completed: — Lab Unit Mgr: [signature] — [signature]

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9407 Date: 06-27-1991 Time: 08:45:18

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	1.20	100.00
3	3.01	2.10	42.86
4	4.01	2.80	25.00
5	5.01	3.50	20.00
6	6.01	4.20	16.67
7	7.01	4.70	10.64

BLANK VALUE = 4.7 / 7.006653 = .670791 g/L/minute

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9408DUP Date: 06-27-1991 Time: 09:27:48

Blank = .670791 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	5.70	100.00
3	3.01	7.90	27.85
4	4.01	9.40	15.96
5	5.01	10.30	8.74
6	6.01	11.20	8.04
7	7.01	12.00	6.67

(12 - 4.699959)(11)/(200) = .4015023 g/L Carbon

(12 - 4.699959)(11)/(200)(12) = 3.345853E-02 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9412 Date: 06-27-1991 Time: 11:27:31

Blank = .670791 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	38.60	100.00
3	3.01	51.40	24.90
4	4.01	55.90	8.05
5	5.01	58.00	3.62
6	6.01	59.40	2.36
7	7.01	60.30	1.49

(60.3 - 4.699344)(11)/(200) = 3.058036 g/L Carbon

(60.3 - 4.699344)(11)/(200)(12) = .2548363 Molar Carbon

Sample Run By: 80028_____

9 3 1 2 3 3 0 6 3 1

08/20/92
~~110~~

TOTAL INORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5527	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
TIC	LA-622-102	% RECOVERY	W1DEO	0

Sample Size: ? 50uL — Customer ID: STD

Remarks, Calculations, Results:
S223 CO3
STD# 69C11 K RESULT 2.043E-1 m
STD VAL 2.00E-1 m % REC 102.2%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs: [signature]	Hrs:	Hrs:	Hrs: [signature]	Hrs:

Date: 9-4-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5627	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
TIC	LA-622-102	G/G	W1DEO	0

Sample Size: ? 50uL — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
3.80ug C
PJB 6/11/92 ~~5.12E-1 g/l/minute~~

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				DY Bisenius
Hrs: [signature]	Hrs:	Hrs:	Hrs:	Hrs:

Date: 9-4-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9408.-5727	102AW	6-14-91	12:47	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
TIC	LA-622-102	G/G	W1DEO	0

Sample Size: ? 50uL — Customer ID: 2291-1-1

Remarks, Calculations, Results:
684 E-1 g/l C

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				
Hrs: [signature]	Hrs:	Hrs:	Hrs:	Hrs:

Date: 9-4-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5527	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
TIC	LA-622-102	% RECOVERY	W1DEO	0

Sample Size: ? 50uL — Customer ID: STD

Remarks, Calculations, Results:
S223 CO3
STD# 69C11 K RESULT 2.085E-1 m
STD VAL 2.00E-1 m % REC 102.8%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80027				
Hrs: [signature]	Hrs:	Hrs:	Hrs: [signature]	Hrs:

Date: 9-4-91 — Time Completed: — Lab Unit Mgr: [signature]

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: ~~BLK-A~~ R-9407 RC Date: 09-04-1991 Time: 09:43:11

Blank = N/A Sample Size = 50 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	1.40	100.00
3	3.01	1.90	26.32
4	4.01	2.40	20.83
5	5.01	2.90	17.24
6	6.01	3.40	14.71
7	7.01	3.80	10.53

BLANK VALUE = 3.8 / 7.005677 = .5424173 g/L/minute

Sample Run By: 80028

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9412 Date: 09-04-1991 Time: 12:47:05

Blank = .5424173 Sample Size = 50 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	97.30	100.00
3	3.01	116.90	16.77
4	4.01	123.40	5.27
5	5.01	125.50	1.67
6	6.01	126.70	0.95
7	7.01	127.10	0.31

(127.1 - 3.8)(1)/(50) = 2.466 g/L Carbon

(127.1 - 3.8)(1)/(50)(12) = .2055 Molar Carbon

Sample Run By: 80028

AMMONIA ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-552B	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	% RECOVERY	W1BED	0

Sample Size: ? 250ul .09941 m HCl — Customer ID: STD

Remarks, Calculations, Results:
S235 NH4CL — BLK 29, STD 158
STDH 4C11QL RESULT 5.13E-2
STD VAL 5.30E-3 m %REC 96.8%
(158-29)(.09941)/250 =

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82583				
Hrs: SL Cobb	Hrs	Hrs	Hrs	Hrs

Date: 08-23-91 — Time Completed — Lab Unit Mgr

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-562B	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	G/G	W1BED	1

Sample Size: ? .09941 m HCL — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK — BLK 29, 29
(L10)(.09941)/1000 = L9.94E-4 m
Lost original Card

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82583				4-10-92
Hrs: SL Cobb	Hrs	Hrs	Hrs	Hrs

Date: 4-9-92, 08-23-91 — Time Completed — Lab Unit Mgr

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-572B	102AW	6-14-91	12:43	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	G/G	W1BED	0

Sample Size: ? 1ml .09941 m HCl — Customer ID: 2291-1-3

Remarks, Calculations, Results:
BLK 29, Sample 106
(106-29)(.09941)/1000 =
7.65E-3 m

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82583				
Hrs: SL Cobb	Hrs	Hrs	Hrs	Hrs

Date: 08-23-91 — Time Completed — Lab Unit Mgr

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-552B	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	% RECOVERY	W1BED	0

Sample Size: ? 250ul .09941 m HCl — Customer ID: STD

Remarks, Calculations, Results:
S235 NH4CL — BLK 29, STD 156
STDH 4C11QL RESULT 5.05E-2
STD VAL 5.30E-2 %REC 95.3%
(156-29)(.09941)/250 = 5.05E-2

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82583				
Hrs: SL Cobb	Hrs	Hrs	Hrs	Hrs

Date: 08-23-91 — Time Completed — Lab Unit Mgr

9 3 1 2 3 3 7 6 3 9

DETERMINATION OF HYDROXIDE ION IN SOLUTION - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-5529	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	% RECOVERY	W1BEO	0

Sample Size: ? .100 ml
Customer ID: STD

Remarks, Calculations, Results:
S273 ITS-OH
STD# 9C11AF RESULT 1.01
STD VAL 1.013 %REC 99.7%
.1905 M HNO3
1 ml BaCl
3 ml Q-H2O
(537-8)(.1905)/100 =

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C559				
MB				

Date: 9/10/91 Time Completed: Lab Unit Mgr: [signature] [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-5629	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	M	W1BEO	0

Sample Size: ? 3 ml Q-H2O
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
.1905 M HNO3
(8)(.1905) / 3000 5.08E-4 M

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C559				
MB				

Date: 9/10/91 Time Completed: Lab Unit Mgr: [signature] [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-5729	102AW	6-14-91	12:43	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	M	W1BEO	0

Sample Size: ? .250 ml
Customer ID: 2291-1-3

Remarks, Calculations, Results:
Its-OH (9C11AF) .100 ml
1 ml BaCl
10 ml Q-H2O
.1905 M HNO3
(769-537)(.1905) / 250 1.77E-1 M

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C559				
MB				

Date: 9/10/91 Time Completed: Lab Unit Mgr: [signature] [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-5529	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	% RECOVERY	W1BEO	0

Sample Size: ? .100 ml
Customer ID: STD

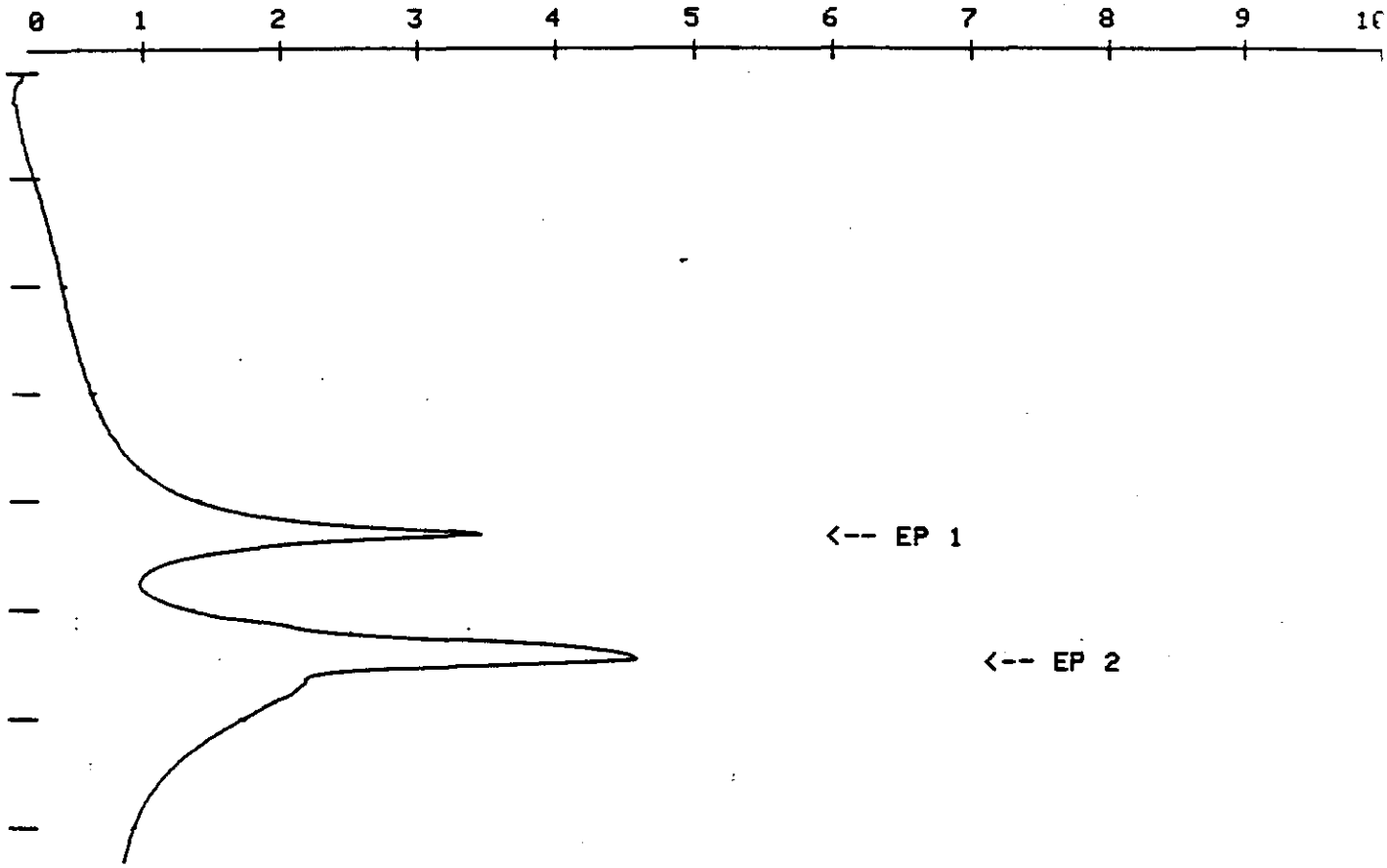
Remarks, Calculations, Results:
S273 ITS-OH
STD# 9C11AF RESULT 1.01
STD VAL 1.013 %REC 99.7%
1 ml BaCl
.1905 M HNO3
1.01 M/
(538-8)(.1905)/100 =

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C559				
MB				

Date: 9/10/91 Time Completed: Lab Unit Mgr: [signature] [signature]

SAMPLE NUMBER: 1
DIRECT READ PH: 12.001
R-9406 std

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

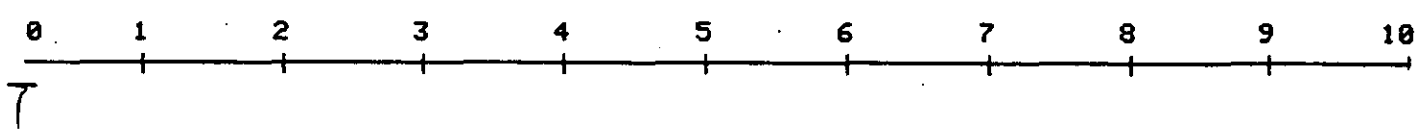
EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.66	0.538	0.0000
5.87	0.679	0.0000

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:35 AM

SAMPLE NUMBER: 2
DIRECT READ PH: 11.994
R-9406 std

DERIVATIVE OUTPUT, dE/dV



SAMPLE NUMBER: 1
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:21 AM

SAMPLE NUMBER: 2
DIRECT READ PH: 5.554

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:23 AM

SAMPLE NUMBER: 3
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

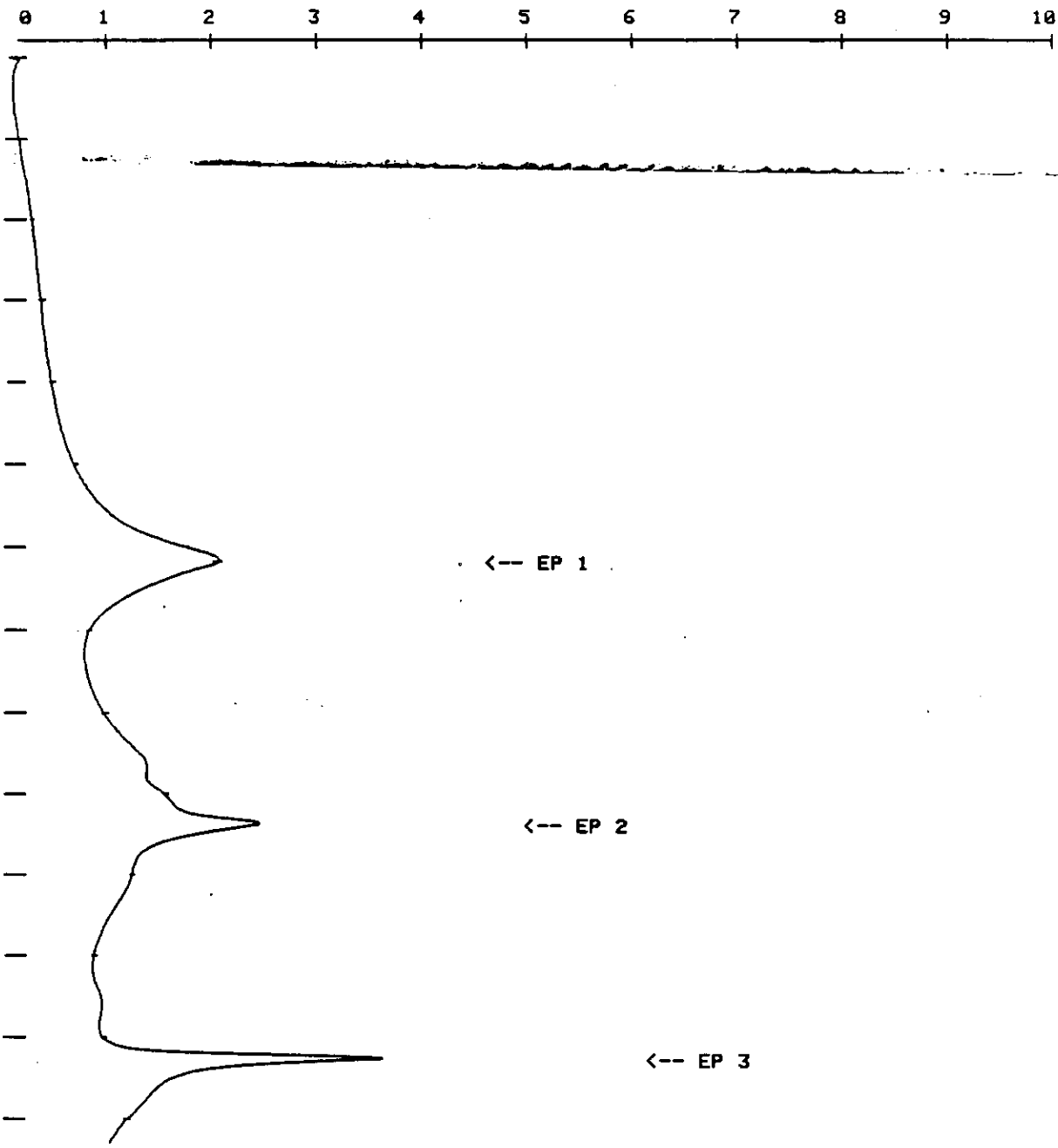
DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:25 AM

SAMPLE NUMBER: 2
SAMPLE DATA: 9408.
DIRECT READ PH: 11.866

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.92	0.771	0.0000
7.01	1.171	0.0000
4.25	1.529	0.0000

TITRATION TERMINATED BY PH LIMIT.

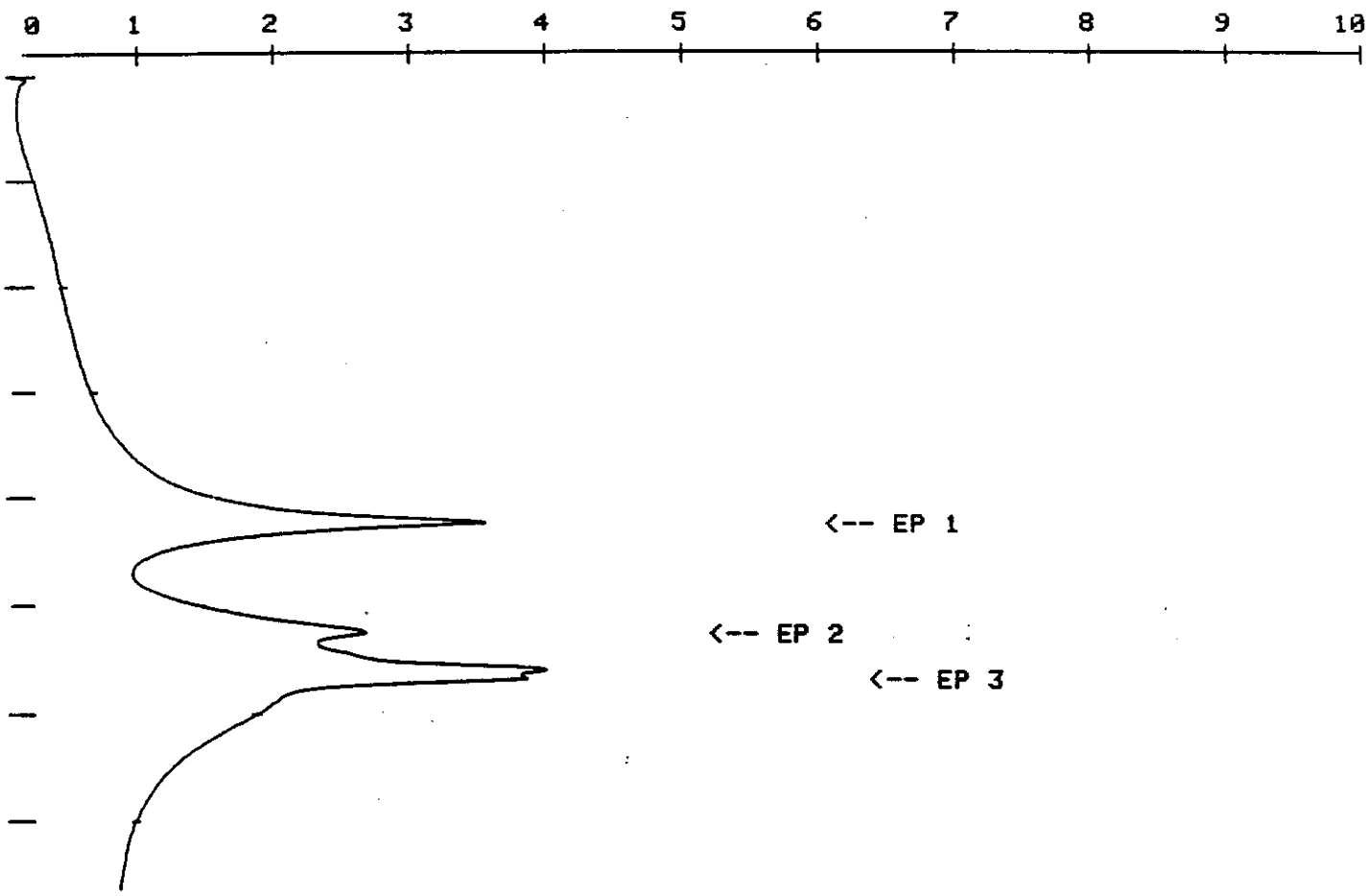
SEP 10 1991 1:59 PM

BEST AVAILABLE COPY

SAMPLE NUMBER: 2
SAMPLE DATA: 9412.
DIRECT READ PH: 12.053

WHC-SD-WM-DP-025
Addendum 3 Rev 0

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.67	0.529	0.0000
8.02	0.656	0.0000
5.11	0.708	0.0000

TITRATION TERMINATED BY PH LIMIT.

SEP 11 1991 10:12 AM

BEST AVAILABLE COPY

08/20/92

CYANIDE ANALYSIS - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Issued	Priority
R 9408.-5878	102AW	6-14-91	12:36	26

Determination	Method Standard	Result Units	Charge Code	Results
CN	LA-695-102	% RECOVERY	WIBEU	0

Sample Size: ? 100mL - 10mL - 500mL
Customer ID: SID

Remarks, Calculations, Results

S244 KCN
STDN 78211P REBUL ~~904.9~~ 896.0 ABS .761
STD VAL 891.7 %REC ~~100.59~~ 100.5%

$$\left[\frac{(.761 - .004) - .012836}{.166108} / .500\right] \times 100$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
90022				
Hrs	Hrs	Hrs	Hrs	Hrs
8				
Date	Time Completed	Laboratory		
6-20-91				

Sample No	Sample Point	Date	Time Issued	Priority
R 9407.-5876	102AW	6-14-91	12:39	26

Determination	Method Standard	Result Units	Charge Code	Results
CN	LA-695-102	PPM	WIBEU	0

Sample Size: ?
Customer ID: REG. BL

Remarks, Calculations, Results

REAGENT BLANK ABS .004

$$\frac{.004 - .012836}{.166108} = <.5\text{ppm}$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
90022				
Hrs	Hrs	Hrs	Hrs	Hrs
8				
Date	Time Completed	Laboratory		
6-20-91				

Sample No	Sample Point	Date	Time Issued	Priority
R 9408.-5878	102AW	6-14-91	12:43	26

Determination	Method Standard	Result Units	Charge Code	Results
CN	LA-695-102	PPM	WIBEU	0

Sample Size: ? 1mL
Customer ID: 2291-1-3

Remarks, Calculations, Results

ABS .228

$$\left[\frac{(.228 - .004) - .012836}{.166108}\right] \div 1 = 1.27\text{ppm}$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
90022				
Hrs	Hrs	Hrs	Hrs	Hrs
8				
Date	Time Completed	Laboratory		
6-20-91				

Sample No	Sample Point	Date	Time Issued	Priority
R 9408.-5878	102AW	6-14-91	12:43	26

Determination	Method Standard	Result Units	Charge Code	Results
CN	LA-695-102	PPM	WIBEU	0

Sample Size: ? 1mL
Customer ID: 2291-1-3

Remarks, Calculations, Results

DUPLICATE SAMPLE ABS .211

$$\frac{(.211 - .004) - .012836}{.166108} \div 1 = 1.17\text{ppm}$$

94.0% 6-20-91
avg 78.3% spike recover

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
90022				
Hrs	Hrs	Hrs	Hrs	Hrs
8				
Date	Time Completed	Laboratory		
6-20-91				

$$\frac{(.923 - .004) - .012836}{.166108} = \cancel{4.76}\ 5.46$$

$$\frac{\cancel{4.76}\ 5.46 - 1.27}{4.4585\text{ppm}} \times 100 = \cancel{78.3\%}\ 94.0\%$$

R9408-5878

$$\frac{891.7}{100} \times .5 = 4.4585$$

TODAYS DATE: 6-20-91

ROLL NO.: 80028

Y-INTERCEPT= .012836
SLOPE= .166108

SAMPLE ID#: R-9407 BLANK
SAMPLE SIZE: 0
WVL AND ABS= 580NM 0.004 A

SAMPLE ID#: R-9406 STD 75C11-P
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.761 A

SAMPLE ID#: R-9408
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.228 A

SAMPLE ID#: R-9408 DUPLICATE
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.211 A

SAMPLE ID#: R-9408+100UL-10ML-500UL 75C11-P SPIKE
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.923 A

SAMPLE ID#: R-9412 STD 75C11-P
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.751 A

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: ION CHROMATOGRAPHIC - CHLORIDE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 05-18-92
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5572	11		
2	REAGENT BLANK	R9407-5672	12		
3	SAMPLE 2291-1-3	R9408-5772	13		
4	FINAL LMCS CHECK STD	R9412-5572	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: ION CHROMATOGRAPHIC - FLUORIDE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 05-18-92
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5571	11		
2	REAGENT BLANK	R9407-5671	12		
3	SAMPLE 2291-1-3	R9408-5771	13		
4	SAM DUP OF 2291-1-3	R9408-5871	14		
5	FINAL LMCS CHECK STD	R9412-5571	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

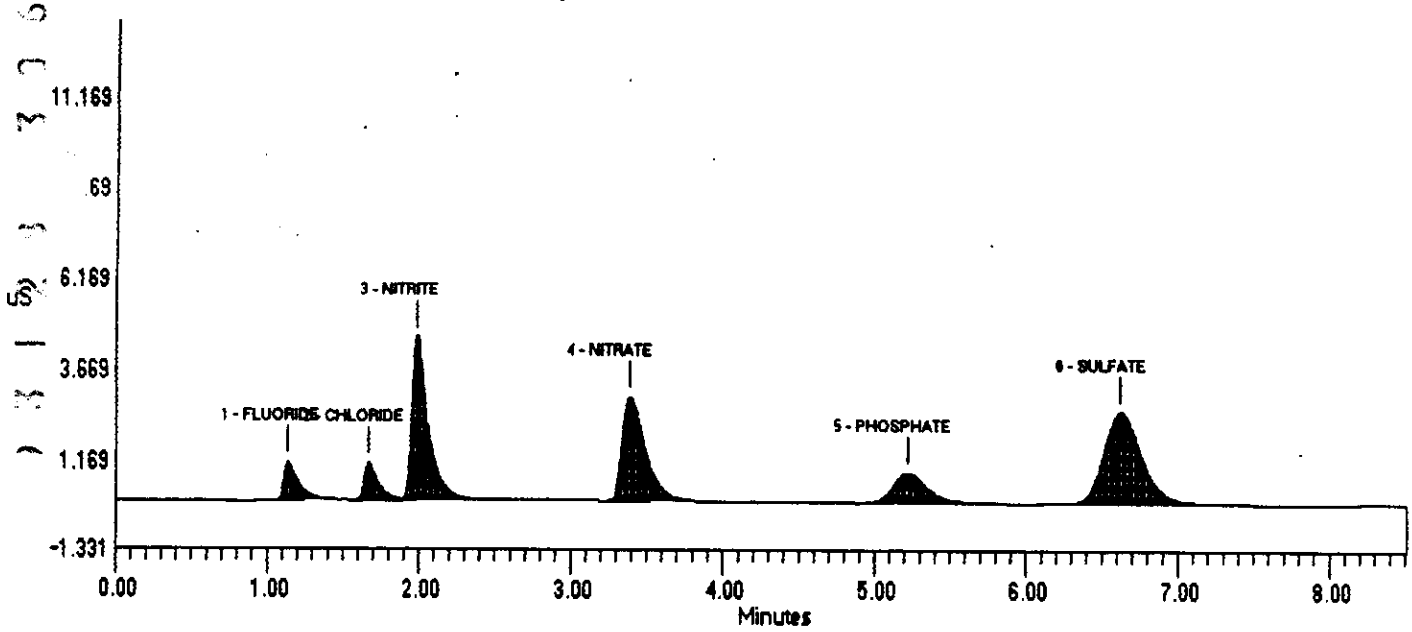
A-6000-881 (03/92)

```
Sample Name: LMCS/73C11CM R9406 JK 7-22-92        Date: Wed Sep 25 13:59:38 1991
Data File   : c:\dx\data\91092511.D03
Method      : c:\dx\method\SYSTEM1.met
ACI Address: 1        System : 1        Inject#:   3  Detector: CDM-1
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.031	1079	7472	1	0.00
2	1.67	CHLORIDE	71.776	1034	6670	2	-1.96
3	1.99	NITRITE	501.818	4487	33395	2	-2.30
4	3.38	NITRATE	530.270	2877	30926	1	2.53
5	5.22	PHOSPHATE	517.102	836	13098	1	-1.88
6	6.62	SULFATE	590.417	2525	43628	1	-3.41

File: c:\dx\data\91092511.D03 Sample: LMCS/73C11CM



78

JMA 08/20/92

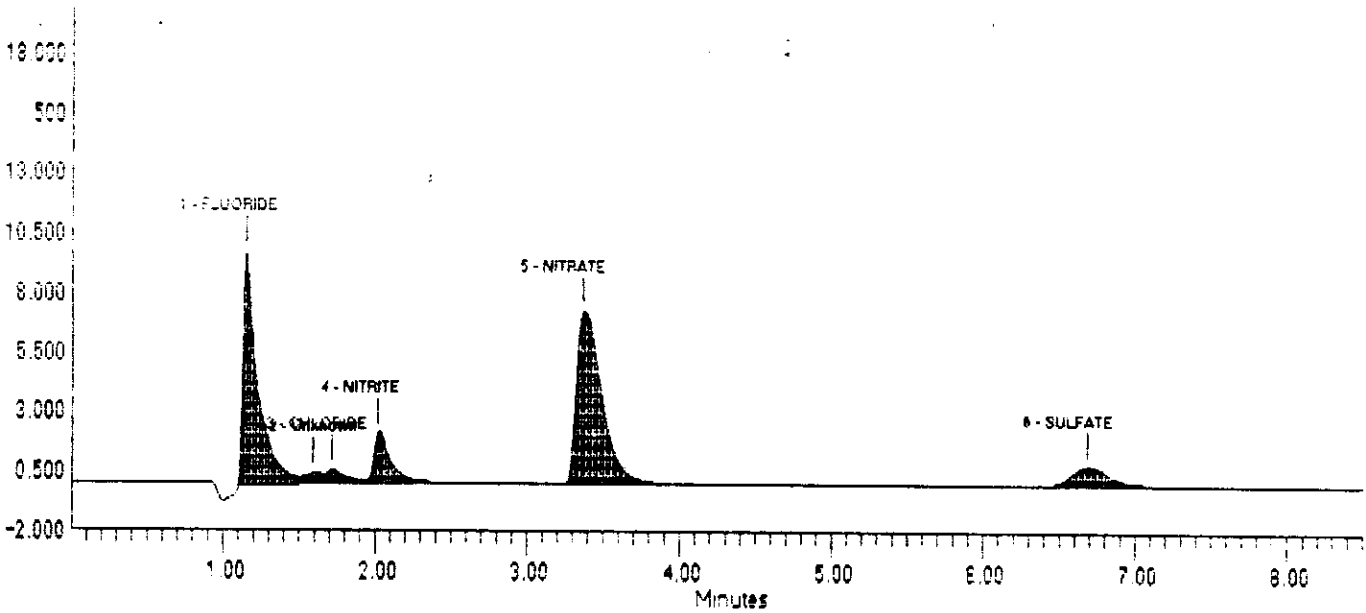
68

DATA REPROCESSED ON Tue Ma[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	Concentration	Height	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

File: A:\91092511.D04 Sample: R9408



Chromatogram reprocessed for most accurate F^- + Cl^- conc.

Denise J Hert

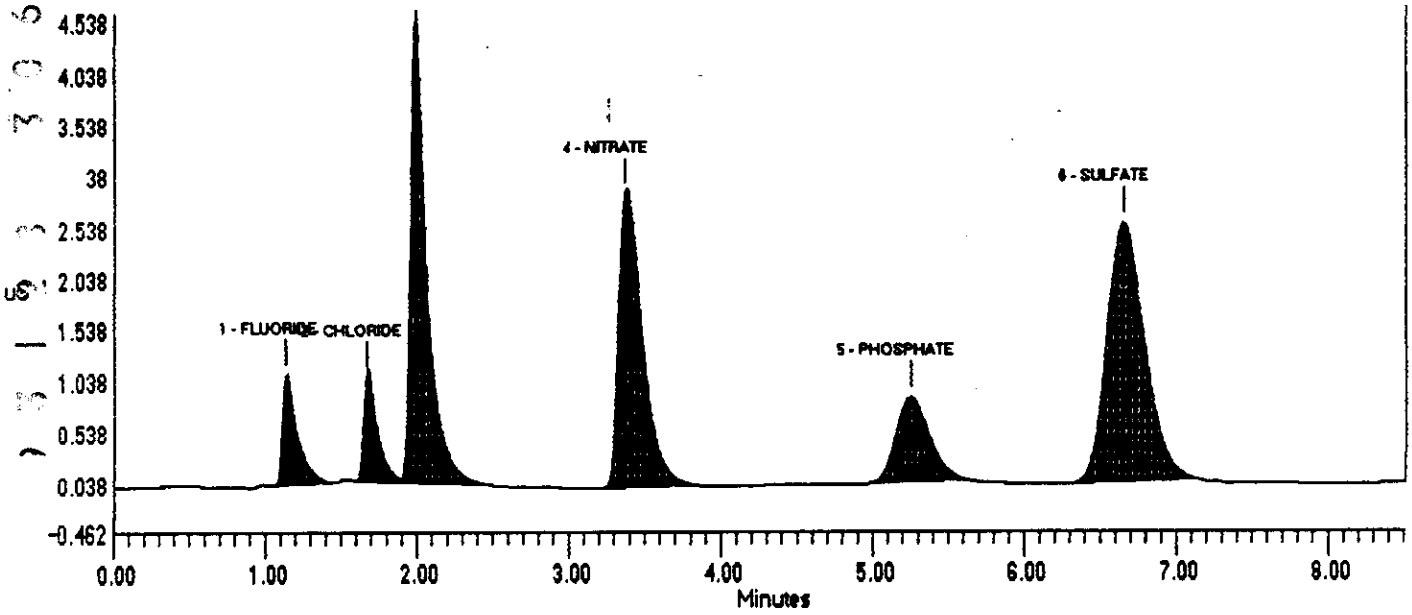
[illegible] 06/20/92
72

Sample Name: LMCS/73C11CM R9412 DL 7-22-92 Date: Wed Sep 25 15:18:32 1991
ta File : c:\dx\data\91092511.D10
method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	53.542	1070	7391	1	0.00
2	1.67	CHLORIDE	71.072	1012	6600	2	-1.96
3	1.98	NITRITE	500.223	4495	33278	2	-2.30
4	3.37	NITRATE	534.703	2855	31203	1	2.02
5	5.25	PHOSPHATE	507.540	825	12822	1	-1.25
6	6.65	SULFATE	587.648	2522	43407	1	-2.92

File: c:\dx\data\91092511.D10 Sample: LMCS/73C11CM



08/20/92

ION CHROMATOGRAPHIC ANALYSIS (PHOSPHATE) - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Issued	Priority
R 9406.-55/4	102AW	6-14-91	12:36	26

Determination	Methods Standard	Result Units	Charge Code	Results
PO4	LA-533-105	% RECOVERY	W1DEO	0

Sample Size: 7 .100mL -10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDF R9/6 DIONEX
STDN 5.17e2 RESULT 536.303
STD VAL 73C11Cm %REC 103.7%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 24hr	Hrs	Hrs	Hrs	Hrs
Date 9-23-91	Time Completed	Lab Unit Mgr	[signature]	

Sample No	Sample Point	Date	Time Issued	Priority
R 9407.-56/4	102AW	6-14-91	12:39	26

Determination	Methods Standard	Result Units	Charge Code	Results
PO4	LA-533-105	G/G	W1DEO	0

Sample Size: 7 1.0mL direct
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 24hr	Hrs	Hrs	Hrs	Hrs
Date 9-23-91	Time Completed	Lab Unit Mgr	[signature]	

Sample No	Sample Point	Date	Time Issued	Priority
R 9408.-57/4	102AW	6-14-91	12:43	26

Determination	Methods Standard	Result Units	Charge Code	Results
PO4	LA-533-105	G/G	W1DEO	0

Sample Size: 7 .100mL - 10mL
Customer ID: [illegible]

Remarks, Calculations, Results:
1.79E2 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 24hr	Hrs	Hrs	Hrs	Hrs
Date 9-23-91	Time Completed	Lab Unit Mgr	[signature]	

Sample No	Sample Point	Date	Time Issued	Priority
R 9408.-58/4	102AW	6-14-91	12:43	26

Determination	Methods Standard	Result Units	Charge Code	Results
PO4	LA-533-105	G/G	W1DEO	0

Sample Size: 7 .100mL - 10mL
Customer ID: [illegible]

Remarks, Calculations, Results:
DUPLICATE SAMPLE
1.77E2 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 24hr	Hrs	Hrs	Hrs	Hrs
Date 9-23-91	Time Completed	Lab Unit Mgr	[signature]	

Sample No	Sample Point	Date	Time Issued	Priority
R 9412.-55/4	102AW	6-14-91	12:59	26

Determination	Methods Standard	Result Units	Charge Code	Results
PO4	LA-533-105	% RECOVERY	W1DEO	0

Sample Size: 7 .100mL - 10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDF R9/6 DIONEX
STDN 73C11Cm RESULT 524.991
STD VAL 517.0 %REC 101.5%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 24hr	Hrs	Hrs	Hrs	Hrs
Date 13 9-24-91	Time Completed	Lab Unit Mgr	[signature]	

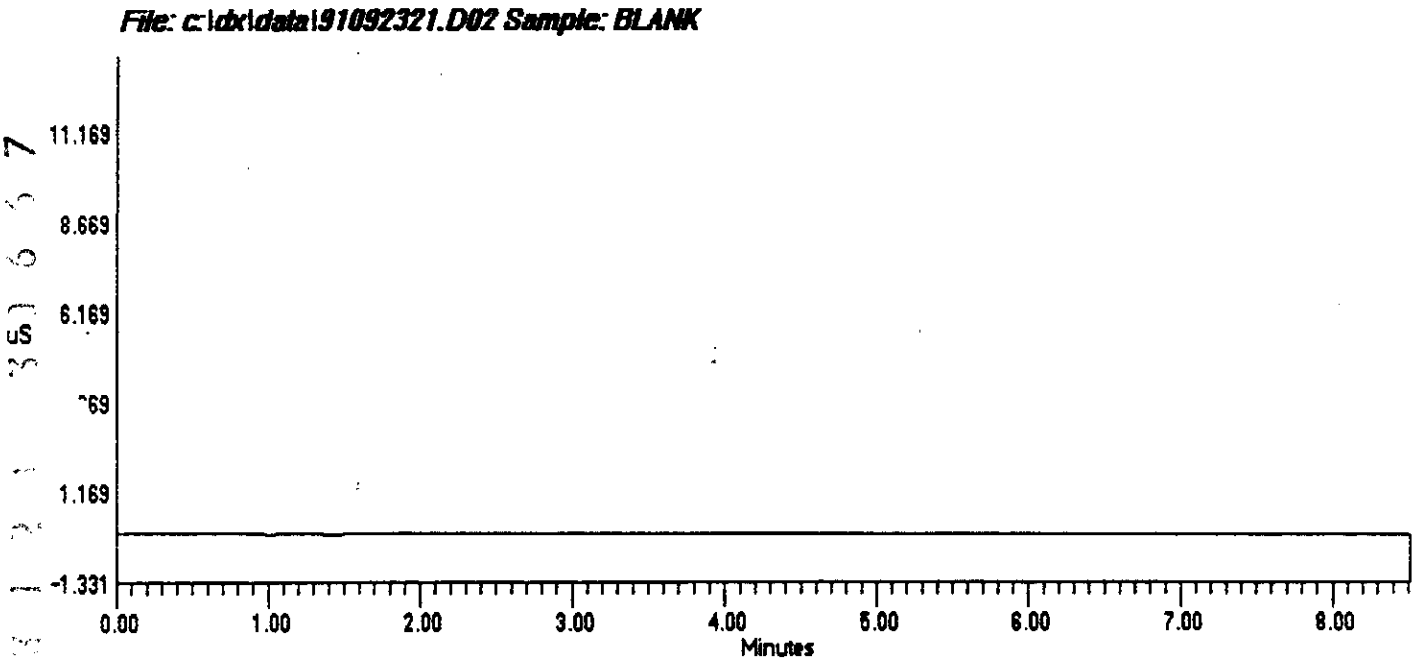
JK 8-15-92

```
Sample Name: BLANK                                  Date: Mon Sep 23 15:01:56 1991
  ta File   : c:\dx\data\91092321.D02
  thod      : c:\dx\method\SYSTEM1.met
ACI Address: 1        System : 1        Inject#:    2  Detector: CDM-1
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

File: c:\dx\data\91092321.D02 Sample: BLANK



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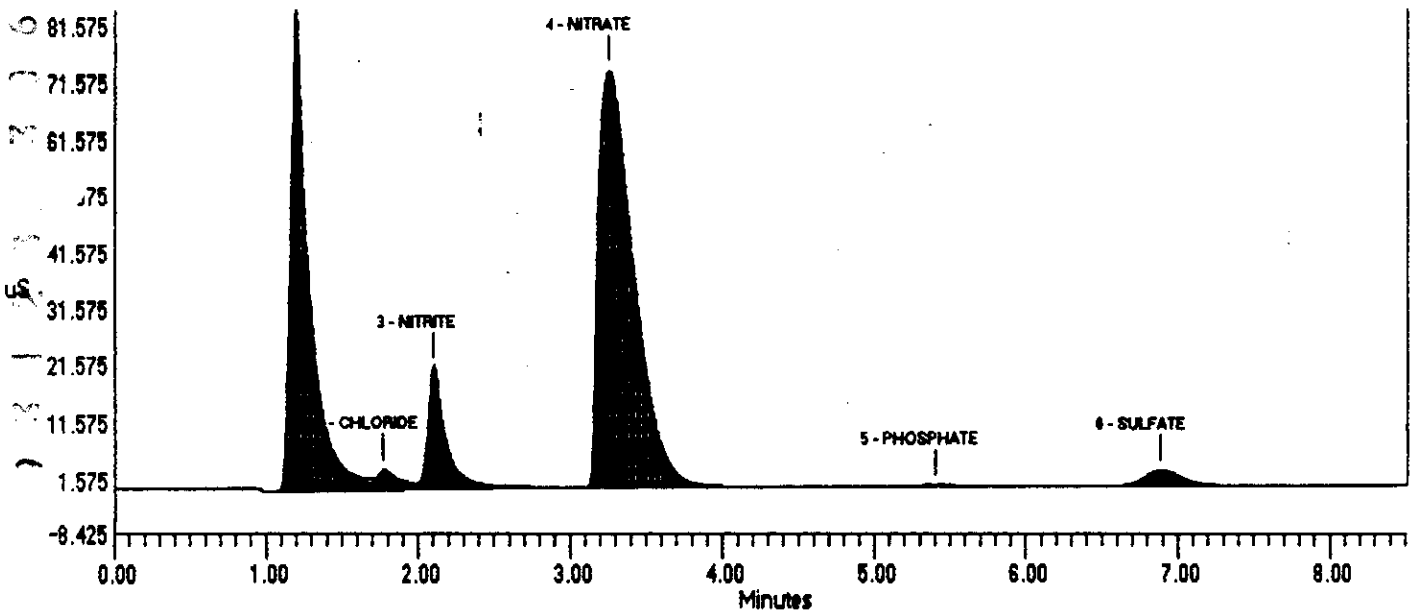
08/20/92
82

Sample Name: R9408DUP Date: Mon Sep 23 15:31:29 1991
ta File : c:\dx\data\91092311.D05
thod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 5 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.18	FLUORIDE	1127.546	77627	740041	3	0.00
2	1.77	CHLORIDE	310.256	2894	30821	4	-0.47
3	2.10	NITRITE	2423.676	21230	174234	2	-0.92
4	3.25	NITRATE	11116.838	73293	1184352	1	-5.68
5	5.40	PHOSPHATE	176.725	235	3398	1	-2.72
6	6.88	SULFATE	651.993	2808	48545	1	-3.76

File: c:\dx\data\91092311.D05 Sample: R9408DUP



WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: ION CHROMATOGRAPHIC - SULFATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5575	11		
2	REAGENT BLANK	R9407-5675	12		
3	SAMPLE 2291-1-3	R9408-5775	13		
4	SAM DUP 2291-1-3	R9408-5875	14		
5	FINAL LMCS CHECK STD	R9412-5575	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

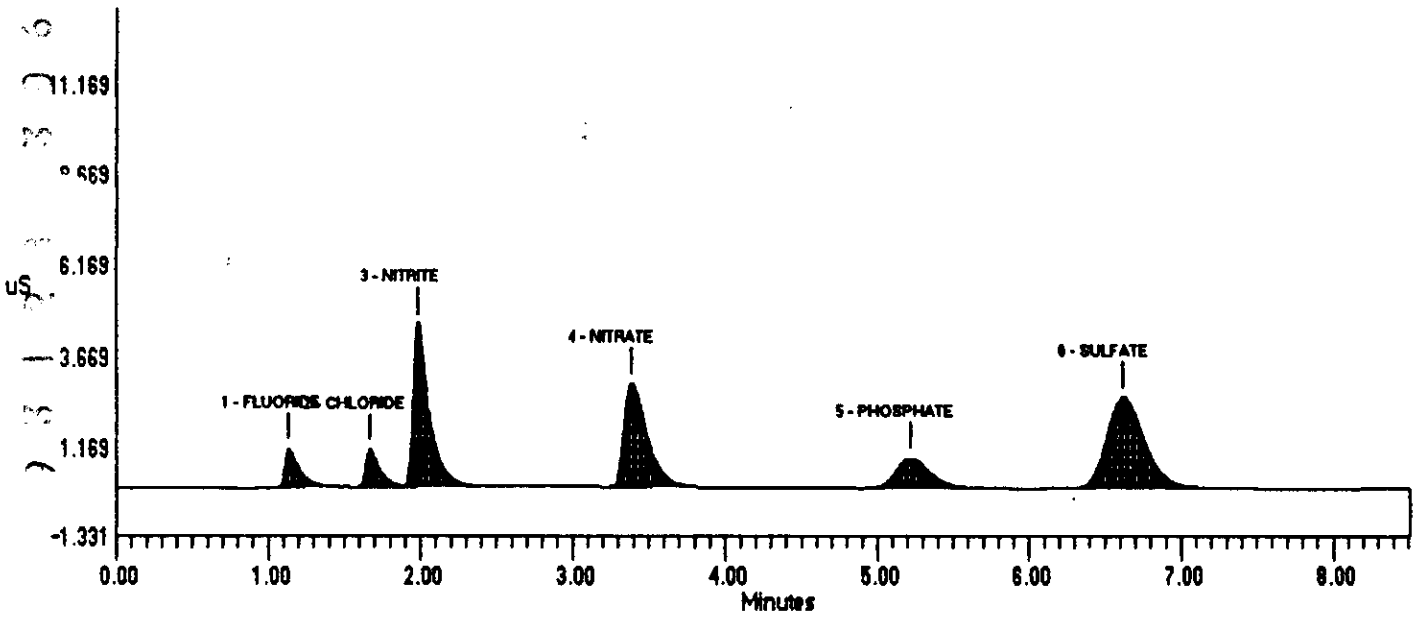
A-6000-881 (03/92)

Sample Name: LMCS/73C11CM R9406 8-14-92 Date: Wed Sep 25 13:59:38 1991
ta File : c:\dx\data\91092511.D03
chod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 3 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.031	1079	7472	1	0.00
2	1.67	CHLORIDE	71.776	1034	6670	2	-1.96
3	1.98	NITRITE	501.818	4487	33395	2	-2.30
4	3.38	NITRATE	530.270	2877	30926	1	2.53
5	5.22	PHOSPHATE	517.102	836	13098	1	-1.88
6	6.62	SULFATE	590.417	2525	43628	1	-3.41

File: c:\dx\data\91092511.D03 Sample: LMCS/73C11CM

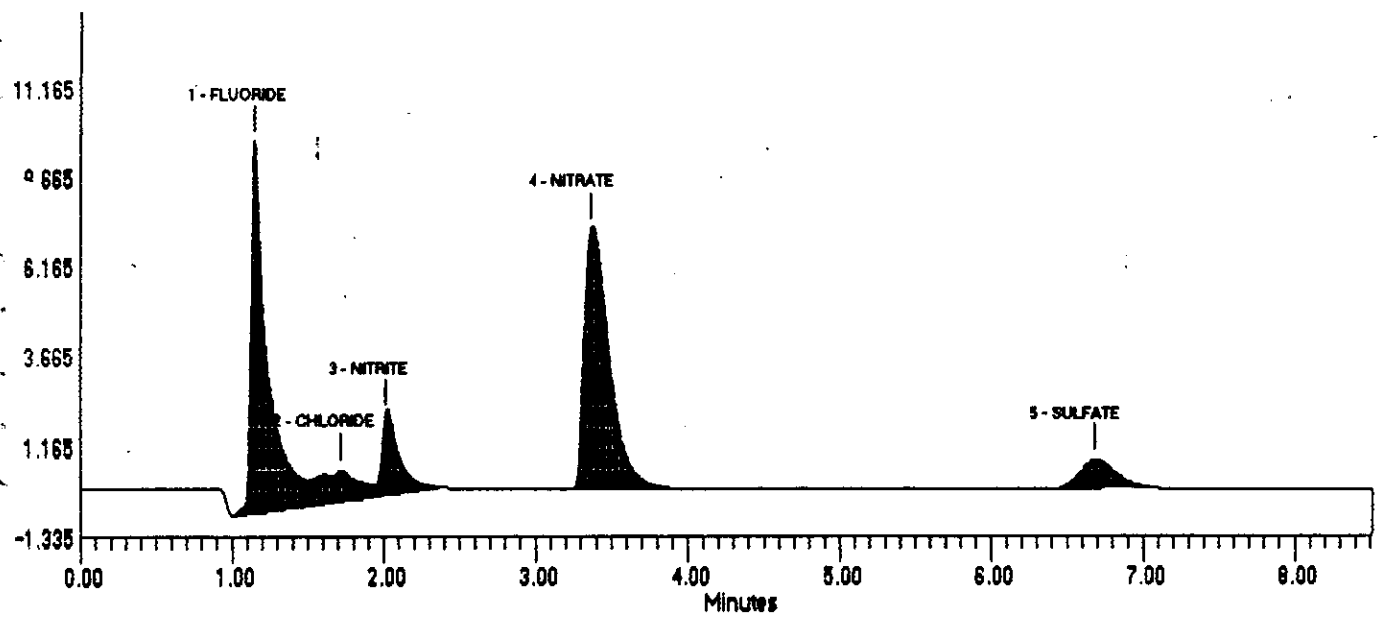


Sample Name: R9408 Date: Wed Sep 25 14:09:52 1991
Data File : c:\dx\data\91092511.D04
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 4 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1111	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	5158.329	10355	81997	3	0.00
2	1.72	CHLORIDE	1394.554	730	12142	4	-0.48
3	2.02	NITRITE	3372.762	2197	18999	2	-2.10
4	3.37	NITRATE	14773.196	7232	82792	1	0.54
5	6.68	SULFATE	2264.997	788	13253	1	-3.85

File: c:\dx\data\91092511.D04 Sample: R9408



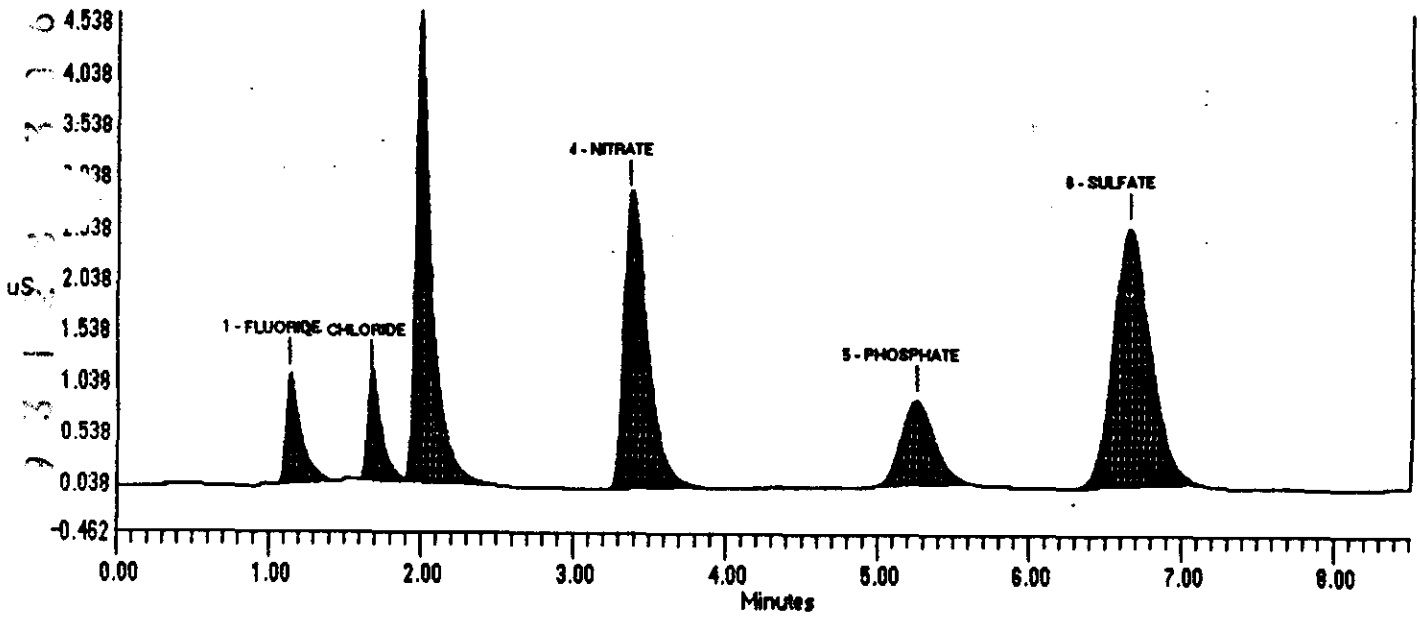
08/20/92

Sample Name: LMCS/73C11CM 194/2 JK 8.14.92 Date: Wed Sep 25 15:18:32 1991
Data File : c:\dx\data\91092511.D10
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	53.542	1070	7391	1	0.00
2	1.67	CHLORIDE	71.072	1012	6600	2	-1.96
3	1.98	NITRITE	500.223	4495	33278	2	-2.30
4	3.37	NITRATE	534.703	2855	31203	1	2.02
5	5.25	PHOSPHATE	507.540	825	12822	1	-1.25
6	6.65	SULFATE	587.648	2522	43407	1	-2.92

File: c:\dx\data\91092511.D10 Sample: LMCS/73C11CM



ION CHROMATOGRAPHIC ANALYSIS (NITRATE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-557	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL - 10mL ~~1.0~~ SR 9/1/92 — Customer ID: SID 73C11CM

Remarks, Calculations, Results:
EDP R978 DIONEX
STD #73C11CM RESULT 539.772
STD VAL 564 %REC 95.7%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-567	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	G/G	W1BEO	0

Sample Size: ? 1.0mL direct — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
<1 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9408.-577	102AW	6-14-91	12:43	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	G/G	W1BEO	0

Sample Size: ? .100mL - 10mL - 1.0mL - 10mL — Customer ID: 2291-1-3

Remarks, Calculations, Results:
1.44 E4 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9408.-587	102AW	6-14-91	12:43	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	G/G	W1BEO	0

Sample Size: ? .100mL - 10mL - 1.0mL - 10mL — Customer ID: 2291-1-3

Remarks, Calculations, Results:
DUPLICATE SAMPLE
1.41 E4 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-557	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL - 10mL — Customer ID: SID 73C11CM

Remarks, Calculations, Results:
EDP R978 DIONEX
STD #73C11CM RESULT 546.9
STD VAL 564 %REC 95.9%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 — Time Completed: — Lab Unit Mgr: [signature]

ION CHROMATOGRAPHIC ANALYSIS (NITRITE) - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-5576	102AW	6-14-91	12:36	26

Determination	Method Standard	Result Units	Charge Code	Rerun
NO2	LA-533-105	% RECOVERY	WIDEO	0

Sample Size: ? .100mL -10mL — Customer ID: STD73C11CM

Remarks, Calculations, Results:
EDP R968 DIONEX
STD# 73C11CM RESULT 5.1791E2
STD VAL 5.13E2 %REC 100.96%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
34r				[signature]

Date: 9-25-91 — Time Completed: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-5676	102AW	6-14-91	12:39	26

Determination	Method Standard	Result Units	Charge Code	Rerun
NO2	LA-533-105	G/G	WIDEO	0

Sample Size: ? 1.0mL direct — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
<1 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
34r				

Date: 9-25-91 — Time Completed: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-5776	102AW	6-14-91	12:43	26

Determination	Method Standard	Result Units	Charge Code	Rerun
NO2	LA-533-105	G/G	WIDEO	0

Sample Size: ? .100mL - 10mL - 1.0mL - 10mL — Customer ID: 2291-1-3

Remarks, Calculations, Results:
2.53E3 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
34r				

Date: 9-25-91 — Time Completed: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-5876	102AW	6-14-91	12:43	26

Determination	Method Standard	Result Units	Charge Code	Rerun
NO2	LA-533-105	G/G	WIDEO	0

Sample Size: ? .100mL - 10mL - 1.0mL - 10mL — Customer ID: 2291-1-3

Remarks, Calculations, Results:
DUPLICATE SAMPLE
2.51E3 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
34r				

Date: 9-25-91 — Time Completed: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-5576	102AW	6-14-91	12:39	26

Determination	Method Standard	Result Units	Charge Code	Rerun
NO2	LA-533-105	% RECOVERY	WIDEO	0

Sample Size: ? .100mL - 10mL — Customer ID: STD73C11CM

Remarks, Calculations, Results:
EDP R968 DIONEX
STD# 73C11CM RESULT 509.856
STD VAL 5.13E2 %REC 99.4%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
34r				[signature]

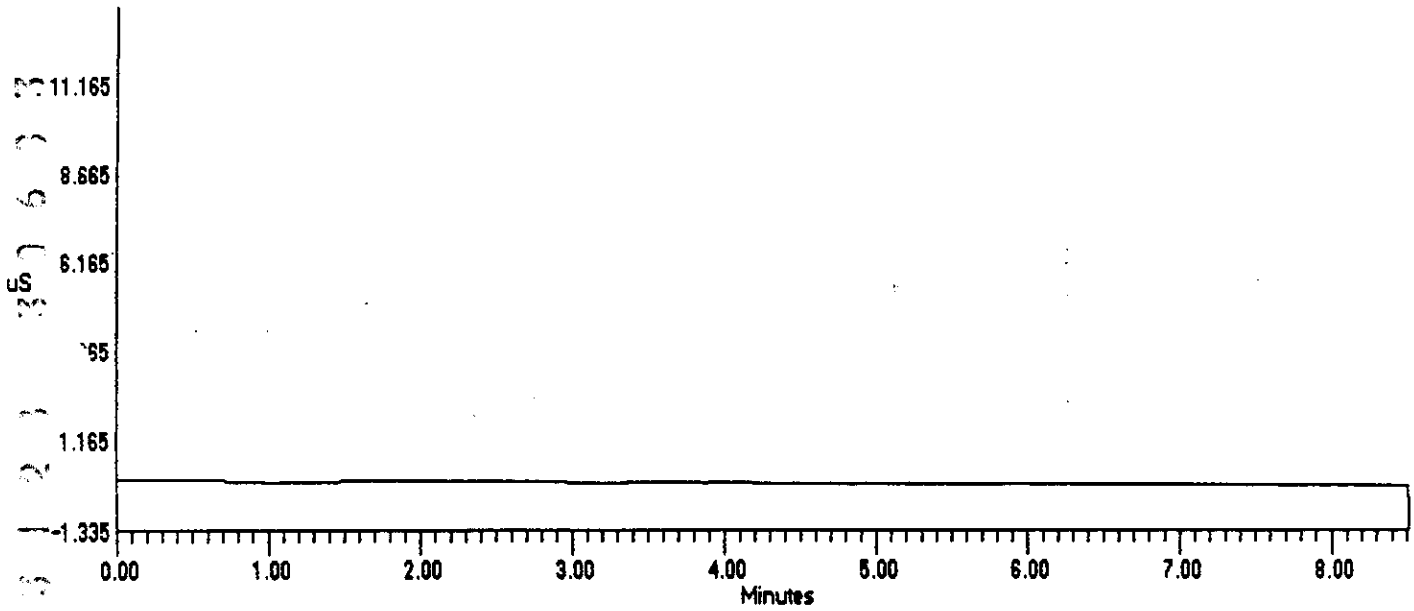
Date: 9-25-91 — Time Completed: [signature]

Sample Name: BLANK Date: Wed Sep 25 10:19:25 1991
Data File : c:\dx\data\91092501.D02
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 2 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

File: c:\dx\data\91092501.D02 Sample: BLANK



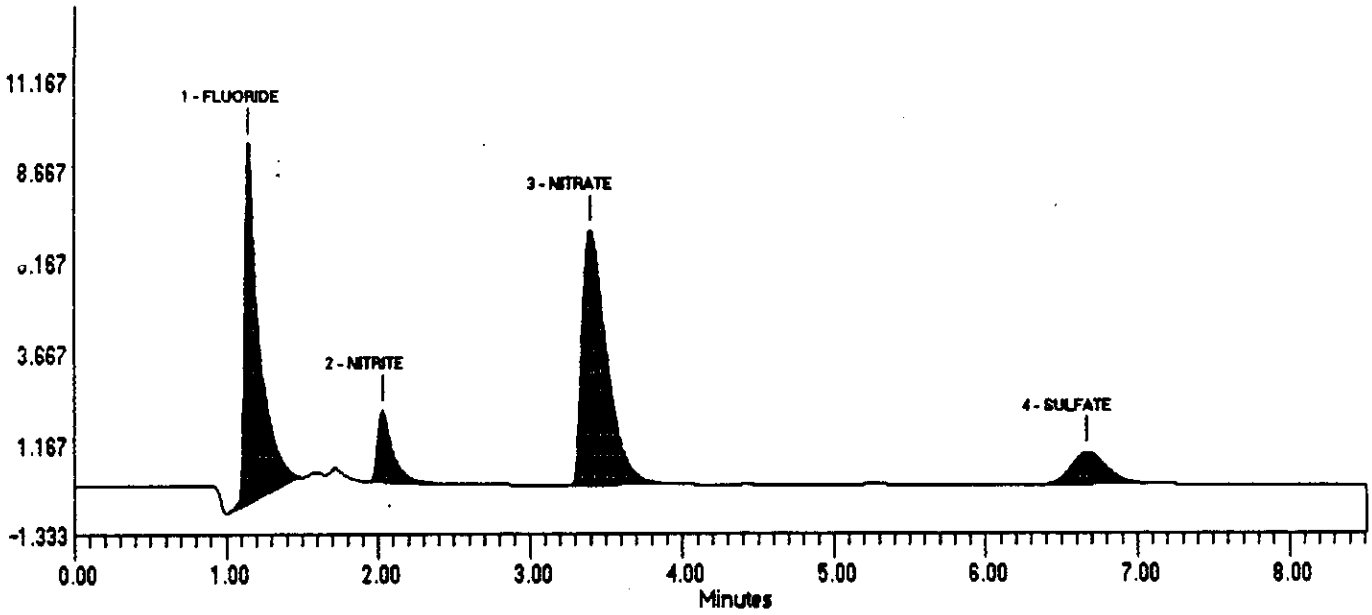
Jan 08/20/92

Sample Name: R9408DUP Date: Wed Sep 25 10:49:54 199
ta File : c:\dx\data\91092501.D05
ethod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 5 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1111	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	4266.010	9913	66397	1	0.00
2	2.03	NITRITE	2507.809	1974	13195	1	-1.29
3	3.40	NITRATE	14083.401	7014	78717	1	1.54
4	6.67	SULFATE	2447.089	880	14549	1	-4.09

File: c:\dx\data\91092501.D05 Sample: R9408DUP



08/20/9
95

9-22-91
4469-AC

DIONEX METHOD PARAMETERS - SYSTEM1.MET

System Parameters

System Name : system1/gpm
Number of Detectors..... 1
Detector 1 Type..... CDM-1
Detector 1 real time plot scale (uS)..... 20.00
Run Time (minutes)..... 8.50
Sampling Rate (seconds)..... 0.20

-- DETECTOR 1 PARAMETERS --

Report Options

Save Data File..... Yes
Data File Name: c:\dx\data\91092201.D08
Create ASCII Report File..... No
Print Report..... Yes
List Peaks Not Found in this run..... No
Report Unknowns Found in this run..... Yes
Print Chromatogram..... Yes
AutoScale Chromatogram to Highest Peak..... Yes
Fill Peaks with Color ..... Yes
Draw Grid Lines on Chromatogram..... No
Label with Peak Number..... Yes
Label with Retention Times on Chromatogram..... No
Label with Component Name..... Yes
Format File Name: c:\dx\method\default.prf

Integration Parameters

Starting Peak Width (seconds)..... 10.0
Peak Threshold (mV or uS/data pt interval)..... 0.500
Peak Area Reject..... 1000
Area Reject for Reference Peaks..... 1000
Percent Retention Time Window for Reference Peaks..... 5.0

Integration Timed Events

Time	Description
1.32	Start peak detection
1.44	Start peak detection
1.46	Start peak detection
1.77	
1.77	Enable end of peak detection

Component # 1 FLUORIDE Retention Time 1.13
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 8.52797E-002
K1 = 6.06440E-005
K2 = -6.17180E-011

Level	Amount	Area	Height
1	1.20000E-001	1439	225
2	3.00000E-001	4035	566
3	6.00000E-001	8217	1141
4	1.20000E+000	16507	2218
5	2.30000E+000	39534	4812
6	4.40000E+000	76890	9371

Component # 2 CHLORIDE Retention Time 1.70
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.93335E-002
K1 = 1.01273E-004
K2 = -9.35560E-011

Level	Amount	Area	Height
1	1.60000E-001	1319	217
2	3.90000E-001	3754	568
3	7.80000E-001	6942	1045
4	1.50000E+000	14461	1975
5	3.00000E+000	30287	3987
6	5.90000E+000	61305	8910

Component # 3 NITRITE Retention Time 2.03
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.88691E-001
K1 = 1.33960E-004
K2 = 5.52630E-012

Level	Amount	Area	Height
1	1.08000E+000	6239	874
2	2.69000E+000	17299	2252
3	5.37000E+000	34328	4729
4	1.06200E+001	72787	9300
5	2.08500E+001	153501	19401
6	4.01500E+001	292053	34439

Component # 4 BROMIDE Retention Time 2.80
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.01960E-002
K1 = 2.00453E-004
K2 = -1.00008E-010

Level	Amount	Area	Height
1	1.56000E+000	7660	753
2	3.90000E+000	20706	1880
3	7.80000E+000	38868	3455
4	1.54000E+001	78061	6644
5	3.02000E+001	165133	12632
6	5.81000E+001	350930	24386

BEST AVAILABLE COPY

08/20/92
~~100~~

IC Control File: C:\DX\METHOD\SYSTEM1.TE

Step	Time	Description
Init		CDM-1 AutoOffset Off
Init		CDM-1 Recorder Mark OFF
Init		CDM-1 Temp. Comp. = 1.7 / Deg C
Init		CDM-1 Recorder Range = 1.0 uS
Init		CDM-1 Cell ON
Init		CHA Heater = 25 Deg. C
Init		Valve A ON
Init		Valve B ON
Init		Inject Valve OFF
Init		ACI Autosmp OFF
Init		ACI RLY 2 OFF
Init		ACI TTL 1 OFF
Init		ACI TTL 2 OFF
Init		ACI AC 1 ON
Init		GPM Start
Init		GPM Hold Gradient Clock
Init		GPM Reset ON
1	0.0	CDM-1 AutoOffset ON
1	0.0	Start Sampling
1	0.0	GPM Reset OFF
2	0.1	CDM-1 Recorder Range = 10.0 uS
2	0.1	Inject Valve ON
2	0.1	GPM Run Gradient Clock
3	3.0	Inject Valve OFF
4	3.5	ACI Autosmp ON
5	8.0	ACI Autosmp OFF

GpmFile: C:\DX\METHOD\SYSTEM1.GPM
Lo Pressure Limit = 200
Hi Pressure Limit = 2000
Eluant 1 - DI WATER
Eluant 2 - SODIUM CARBONATE
Eluant 3 - SODIUM BICARBONATE
Eluant 4 - Eluant 4

Time	Flow	%1	%2	%3	%4	V5	V6	Comment
0.0	2.0	84	8	8	0	0	0	

VISUAL CHECK AND OVER-THE-TOP READING ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9408.-5000	102AW	6-14-91	12:43	26

Determination	Method/Standard	Result Units	Charge Code	Retune
APPEAR	[illegible] 6/14/91 [illegible] 519-151		W1BEU	0

Sample Size	Customer ID
?	2291-1-3

Remarks, Calculations, Results:
A. JAR ID#
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-B=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
some solids settled
on bottom of vial

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs
[illegible]				

Date	Time Completed	Last Operator
6/14/91		[illegible]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5000	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Retune
APPEAR	[illegible] 6/14/91 [illegible] 519-151		W1BEU	0

Sample Size	Customer ID
?	2291-2-3

Remarks, Calculations, Results:
A. JAR ID#
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-B=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
no solids present

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs
[illegible]				

Date	Time Completed	Last Operator
6/14/91		[illegible]

Serial No	Sample Point	Date	Time Issued	Priority
R 9410.-5000	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Retune
APPEAR	[illegible] 5-14-91		W1BEU	0

Sample Size	Customer ID
?	2291-3-3

Remarks, Calculations, Results:
A. JAR ID#
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-B=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
aqueous solution
light tint yellow
clarity-clear
solid settled on
bottom of vial

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs
[illegible]				

Date	Time Completed	Last Operator
6/14/91		[illegible]

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-5000	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Retune
APPEAR	[illegible] 5-14-91		W1BEU	0

Sample Size	Customer ID
?	2291-4-3

Remarks, Calculations, Results:
A. JAR ID#
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-B=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
solids-present

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs
[illegible]				

Date	Time Completed	Last Operator
6/14/91		[illegible]

SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406-5506	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Results
SPG	LA-510-112	% RECOVERY	WIDEO	1

Sample Size: 100 100.32 L — Customer ID: STD

Remarks, Calculations, Results

S332 ZHCL2
STD# 15C11-8J RESULT 1.4270
STD VAL 1.4386 %REC 99.2%

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82580 Tania Lee				

Date: 8-12-91 — Time Completed: — Laboratory Mgr: [signature]

R9406-5506
G - 2.0110
T - 1.8678
N - .1432

G - 2.0530
T - 1.9098
N - .1432

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407-5506	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Results
SPG	LA-510-112	% RECOVERY	WIDEO	1

Sample Size: 100.32 L — Customer ID: REC 1

Remarks, Calculations, Results

REAGENT BLANK
S332 ZHCL2
STD# RESULT 9.9033E-1
STD VAL %REC
T.L.
5.14.91

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82580 Tania Lee				

Date: 8-12-91 — Time Completed: — Laboratory Mgr: [signature]

R9407-5506
G - 2.0005
T - 1.9012
N - .0993

G - 1.9915
T - 1.8921
N - .0994

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409-5706	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Results
SPG	LA-510-112		WIDEO	1

Sample Size: 100.32 L — Customer ID: 2291-2-3

Remarks, Calculations, Results

1.0242

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82580 Tania Lee				

Date: 8-12-91 — Time Completed: — Laboratory Mgr: [signature]

R9409-5706
G - 1.9667
T - 1.8642
N - .1025

G - 2.0337
T - 1.9307
N - .1030

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

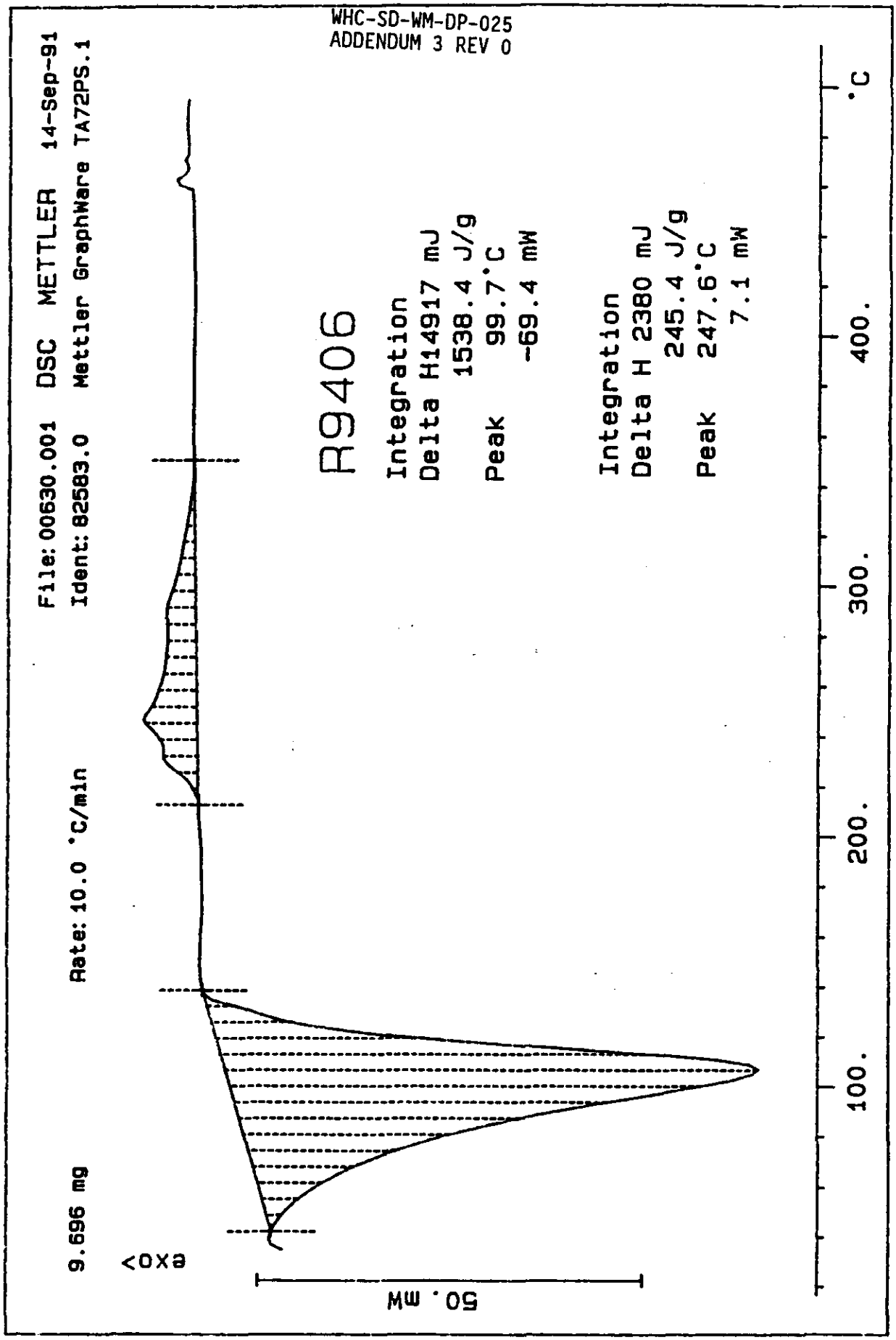
Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: DIFFERENTIAL THERMAL	Sample Prep: UNDIGESTED

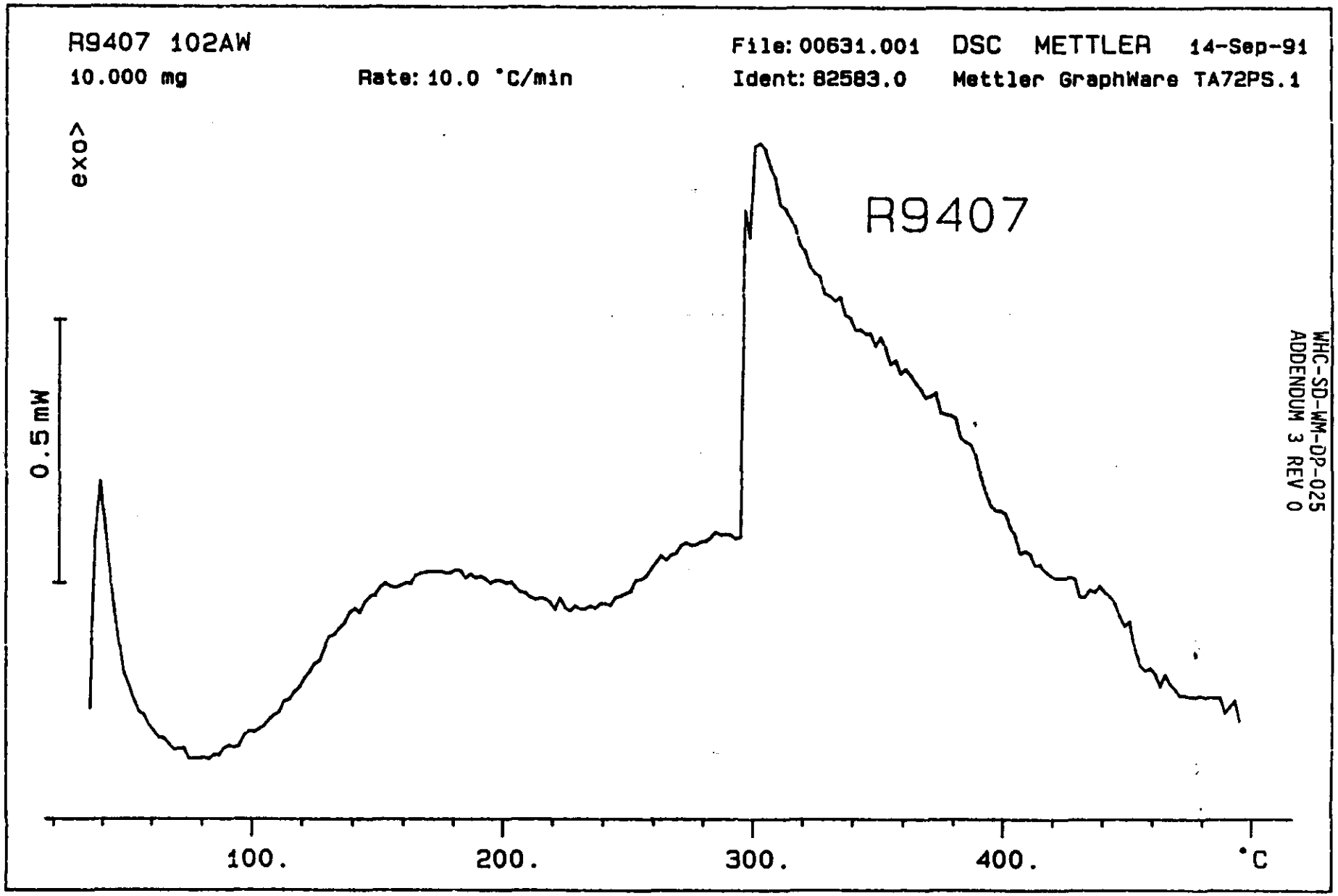
Instrument: WC16134, WC16129	Procedure/Rev: LA-514-113/A-0
Technologist: S. COBB	Date: 09-15-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. HERT

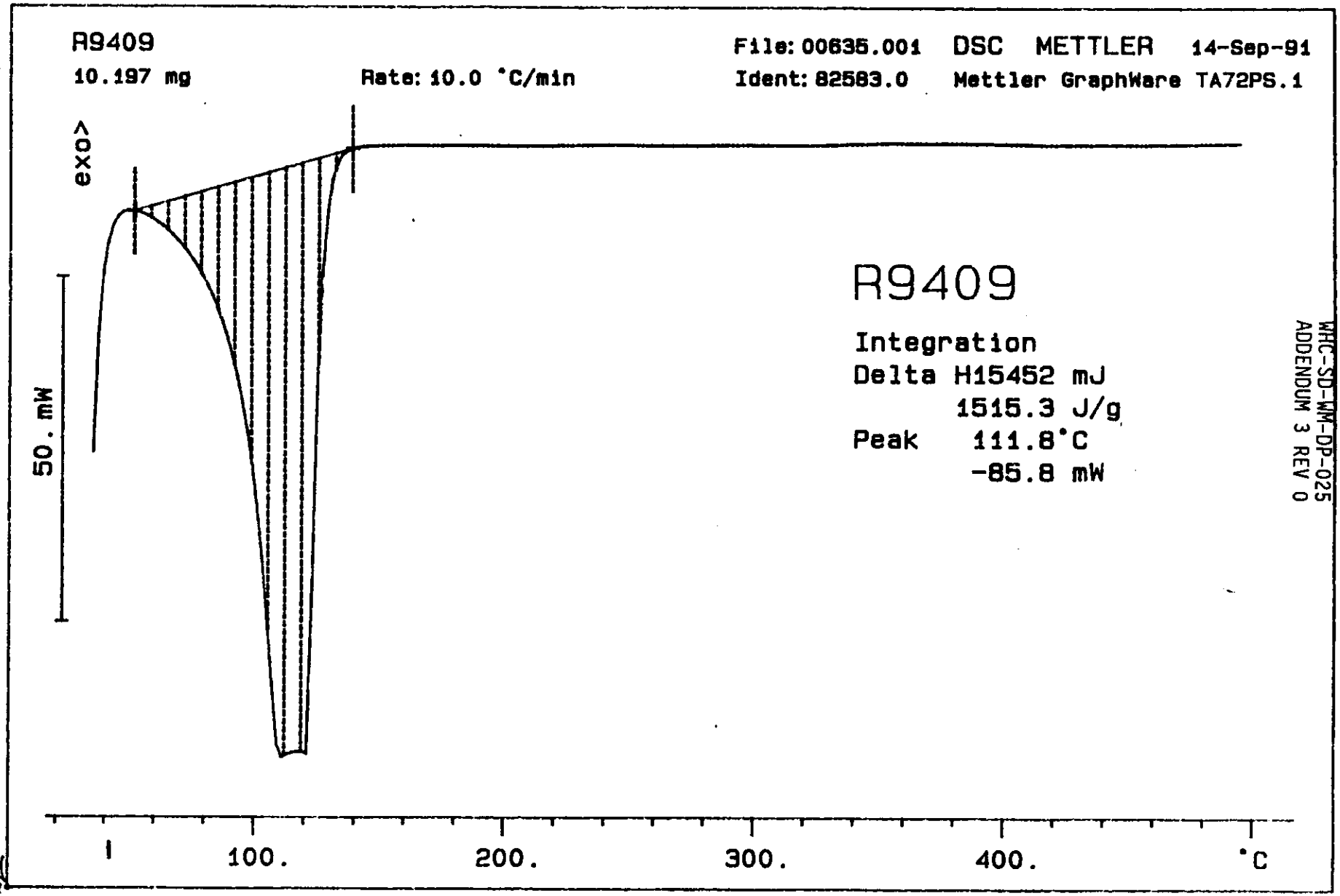
	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5511	11		
2	REAGENT BLANK	R9407-5611	12		
3	SAMPLE 2291-2-3	R9409-5711	13		
4	FINAL LMCS CHECK STD	R9412-5511	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	27C11-AZ/.10 mL			NA

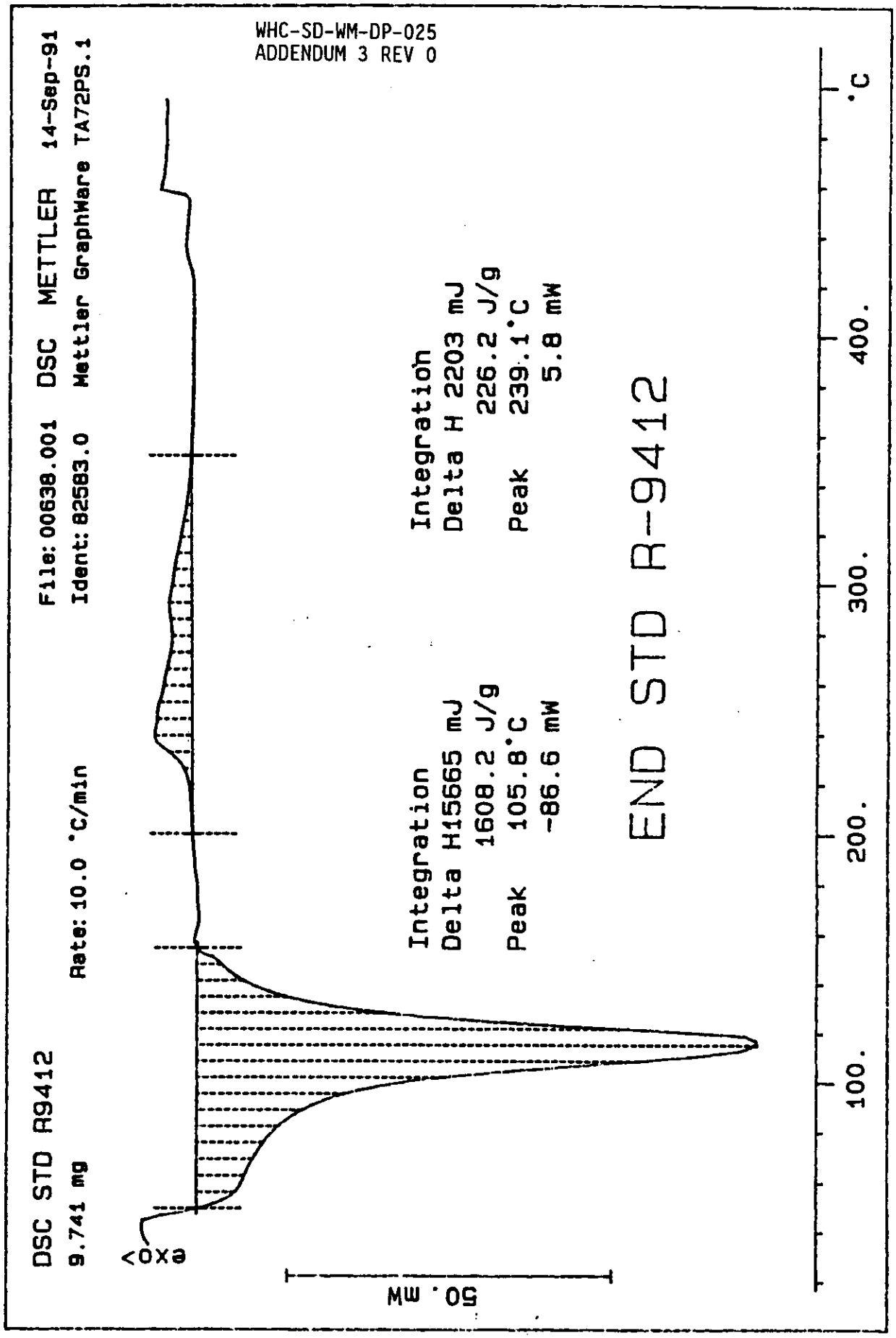
A-6000-881 (03/92)


File: 00630.001 DSC METTLER 14-Sep-91
Ident: 82583.0 Mettler GraphWare TA72PS.1
Rate: 10.0 °C/min
9.696 mg
exo>
50. mW
R9406
Integration
Delta H14917 mJ
1538.4 J/g
Peak 99.7°C
-69.4 mW
Integration
Delta H 2380 mJ
245.4 J/g
Peak 247.6°C
7.1 mW
100.
200.
300.
400.
°C


R9407 102AW
10.000 mg
Rate: 10.0 °C/min
File: 00631.001
Ident: 82583.0
DSC METTLER
Mettler GraphWare TA72PS.1
14-Sep-91
exo>
0.5 mW
R9407
100.
200.
300.
400.
°C



WHC-SD-WM-DP-025
ADDENDUM 3 REV 0


DSC STD R9412
9.741 mg
Rate: 10.0 °C/min
File: 00638.001
Ident: 82583.0
DSC METTLER 14-Sep-91
Mettler GraphWare TA72PS.1
exo>
50. mW
Integration
Delta H15665 mJ
1608.2 J/g
Peak 105.8°C
-86.6 mW
Integration
Delta H 2203 mJ
226.2 J/g
Peak 239.1°C
5.8 mW
END STD R-9412
100.
200.
300.
400.
°C

DSC

CONFIGURATION

20-JUL-91 19:16

E INDIUM	250.8
DSC SIGN ICTA	1
TAU LAG	9
TAU SIGNAL	0
E DIMIN. FACT.	1
S	2400
TAU LAG 2	13
TAU SIGNAL 2	0
E DIMIN. F. 2	0.88
S 2	2200
MAX. TEMP.	600.
MIN. TEMP.	-50.
A PT100	.21409
B PT100	.74787
C PT100	-.10809
HEAT P	3000
HEAT I	250
HEAT D	30
COOL 1	0
COOL 2	0
COOL 3	0
A1	10773
B1	58.121
C1	.14689
T1	-100
A2	8940
B2	17.884
C2	-.072
T2	363
A3	9360.3
B3	-15.043
C3	.01538

******** METTLER TA4000 SYSTEM *********

TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5526	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
TOC	LA-344-105	% RECOVERY	W1BEU	0

Sample Size: ? 200uL-2mL-200uL
Customer ID: STD

Remarks, Calculations, Results:
B356 CU3TOC
STDN 70C11 H RESULT 3.0525g/L
STD VAL 3.00 g/L %REC 101.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
30027				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 6-27-91	Time Completed			

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5526	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
TOC	LA-344-105	B/B	W1BEU	0

Sample Size: ? 200uL
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK SKM 12-2-91
4.70 ug
~~6.71e-1 g/L/minute~~

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
30027				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 6-27-91	Time Completed			

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5526	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
TOC	LA-344-105	B/B	W1BEU	0

Sample Size: ? 200uL-2mL-200uL
Customer ID: 2291-2-3

Remarks, Calculations, Results:
6.16e-1 g/L

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
30027				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 6-27-91	Time Completed			

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5526	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
TOC	LA-344-105	% RECOVERY	W1BEU	0

Sample Size: ? 200uL-2mL-200uL
Customer ID: STD

Remarks, Calculations, Results:
B356 CU3TOC
STDN 70C11 H RESULT ~~3.00g/L~~ 3.058g/L
STD VAL 3.00g/L %REC 101.9%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
30027				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 6-27-91	Time Completed			

9312333709

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9407 Date: 06-27-1991 Time: 08:45:18

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	1.20	100.00
3	3.01	2.10	42.86
4	4.01	2.80	25.00
5	5.01	3.50	20.00
6	6.01	4.20	16.67
7	7.01	4.70	10.64

BLANK VALUE = 4.7 / 7.006653 = .670791 g/L/minute

Sample Run By: 80028

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9412 Date: 06-27-1991 Time: 11:27:31

Blank = .670791 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	38.60	100.00
3	3.01	51.40	24.90
4	4.01	55.90	8.05
5	5.01	58.00	3.62
6	6.01	59.40	2.36
7	7.01	60.30	1.49

(60.3 - 4.699344)(11)/(200) = 3.058036 g/L Carbon

(60.3 - 4.699344)(11)/(200)(12) = .2548363 Molar Carbon

Sample Run By: 80028_____

TOTAL INORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-5527	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Results
TIC	LA-622-102	% RECOVERY	W1DEO	0

Sample Size: ? 50 uL — Customer ID: STD

Remarks, Calculations, Results:
S223 CO3
STDN 69C11 K RESULT 2.043E-1 m
STD VAL 2.00E-1 m % REC 102.2%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Cohn				

Date: 9-4-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-5627	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Results
TIC	LA-622-102	G/G	W1DEO	0

Sample Size: ? 50 uL — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
3.80 ug C
PYB 6/11/92 ~~5.42E-1 g/l/minute~~

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				DY Bivenius
Ed Cohn				

Date: 9-4-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-5727	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Results
TIC	LA-622-102	G/G	W1DEO	0

Sample Size: ? 50 uL — Customer ID: 2291-2-3

Remarks, Calculations, Results:
856E-1 g/l

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Cohn				

Date: 9-4-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-5527	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Results
TIC	LA-622-102	% RECOVERY	W1DEO	0

Sample Size: ? 50 uL — Customer ID: STD

Remarks, Calculations, Results:
S223 CO3
STDN 69C11 K RESULT 2.085E-1 m
STD VAL 2.00E-1 m % REC 102.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Cohn				

Date: 9-4-91 — Time Completed: — Lab Unit Mgr: [signature]

93129307 15

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: ~~BLK R~~ R-9407 RC 8-13-92 Date: 09-04-1991 Time: 09:43:11

Blank = N/A Sample Size = 50 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	1.40	100.00
3	3.01	1.90	26.32
4	4.01	2.40	20.83
5	5.01	2.90	17.24
6	6.01	3.40	14.71
7	7.01	3.80	10.53

BLANK VALUE = 3.8 / 7.005677 = .5424173 g/L/minute

Sample Run By: 80028

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9412 Date: 09-04-1991 Time: 12:47:05

Blank = .5424173 Sample Size = 50 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	97.30	100.00
3	3.01	116.90	16.77
4	4.01	123.40	5.27
5	5.01	125.50	1.67
6	6.01	126.70	0.95
7	7.01	127.10	0.31

(127.1 - 3.8)(1)/(50) = 2.466 g/L Carbon

(127.1 - 3.8)(1)/(50)(12) = .2055 Molar Carbon

Sample Run By: 80028

AMMONIA ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-552E	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	% RECOVERY	W1BEO	0

Sample Size: ? 250ul .09941 m HCl — Customer ID: STD

Remarks, Calculations, Results:
S235 NH4CL — BLK 29, STD 158
STDN 4C11QL RESULT 5.13E-2
STD VAL 5.30E-3 m %REC 96.8%
(158-29)(.09941)/250 =

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82583				
SL Cobb				

Date: 08-23-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-562E	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	G/G	W1BEO	1

Sample Size: ? .09941 m HCL — Customer ID: REG. BL.

Remarks, Calculations, Results:
REAGENT BLANK — BLK 29, 29
(L10)(.09941)(1000 = L9.94E-4 m
Lost original Card

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82583				RK 4-10-92
SL Cobb				

Date: 4-9-92, 08-23-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-572E	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	G/G	W1BEO	0

Sample Size: ? 1ml .09941 m HCl — Customer ID: 2291-2-3

Remarks, Calculations, Results:
BLK 29, Sample 100
(100-29)(.09941)/1000 =
7.06E-3 m

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82583				
SL Cobb				

Date: 08-23-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-552E	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	% RECOVERY	W1BEO	0

Sample Size: ? 250ul .09941 m HCl — Customer ID: STD

Remarks, Calculations, Results:
S235 NH4CL — BLK 29, STD 156
STDN 4C11QL RESULT 5.05E-2
STD VAL 5.30E-2 %REC 95.3%
(156-29)(.09941)/250 = 5.05E-2

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82583				
SL Cobb				

Date: 08-23-91 — Time Completed: — Lab Unit Mgr: [signature]

9 3 1 2 3 3 0 7 2 1

DETERMINATION OF HYDROXIDE ION IN SOLUTION - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5529	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	% RECOVERY	WIDEO	0

Sample Size: ? .100 ml — Customer ID: STD

Remarks, Calculations, Results:
S2/3 ITS-OH
STD# 9C11AF RESULT 1.01
STD VAL 1.013 %REC 99.7%
.1905 M HNO3
1 ml BaCl
3 ml Q-H2O
(537-8)(.1905)/100 =

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs
[signature]				[signature]

Date: 9/10/91 — Time Completed: [signature] — Lab Unit Mgr.: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5629	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	M	WIDEO	0

Sample Size: ? 3 ml Q-H2O — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
.1905 M HNO3
(8)(.1905) / 3000 5.08E-4M

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs
[signature]				

Date: 9/10/91 — Time Completed: [signature] — Lab Unit Mgr.: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5729	102AW	6-14-91	12:50	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	M	WIDEO	0

Sample Size: ? .250 ml — Customer ID: 2291-2-3

Remarks, Calculations, Results:
(738.5-537)(.1905)/250 = 1.54E-1M

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
Hrs	Hrs	Hrs	Hrs	Hrs
6C559				

Date: [signature] 9/10/91 — Time Completed: [signature] — Lab Unit Mgr.: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5529	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	% RECOVERY	WIDEO	0

Sample Size: ? .100 ml — Customer ID: STD

Remarks, Calculations, Results:
S2/3 ITS-OH
STD# 9C11AF RESULT 1.01
STD VAL 1.013 %REC 99.7%
1 ml BaCl
.1905 M HNO3
1.01M/
(538-8)(.1905)/100 =

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
Hrs	Hrs	Hrs	Hrs	Hrs
[signature]				[signature]

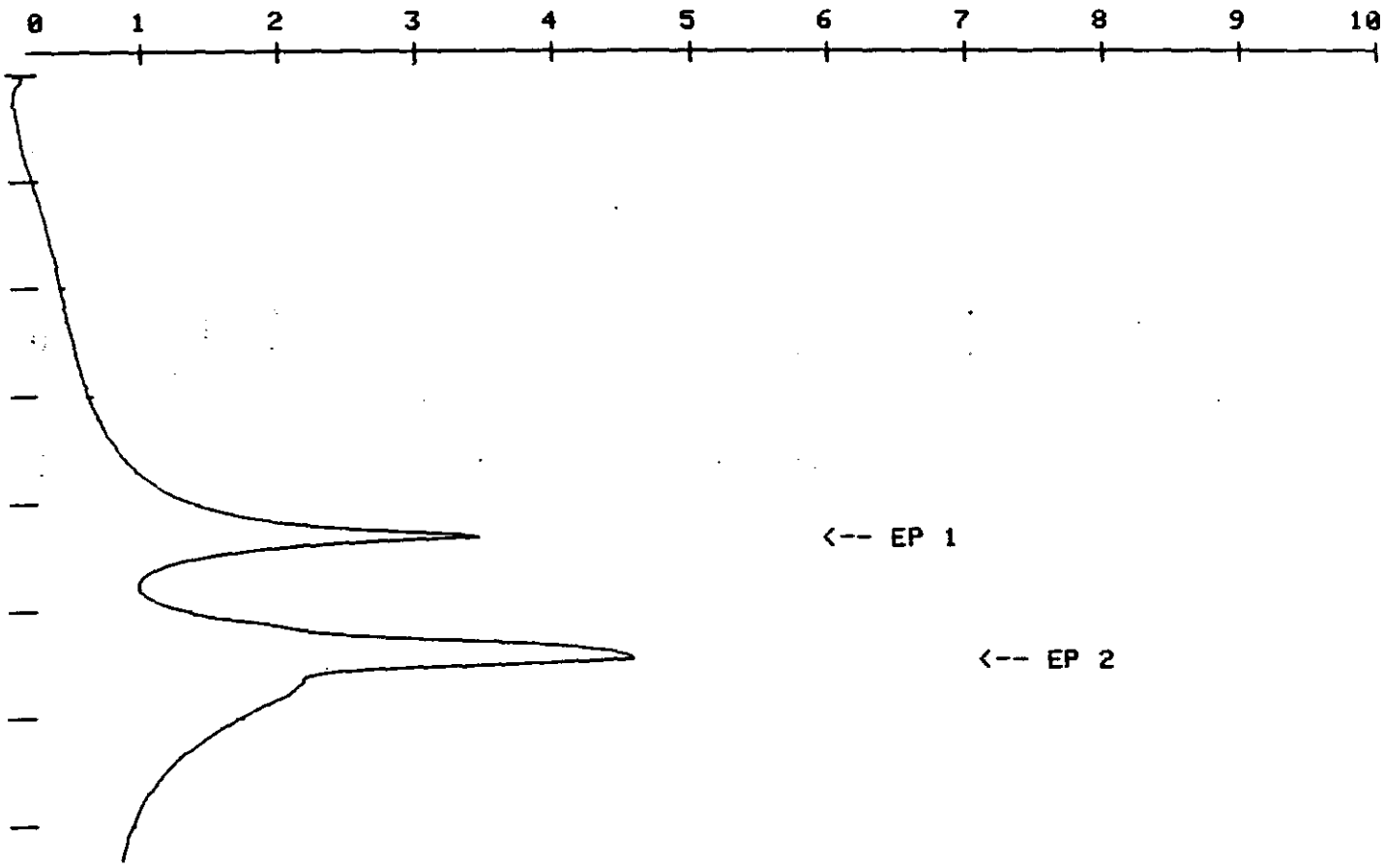
Date: 9/10/91 — Time Completed: [signature] — Lab Unit Mgr.: [signature]

9 3 1 2 1 3 0 7 2 3

BEST AVAILABLE COPY

SAMPLE NUMBER: 1
DIRECT READ PH: 12.001
R-9406
8-14-92

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.66	0.538	0.0000
5.87	0.679	0.0000

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:35 AM

SAMPLE NUMBER: 1
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:21 AM

SAMPLE NUMBER: 2
DIRECT READ PH: 5.554

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:23 AM

SAMPLE NUMBER: 3
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:25 AM

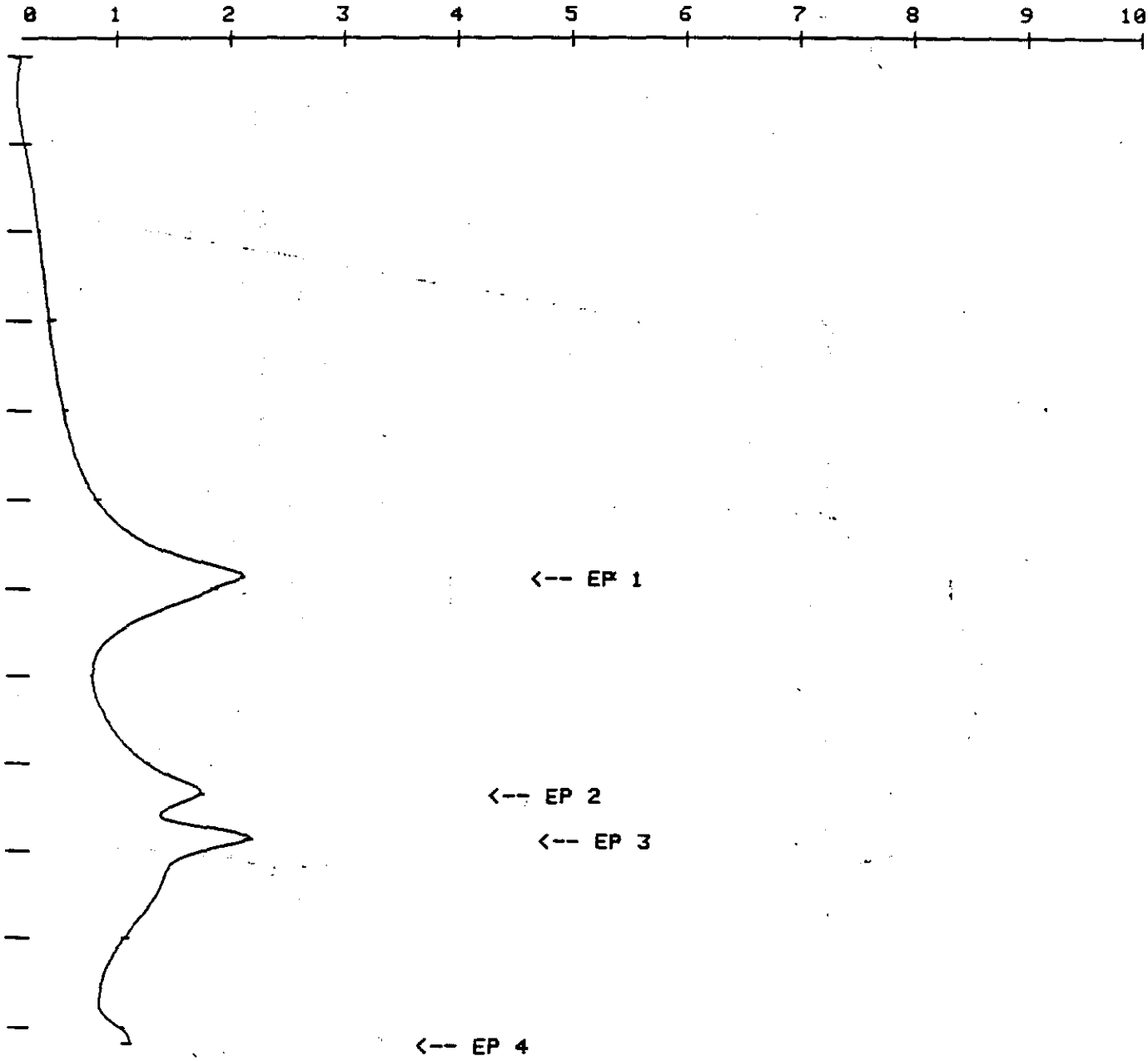
9312303727

SAMPLE NUMBER: 1
SAMPLE DATA: 9409.
DIRECT READ PH: 11.871

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

BEST AVAILABLE COPY

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.96	0.733	0.0000
8.08	1.042	0.0000
7.14	1.107	0.0000
5.45	1.395	0.0000

TITRATION TERMINATED BY LIMIT ON NUMBER OF EQUIVALENCES PERMISSIBLE.

SEP 10 1991 2:46 PM

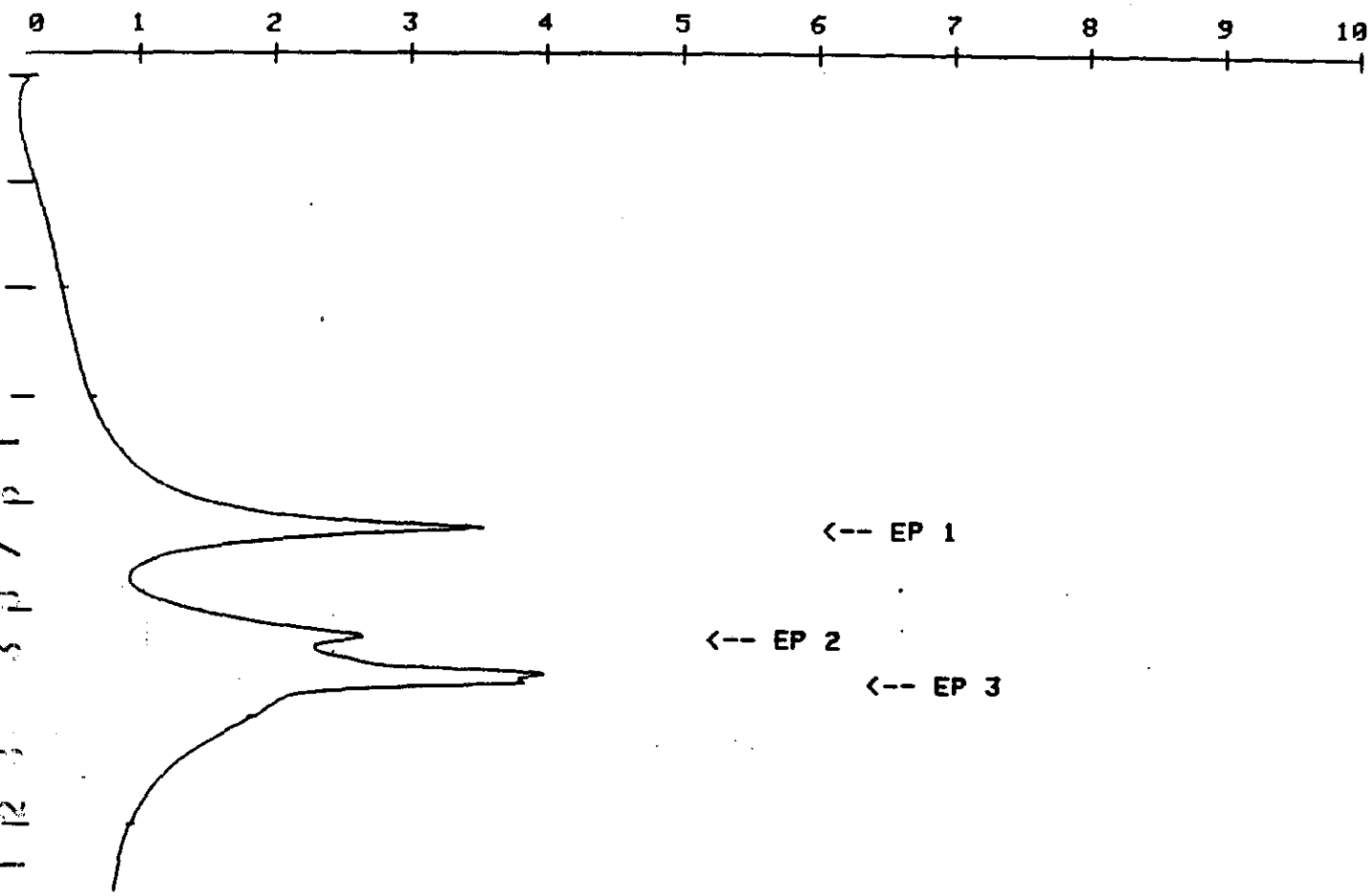
147

08/20/92

~~139~~

SAMPLE NUMBER: 2
SAMPLE DATA: 9412.
DIRECT READ PH: 12.053

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.67	0.529	0.0000
8.02	0.656	0.0000
5.11	0.708	0.0000

TITRATION TERMINATED BY PH LIMIT.

SEP 11 1991 10:12 AM

CYANIDE ANALYSIS - UNDIGESTED SAMPLE

STANDARD #5-14-92

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-5578	102AW	6-14-91	12:50	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	WIDEO	0

Sample Size: ? 100uL-10mL-500uL

Customer ID: STANDARD #5-14-92

Remarks, Calculations, Results: S244 KCN STD# 75C11P RESULT 891.8 STD VAL 891.7 %REC 100.0%

ABS .747

$$\frac{(.747-.01)-.013899}{.162164} \div .5 \times 100 =$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Ch				

Date: 6-27-91

Time Completed:

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-5678	102AW	6-14-91	12:50	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	PPM	[illegible]	0

Sample Size: ?

Customer ID: Blank

Remarks, Calculations, Results: REAGENT BLANK

$$\frac{.010-.013899}{.162164} = < .5 ppm$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Ch				

Date: 6-27-91

Time Completed:

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-5778	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	PPM	WIDEO	0

Sample Size: ? 1mL

Customer ID: 2291-2-3

Remarks, Calculations, Results: ABS .237

$$\frac{[(.237-.01)-.013899]}{.162164} \div 1 = 1.31 ppm$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Ch				

Date: 6-27-91

Time Completed:

#5-14-92

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-5878	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	WIDEO	0

Sample Size: ? 1mL

Customer ID: 2291-2-3

Remarks, Calculations, Results: ABS .239

DUPLICATE

$$\frac{(.239-.01)-.013899}{.162164} \div 1 = 1.33 ppm$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Ch				

Date: 6-27-91

Time Completed:

STANDARD #5-14-92

Serial No.	Sample Point	Date	Time Issued	Priority
R 9411.-5578	102AW	6-14-91	12:58	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	WIDEO	0

Sample Size: ? 100uL-10mL-500uL

Customer ID: STANDARD #5-14-92

Remarks, Calculations, Results: S244 KCN STD# 75C11P RESULT 873.3 STD VAL 891.7 %REC 97.9%

ABS .732

$$\frac{(.732-.01)-.013899}{.162164} \div .5 \times 100$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Ed Ch				

Date: 6-27-91

Time Completed:

9312 3 0 7 3 3

DAYS DATE: 6-27-91

PAYROLL NO.: 80028

Y-INTERCEPT= CAL
SLOPE= CAL

SAMPLE ID#: BLANK
SAMPLE SIZE: 0
WVL AND ABS= 580NM 0.004 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-50UL
WVL AND ABS= 580NM 0.094 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.848 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-1ML
WVL AND ABS= 580NM 1.628 A HI

Y:INTEC. .013899
SLOPE .162164
CC = .999801

ION CHROMATOGRAPHIC ANALYSIS (CHLORIDE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5572	102AW	6-14-91	12:30	26

Determination	Method/Standard	Report Units	Charge Code	Remarks
CL	LA-533-105	% RECOVERY	H1140	0

Sample Size: 0.100 mL - 10.0 mL
Customer ID: BID

EDF 8972 DIONEX
STDN 73C11CH RESULT 71.8
STD VAL 75.0 %REC 95.7

Data was retrieved per OSM's request. David L. Lo 5-18-92

Analyst: GCLPO
Date: 5/11/92
Time Completed:

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5572	102AW	6-14-91	12:42	26

Determination	Method/Standard	Report Units	Charge Code	Remarks
CL	LA-533-105	% RECOVERY	H1140	0

Sample Size: Direct
Customer ID: BID. 16

EDF 8972 DIONEX
STDN RESULT <111.1 ppm
STD VAL %REC
DSH 4-14-92

Data was retrieved per OSM's request. David L. Lo 5-18-92

Analyst: GCLPO
Date: 5/18/92
Time Completed:

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5572	102AW	6-14-91	12:50	26

Determination	Method/Standard	Report Units	Charge Code	Remarks
CL	LA-533-105	PPM	H1140	0

Sample Size: 0.1 mL - 10.0mL - 10mL - 10.0 mL
Customer ID: 2291-2-3

1.75E2 ppm

Analyst: GCLPO
Date: 5/18/92
Time Completed:

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5572	102AW	6-14-91	13:12	26

Determination	Method/Standard	Report Units	Charge Code	Remarks
CL	LA-533-105	% RECOVERY	H1140	0

Sample Size: 0.1 mL - 10.0 mL
Customer ID: BID

EDF 8972 DIONEX
STDN 73C11CH RESULT 71.0 ppm
STD VAL 75 ppm %REC 94.8 %

Data was retrieved per OSM's request. David L. Lo 5-18-92

Analyst: GCLPO
Date: 5/18/92
Time Completed:

ION CHROMATOGRAPHIC ANALYSIS (FLUORIDE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5571	102AW	6-14-91	12:38	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
F	LA-533-105	% RECOVERY	N1140	0

Sample Size: 0.100mL-10.0mL
Customer ID: STD

Remarks, Calculations, Results:
EDP 974 F ~~EDP 972 CL~~ DW 4-4-92
~~EDP 970 SO4 EDP 960~~
~~NO2 EDP 976 PO4 EDP~~
~~978 NO3~~
STD#73CUCM RESULT
STD VAL %REC

F⁻ result = 54.0 ppm
std. value = 56.0 ppm
recovery = 96.4%

Data was retrieved per OSM's request. Dennis L. Tate 5-28-92

Analyst	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280				

Date: 5/18/92 Time Completed: Dennis J. Hart Dennis L. Tate

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5571	102AW	6-14-91	12:42	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
F	LA-533-105	% RECOVERY	N1140	0

Sample Size: direct
Customer ID: REQ. NL

Remarks, Calculations, Results: DW 5-4-92
EDP 974 F ~~EDP 972 CL~~
~~EDP 970 SO4 EDP 960~~
~~NO2 EDP 976 PO4 EDP~~
~~978 NO3~~
~~STD#~~ RESULT
~~STD VAL~~ %REC

< 11.61 ppm

Data was retrieved per OSM's request. Dennis L. Tate 5-28-92

Analyst	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280				

Date: 5/18/92 Time Completed: Dennis J. Hart Dennis L. Tate
JL 5-28-92

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5771	102AW	6-14-91	12:50	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
F⁻	LA-533-105	UU/ML	N1140	0

Sample Size: 0.1mL-10.0mL-1.0mL-10.0mL
Customer ID: 2291-2-3

Remarks, Calculations, Results:
3.87 E3 ppm

Analyst	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280				

Date: 5/18/92 Time Completed: Dennis J. Hart Dennis L. Tate

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5571	102AW	6-14-91	13:2	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
F	LA-533-105	% RECOVERY	N1140	0

Sample Size: 0.1mL-10.0mL
Customer ID: STD

Remarks, Calculations, Results:
EDP 974 F EDP 972 CL
EDP 970 SO4 EDP 960
NO2 EDP 976 PO4 EDP
978 NO3
STD#73CUCM RESULT 53.5 ppm
STD VAL 56.0 ppm %REC 95.5%

Data was retrieved per OSM's request. Dennis L. Tate 5-28-92

Analyst	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280				

Date: 5/18/92 Time Completed: Dennis J. Hart Dennis L. Tate
JL 5-28-92

9 3 1 2 3 3 0 7 3 9

ION CHROMATOGRAPHIC ANALYSIS (PHOSPHATE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-55/4	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
PO4	LA-533-105	% RECOVERY	WIBEU	0

Sample Size: ? .100mL - 10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDP R9/6 DIONEX
STD# 5.17E² RESULT 536.303
STD VAL 73C11Cm %REC 103.7%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-56/4	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
PO4	LA-533-105	G/G	WIBEU	0

Sample Size: ? 1.0mL direct
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-57/4	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
PO4	LA-533-105	G/G	WIBEU	0

Sample Size: ? .100mL - 10mL
Customer ID: 2291-2-3

Remarks, Calculations, Results:

1.79 E² ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-59/4	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
PO4	LA-533-105	% RECOVERY	WIBEU	0

Sample Size: ? .025mL - 10mL
Customer ID: 2291-2-3

Remarks, Calculations, Results:
SAMPLE SPIKED ID
SPIKE ID 73C11Cm
SPIKE VOLUME .05mL

$$\frac{(1144-179)}{(.05)(401)(517)/10.075} \times 100 = 93.8\%$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]
JK 8-18-92

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-55/4	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
PO4	LA-533-105	% RECOVERY	WIBEU	0

Sample Size: ? .100mL - 10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDP R9/6 DIONEX
STD# 73C11Cm RESULT 524.991
STD VAL 517.0 %REC 101.5%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

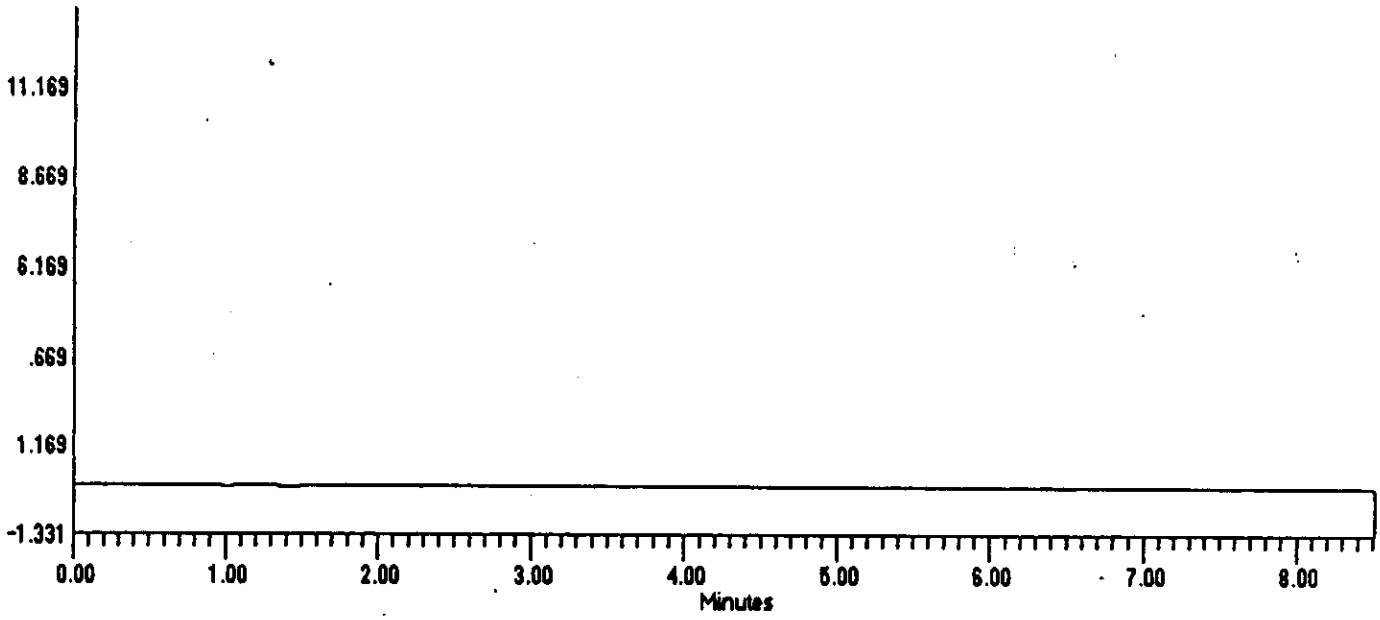
Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]
JK 8-18-92

```
 ample Name: BLANK                                  Date: Mon Sep 23 15:01:56 1991
 ata File   : c:\dx\data\91092321.D02
 Method     : c:\dx\method\SYSTEM1.met
 ACI Address: 1        System : 1        Inject#:   2  Detector: CDM-1
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

File: c:\dx\data\91092321.D02 Sample: BLANK

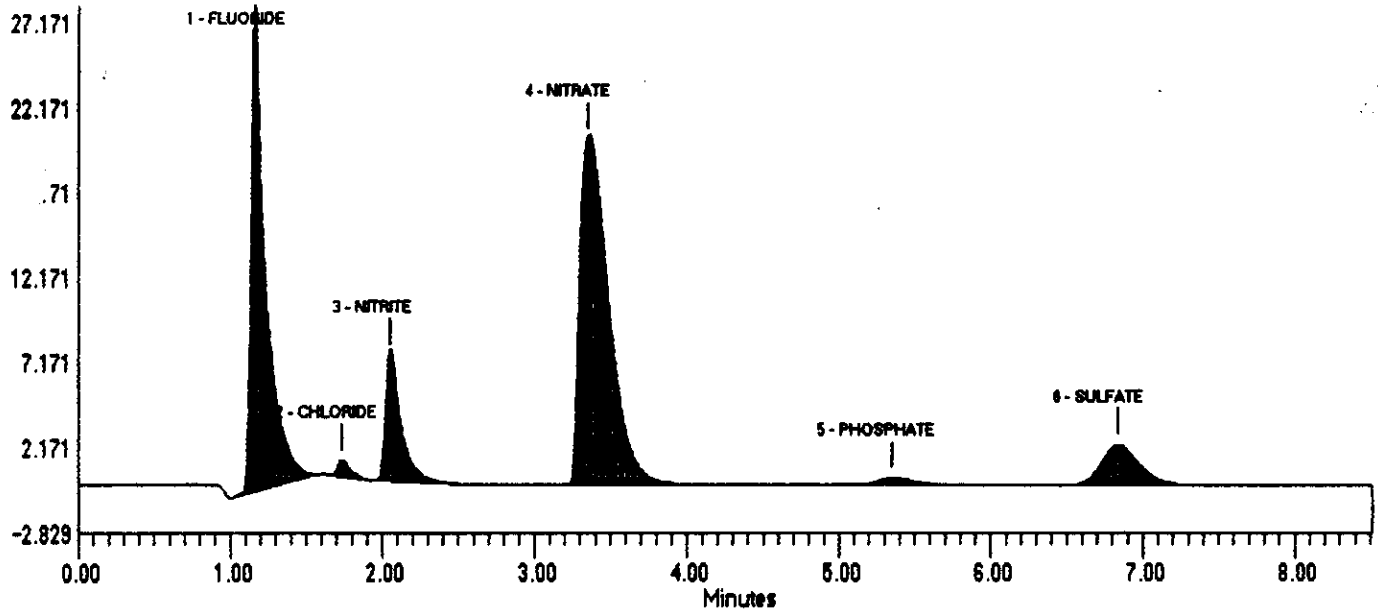


Sample Name: R9409SPIKE Date: Mon Sep 23 15:51:13 1991
Data File : c:\dx\data\91092311.D07
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 7 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	401	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	3750.882	25103	189307	1	0.00
2	1.73	CHLORIDE	244.395	971	5659	1	0.48
3	2.05	NITRITE	3017.511	7405	52412	1	-0.48
4	3.35	NITRATE	15935.713	20406	270067	1	0.04
5	5.35	PHOSPHATE	1144.082	431	6553	1	-0.83
6	6.83	SULFATE	2221.272	2374	41163	1	-1.69

File: c:\dx\data\91092311.D07 Sample: R9409SPIKE



WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: ION CHROMATOGRAPHIC - SULFATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 11:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5575	11		
2	REAGENT BLANK	R9407-5675	12		
3	SAMPLE 2291-2-3	R9409-5775	13		
4	SPIKE OF 2291-2-3	R9409-5975	14		
5	FINAL LMCS CHECK STD	R9412-5575	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA
SPIKE	73C11CM/.05 mL			NA

A-6000-881 (03/92)

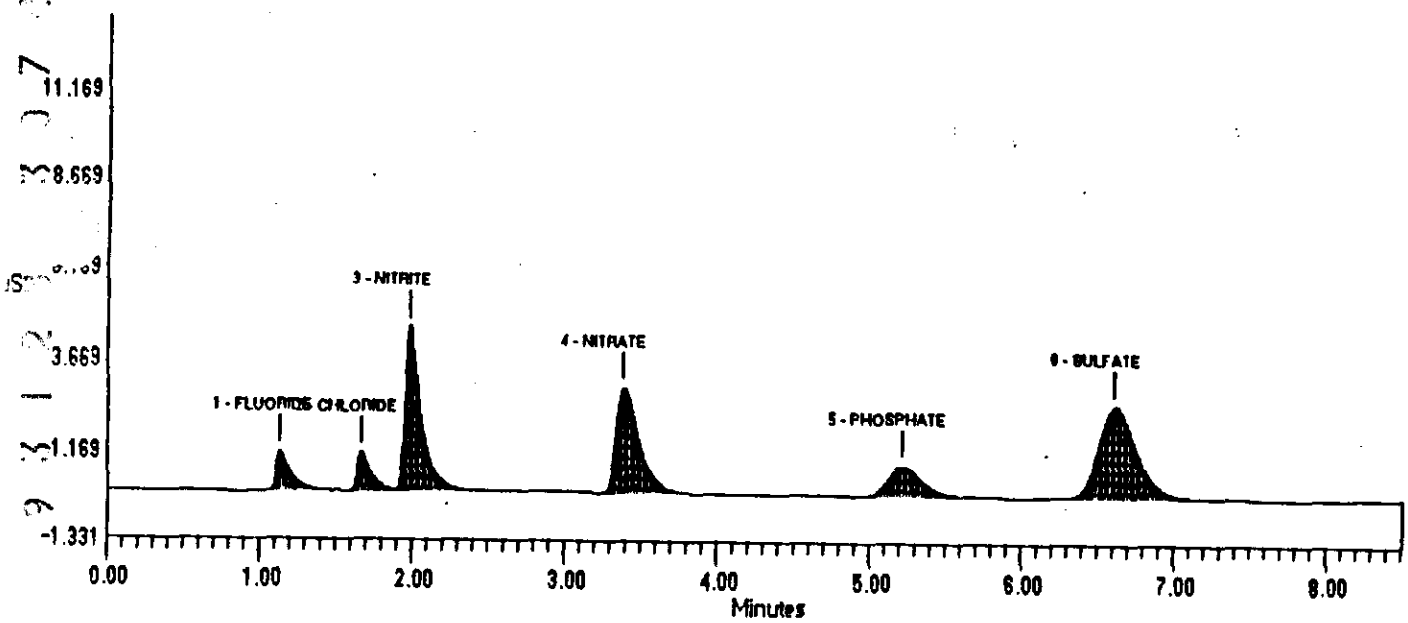
WHC-SD-WM-DP-025
Addendum 3 REV 0

Sample Name: LMCS/73C11CM R9406 8-14-92 Date: Wed Sep 25 13:59:38 1991
Data File : c:\dx\data\91092511.D03
Method : c:\dx\method\SYSTEM1.met
Inst Address: 1 System : 1 Inject#: 3 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.031	1079	7472	1	0.00
2	1.67	CHLORIDE	71.776	1034	6670	2	-1.96
3	1.98	NITRITE	501.818	4487	33395	2	-2.30
4	3.38	NITRATE	530.270	2877	30926	1	2.53
5	5.22	PHOSPHATE	517.102	836	13098	1	-1.88
6	6.62	SULFATE	590.417	2525	43628	1	-3.41

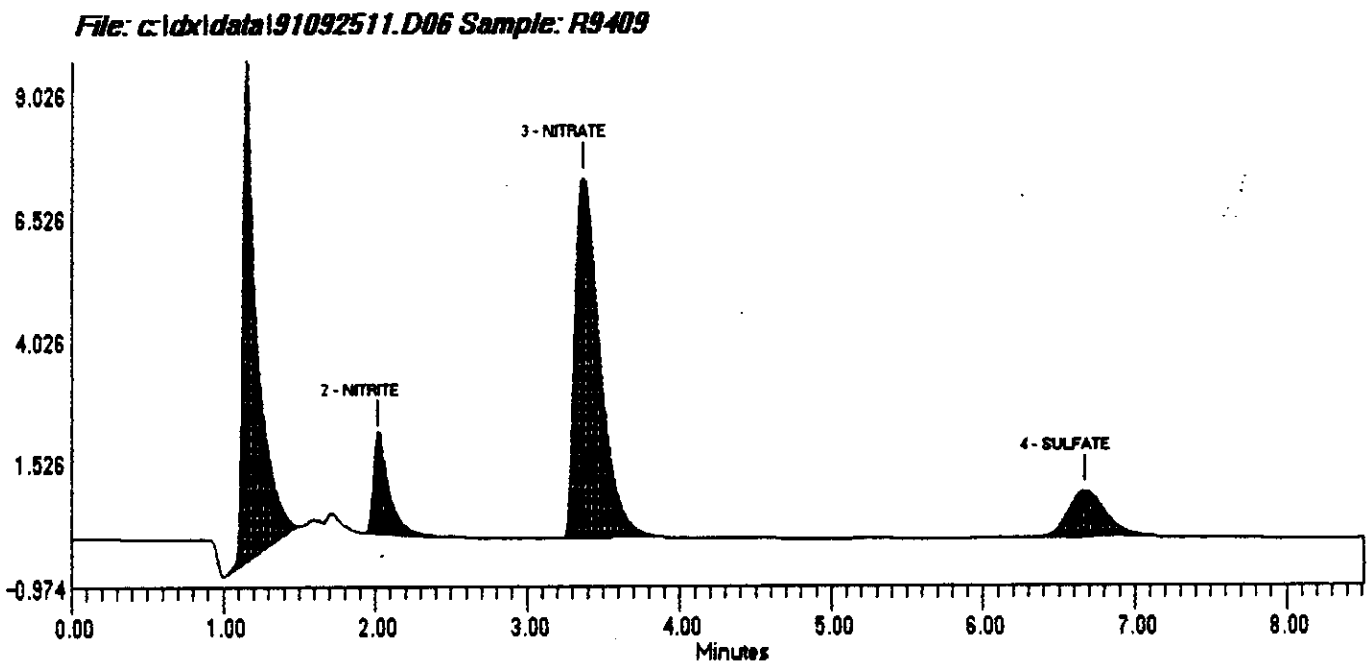
File: c:\dx\data\91092511.D03 Sample: LMCS/73C11CM



Sample Name: R9409 Date: Wed Sep 25 14:30:22 1991
ta File : c:\dx\data\91092511.D06
ethod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 6 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1111	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	4312.914	10212	67203	1	0.00
2	2.02	NITRITE	2608.620	1991	13872	1	-2.10
3	3.37	NITRATE	14824.586	7349	83096	1	0.54
4	6.67	SULFATE	2622.263	922	15797	1	-4.09

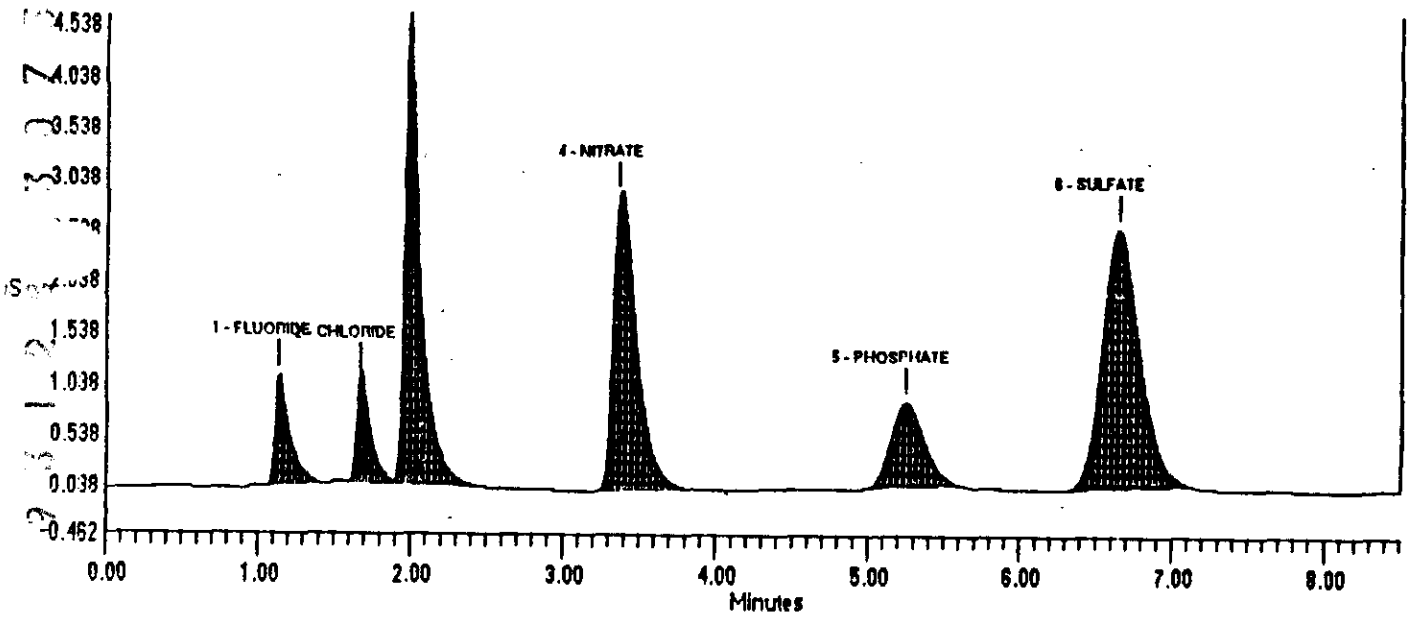


Sample Name: LMCS/73C11CM RG 8/12 8-14-92 Date: Wed Sep 25 15:18:32 1991
Data File : c:\dx\data\91092511.D10
Method : c:\dx\method\SYSTEM1.met
Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Rl. Code	%Delta
1	1.13	FLUORIDE	53.542	1070	7391	1	0.00
2	1.67	CHLORIDE	71.072	1012	6600	2	-1.96
3	1.98	NITRITE	500.223	4495	33278	2	-2.30
4	3.37	NITRATE	534.703	2855	31203	1	2.02
5	5.25	PHOSPHATE	507.540	825	12822	1	-1.25
6	6.65	SULFATE	587.648	2522	43407	1	-2.92

File: c:\dx\data\91092511.D10 Sample: LMCS/73C11CM



ION CHROMATOGRAPHIC ANALYSIS (NITRATE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5573	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	W1BEO	0

Sample Size	Customer ID
? .100mL - 10mL ~~1.0mL~~ SR 9/4/92	STD 73C11CM

Remarks, Calculations, Results

EDP R978 DIONEX
STD #73C11CM RESULT 539.772
STD VAL 564 %REC 95.7%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date 9-25-91 Time Completed Lab Unit Mgr [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5673	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	G/B	W1BEO	0

Sample Size	Customer ID
? 1.0mL direct	REG. BL

Remarks, Calculations, Results

REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date 9-25-91 Time Completed Lab Unit Mgr [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5773	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	G/B	W1BEO	0

Sample Size	Customer ID
? .100mL - 10mL - 1.0mL - 10mL	2291-2-3

Remarks, Calculations, Results

$1.44E^4$ ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date 9-25-91 Time Completed Lab Unit Mgr [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5973	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	W1BEO	0

Sample Size	Customer ID
? 0.25mL - 10mL - .100mL - 10mL	2291-2-3

Remarks, Calculations, Results

SAMPLE SPIKED ID
SPIKE ID 73C11CM
SPIKE VOLUME .05mL

$$\frac{1.234E^5 - 1.44E^4}{(.05)(40801)(539.8)/10.15} \times 100 = 101.2\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date 9-25-91 Time Completed Lab Unit Mgr [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5573	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	W1BEO	0

Sample Size	Customer ID
? .100mL - 10mL	STD 73C11CM

Remarks, Calculations, Results

EDP R978 DIONEX
STD #73C11CM RESULT 540.9
STD VAL 564 %REC 95.9%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date 9-25-91 Time Completed Lab Unit Mgr [signature]

9312130755

ION CHROMATOGRAPHIC ANALYSIS (NITRITE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5576	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO2	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL -10mL
Customer ID: STD73C11CM

Remarks, Calculations, Results:
EDP R968 DIONEX
STD# 73C11CM RESULT 5.1791E2
STD VAL 5.13E2 %REC 100.96%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5676	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO2	LA-533-105	G/G	W1BEO	0

Sample Size: ? 1.0mL direct
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5776	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO2	LA-533-105	G/G	W1BEO	0

Sample Size: ? .100mL - 10mL - 1.0mL - 10mL
Customer ID: 2291-2-3

Remarks, Calculations, Results:

2.64E3 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5976	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO2	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .025mL - 10mL - .100mL - 10mL
Customer ID: 2291-2-3

Remarks, Calculations, Results:
SAMPLE SPIKED ID
SPIKE ID 73C11CM
SPIKE VOLUME .05mL

$$\frac{1.193E^5 - 2.64E^3}{(.05)(40501)(513)/10.05} \times 100 = 114\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5576	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO2	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL - 10mL
Customer ID: STD73C11CM

Remarks, Calculations, Results:
EDP R968 DIONEX
STD# 73C11CM RESULT 509.856
STD VAL 5.13E2 %REC 99.4%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

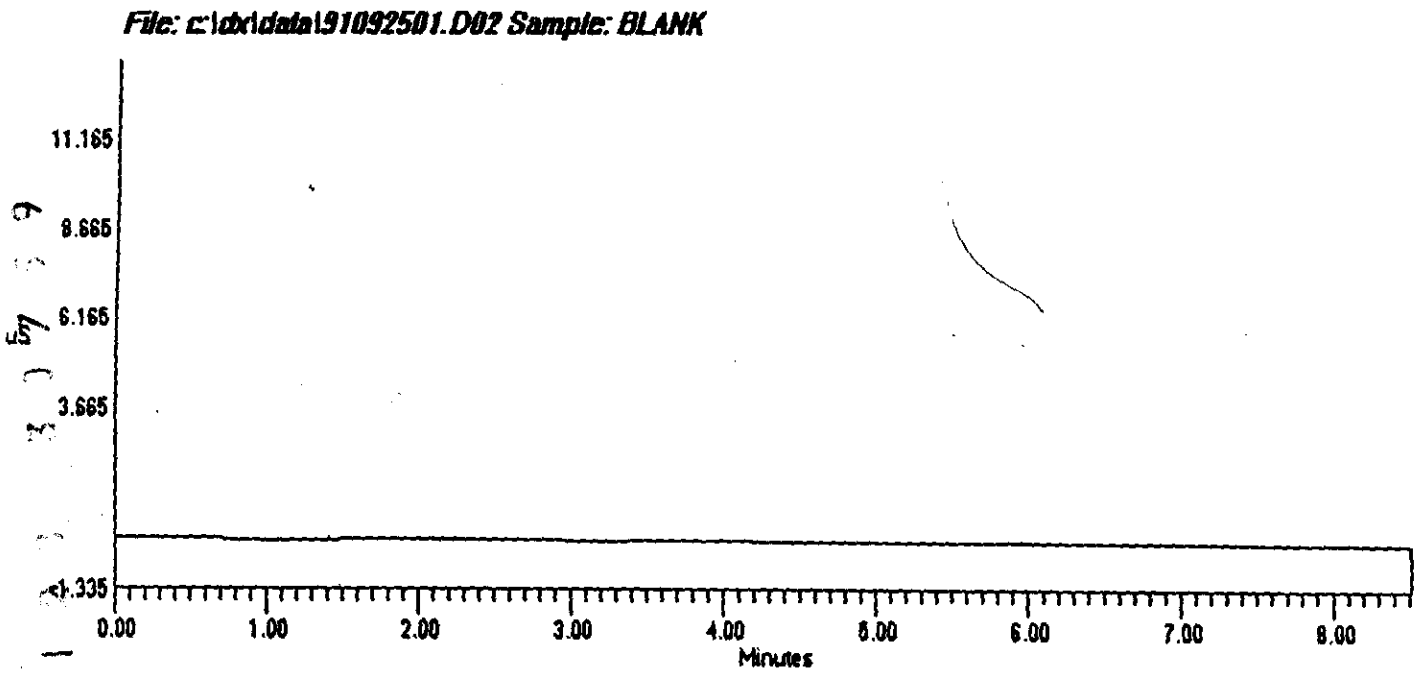
Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

9 3 1 2 1 3 0 7 7

Sample Name: BLANK Date: Wed Sep 25 10:19:25 1991
Data File : c:\dx\data\91092501.D02
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 2 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

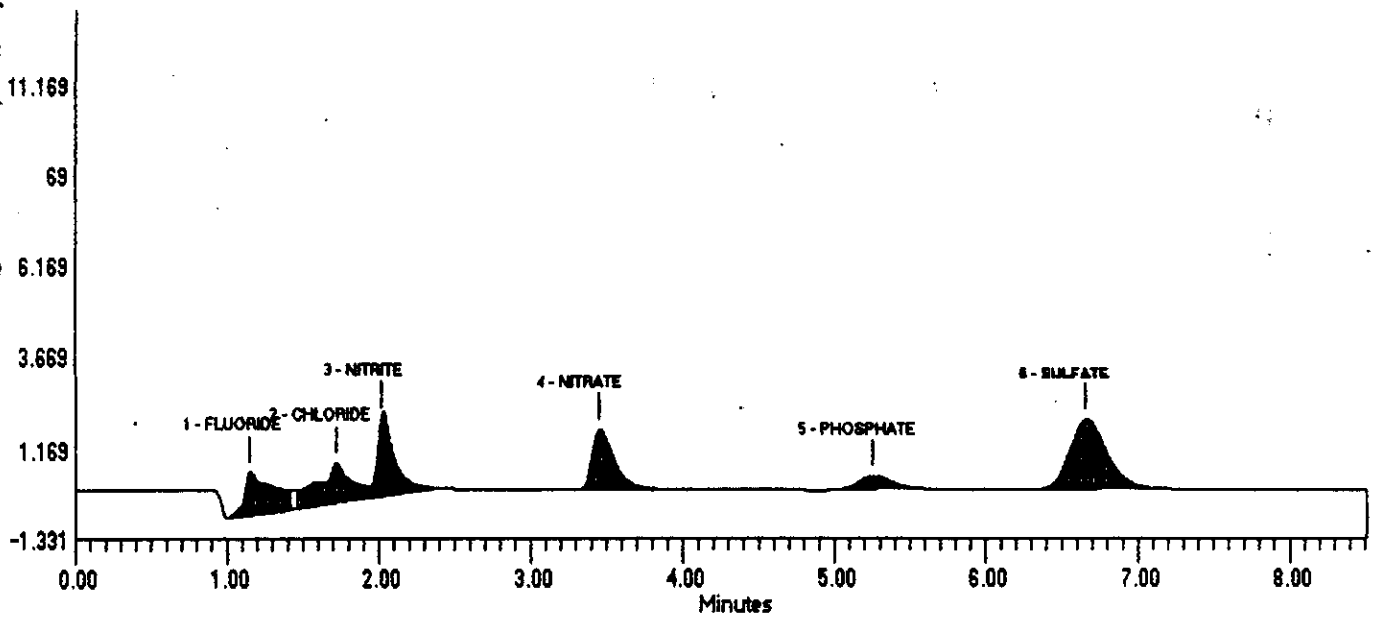


Sample Name: R9409SPIKE Date: Wed Sep 25 11:10:20 1991
ta File : c:\dx\data\91092501.D07
thod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 7 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	40501	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	41363.810	1213	15685	2	0.00
2	1.72	CHLORIDE	72163.742	1131	17488	2	-0.48
3	2.02	NITRITE	119262.095	2158	18320	2	-2.10
4	3.45	NITRATE	123365.846	1673	17062	1	3.03
5	5.25	PHOSPHATE	105348.569	391	5831	1	-2.69
6	6.65	SULFATE	183061.900	1937	32986	1	-4.33

File: c:\dx\data\91092501.D07 Sample: R9409SPIKE



08/26/9
185

9-22-91

4469-AC

DIONEX METHOD PARAMETERS - SYSTEM1.MET

System Parameters

System Name : system1/gpm
Number of Detectors..... 1
Detector 1 Type..... CDM-1
Detector 1 real time plot scale (uS)..... 20.00
Run Time (minutes)..... 8.50
Sampling Rate (seconds)..... 0.20

-- DETECTOR 1 PARAMETERS --

Report Options

Save Data File..... Yes
Data File Name: c:\dx\data\91092201.D08
Create ASCII Report File..... No
Print Report..... Yes
List Peaks Not Found in this run..... No
Report Unknowns Found in this run..... Yes
Print Chromatogram..... Yes
AutoScale Chromatogram to Highest Peak..... Yes
Fill Peaks with Color ..... Yes
Draw Grid Lines on Chromatogram..... No
Label with Peak Number..... Yes
Label with Retention Times on Chromatogram..... No
Label with Component Name..... Yes
Format File Name: c:\dx\method\default.prf

Integration Parameters

Starting Peak Width (seconds)..... 10.0
Peak Threshold (mV or uS/data pt interval)..... 0.500
Peak Area Reject..... 1000
Area Reject for Reference Peaks..... 1000
Percent Retention Time Window for Reference Peaks..... 5.0

Integration Timed Events

Time	Description
1.32	Start peak detection
1.44	Start peak detection
1.46	Start peak detection
1.77	
1.77	Enable end of peak detection

Component # 1 FLUORIDE Retention Time 1.13
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 8.52797E-002
K1 = 6.06440E-005
K2 = -6.17180E-011

Level	Amount	Area	Height
1	1.20000E-001	1439	225
2	3.00000E-001	4035	566
3	6.00000E-001	8217	1141
4	1.20000E+000	16507	2218
5	2.30000E+000	39534	4812
6	4.40000E+000	76890	9371

Component # 2 CHLORIDE Retention Time 1.70
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.93335E-002
K1 = 1.01273E-004
K2 = -9.35560E-011

Level	Amount	Area	Height
1	1.60000E-001	1319	217
2	3.90000E-001	3754	568
3	7.80000E-001	6942	1045
4	1.50000E+000	14461	1975
5	3.00000E+000	30287	3987
6	5.90000E+000	61305	8910

Component # 3 NITRITE Retention Time 2.03
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.88691E-001
K1 = 1.33960E-004
K2 = 5.52630E-012

Level	Amount	Area	Height
1	1.08000E+000	6239	874
2	2.69000E+000	17299	2252
3	5.37000E+000	34328	4729
4	1.06200E+001	72787	9300
5	2.08500E+001	153501	19401
6	4.01500E+001	292053	34439

Component # 4 BROMIDE Retention Time 2.80
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.01960E-002
K1 = 2.00453E-004
K2 = -1.00008E-010

Level	Amount	Area	Height
1	1.56000E+000	7660	753
2	3.90000E+000	20706	1880
3	7.80000E+000	38868	3455
4	1.54000E+001	78061	6644
5	3.02000E+001	165133	12632
6	5.81000E+001	350930	24386

IC Control File: C:\DX\METHOD\SYSTEM1.TE

Step	Time	Description
Init		CDM-1 AutoOffset Off
Init		CDM-1 Recorder Mark OFF
Init		CDM-1 Temp. Comp. = 1.7 / Deg C
Init		CDM-1 Recorder Range = 1.0 uS
Init		CDM-1 Cell ON
Init		CHA Heater = 25 Deg. C
Init		Valve A ON
Init		Valve B ON
Init		Inject Valve OFF
Init		ACI Autosmp OFF
Init		ACI RLY 2 OFF
Init		ACI TTL 1 OFF
Init		ACI TTL 2 OFF
Init		ACI AC 1 ON
Init		GPM Start
Init		GPM Hold Gradient Clock
Init		GPM Reset ON
1	0.0	CDM-1 AutoOffset ON
1	0.0	Start Sampling
1	0.0	GPM Reset OFF
2	0.1	CDM-1 Recorder Range = 10.0 uS
2	0.1	Inject Valve ON
2	0.1	GPM Run Gradient Clock
3	3.0	Inject Valve OFF
4	3.5	ACI Autosmp ON
5	8.0	ACI Autosmp OFF

GpmFile: C:\DX\METHOD\SYSTEM1.GPM
Lo Pressure Limit = 200
Hi Pressure Limit = 2000
Eluant 1 - DI WATER
Eluant 2 - SODIUM CARBONATE
Eluant 3 - SODIUM BICARBONATE
Eluant 4 - Eluant 4

Time	Flow	%1	%2	%3	%4	V5	V6	Comment
0.0	2.0	84	8	8	0	0	0	

VISUAL CHECK AND OVER-THE-TOP READING ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9408.-5000	102AW	6-14-91	12:43	26

Determination	Method/Standard	Result Units	Charge Code	Retune
APPEAR	LA-519-151		W1DEO	0

Sample Size	Customer ID
?	2291-1-3

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-D=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
some solids settled
on bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
MHB				

Date	Time Completed	Last Order Day
6/14/91		Todd A. Pool Kathy Chandelke

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5000	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Retune
APPEAR	LA-519-151		W1DEO	0

Sample Size	Customer ID
?	2291-2-3

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-D=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
no solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
MHB				

Date	Time Completed	Last Order Day
6/14/91		Todd A. Pool Kathy Chandelke

Serial No	Sample Point	Date	Time Issued	Priority
R 9410.-5000	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Retune
APPEAR	LA-519-151		W1DEO	0

Sample Size	Customer ID
?	2291-3-3

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-D=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
aqueous solution
light tint yellow
clarity-clear
solid settled in
bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
MHB				

Date	Time Completed	Last Order Day
6/14/91		Todd A. Pool Kathy Chandelke

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-5000	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Retune
APPEAR	LA-519-151		W1DEO	0

Sample Size	Customer ID
?	2291-4-3

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-D=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
solids-present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C559				
MHB				

Date	Time Completed	Last Order Day
6/14/91		Todd A. Pool Kathy Chandelke

SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406-5506	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Results
SPG	LA-510-112	% RECOVERY	W1BEO	1

Sample Size: 100 100.32 L — Customer ID: STD

Remarks, Calculations, Results:

S332 ZNCL2

STD# 15C11-65 RESULT 1.4270

STD VAL 1.4386 %REC 99.2%

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
92550 Xania Lee				

Date: 8-12-91 — Time Completed: — Lab Unit No.: [signature]

R9406-5506

G - 2.0110
T - 1.8678
N - .1432

G - 2.0530
T - 1.9098
N - .1432

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407-5506	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Results
SPG	LA-510-112	% RECOVERY	W1BEO	1

Sample Size: ? 100.32 L — Customer ID: REG BL

Remarks, Calculations, Results:

REAGENT BLANK

S332 ZNCL2

STD# RESULT 9.9033E-1

STD VAL %REC

T.L. 5.14.92

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
92550 Xania Lee				

Date: 8-12-91 — Time Completed: — Lab Unit No.: [signature]

R9407-5506

G - 2.0005
T - 1.9012
N - .0993

G - 1.9915
T - 1.8921
N - .0994

Serial No.	Sample Point	Date	Time Issued	Priority
R 9410-5706	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Results
SPG	LA-510-112		W1BEO	1

Sample Size: ? 100.52 L — Customer ID: 2291-3-3

Remarks, Calculations, Results:

1.0267

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
92550 Xania Lee				

Date: 8-12-91 — Time Completed: — Lab Unit No.: [signature]

R9410-5706

G - 2.0239
T - 1.9209
N - .1030

G - 1.9413
T - 1.8383
N - .1030

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: DIFFERENTIAL THERMAL	Sample Prep: UNDIGESTED

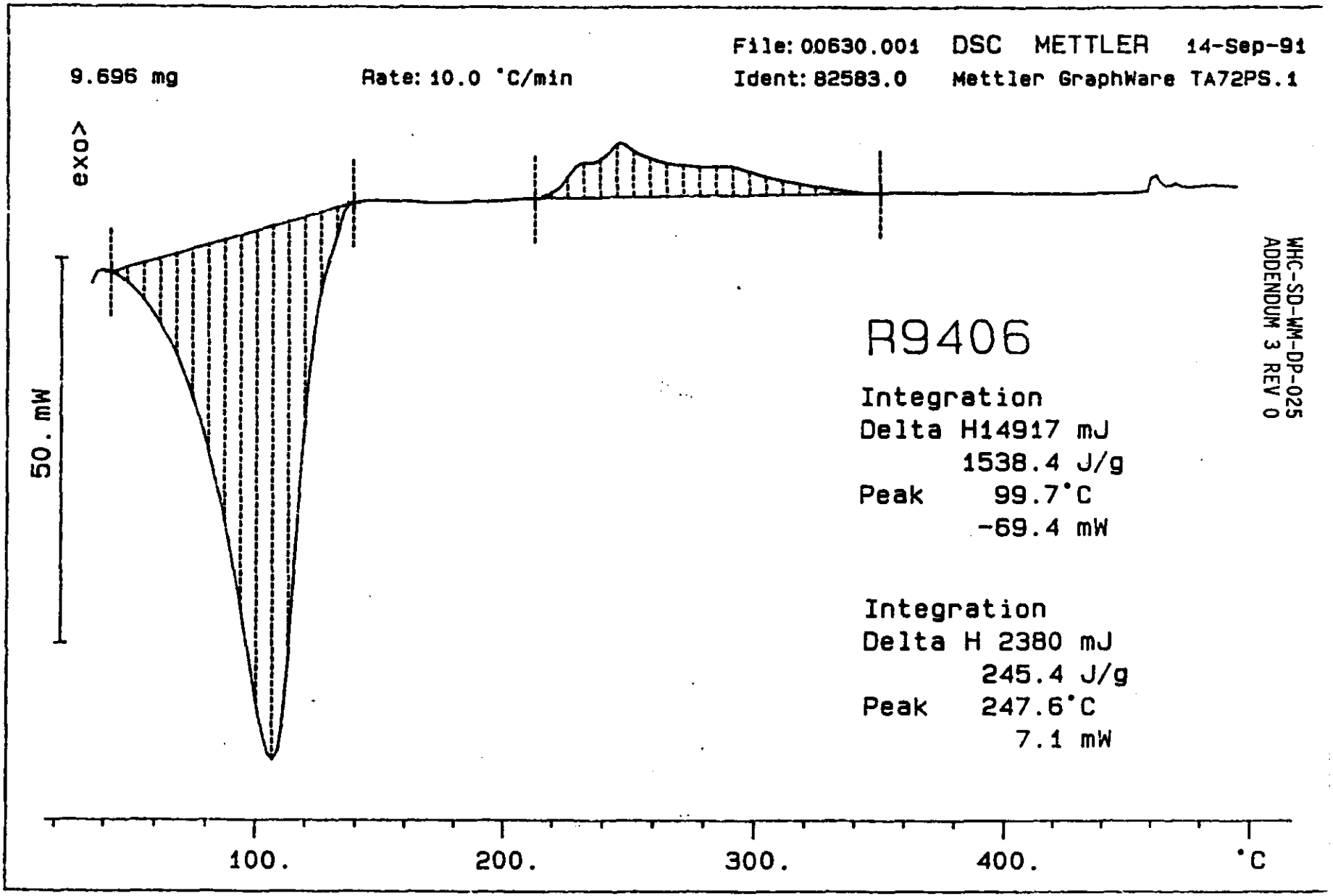
Instrument: WC16134, WC16129	Procedure/Rev: LA-514-113/A-0
Technologist: S. COBB	Date: 09-15-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. HERT

	Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5511
2	REAGENT BLANK	R9407-5611
3	SAMPLE 2291-3-3	R9410-5711
4	FINAL LMCS CHECK STD	R9412-5511
5		
6		
7		
8		
9		
10		

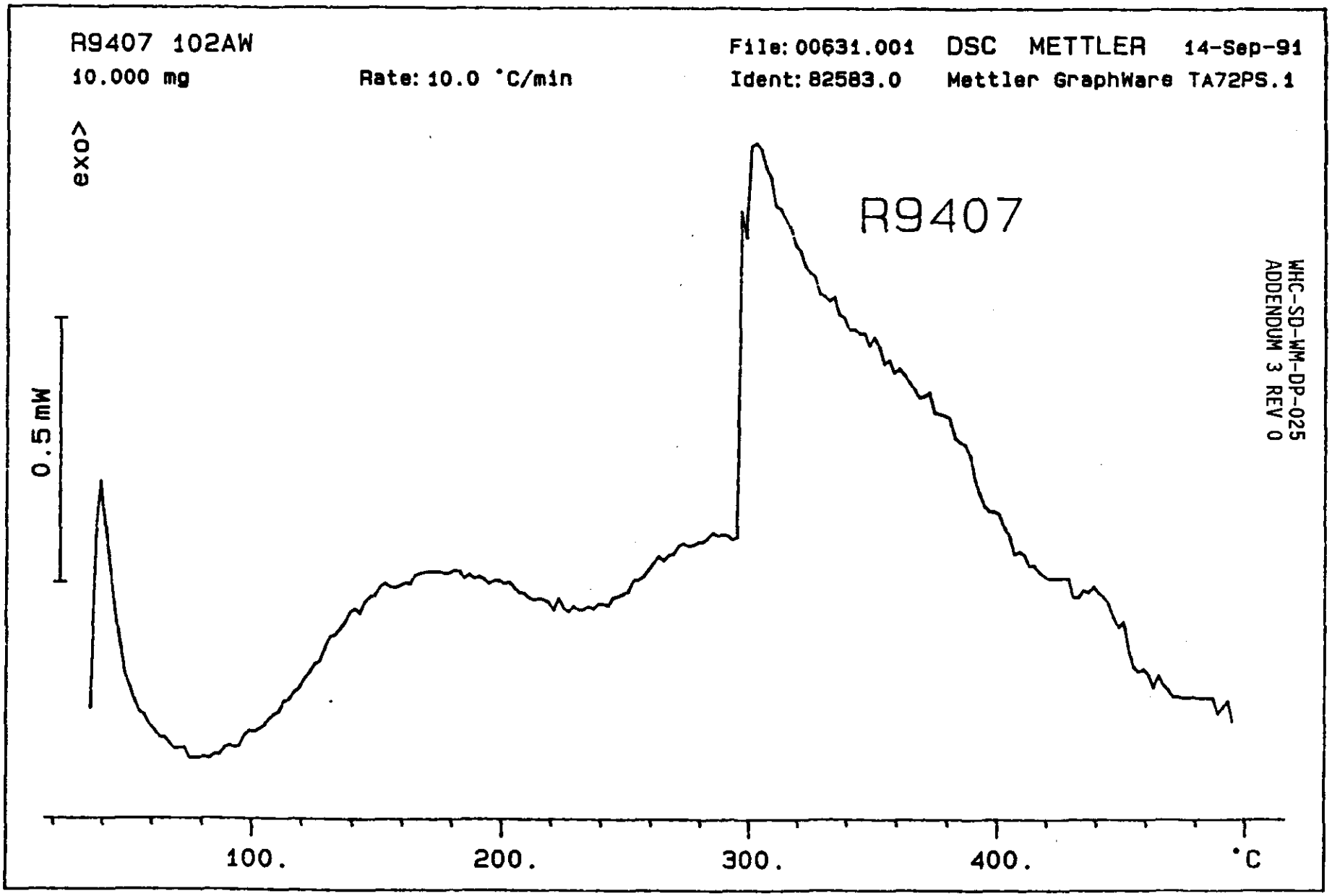
	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

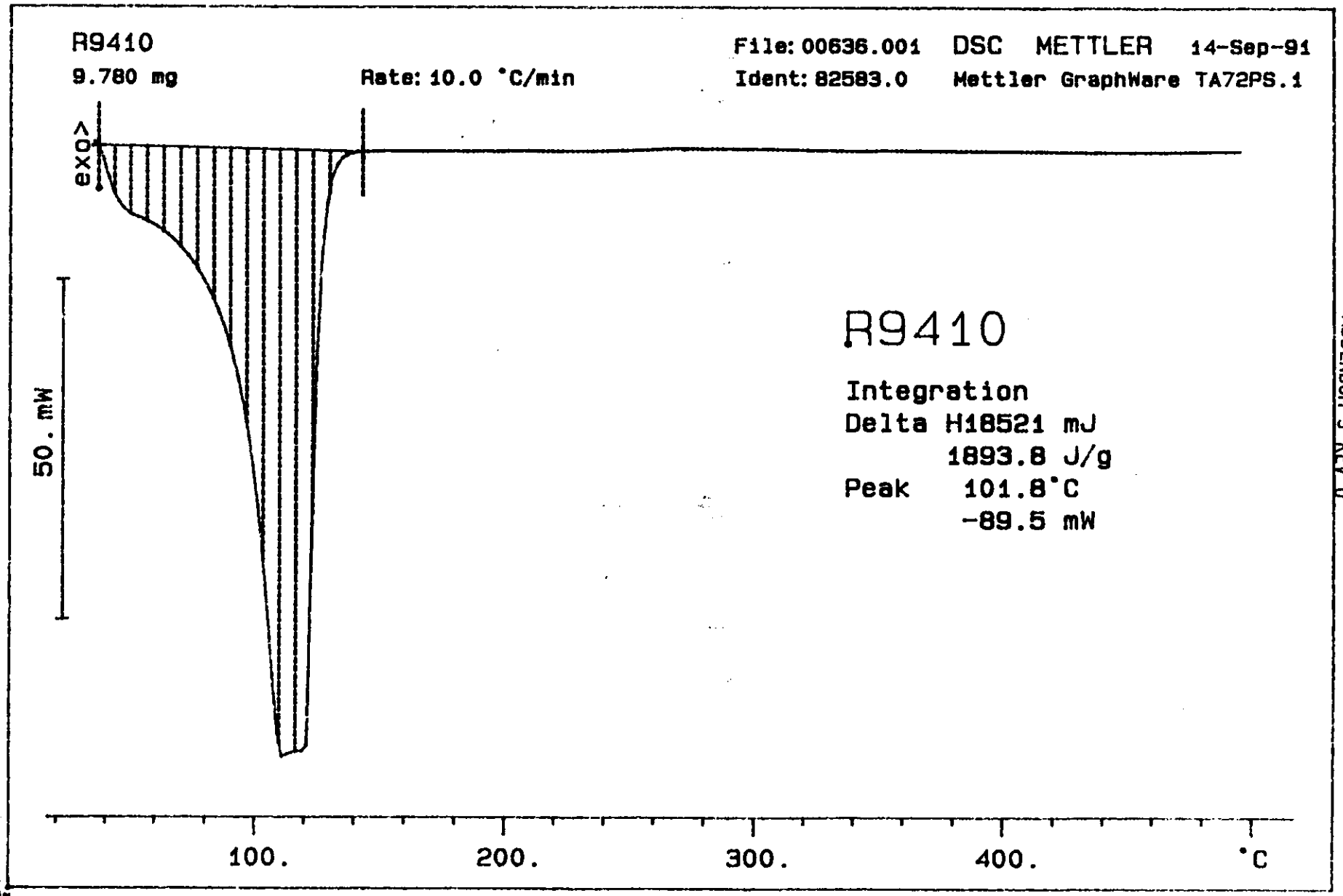
Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	27C11-AZ/.10 mL			NA

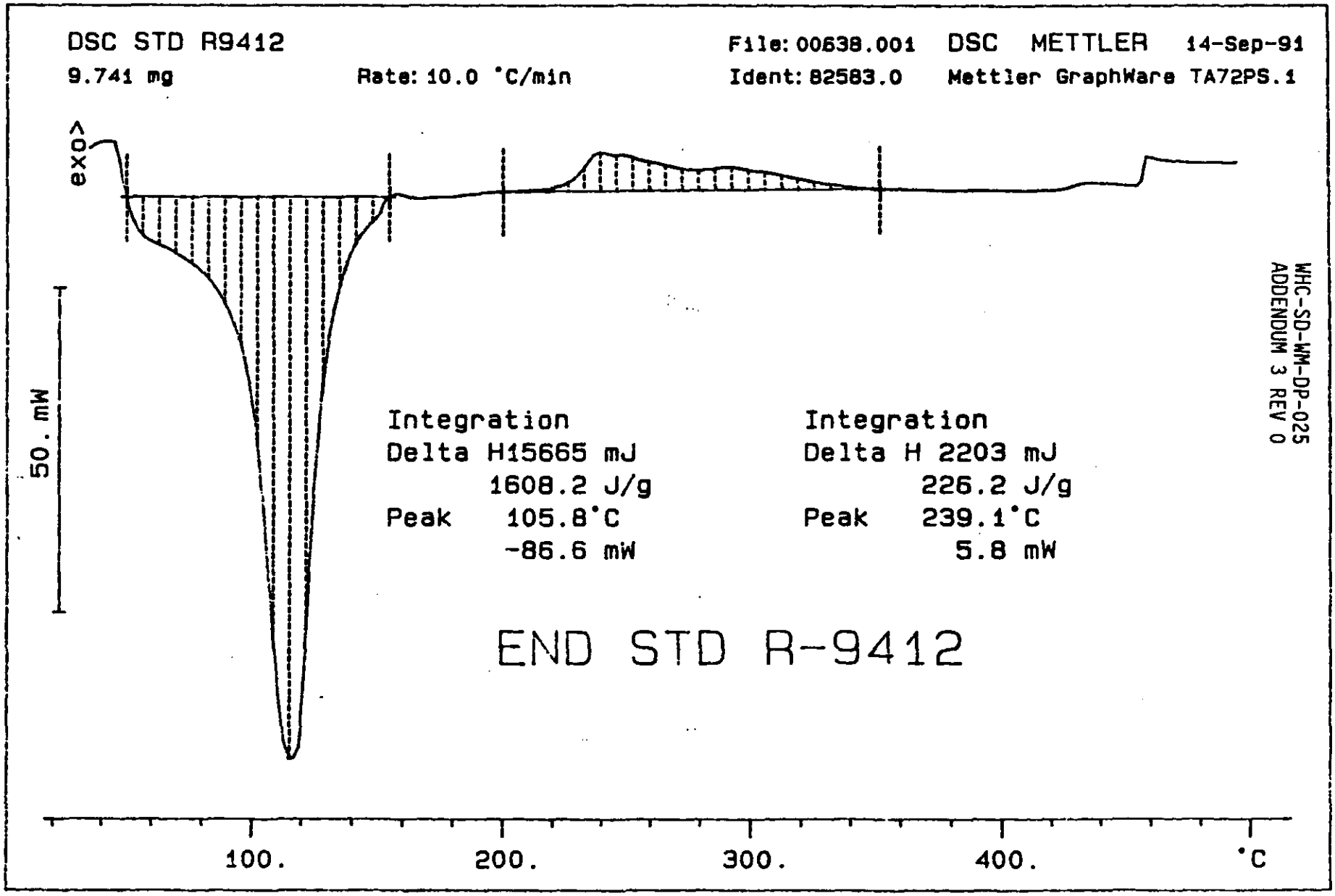
A-6000-881 (03/92)



WHC-SD-WM-DP-025
ADDENDUM 3 REV 0


R9407 102AW
10.000 mg
Rate: 10.0 °C/min
File: 00631.001
Ident: 82583.0
DSC METTLER
Mettler GraphWare TA72PS.1
14-Sep-91
exo>
0.5 mW
R9407
100.
200.
300.
400.
°C


R9410
9.780 mg
Rate: 10.0 °C/min
File: 00636.001
Ident: 82583.0
DSC METTLER 14-Sep-91
Mettler GraphWare TA72PS.1
exo>
50. mW
R9410
Integration
Delta H18521 mJ
1893.8 J/g
Peak 101.8°C
-89.5 mW
100.
200.
300.
400.
°C



WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: TOTAL ORGANIC CARBON	Sample Prep: UNDIGESTED

Instrument: MODEL 5011-WC16130	Procedure/Rev: LA-344-105/A-3
Technologist: E. COLVIN	Date: 06-27-91
Starting Time: 08:00	Temperature: NA
Ending Time: 14:00	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5526	11		
2	REAGENT BLANK	R9407-5626	12		
3	SAMPLE 2291-3-3	R9410-5726	13		
4	FINAL LMCS CHECK STD	R9412-5526	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	70C11H/.200 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9406 Date: 06-27-1991 Time: 09:01:20

Blank = .670791 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	39.20	100.00
3	3.01	51.80	24.32
4	4.01	55.70	7.00
5	5.01	57.80	3.63
6	6.01	59.20	2.36
7	7.01	60.20	1.66

(60.2 - 4.7)(11)/(200) = 3.0525 g/L Carbon

(60.2 - 4.7)(11)/(200)(12) = .254375 Molar Carbon

Sample Run By: 8002B_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9410 Date: 06-27-1991 Time: 09:58:23

Blank = .670791 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	6.30	100.00
3	3.01	9.30	32.26
4	4.01	11.00	15.45
5	5.01	12.50	12.00
6	6.01	13.40	6.72
7	7.01	14.10	4.96

(14.1 - 4.699344)(11)/(200) = .5170361 g/L Carbon

(14.1 - 4.699344)(11)/(200)(12) = 4.308634E-02 Molar Carbon

Sample Run By: 80028_____

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: TOTAL INORGANIC CARBON	Sample Prep: UNDIGESTED

Instrument: WB39927	Procedure/Rev: LA-622-102/B-0
Technologist: E. COLVIN	Date: 09-04-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5527	11		
2	REAGENT BLANK	R9407-5627	12		
3	SAMPLE 2291-3-3	R9410-5727	13		
4	SAM DUP 2291-3-3	R9410-5827	14		
5	FINAL LMCS CHECK STD	R9412-5527	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	69C11K/.050 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: E-9406 Date: 09-04-1991 Time: 09:51:44

Blank = .5424173 Sample Size = 50 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	104.90	100.00
3	3.01	119.70	12.36
4	4.01	124.20	3.62
5	5.01	125.30	0.88
6	6.01	125.90	0.48
7	7.01	126.40	0.40

(126.4 - 3.800099)(1)/(50) = 2.451998 g/L Carbon

(126.4 - 3.800099)(1)/(50)(12) = .2043332 Molar Carbon

Sample Run By: 80028

08/20/92
279

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9410 Date: 09-04-1991 Time: 10:43:11

Blank = .5424173 Sample Size = 50 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	42.30	100.00
3	3.01	50.70	16.57
4	4.01	54.30	6.63
5	5.01	55.50	2.16
6	6.01	56.50	1.77
7	7.01	57.20	1.22

(57.2 - 3.8)(1)/(50) = 1.068 g/L Carbon

(57.2 - 3.8)(1)/(50)(12) = .089 Molar Carbon

Sample Run By: 80028

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9412 Date: 09-04-1991 Time: 12:47:05

Blank = .5424173 Sample Size = 50 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	97.30	100.00
3	3.01	116.90	16.77
4	4.01	123.40	5.27
5	5.01	125.50	1.67
6	6.01	126.70	0.95
7	7.01	127.10	0.31

(127.1 - 3.8)(1)/(50) = 2.466 g/L Carbon

(127.1 - 3.8)(1)/(50)(12) = .2055 Molar Carbon

Sample Run By: 80028

213

08/26/92
~~283~~

AMMONIA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Sample No	Sample Point	Date	Time Issued	Priority
K 9406.-5526	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Results
NH4	LA-634-102	% RECOVERY	W1BEO	0

Sample Size: ? 25ml .09941 m HCl — Customer ID: BID

Remarks, Calculations, Results:
S235 NHHCL
BLK 29
STD 158
STD# 42/1 QL RESULT 5.13E-2
STD VAL 5.30E-2 m %REC 96.8%
(158-29)(.09941)/250 =

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
82583				
SL Cobb				
08-23-91				

Sample No	Sample Point	Date	Time Issued	Priority
K 9407.-5620	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Results
NH4	LA-634-102	G/G	W1BEO	1

Sample Size: ? .09941 m HCL — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
BLK 29
29
(210)(.09941)(1000 = 2.94E-4 m
Lost original Card

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
82583				
SL Cobb				
4-9-92 08-23-91				

Sample No	Sample Point	Date	Time Issued	Priority
K 9410.-5726	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Results
NH4	LA-634-102	G/G	W1BEO	0

Sample Size: ? 1ml .09941 m HCl — Customer ID: 2291-3-3

Remarks, Calculations, Results:
BLK 29
Sample 61
(61-29)(.09941)/1000 =
3.18E-3 m

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
82583				
SL Cobb				
08-23-91				

Sample No	Sample Point	Date	Time Issued	Priority
K 9410.-5826	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Results
NH4	LA-634-102	G/G	W1BEO	0

Sample Size: ? 1ml .09941 m HCl — Customer ID: 2291-3-3

Remarks, Calculations, Results:
DUPLICATE SAMPLE
BLK 29
Sample 67
(67-29)(.09941)/1000 =
3.78E-3m

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
82583				
SL Cobb				
08-23-91				

Sample No	Sample Point	Date	Time Issued	Priority
K 9412.-5526	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Results
NH4	LA-634-102	% RECOVERY	W1BEO	0

Sample Size: ? 250ul .09941 m HCl — Customer ID: BID

Remarks, Calculations, Results:
S235 NHHCL
BLK 29
STD 156
STD# 42/1 QL RESULT 5.05E-2
STD VAL 5.30E-2 %REC 95.3%
(156-29)(.09941)/250 = 5.05E-2

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
82583				
SL Cobb				
08-23-91				

DETERMINATION OF HYDROXIDE ION IN SOLUTION - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5529	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	% RECOVERY	WIDEO	0

Sample Size: ? .100 ml — Customer ID: STD

Remarks, Calculations, Results:
S273 ITS-OH
STDN 9C11AF RESULT 1.01
STD VAL 1.013 %REC 99.7%
.1905 ≈ HNO3
1 ml BaCl
3 ml Q-H2O
(537-8)(.1905)/100 =

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
LC559				
[signature]				[signature]

Date: 9/10/91 — Time Completed: — Lab Unit Mgr: [signature] [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5629	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	M	WIDEO	0

Sample Size: ? 3 ml Q-H2O — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
.1905 ≈ HNO3
(8)(.1905) / 3000 = 5.08E-4 m

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
LC559				
[signature]				

Date: 9/10/91 — Time Completed: — Lab Unit Mgr: [signature] [signature]

R 9410 [illegible]

Serial No	Sample Point	Date	Time Issued	Priority
R [illegible] -5729	102AW	6-14-91	12:54	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	M	WIDEO	0

Sample Size: ? .250 ml — Customer ID: [illegible] 3/14/92 2291-3-2

Remarks, Calculations, Results:
Its-OH (9C11AF) .100 ml
1 ml BaCl
10 ml Q-H2O
.1905 ≈ HNO3
(768.5-537)(.1905)/250 = 1.76E-1 m
used aliquot of R 9403 (2291-3-2)

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
LC559				
[signature]				[signature]

Date: 9/11/91 — Time Completed: — Lab Unit Mgr: [signature] [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R [illegible] -5829	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	M	WIDEO	0

Sample Size: ? .250 ml — Customer ID: [illegible] 3/14/92 2291-3-2

Remarks, Calculations, Results:
DUPLICATE SAMPLE
Its-OH (9C11AF) .100 ml
1 ml BaCl
10 ml Q-H2O
.1905 ≈ HNO3
(776-537)(.1905)/250 = 1.82E-1 m
Used aliquot of R 9403 (2291-3-2)

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
LC559				
[signature]				

Date: 9/11/91 — Time Completed: — Lab Unit Mgr: [signature] [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5529	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
OH	LA-661-102	% RECOVERY	WIDEO	0

Sample Size: ? .100 ml — Customer ID: STD

Remarks, Calculations, Results:
S273 ITS-OH
STDN 9C11AF RESULT 1.01
STD VAL 1.013 %REC 99.7%
1 ml BaCl
.1905 ≈ HNO3
1.01 m/
(538-8)(.1905)/100 =

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
LC559				
[signature]				[signature]

Date: 9/10/91 — Time Completed: — Lab Unit Mgr: [signature] [signature]

DOCUMENTATION SEP 10 1991 8:10 AM

ANALYST: 6559 LOCATION: 222-S 200 West

TITRANT: .1905 M HNO3

INDICATING ELECTRODE:

REFERENCE ELECTRODE: 98% efficiency

SAMPLE:

SETUP PARAMETERS

MODE:	DIRECT READ PH
ELECTRODE STDZ:	PH
EQUILIBRATION TIME, SEC:	15

MODE:	DRV TITRATION
ELECTRODE STDZ:	PH
dE/dV SIGN:	+
ML LIMIT:	2.50
PH LIMIT:	3.
TITRATION RATE:	10
SENSITIVITY:	1
DISPENSE, ML:	0.
PLOT GAIN:	5
COMPUTATION:	CONCENTRATION
TITRANT NORMALITY:	0.1900
SOLVENT BLANK:	0.
MULTIPLIER:	0.

LAST ELECTRODE STANDARDIZATION: SEP 10 1991 8:10 AM

SAMPLE NUMBER: 1
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:21 AM

SAMPLE NUMBER: 2
DIRECT READ PH: 5.334

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:23 AM

SAMPLE NUMBER: 3
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

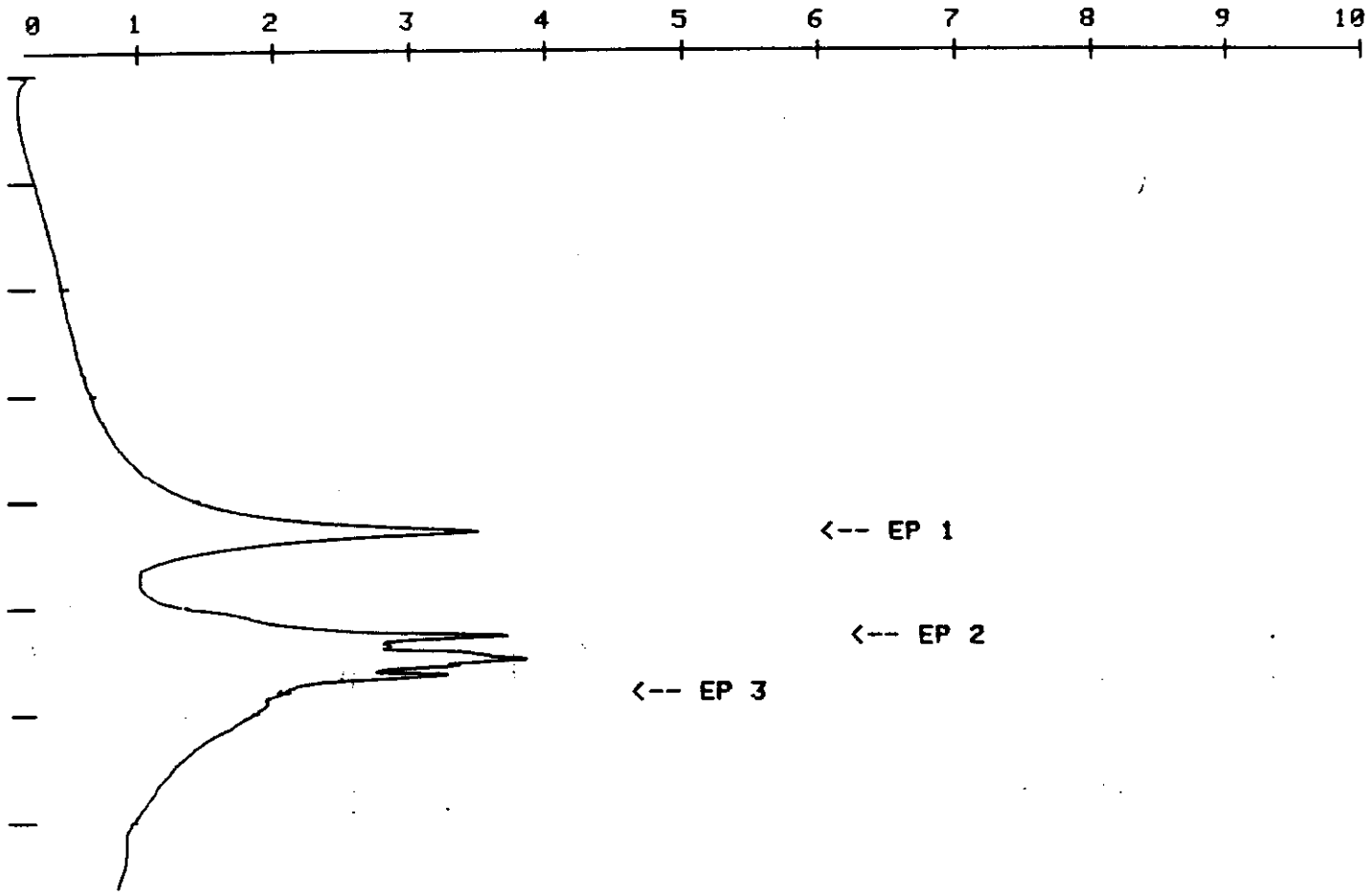
0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SAMPLE NUMBER: 2
DIRECT READ PH: 11.994
R-9406 std
8-14-92

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.62	0.536	0.0000
7.78	0.659	0.0000
4.53	0.722	0.0000

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:43 AM

BEST AVAILABLE COPY

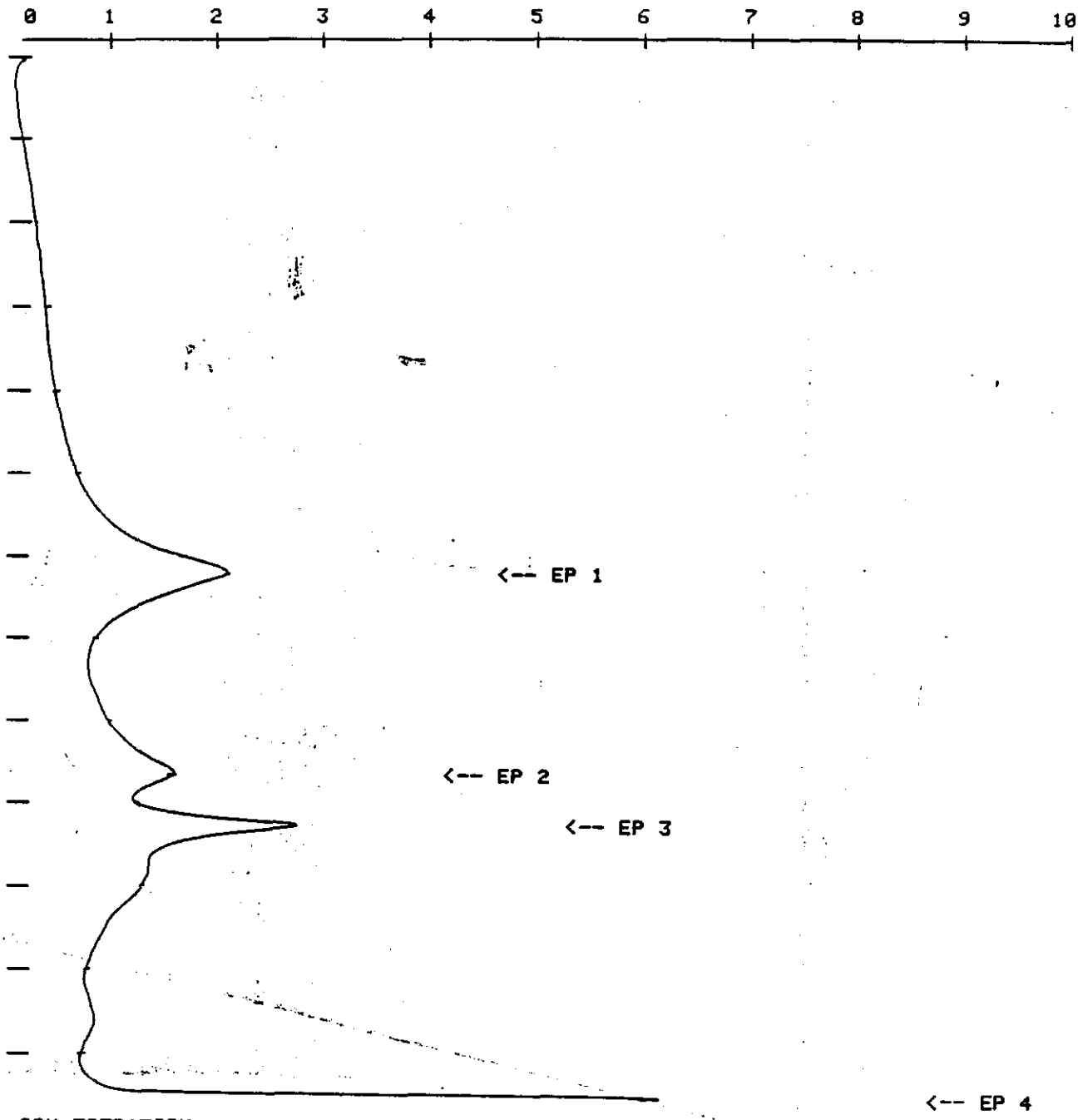
JMMAR 08/20/92

BEST AVAILABLE COPY

SAMPLE NUMBER: 7710
SAMPLE DATA: [redacted] duplicate
DIRECT READ PH: 11.875

8-14-92

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.91	0.776	0.0000
8.22	1.083	0.0000
7.06	1.160	0.0000
3.77	1.565	0.0000

TITRATION TERMINATED BY LIMIT ON NUMBER OF EQUIVALENCES PERMISSIBLE.

SEP 11 1991 9:01 AM

223

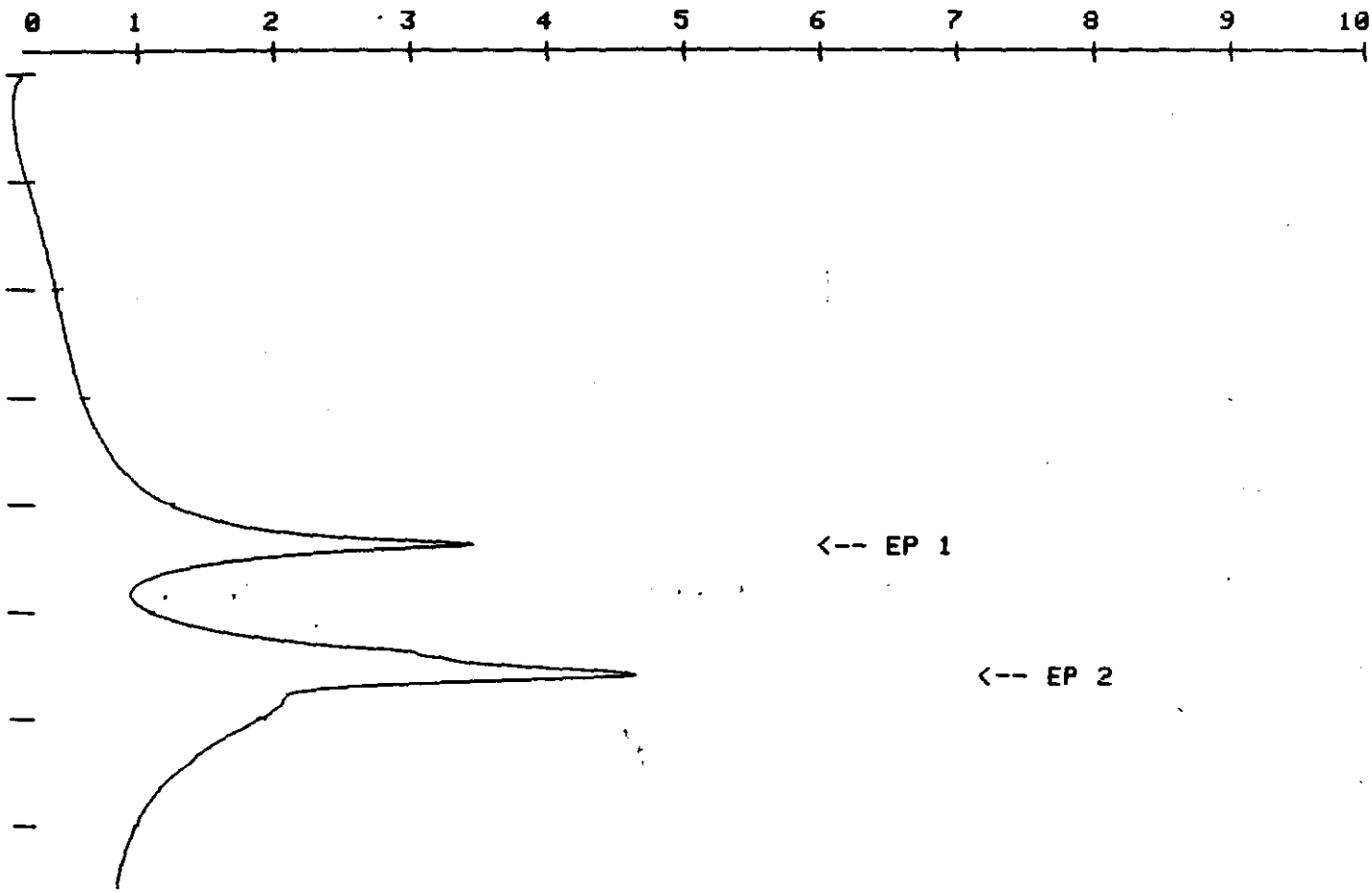
08/20/92

226

BEST AVAILABLE COPY

SAMPLE NUMBER: 1
SAMPLE DATA: 9412.
DIRECT READ PH: 11.999

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.68	0.547	0.0000
5.63	0.700	0.0000

TITRATION TERMINATED BY PH LIMIT.

SEP 11 1991 10:03 AM

January 08/20/92

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: CYANIDE	Sample Prep: UNDIGESTED

Instrument: MILTON ROY SPEC. 301 AL10724	Procedure/Rev: LA-695-102/A-3
Technologist: E. COLVIN	Date: 06-27-91
Starting Time: 08:00	Temperature: NA
Ending Time: 15:00	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9409-5578	11		
2	REAGENT BLANK	R9409-5678	12		
3	SAMPLE 2291-3-3	R9410-5778	13		
4	SPIKE OF 2291-3-3	R9410-5978	14		
5	FINAL LMCS CHECK STD	R9411-5578	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	75C11P/.100 mL			NA
SPIKE	75C11P/.100 mL			NA

A-6000-881 (03/92)

TODAYS DATE: 6-27-91

ROLL NO.: 80028

Y-INTERCEPT= CAL
SLOPE= CAL

SAMPLE ID#: BLANK
SAMPLE SIZE: 0
WVL AND ABS= 580NM 0.004 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-50UL
WVL AND ABS= 580NM 0.094 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.848 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-1ML
WVL AND ABS= 580NM 1.628 A HI

Y-INTEC. .013899
6-15-92 SLOPE .162164
CC = .999801

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: ION CHROMATOGRAPHIC - CHLORIDE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 05-18-92
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5572	11		
2	REAGENT BLANK	R9407-5672	12		
3	SAMPLE 2291-3-3	R9410-5772	13		
4	FINAL LMCS CHECK STD	R9412-5572	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: ION CHROMATOGRAPHIC - FLUORIDE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 05-18-92
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5571	11		
2	REAGENT BLANK	R9407-5671	12		
3	SAMPLE 2291-3-3	R9410-5771	13		
4	FINAL LMCS CHECK STD	R9412-5571	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: ION CHROMATOGRAPHIC - SULFATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5575	11		
2	REAGENT BLANK	R9407-5675	12		
3	SAMPLE 2291-3-3	R9410-5775	13		
4	FINAL LMCS CHECK STD	R9412-5575	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

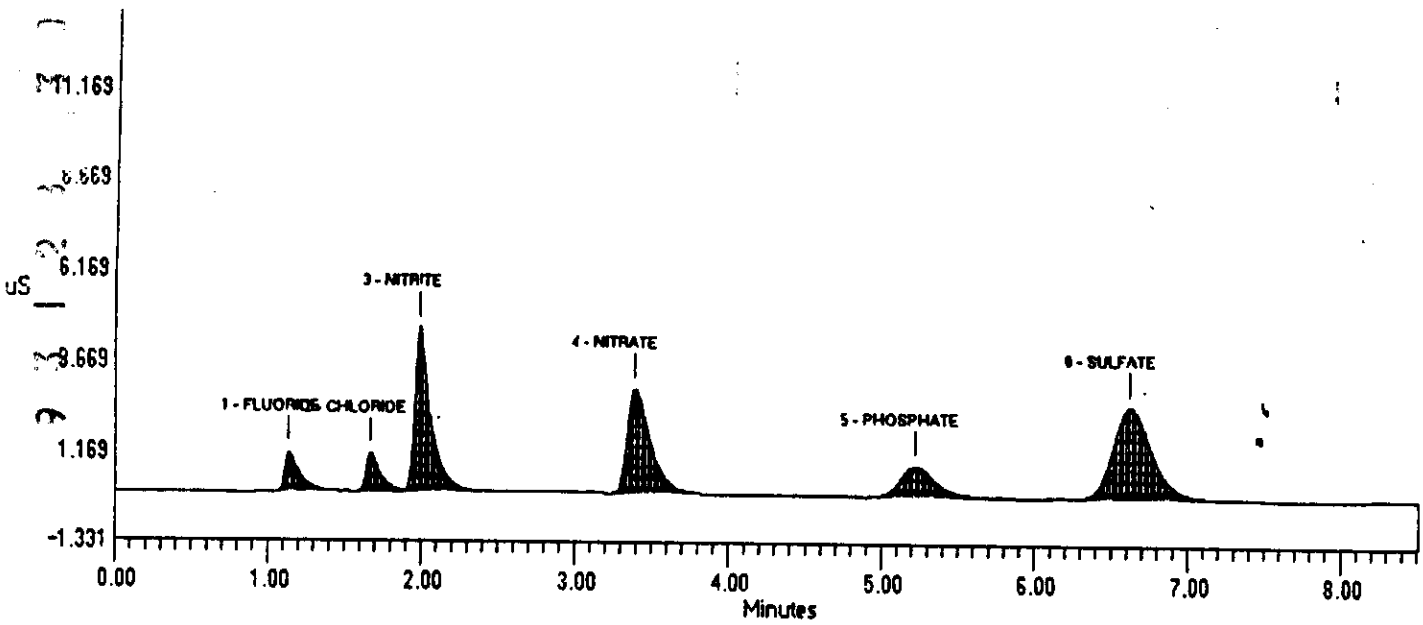
A-6000-881 (03/92)

ample Name: LMCS/73C11CM R9406 JK 7-22-92 Date: Wed Sep 25 13:59:38 1991
Data File : c:\dx\data\91092511.D03
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 3 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.031	1079	7472	1	0.00
2	1.67	CHLORIDE	71.776	1034	6670	2	-1.96
3	1.98	NITRITE	501.818	4487	33395	2	-2.30
4	3.38	NITRATE	530.270	2877	30926	1	2.53
5	5.22	PHOSPHATE	517.102	836	13098	1	-1.88
6	6.62	SULFATE	590.417	2525	43628	1	-3.41

File: c:\dx\data\91092511.D03 Sample: LMCS/73C11CM



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06/20/92
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DATA REPROCESSED ON Tue May [illegible]

[illegible]

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[illegible]	[illegible]	[illegible]	[illegible]	2555	5Hz	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	Concentration	Height	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	502.525	574	[illegible]
[illegible]	[illegible]	[illegible]	2946.585	2098	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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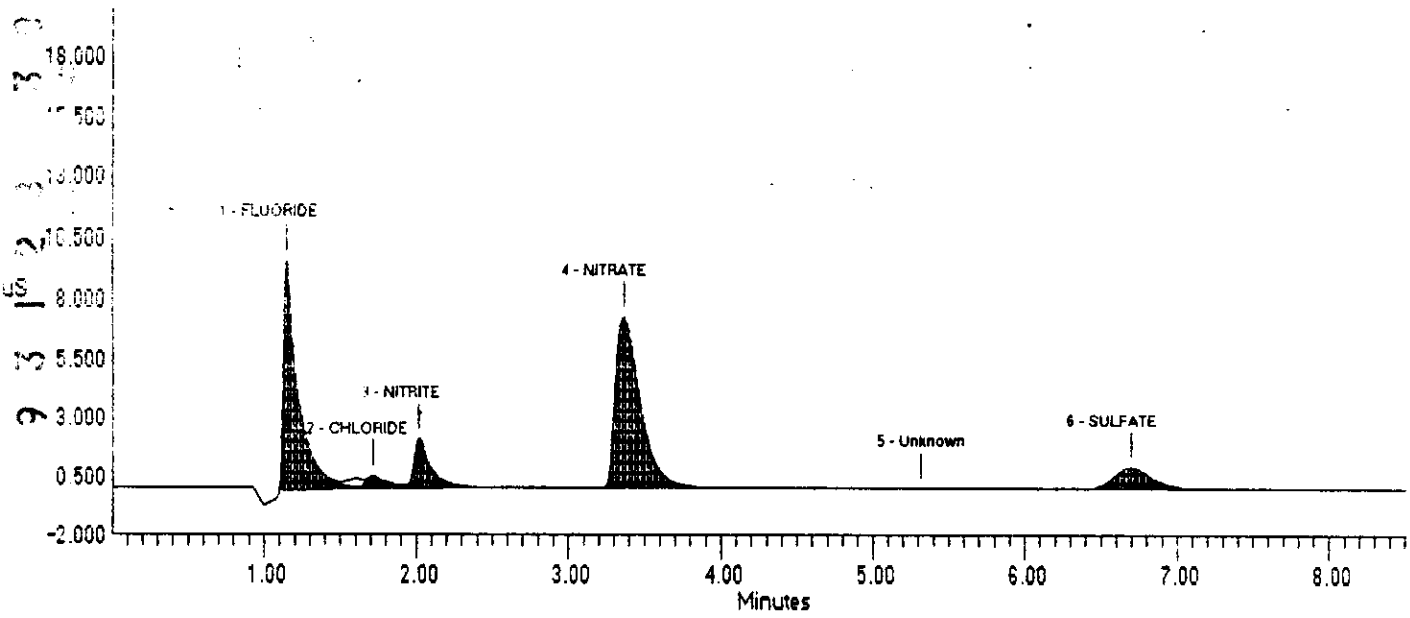
File: A:\91092511.D08 Sample: R9410



Data reprocessed for accuracy of F & Cl conc.

Denise J. Hert

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JMH 08/20/92

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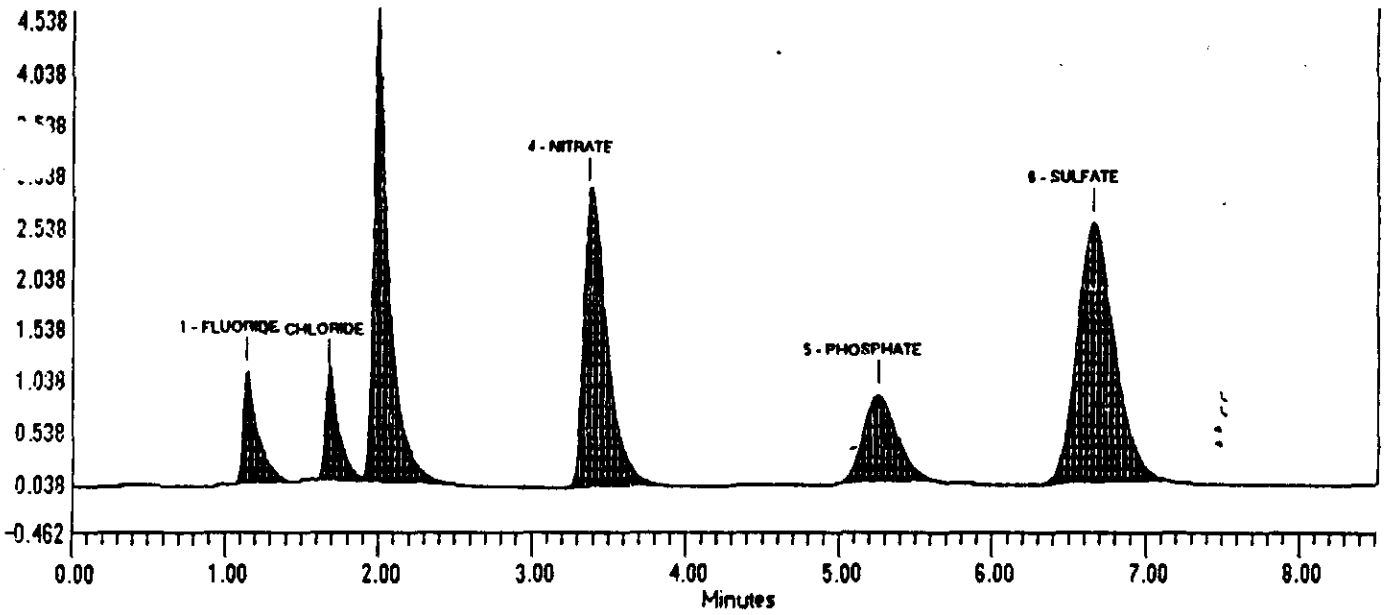
Sample Name: LMCS/73C11CM R9412 DKL 7-22-92 Date: Wed Sep 25 15:18:32 1991
Data File : c:\dx\data\91092511.D10
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	53.542	1070	7391	1	0.00
2	1.67	CHLORIDE	71.072	1012	6600	2	-1.96
3	1.98	NITRITE	500.223	4495	33278	2	-2.30
4	3.37	NITRATE	534.703	2855	31203	1	2.02
5	5.25	PHOSPHATE	507.540	825	12822	1	-1.23
6	6.65	SULFATE	587.648	2522	43407	1	-2.92

File: c:\dx\data\91092511.D10 Sample: LMCS/73C11CM



Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5574	102AW	6-14-91	12:36	26

Determination	Method Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL -10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDP R976 DIONEX
STD# 5.17E² RESULT 536.303
STD VAL 73C11Cm %REC 103.7%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5674	102AW	6-14-91	12:39	26

Determination	Method Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	G/G	W1BEO	0

Sample Size: ? 1.0mL direct
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9410.-5774	102AW	6-14-91	12:52	26

Determination	Method Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	G/G.	W1BEO	0

Sample Size: ? .100mL - 10mL
Customer ID: 2291-3-3

Remarks, Calculations, Results:

1.74E² ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5574	102AW	6-14-91	12:59	26

Determination	Method Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL - 10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDP R976 DIONEX
STD# 73C11Cm RESULT 524.991
STD VAL 517.0 %REC 101.5%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

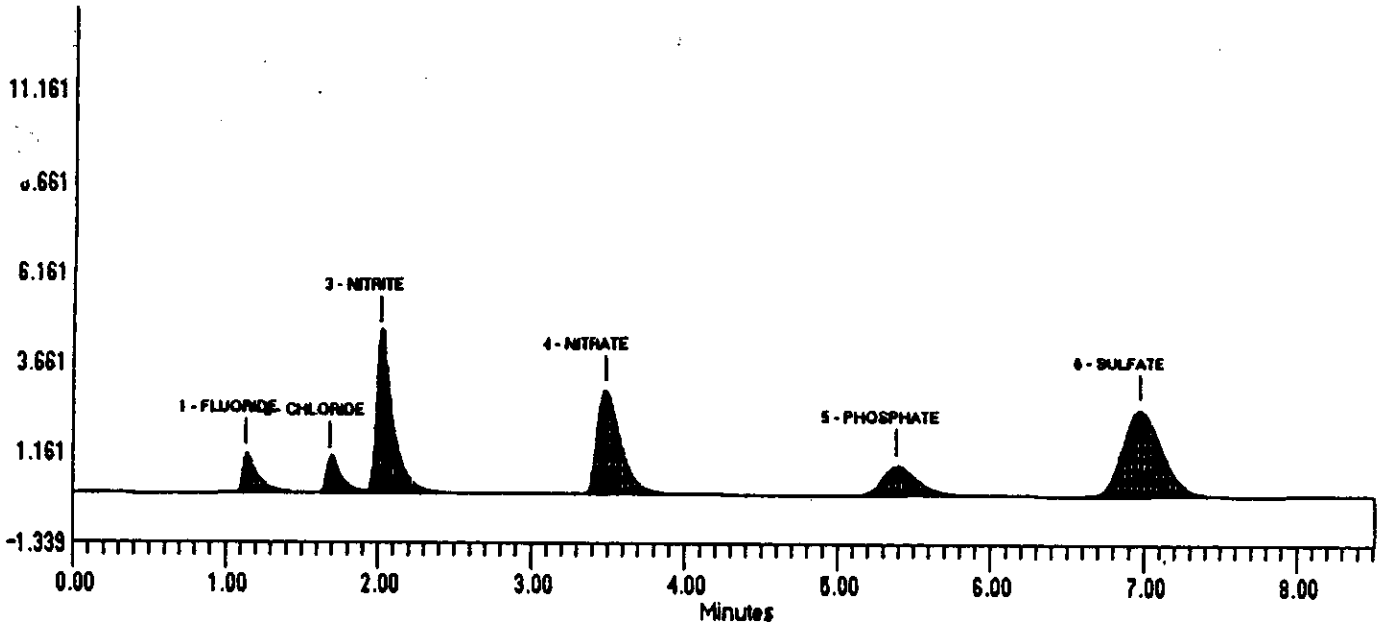
Date: 9-23-91 (8-18-92)
Time Completed:
Lab Unit Mgr: [signature]

Sample Name: LMCS/73C11CM Date: Mon Sep 23 15:11:35 1991
Data File : c:\dx\data\91092311.D03
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 3 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.136	1052	7489	1	0.00
2	1.68	CHLORIDE	73.700	967	6860	2	-0.98
3	2.02	NITRITE 99	508.155	4483	33862	2	-0.66
4	3.48	NITRATE 95	541.275	2905	31615	1	5.56
5	5.38	PHOSPHATE 103	536.303	840	13650	1	1.25
6	6.97	SULFATE 96	591.654	2426	43727	1	1.70

File: c:\dx\data\91092311.D03 Sample: LMCS/73C11CM

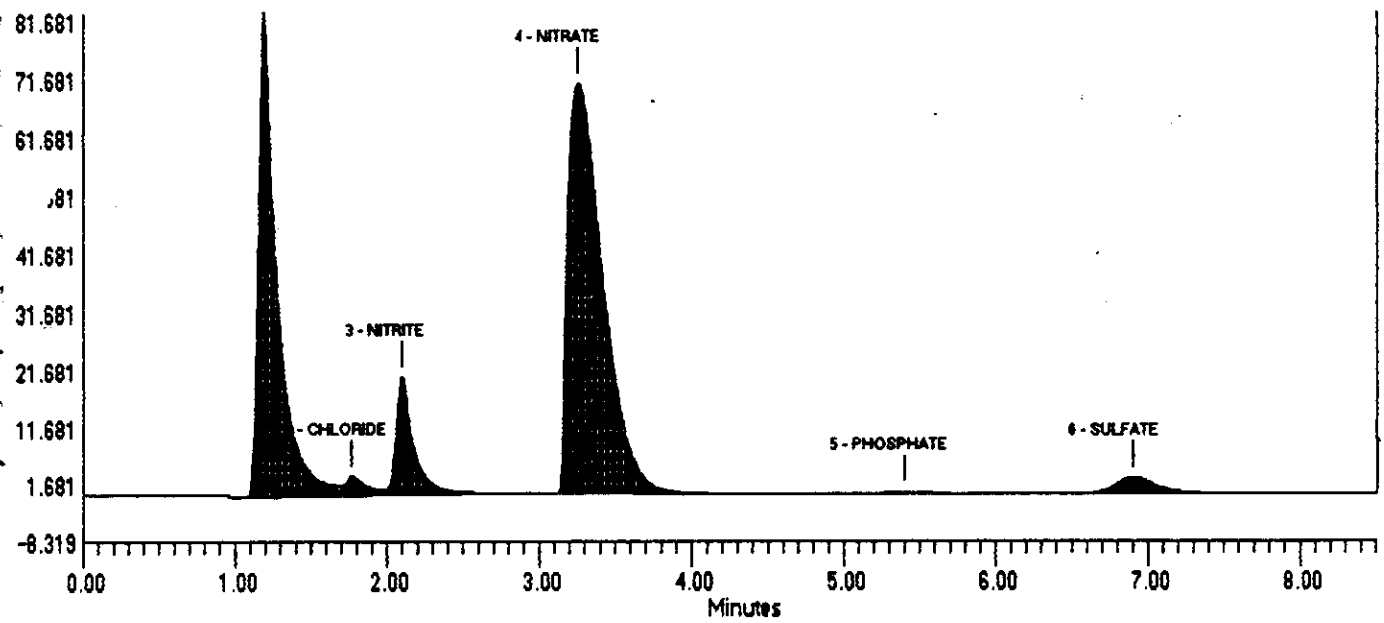


Sample Name: R9410 Date: Mon Sep 23 16:01:03 1991
ta File : c:\dx\data\91092311.D08
ethod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 8 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.18	FLUORIDE	1149.934	81925	732714	3	0.00
2	1.77	CHLORIDE	291.366	2973	28867	4	-0.47
3	2.10	NITRITE	2330.110	20689	167414	2	-0.92
4	3.25	NITRATE	10999.357	70733	1139899	1	-5.68
5	5.40	PHOSPHATE	174.305	228	3330	1	-2.72
6	6.90	SULFATE	642.956	2724	47822	1	-3.53

File: c:\dx\data\91092311.D08 Sample: R9410



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WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: ION CHROMATOGRAPHIC - NITRATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 11:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5573	11		
2	REAGENT BLANK	R9407-5673	12		
3	SAMPLE 2291-3-3	R9410-5773	13		
4	FINAL LMCS CHECK STD	R9412-5573	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: ION CHROMATOGRAPHIC - NITRITE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 11:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5576	11		
2	REAGENT BLANK	R9407-5676	12		
3	SAMPLE 2291-3-3	R9410-5776	13		
4	FINAL LMCS CHECK STD	R9412-5576	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

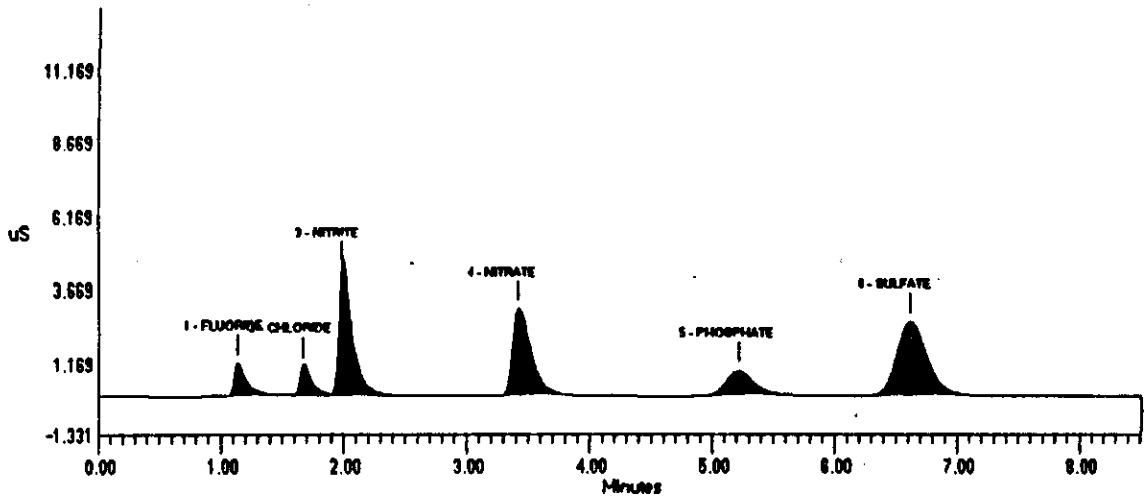
A-6000-881 (03/92)

Sample Name: LMCS/73C11CM Date: Wed Sep 25 10:29:13 1991
Data File : c:\dx\data\91092501.D03
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 3 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Rl. Code	%Delta
1	1.13	FLUORIDE	55.176	1197	7662	1	0.00
2	1.67	CHLORIDE	75.098	1013	6999	2	-1.96
3	1.98	NITRITE	517.910	4303	34581	2	-2.30
4	3.42	NITRATE	539.772	2934	31521	1	3.54
5	5.22	PHOSPHATE	526.308	858	13363	1	-1.88
6	6.62	SULFATE	591.757	2548	43735	1	-3.41

File: c:\dx\data\91092501.D03 Sample: LMCS/73C11CM



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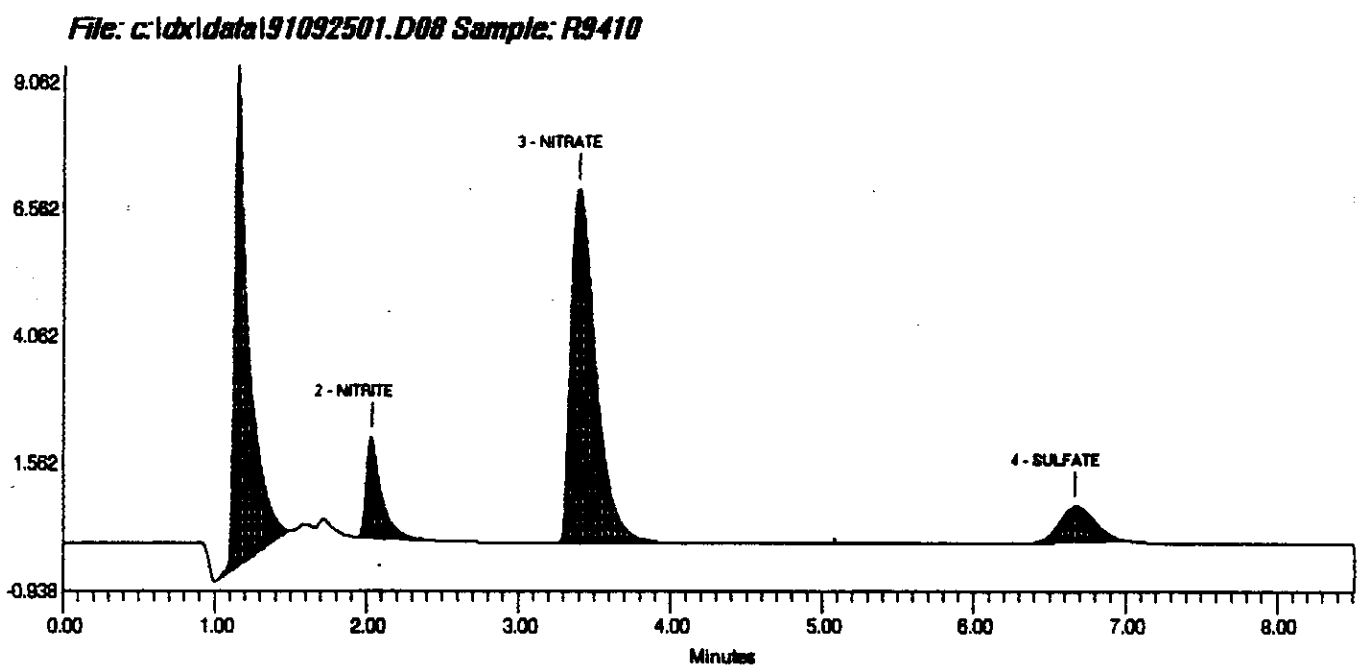
=====================================================================================
   ample Name: R9410                                  Date: Wed Sep 25 11:20:31 1991
 |   ta File   : c:\dx\data\91092501.D08
 | method      : c:\dx\method\SYSTEM1.met
 | ACI Address: 1        System : 1        Inject#:   8  Detector: CDM-1
=====================================================================================
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1111	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	4171.211	9844	64774	1	0.00
2	2.03	NITRITE	2540.811	1976	13417	1	-1.29
3	3.40	NITRATE	14073.415	6966	78658	1	1.54
4	6.67	SULFATE	2078.023	718	11923	1	-4.09



9-22-91

4469-AC

DIONEX METHOD PARAMETERS - SYSTEM1.MET

System Parameters

System Name : system1/gpm
Number of Detectors..... 1
Detector 1 Type..... CDM-1
Detector 1 real time plot scale (uS)..... 20.00
Run Time (minutes)..... 8.50
Sampling Rate (seconds)..... 0.20

-- DETECTOR 1 PARAMETERS --

Report Options

Save Data File..... Yes
Data File Name: c:\dx\data\91092201.D08
Create ASCII Report File..... No
Print Report..... Yes
List Peaks Not Found in this run..... No
Report Unknowns Found in this run..... Yes
Print Chromatogram..... Yes
AutoScale Chromatogram to Highest Peak..... Yes
Fill Peaks with Color ..... Yes
Draw Grid Lines on Chromatogram..... No
Label with Peak Number..... Yes
Label with Retention Times on Chromatogram..... No
Label with Component Name..... Yes
Format File Name: c:\dx\method\default.prf

Integration Parameters

Starting Peak Width (seconds)..... 10.0
Peak Threshold (mV or uS/data pt interval)..... 0.500
Peak Area Reject..... 1000
Area Reject for Reference Peaks..... 1000
Percent Retention Time Window for Reference Peaks..... 5.0

Integration Timed Events

Time	Description
1.32	Start peak detection
1.44	Start peak detection
1.46	Start peak detection
1.77	
1.77	Enable end of peak detection

Component # 1 FLUORIDE Retention Time 1.13
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 8.52797E-002
K1 = 6.06440E-005
K2 = -6.17180E-011

Level	Amount	Area	Height
1	1.20000E-001	1439	225
2	3.00000E-001	4035	566
3	6.00000E-001	8217	1141
4	1.20000E+000	16507	2218
5	2.30000E+000	39534	4812
6	4.40000E+000	76890	9371

Component # 2 CHLORIDE Retention Time 1.70
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.93335E-002
K1 = 1.01273E-004
K2 = -9.35560E-011

Level	Amount	Area	Height
1	1.60000E-001	1319	217
2	3.90000E-001	3754	568
3	7.80000E-001	6942	1045
4	1.50000E+000	14461	1975
5	3.00000E+000	30287	3987
6	5.90000E+000	61305	8910

Component # 3 NITRITE Retention Time 2.03
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.88691E-001
K1 = 1.33960E-004
K2 = 5.52630E-012

Level	Amount	Area	Height
1	1.08000E+000	6239	874
2	2.69000E+000	17299	2252
3	5.37000E+000	34328	4729
4	1.06200E+001	72787	9300
5	2.08500E+001	153501	19401
6	4.01500E+001	292053	34439

Component # 4 BROMIDE Retention Time 2.80
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.01960E-002
K1 = 2.00453E-004
K2 = -1.00008E-010

Level	Amount	Area	Height
1	1.56000E+000	7660	753
2	3.90000E+000	20706	1880
3	7.80000E+000	38868	3455
4	1.54000E+001	78061	6644
5	3.02000E+001	165133	12632
6	5.81000E+001	350930	24386

IC Control File: C:\DX\METHOD\SYSTEM1.TE

Step	Time	Description
Init		CDM-1 AutoOffset Off
Init		CDM-1 Recorder Mark OFF
Init		CDM-1 Temp. Comp. = 1.7 / Deg C
Init		CDM-1 Recorder Range = 1.0 uS
Init		CDM-1 Cell ON
Init		CHA Heater = 25 Deg. C
Init		Valve A ON
Init		Valve B ON
Init		Inject Valve OFF
Init		ACI Autosmp OFF
Init		ACI RLY 2 OFF
Init		ACI TTL 1 OFF
Init		ACI TTL 2 OFF
Init		ACI AC 1 ON
Init		GPM Start
Init		GPM Hold Gradient Clock
Init		GPM Reset ON
1	0.0	CDM-1 AutoOffset ON
1	0.0	Start Sampling
1	0.0	GPM Reset OFF
2	0.1	CDM-1 Recorder Range = 10.0 uS
2	0.1	Inject Valve ON
2	0.1	GPM Run Gradient Clock
3	3.0	Inject Valve OFF
4	3.5	ACI Autosmp ON
5	8.0	ACI Autosmp OFF

GpmFile: C:\DX\METHOD\SYSTEM1.GPM
Lo Pressure Limit = 200
Hi Pressure Limit = 2000
Eluant 1 - DI WATER
Eluant 2 - SODIUM CARBONATE
Eluant 3 - SODIUM BICARBONATE
Eluant 4 - Eluant 4

Time	Flow	%1	%2	%3	%4	V5	V6	Comment
0.0	2.0	84	8	8	0	0	0	

VISUAL CHECK AND OVER-THE-TOP READING ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
R 9408.-5000	102AW	6-14-91	12:43	26

Determination	Method Reference	Result Units	Charge Code	Results
APPEAR	[illegible]		W1DEO	0

Sample Size	Customer ID
?	2291-1-3

Remarks, Calculations, Results

A. JAR 1DH
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-1m
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
some solids settled
on bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 6/14/91	Time Completed	Laboratory Man		

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5000	102AW	6-14-91	12:48	26

Determination	Method Reference	Result Units	Charge Code	Results
APPEAR	[illegible]		W1DEO	0

Sample Size	Customer ID
?	2291-2-3

Remarks, Calculations, Results

A. JAR 1DH
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-1m
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
no solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 6/14/91	Time Completed	Laboratory Man		

Serial No	Sample Point	Date	Time Issued	Priority
R 9410.-5000	102AW	6-14-91	12:52	26

Determination	Method Reference	Result Units	Charge Code	Results
APPEAR	[illegible]		W1DEO	0

Sample Size	Customer ID
?	2291-3-3

Remarks, Calculations, Results

A. JAR 1DH
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-1m
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
aqueous solution
light tint yellow
clarity-clear
solid settled on
bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 6/14/91	Time Completed	Laboratory Man		

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-5000	102AW	6-14-91	12:57	26

Determination	Method Reference	Result Units	Charge Code	Results
APPEAR	[illegible]		W1DEO	0

Sample Size	Customer ID
?	2291-4-3

Remarks, Calculations, Results

A. JAR 1DH
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-1m
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity-clear
solids-present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 6/14/91	Time Completed	Laboratory Man		

9312303115

SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406-5506	1020W	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
SPG	LA-510-112	% RECOVERY	W1BEQ	1

Sample Size: 100 100.32 L
Customer ID: STD

Remarks, Calculations, Results:

S332 ZNCL2
STD# 15C11-BT RESULT 1.4270
STD VAL 1.4386 %REC 99.2%

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82580 Tania Lee				
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 8-12-91
Time Completed:
Lab Unit Mgr: [signature]

R9406-5506
G - 2.0110
T - 1.8678
N - .1432

G - 2.0530
T - 1.9098
N - .1432

Serial No	Sample Point	Date	Time Issued	Priority
R 9407-5606	1020W	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
SPG	LA-510-112	% RECOVERY	W1BEQ	1

Sample Size: 2 100.32 L
Customer ID: REG BL

Remarks, Calculations, Results:

Reagent Blank
~~S332~~ ZNCL2
STD# RESULT 9.9033E-1
STD VAL ~~%REC~~
T.L. 5.10.91

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82580 Tania Lee				
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 8-12-91
Time Completed:
Lab Unit Mgr: [signature]

R9407-5506
G - 2.0005
T - 1.9012
N - .0993

G - 1.9915
T - 1.8921
N - .0994

Serial No	Sample Point	Date	Time Issued	Priority
R 9411-5706	1020W	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
SPG	LA-510-112 6-5-91		W1BEQ	1

Sample Size: 2 100.32 L
Customer ID: 2291-4-3

Remarks, Calculations, Results:

1.0262

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82580 Tania Lee				
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 8-12-91
Time Completed:
Lab Unit Mgr: [signature]

R9411-5706
G - 1.9504
T - 1.8473
N - .1031

G - 2.0446
T - 1.9418
N - .1028

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: DIFFERENTIAL THERMAL	Sample Prep: UNDIGESTED

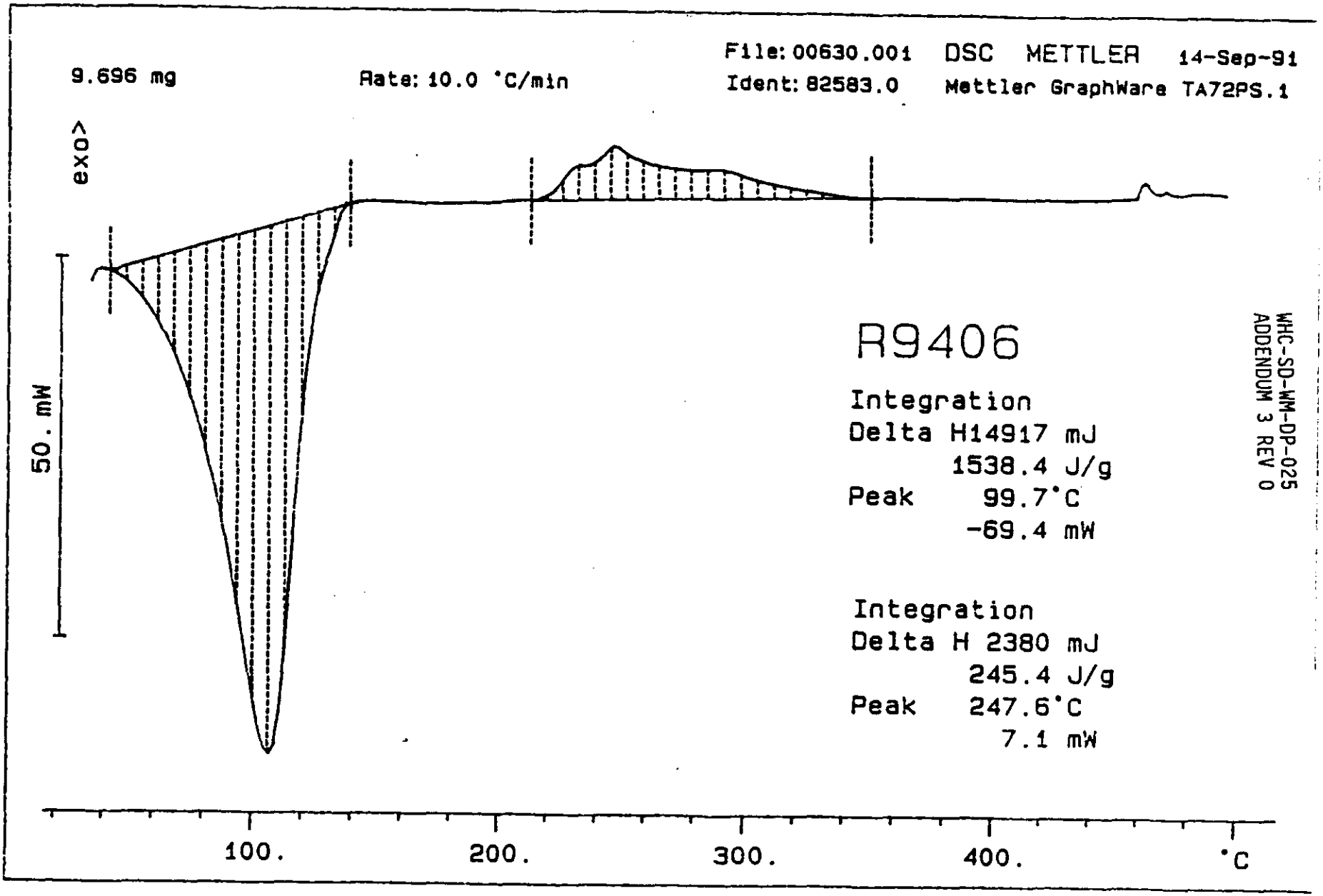
Instrument: WC16134, WC16129	Procedure/Rev: LA-514-113/A-0
Technologist: S. COBB	Date: 09-15-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5511	11		
2	REAGENT BLANK	R9407-5611	12		
3	SAMPLE 2291-4-3	R9411-5711	13		
4	FINAL LMCS CHECK STD	R9412-5511	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

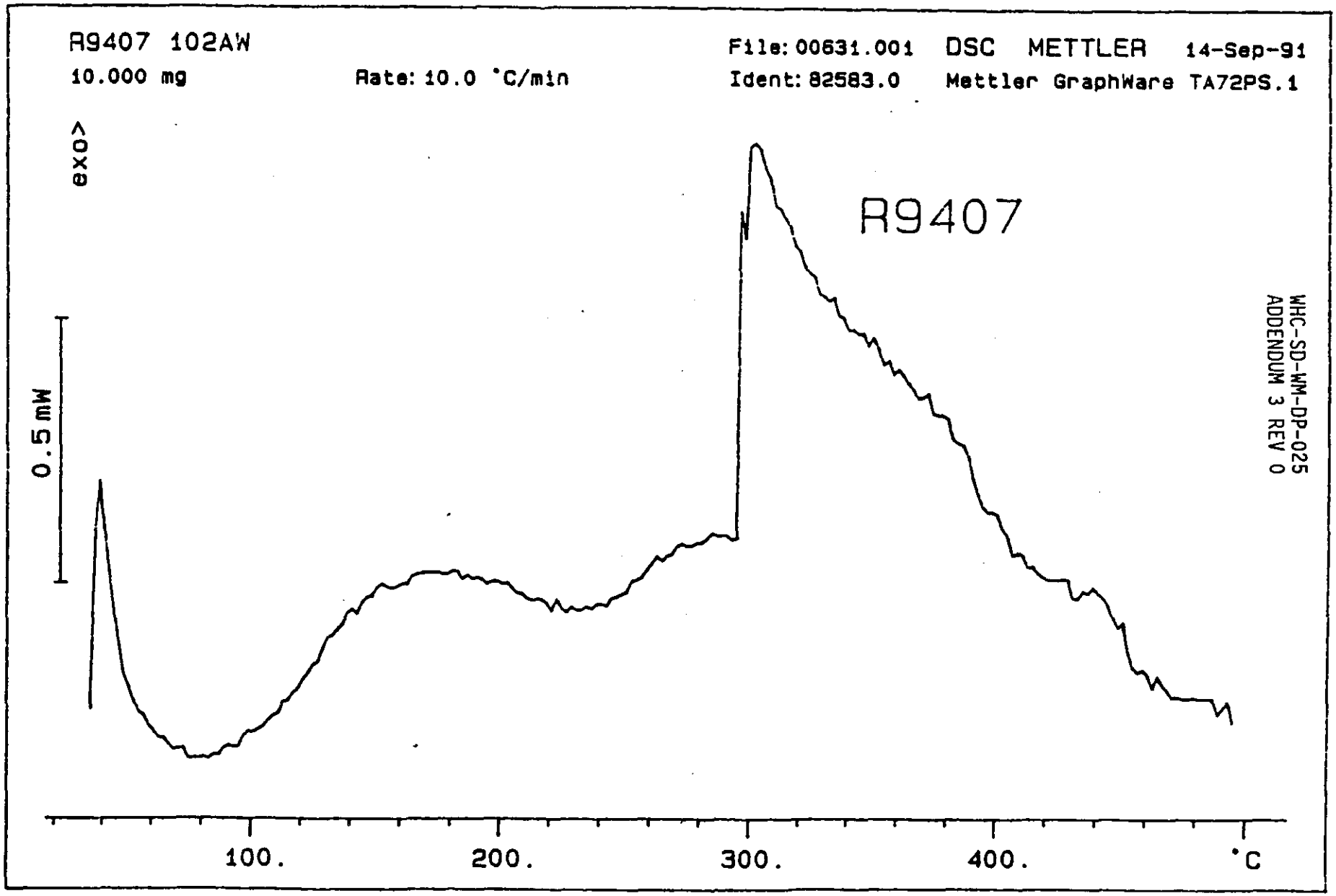
Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	27C11-AZ/.10 mL			NA

A-6000-881 (03/92)

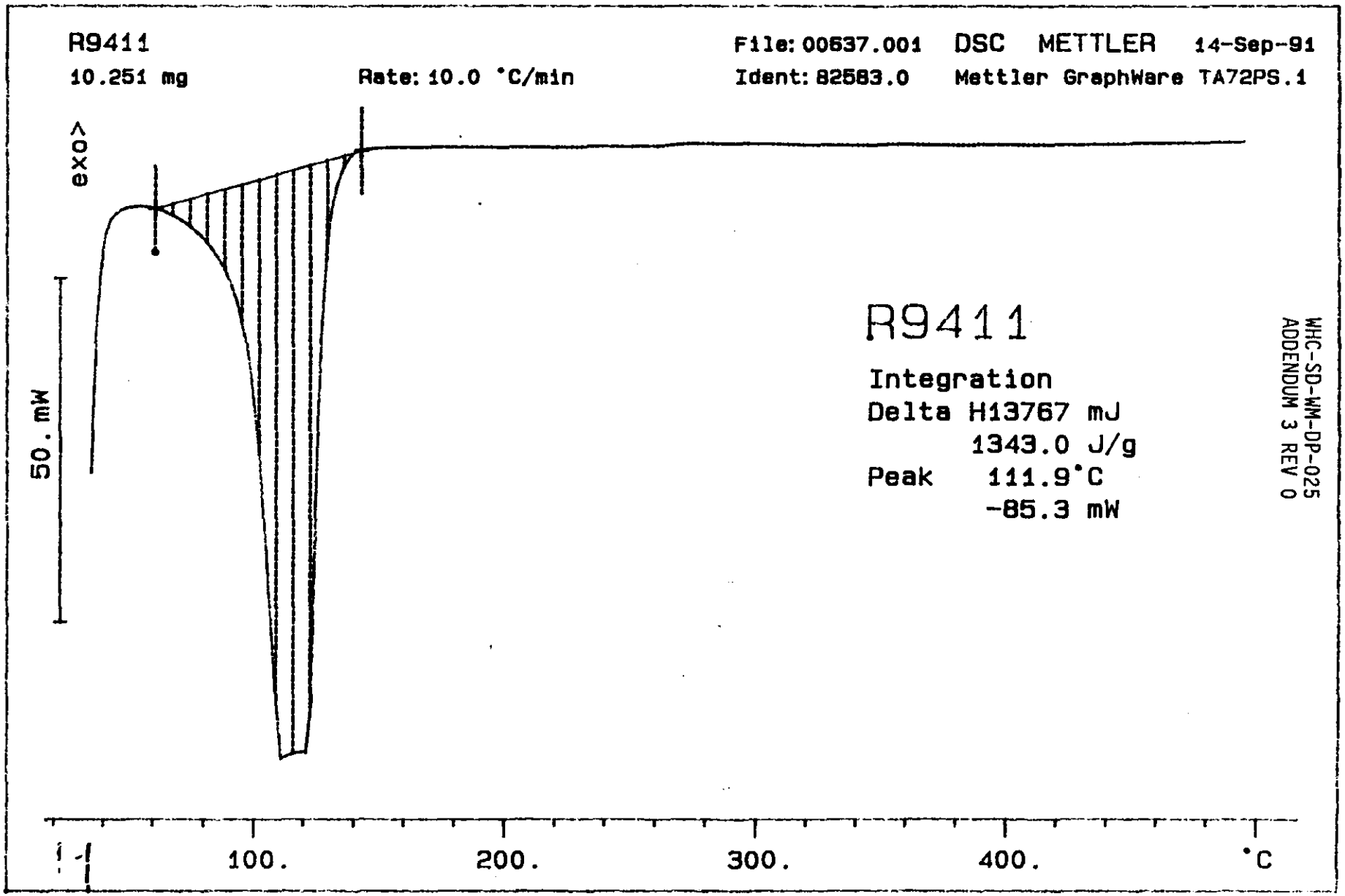
9 3 1 2 3 3 1 3 4 9

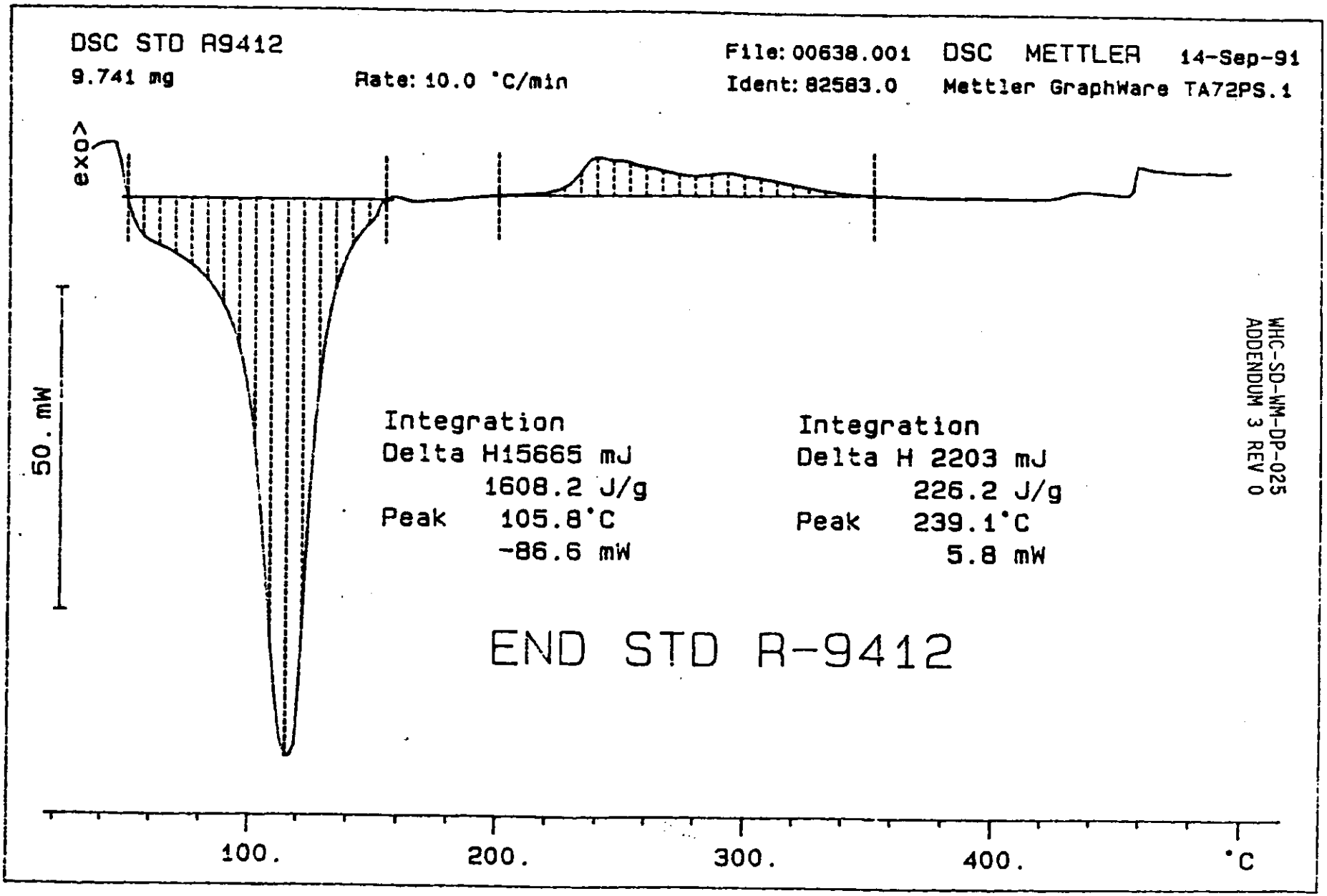


WHC-SD-WM-DP-025
ADDENDUM 3 REV 0



WHC-SD-WM-DP-025
ADDENDUM 3 REV 0


R9411
10.251 mg
Rate: 10.0 °C/min
File: 00637.001
Ident: 82583.0
DSC METTLER
Mettler GraphWare TA72PS.1
14-Sep-91
exo>
50. mW
R9411
Integration
Delta H13767 mJ
1343.0 J/g
Peak 111.9°C
-85.3 mW
100.
200.
300.
400.
°C



WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: TOTAL ORGANIC CARBON	Sample Prep: UNDIGESTED

Instrument: MODEL 5011-WC16130	Procedure/Rev: LA-344-105/A-3
Technologist: E. COLVIN	Date: 06-27-91
Starting Time: 08:00	Temperature: NA
Ending Time: 14:00	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5526	11		
2	REAGENT BLANK	R9407-5626	12		
3	SAMPLE 2291-4-3	R9411-5726	13		
4	FINAL LMCS CHECK STD	R9412-5526	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	70C11H/.200 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9406 Date: 06-27-1991 Time: 09:01:20

Blank = .670791 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	39.20	100.00
3	3.01	51.80	24.32
4	4.01	55.70	7.00
5	5.01	57.80	3.63
6	6.01	59.20	2.36
7	7.01	60.20	1.66

(60.2 - 4.7)(11)/(200) = 3.0525 g/L Carbon

(60.2 - 4.7)(11)/(200)(12) = .254375 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9411 Date: 06-27-1991 Time: 11:15:58

Blank = .670791 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	6.10	100.00
3	3.01	8.60	29.07
4	4.01	10.00	14.00
5	5.01	10.90	8.26
6	6.01	11.50	5.22
7	7.01	12.40	7.26

(12.4 - 4.699344)(11)/(200) = .4235361 g/L Carbon

(12.4 - 4.699344)(11)/(200)(12) = 3.529467E-02 Molar Carbon

Sample Run By: 80028_____

08/20/92
~~350~~

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: TOTAL INORGANIC CARBON	Sample Prep: UNDIGESTED

Instrument: WB39927	Procedure/Rev: LA-622-102/B-0
Technologist: E. COLVIN	Date: 09-04-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5527	11		
2	REAGENT BLANK	R9407-5627	12		
3	SAMPLE 2291-4-3	R9411-5727	13		
4	SPIKE OF 2291-4-3	R9411-5927	14		
5	FINAL LMCS CHECK STD	R9412-5527	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	69C11K/.050 mL			NA
SPIKE	69C11K/.050 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: E-9406 Date: 09-04-1991 Time: 09:51:44

Blank = .5424173 Sample Size = 50 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	104.90	100.00
3	3.01	119.70	12.36
4	4.01	124.20	3.62
5	5.01	125.30	0.88
6	6.01	125.90	0.48
7	7.01	126.40	0.40

(126.4 - 3.800099)(1)/(50) = 2.451998 g/L Carbon

(126.4 - 3.800099)(1)/(50)(12) = .2043332 Molar Carbon

Sample Run By: 80028

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9411 Date: 09-04-1991 Time: 12:31:03

Blank = .5424173 Sample Size = 50 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	34.50	100.00
3	3.01	38.60	10.62
4	4.01	39.70	2.77
5	5.01	40.70	2.46
6	6.01	41.20	1.21
7	7.00	41.70	1.20

(41.7 - 3.799503)(1)/(50) = .75801 g/L Carbon

(41.7 - 3.799503)(1)/(50)(12) = .0631675 Molar Carbon

Sample Run By: 80028

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9412 Date: 09-04-1991 Time: 12:47:05

Blank = .5424173 Sample Size = 50 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	97.30	100.00
3	3.01	116.90	16.77
4	4.01	123.40	5.27
5	5.01	125.50	1.67
6	6.01	126.70	0.95
7	7.01	127.10	0.31

(127.1 - 3.8)(1)/(50) = 2.466 g/L Carbon

(127.1 - 3.8)(1)/(50)(12) = .2055 Molar Carbon

Sample Run By: 80028

AMMONIA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-552E	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	% RECOVERY	W1BEO	0

Sample Size: ? 250ul .09941 m HCl — Customer ID: STD

Remarks, Calculations, Results:
S235 NH4CL
STDN 4C11QL RESULT 5.13E-2
STD VAL 5.30E-3 m %REC 96.8%
(158-29)(.09941)/250 =

BLK 29
STD 158

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				
Hrs: SL Cobb	Hrs	Hrs	Hrs	Hrs

Date: 08-23-91 — Time Completed — Lab Unit Mgr

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-562B	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	G/G	W1BEO	1

Sample Size: ? .09941 m HCL — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK

BLK 29
29

(L10)(.09941)(1000 = L9.94E-4 m

Lost original Card

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				11-10-92
Hrs: SL Cobb	Hrs	Hrs	Hrs	Hrs

Date: 4-9-92 08-23-91 — Time Completed — Lab Unit Mgr 5-19-92

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-572E	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	G/G	W1BEO	0

Sample Size: ? 1ml .09941 m HCl — Customer ID: 2291-4-3

Remarks, Calculations, Results:
(108-29)(.09941)/1000 =
7.85E-3m

BLK 29
Sample 108

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				
Hrs: SL Cobb	Hrs	Hrs	Hrs	Hrs

Date: 08-23-91 — Time Completed — Lab Unit Mgr

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-592E	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	% RECOVERY	W1BEO	0

Sample Size: ? 1ml .09941 m HCl — Customer ID: 2291-4-3

Remarks, Calculations, Results:
SAMPLE SPIKED ID
SPIKE ID 4C11QL
SPIKE VOLUME 250ul

BLK 29
Sample 225
87.7%

[(225-29)-(108-29)](.09941) / 250 = 4.65E-2 / 5.30E-2

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				
Hrs: SL Cobb	Hrs	Hrs	Hrs	Hrs

Date: 08-23-91 — Time Completed — Lab Unit Mgr

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-552E	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NH4	LA-634-102	% RECOVERY	W1BEO	0

Sample Size: ? 250ul .09941 m HCl — Customer ID: STD

Remarks, Calculations, Results:
S235 NH4CL
STDN 4C11QL RESULT 5.05E-2
STD VAL 5.30E-2 %REC 95.3%
(156-29)(.09941)/250 = 5.05E-2

BLK 29
STD 156

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				
Hrs: SL Cobb	Hrs	Hrs	Hrs	Hrs

Date: 08-23-91 — Time Completed — Lab Unit Mgr

CYANIDE ANALYSIS - UNDIGESTED SAMPLE

STANDARD 3R 5-14-92

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-557E	102AW	6-14-91	12:50	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	W1BEO	0

Sample Size: ? 100uL-10mL-500uL
Customer ID: 2291-4-3 STANDARD 5-14-92

Remarks, Calculations, Results:
S244 KCN
STDN 75C11P RESULT 891.8 ABS .747
STD VAL 891.7 %REC 100.0%

$\frac{(.747-.01)-.013899}{.162164} \div .5 \times 100 =$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Ed Cole				

Date: 6-27-91 Time Completed: Lab Director: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-562E	102AW	6-14-91	12:50	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	PPM	H5402	0

Sample Size: ?
Customer ID: Blank SAM 12-2-91

Remarks, Calculations, Results:
REAGENT BLANK

$\frac{.010-.013899}{.162164} = < .5ppm$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Ed Cole				

Date: 6-27-91 Time Completed: Lab Director: [signature] SKM Sbrecard

Serial No.	Sample Point	Date	Time Issued	Priority
R 9411.-577E	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	PPM	W1BEO	0

Sample Size: ? 1mL
Customer ID: 2291-4-3

Remarks, Calculations, Results:
ABS .248

$\frac{(.248-.01)-.013899}{.162164} / 1 = 1.38ppm$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Ed Cole				

Date: 6-27-91 Time Completed: Lab Director: [signature]

STANDARD 3R 5-14-92

Serial No.	Sample Point	Date	Time Issued	Priority
R 9411.-557E	102AW	6-14-91	12:58	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	W1BEO	0

Sample Size: ? 100uL-10mL-500uL
Customer ID: 2291-4-3 STANDARD 5-14-92

Remarks, Calculations, Results:
S244 KCN
STDN 75C11P RESULT 873.3 ABS .732
STD VAL 891.7 %REC 97.9%

$\frac{(.732-.01)-.013899}{.162164} \div .5 \times 100$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Ed Cole				

Date: 6-27-91 Time Completed: Lab Director: [signature]

9312930875

YS DATE: 6-27-91

PAYROLL NO.: 80028

Y-INTERCEPT= CAL
SLOPE= CAL

SAMPLE ID#: BLANK
SAMPLE SIZE: 0
WVL AND ABS= 580NM 0.004 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-50UL
WVL AND ABS= 580NM 0.094 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.848 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-1ML
WVL AND ABS= 580NM 1.628 A HI

Y:INTEC. .013899
SLOPE .162164
CC = .999801

ION CHROMATOGRAPHIC ANALYSIS (CHLORIDE) - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Issued	Priority
R 9406.-5572	102AW	6-14-91	12:38	26

Determination	Method/Standard	Result Units	Charge Code	Remote
Cl	LA-533-105	% RECOVERY	H114U	0

Sample Size: ? 0.100 mL - 10.0 mL
Customer ID: SID

Remarks, Calculations, Results:
EDP R972 DIONEX
STDH 73CUCH RESULT 71.8
STD VAL 75.0 %REC 95.7

Data was retrieved per OSM's request. David K. Todd 5-18-92

Analyst: 6C2PD
Date: 5/18/92
Time Completed:
Date Line Mgr: Denise J. Hurst David K. Todd

Sample No	Sample Point	Date	Time Issued	Priority
R 9407.-5572	102AW	6-14-91	12:42	26

Determination	Method/Standard	Result Units	Charge Code	Remote
Cl	LA-533-105	% RECOVERY	H114U	0

Sample Size: ? Quiet
Customer ID: REG. 18

Remarks, Calculations, Results:
EDP R972 DIONEX
RESULT < 111.1 ppm
%REC
DJH 4-14-92

Data was retrieved per OSM's request. David K. Todd 5-18-92

Analyst: 6C2PD
Date: 5/18/92
Time Completed:
Date Line Mgr: Denise J. Hurst David K. Todd

Sample No	Sample Point	Date	Time Issued	Priority
R 9411.-5572	102AW	6-14-91	12:58	26

Determination	Method/Standard	Result Units	Charge Code	Remote
Cl	LA-533-105	PPM	H114U	0

Sample Size: ? 0.1 mL-10 mL-1.0 mL-10.1 mL
Customer ID: 2291-4-3

Remarks, Calculations, Results:
4.80 E12 ppm
4.81 E12

Data was retrieved per OSM's request. David K. Todd 5-18-92

Analyst: 6C2PD
Date: 5/18/92
Time Completed:
Date Line Mgr: Denise J. Hurst David K. Todd

Sample No	Sample Point	Date	Time Issued	Priority
R 9412.-5572	102AW	6-14-91	13: 2	26

Determination	Method/Standard	Result Units	Charge Code	Remote
Cl	LA-533-105	% RECOVERY	H114U	0

Sample Size: ? 0.1 mL-10.0 mL
Customer ID: SID

Remarks, Calculations, Results:
EDP R972 DIONEX
STDH 73CUCH RESULT 71.07 ppm
STD VAL 75 ppm %REC 94.8 %

Data was retrieved per OSM's request. David K. Todd 5-18-92

Analyst: 6C2PD
Date: 5/18/92
Time Completed:
Date Line Mgr: Denise J. Hurst David K. Todd

9.3 1 2 3 3 1 3 3 7 9

ION CHROMATOGRAPHIC ANALYSIS (FLUORIDE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5571	102AW	6-14-91	12:38	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
DJH 4-14-92 F 1E	LA-533-105	% RECOVERY	N114U	0

Sample Size: ? 0.100mL-10.0mL — Customer ID: STD

Remarks, Calculations, Results:
EDP 974 F ~~EDP 972 CL~~ DJH 4-14-92
~~EDP 970 SO4 EDP 968~~
~~NO2 EDP 976 PO4 EDP~~
~~978 NO3~~
STD#13CUCM RESULT
STD VAL %REC

F⁻ result = 54.0 ppm
std. value = 56.0 ppm
recovery = 96.4%

Data was retrieved per OSM's request. Denis R. Lott 5-18-92

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
[signature]				
Hrs 6CL80	Hrs	Hrs	Hrs	Hrs

Date: 5/18/92 — Time Completed: — Lab Unit Mgr: Denise J. Hert, Denis R. Lott

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5671 ~~5-18-91~~	102AW	6-14-91	12:42	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
DJH 4-14-92 F⁻	LA-533-105	% RECOVERY	N114U	0

Sample Size: ? direct — Customer ID: REG. BL

Remarks, Calculations, Results: DJH 5-14-92
EDP 974 F ~~EDP 972 CL~~
~~EDP 970 SO4 EDP 968~~
~~NO2 EDP 976 PO4 EDP~~
~~978 NO3~~
~~STD#~~ ~~RESULT~~
~~STD VAL~~ ~~%REC~~

< 1161 ppm

Data was retrieved per OSM's request. Denis R. Lott 5-18-92

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
[signature]				
Hrs 6CL80	Hrs	Hrs	Hrs	Hrs

Date: 5/18/92 — Time Completed: — Lab Unit Mgr: Denise J. Hert, Denis R. Lott
DJH 5-18-92

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-5771	102AW	6-14-91	12:58	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
DJH F 5-15-92	LA-533-105	UG/ML	N114U	0

Sample Size: ? 0.1 mL-10.0 mL-1.0 mL-10.0 mL — Customer ID: 2291-4-3

Remarks, Calculations, Results:
3.902E13 ppm

Data was retrieved per OSM's request. Denis R. Lott 5-18-92

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
[signature]				
Hrs 6CL80	Hrs	Hrs	Hrs	Hrs

Date: 5/18/92 — Time Completed: — Lab Unit Mgr: Denise J. Hert, Denis R. Lott

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5571	102AW	6-14-91	13: 2	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
DJH 4-14-92 F	LA-533-105	% RECOVERY	N114U	0

Sample Size: ? 0.1mL- 10.0mL — Customer ID: STD

Remarks, Calculations, Results:
EDP 974 F EDP 972 CL
EDP 970 SO4 EDP 968
NO2 EDP 976 PO4 EDP
978 NO3
STD#13CUCM RESULT 53.5 ppm
STD VAL 56.0 ppm %REC 95.5%

Data was retrieved per OSM's request. Denis R. Lott 5-18-92

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
[signature]				
Hrs 6CL80	Hrs	Hrs	Hrs	Hrs

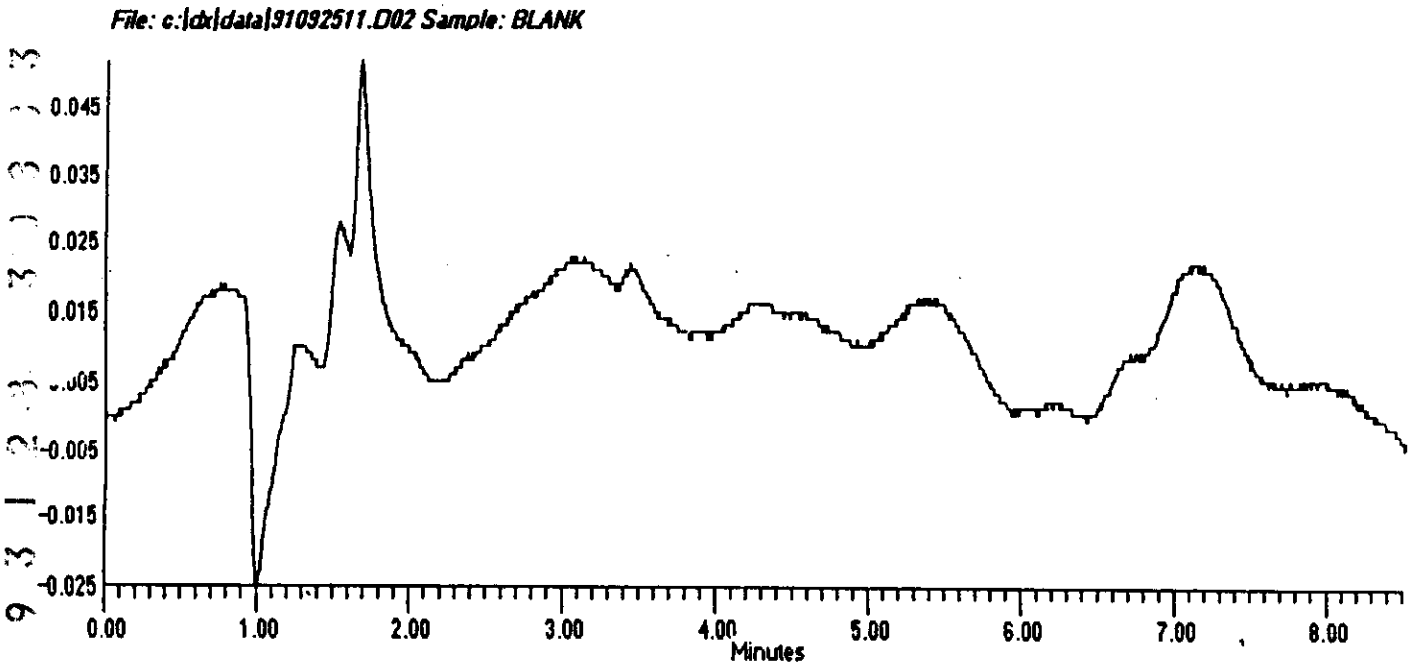
Date: 5/18/92 — Time Completed: — Lab Unit Mgr: Denise J. Hert, Denis R. Lott
DJH 5-18-92

9312 3 0 9 1

```
=====================================================================================
|   mple Name: BLANK                                  Date: Wed Sep 25 13:49:55 1991|
| Data File   : c:\dx\data\91092511.D02                                             |
| Method      : c:\dx\method\SYSTEM1.met                                            |
| ACI Address: 1        System : 1        Inject#:    2  Detector: CDM-1          |
=====================================================================================
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

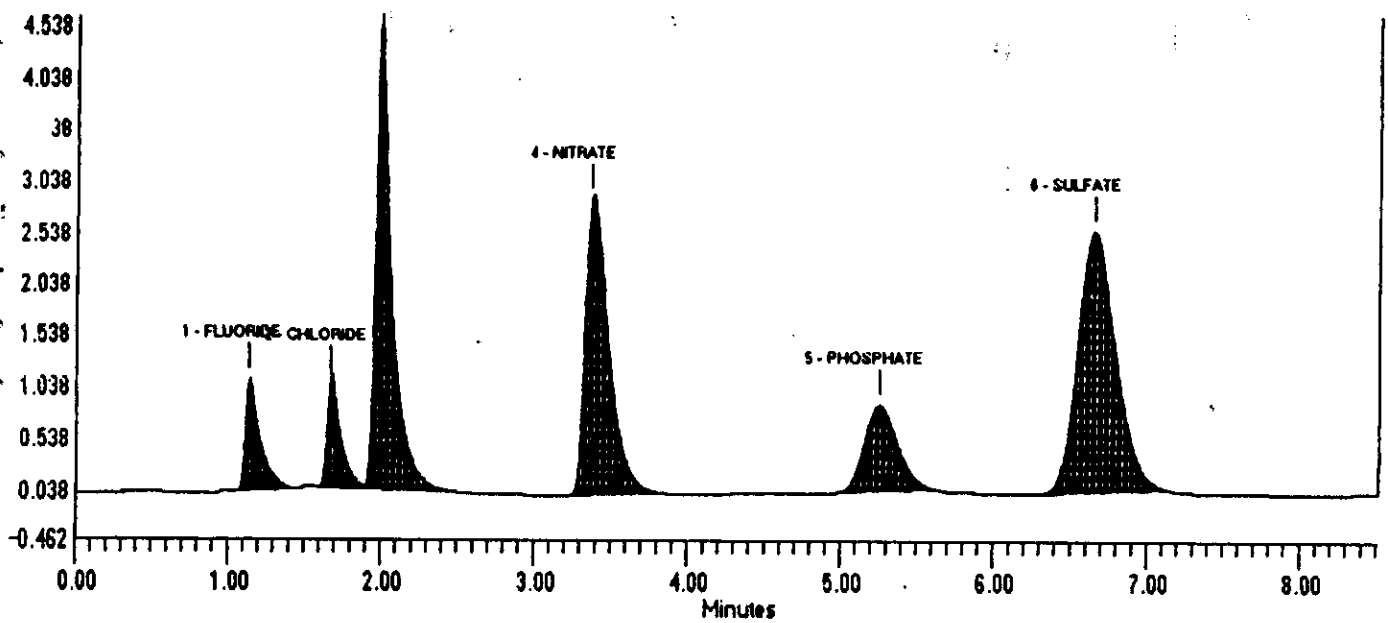


Sample Name: LMCS/73C11CM Date: Wed Sep 25 15:18:32 1991
Data File : c:\dx\data\91092511.D10
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	53.542	1070	7391	1	0.00
2	1.67	CHLORIDE	71.072	1012	6600	2	-1.96
3	1.98	NITRITE	500.223	4495	33278	2	-2.30
4	3.37	NITRATE	534.703	2855	31203	1	2.02
5	5.25	PHOSPHATE	507.540	825	12822	1	-1.25
6	6.65	SULFATE	587.648	2522	43407	1	-2.92

File: c:\dx\data\91092511.D10 Sample: LMCS/73C11CM



ION CHROMATOGRAPHIC ANALYSIS (PHOSPHATE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5574	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Retune
PO4	LA-533-105	% RECOVERY	WIDEO	0

Sample Size: ? .100mL -10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDP R976 DIONEX
STD# 5.17E² RESULT 536.303
STD VAL 73C11Cm %REC 103.7%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91 Time Completed: Lab Use Sign: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5674	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Retune
PO4	LA-533-105	G/G	WIDEO	0

Sample Size: ? 1.0mL direct
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91 Time Completed: Lab Use Sign: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-5774	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Retune
PO4	LA-533-105	G/G	WIDEO	0

Sample Size: ? .100mL - 10mL
Customer ID: 2291-4-3

Remarks, Calculations, Results:
1.67E² ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91 Time Completed: Lab Use Sign: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5574	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Retune
PO4	LA-533-105	% RECOVERY	WIDEO	0

Sample Size: ? .100mL - 10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDP R976 DIONEX
STD# 73C11Cm RESULT 524.991
STD VAL 517.0 %REC 101.5%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91 Time Completed: Lab Use Sign: [signature]
JK 8-18-92

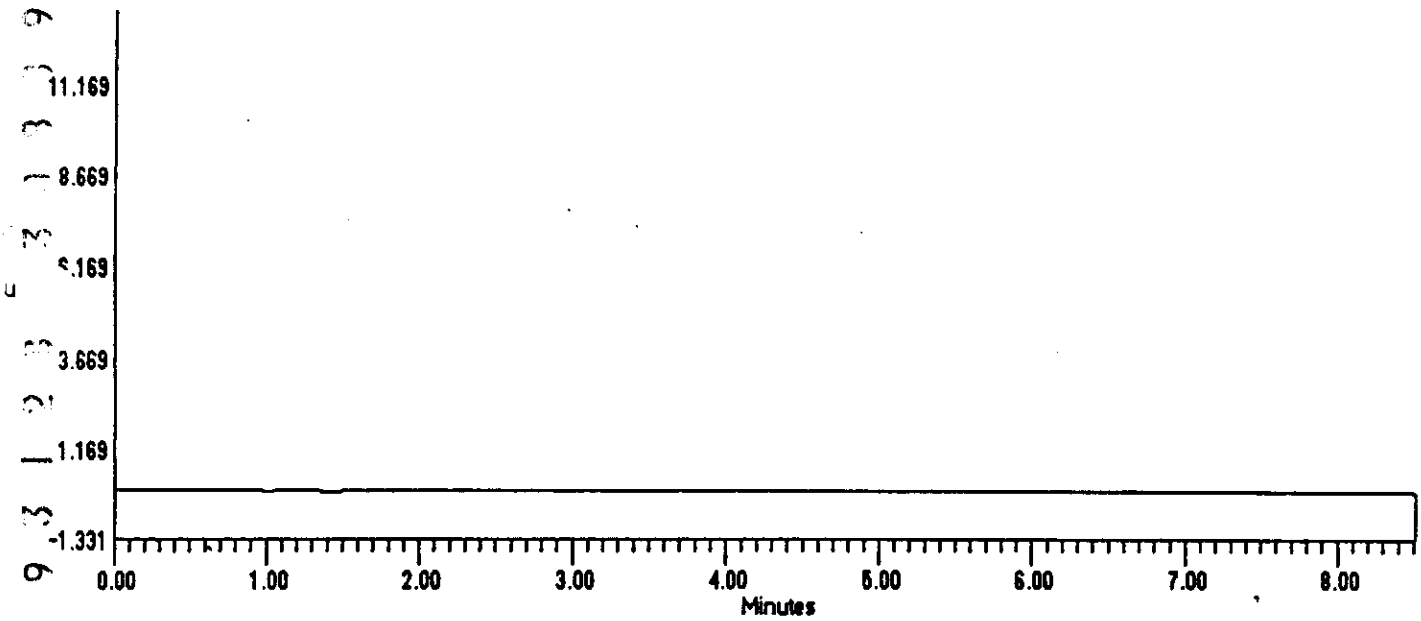
9312333317

Sample Name: BLANK		Date: Mon Sep 23 15:01:56 1991	
Data File : c:\dx\data\91092321.D02			
Method : c:\dx\method\SYSTEM1.met			
ACI Address: 1	System : 1	Inject#: 2	Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

File: c:\dx\data\91092321.D02 Sample: BLANK

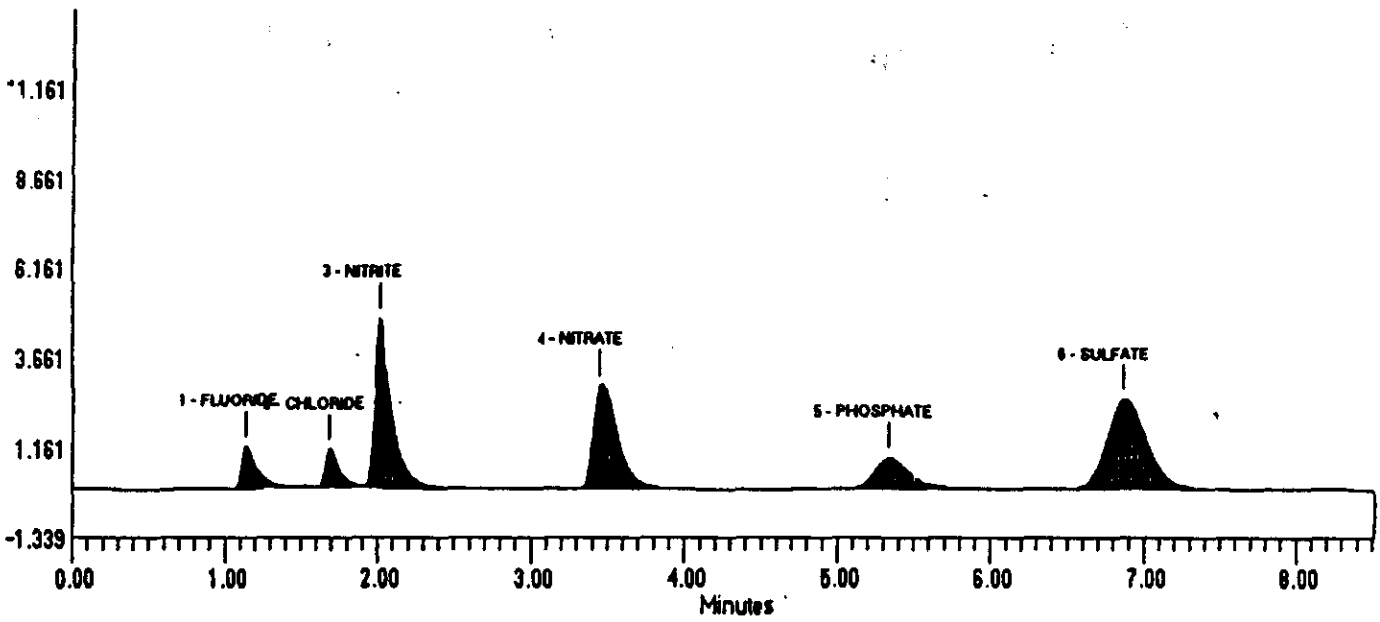


```
 mple Name: LMCS/73C11CM                          Date: Mon Sep 23 16:20:47 1991
Data File   : c:\dx\data\91092311.D10
Method      : c:\dx\method\SYSTEM1.met
ACI Address: 1        System : 1        Inject#:  10  Detector: CDM-1
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	57.360	1148	8024	1	0.00
2	1.68	CHLORIDE	72.097	1017	6702	2	-0.98
3	2.02	NITRITE	518.617	4696	34634	2	-0.66
4	3.45	NITRATE	543.291	2890	31741	1	4.55
5	5.33	PHOSPHATE	524.991	836	13325	1	0.31
6	6.87	SULFATE	599.619	2488	44362	1	0.24

File: c:\dx\data\91092311.D10 Sample: LMCS/73C11CM



ION CHROMATOGRAPHIC ANALYSIS (NITRATE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5573	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL - 10mL ~~1.0mL~~ SR 4/8/92 — Customer ID: STD 73C11CM

Remarks, Calculations, Results:
EDP R978 DIONEX
STD #73C11CM RESULT 539.772
STD VAL 564 %REC 95.7%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5673	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	G/G	W1BEO	0

Sample Size: ? 1.0mL direct — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-5773	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	G/G	W1BEO	0

Sample Size: ? .100mL - 10mL - 1.0mL - 10mL — Customer ID: 2291-4-3

Remarks, Calculations, Results:
~~1.46E5 ppm~~ 5 [signature] 12-12-91
1.46E+4 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 — Time Completed: — Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5573	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL - 10mL — Customer ID: STD 73C11CM

Remarks, Calculations, Results:
EDP R978 DIONEX
STD #73C11CM RESULT 540.9
STD VAL 564 %REC 95.9%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 3hr	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 — Time Completed: — Lab Unit Mgr: [signature]

ION CHROMATOGRAPHIC ANALYSIS (NITRITE) - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5576	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO2	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL -10mL
Customer ID: STD73C11CM

Remarks, Calculations, Results:
EDP R968 DIONEX
STD# 73C11CM RESULT 5.1791E2
STD VAL 5.13E2 %REC 100.96%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 34V	Hrs	Hrs	Hrs	Hrs [signature]

Date: 9-25-91 Time Completed: Lab Unit Mgr: [signature] [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5676	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO2	LA-533-105	G/G	W1BEO	0

Sample Size: ? 1.0mL direct
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
<1 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 34V	Hrs	Hrs	Hrs	

Date: 9-25-91 Time Completed: Lab Unit Mgr: [signature] [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-5776	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO2	LA-533-105	G/G	W1BEO	0

Sample Size: ? .100mL -10mL -1.0mL -10mL
Customer ID: 2291-4-3

Remarks, Calculations, Results:
2.58E3 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 34V	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91 Time Completed: Lab Unit Mgr: [signature] [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5576	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO2	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL -10mL
Customer ID: STD73C11CM

Remarks, Calculations, Results:
EDP R968 DIONEX
STD# 73C11CM RESULT 509.856
STD VAL 5.13E2 %REC 99.4%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 34V	Hrs	Hrs	Hrs	Hrs [signature]

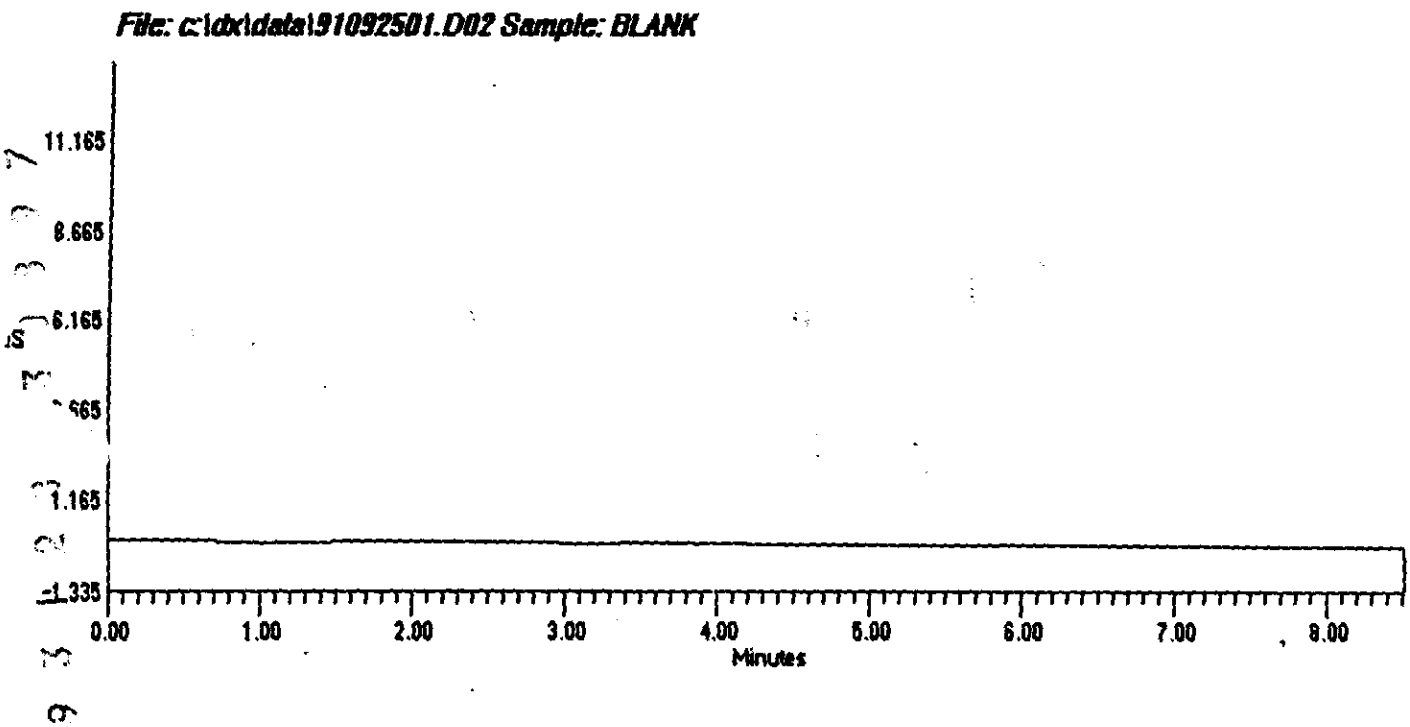
Date: 9-25-91 Time Completed: Lab Unit Mgr: [signature] [signature]

9 3 1 2 1 3 0 9 9 5

```
Sample Name: BLANK                                  Date: Wed Sep 25 10:19:25 1991
Data File   : c:\dx\data\91092501.D02
Method      : c:\dx\method\SYSTEM1.met
ACI Address: 1        System : 1        Inject#:    2  Detector: CDM-1
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

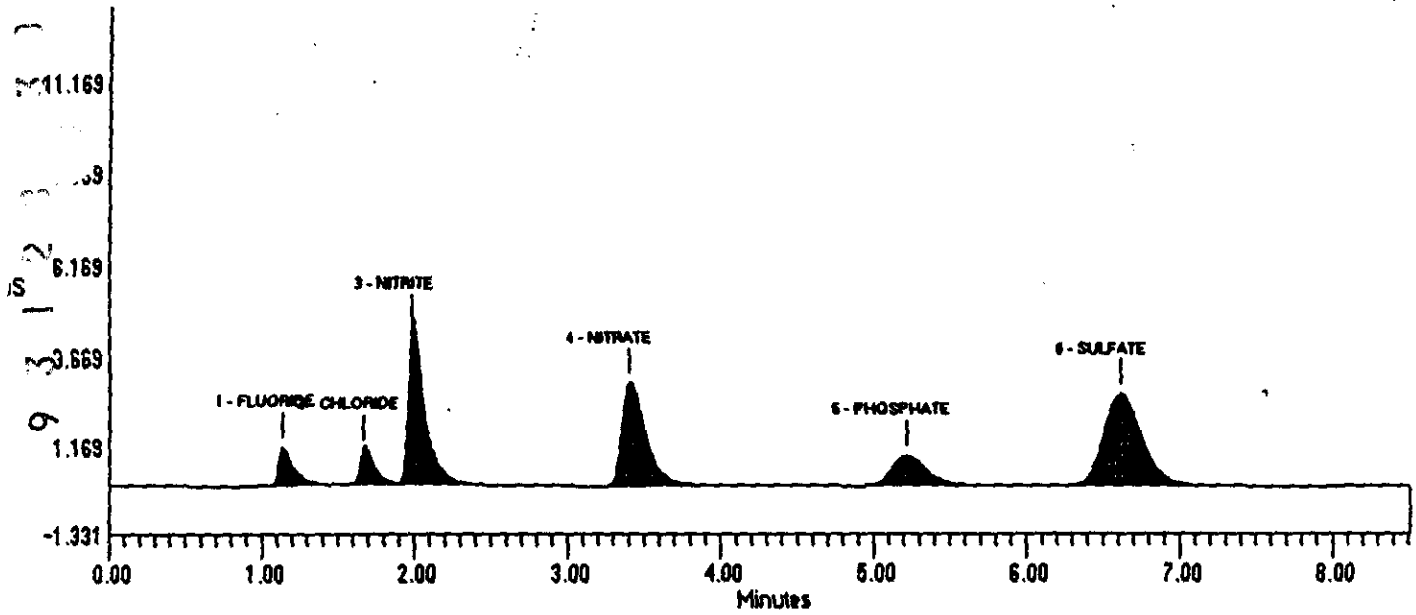


Sample Name: LMCS/73C11CM Date: Wed Sep 25 11:41:00 1991
Data File : c:\dx\data\91092501.D10
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.425	1099	7537	1	0.00
2	1.67	CHLORIDE	73.303	1005	6821	2	-1.96
3	1.98	NITRITE	509.856	4351	33988	2	-2.30
4	3.40	NITRATE	540.888	2919	31591	1	3.03
5	5.22	PHOSPHATE	525.714	851	13345	1	-1.88
6	6.62	SULFATE	604.077	2604	44717	1	-3.41

File: c:\dx\data\91092501.D10 Sample: LMCS/73C11CM



Calibration Parameters

Number Of Levels for Calibration	6
Calibration Fit Type	Quadratic
Replace Or Average Calibrations	Replace
External or Internal Calibration	External
Calibrate by Area or Height	Area
Default Injection Volume	1.0
Default Dilution Factor	1.0
Response Factor for Unknown Peaks	1.0
Calibration Standard Volume	1.0
Internal Standard Volume	1.0
Sample Unit	PPM

Component # 5 NITRATE Retention Time 3.30
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.02611E-001
K1 = 1.61787E-004
K2 = -5.83501E-011

Level	Amount	Area	Height
1	1.37000E+000	7543	727
2	3.43000E+000	19321	1803
3	6.83000E+000	40244	3563
4	1.35000E+001	83386	7010
5	2.65000E+001	173503	13640
6	5.11000E+001	360809	25639

Component # 6 PHOSPHATE Retention Time 5.32
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 5.53452E-001
K1 = 3.53243E-004
K2 = -3.51156E-010

Level	Amount	Area	Height
1	1.19000E+000	2277	162
2	2.98000E+000	7242	453
3	5.93000E+000	15025	935
4	1.17400E+001	31660	1933
5	2.30300E+001	69135	4130
6	4.43700E+001	144749	8447

Component # 7 SULFATE Retention Time 6.85
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.55734E-001
K1 = 1.27491E-004
K2 = -3.79358E-011

Level	Amount	Area	Height
1	1.40000E+000	9418	543
2	3.50000E+000	24497	1382
3	6.96000E+000	52303	2890
4	1.37800E+001	107173	5909
5	2.70400E+001	225632	12225
6	5.20700E+001	471630	24686

IC Control File: C:\DX\METHOD\SYSTEM1.TE

Step	Time	Description
Init		CDM-1 AutoOffset Off
Init		CDM-1 Recorder Mark OFF
Init		CDM-1 Temp. Comp. = 1.7 / Deg C
Init		CDM-1 Recorder Range = 1.0 uS
Init		CDM-1 Cell ON
Init		CHA Heater = 25 Deg. C
Init		Valve A ON
Init		Valve B ON
Init		Inject Valve OFF
Init		ACI Autosmp OFF
Init		ACI RLY 2 OFF
Init		ACI TTL 1 OFF
Init		ACI TTL 2 OFF
Init		ACI AC 1 ON
Init		GPM Start
Init		GPM Hold Gradient Clock
Init		GPM Reset ON
1	0.0	CDM-1 AutoOffset ON
1	0.0	Start Sampling
1	0.0	GPM Reset OFF
2	0.1	CDM-1 Recorder Range = 10.0 uS
2	0.1	Inject Valve ON
2	0.1	GPM Run Gradient Clock
3	3.0	Inject Valve OFF
4	3.5	ACI Autosmp ON
5	8.0	ACI Autosmp OFF

GpmFile: C:\DX\METHOD\SYSTEM1.GPM
Lo Pressure Limit = 200
Hi Pressure Limit = 2000
Eluant 1 - DI WATER
Eluant 2 - SODIUM CARBONATE
Eluant 3 - SODIUM BICARBONATE
Eluant 4 - Eluant 4

Time	Flow	%1	%2	%3	%4	V5	V6	Comment
0.0	2.0	84	8	8	0	0	0	

Component # 1 FLUORIDE Retention Time 1.13
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 8.52797E-002
K1 = 6.06440E-005
K2 = -6.17180E-011

Level	Amount	Area	Height
1	1.20000E-001	1439	225
2	3.00000E-001	4035	566
3	6.00000E-001	8217	1141
4	1.20000E+000	16507	2218
5	2.30000E+000	39534	4812
6	4.40000E+000	76890	9371

Component # 2 CHLORIDE Retention Time 1.70
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.93335E-002
K1 = 1.01273E-004
K2 = -9.35560E-011

Level	Amount	Area	Height
1	1.60000E-001	1319	217
2	3.90000E-001	3754	568
3	7.80000E-001	6942	1045
4	1.50000E+000	14461	1975
5	3.00000E+000	30287	3987
6	5.90000E+000	61305	8910

Component # 3 NITRITE Retention Time 2.03
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.88691E-001
K1 = 1.33960E-004
K2 = 5.52630E-012

Level	Amount	Area	Height
1	1.08000E+000	6239	874
2	2.69000E+000	17299	2252
3	5.37000E+000	34328	4729
4	1.06200E+001	72787	9300
5	2.08500E+001	153501	19401
6	4.01500E+001	292053	34439

Component # 4 BROMIDE Retention Time 2.80
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.01960E-002
K1 = 2.00453E-004
K2 = -1.00008E-010

Level	Amount	Area	Height
1	1.56000E+000	7660	753
2	3.90000E+000	20706	1880
3	7.80000E+000	38868	3455
4	1.54000E+001	78061	6644
5	3.02000E+001	165133	12632
6	5.81000E+001	350930	24386

9-22-91

4469-AC

DIONEX METHOD PARAMETERS - SYSTEM1.MET

System Parameters

System Name : system1/gpm
Number of Detectors..... 1
Detector 1 Type..... CDM-1
Detector 1 real time plot scale (uS)..... 20.00
Run Time (minutes)..... 8.50
Sampling Rate (seconds)..... 0.20

-- DETECTOR 1 PARAMETERS --

Report Options

Save Data File..... Yes
ata File Name: c:\dx\data\91092201.D0B
Create ASCII Report File..... No
Print Report..... Yes
List Peaks Not Found in this run..... No
Report Unknowns Found in this run..... Yes
Print Chromatogram..... Yes
AutoScale Chromatogram to Highest Peak..... Yes
Fill Peaks with Color ..... Yes
Draw Grid Lines on Chromatogram..... No
Label with Peak Number..... Yes
Label with Retention Times on Chromatogram..... No
Label with Component Name..... Yes
Format File Name: c:\dx\method\default.prf

Integration Parameters

Starting Peak Width (seconds)..... 10.0
Peak Threshold (mV or uS/data pt interval)..... 0.500
Peak Area Reject..... 1000
Area Reject for Reference Peaks..... 1000
Percent Retention Time Window for Reference Peaks..... 5.0

Integration Timed Events

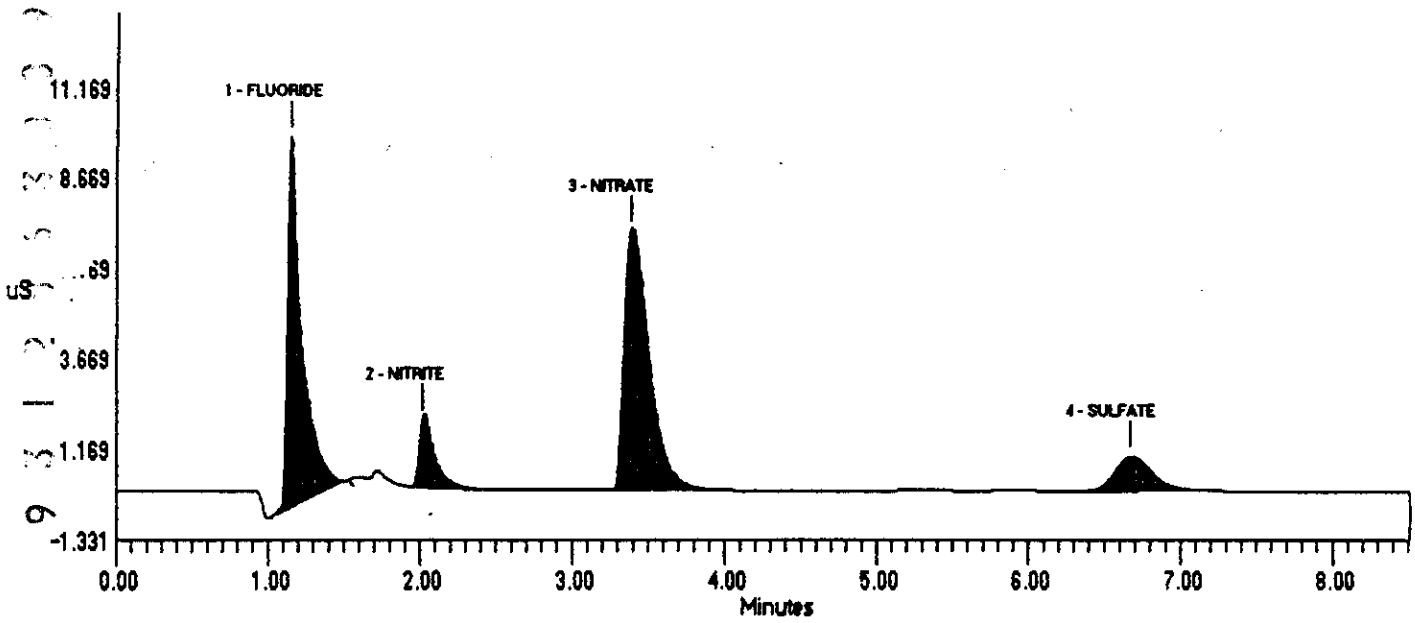
Time	Description
1.32	Start peak detection
1.44	Start peak detection
1.46	Start peak detection
1.77	
1.77	Enable end of peak detection

Sample Name: R9411 Date: Wed Sep 25 11:30:47 1991
ta File : c:\dx\data\91092501.D09
chod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 9 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1111	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	4322.886	10258	67375	1	0.00
2	2.02	NITRITE	2575.602	1830	13650	1	-2.10
3	3.38	NITRATE	14653.487	7150	82083	1	1.04
4	6.67	SULFATE	2578.622	926	15486	1	-4.09

File: c:\dx\data\91092501.D09 Sample: R9411

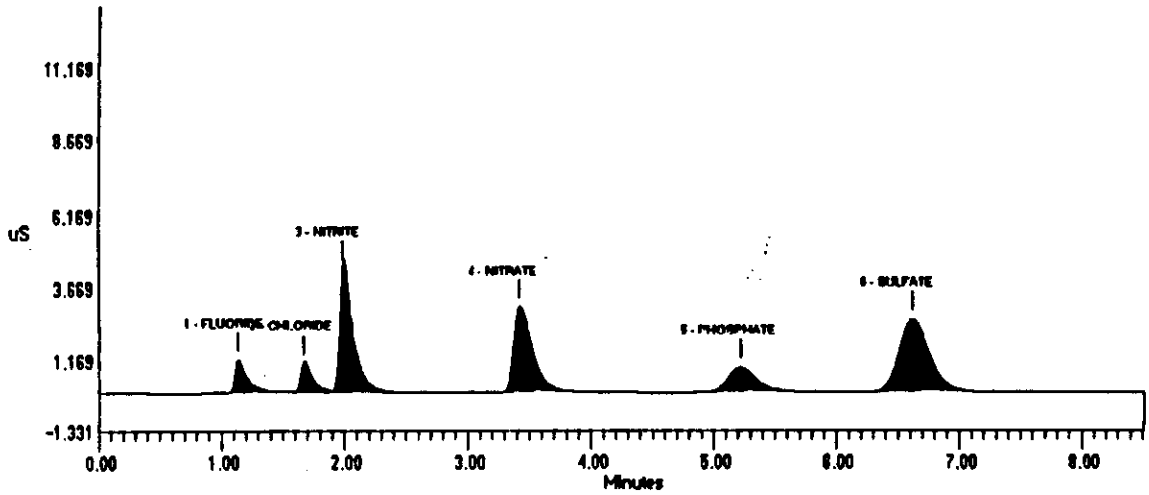


Sample Name: LMCS/73C11CM Date: Wed Sep 25 10:29:13 1991
Data File : c:\dx\data\91092501.D03
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 3 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	55.176	1107	7662	1	0.00
2	1.67	CHLORIDE	75.098	1013	6999	2	-1.96
3	1.98	NITRITE	517.910	4303	34581	2	-2.30
4	3.42	NITRATE	539.772	2934	31521	1	3.54
5	5.22	PHOSPHATE	526.308	858	13363	1	-1.88
6	6.62	SULFATE	591.757	2548	43735	1	-3.41

File: c:\dxdata\91092501.D03 Sample: LMCS/73C11CM



WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: ION CHROMATOGRAPHIC - NITRITE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 11:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5576	11		
2	REAGENT BLANK	R9407-5676	12		
3	SAMPLE 2291-4-3	R9411-5776	13		
4	FINAL LMCS CHECK STD	R9412-5576	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: ION CHROMATOGRAPHIC - NITRATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 11:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5573	11		
2	REAGENT BLANK	R9407-5673	12		
3	SAMPLE 2291-4-3	R9411-5773	13		
4	FINAL LMCS CHECK STD	R9412-5573	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

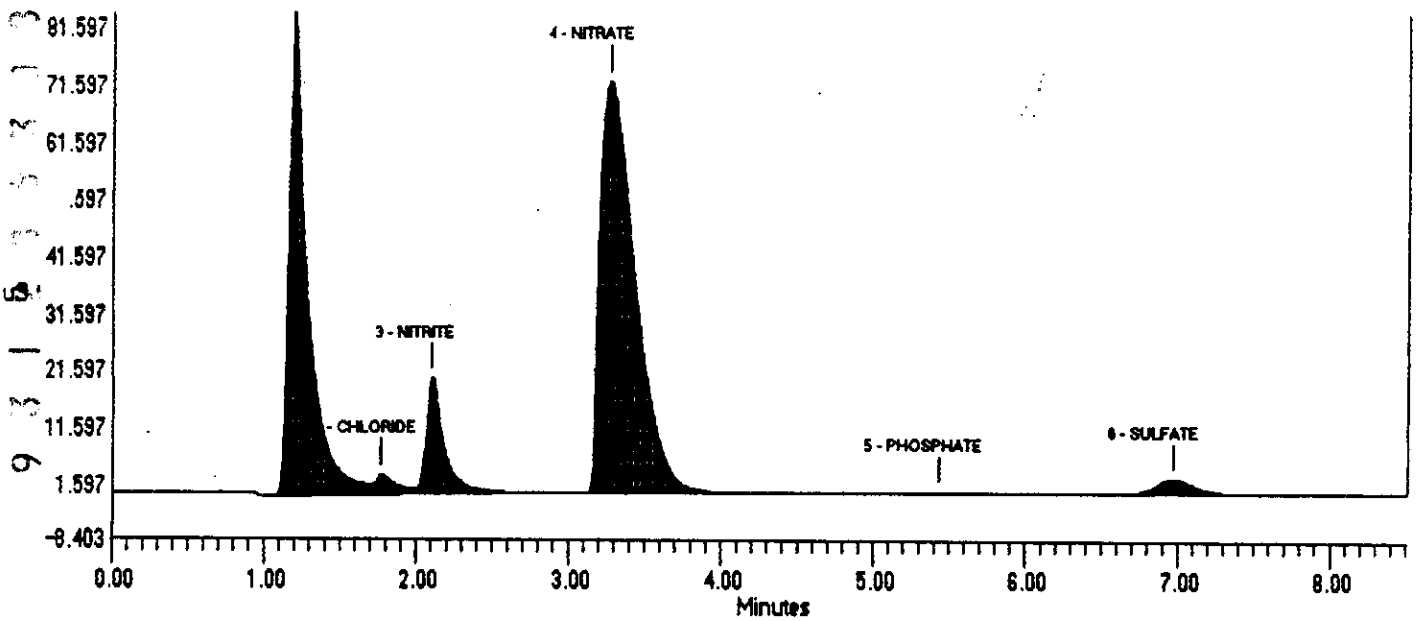
A-6000-881 (03/92)

Sample Name: R9411 Date: Mon Sep 23 16:10:55 1991
Data File : c:\dx\data\91092311.D09
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 9 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.18	FLUORIDE	1132.749	80624	738358	3	0.00
2	1.77	CHLORIDE	305.524	2972	30331	4	-0.47
3	2.10	NITRITE	2322.725	20259	166876	2	-0.92
4	3.27	NITRATE	11052.899	72117	1159077	[illegible]	-5.19
5	5.43	PHOSPHATE	166.644	218	3114	1	-2.12
6	6.97	SULFATE	643.414	2678	47859	1	-2.59

File: c:\dx\data\91092311.D09 Sample: R9411



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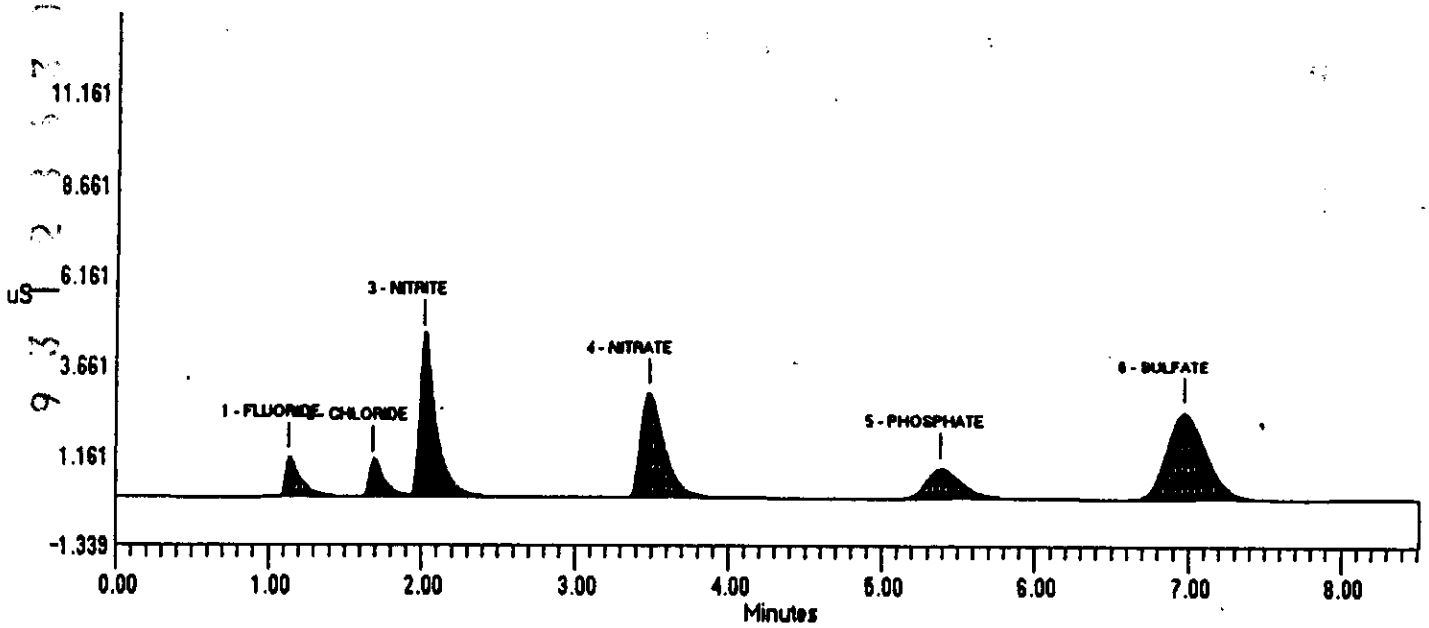
==========================================================================
|   mple Name: LMCS/73C11CM                    Date: Mon Sep 23 15:11:35 1991|
| Data File   : c:\dx\data\91092311.D03                                    |
| Method      : c:\dx\method\SYSTEM1.met                                   |
| ACI Address: 1        System : 1        Inject#:   3  Detector: CDM-1    |
==========================================================================
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.136	1052	7489	1	0.00
2	1.68	CHLORIDE	73.700	967	6860	2	-0.98
3	2.02	NITRITE 99	508.155	4483	33862	2	-0.66
4	3.48	NITRATE 95	541.275	2905	31615	1	5.56
5	5.38	PHOSPHATE 103	536.303	840	13650	1	1.25
6	6.97	SULFATE 96	591.654	2426	43727	1	1.70

File: c:\dx\data\91092311.D03 Sample: LMCS/73C11CM



WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

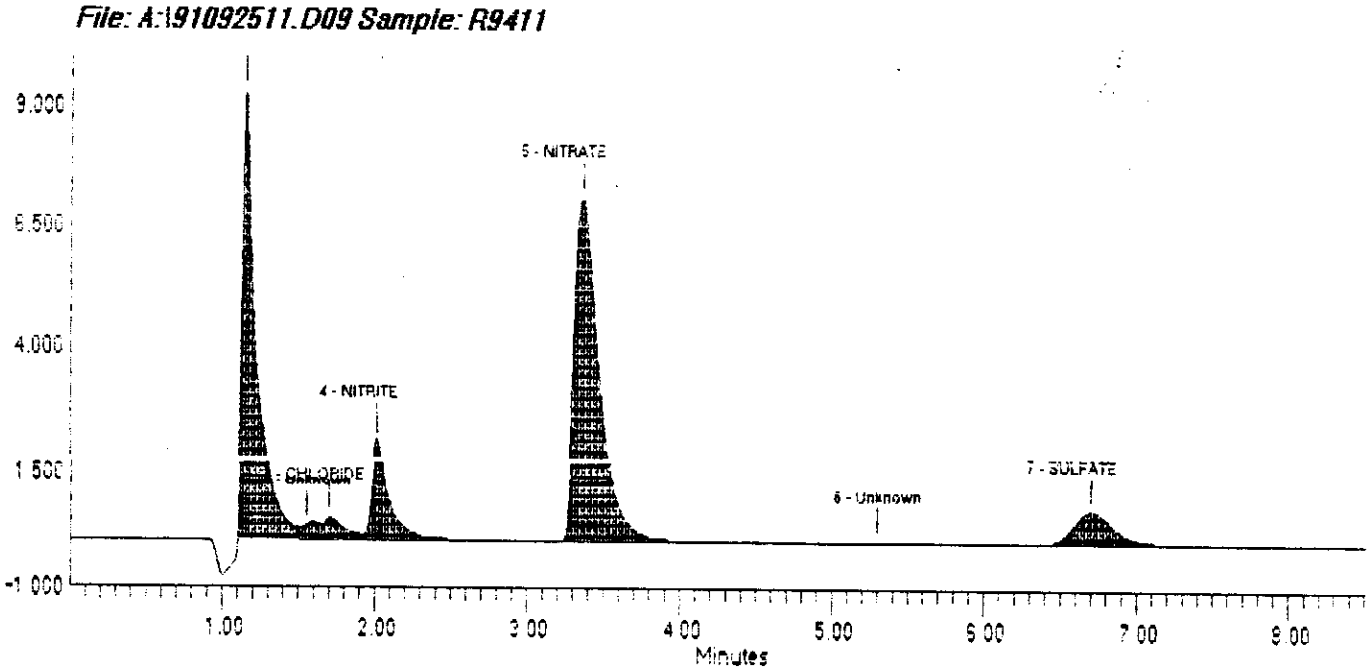
Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: ION CHROMATOGRAPHIC - PHOSPHATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659, WB97286, AL10657, WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-23-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5574	11		
2	REAGENT BLANK	R9407-5674	12		
3	SAMPLE 2291-4-3	R9411-5774	13		
4	FINAL LMCS CHECK STD	R9412-5574	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)



data reprocessed for accuracy of F^- & Cl^- concentrations.

Denise J Hert

3

08/20/92

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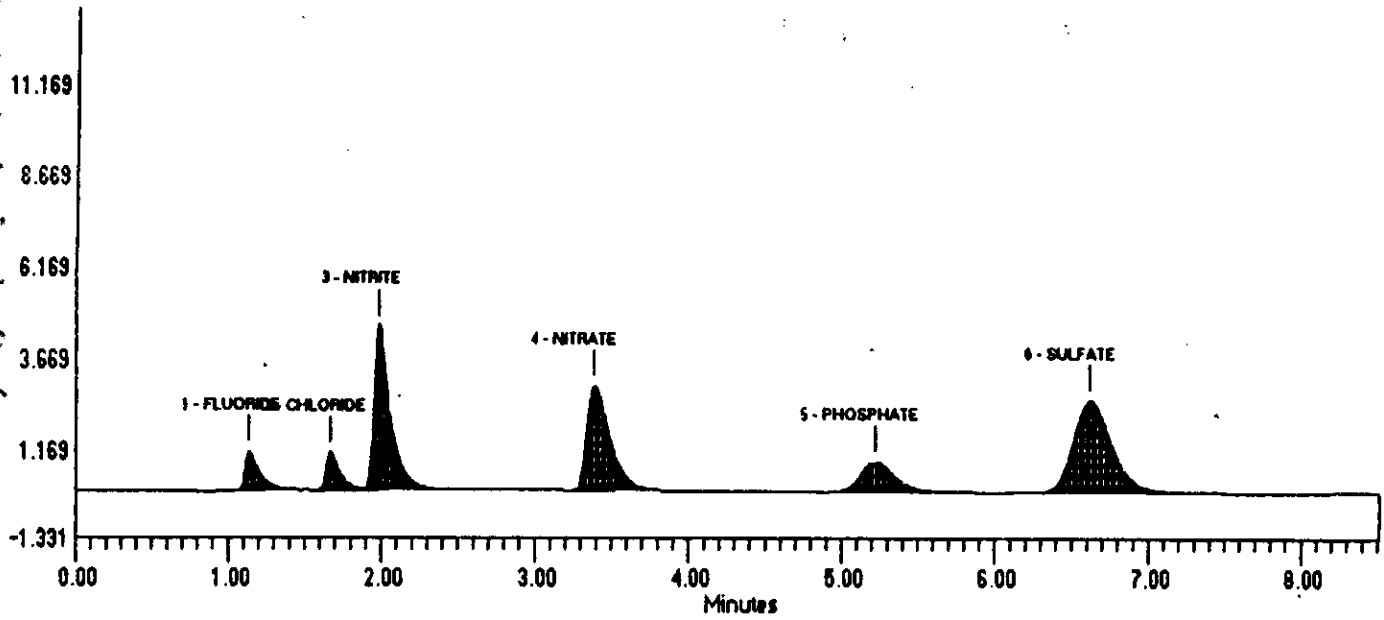
==========================================================================
|   mple Name: LMCS/73C11CM                    Date: Wed Sep 25 13:59:38 1991|
| Data File   : c:\dx\data\91092511.D03                                    |
| Method      : c:\dx\method\SYSTEM1.met                                   |
| ACI Address: 1        System : 1        Inject#:   3  Detector: CDM-1    |
==========================================================================
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.031	1079	7472	1	0.00
2	1.67	CHLORIDE	71.776	1034	6670	2	-1.96
3	1.98	NITRITE	501.818	4487	33395	2	-2.30
4	3.38	NITRATE	530.270	2877	30926	1	2.53
5	5.22	PHOSPHATE	517.102	836	13098	1	-1.88
6	6.62	SULFATE	590.417	2525	43628	1	-3.41

File: c:\dx\data\91092511.D03 Sample: LMCS/73C11CM



WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: ION CHROMATOGRAPHIC - FLUORIDE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 05-18-92
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5571	11		
2	REAGENT BLANK	R9407-5671	12		
3	SAMPLE 2291-4-3	R9411-5771	13		
4	FINAL LMCS CHECK STD	R9412-5571	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: ION CHROMATOGRAPHIC - CHLORIDE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 05-18-92
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5572	11		
2	REAGENT BLANK	R9407-5672	12		
3	SAMPLE 2291-4-3	R9411-5772	13		
4	FINAL LMCS CHECK STD	R9412-5572	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

DAYS DATE: 6-27-91

PAYROLL NO.: 80028

Y-INTERCEPT= .013899
SLOPE= .162164

SAMPLE ID#: BLANK
SAMPLE SIZE: 0
WVL AND ABS= 580NM 0.010 A

SAMPLE ID#: R-9409 STD 75C11-P
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.747 A

SAMPLE ID#: R-9409
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.237 A

SAMPLE ID#: R-9409 DUPLICATE
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.239 A

SAMPLE ID#: R-9410
SAMPLE SIZE: 1ML
AND ABS= 580NM 0.220 A

SAMPLE ID#: R-9410
SAMPLE SIZE: 1ML+100UL-10ML-500UL 75C11P SPIKE
WVL AND ABS= 580NM 0.949 A

SAMPLE ID#: R-9411
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.248 A

SAMPLE ID#: R-9411 STD 75C11-P
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.732 A

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: CYANIDE	Sample Prep: UNDIGESTED

Instrument: MILTON ROY SPEC. 301 AL10724	Procedure/Rev: LA-695-102/A-3
Technologist: E. COLVIN	Date: 06-27-91
Starting Time: 08:00	Temperature: NA
Ending Time: 15:00	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9409-5578	11		
2	REAGENT BLANK	R9409-5678	12		
3	SAMPLE 2291-4-3	R9411-5778	13		
4	FINAL LMCS CHECK STD	R9411-5578	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	75C11P/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: AMMONIA	Sample Prep: UNDIGESTED

Instrument: AL10665, AL10696	Procedure/Rev: LA-634-102/D-0
Technologist: S. COBB	Date: 08-23-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5528	11		
2	REAGENT BLANK	R9407-5628	12		
3	SAMPLE 2291-4-3	R9411-5728	13		
4	SPIKE OF 2291-4-3	R9411-5928	14		
5	FINAL LMCS CHECK STD	R9412-5528	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	4C11QL/.250 mL			NA
SPIKE	4C11QL/.250 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9411+SP Date: 09-04-1991 Time: 12:39:09

Blank = .5424173 Sample Size = 50 Dilution Factor = 3
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	88.60	100.00
3	3.01	102.70	13.73
4	4.01	107.90	4.82
5	5.01	109.10	1.10
6	6.01	110.30	1.09
7	7.01	110.90	0.54

(110.9 - 3.800066)(3)/(50) = 6.425997 g/L Carbon

(110.9 - 3.800066)(3)/(50)(12) = .5354997 Molar Carbon

Sample Run By: 80028

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: ~~BLK-A~~ R.9407 RC Date: 09-04-1991 Time: 09:43:11

Blank = N/A Sample Size = 50 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	1.40	100.00
3	3.01	1.90	26.32
4	4.01	2.40	20.83
5	5.01	2.90	17.24
6	6.01	3.40	14.71
7	7.01	3.80	10.53

BLANK VALUE = 3.8 / 7.005677 = .5424173 g/L/minute

Sample Run By: 80028

TOTAL INORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-5527	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
TIC	LA-622-102	% RECOVERY	WIDEO	0

Sample Size: ? 50uL — Customer ID: STD

Remarks, Calculations, Results:
S223 CO3
STDH 69C11 K RESULT 2.043E-1 m
STD VAL 2.00E-1 m % REC 102.2%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohn				

Date: 9-4-91 — Time Completed — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-5627	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
TIC	LA-622-102	G/G	WIDEO	0

Sample Size: ? 50uL — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
3.80ug C
PYB 6/11/92 ~~5.42E-1 g/l/minute~~

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				DY Bixenius
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohn				

Date: 9-4-91 — Time Completed — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9411.-5727	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
TIC	LA-622-102	G/G	WIDEO	0

Sample Size: ? 50uL — Customer ID: 2291-4-3

Remarks, Calculations, Results:
7.58E-1 g/l

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohn				

Date: 9-4-91 — Time Completed — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9411.-5927	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
TIC	LA-622-102	% RECOVERY	WIDEO	0

Sample Size: ? 50uL — Customer ID: 2291-4-1

Remarks, Calculations, Results:
SAMPLE SPIKED ID
SPIKE ID 69C11K
SPIKE VOLUME
100uL

$$\frac{(3)(110.9-3.8)-(41.7-3.8)(1)}{(.1)(2400)(3)} \times 100 = 118.8\%$$

KS 9-4-91

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohn				

Date: 9-4-91 — Time Completed — Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-5527	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
TIC	LA-622-102	% RECOVERY	WIDEO	0

Sample Size: ? 50uL — Customer ID: STD

Remarks, Calculations, Results:
S223 CO3
STDH 69C11 K RESULT 2.055E-1 m
STD VAL 2.00E-1 m % REC 102.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohn				

Date: 9-4-91 — Time Completed — Lab Unit Mgr: [signature]

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9412 Date: 06-27-1991 Time: 11:27:31

Blank = .670791 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	38.60	100.00
3	3.01	51.40	24.90
4	4.01	55.90	8.05
5	5.01	58.00	3.62
6	6.01	59.40	2.36
7	7.01	60.30	1.49

(60.3 - 4.699344)(11)/(200) = 3.058036 g/L Carbon

(60.3 - 4.699344)(11)/(200)(12) = .2548363 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9407 Date: 06-27-1991 Time: 08:45:18

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	1.20	100.00
3	3.01	2.10	42.86
4	4.01	2.80	25.00
5	5.01	3.50	20.00
6	6.01	4.20	16.67
7	7.01	4.70	10.64

BLANK VALUE = 4.7 / 7.006653 = .670791 g/L/minute

Sample Run By: 80028_____

TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5526	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	W1BEO	0

Sample Size: ? 200uL-2mL-200uL
Customer ID: STD

Remarks, Calculations, Results:
S356 CO3TOC
STDH 70C11 H RESULT 3.0525g/l
STD VAL 3.00g/l %REC 101.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohn				

Date: 6-27-91 Time Completed: Last Unit Mgr: Paul M. Pool

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5626	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/G	W1BEO	0

Sample Size: ? 200uL
Customer ID: REG. BL.

Remarks, Calculations, Results:
REAGENT BLANK SKM 12-2-91
4.70 ug
~~6.71e-1 g/l/minute~~

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohn				

Date: 6-27-91 Time Completed: Last Unit Mgr: Paul M. Pool

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-5726	102AW	6-14-91	12:57	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/G	W1BEO	0

Sample Size: ? 200uL-2mL-200uL
Customer ID: 2291-4-3

Remarks, Calculations, Results:
4.24e-1 g/l

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohn				

Date: 6-27-91 Time Completed: Last Unit Mgr: Paul M. Pool

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5526	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	W1BEO	0

Sample Size: ? 200uL-2mL-200uL
Customer ID: STD

Remarks, Calculations, Results:
S356 CO3TOC
STDH 70C11 H RESULT ~~3.00g/l~~ 3.058g/l
STD VAL 3.00g/l %REC 101.9%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohn				

Date: 6-27-91 Time Completed: Last Unit Mgr: Paul M. Pool

DSC

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Configuration used from 8-8-91 to Nov 25, 1991

Denise Hebert

NFIGURATION

26-NOV-91 8:14

E .NDIUM	255
DSC SIGN ICTA	1
TAU LAG	12
TAU SIGNAL	0
E DIMIN. FACT.	.93
S	2400
TAU LAG 2	16
TAU SIGNAL 2	0
E DIMIN. F. 2	.93
S 2	1850
MAX. TEMP.	600.
MIN. TEMP.	-50.
A PT100	.21610
B PT100	.74150
C PT100	-.10116
HEAT P	3000
HEAT I	250
HEAT D	30
COOL 1	0
COOL 2	0
COOL 3	0
A1	10773
B1	58.121
C1	.14689
T.	-100
A2	8940
B2	17.884
C2	-.072
I2	363
A3	9360.3
B3	-15.043
C3	.01538

Heat flow calibration began July 20, 1991. Used until Nov 25, 1991

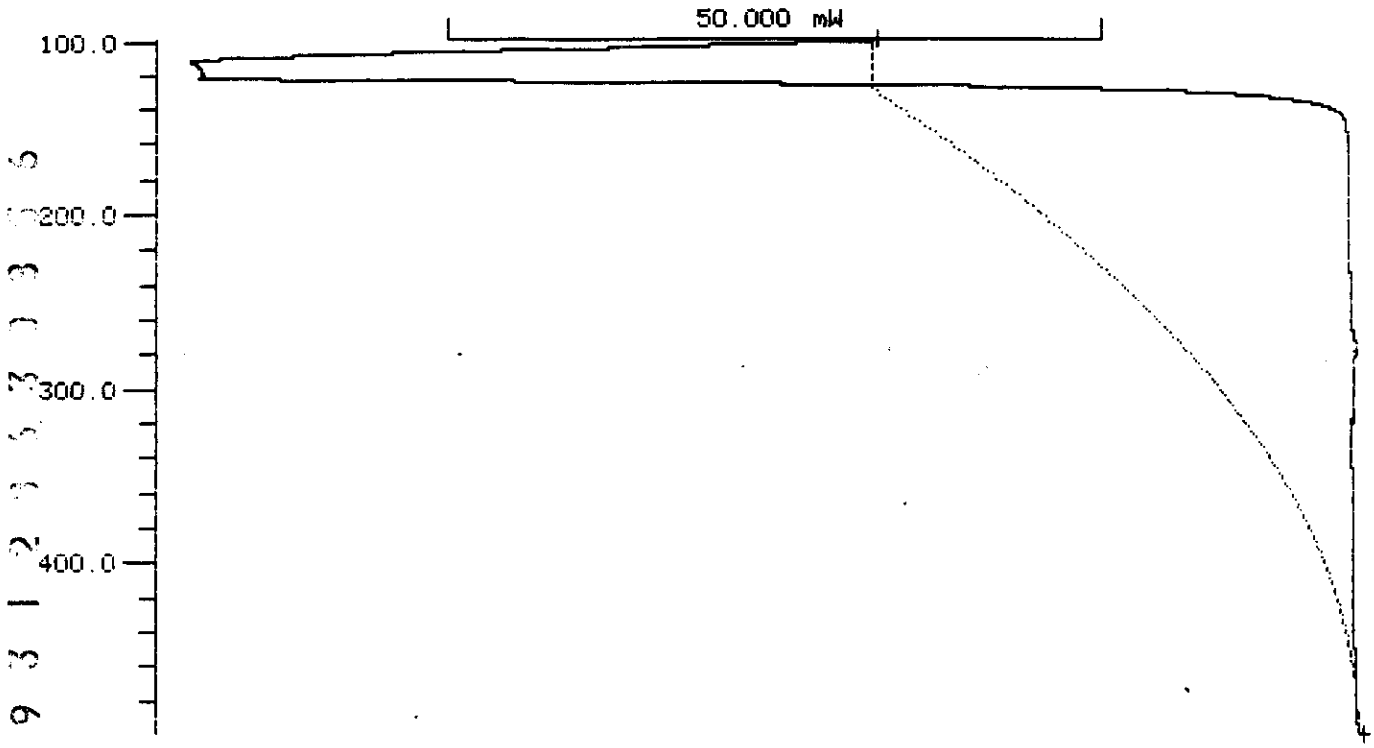
******** METTLER TA4000 SYSTEM *********

BEST AVAILABLE COPY

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->



WARNING		1
ΔH EXO	mJ	20428
ΔH	J/G	1992.8
PEAK TEMP. °C		143.6

******** METTLER TA4000 SYSTEM *********

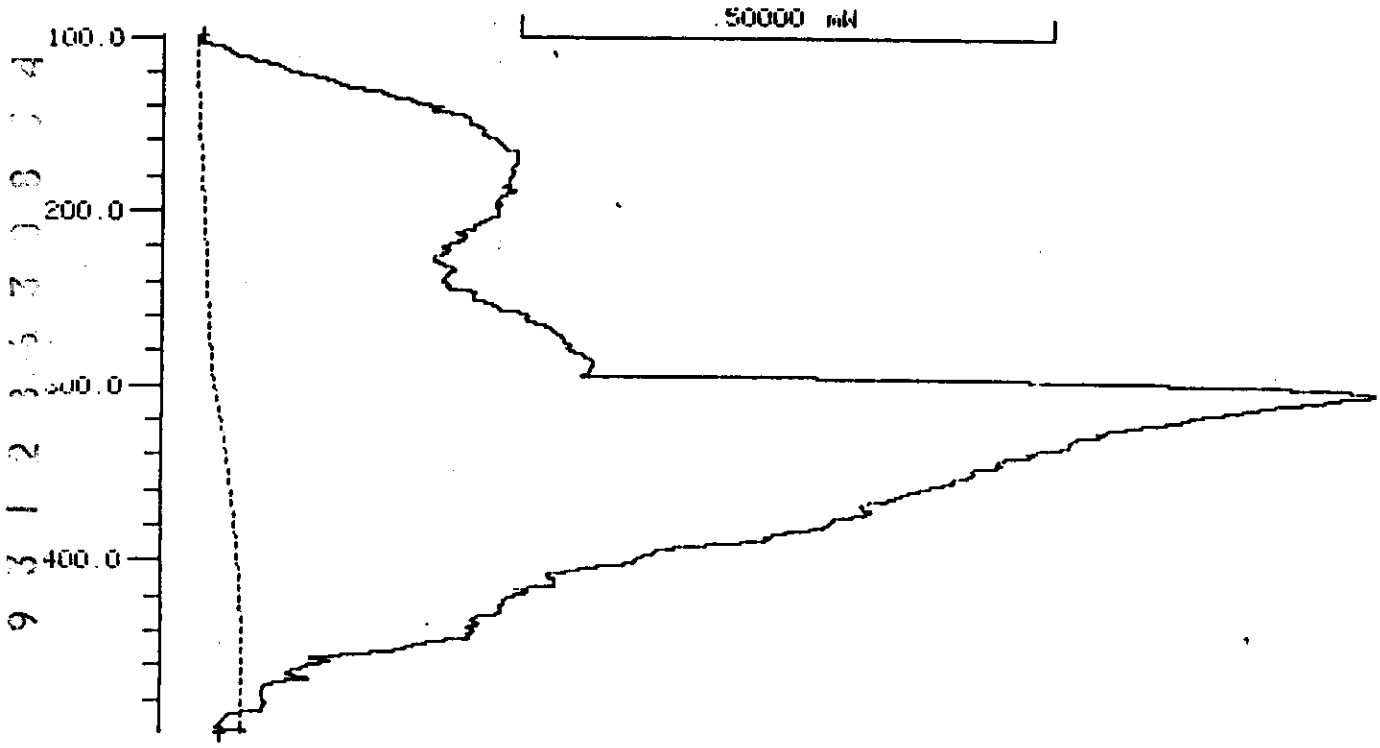
Sample
R9411
82583
SL Colab
09-15-91

273 08/20/92
295

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->



ΔH EXO	mJ	827.11
ΔH	J/G	82.711
PEAK TEMP.	°C	304.0

******** METTLER TA4000 SYSTEM *********

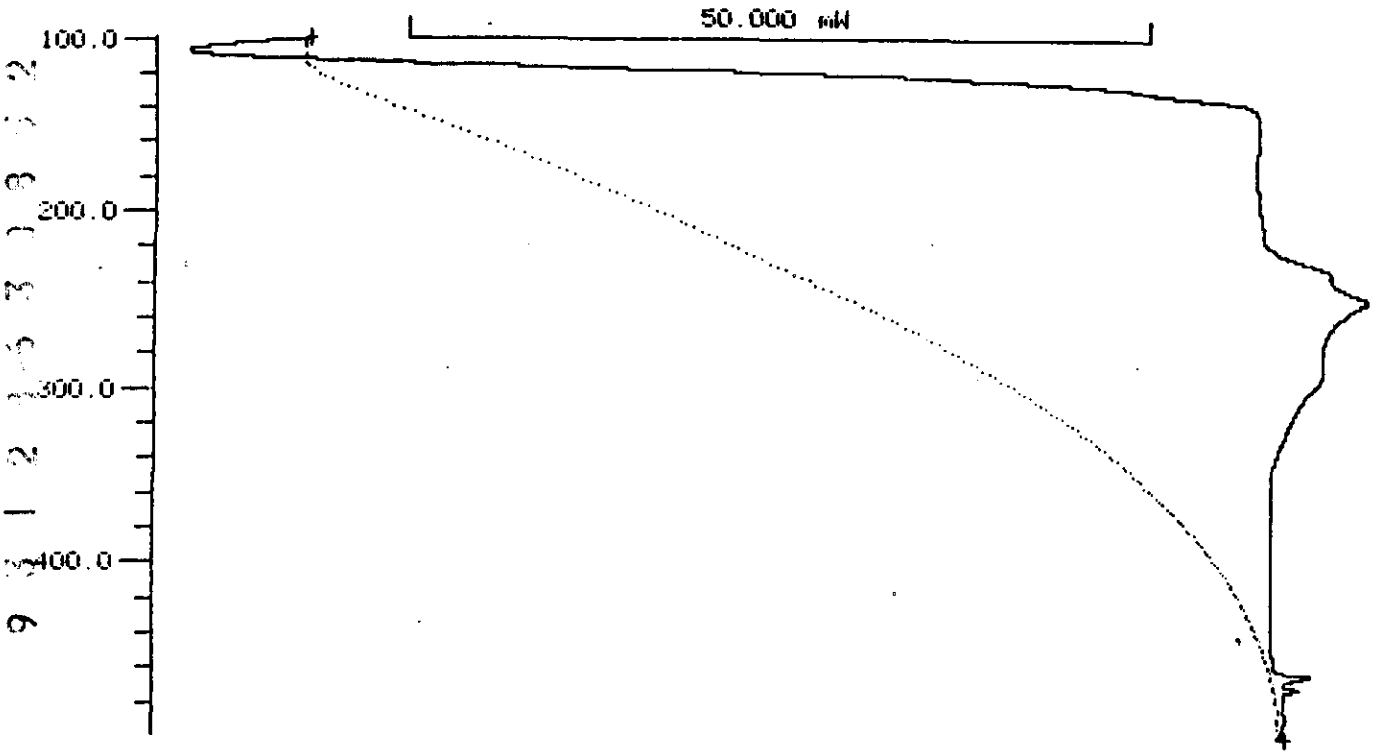
BLK
R9409
82503

Δ

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->



ΔH EXO	mJ	49998
ΔH	J/G	5156.6
PEAK TEMP.	°C	139.9

******** METTLER TA4000 SYSTEM *********

26

STD
R9406
82583
SL Cobb
09-15-91

DIFFERENTIAL THERMAL ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-551	102AW	6-14-91	12:38	26

Determination	Method/Standard	Result Units	Charge Code	Retests
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size	Customer ID
7 10ul	STD

Remarks, Calculations, Results: 2211-A2

100%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82533				
Yes	Yes	Yes	Yes	Yes
SL Cobb				

Date	Time Completed	Log Use/Day
09-15-91		

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-561	102AW	6-14-91	12:42	26

Determination	Method/Standard	Result Units	Charge Code	Retests
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size	Customer ID
7	REG. BL

Remarks, Calculations, Results: REAGENT BLANK

No exotherm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				
Yes	Yes	Yes	Yes	Yes
SL Cobb				

Date	Time Completed	Log Use/Day
09-15-91		

Serial No	Sample Point	Date	Time Issued	Priority
R 9411.-571	102AW	6-14-91	12:58	26

Determination	Method/Standard	Result Units	Charge Code	Retests
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size	Customer ID
7 10 ul	2291-4-3

Remarks, Calculations, Results:

No exotherm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				
Yes	Yes	Yes	Yes	Yes
SL Cobb				

Date	Time Completed	Log Use/Day
09-15-91		

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-571	102AW	6-14-91	13:2	26

Determination	Method/Standard	Result Units	Charge Code	Retests
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size	Customer ID
7 10 ul	STD

Remarks, Calculations, Results:

100.0%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				
Yes	Yes	Yes	Yes	Yes
SL Cobb				

Date	Time Completed	Log Use/Day
09-15-91		

SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-5506	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Returns
SPG	LA-510-112	% RECOVERY	WIDED	1

Sample Size	Container ID
7100.32L	STD

Remarks, Calculations, Results:

RERUN

8332 ZNCL2
STDN 15611-6J RESULT 1.4215
STD VAL 1.4586 %REC 98.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82586 Tania UE				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
8-12-91		[signature]	[signature]

6-1.9864
1-1.8436
N-.1428

R9412-5506

3K 6-15-92
2.0330
6-~~2.0342~~
1-1.8906
N-.1424

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: SPECIFIC GRAVITY	Sample Prep: UNDIGESTED

Instrument: WA96787	Procedure/Rev: LA-510-112/C-2
Technologist: T. LEE	Date: 08-12-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist:

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5506	11		
2	REAGENT BLANK	R9407-5606	12		
3	SAMPLE 2291-4-3	R9411-5706	13		
4	FINAL LMCS CHECK STD	R9412-5506	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	15C11-B/.10032 mL			NA
SAMPLES RERUN.				

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9411	Customer ID: 2291-4-3
Analysis: VISUAL CHECK AND OVER-THE-TOP READING	Sample Prep: UNDIGESTED

Instrument: N/A	Procedure/Rev: LA-519-151/D-1
Technologist: M. BIERMAN	Date: 06-14-91
Starting Time: 13:30	Temperature: 25degC
Ending Time: 15:00	Chemist: N/A

	Description	Lab ID		Description	Lab ID
1	SAMPLE 1-3	R9408-5000	11		
2	SAMPLE 2-3	R9409-5000	12		
3	SAMPLE 3-3	R9410-5000	13		
4	SAMPLE 4-3	R9411-5000	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
N/A				

A-6000-881 (03/92)

Component # 5 NITRATE Retention Time 3.30
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.02611E-001
K1 = 1.61787E-004
K2 = -5.83501E-011

Level	Amount	Area	Height
1	1.37000E+000	7543	727
2	3.43000E+000	19321	1803
3	6.83000E+000	40244	3563
4	1.35000E+001	83386	7010
5	2.65000E+001	173503	13640
6	5.11000E+001	360809	25639

Component # 6 PHOSPHATE Retention Time 5.32
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 5.53452E-001
K1 = 3.53243E-004
K2 = -3.51156E-010

Level	Amount	Area	Height
1	1.19000E+000	2277	162
2	2.98000E+000	7242	453
3	5.93000E+000	15025	935
4	1.17400E+001	31660	1933
5	2.30300E+001	69135	4130
6	4.43700E+001	144749	8447

Component # 7 SULFATE Retention Time 6.85
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.55734E-001
K1 = 1.27491E-004
K2 = -3.79358E-011

Level	Amount	Area	Height
1	1.40000E+000	9418	543
2	3.50000E+000	24497	1382
3	6.96000E+000	52303	2890
4	1.37800E+001	107173	5909
5	2.70400E+001	225632	12225
6	5.20700E+001	471630	24686

Calibration Parameters

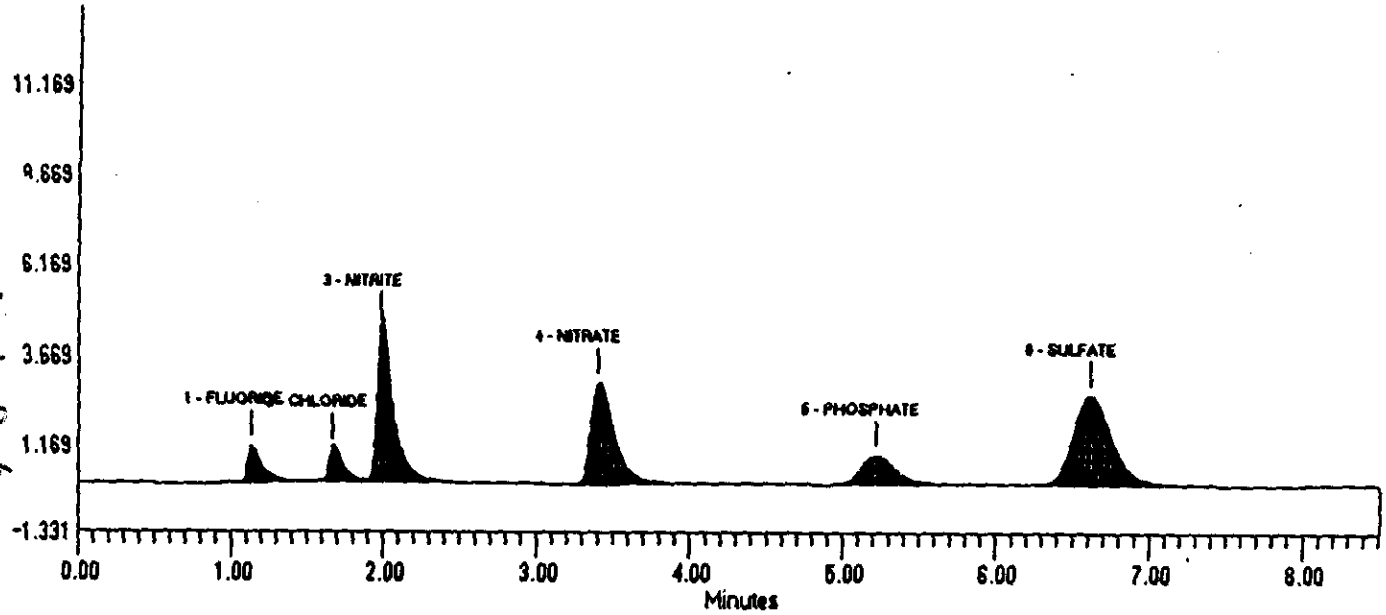
Number Of Levels for Calibration	6
Calibration Fit Type	Quadratic
Replace Or Average Calibrations	Replace
External or Internal Calibration	External
Calibrate by Area or Height	Area
Default Injection Volume	1.0
Default Dilution Factor	1.0
Response Factor for Unknown Peaks	1.0
Calibration Standard Volume	1.0
Internal Standard Volume	1.0
Sample Unit	PPM

Sample Name: LMCS/73C11CM Date: Wed Sep 25 11:41:00 1991
Data File : c:\dx\data\91092501.D10
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.425	1099	7537	1	0.00
2	1.67	CHLORIDE	73.303	1005	6821	2	-1.96
3	1.98	NITRITE	509.856	4351	33988	2	-2.30
4	3.40	NITRATE	540.888	2919	31591	1	3.03
5	5.22	PHOSPHATE	525.714	851	13345	1	-1.88
6	6.62	SULFATE	604.077	2604	44717	1	-3.41

File: c:\dx\data\91092501.D10 Sample: LMCS/73C11CM

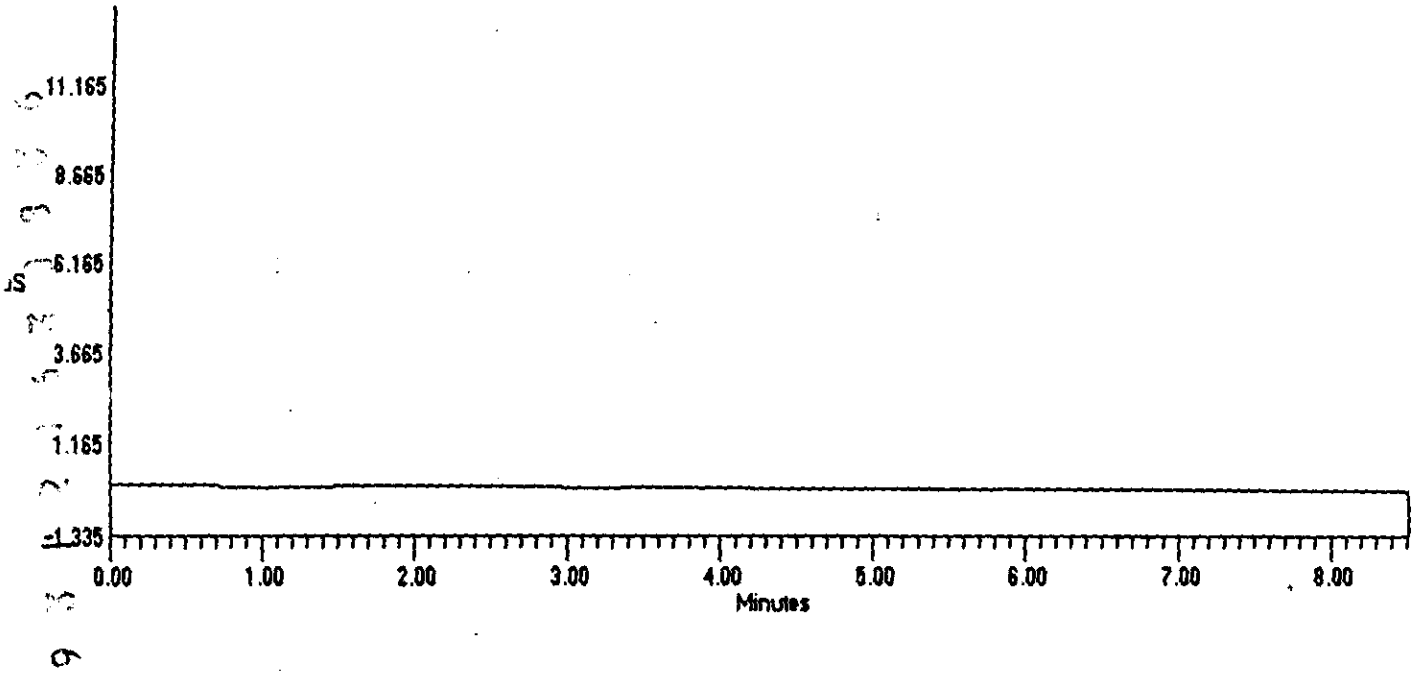


Sample Name: BLANK	Date: Wed Sep 25 10:19:25 1991
Data File : c:\dx\data\91092501.D02	
Method : c:\dx\method\SYSTEM1.met	
ACI Address: 1 System : 1 Inject#: 2 Detector: CDM-1	

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

File: c:\dx\data\91092501.D02 Sample: BLANK



ION CHROMATOGRAPHIC ANALYSIS (NITRITE) - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Sampled	Priority
R 9406.-5576	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Results
NO2	LA-533-105	% RECOVERY	W1DEU	0

Sample Size: 7 .100mL -10mL
Customer ID: STD73C11CM

Remarks, Calculations, Results:
EDP RY48 DIONEX
STDN 73C11CM RESULT 5.191E2
STD VAL 5.13E2 %REC 100.96%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C280	[signature]			[signature]
Hrs	Hrs	Hrs	Hrs	Hrs
34r				[signature]
Date	Time Completed	Lab Use Only		
9-25-91		[signature]		

Sample No	Sample Point	Date	Time Sampled	Priority
R 9407.-5576	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Results
NO2	LA-533-105	G/G	W1DEU	0

Sample Size: 7 1.0mL direct
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C280	[signature]			[signature]
Hrs	Hrs	Hrs	Hrs	Hrs
34r				[signature]
Date	Time Completed	Lab Use Only		
9-25-91		[signature]		

Sample No	Sample Point	Date	Time Sampled	Priority
R 9410.-5776	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Results
NO2	LA-533-105	G/G	W1DEU	0

Sample Size: 7 .100mL - 10mL - 1.0mL - 10mL
Customer ID: 2291-3-3

Remarks, Calculations, Results:
$2.54E^{3}$ ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C280	[signature]			[signature]
Hrs	Hrs	Hrs	Hrs	Hrs
34r				
Date	Time Completed	Lab Use Only		
9-25-91		[signature]		

Sample No	Sample Point	Date	Time Sampled	Priority
R 9412.-5576	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Results
NO2	LA-533-105	% RECOVERY	W1DEU	0

Sample Size: 7 .100mL - 10 mL
Customer ID: STD73C11CM

Remarks, Calculations, Results:
EDP RY48 DIONEX
STDN 73C11CM RESULT 509.856
STD VAL 5.13E2 %REC 99.4%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C280	[signature]			[signature]
Hrs	Hrs	Hrs	Hrs	Hrs
34r				[signature]
Date	Time Completed	Lab Use Only		
9-25-91		[signature]		

ION CHROMATOGRAPHIC ANALYSIS (NITRATE) - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-557	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	W1DEO	0

Sample Size: ? .100mL - 10mL - 10mL SR #1/2
Customer ID: STD 73C11CM

Remarks, Calculations, Results:
EDP R9/8 DIONEX
STD #73C11CM REBULT 539.772
STD VAL 564 %REC 95.7%

Analyst-1: GC280 Analyst-2: Analyst-3: Analyst-4: Analyst-5:
Hrs: 36V
Date: 9-25-91 Time Completed: Lab Unit Price:

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-567	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	U/G	W1DEO	0

Sample Size: ? 1.0mL direct
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
<1 ppm

Analyst-1: GC280 Analyst-2: Analyst-3: Analyst-4: Analyst-5:
Hrs: 36V
Date: 9-25-91 Time Completed: Lab Unit Price:

Serial No.	Sample Point	Date	Time Issued	Priority
R 9410.-577	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	U/G	W1DEO	0

Sample Size: ? .100mL - 10mL - 10mL - 10mL
Customer ID: 2291-3-3

Remarks, Calculations, Results:
~~1.41E-4~~ 5 ppm ~~1.41E~~ ppm 12-12-91

Analyst-1: GC290 Analyst-2: Analyst-3: Analyst-4: Analyst-5:
Hrs: 36V
Date: 9-25-91 Time Completed: Lab Unit Price:

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-557	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	W1DEO	0

Sample Size: ? .100mL .10mL
Customer ID: STD 73C11CM

Remarks, Calculations, Results:
EDP R9/8 DIONEX
STD #73C11CM REBULT 540.9
STD VAL 564 %REC 95.9%

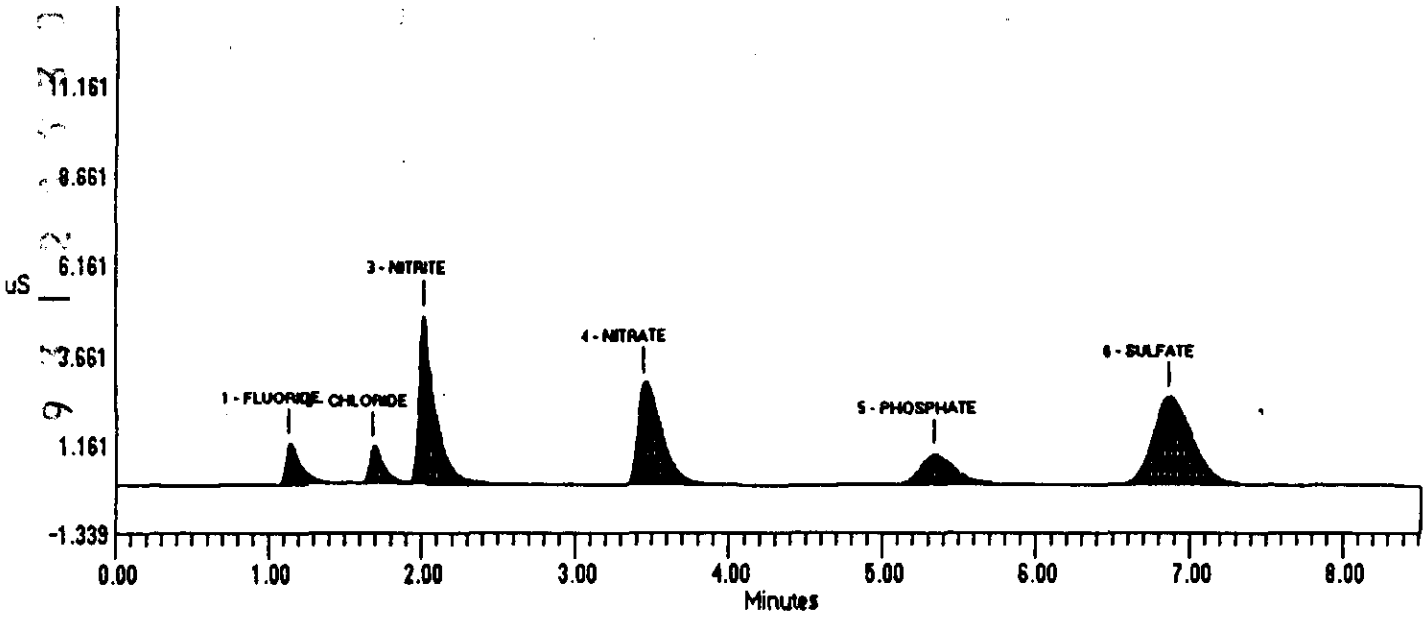
Analyst-1: GC280 Analyst-2: Analyst-3: Analyst-4: Analyst-5:
Hrs: 36V
Date: 9-25-91 Time Completed: Lab Unit Price:

```
==  ==========================================================================
:   mple Name: LMCS/73C11CM                    Date: Mon Sep 23 16:20:47 1991:
: Data File   : c:\dx\data\91092311.D10                                      :
: Method      : c:\dx\method\SYSTEM1.met                                     :
: ACI Address: 1        System : 1        Inject#:  10  Detector: CDM-1      :
==========================================================================
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	57.360	1148	8024	1	0.00
2	1.68	CHLORIDE	72.097	1017	6702	2	-0.98
3	2.02	NITRITE	518.617	4696	34634	2	-0.66
4	3.45	NITRATE	543.291	2890	31741	1	4.55
5	5.33	PHOSPHATE	524.991	836	13325	1	0.31
6	6.87	SULFATE	599.619	2488	44362	1	0.24

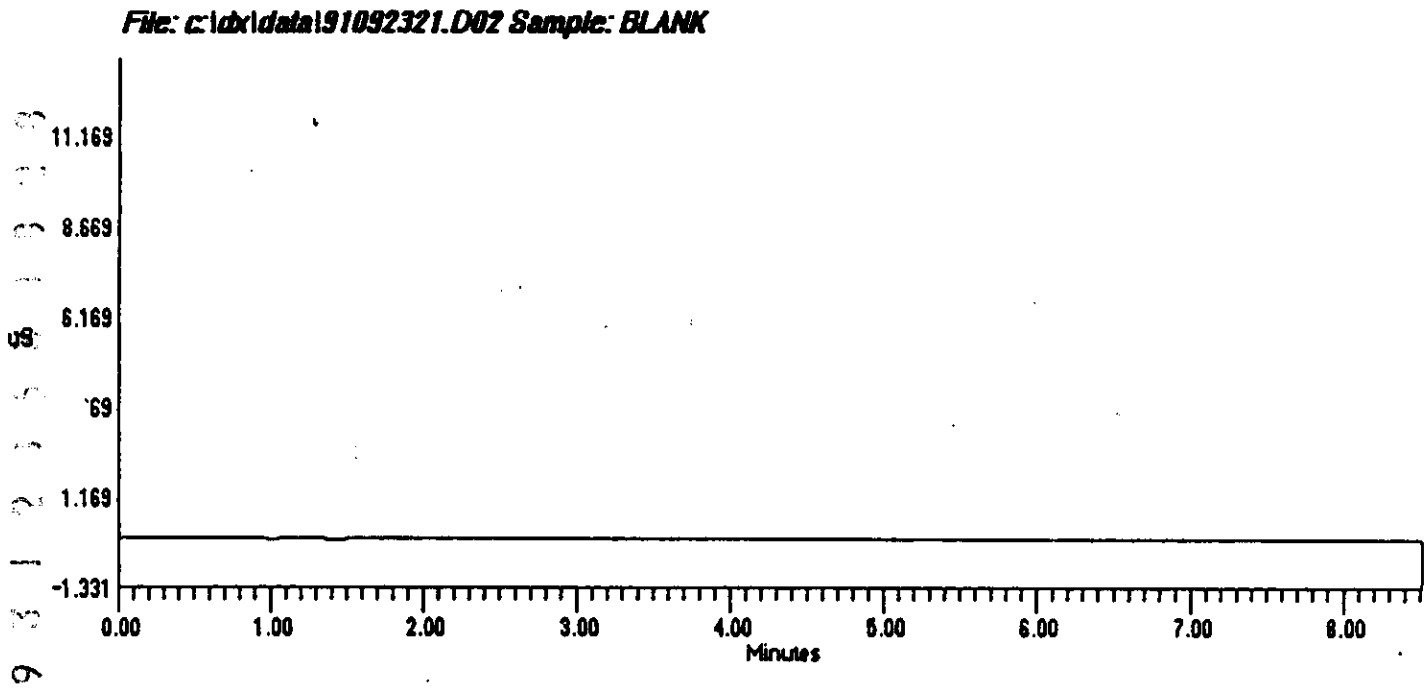
File: c:\dx\data\91092311.D10 Sample: LMCS/73C11CM



```
: Sample Name: BLANK                                  Date: Mon Sep 23 15:01:56 1991 :
:   ta File   : c:\dx\data\91092321.D02                                              :
: method      : c:\dx\method\SYSTEM1.met                                              :
: ACI Address: 1        System : 1        Inject#:    2  Detector: CDM-1            :
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta



ION CHROMATOGRAPHIC ANALYSIS (PHOSPHATE) - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5574	102AW	6-14-91	12:36	26

Determination	Method Standard	Result Units	Charge Code	Returns
PO4	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL -10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDP R9/6 DIONEX
STD# 5.17E² RESULT 536.303
STD VAL 73C11Cm %REC 103.7%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5674	102AW	6-14-91	12:39	26

Determination	Method Standard	Result Units	Charge Code	Returns
PO4	LA-533-105	G/G	W1BEO	0

Sample Size: ? 1.0mL direct
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9410.-5774	102AW	6-14-91	12:52	26

Determination	Method Standard	Result Units	Charge Code	Returns
PO4	LA-533-105	G/G.	W1BEO	0

Sample Size: ? .100mL - 10mL
Customer ID: 2291-3-3

Remarks, Calculations, Results:
1.74E² ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5574	102AW	6-14-91	12:59	26

Determination	Method Standard	Result Units	Charge Code	Returns
PO4	LA-533-105	% RECOVERY	W1BEO	0

Sample Size: ? .100mL - 10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDP R9/6 DIONEX
STD# 73C11Cm RESULT 524.991
STD VAL 517.0 %REC 101.5%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
GC280	[signature]			[signature]
Hrs 2hr	Hrs	Hrs	Hrs	Hrs

Date: 9-23-91 (8-18-92)
Time Completed:
Lab Unit Mgr: [signature]

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: ION CHROMATOGRAPHIC - PHOSPHATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-23-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5574	11		
2	REAGENT BLANK	R9407-5674	12		
3	SAMPLE 2291-3-3	R9410-5774	13		
4	FINAL LMCS CHECK STD	R9412-5574	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

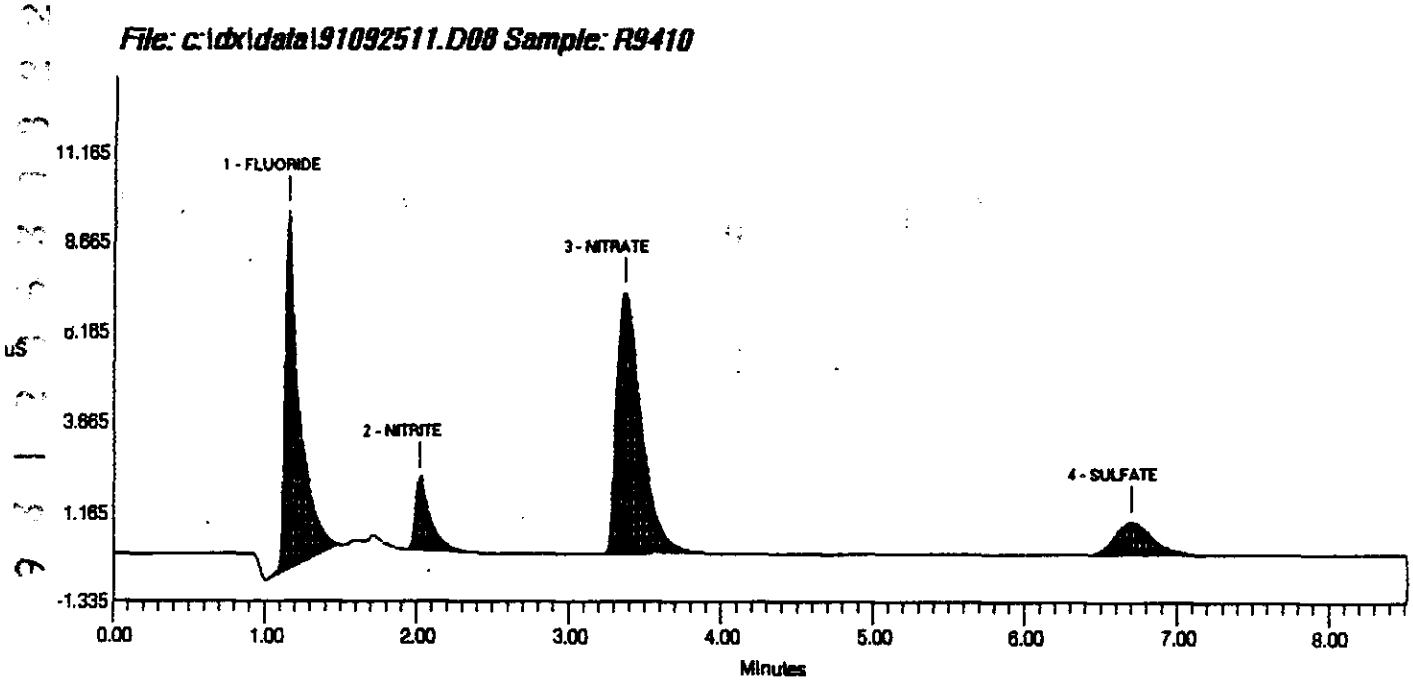
Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

```
=====================================================================================
   mple Name: R9410                                  Date: Wed Sep 25 14:57:47 1991
   ta File   : c:\dx\data\91092511.D08
 Method      : c:\dx\method\SYSTEM1.met
 ACI Address: 1        System : 1        Inject#:   8  Detector: CDM-1
=====================================================================================
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1111	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	4227.032	9977	65729	1	0.00
2	2.02	NITRITE	2596.744	1985	13792	1	-2.10
3	3.37	NITRATE	14508.823	7216	81228	1	0.54
4	6.70	SULFATE	2553.585	907	15308	1	-3.61

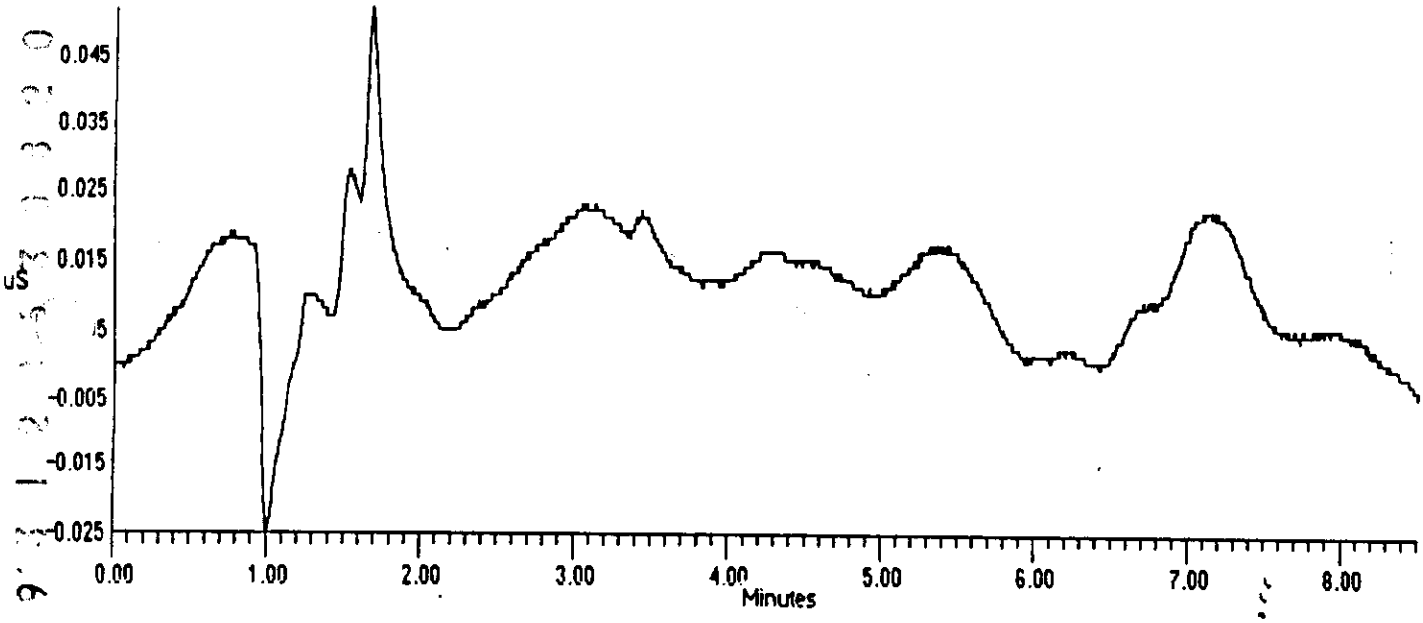


```
Sample Name: BLANK                                    Date: Wed Sep 25 13:49:55 1991
Data File   : c:\dx\data\91092511.D02
Method      : c:\dx\method-SYSTEM1.met
ACI Address: 1        System : 1        Inject#:   2  Detector: CDM-1
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

File: c:\dx\data\91092511.D02 Sample: BLANK



228

05/20/92

242

ION CHROMATOGRAPHIC ANALYSIS (SULFATE) - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Issued	Priority
R 9406.-5571	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Results
SO4	LA-533-105	% RECOVERY	W1DEO	0

Sample Size: 1 .100mL -10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDF R970 DIONEX
STDN 73C11Cm RESULT 5.9012E2
STD VAL 6.10E2 %REC 96.8%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280				
24v				

Date: 9-25-91

Sample No	Sample Point	Date	Time Issued	Priority
R 9407.-5571	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Results
SO4	LA-533-105	U/D	W1DEO	0

Sample Size: 1 1.0mL Diect
Customer ID: REG. BL.

Remarks, Calculations, Results:
REAGENT BLANK
<1.00 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280				
24v				

Date: 15 9-26-91 *8-8-91

Sample No	Sample Point	Date	Time Issued	Priority
R 9410.-5571	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Results
SO4	LA-533-105	U/D	W1DEO	0

Sample Size: 1 .100mL-10mL-1.0mL-10mL
Customer ID: 2241-3-3

Remarks, Calculations, Results:
2.55E3 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280				
24v				

Date: 9-25-91

Sample No	Sample Point	Date	Time Issued	Priority
R 9412.-5571	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Results
SO4	LA-533-105	% RECOVERY	W1DEO	0

Sample Size: 1 100mL -10mL
Customer ID: STD73C11Cm

Remarks, Calculations, Results:
EDF R970 DIONEX
STDN 73C11Cm RESULT 587.65
STD VAL 610 %REC 96.3%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GC280				
24v				

Date: 9-25-91

ION CHROMATOGRAPHIC ANALYSIS (FLUORIDE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5571	102AW	6-14-91		

Determination	Method Standard	Result Units	Charge Code	Revision
F	LA-533-105	% RECOVERY	H1140	0

Sample Size: 0.100mL-10.0mL
Customer ID: STD

Remarks, Calculations, Results
EDF 974 F
STDMSCHECK RESULT
STD VAL %REC

F⁻ result = 54.0 ppm
Std. value = 56.0 ppm
recovery = 96.4 %

Data was corrected per OSM's request. 5-18-92

Analyst 1: 6CLPO | Analyst 2 | Analyst 3 | Analyst 4 | Analyst 5
Date: 5/18/92 | Time Completed | Lab Unit Mgr

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5571	102AW	6-14-91		

Determination	Method Standard	Result Units	Charge Code	Revision
F	LA-533-105	% RECOVERY	H1140	0

Sample Size: direct
Customer ID: [illegible]

Remarks, Calculations, Results
EDF 974 F
RESULT
%REC

< 11.61 ppm

Data was corrected per OSM's request. 5-18-92

Analyst 1: 6CLPO | Analyst 2 | Analyst 3 | Analyst 4 | Analyst 5
Date: 5/18/92 | Time Completed | Lab Unit Mgr

Serial No	Sample Point	Date	Time Issued	Priority
R 9410.-5571	102AW	6-14-91		

Determination	Method Standard	Result Units	Charge Code	Revision
F	LA-533-105	[illegible]	H1140	0

Sample Size: 0.1mL-10.0mL-1.0mL-10.0mL
Customer ID: [illegible]

Remarks, Calculations, Results
4.09E3 ppm

Analyst 1: 6CLPO | Analyst 2 | Analyst 3 | Analyst 4 | Analyst 5
Date: 5/17/92 | Time Completed | Lab Unit Mgr

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5571	102AW	6-14-91		

Determination	Method Standard	Result Units	Charge Code	Revision
F	LA-533-105	% RECOVERY	H1140	0

Sample Size: 0.1mL-10.0mL
Customer ID: STD

Remarks, Calculations, Results
EDF 974 F
STDMSCHECK RESULT 53.5 ppm
STD VAL 56.0 ppm %REC 95.5 %

Data was corrected per OSM's request. 5-18-92

Analyst 1: 6CLPO | Analyst 2 | Analyst 3 | Analyst 4 | Analyst 5
Date: 5/18/92 | Time Completed | Lab Unit Mgr

ION CHROMATOGRAPHIC ANALYSIS (CHLORIDE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5572	102AW	6-14-91	12:31	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	% RECOVERY	H1140	0

Sample Size: 0.100 mL - 10.0 mL — Customer ID: STD

Remarks, Calculations, Results:
FDP R972 DIONEX
STD# 73C11CM RESULT 71.8
STD VAL 75.0 %REC 95.7

Data was retrieved per OSM's request. Daniel K. Todd 5-18-92

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
6CL80				

Date: 5/18/92 — Time Completed: — Lab Unit Mgr: Denise J. Hert, Daniel K. Todd

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5672	102AW	6-14-91	12:42	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	% RECOVERY	H1140	0

Sample Size: % direct — Customer ID: REG. 10

Remarks, Calculations, Results:
FDP R972 DIONEX
~~STD#~~ RESULT < 111.1 ppm
~~STD VAL~~ ~~%REC~~
DJH 4-14-92

Data ~~was~~ was retrieved per OSM's request. Daniel K. Todd 5-18-92

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
6CL80				

Date: 5/18/92 — Time Completed: — Lab Unit Mgr: Denise J. Hert, Daniel K. Todd

Serial No	Sample Point	Date	Time Issued	Priority
R 9410.-5772	102AW	6-14-91	12:54	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	PPM	H1140	0

Sample Size: 0.1 mL - 10 mL - 1.0 mL - 10.0 mL — Customer ID: 2291-3-3

Remarks, Calculations, Results:
5.82E2 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
6CL80				

Date: 5/18/92 — Time Completed: — Lab Unit Mgr: Denise J. Hert, Daniel K. Todd

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5572	102AW	6-14-91	12:[illegible]	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	% RECOVERY	H1140	0

Sample Size: 0.1 mL - 10.0 mL — Customer ID: STD

Remarks, Calculations, Results:
FDP R972 DIONEX
STD# 73C11CM RESULT 71.07 ppm
STD VAL 75 ppm %REC 94.8 %

Data was retrieved per OSM's request. Daniel K. Todd 5-18-92

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]				
6CL80				

Date: 5/18/92 — Time Completed: — Lab Unit Mgr: Denise J. Hert, Daniel K. Todd

TODAYS DATE: 6-27-91

YROLL NO.: 80028

Y-INTERCEPT= .013899
SLOPE= .162164

SAMPLE ID#: BLANK
SAMPLE SIZE: 0
WVL AND ABS= 580NM 0.010 A

SAMPLE ID#: R-9409 STD 75C11-P
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.747 A

SAMPLE ID#: R-9409
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.237 A

SAMPLE ID#: R-9409 DUPLICATE
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.239 A

SAMPLE ID#: R-9410
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.220 A

SAMPLE ID#: R-9410
SAMPLE SIZE: 1ML+100UL-10ML-500UL 75C11P SPIKE
WVL AND ABS= 580NM 0.949 A

SAMPLE ID#: R-9411
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.248 A

SAMPLE ID#: R-9411 STD 75C11-P
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.732 A

$$\frac{(\underbrace{0.949}_{\text{SPIKE}} - 0.010) - 0.013899}{0.162164} = 5.70 \text{ mg } CN^-$$

$$D.F. = \frac{10 \text{ mL}}{0.1 \text{ mL}} = 100$$

$$\text{SPIKE} = \frac{(891.7 \text{ mg/mL})(0.5 \text{ mL})}{100} = 4.46 \text{ mg } CN^-$$

$$\frac{5.70 \text{ mg } CN - 1.21 \text{ mg } CN}{4.46 \text{ mg } CN^-} \times 100\% = \boxed{100.7\% \text{ RECOVERY}}$$

J. S. Lachut 9/10/92

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JMM 08/20/92

~~236~~

CYANIDE ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

STANDARD 5-4-92

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-5578	102AW	6-14-91	12:50	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	W1BED	0

Sample Size: ? 100uL-10mL-500uL — Customer ID: ~~2291-3-3~~ STANDARD 5-4-92

Remarks, Calculations, Results:
S244 KCN
STD# 75C11P RESULT 891.8 ABS .747
STD VAL 891.7 %REC 100.0%

$\frac{(.747-.01)-.013899}{.162164} \div .5 \times 100 =$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Ed Colin				

Date: 6-27-91 — Time Completed: — Lab Unit: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9409.-5678	102AW	6-14-91	12:50	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	PPM	H54D2	0

Sample Size: ? — Customer ID: Blank SKM 12-3-91

Remarks, Calculations, Results:
REAGENT BLANK

$\frac{.010-.013899}{.162164} = < .5 ppm$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Ed Colin				

Date: 6-27-91 — Time Completed: — Lab Unit: [signature] SKM [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9410.-5778	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	PPM	W1BED	0

Sample Size: ? 1mL — Customer ID: 2291-3-3

Remarks, Calculations, Results:
ABS. .220

$\frac{(.220-.01)-.013899}{.162164} \div 1 = 1.21 ppm$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Ed Colin				

Date: 6-27-91 — Time Completed: — Lab Unit: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9410.-5878	102AW	6-14-91	12:54	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	PPM	W1BED	0

Sample Size: ? 1mL — Customer ID: 2291-3-3

Remarks, Calculations, Results:
~~DUPLICATE SAMPLE~~ 5-20-92 ABS .949
SPIKE ID. 75C11P
SPIKE VOL. 100uL-10mL-500uL 100.8%

$\left[\frac{(.949-.01)-.013899}{.162164}\right] - 1.21 / 4.458 \times 100$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028 by Jamil R. Lal 5-20-92				
Ed Colin				

Date: 6-27-92 — Time Completed: — Lab Unit: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9410.-5978	102AW	6-14-91	12:54	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	H54D2	0

Sample Size: ? — Customer ID: 2291-3-3

Remarks, Calculations, Results:
SAMPLE SPIKED ID
SPIKE ID
SPIKE VOLUME

See attached card (Information placed on wrong card) SKM 12-3-91

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028 by Jamil R. Lal 5-20-92				
Ed Colin				

Date: 6-27-91 — Time Completed: — Lab Unit: [signature] SKM [signature]

STANDARD 5-4-92

Serial No.	Sample Point	Date	Time Issued	Priority
R 9411.-5578	102AW	6-14-91	12:58	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	W1BED	0

Sample Size: ? 100uL-10mL-500uL — Customer ID: ~~2291~~ STANDARD 5-4-92

Remarks, Calculations, Results:
S244 KCN
STD# 75C11P RESULT 873.3 ABS .732
STD VAL 891.7 %REC 97.9%

$\frac{(.732-.01)-.013899}{.162164} \div .5 \times 100$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Ed Colin				

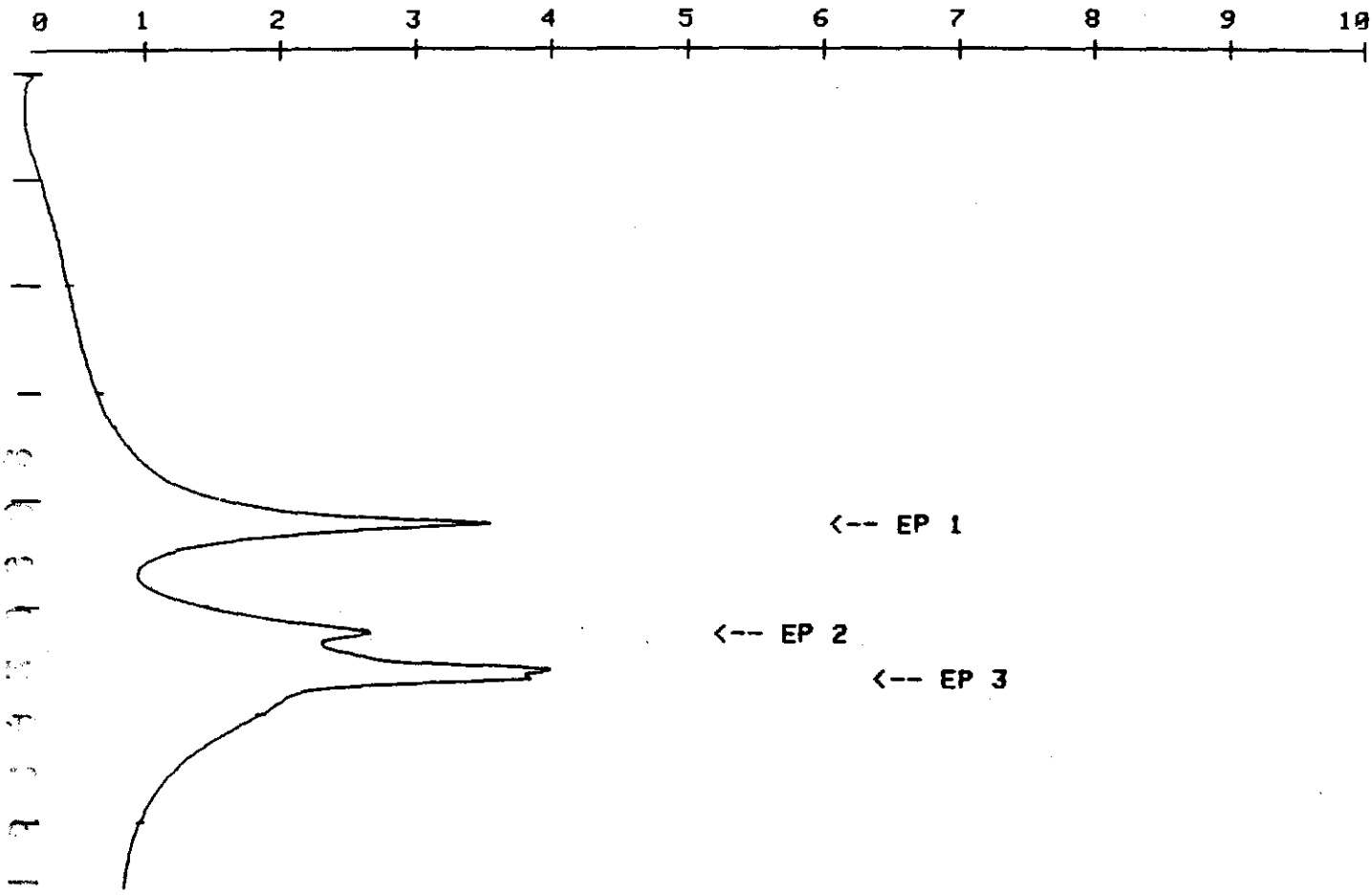
Date: 6-27-91 — Time Completed: — Lab Unit: [signature]

Calculation of R 9410-5978 is at the bottom of page 230. J.S. Lachut 9/10/92

BEST AVAILABLE COPY

SAMPLE NUMBER: 2
SAMPLE DATA: 9412.
DIRECT READ PH: 12.053

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.67	0.529	0.0000
8.02	0.656	0.0000
5.11	0.708	0.0000

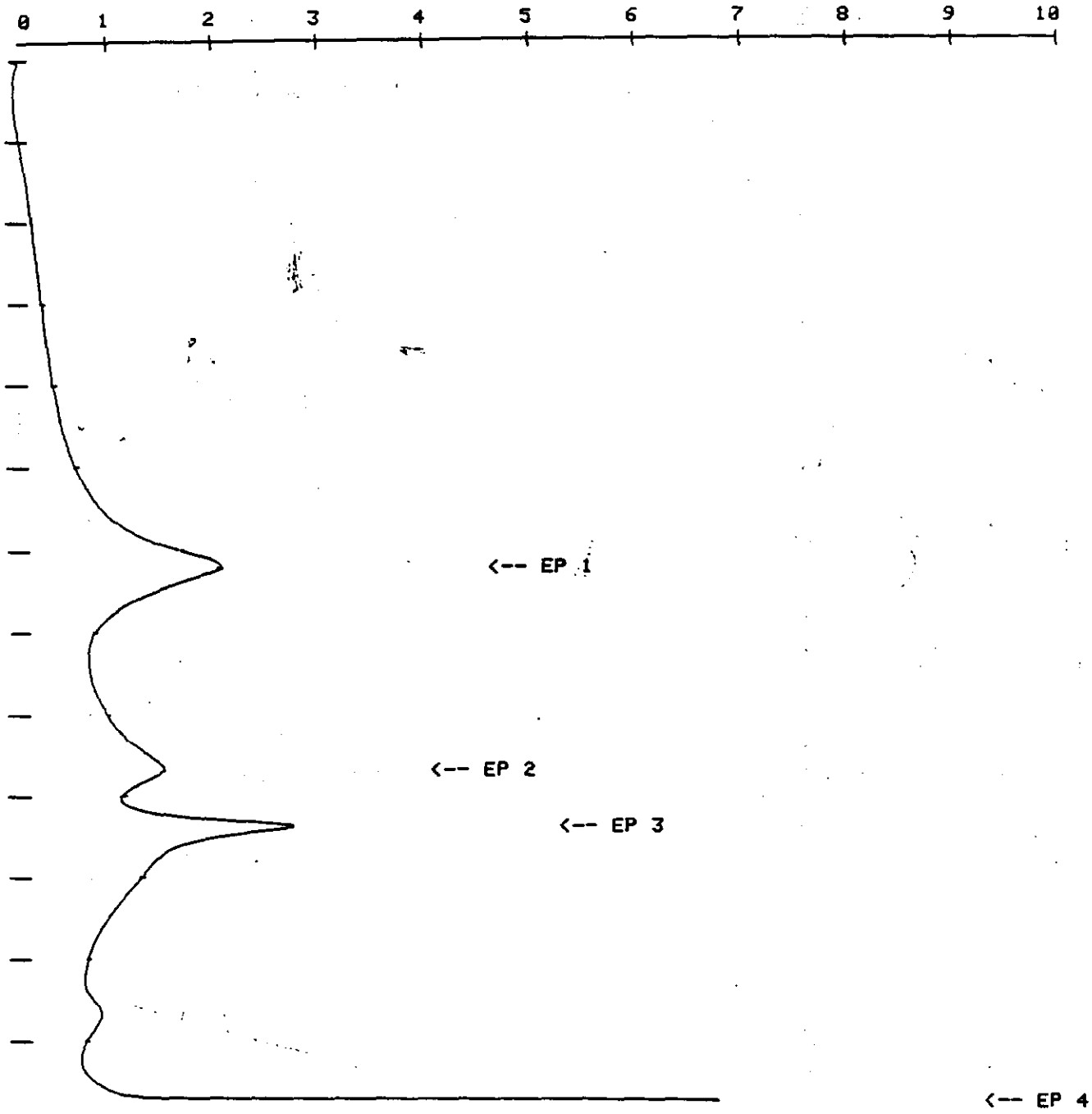
TITRATION TERMINATED BY PH LIMIT.

SEP 11 1991 10:12 AM

SAMPLE NUMBER: [redacted]
SAMPLE DATA: [redacted] duplicate
DIRECT READ PH: 11.899 8-12-92

BEST AVAILABLE COPY

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.94	0.776	0.0000
8.31	1.086	0.0000
7.12	1.172	0.0000
3.62	1.594	0.0000

TITRATION TERMINATED BY LIMIT ON NUMBER OF EQUIVALENCES PERMISSIBLE.

SEP 11 1991 8:43 AM

08/20/92

SAMPLE NUMBER: 1
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:21 AM

SAMPLE NUMBER: 2
DIRECT READ PH: 5.554

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:23 AM

SAMPLE NUMBER: 3
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

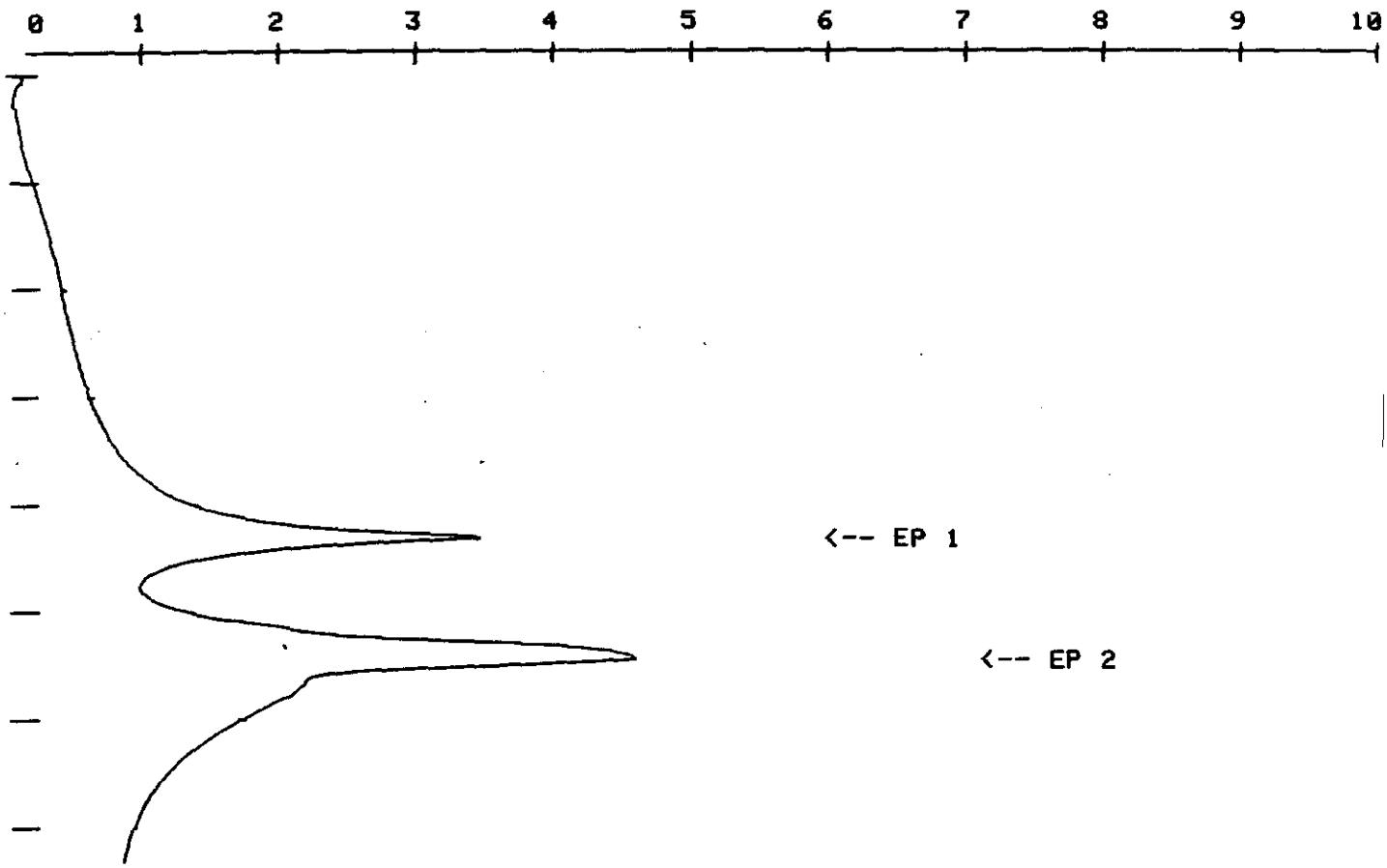
TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:25 AM

BEST AVAILABLE COPY

SAMPLE NUMBER: 1
DIRECT READ PH: 12.001
R-9406
8-14-92

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.66	0.538	0.0000
5.87	0.679	0.0000

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:35 AM

2

PRINTOUT FOR SAMPLE 9410 IS MISSING. I CONTACTED THE LABORATORY AND THE PRINTOUT CANNOT BE FOUND. IT CANNOT BE RECREATED, THEREFORE, IT IS CONSIDERED LOST.

Submitted by: Lola R. Webb, Records Management Specialist
Laboratory Data Management

Dated: 08/19/92

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: DETERMINATION OF HYDROXIDE IONS IN SOLUTION	Sample Prep: UNDIGESTED

Instrument: FISHER WA77509	Procedure/Rev: LA-661-102/F-1
Technologist: M. BIERMAN	Date: 09-10-91
Starting Time: NA	Temperature: 25degC
Ending Time: NA	Chemist: S. ISAACSON

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5529	11		
2	REAGENT BLANK	R9407-5629	12		
3	SAMPLE 2291-3-3	R9410-5729	13		
4	SAM DUP 2291-3-3	R9410-5829	14		
5	FINAL LMCS CHECK STD	R9412-5529	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	9C11AF/.100 mL			.100 mL

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: AMMONIA	Sample Prep: UNDIGESTED

Instrument: AL10665, AL10696	Procedure/Rev: LA-634-102/D-0
Technologist: S. COBB	Date: 08-23-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5528	11		
2	REAGENT BLANK	R9407-5628	12		
3	SAMPLE 2291-3-3	R9410-5728	13		
4	SAM DUP 2291-3-3	R9410-5828	14		
5	FINAL LMCS CHECK STD	R9412-5528	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	4C11QL/.250 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9410DUP Date: 09-04-1991 Time: 10:51:00

Blank = .5424173 Sample Size = 50 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	45.90	100.00
3	3.01	51.90	11.56
4	4.01	54.70	5.12
5	5.01	56.00	2.32
6	6.01	56.80	1.41
7	7.01	57.50	1.22

(57.5 - 3.8)(1)/(50) = 1.074 g/L Carbon

(57.5 - 3.8)(1)/(50)(12) = .0895 Molar Carbon

Sample Run By: 80028

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: ~~BLK-A~~ R.9407 RE 5/18/92 Date: 09-04-1991 Time: 09:43:11

Blank = N/A Sample Size = 50 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	1.40	100.00
3	3.01	1.90	26.32
4	4.01	2.40	20.83
5	5.01	2.90	17.24
6	6.01	3.40	14.71
7	7.01	3.80	10.53

BLANK VALUE = 3.8 / 7.005677 = .5424173 g/L/minute

Sample Run By: 80028

Lanae 08/20/92

280

TOTAL INORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-5527	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TIC	LA-622-102	% RECOVERY	W1DEO	0

Sample Size	Customer ID
? 50uL	STD

Remarks, Calculations, Results

S223 CO3

STDH 69C11 K RESULT 2.043E-1 m

STD VAL 2.00E-1 m % REC 102.2%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-4-91	Time Completed	Lab Unit Mgr		

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-5627	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TIC	LA-622-102	G/G	W1DEO	0

Sample Size	Customer ID
? 50uL	REG. BL

Remarks, Calculations, Results

REAGENT BLANK

3.80ug C

PYO 6/11/92 ~~5.42E-1 g/l/minute~~

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				DY Pivenius
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-4-91	Time Completed	Lab Unit Mgr		

Serial No.	Sample Point	Date	Time Issued	Priority
R 9410.-5727	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TIC	LA-622-102	G/G	W1DEO	0

Sample Size	Customer ID
? 50uL	2291-3-3

Remarks, Calculations, Results

1.07g/l

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-4-91	Time Completed	Lab Unit Mgr		

Serial No.	Sample Point	Date	Time Issued	Priority
R 9410.-5827	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TIC	LA-622-102	G/G	W1DEO	0

Sample Size	Customer ID
? 50uL	2291-3-3

Remarks, Calculations, Results

DUPLICATE SAMPLE

1.07g/l

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-4-91	Time Completed	Lab Unit Mgr		

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-5527	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TIC	LA-622-102	% RECOVERY	W1DEO	0

Sample Size	Customer ID
? 50uL	STD

Remarks, Calculations, Results

S223 CO3

STDH 69C11 K RESULT 2.055E-1 m

STD VAL 2.00E-1 m % REC 102.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80028				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-4-91	Time Completed	Lab Unit Mgr		

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9412 Date: 06-27-1991 Time: 11:27:31

Blank = .670791 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	38.60	100.00
3	3.01	51.40	24.90
4	4.01	55.90	8.05
5	5.01	58.00	3.62
6	6.01	59.40	2.36
7	7.01	60.30	1.49

(60.3 - 4.699344)(11)/(200) = 3.058036 g/L Carbon

(60.3 - 4.699344)(11)/(200)(12) = .2548363 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9407 Date: 06-27-1991 Time: 08:45:18

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	1.20	100.00
3	3.01	2.10	42.86
4	4.01	2.80	25.00
5	5.01	3.50	20.00
6	6.01	4.20	16.67
7	7.01	4.70	10.64

BLANK VALUE = 4.7 / 7.006653 = .670791 g/L/minute

Sample Run By: 80028_____

TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-5626	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Retune
TOC	LA-344-105	G/G	W1BEO	0

Sample Size	Customer ID
? 200uL	REG. BL

Remarks, Calculations, Results: REAGENT BLANK SKM 12-2-91

4.70 ug

~~6.71 E-1 g/l/minute~~

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
6-27-91		[signature]	[signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-5526	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Retune
TOC	LA-344-105	% RECOVERY	W1BEO	0

Sample Size	Customer ID
? 200uL-2mL-200uL	STD

Remarks, Calculations, Results:
S356 CU3TOC
STDH 70C11 M RESULT 3.0525g/l
STD VAL 3.00g/l %REC 101.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
6-27-91		[signature]	[signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9410.-5726	102AW	6-14-91	12:52	26

Determination	Method/Standard	Result Units	Charge Code	Retune
TOC	LA-344-105	G/G	W1BEO	0

Sample Size	Customer ID
? 200uL-2mL-200uL	2291-3-3

Remarks, Calculations, Results:

5.17 E-1 g/l

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
6-27-91		[signature]	[signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-5526	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Retune
TOC	LA-344-105	% RECOVERY	W1BEO	0

Sample Size	Customer ID
? 200uL-2mL-200uL	STD

Remarks, Calculations, Results:
S356 CU3TOC
STDH 70C11 M RESULT ~~3.00g/l~~ 3.058g/l 6-27-91
STD VAL 3.00g/l %REC 101.9%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80027				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
6-27-91		[signature]	[signature]

DSC

Configuration used from 8-8-91 to Nov 25, 1991

Denise Hebert

Heat flow calibration began July 20, 1991. Used until Nov 25, 1991

NFIGURATION

7 NOV-91 8:14

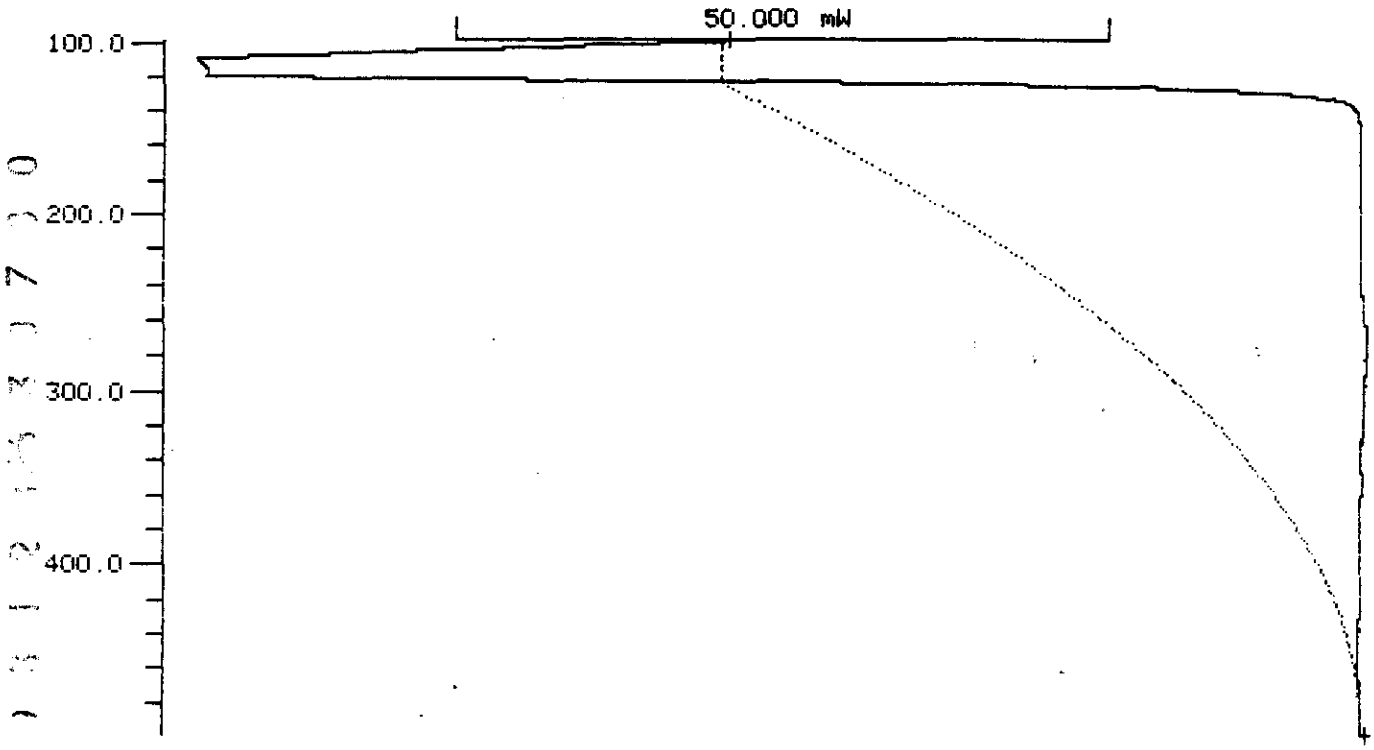
E INDIUM	255
DSC SIGN ICTA	1
TAU LAG	12
TAU SIGNAL	0
E DIMIN. FACT.	.93
S	2400
TAU LAG 2	16
TAU SIGNAL 2	0
E DIMIN. F. 2	.93
S 2	1850
MAX. TEMP.	600.
MIN. TEMP.	-50.
A PT100	.21610
B PT100	.74150
C PT100	-.10116
HEAT P	3000
HEAT I	250
HEAT D	30
COOL 1	0
COOL 2	0
COOL 3	0
A1	10773
B1	58.121
C1	.14689
T1	-100
A2	8940
B2	17.884
C2	-.072
T2	363
A3	9360.3
B3	-15.043
C3	.01538

******** METTLER TA4000 SYSTEM *********

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->



WARNING		1
ΔH EXO	mJ	32086
ΔH	J/G	3280.8
PEAK TEMP.	°C	139.6

******** METTLER TA4000 SYSTEM *********

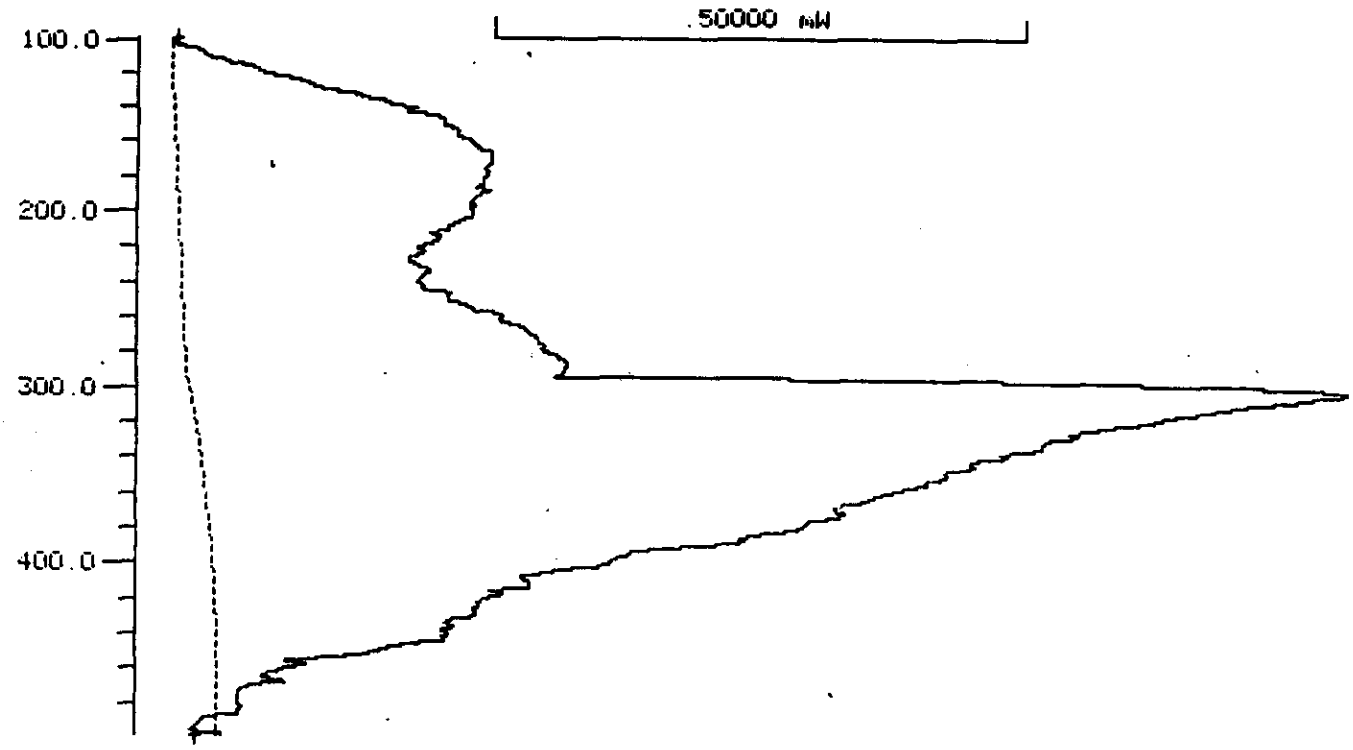
Sample
R9410
82583
SLCobb
09-15-91

198 ~~215~~ 08/20/92

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->



ΔH EXO	mJ	827.11
ΔH	J/G	82.711
PEAK TEMP.	°C	304.0

******** METTLER TA4000 SYSTEM *********

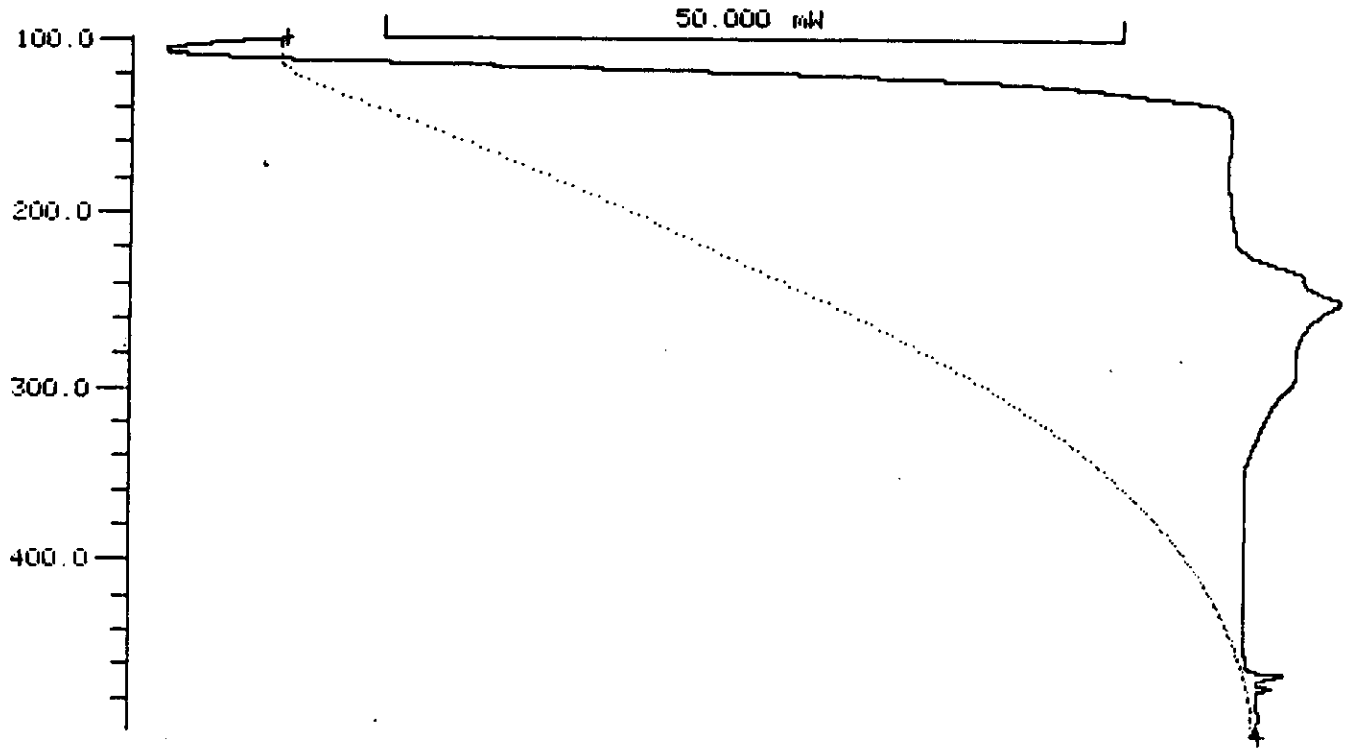
BLK
R9407
82583
SL066
196 09-15-91

Δ

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->



ΔH EXO	mJ	49998
ΔH	J/G	5156.6
PEAK TEMP.	°C	139.9

******** METTLER TA4000 SYSTEM *********

STD
R9406
8258.
SL Cobb
09-15-91

DIFFERENTIAL THERMAL ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Sample No	Sample Point	Date	Time Issued	Priority
R 9406.-551	102AW	6-14-91	12:38	26

Determination	Method Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size	Customer ID
? 10 ul	STD

Remarks, Calculations, Results

2211-12

100%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82533				
Sc Cobb				
09-16-91				

Sample No	Sample Point	Date	Time Issued	Priority
R 9407.-561	102AW	6-14-91	12:42	26

Determination	Method Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size	Customer ID
?	REG. BL

Remarks, Calculations, Results

READENT BLANK

No exotherm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82533				
Sc Cobb				
09-16-91				

Sample No	Sample Point	Date	Time Issued	Priority
R 9410.-571	102AW	6-14-91	12:54	26

Determination	Method Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size	Customer ID
? 10 ul	2241-3-3

Remarks, Calculations, Results

No exotherm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82533				
Sc Cobb				
09-15-91				

Sample No	Sample Point	Date	Time Issued	Priority
R 9412.-551	102AW	6-14-91	13:12	26

Determination	Method Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size	Customer ID
? 10 ul	STD

Remarks, Calculations, Results

100.0%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82533				
Sc Cobb				
09-18-91				

SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9410.-5806	102AW	6-14-91	12:52	26

Description	Method/Standard	Result Units	Charge Code	Results
SPG	LA-510-112		W1DEO	1

Sample Size	Customer ID
? 100.32 L	2291-3-3

Remarks, Calculations, Results

DUPLICATE SAMPLE

RERUN

1.0267

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82586 Tania Lee				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
8-12-91		[signature]

G - 1.9897
T - 1.8867
N - .1030

R9410-5806

G - 1.9953
T - 1.8923
N - .1030

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-5506	102AW	6-14-91	12:59	26

Description	Method/Standard	Result Units	Charge Code	Results
SPG	LA-510-112	% RECOVERY	W1DEO	1

Sample Size	Customer ID
? 100.32 L	STD

Remarks, Calculations, Results

8332 ZNCL2

STDN 15CU-6J RESULT 1.4215

STD VAL 1.4586 %REC 98.8%

RERUN

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82586 Tania Lee				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
8-12-91		[signature]

G - 1.9864
T - 1.8436
N - .1428

R9412-5506

G - ~~2.0342~~ 2.0330
T - 1.8906
N - .1424

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: SPECIFIC GRAVITY	Sample Prep: UNDIGESTED

Instrument: WA96787	Procedure/Rev: LA-510-112/C-2
Technologist: T. LEE	Date: 08-12-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5506*	11		
2	REAGENT BLANK	R9407-5606*	12		
3	SAMPLE 2291-3-3	R9410-5706	13		
4	SAM DUP 2291-3-3	R9410-5806	14		
5	FINAL LMCS CHECK STD	R9412-5506*	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	15C11-B/.10032 mL			NA
*SAMPLES RERUN.				

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9410	Customer ID: 2291-3-3
Analysis: VISUAL CHECK AND OVER-THE-TOP READING	Sample Prep: UNDIGESTED

Instrument: N/A	Procedure/Rev: LA-519-151/D-1
Technologist: M. BIERMAN	Date: 06-14-91
Starting Time: 13:30	Temperature: 25degC
Ending Time: 15:00	Chemist: N/A

	Description	Lab ID		Description	Lab ID
1	SAMPLE 1-3	R9408-5000	11		
2	SAMPLE 2-3	R9409-5000	12		
3	SAMPLE 3-3	R9410-5000	13		
4	SAMPLE 4-3	R9411-5000	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
N/A				

A-6000-881 (03/92)

Component # 5 NITRATE Retention Time 3.30
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.02611E-001
K1 = 1.61787E-004
K2 = -5.83501E-011

Level	Amount	Area	Height
1	1.37000E+000	7543	727
2	3.43000E+000	19321	1803
3	6.83000E+000	40244	3563
4	1.35000E+001	83386	7010
5	2.65000E+001	173503	13640
6	5.11000E+001	360809	25639

Component # 6 PHOSPHATE Retention Time 5.32
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 5.53452E-001
K1 = 3.53243E-004
K2 = -3.51156E-010

Level	Amount	Area	Height
1	1.19000E+000	2277	162
2	2.98000E+000	7242	453
3	5.93000E+000	15025	935
4	1.17400E+001	31660	1933
5	2.30300E+001	69135	4130
6	4.43700E+001	144749	8447

Component # 7 SULFATE Retention Time 6.85
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.55734E-001
K1 = 1.27491E-004
K2 = -3.79358E-011

Level	Amount	Area	Height
1	1.40000E+000	9418	543
2	3.50000E+000	24499	1382
3	6.96000E+000	52303	2890
4	1.37800E+001	107173	5909
5	2.70400E+001	225632	12225
6	5.20700E+001	471630	24686

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Calibration Parameters

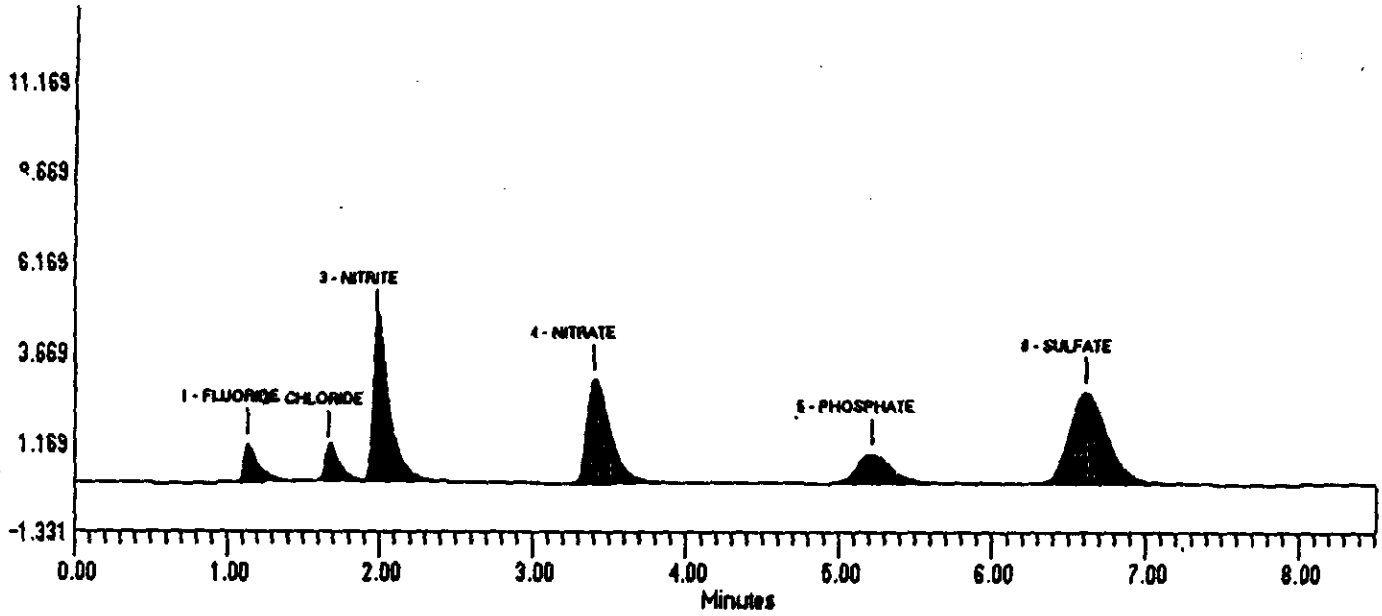
Number Of Levels for Calibration	6
Calibration Fit Type	Quadratic
Replace Or Average Calibrations	Replace
External or Internal Calibration	External
Calibrate by Area or Height	Area
Default Injection Volume	1.0
Default Dilution Factor	1.0
Response Factor for Unknown Peaks	1.0
Calibration Standard Volume	1.0
Internal Standard Volume	1.0
Sample Unit	PPM

Sample Name: LMCS/73C11CM Date: Wed Sep 25 11:41:00 1991
Data File : c:\dx\data\91092501.D10
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.425	1099	7537	1	0.00
2	1.67	CHLORIDE	73.303	1005	6821	2	-1.96
3	1.98	NITRITE	509.856	4351	33988	2	-2.30
4	3.40	NITRATE	540.868	2919	31591	1	3.03
5	5.22	PHOSPHATE	525.714	851	13345	1	-1.88
6	6.62	SULFATE	604.077	2604	44717	1	-3.41

File: c:\dx\data\91092501.D10 Sample: LMCS/73C11CM

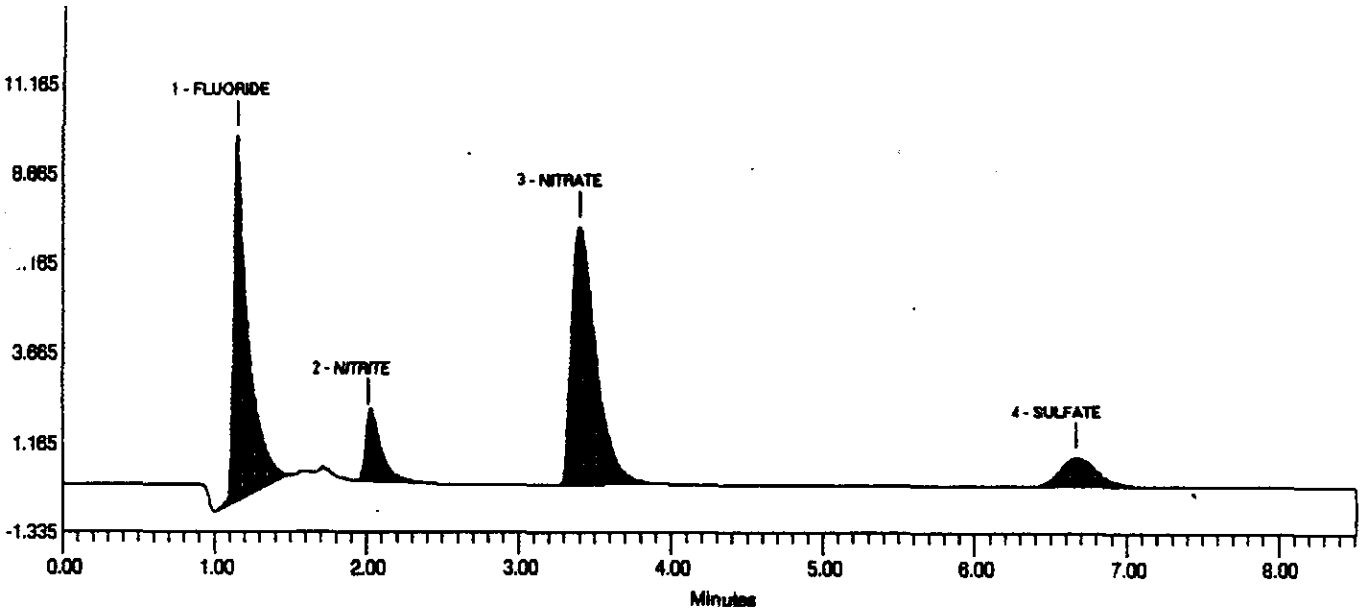


Sample Name: R9409 Date: Wed Sep 25 11:00:05 1991
ta File : c:\dx\data\91092501.D06
ethod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 6 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1111	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	4338.287	10208	67640	1	0.00
2	2.02	NITRITE	2639.359	1857	14078	1	-2.10
3	3.40	NITRATE	14375.849	7210	80443	1	1.54
4	6.67	SULFATE	2282.323	803	13376	1	-4.09

File: c:\dx\data\91092501.D06 Sample: R9409

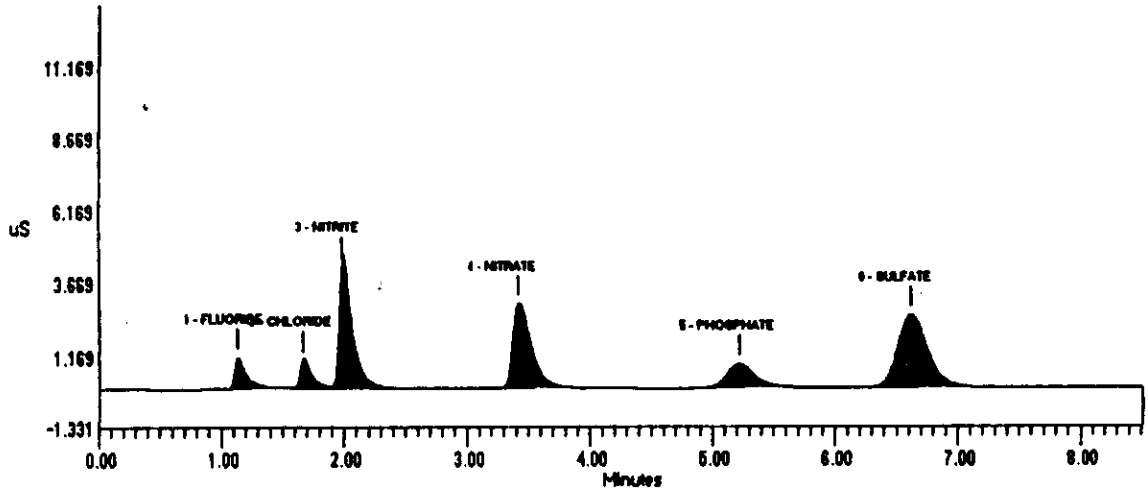


Sample Name: LMCS/73C11CM	Date: Wed Sep 25 10:29:13 1991
Data File : c:\dx\data\91092501.D03	
Method : c:\dx\method\SYSTEM1.met	
ACI Address: 1 System : 1 Inject#: 3 Detector: CDM-1	

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	55.176	1107	7662	1	0.00
2	1.67	CHLORIDE	75.098	1013	6999	2	-1.96
3	1.98	NITRITE	517.910	4303	34581	2	-2.30
4	3.42	NITRATE	539.772	2934	31521	1	3.54
5	5.22	PHOSPHATE	526.308	858	13363	1	-1.88
6	6.62	SULFATE	591.757	2548	43735	1	-3.41

File: c:\dx\data\91092501.D03 Sample: LMCS/73C11CM



WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: ION CHROMATOGRAPHIC - NITRITE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 11:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5576	11		
2	REAGENT BLANK	R9407-5676	12		
3	SAMPLE 2291-2-3	R9409-5776	13		
4	SPIKE OF 2291-2-3	R9409-5976	14		
5	FINAL LMCS CHECK STD	R9412-5576	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA
SPIKE	73C11CM/.05 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: ION CHROMATOGRAPHIC - NITRATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 11:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5573	11		
2	REAGENT BLANK	R9407-5673	12		
3	SAMPLE 2291-2-3	R9409-5773	13		
4	SPIKE OF 2291-2-3	R9409-5973	14		
5	FINAL LMCS CHECK STD	R9412-5573	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA
SPIKE	73C11CM/.05 mL			NA

A-6000-881 (03/92)

Sample Name: R9409SPIKE Date: Wed Sep 25 14:40:38 1991
Data File : c:\dx\data\91092511.D07
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 7 Detector: CDM-1

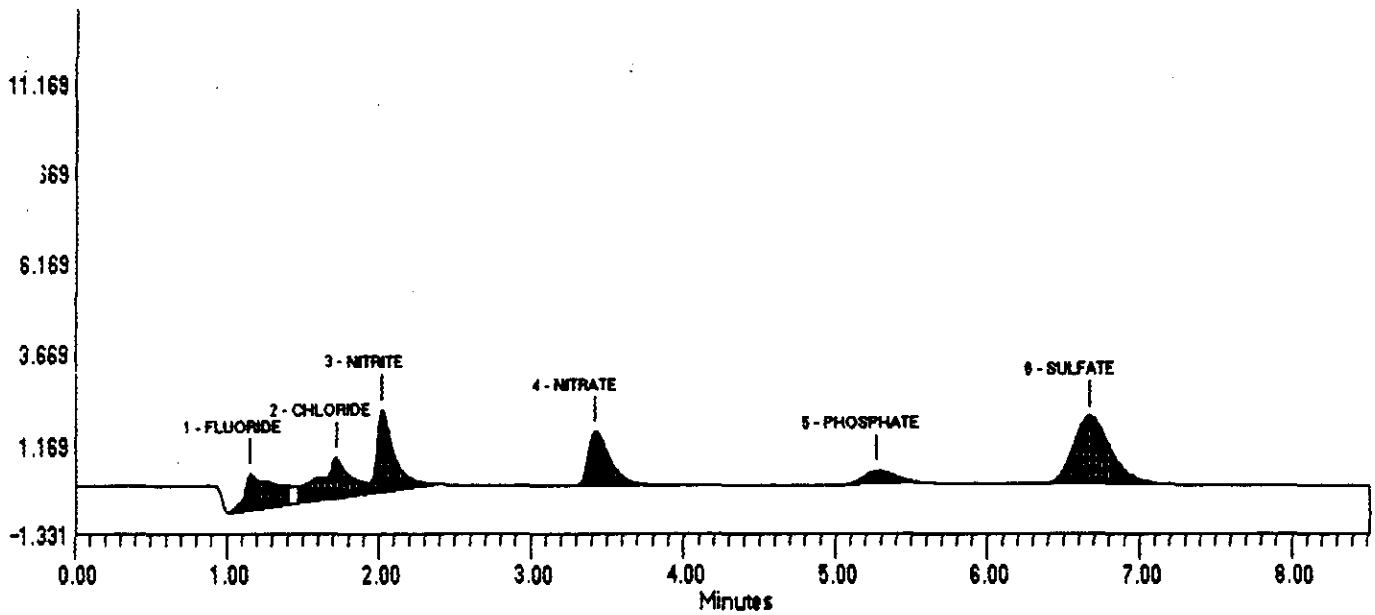
REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	~~[illegible]~~ 160801	2565	5Hz	0.00	8.52	1000

SED 8/25/92

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	36265.200	1000	13546	2	0.00
2	1.72	CHLORIDE	70818.647	1129	17149	2	-0.48
3	2.02	NITRITE	119754.233	2293	18410	2	-2.10
4	3.42	NITRATE	110461.901	1507	15069	1	2.03
5	5.27	PHOSPHATE	98461.425	370	5344	1	-2.38
6	6.67	SULFATE	719517.4 ~~[illegible]~~	1888	32624	1	-4.09

8/25/92 SR

File: c:\dx\data\91092511.D07 Sample: R9409SPIKE

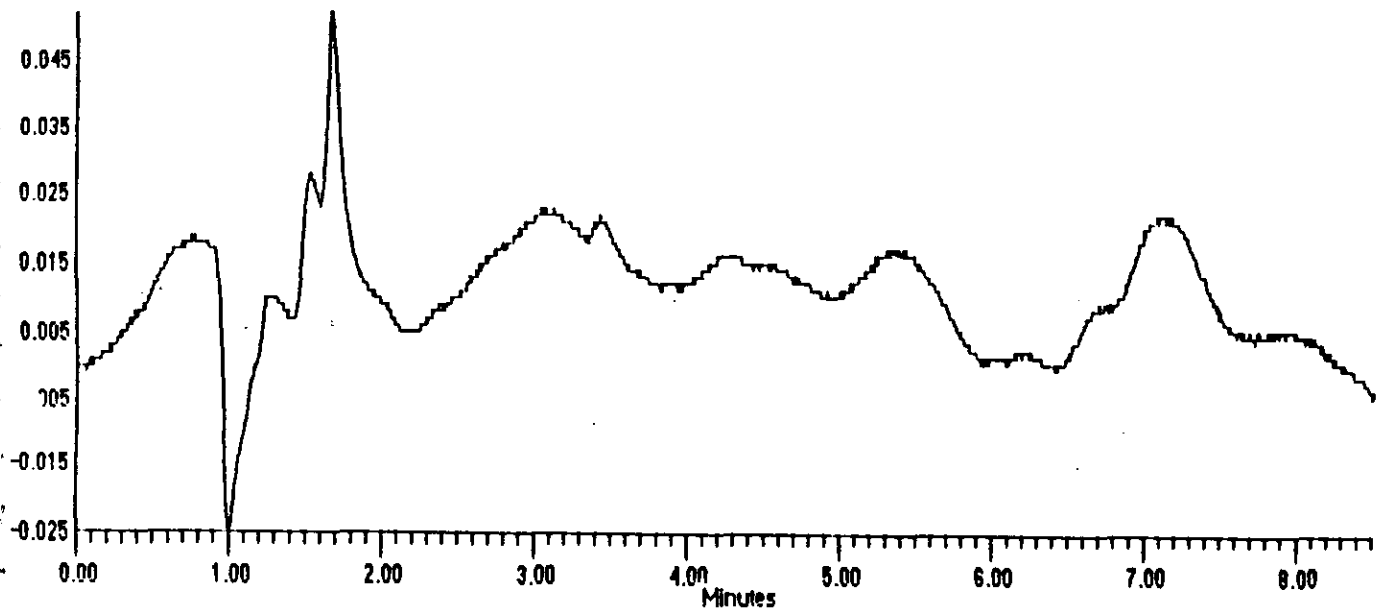


Sample Name: BLANK R9407 8-14-92 Date: Wed Sep 25 13:49:55 1991
Data File : c:\dx\data\91092511.D02
Method : c:\dx\method\SYSTEM1.met
GC Address: 1 System : 1 Inject#: 2 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA	REJ
External	1	1	2555	5Hz	0.00	8.52	1000	

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta

File: c:|dx|data|91092511.D02 Sample: BLANK



ION CHROMATOGRAPHIC ANALYSIS (SULFATE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5575	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Retune
SO4	LA-533-105	% RECOVERY	WIDEO	0

Sample Size: ? .100mL -10mL
Customer ID: STD73C11CM

Remarks, Calculations, Results:
EDP R970 DIONEX
STDN 73C11CM RESULT 5.9042E2
STD VAL 6.10E2 %REC 96.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 24V	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5675	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Retune
SO4	LA-533-105	O/U	WIDEO	0

Sample Size: ? 1.0mL direct
Customer ID: REG. III

Remarks, Calculations, Results:
REAGENT BLANK

<1.00 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 24V	Hrs	Hrs	Hrs	Hrs

Date: 15 9-26-91 JK 8-13-92
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5775	102AW	6-14-91	12:40	26

Determination	Method/Standard	Result Units	Charge Code	Retune
SO4	LA-533-105	O/U	WIDEO	0

Sample Size: ? .100mL -10mL -1.0mL -10mL
Customer ID: 2291-2-3

Remarks, Calculations, Results:

2.62E3 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 24V	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-5975	102AW	6-14-91	12:48	26

Determination	Method/Standard	Result Units	Charge Code	Retune
SO4	LA-533-105	% RECOVERY	WIDEO	0

Sample Size: ? .025mL -10mL -.025mL -10mL
Customer ID: 2291-2-3

Remarks, Calculations, Results:
SAMPLE SPIKED ID
SPIKE ID 73C11CM
SPIKE VOLUME .05mL

$$\frac{7.195^5 - 2.62E^3}{(.05)(\text{[illegible]})(610)/10.075} \times 100 = 147.3\%$$

Flag- Matrix Interference

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 24V	Hrs	Hrs	Hrs	Hrs

Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5575	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Retune
SO4	LA-533-105	% RECOVERY	WIDEO	0

Sample Size: ? 100mL -10mL
Customer ID: STD 73C11CM

Remarks, Calculations, Results:
EDP R970 DIONEX
STDN 73C11CM RESULT 587.65
STD VAL 610 %REC 96.3%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
Hrs 24V	Hrs	Hrs	Hrs	Hrs

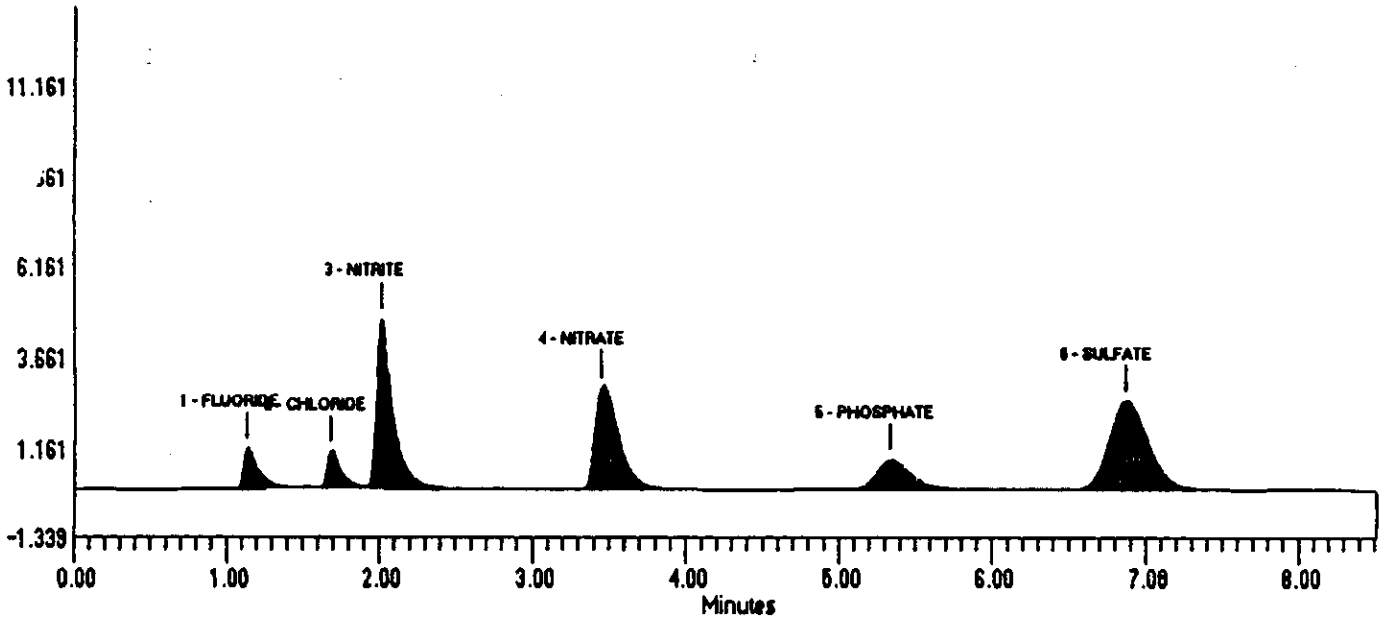
Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Sample Name: LMCS/73C11CM Date: Mon Sep 23 16:20:47 1991
Data File : c:\dx\data\91092311.D10
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	57.360	1148	8024	1	0.00
2	1.68	CHLORIDE	72.097	1017	6702	2	-0.98
3	2.02	NITRITE	518.617	4696	34634	2	-0.66
4	3.45	NITRATE	543.291	2890	31741	1	4.55
5	5.33	PHOSPHATE	524.991	836	13325	1	0.31
6	6.87	SULFATE	599.619	2488	44362	1	0.24

File: c:\dx\data\91092311.D10 Sample: LMCS/73C11CM

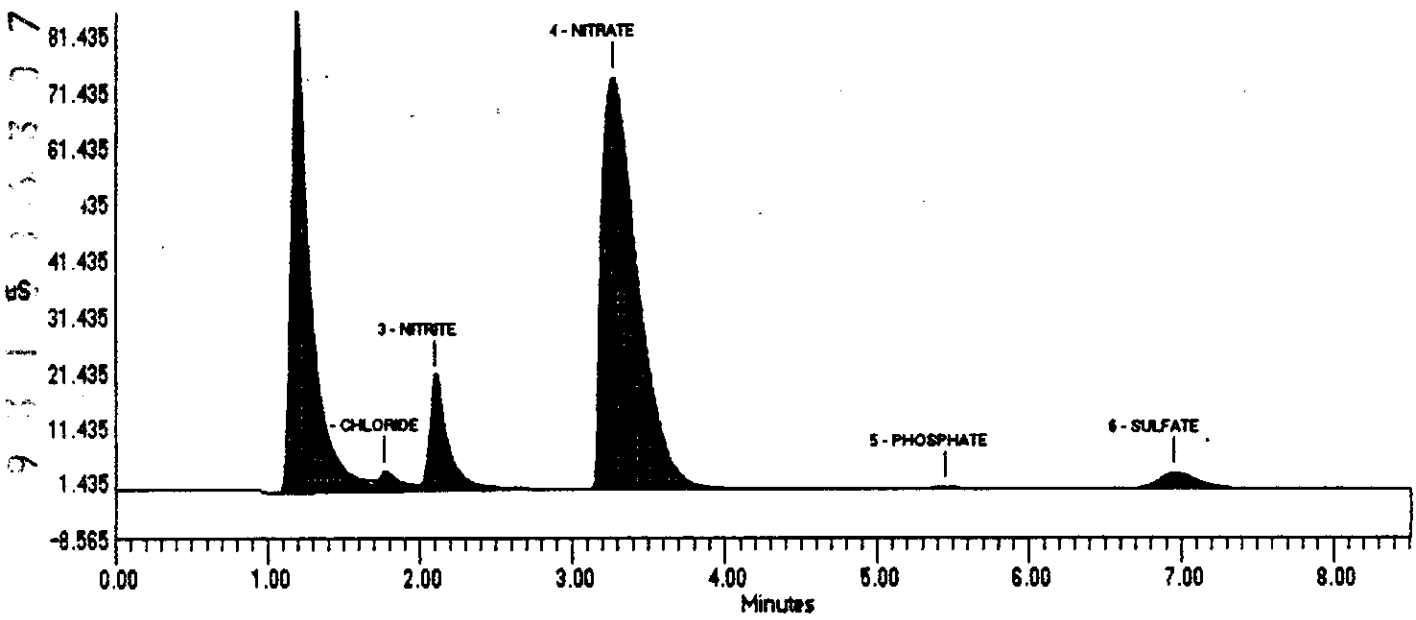


Sample Name: R9409 Date: Mon Sep 23 15:41:21 1991
ta File : c:\dx\data\91092311.D06
thod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 6 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.18	FLUORIDE	1064.097	82117	759723	3	0.00
2	1.77	CHLORIDE	303.239	2954	30094	4	-0.47
3	2.10	NITRITE	2380.898	20709	171116	2	-0.92
4	3.27	NITRATE	11130.540	73566	1190192	1	-5.19
5	5.45	PHOSPHATE	178.748	234	3455	1	-1.82
6	6.95	SULFATE	660.949	2779	49261	1	-2.83

File: c:\dx\data\91092311.D06 Sample: R9409

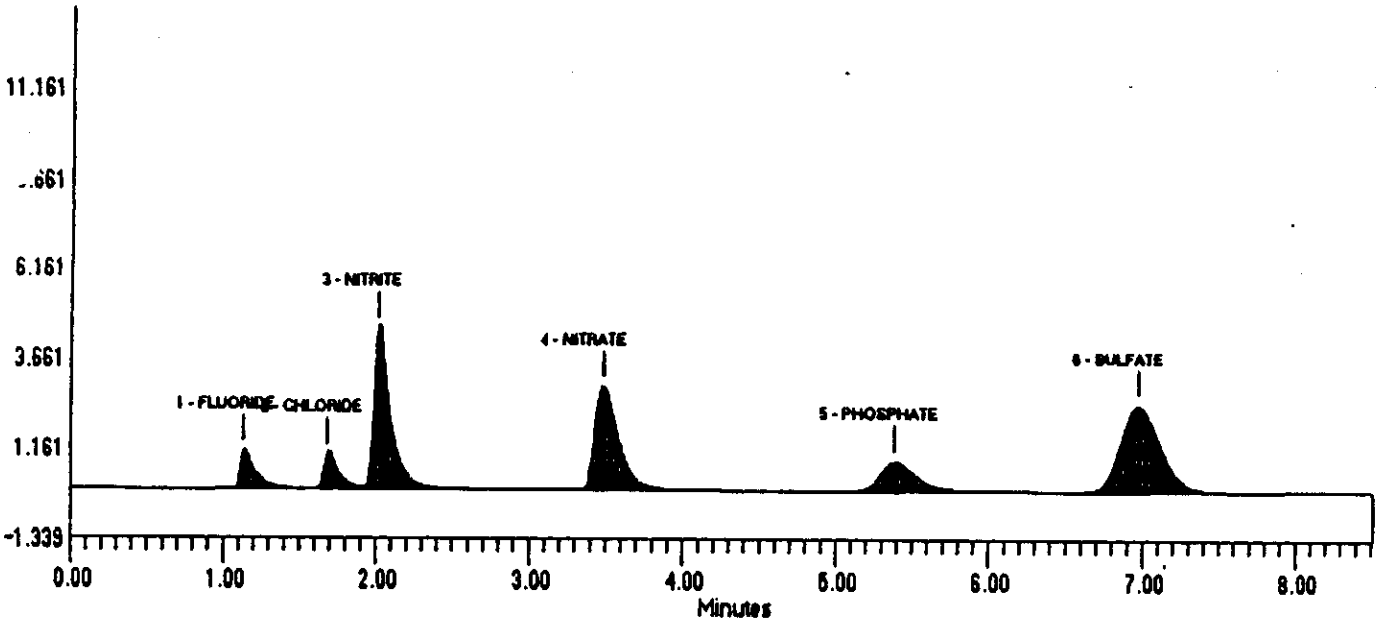


```
==========================================================================
| Sample Name: LMCS/73C11CM                    Date: Mon Sep 23 15:11:35 1991|
|  Data File   : c:\dx\data\91092311.D03                                  |
| Method       : c:\dx\method\SYSTEM1.met                                 |
| ACI Address: 1        System : 1        Inject#:    3  Detector: CDM-1  |
==========================================================================
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.136	1052	7489	1	0.00
2	1.68	CHLORIDE	73.700	967	6860	2	-0.98
3	2.02	NITRITE 99	508.155	4483	33862	2	-0.66
4	3.48	NITRATE 95	541.275	2905	31615	1	5.56
5	5.38	PHOSPHATE 103	536.303	840	13650	1	1.25
6	6.97	SULFATE 96	591.654	2426	43727	1	1.70

File: c:\dx\data\91092311.D03 Sample: LMCS/73C11CM



WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: ION CHROMATOGRAPHIC - PHOSPHATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-23-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5574	11		
2	REAGENT BLANK	R9407-5674	12		
3	SAMPLE 2291-2-3	R9409-5774	13		
4	SPIKE OF SAMPLE 2291-2-3	R9409-5974	14		
5	FINAL LMCS CHECK STD	R9412-5574	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: ION CHROMATOGRAPHIC - FLUORIDE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 05-18-92
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5571	11		
2	REAGENT BLANK	R9407-5671	12		
3	SAMPLE 2291-2-3	R9409-5771	13		
4	FINAL LMCS CHECK STD	R9412-5571	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: ION CHROMATOGRAPHIC - CHLORIDE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 05-18-92
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5572	11		
2	REAGENT BLANK	R9407-5672	12		
3	SAMPLE 2291-2-3	R9409-5772	13		
4	FINAL LMCS CHECK STD	R9412-5572	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

TODAYS DATE: 6-27-91

..YROLL NO.: 80028

Y-INTERCEPT= .013899
SLOPE= .162164

SAMPLE ID#: BLANK
SAMPLE SIZE: 0
WVL AND ABS= 580NM 0.010 A

SAMPLE ID#: R-9409 STD 75C11-P
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.747 A

SAMPLE ID#: R-9409
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.237 A

SAMPLE ID#: R-9409 DUPLICATE
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.239 A

SAMPLE ID#: R-9410
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.220 A

SAMPLE ID#: R-9410
SAMPLE SIZE: 1ML+100UL-10ML-500UL 75C11P SPIKE
WVL AND ABS= 580NM 0.949 A

SAMPLE ID#: R-9411
SAMPLE SIZE: 1ML
WVL AND ABS= 580NM 0.248 A

SAMPLE ID#: R-9411 STD 75C11-P
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.732 A

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: CYANIDE	Sample Prep: UNDIGESTED

Instrument: MILTON ROY SPEC. 301 AL10724	Procedure/Rev: LA-695-102/A-3
Technologist: E. COLVIN	Date: 06-27-91
Starting Time: 08:00	Temperature: NA
Ending Time: 15:00	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9409-5578	11		
2	REAGENT BLANK	R9409-5678	12		
3	SAMPLE 2291-2-3	R9409-5778	13		
4	SAM DUP 2291-2-3	R9409-5878	14		
5	FINAL LMCS CHECK STD	R9411-5578	15		
6			16		
7			17		
8			18		
9			19		
10			20		

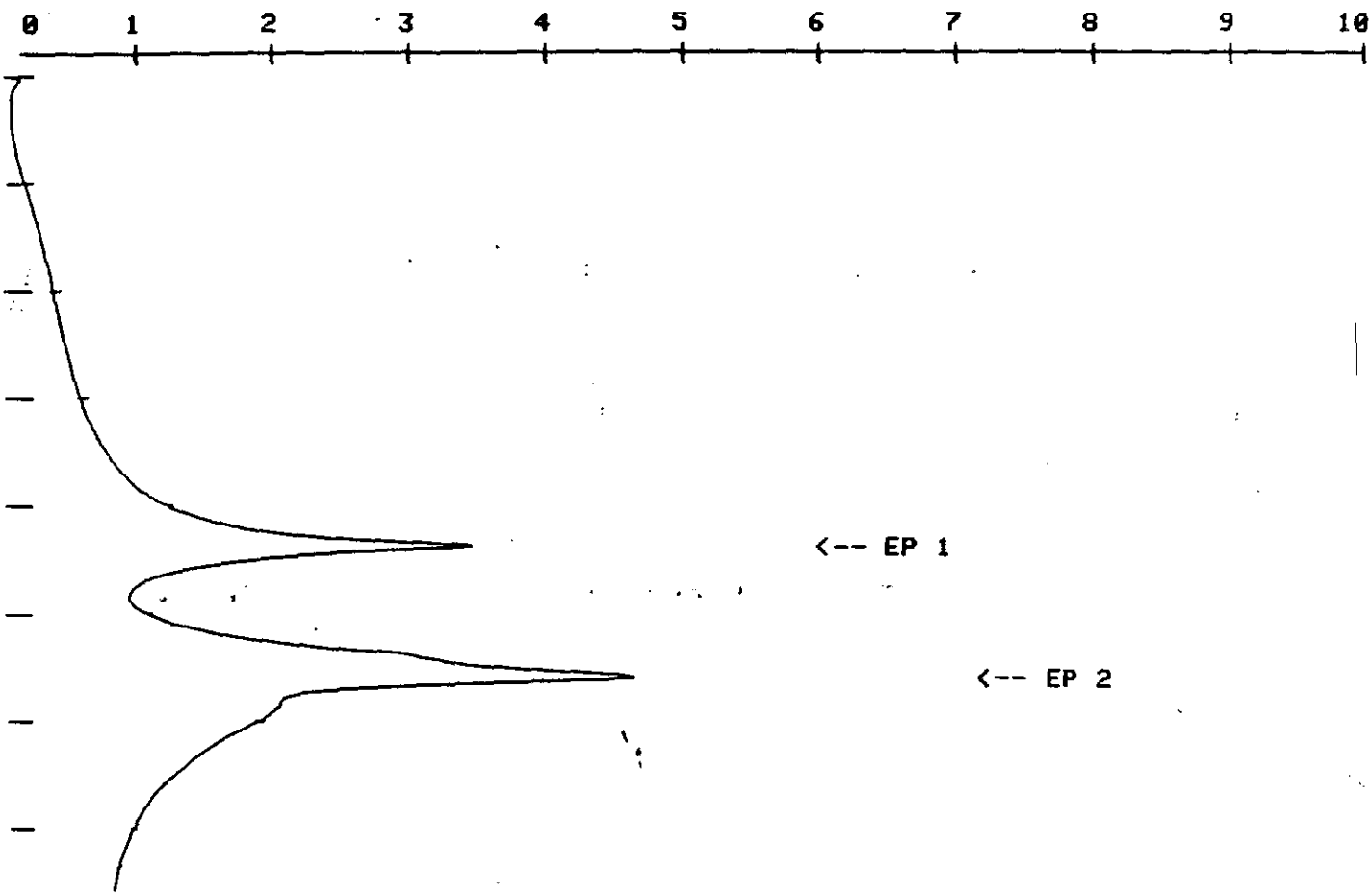
Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	75C11P/.100 mL			NA

A-6000-881 (03/92)

BEST AVAILABLE COPY

SAMPLE NUMBER: 1
SAMPLE DATA: 9412.
DIRECT READ PH: 11.999

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.68	0.547	0.0000
5.63	0.700	0.0000

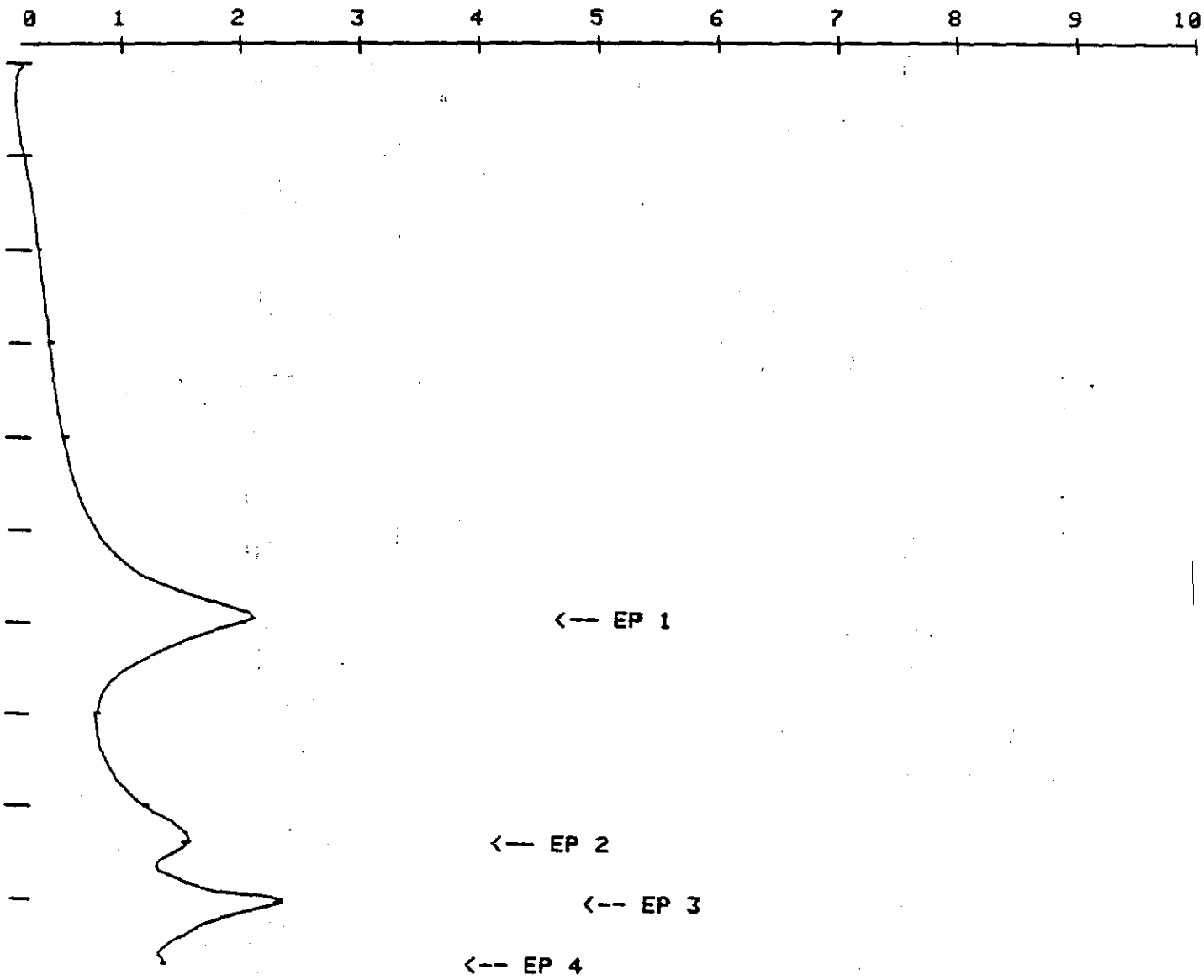
TITRATION TERMINATED BY PH LIMIT.

SEP 11 1991 10:03 AM

BEST AVAILABLE COPY

SAMPLE NUMBER: 1
SAMPLE DATA: 9409.
DIRECT READ PH: 11.863

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.89	0.744	0.0000
8.19	1.049	0.0000
7.08	1.129	0.0000
6.22	1.209	0.0000

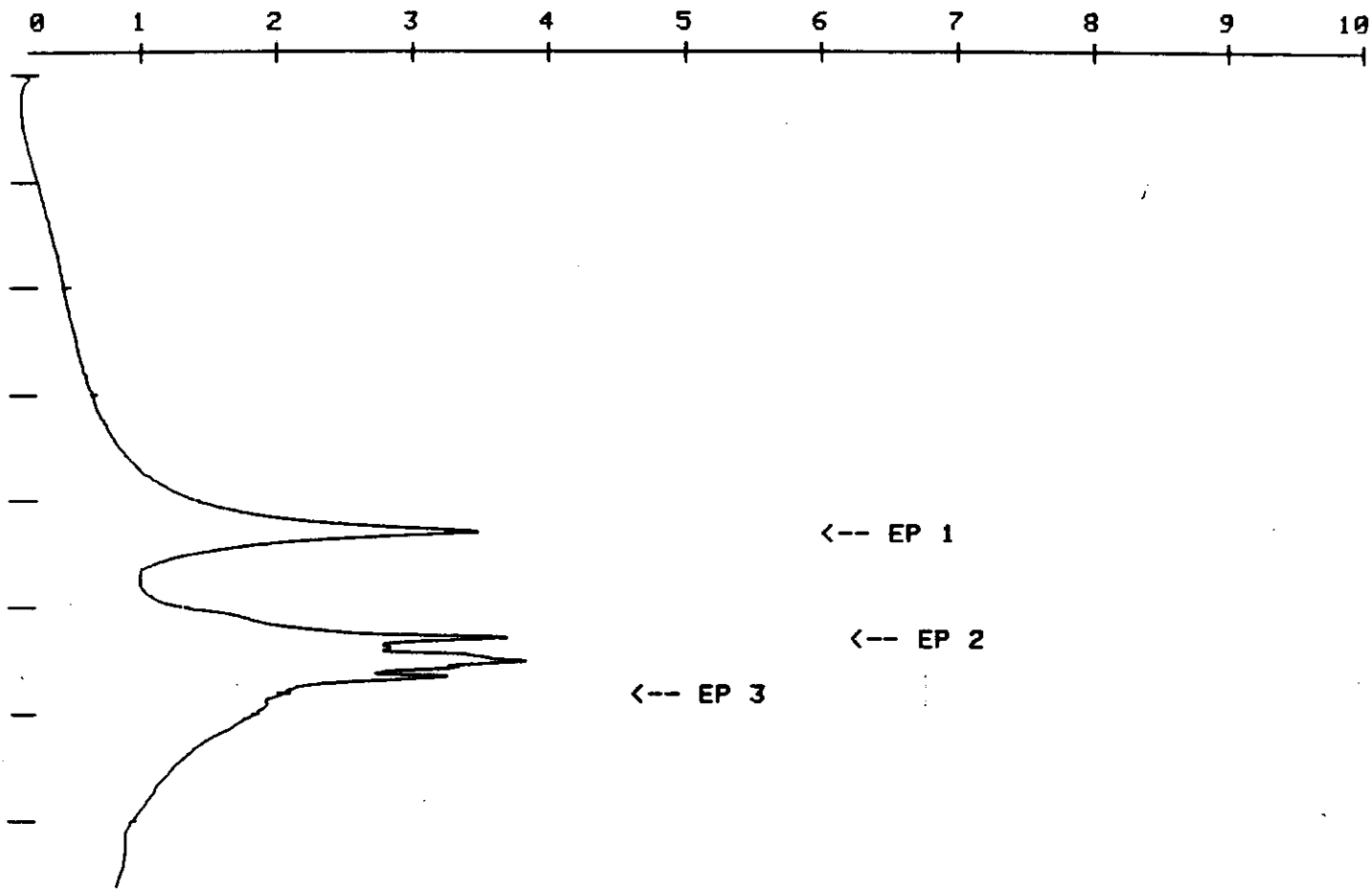
TITRATION TERMINATED BY LIMIT ON NUMBER OF EQUIVALENCES PERMISSIBLE.

SEP 10 1991 2:16 PM

SAMPLE NUMBER: 2
DIRECT READ PH: 11.994
R-9406 std
8-14-92

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.62	0.536	0.0000
7.78	0.659	0.0000
4.53	0.722	0.0000

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:43 AM

BEST AVAILABLE COPY

DOCUMENTATION SEP 10 1991 8:10 AM

ANALYST: 6559 LOCATION: 222-S 200 West

TITRANT: .1905 M HNO_3

INDICATING ELECTRODE:

REFERENCE ELECTRODE: 98% efficiency

SAMPLE:

SETUP PARAMETERS

MODE:	DIRECT READ PH
ELECTRODE STDZ:	PH
EQUILIBRATION TIME, SEC:	15

MODE:	DRV TITRATION
ELECTRODE STDZ:	PH
dE/dV SIGN:	+
ML LIMIT:	2.50
PH LIMIT:	3.
TITRATION RATE:	10
SENSITIVITY:	1
DISPENSE, ML:	0.
PLOT GAIN:	5
COMPUTATION:	CONCENTRATION
TITRANT NORMALITY:	0.1900
SOLVENT BLANK:	0.
MULTIPLIER:	0.

LAST ELECTRODE STANDARDIZATION: SEP 10 1991 8:10 AM

SAMPLE NUMBER: 1
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:21 AM

SAMPLE NUMBER: 2
DIRECT READ PH: 5.554

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:23 AM

SAMPLE NUMBER: 3
DIRECT READ PH: 5.317

DERIVATIVE OUTPUT, dE/dV

0 1 2 3 4 5 6 7 8 9 10

DRV TITRATION: .008

TITRATION TERMINATED BY PH LIMIT.

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: DETERMINATION OF HYDROXIDE IONS IN SOLUTION	Sample Prep: UNDIGESTED

Instrument: FISHER WA77509	Procedure/Rev: LA-661-102/F-1
Technologist: M. BIERMAN	Date: 09-10-91
Starting Time: NA	Temperature: 25degC
Ending Time: NA	Chemist: S. ISAACSON

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5529	11		
2	REAGENT BLANK	R9407-5629	12		
3	SAMPLE 2291-2-3	R9409-5729	13		
4	FINAL LMCS CHECK STD	R9412-5529	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	9C11AF/.100 mL			.100 mL

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: AMMONIA	Sample Prep: UNDIGESTED

Instrument: AL10665, AL10696	Procedure/Rev: LA-634-102/D-0
Technologist: S. COBB	Date: 08-23-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5528	11		
2	REAGENT BLANK	R9407-5628	12		
3	SAMPLE 2291-2-3	R9409-5728	13		
4	FINAL LMCS CHECK STD	R9412-5528	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	4C11QL/.250 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9409 Date: 09-04-1991 Time: 10:33:39

Blank = .5424173 Sample Size = 50 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	35.40	100.00
3	3.01	42.00	15.71
4	4.01	44.40	5.41
5	5.01	45.50	2.42
6	6.01	46.20	1.52
7	7.00	46.60	0.86

(46.6 - 3.799537)(1)/(50) = .8560092 g/L Carbon

(46.6 - 3.799537)(1)/(50)(12) = .0713341 Molar Carbon

Sample Run By: 80028

1

202

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: E-9406 Date: 09-04-1991 Time: 09:51:44

Blank = .5424173 Sample Size = 50 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	104.90	100.00
3	3.01	119.70	12.38
4	4.01	124.20	3.62
5	5.01	125.30	0.88
6	6.01	125.90	0.48
7	7.01	126.40	0.40

(126.4 - 3.800099)(1)/(50) = 2.451998 g/L Carbon

(126.4 - 3.800099)(1)/(50)(12) = .2043332 Molar Carbon

Sample Run By: 80028

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: TOTAL INORGANIC CARBON	Sample Prep: UNDIGESTED

Instrument: WB39927	Procedure/Rev: LA-622-102/B-0
Technologist: E. COLVIN	Date: 09-04-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5527	11		
2	REAGENT BLANK	R9407-5627	12		
3	SAMPLE 2291-2-3	R9409-5727	13		
4	FINAL LMCS CHECK STD	R9412-5527	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	69C11K/.050 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9409 Date: 06-27-1991 Time: 09:47:59

Blank = .670791 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	6.30	100.00
3	3.01	9.80	35.71
4	4.01	12.00	18.33
5	5.01	13.40	10.45
6	6.01	14.80	9.46
7	7.01	15.90	6.92

(15.9 - 4.700573)(11)/(200) = .6159685 g/L Carbon

(15.9 - 4.700573)(11)/(200)(12) = 5.133071E-02 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9406 Date: 06-27-1991 Time: 09:01:20

Blank = .670791 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	39.20	100.00
3	3.01	51.80	24.32
4	4.01	55.70	7.00
5	5.01	57.80	3.63
6	6.01	59.20	2.36
7	7.01	60.20	1.66

(60.2 - 4.7)(11)/(200) = 3.0525 g/L Carbon

(60.2 - 4.7)(11)/(200)(12) = .254375 Molar Carbon

Sample Run By: 80028_____

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: TOTAL ORGANIC CARBON	Sample Prep: UNDIGESTED

Instrument: MODEL 5011-WC16130	Procedure/Rev: LA-344-105/A-3
Technologist: E. COLVIN	Date: 06-27-91
Starting Time: 08:00	Temperature: NA
Ending Time: 14:00	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5526	11		
2	REAGENT BLANK	R9407-5626	12		
3	SAMPLE 2291-2-3	R9409-5726	13		
4	FINAL LMCS CHECK STD	R9412-5526	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	70C11H/.200 mL			NA

A-6000-881 (03/92)

DSC

WHC-SD-WM-DP-025
ADDENDUM 3 REV 0

Configuration used from
8-8-91 to Nov 25, 1991
Denise [illegible]

CONFIGURATION

26-NOV-91 8:14

INDIUM	255
DSC SIGN ICTA	1
TAU LAG	12
TAU SIGNAL	0
E DIMIN. FACT.	.93
S	2400
TAU LAG 2	16
TAU SIGNAL 2	0
E DIMIN. F. 2	.93
S 2	1850
MAX. TEMP.	600.
MIN. TEMP.	-50.
A PT100	.21610
B PT100	.74150
C PT100	-.10116
HEAT P	3000
HEAT I	250
HEAT D	30
COOL 1	0
COOL 2	0
COOL 3	0
A1	10773
B1	58.121
	.14689
	-100
A2	8940
B2	17.884
C2	-.072
T2	363
A3	9360.3
B3	-15.043
C3	.01538

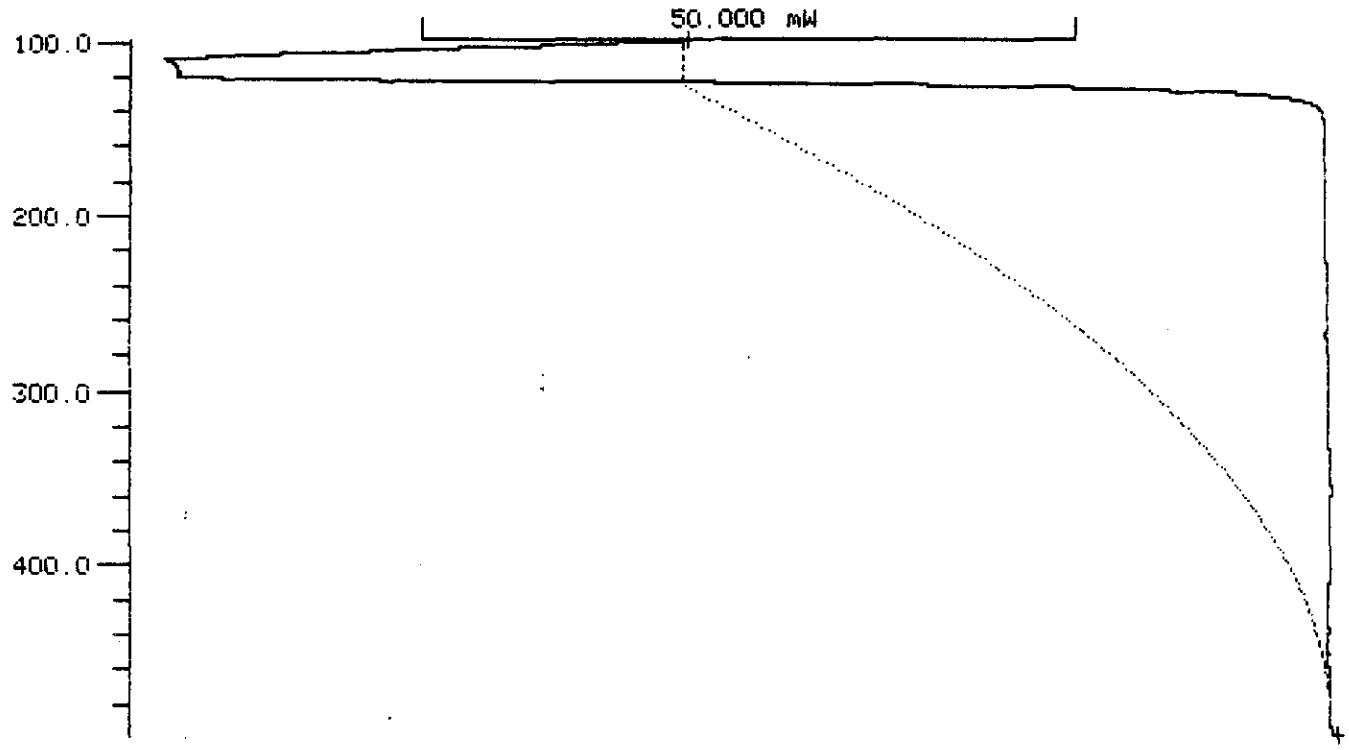
Heat flow calibration
began July 20, 1991.
Used until Nov 25, 1991

******** METTLER TA4000 SYSTEM *********

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->



WARNING		1
ΔH EXO	mJ	31866
ΔH	J/G	3125.0
PEAK TEMP. °C		139.6

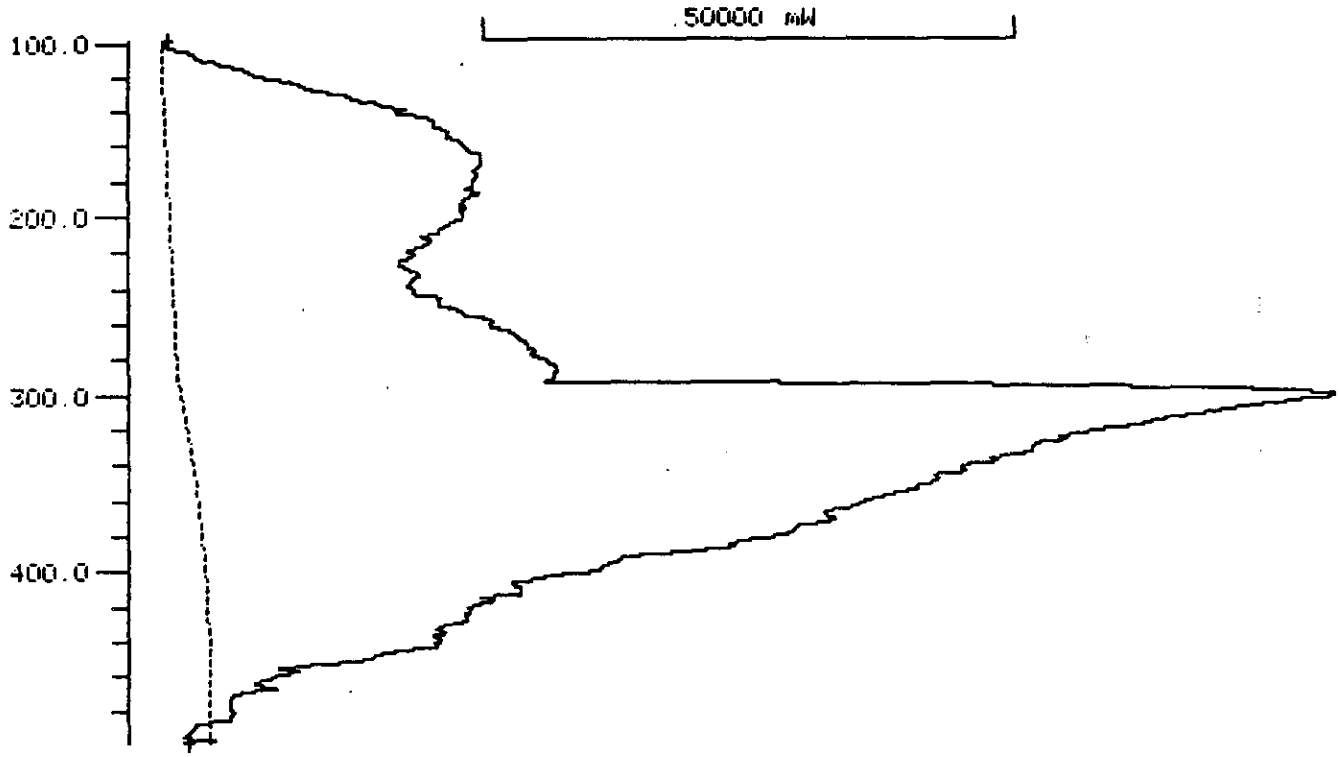
******** METTLER TA4000 SYSTEM *********

Sample
R9409
82583
SL Cobb
09-15-91
JMA 08/20/92

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL--> -



ΔH EXO	mJ	827.11
ΔH	J/G	82.711
PEAK TEMP.	°C	304.0

******** METTLER TA4000 SYSTEM *********

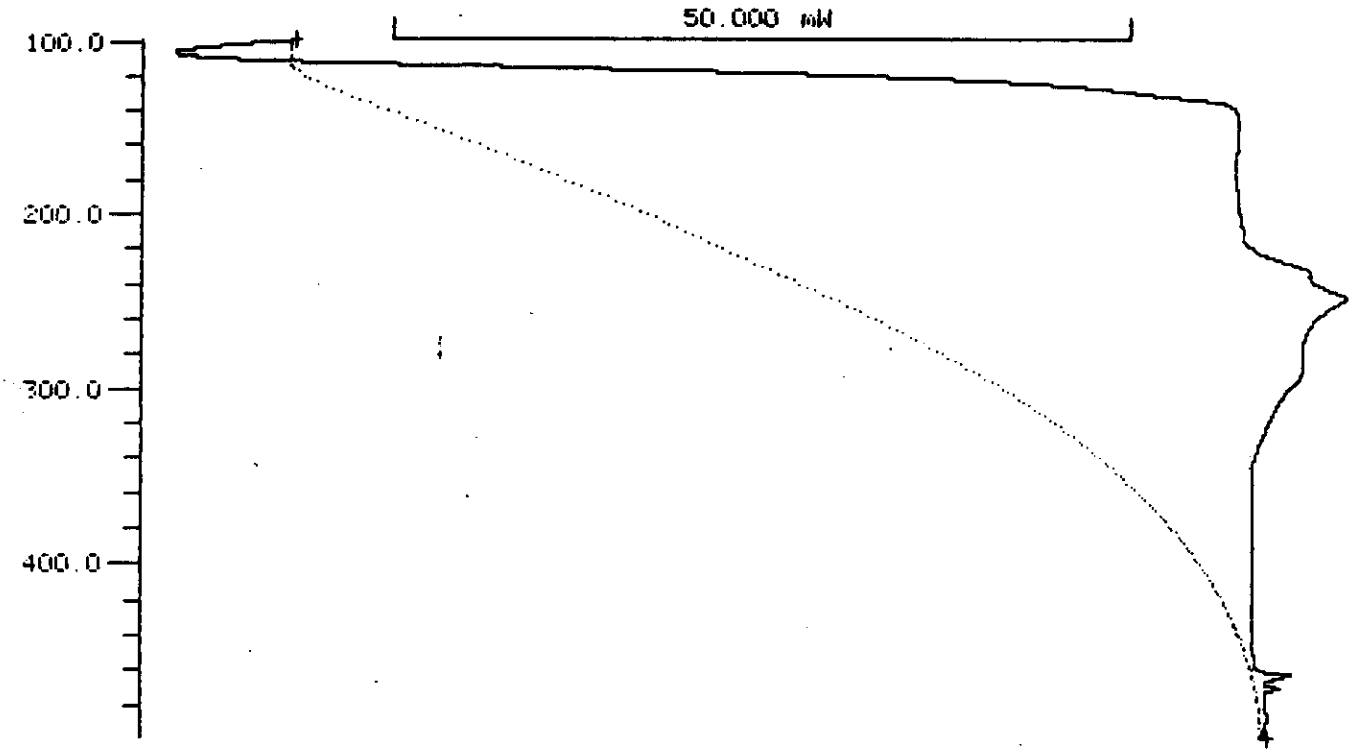
BLK
R9407
82583
SL666
09-15-91

Δ

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL--> ·



ΔH EXO	mJ	49998
ΔH	J/G	5156.6
PEAK TEMP. °C		139.9

******** METTLER TA4000 SYSTEM *********

STD
R94C
82583
SL Cobb
09-15-91

DIFFERENTIAL THERMAL ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-551	102AW	6-14-91	12:38	26

Determination	Method Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size: ? 10 ul
Customer ID: STD
Remarks, Calculations, Results: 2R11-A2

100%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82533				[signature]
Pts: SL Cobb	Pts:	Pts:	Pts:	Pts: [signature]

Date: 09-15-91
Time Completed:
Lab Unit Mgr: [signature] [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-561	102AW	6-14-91	12:42	26

Determination	Method Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size: ?
Customer ID: REG. BL
Remarks, Calculations, Results: REAGENT BLANK

No exotherm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				[signature]
Pts: SL Cobb	Pts:	Pts:	Pts:	Pts:

Date: 09-15-91
Time Completed:
Lab Unit Mgr: [signature] [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9409.-571	102AW	6-14-91	12:50	26

Determination	Method Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size: ? 10 ul
Customer ID: 2291-2-3
Remarks, Calculations, Results:

No exotherm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				[signature]
Pts: SL Cobb	Pts:	Pts:	Pts:	Pts:

Date: 09-15-91
Time Completed:
Lab Unit Mgr: [signature] [signature]

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-551	102AW	6-14-91	13: 2	26

Determination	Method Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size: ? 10 ul
Customer ID: STD
Remarks, Calculations, Results:

100.0%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82583				[signature]
Pts: SL Cobb	Pts:	Pts:	Pts:	Pts: [signature]

Date: 09-15-91
Time Completed:
Lab Unit Mgr: [signature] [signature]

SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5506	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Returns
SPG	LA-510-112	% RECOVERY	WIDEO	1

Sample Size	Customer ID
2100.32L	STD

Remarks, Calculations, Results

RERUN

8332 ZNCL2
STDN 15211-BJ RESULT 1.4215
STD VAL 1.4586 %REC 98.8%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
82580 Tania LE				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Laboratory Date
8-12-91	-	

G - 1.9864
T - 1.8436
N - .1428

R9412-5506

G - ~~2.0342~~ 2.0330
T - 1.8906
N - .1424

9312143 0696

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: SPECIFIC GRAVITY	Sample Prep: UNDIGESTED

Instrument: WA96787	Procedure/Rev: LA-510-112/C-2
Technologist: T. LEE	Date: 08-12-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5506	11		
2	REAGENT BLANK	R9407-5606	12		
3	SAMPLE 2291-2-3	R9409-5706	13		
4	FINAL LMCS CHECK STD	R9412-5506	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	15C11-B/.10032 mL			NA
SAMPLES RERUN.				

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9409	Customer ID: 2291-2-3
Analysis: VISUAL CHECK AND OVER-THE-TOP READING	Sample Prep: UNDIGESTED

Instrument: N/A	Procedure/Rev: LA-519-151/D-1
Technologist: M. BIERMAN	Date: 06-14-91
Starting Time: 13:30	Temperature: 25degC
Ending Time: 15:00	Chemist: N/A

	Description	Lab ID		Description	Lab ID
1	SAMPLE 1-3	R9408-5000	11		
2	SAMPLE 2-3	R9409-5000	12		
3	SAMPLE 3-3	R9410-5000	13		
4	SAMPLE 4-3	R9411-5000	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
N/A				

A-6000-881 (03/92)

Component # 5 NITRATE Retention Time 3.30
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.02611E-001
K1 = 1.61787E-004
K2 = -5.83501E-011

Level	Amount	Area	Height
1	1.37000E+000	7543	727
2	3.43000E+000	19321	1803
3	6.83000E+000	40244	3563
4	1.35000E+001	83386	7010
5	2.65000E+001	173503	13640
6	5.11000E+001	360809	25639

Component # 6 PHOSPHATE Retention Time 5.32
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 5.53452E-001
K1 = 3.53243E-004
K2 = -3.51156E-010

Level	Amount	Area	Height
1	1.19000E+000	2277	162
2	2.98000E+000	7242	453
3	5.93000E+000	15025	935
4	1.17400E+001	31660	1933
5	2.30300E+001	69135	4130
6	4.43700E+001	144749	8447

Component # 7 SULFATE Retention Time 6.85
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.55734E-001
K1 = 1.27491E-004
K2 = -3.79358E-011

Level	Amount	Area	Height
1	1.40000E+000	9418	543
2	3.50000E+000	24499	1382
3	6.96000E+000	52303	2890
4	1.37800E+001	107173	5909
5	2.70400E+001	225632	12225
6	5.20700E+001	471630	24686

BEST AVAILABLE COPY

Calibration Parameters

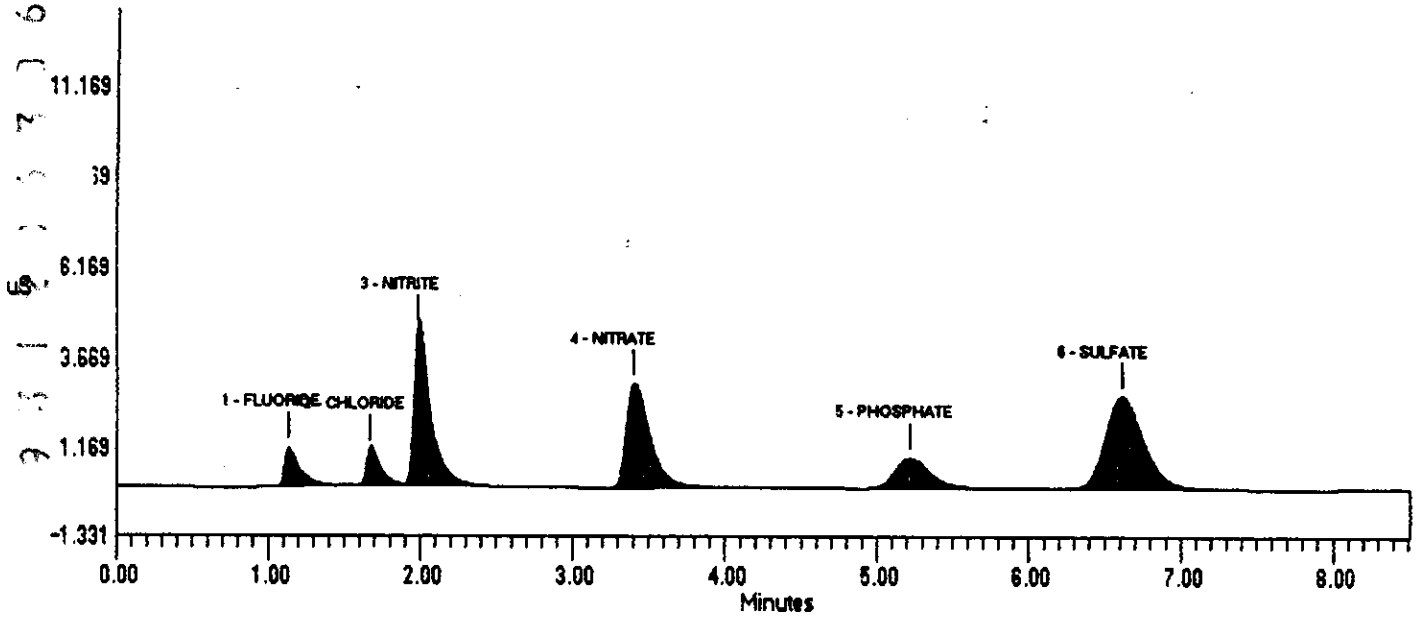
Number Of Levels for Calibration	6
Calibration Fit Type	Quadratic
Replace Or Average Calibrations	Replace
External or Internal Calibration	External
Calibrate by Area or Height	Area
Default Injection Volume	1.0
Default Dilution Factor	1.0
Response Factor for Unknown Peaks	1.0
Calibration Standard Volume	1.0
Internal Standard Volume	1.0
Sample Unit	PPM

Sample Name: LMCS/73C11CM Date: Wed Sep 25 11:41:00 1991
Data File : c:\dx\data\91092501.D10
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 10 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.425	1099	7537	1	0.00
2	1.67	CHLORIDE	73.303	1005	6821	2	-1.96
3	1.98	NITRITE	509.856	4351	33988	2	-2.30
4	3.40	NITRATE	540.888	2919	31591	1	3.03
5	5.22	PHOSPHATE	525.714	851	13345	1	-1.88
6	6.62	SULFATE	604.077	2604	44717	1	-3.41

File: c:\dx\data\91092501.D10 Sample: LMCS/73C11CM



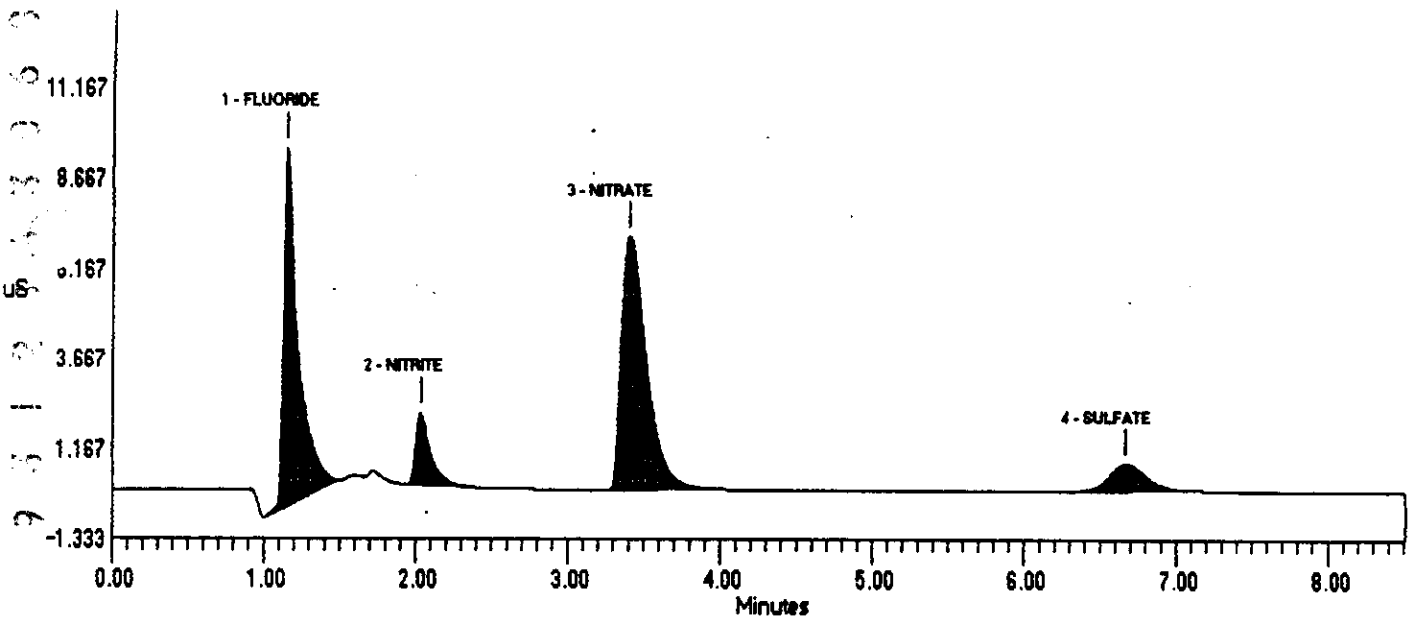
08/30/92
97

Sample Name: R9408 Date: Wed Sep 25 10:39:37 1991
Data File : c:\dx\data\91092501.D04
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 4 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1111	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	4196.899	9967	65213	1	0.00
2	2.03	NITRITE	2531.201	1990	13352	1	-1.29
3	3.40	NITRATE	14365.182	7045	80380	1	1.54
4	6.67	SULFATE	2131.614	743	12304	1	-4.09

File: c:\dx\data\91092501.D04 Sample: R9408

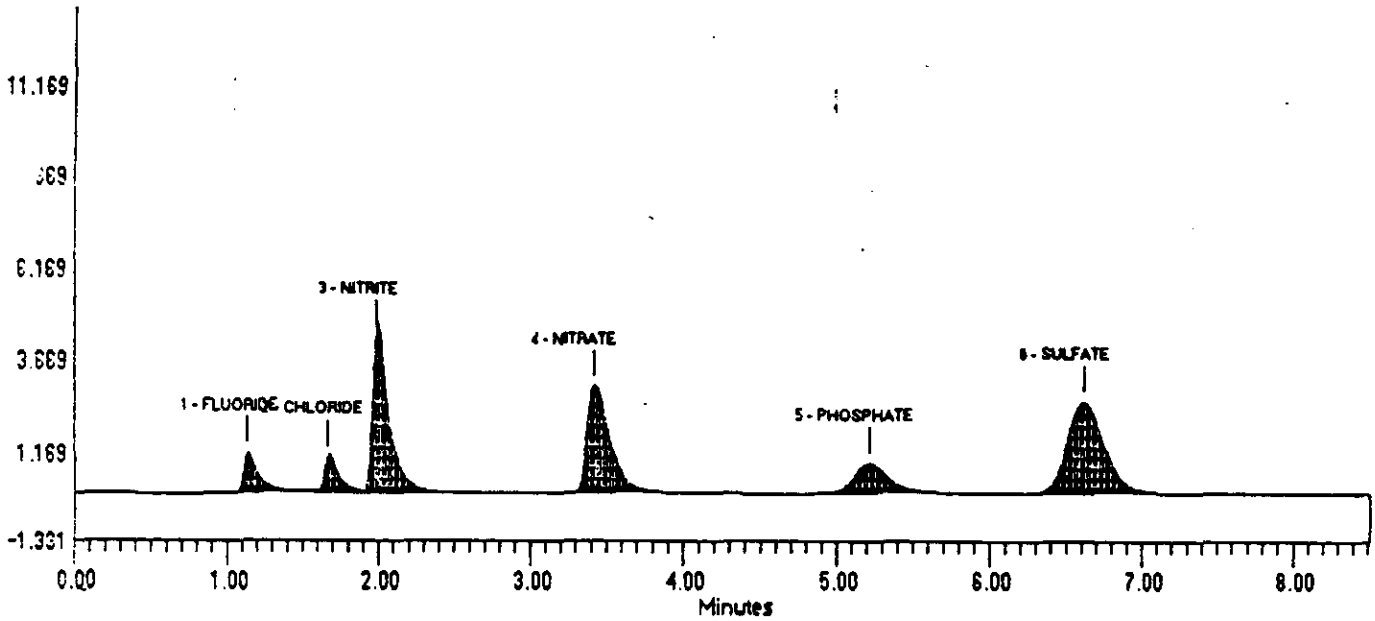


Sample Name: LMCS/73C11CM Date: Wed Sep 25 10:29:13 1991
Data File : c:\dx\data\91092501.D03
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 3 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	55.176	1107	7662	1	0.00
2	1.67	CHLORIDE	75.098	1013	6999	2	-1.96
3	1.98	NITRITE	517.910	4303	34581	2	-2.30
4	3.42	NITRATE	539.772	2934	31521	1	3.54
5	5.22	PHOSPHATE	526.308	858	13363	1	-1.68
6	6.62	SULFATE	591.757	2548	43735	1	-3.41

File: c:\dx\data\91092501.D03 Sample: LMCS/73C11CM



WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: ION CHROMATOGRAPHIC - NITRITE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5576	11		
2	REAGENT BLANK	R9407-5676	12		
3	SAMPLE 2291-1-3	R9408-5776	13		
4	SAM DUP 2291-1-3	R9408-5876	14		
5	FINAL LMCS CHECK STD	R9412-5576	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: ION CHROMATOGRAPHIC - NITRATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-25-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5573	11		
2	REAGENT BLANK	R9407-5673	12		
3	SAMPLE 2291-1-3	R9408-5773	13		
4	SAM DUP 2291-1-3	R9408-5873	14		
5	FINAL LMCS CHECK STD	R9412-5573	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

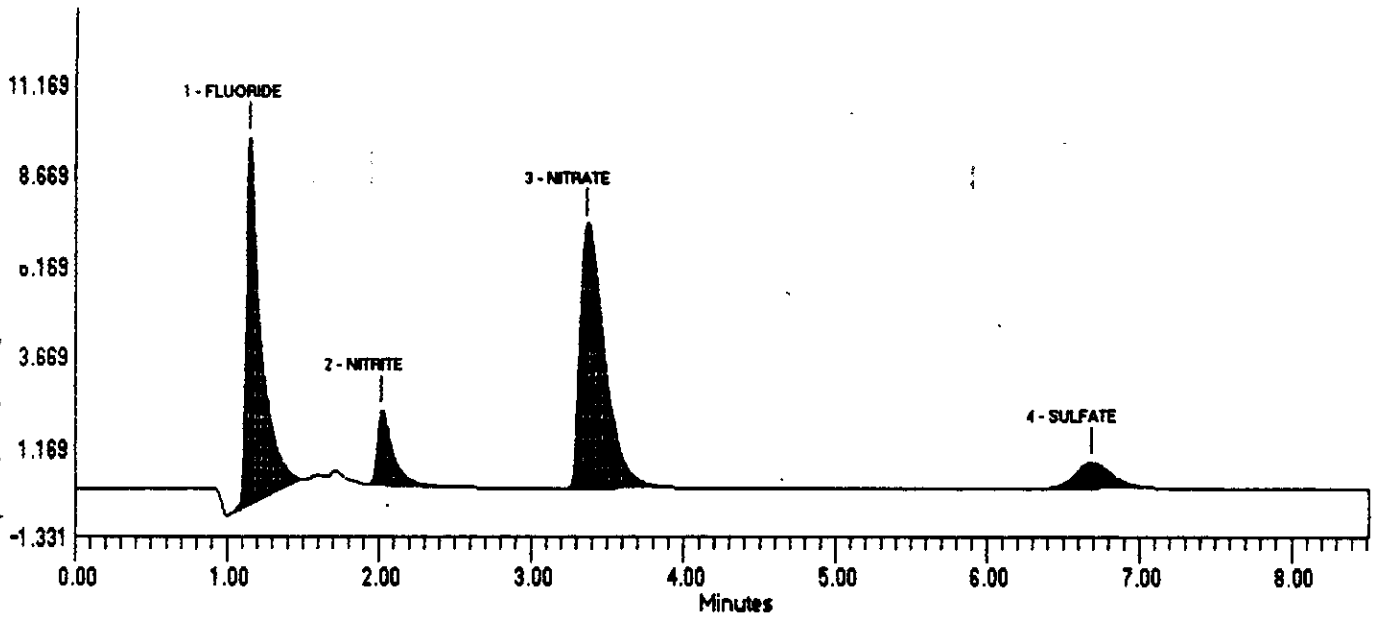
A-6000-881 (03/92)

Sample Name: R9408DUP Date: Wed Sep 25 14:20:09 1991
Data File : c:\dx\data\91092511.D05
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 5 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1111	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.15	FLUORIDE	4382.647	10141	68404	1	0.00
2	2.02	NITRITE	2667.133	2012	14264	1	-2.10
3	3.37	NITRATE	14652.810	7270	82079	1	0.54
4	6.68	SULFATE	2122.699	730	12241	1	-3.85

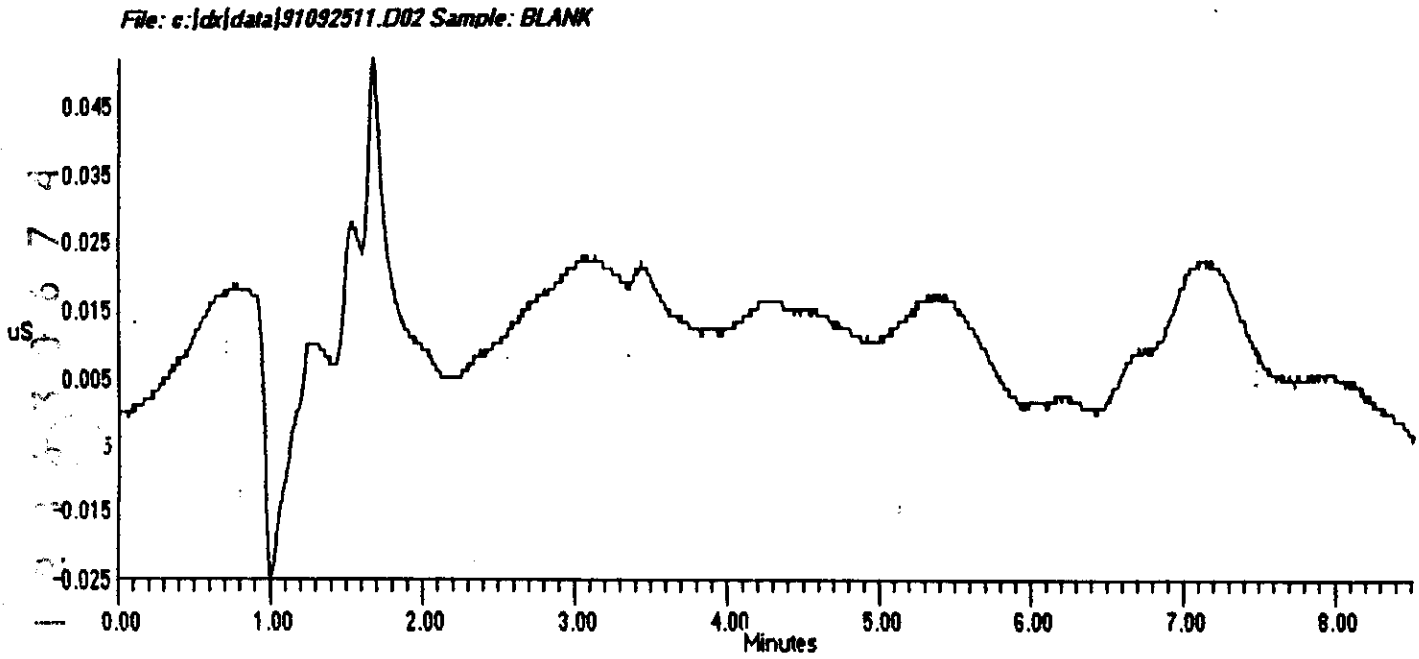
File: c:\dx\data\91092511.D05 Sample: R9408DUP



```
Sample Name: BLANK                                  Date: Wed Sep 25 13:49:55 1991
Data File   : c:\dx\data\91092511.D02
hod         : c:\dx\method\SYSTEM1.met
Acl Address: 1        System : 1        Inject#:   2  Detector: CDM-1
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta



ION CHROMATOGRAPHIC ANALYSIS (SULFATE) - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-55/5	102AW	6-14-91	12:36	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
SO4	LA-533-105	% RECOVERY	WIDEO	0

Sample Size: ? .100 mL -10 mL
Customer ID: STD 73C11CM

Remarks, Calculations, Results:
EDP R970 DIONEX
STD# 73C11CM RESULT 5.9042E2
STD VAL 6.10E2 %REC 96.8%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
24V				[signature]

Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-56/5	102AW	6-14-91	12:39	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
SO4	LA-533-105	U/G	WIDEO	0

Sample Size: ? 1.0 mL direct
Customer ID: REG. HL

Remarks, Calculations, Results:
REAGENT BLANK

<1.00 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
24V				

Date: 15 9-26-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-57/5	102AW	6-14-91	12:43	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
SO4	LA-533-105	U/G	WIDEO	0

Sample Size: ? .100 mL -10 mL - 1.0 mL - 10 mL
Customer ID: [illegible]

Remarks, Calculations, Results:
JL 8-12-93
~~2.264E3 ppm~~
2.264E3 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
24V				

Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-58/5	102AW	6-14-91	12:43	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
SO4	LA-533-105	U/G	WIDEO	0

Sample Size: ? .100 mL -10 mL - 1.0 mL -10 mL
Customer ID: [illegible]

Remarks, Calculations, Results:
DUPLICATE SAMPLE

2.123E3 ppm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
24V				

Date: 9-26-91
Time Completed:
Lab Unit Mgr: [signature]

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-55/5	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
SO4	LA-533-105	% RECOVERY	WIDEO	0

Sample Size: ? 100 mL -10 mL
Customer ID: STD 73C11CM

Remarks, Calculations, Results:
EDP R970 DIONEX
STD# 73C11CM RESULT 587.65
STD VAL 610 %REC 96.3%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
6C280	[signature]			[signature]
24V				[signature]

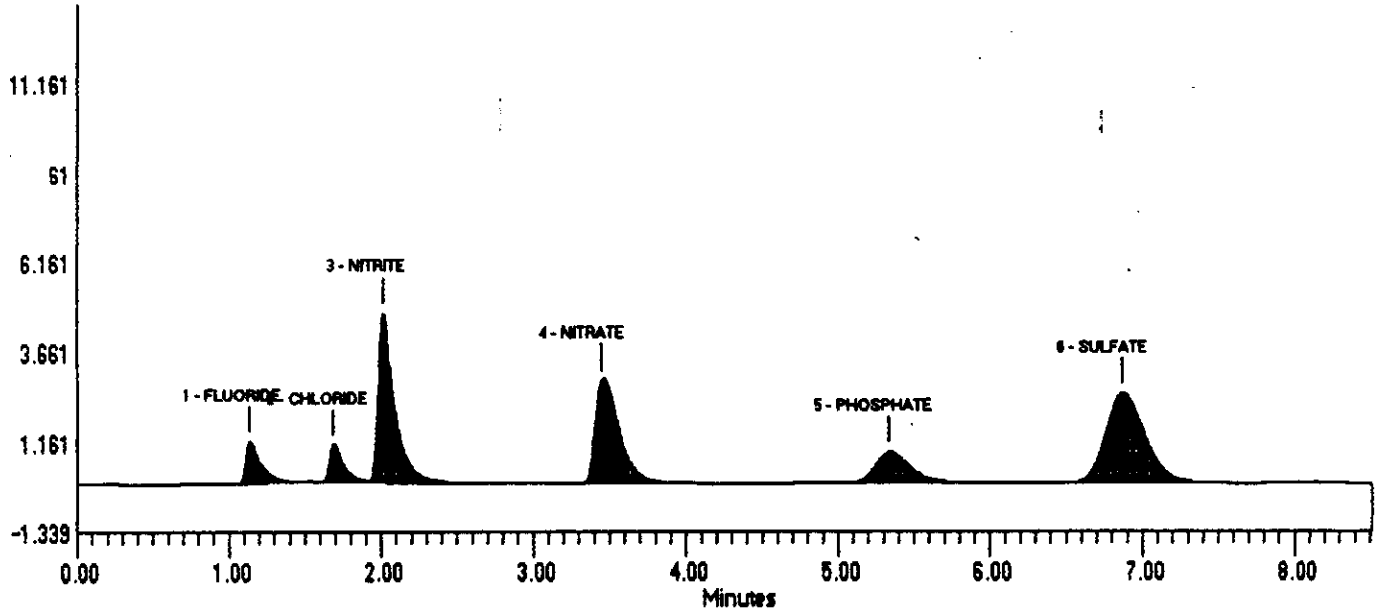
Date: 9-25-91
Time Completed:
Lab Unit Mgr: [signature]

```
==========================================================================
| Sample Name: LMCS/73C11CM                    Date: Mon Sep 23 16:20:47 1991 |
|   ta File   : c:\dx\data\91092311.D10                                    |
|  ethod      : c:\dx\method\SYSTEM1.met                                   |
| ACI Address: 1        System : 1        Inject#:  10  Detector: CDM-1    |
==========================================================================
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	57.360	1148	8024	1	0.00
2	1.68	CHLORIDE	72.097	1017	6702	2	-0.98
3	2.02	NITRITE	518.617	4696	34634	2	-0.66
4	3.45	NITRATE	543.291	2890	31741	1	4.55
5	5.33	PHOSPHATE	524.991	836	13325	1	0.31
6	6.87	SULFATE	599.619	2488	44362	1	0.24

File: c:\dx\data\91092311.D10 Sample: LMCS/73C11CM

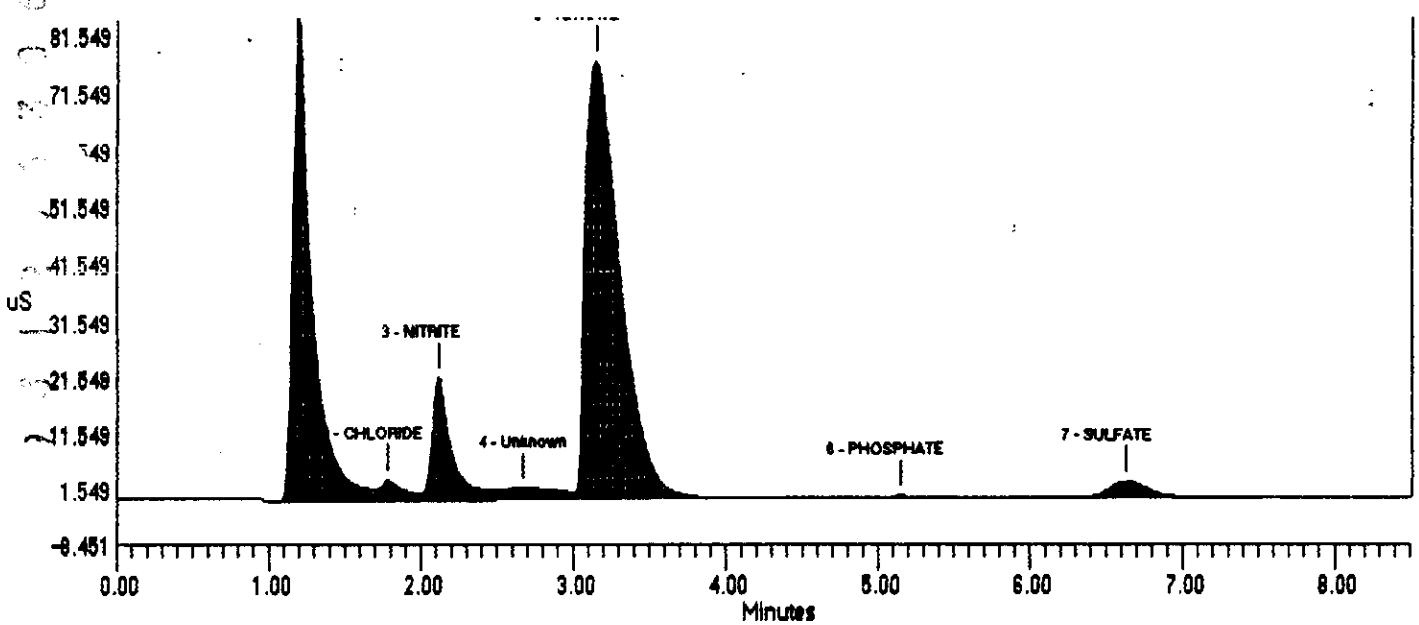


Sample Name: R9408 Date: Mon Sep 23 15:21:23 1991
ta File : c:\dx\data\91092311.D04
thod : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Inject#: 4 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA	REJ
External	1	101 ~~1~~ SRiel	2555	5Hz	0.00	8.52	1000	

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.18	FLUORIDE	10.682	79156	755274	3	0.00
2	1.78	CHLORIDE	3.289	3187	33103	4	0.47
3	2.12	NITRITE	272.0 ~~27.240~~	22007	198075	3	-0.14
4	2.67		48216.546	1717	48217	4	
5	3.15	NITRATE	110.778	77050	1217153	2	-8.58
6	5.15	PHOSPHATE	178.8 ~~1.771~~	243	3458	1	-7.23
7	6.63	SULFATE	682.35 ~~6.756~~	2885	50973	1	-7.25

File: c:\dx\data\91092311.D04 Sample: R9408

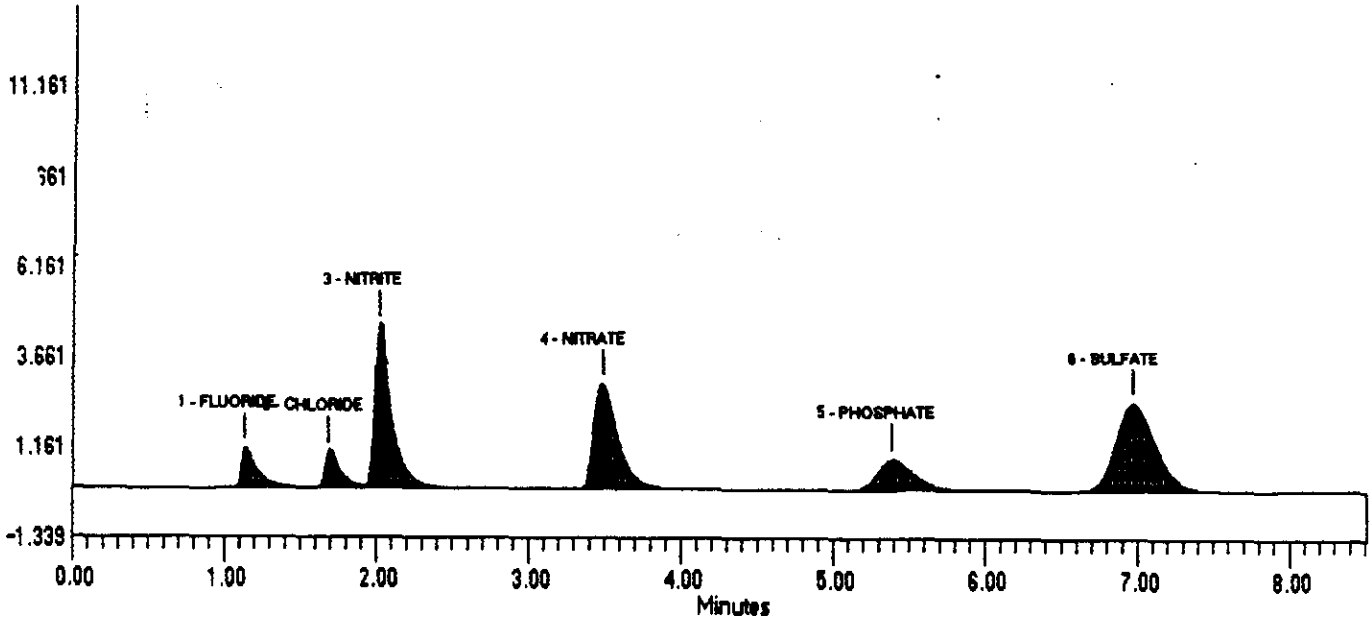


```
==========================================================================
| Sample Name: LMCS/73C11CM                    Date: Mon Sep 23 15:11:35 1991|
|  ata File   : c:\dx\data\91092311.D03                                    |
|  thod       : c:\dx\method\SYSTEM1.met                                   |
| ACI Address: 1        System : 1        Inject#:   3  Detector: CDM-1    |
==========================================================================
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	101	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.13	FLUORIDE	54.136	1052	7489	1	0.00
2	1.68	CHLORIDE	73.700	967	6860	2	-0.98
3	2.02	NITRITE 99	508.155	4483	33862	2	-0.66
4	3.48	NITRATE 95	541.275	2905	31615	1	5.56
5	5.38	PHOSPHATE 103	536.303	840	13650	1	1.25
6	6.97	SULFATE 96	591.654	2426	43727	1	1.70

File: c:\dx\data\91092311.D03 Sample: LMCS/73C11CM



08/20/92

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: ION CHROMATOGRAPHIC - PHOSPHATE	Sample Prep: UNDIGESTED

Instrument: DIONEX 4000 WB98659,WB97286,WB24740,AL10657,WB54428	Procedure/Rev: LA-533-105/B-0
Technologist: S. J. RIEL	Date: 09-23-91
Starting Time: 08:00	Temperature: 70degF
Ending Time: 10:00	Chemist: D. HERT

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5574	11		
2	REAGENT BLANK	R9407-5674	12		
3	SAMPLE 2291-1-3	R9408-5774	13		
4	SAM DUP 2291-1-3	R9408-5874	14		
5	FINAL LMCS CHECK STD	R9412-5574	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	73C11CM/.100 mL			NA

A-6000-881 (03/92)

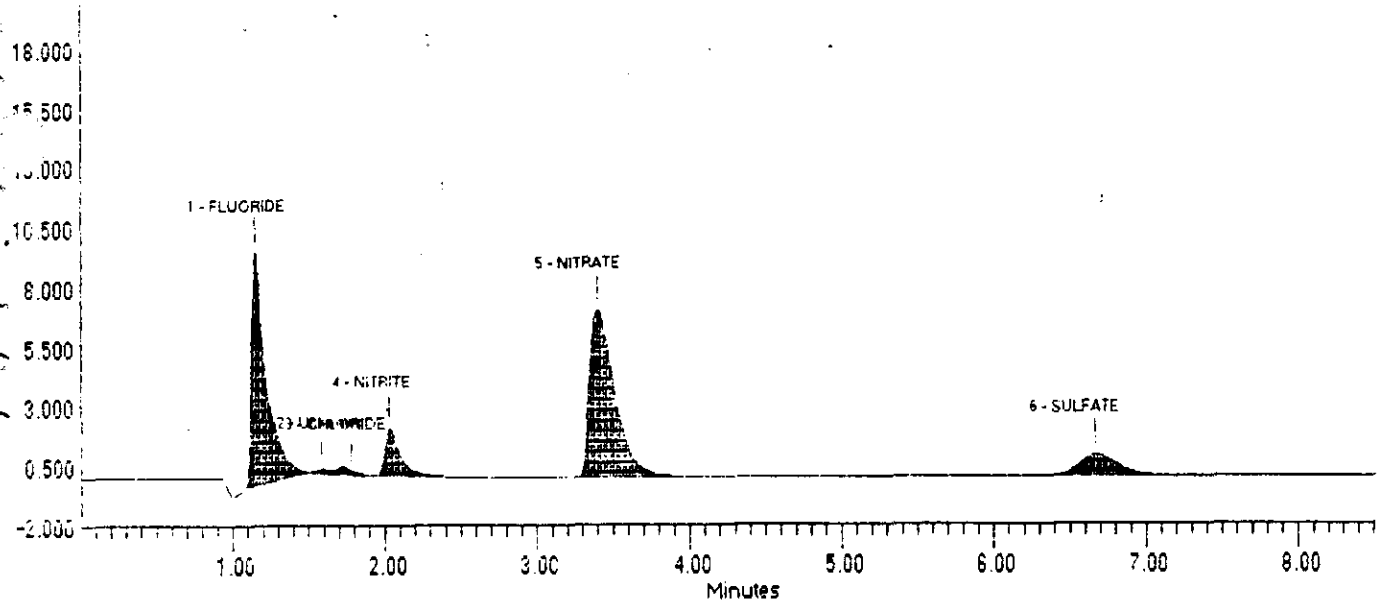
DATA REPROCESSED ON Tue May [illegible]

[illegible]

REPORT	VOLUME	DILUTION	POINTS	RATE	START	[illegible]	[illegible]
[illegible]	3	[illegible]	2503	5Hz	0.00	[illegible]	[illegible]

Pk Num	Ret Time	Component Name	Concentration	Height	Area	[illegible]	[illegible]
1	[illegible]	FLUORIDE	4095.072	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	CHLORIDE	[illegible].010	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	NITRITE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	NITRATE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	SULFATE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

File: A:\91092501.D05 Sample: R9408DUP

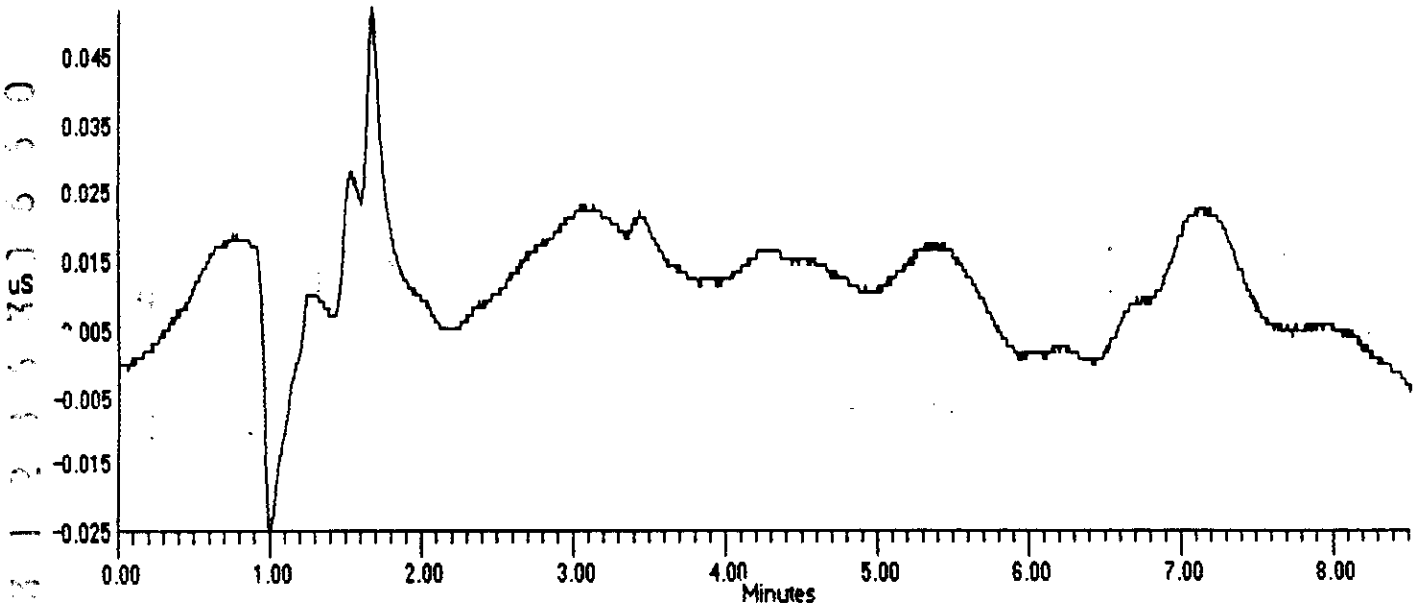


08/20/92
73

```
Sample Name: BLANK                                    Date: Wed Sep 25 13:49:55 1991
  ta File   : c:\dx\data\91092511.D02
 ethod      : c:\dx\method\SYSTEM1.met
ACI Address: 1        System : 1        Inject#:   2  Detector: CDM-1
```

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2555	5Hz	0.00	8.52	1000

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta



09/20/92

ION CHROMATOGRAPHIC ANALYSIS (FLUORIDE) - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Sampled	Priority
R 9406.-5871	102AW	6-14-91	12:13B	26

Determinand	Method Standard	Result Units	Charge Code	Remarks
F	LA-533-105	% RECOVERY	H1140	0

Sample Size: 0.100mL-10.0mL
Customer ID: 910

Remarks Calculations Results:
EDP 974 F ~~EDP 972 CL~~
~~EDP 970 SO4 EDP 960~~
~~NO2 EDP 976 PO4 EDP~~
~~976 NO3~~
STDM SCNCH RESULT
STD VAL %REC

F⁻ result = 94.0 ppm
std. value = 56.0 ppm
recovery = 96.4%

Data was corrected per OSM's request. Denis L. Lee 5-18-92

Analyst: 6CL80 | Date: 5/18/92

Sample No	Sample Point	Date	Time Sampled	Priority
R 9407.-5871	102AW	6-14-91	12:42	26

Determinand	Method Standard	Result Units	Charge Code	Remarks
F⁻	LA-533-105	% RECOVERY	H1140	0

Sample Size: direct
Customer ID: 1PG. 10.

Remarks Calculations Results:
EDP 974 F ~~EDP 972 CL~~
~~EDP 970 SO4 EDP 960~~
~~NO2 EDP 976 PO4 EDP~~
~~976 NO3~~
STDM RESULT
STD VAL %REC

< 11.61 ppm

Data was corrected per OSM's request. Denis L. Lee 5-18-92

Analyst: 6CL80 | Date: 5/18/92

Sample No	Sample Point	Date	Time Sampled	Priority
R 9408.-5871	102AW	6-14-91	12:47	26

Determinand	Method Standard	Result Units	Charge Code	Remarks
F⁻	LA-533-105	UG/ML	H1140	0

Sample Size: 0.1 mL-10mL-1.0mL-10.0mL
Customer ID: 2291-1-3

Remarks Calculations Results:
~~5.16 E3 ppm~~ 4-14-92
4.28 E3 ppm

Analyst: 6CL80 | Date: 5/18/92

Sample No	Sample Point	Date	Time Sampled	Priority
R 9408.-5871	102AW	6-14-91	12:47	26

Determinand	Method Standard	Result Units	Charge Code	Remarks
F⁻	LA-533-105	UG/ML	H1140	0

Sample Size: 0.1 mL-10.0mL-1 mL-10.0 mL
Customer ID: 2291-1-3

Remarks Calculations Results:
DUPLICATE SAMPLE
4.095 E3 ppm
RPD = 4.4%

Analyst: 6CL80 | Date: 5/18/92

Sample No	Sample Point	Date	Time Sampled	Priority
R 9412.-5871	102AW	6-14-91	13:12	26

Determinand	Method Standard	Result Units	Charge Code	Remarks
F	LA-533-105	% RECOVERY	H1140	0

Sample Size: 0.1mL-10.0mL
Customer ID: 910

Remarks Calculations Results:
EDP 974 F EDP 972 CL
EDP 970 SO4 EDP 960
NO2 EDP 976 PO4 EDP
976 NO3
STDM SCNCH RESULT 53.5 ppm
STD VAL 56.0 ppm %REC 95.5%

Data was corrected per OSM's request. Denis L. Lee 5-18-92

Analyst: 6CL80 | Date: 5/18/92

ION CHROMATOGRAPHIC ANALYSIS (CHLORIDE) - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9406.-5572	102AW	6-14-91	12:38	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CL	LA-533-105	% RECOVERY	N114U	0

Sample Size	Customer ID
? 0.100 mL - 10.0 mL	STD

Remarks, Calculations, Results

EDP R972 DIONEX
STD# 73C11CH RESULT 71.8
STD VAL 75.0 %REC 95.7

Data was retrieved per OSM's request. Daniel K. Lutz 5-28-92

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
[signature]				
Hrs 6C280	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
5/18/92		Denise J. Hert Daniel K. Lutz

Serial No	Sample Point	Date	Time Issued	Priority
R 9407.-5672	102AW	6-14-91	12:42	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CL	LA-533 105	% RECOVERY	N114U	0

Sample Size	Customer ID
? direct	REC. 16

Remarks, Calculations, Results

EDP R972 DIONEX
~~STD#~~ RESULT < 111.1 ppm
~~STD VAL~~ ~~%REC~~
DJH 4-14-92

Data ~~was~~ was retrieved per OSM's request. Daniel K. Lutz 5-28-92

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
[signature]				
Hrs 6C280	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
5/18/92		Denise J. Hert Daniel K. Lutz

Serial No	Sample Point	Date	Time Issued	Priority
R 9408.-5772	102AW	6-14-91	12:47	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CL	LA-533-105	PPM	N114U	0

Sample Size	Customer ID
? 0.1 mL - 10.0 mL - 1.0 mL - 10.0 mL	2291-1-3

Remarks, Calculations, Results

~~1.39E3 ppm~~ DJH 4-14-92
6.23E2 ppm

Flag - consistent results difficult due to organic interferences.

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
[signature]				
Hrs 6C280	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
5/18/92		Denise J. Hert Daniel K. Lutz

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5572	102AW	6-14-91	13: 2	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CL	LA-533-105	% RECOVERY	N114U	0

Sample Size	Customer ID
? 0.1 mL - 10.0 mL	STD

Remarks, Calculations, Results

EDP R972 DIONEX
STD# 73C11CH RESULT 71.07 ppm
STD VAL 75 ppm %REC 94.8 %

Data was retrieved per OSM's request. Daniel K. Lutz 5-28-92

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
[signature]				
Hrs 6C280	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
5/18/92		Denise J. Hert Daniel K. Lutz

TODAYS DATE: 6-20-91

PAYROLL NO.: 80028

Y-INTERCEPT= CAL
SLOPE= CAL

SAMPLE ID#: BLANK
SAMPLE SIZE: 0
WVL AND ABS= 580NM 0.005 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-50UL
WVL AND ABS= 580NM 0.091 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.870 A

SAMPLE ID#: 351-P CAL STD
SAMPLE SIZE: 100UL-10ML-1ML
WVL AND ABS= 580NM 1.665 A HI

Y-INTERC .012836

SLOPE .166108

C = 999762

Serial No	Sample Point	Date	Time Issued	Priority
R 9408.-5978	102AW	6-14-91	12:47	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	N54D2	0

Sample Size	Customer ID
? 1ml	2291-1-3

Remarks, Calculations, Results

ABS .923

SAMPLE SPIKED ID
SPIKE ID 75C11-P
SPIKE VOLUME
100uL-10mL-500uL 93.76%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80022				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohen				

Date	Time Completed	Laboratory Use
6-20-91		[signature]

Spike

$$\frac{.923 - .004 - .012836}{.166108} = 5.45$$

R9408-5978

Sample 6-20-91

$$\frac{.228 - .004 - .012836}{.166108} = 1.27$$

$$\frac{5.45 - 1.27}{4.458} \times 100 = 93.76\%$$

Serial No	Sample Point	Date	Time Issued	Priority
R 9412.-5578	102AW	6-14-91	12:59	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
CN	LA-695-102	% RECOVERY	W1DEO	0

Sample Size	Customer ID
? 100uL-10mL-500uL	SID

Remarks, Calculations, Results

S244 KCH 6-20-91 ABS .751
SIDN 75C11P RESULT ~~888.8~~ 884 ppm
SID VAL 891.7 %REC 99.1%

$$\frac{(.751 - .004) - .012836}{.166108} / .500 \times 100 =$$

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
80022				
Hrs	Hrs	Hrs	Hrs	Hrs
Ed Cohen				

Date	Time Completed	Laboratory Use
6-20-91		[signature]

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: CYANIDE	Sample Prep: UNDIGESTED

Instrument: MILTON ROY SPEC. 301 AL10724	Procedure/Rev: LA-695-102/A-3
Technologist: E. COLVIN	Date: 06-20-91
Starting Time: 08:00	Temperature: NA
Ending Time: 15:00	Chemist: D. BISENIUS

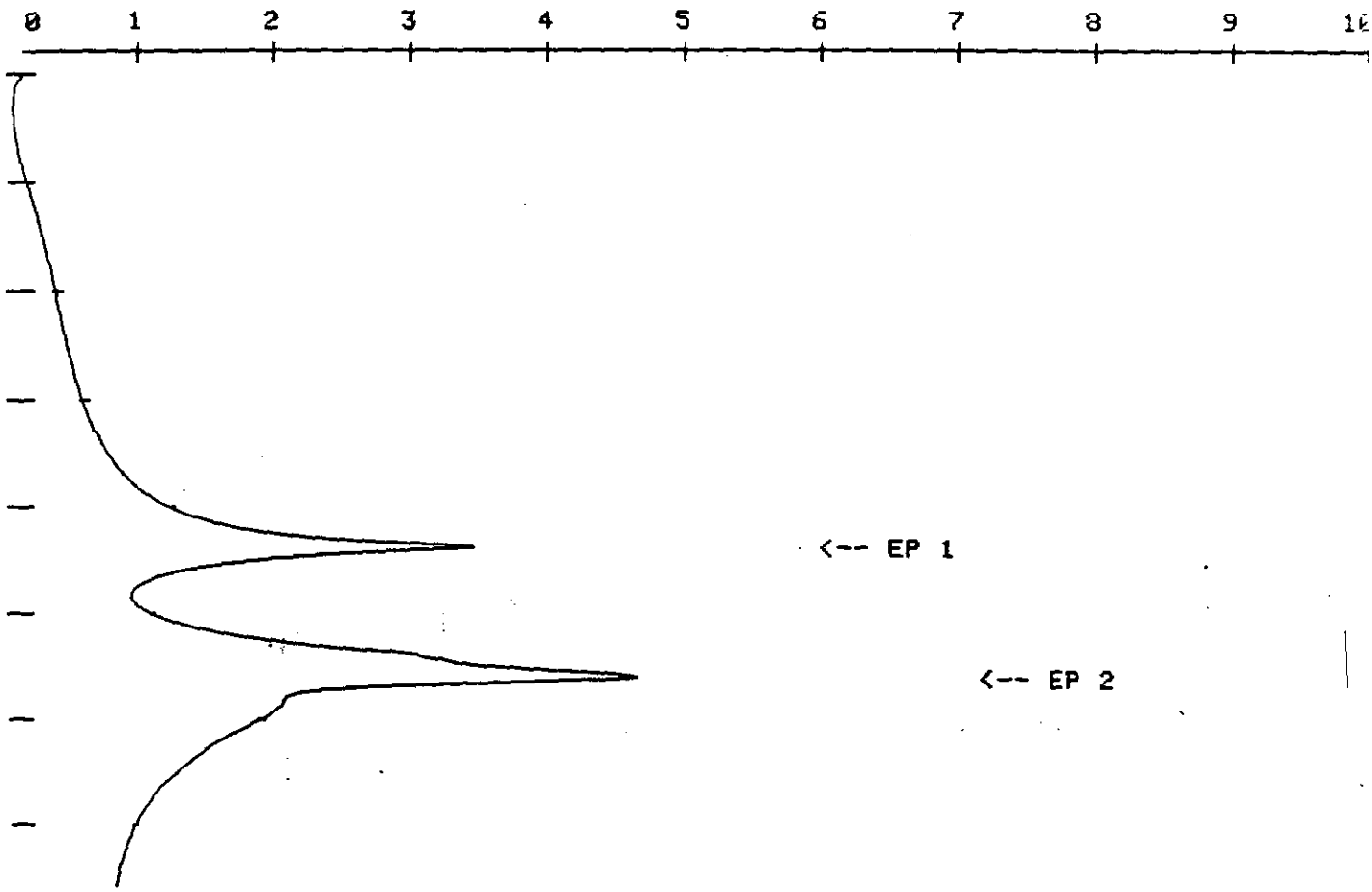
	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5578	11		
2	REAGENT BLANK	R9407-5678	12		
3	SAMPLE 2291-1-3	R9408-5778	13		
4	SAM DUP 2291-1-3	R9408-5878	14		
5	SPIKE OF 2291-1-3	R9408-5978	15		
6	FINAL LMCS CHECK STD	R9412-5578	16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	75C11P/.100 mL			NA
SPIKE	75C11P/.100 mL			NA

A-6000-881 (03/92)

SAMPLE NUMBER: 1
SAMPLE DATA: 9412.
DIRECT READ PH: 11.999

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.68	0.547	0.0000
5.63	0.700	0.0000

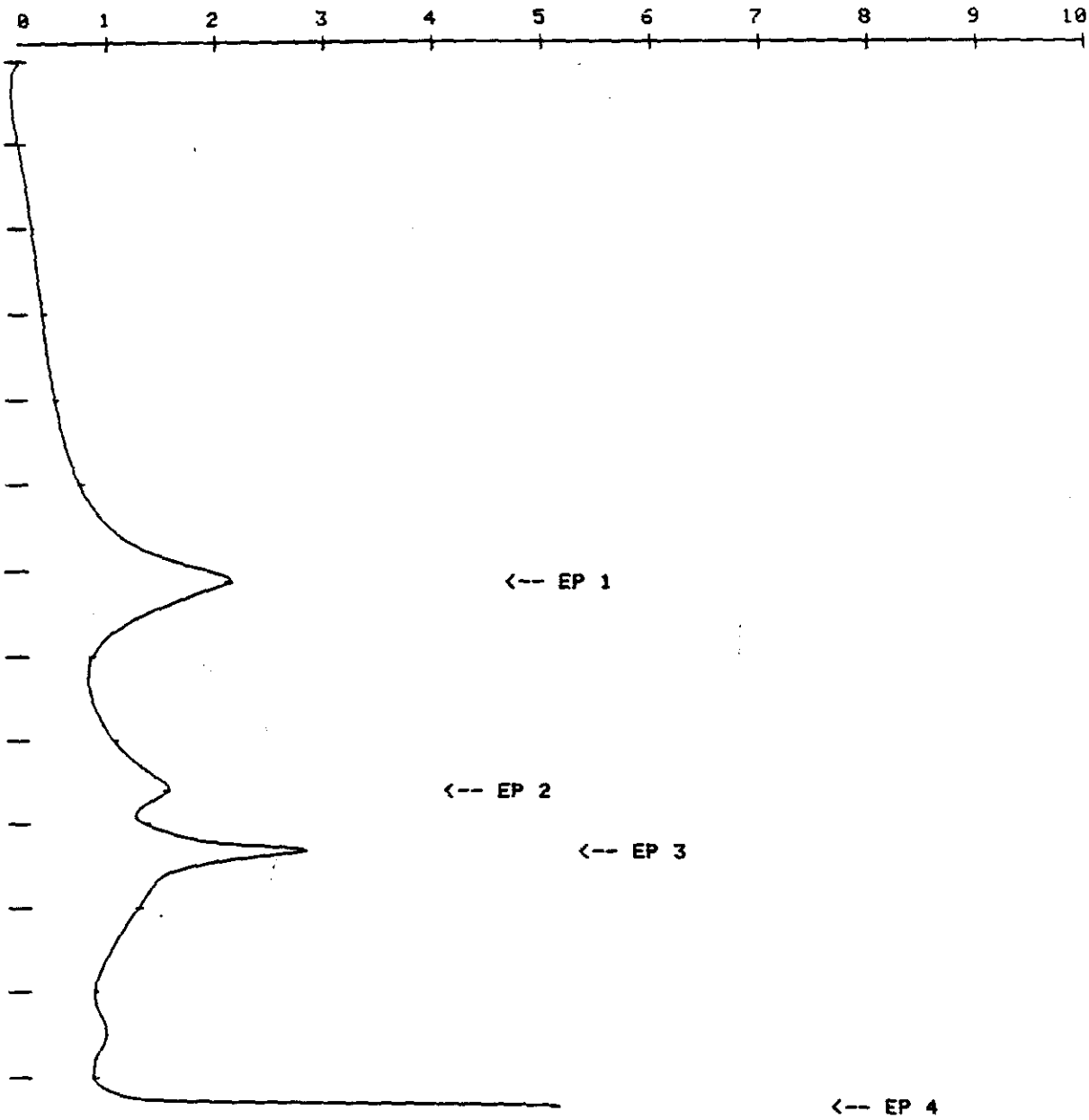
TITRATION TERMINATED BY PH LIMIT.

SEP 11 1991 10:03 AM

BEST AVAILABLE COPY

SAMPLE NUMBER: 1
SAMPLE DATA: 9408.
DIRECT READ PH: 11.870

DERIVATIVE OUTPUT, dE/dV



DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.90	0.767	0.0000
8.24	1.075	0.0000
6.91	1.165	0.0000
3.87	1.541	0.0000

TITRATION TERMINATED BY LIMIT ON NUMBER OF EQUIVALENCES PERMISSIBLE.

SEP 10 1991 2:08 PM

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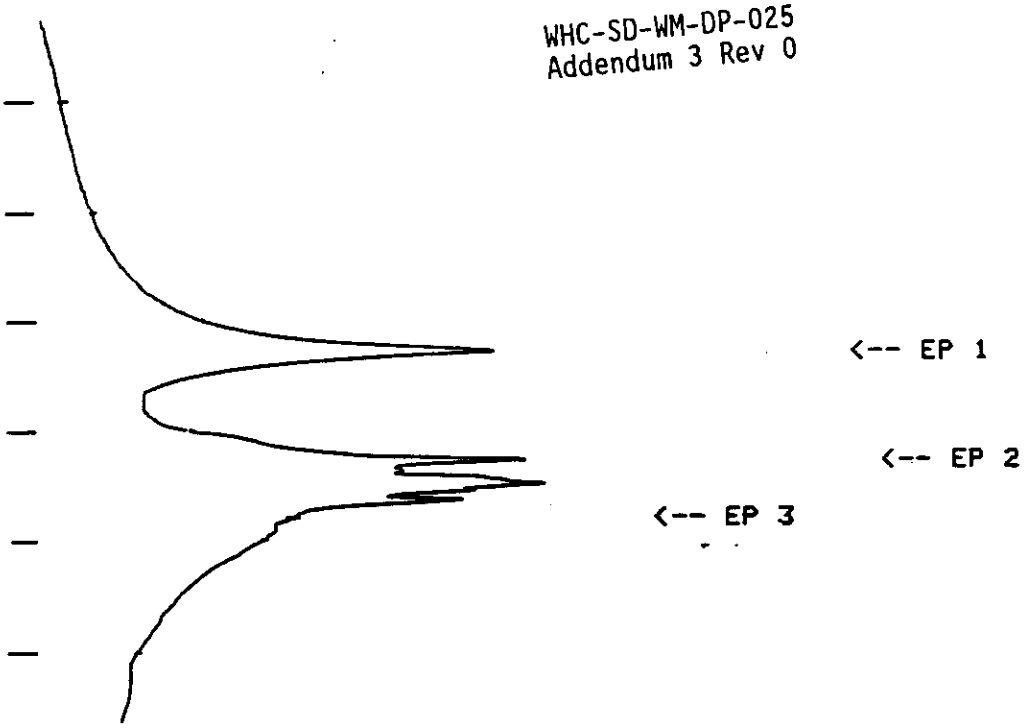

DRV TITRATION:

EQUIVALENCE PH	TITRANT VOLUME	COMPUTATION
9.62	0.536	0.0000
7.78	0.659	0.0000
4.53	0.722	0.0000

TITRATION TERMINATED BY PH LIMIT.

SEP 10 1991 8:43 AM

DOCUMENTATION SEP 10 1991 8:10 AM

ANALYST: 6C559 LOCATION: 222-S 200 West

TITRANT: .1905 M HNO_3

INDICATING ELECTRODE:

REFERENCE ELECTRODE: 98 % efficiency

SAMPLE:

SETUP PARAMETERS

MODE:	DIRECT READ PH
ELECTRODE STDZ:	PH
EQUILIBRATION TIME, SEC:	15

MODE:	DRV TITRATION
ELECTRODE STDZ:	PH
dE/dV SIGN:	+
ML LIMIT:	2.50
PH LIMIT:	3.
TITRATION RATE:	10
SENSITIVITY:	1
DISPENSE, ML:	0.
PLOT GAIN:	5
COMPUTATION:	CONCENTRATION
TITRANT NORMALITY:	0.1900
SOLVENT BLANK:	0.
MULTIPLIER:	0.

LAST ELECTRODE STANDARDIZATION: SEP 10 1991 8:10 AM

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: DETERMINATION OF HYDROXIDE IONS IN SOLUTION	Sample Prep: UNDIGESTED

Instrument: FISHER WA77509	Procedure/Rev: LA-661-102/F-1
Technologist: M. BIERMAN	Date: 09-10-91
Starting Time: NA	Temperature: 25degC
Ending Time: NA	Chemist: S. ISAACSON

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5529	11		
2	REAGENT BLANK	R9407-5629	12		
3	SAMPLE 2291-1-3	R9408-5729	13		
4	FINAL LMCS CHECK STD	R9412-5529	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	9C11AF/.100 mL			.100 mL

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: AMMONIA	Sample Prep: UNDIGESTED

Instrument: AL10665, AL10696	Procedure/Rev: LA-634-102/D-0
Technologist: S. COBB	Date: 08-23-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5528	11		
2	REAGENT BLANK	R9407-5628	12		
3	SAMPLE 2291-1-3	R9408-5728	13		
4	FINAL LMCS CHECK STD	R9412-5528	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	4C11QL/.250 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9408 Date: 09-04-1991 Time: 10:24:08

Blank = .5424173 Sample Size = 50 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	31.60	100.00
3	3.01	35.30	10.48
4	4.01	36.50	3.29
5	5.01	37.20	1.88
6	6.01	37.50	0.80
7	7.01	38.00	1.32

(38 - 3.800099)(1)/(50) = .6839981 g/L Carbon

(38 - 3.800099)(1)/(50)(12) = 5.699984E-02 Molar Carbon

Sample Run By: 80028

55

JMAH 08/20/92

115

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: E-9406 Date: 09-04-1991 Time: 09:51:44

Blank = .5424173 Sample Size = 50 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	104.90	100.00
3	3.01	119.70	12.36
4	4.01	124.20	3.62
5	5.01	125.30	0.88
6	6.01	125.90	0.48
7	7.01	126.40	0.40

(126.4 - 3.800099)(1)/(50) = 2.451998 g/L Carbon

(126.4 - 3.800099)(1)/(50)(12) = .2043332 Molar Carbon

Sample Run By: 80028

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: TOTAL INORGANIC CARBON	Sample Prep: UNDIGESTED

Instrument: WB39927	Procedure/Rev: LA-622-102/B-0
Technologist: E. COLVIN	Date: 09-04-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5527	11		
2	REAGENT BLANK	R9407-5627	12		
3	SAMPLE 2291-1-3	R9408-5727	13		
4	FINAL LMCS CHECK STD	R9412-5527	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	69C11K/.050 mL			NA

A-6000-881 (03/92)

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9408+SP Date: 06-27-1991 Time: 09:38:59

Blank = .670791 Sample Size = 200 Dilution Factor = 2.5
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	72.80	100.00
3	3.01	120.50	39.59
4	4.01	137.30	12.24
5	5.01	143.90	4.59
6	6.01	146.70	1.91
7	7.01	148.40	1.15

(148.4 - 4.699959)(2.5)/(200) = 1.796251 g/L Carbon

(148.4 - 4.699959)(2.5)/(200)(12) = .1496875 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9408 Date: 06-27-1991 Time: 09:19:57

Blank = .670791 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	5.80	100.00
3	3.01	8.40	30.95
4	4.01	9.80	14.29
5	5.01	11.00	10.91
6	6.01	11.60	5.17
7	7.01	12.20	4.92

(12.2 - 4.699467)(11)/(200) = .4125293 g/L Carbon

(12.2 - 4.699467)(11)/(200)(12) = 3.437744E-02 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: R-9406 Date: 06-27-1991 Time: 09:01:20

Blank = .670791 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	39.20	100.00
3	3.01	51.80	24.32
4	4.01	55.70	7.00
5	5.01	57.80	3.63
6	6.01	59.20	2.36
7	7.01	60.20	1.66

(60.2 - 4.7)(11)/(200) = 3.0525 g/L Carbon

(60.2 - 4.7)(11)/(200)(12) = .254375 Molar Carbon

Sample Run By: 80028_____

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: TOTAL ORGANIC CARBON	Sample Prep: UNDIGESTED

Instrument: MODEL 5011-WC16130	Procedure/Rev: LA-344-105/A-3
Technologist: E. COLVIN	Date: 06-27-91
Starting Time: 08:00	Temperature: NA
Ending Time: 14:00	Chemist: D. BISENIUS

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5526	11		
2	REAGENT BLANK	R9407-5626	12		
3	SAMPLE 2291-1-3	R9408-5726	13		
4	SAM DUP 2291-1-3	R9408-5826	14		
5	SPIKE OF 2291-1-3	R9408-5926	15		
6	FINAL LMCS CHECK STD	R9412-5526	16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	70C11H/.200 mL			NA
SPIKE	80C11E/.200 mL			NA

A-6000-881 (03/92)

DSC

Configuration used from 8-8-91 to Nov 25, 1991

Denise [illegible]

Heat flow calibration began July 20, 1991. Used until Nov 25, 1991

NFIGURATION

. NOV-91 8:14

E INDIUM	255
DSC SIGN ICTA	1
TAU LAG	12
TAU SIGNAL	0
E DIMIN. FACT.	.93
S	2400
TAU LAG 2	16
TAU SIGNAL 2	0
E DIMIN. F. 2	.93
S 2	1850
MAX. TEMP.	600.
MIN. TEMP.	-50.
A PT100	.21610
B PT100	.74150
C PT100	-.10116
HEAT P	3000
HEAT I	250
HEAT D	30
COOL 1	0
COOL 2	0
COOL 3	0
A1	10773
B1	58.121
C1	.14689
T1	-100
A2	8940
B2	17.884
C2	-.072
T2	363
A3	9360.3
B3	-15.043
C3	.01538

******** METTLER TA4000 SYSTEM *********

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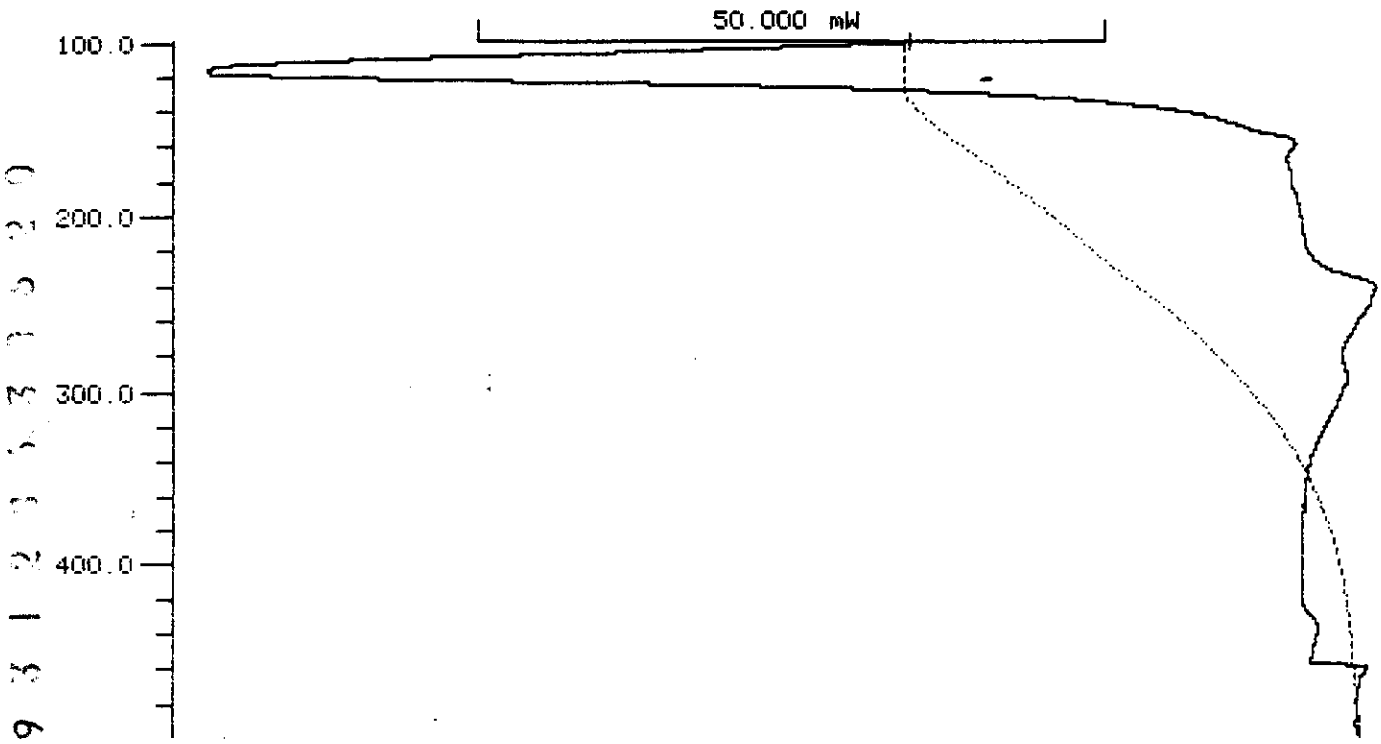
END SCREEN °C 497.8

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->

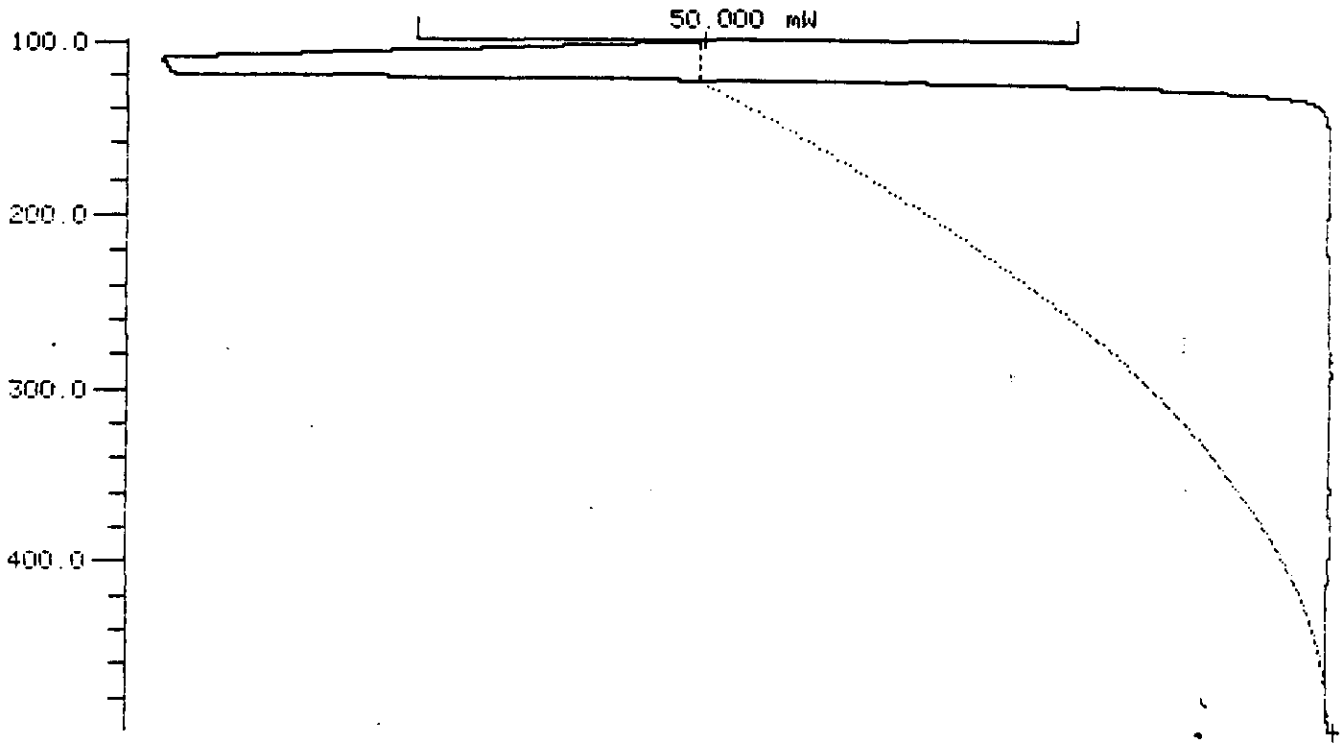


WARNING		1
ΔH EXO	mJ	12318
ΔH	J/G	1264.6
PEAK TEMP. °C		155.4

******** METTLER TA4000 SYSTEM *********

END SCREEN °C 498.0

TEMPERATURE °C HEAT FLOW
EXOTHERMAL-->



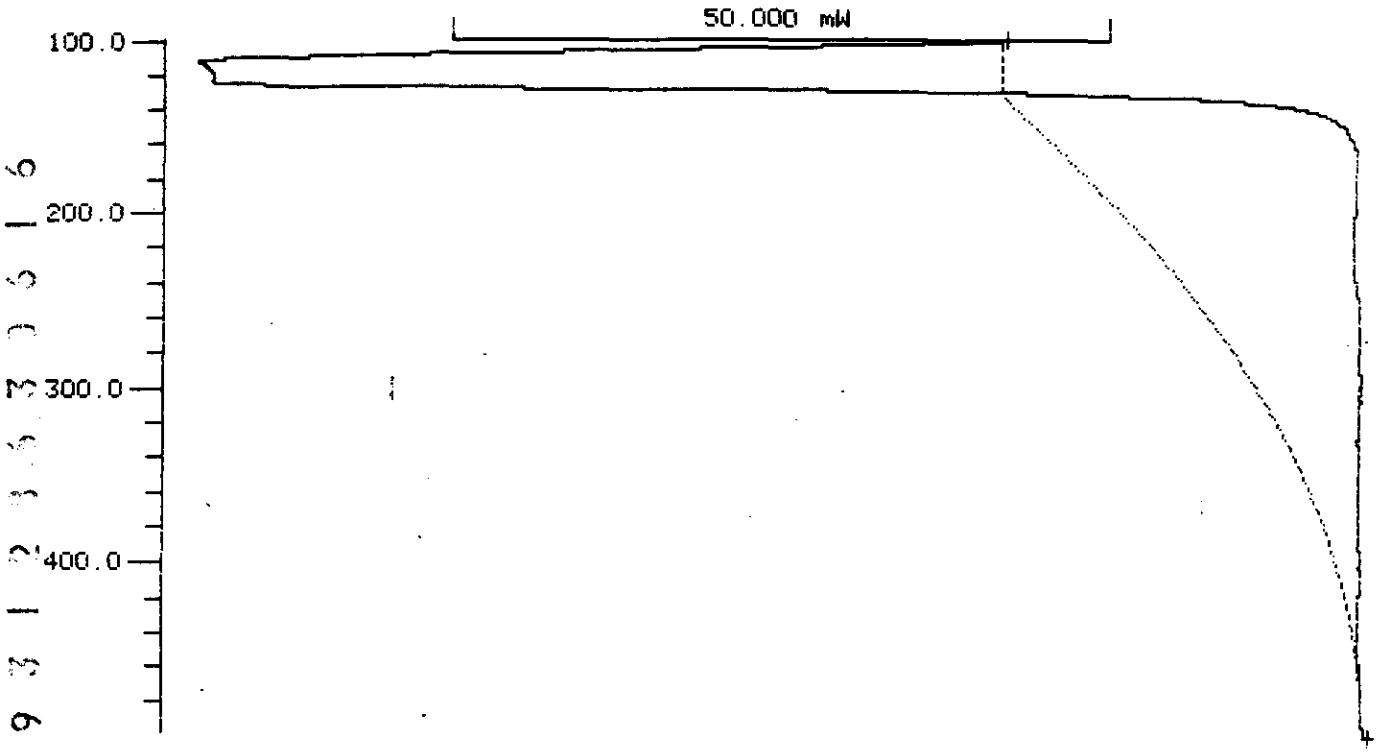
WARNING		1
ΔH EXO	mJ	31489
ΔH	J/G	3367.4
PEAK TEMP. °C		135.6

******** METTLER TA4000 SYSTEM *********

08/20/92
34

END SCREEN °C 498.0

TEMPERATURE °C HEAT FLOW
EXOTHERMAL-->



WARNING		1
ΔH EXO	mJ	11005
ΔH	J/G	1080.3
PEAK TEMP.	°C	155.5

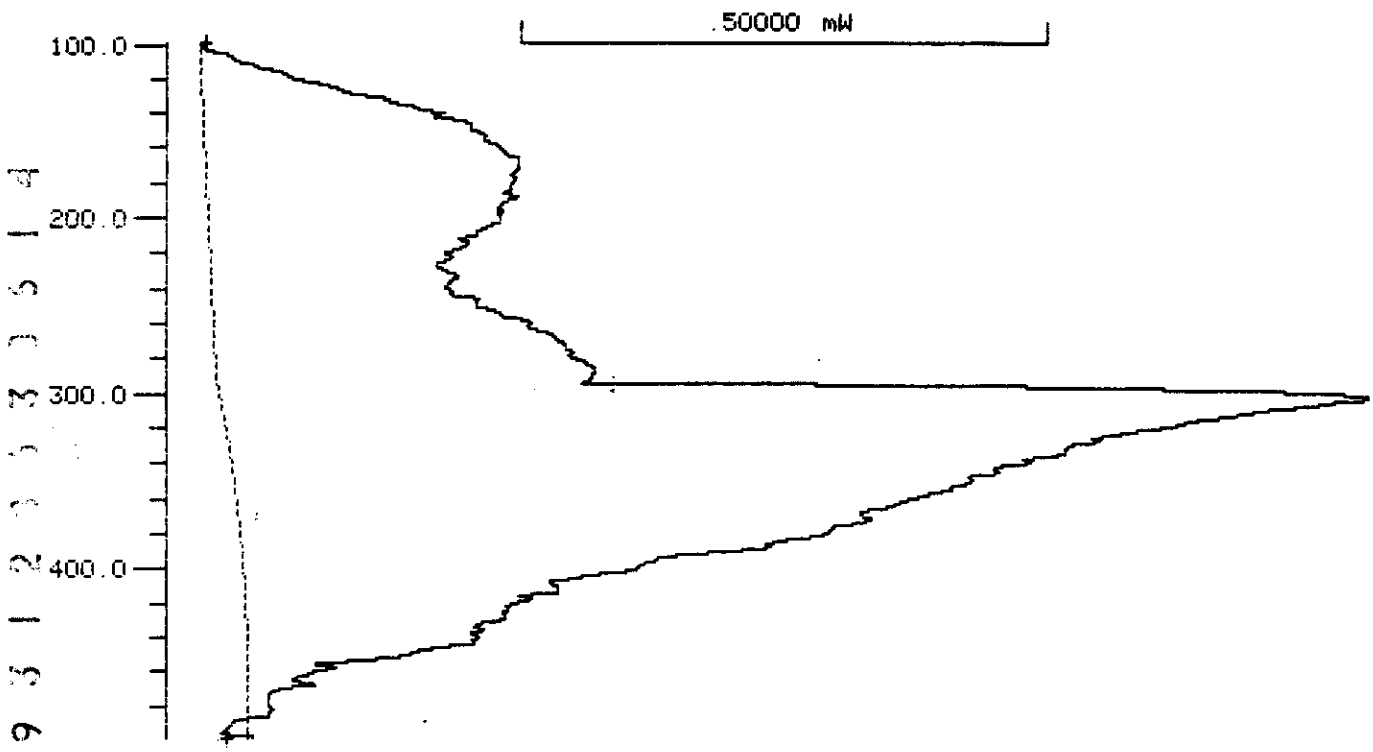
******** METTLER TA4000 SYSTEM *********

Sample
R9408
82583
Sh Cobb
09-15-91

END SCREEN °C 498.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->



ΔH EXO	mJ	827.11
ΔH	J/G	82.711
PEAK TEMP. °C		304.0

******** METTLER TA4000 SYSTEM *********

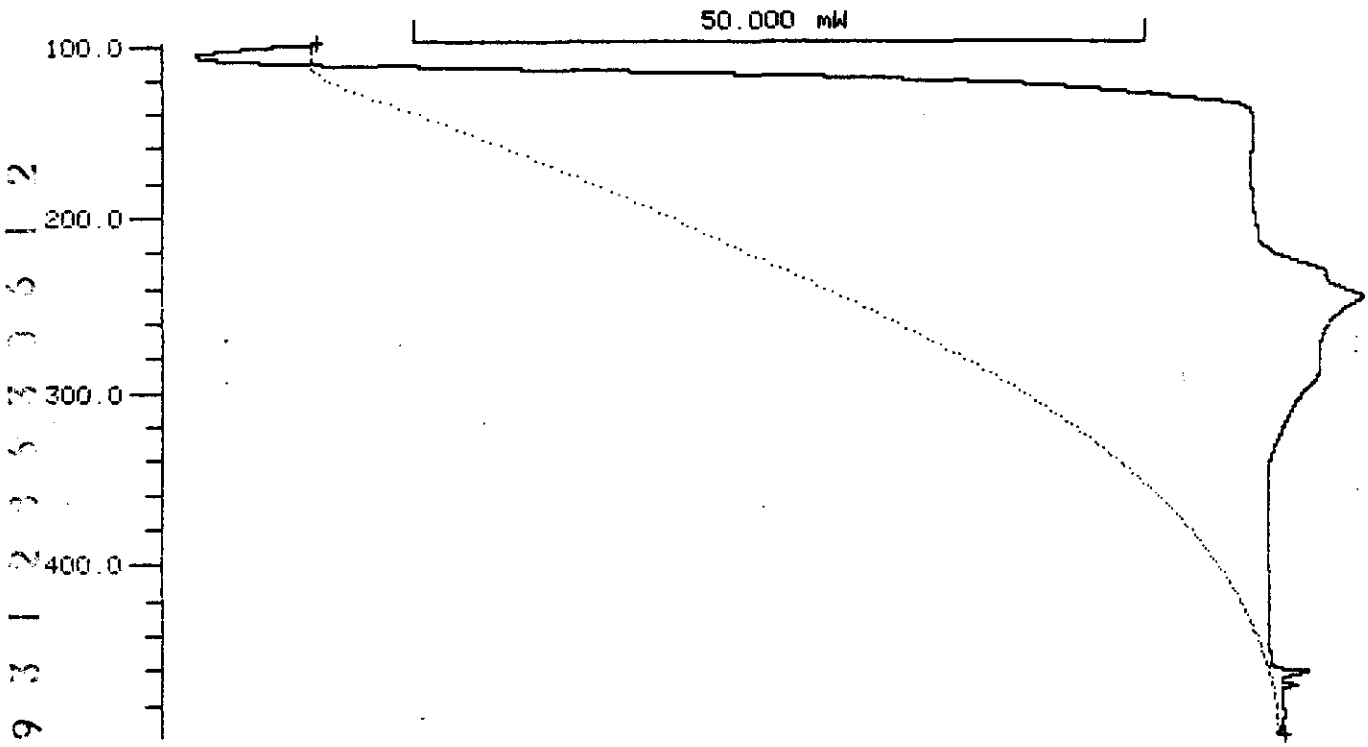
33

BLK
R9407
82503
SLCobb
09-15-91
08/20/0_ 30

Δ

END SCREEN °C 498.0

TEMPERATURE °C HEAT FLOW
EXOTHERMAL-->



ΔH EXO	mJ	49998
ΔH	J/G	5156.6
PEAK TEMP. °C		139.9

******** METTLER TA4000 SYSTEM *********

STD
R9406
82583
SL Cobb
09-15-91

31

08/20/92
28

DIFFERENTIAL THERMAL ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9406.-551	102AW	6-14-91	12:38	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size: ? 10 ul
Customer ID: STD

Remarks, Calculations, Results: 2R11-A2

100%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82533				
Hrs	Hrs	Hrs	Hrs	Hrs
SL Cobb				
Date	Time Completed	Lab Use Only		
09-15-91				

Serial No.	Sample Point	Date	Time Issued	Priority
R 9407.-561	102AW	6-14-91	12:42	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size: ?
Customer ID: REG. BL

Remarks, Calculations, Results: REAGENT BLANK

No exotherm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82533				
Hrs	Hrs	Hrs	Hrs	Hrs
SL Cobb				
Date	Time Completed	Lab Use Only		
09-15-91				

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-571	102AW	6-14-91	12:47	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size: ? 10 ul
Customer ID: 2291-1-3

Remarks, Calculations, Results:

No exotherm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82533				
Hrs	Hrs	Hrs	Hrs	Hrs
09-15-91				
Date	Time Completed	Lab Use Only		
SL Cobb				

Serial No.	Sample Point	Date	Time Issued	Priority
R 9408.-581	102AW	6-14-91	12:47	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size: ? 10 ul
Customer ID: 2291-1-3

Remarks, Calculations, Results: DUPLICATE SAMPLE

No exotherm

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82533				
Hrs	Hrs	Hrs	Hrs	Hrs
SL Cobb				
Date	Time Completed	Lab Use Only		
09-15-91				

Serial No.	Sample Point	Date	Time Issued	Priority
R 9412.-551	102AW	6-14-91	13: 2	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
DSC	LA-514-113	EXOTHERMS	W1DEO	0

Sample Size: ? 10 ul
Customer ID: STD

Remarks, Calculations, Results: 100.0%

Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
82533				
Hrs	Hrs	Hrs	Hrs	Hrs
SL Cobb				
Date	Time Completed	Lab Use Only		
09-15-91				

SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Sampled	Priority
R 9412-5506	102AW	6-14-91	12:59	26

Description	Method/Standard	Result Units	Charge Code	Results
SPG	LA-510-112	% RECOVERY	W1BED	1

Sample Size	Customer ID
7100.82L	STD

Remarks, Calculations, Results

6332 ZNCL2

RERUN

STDN 1541-6J RESULT 1.4215

STD VAL 1.4586 %REC 98.8%

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

Date	Time Completed	Laboratory
8-12-91		

G - 1.9864
L - 1.8436
N - .1428

R9412-5506

G - 2.0330 ~~2.0342~~
L - 1.8906
N - .1424

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: SPECIFIC GRAVITY	Sample Prep: UNDIGESTED

Instrument: WA96787	Procedure/Rev: LA-510-112/C-2
Technologist: T. LEE	Date: 08-12-91
Starting Time: NA	Temperature: NA
Ending Time: NA	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9406-5506	11		
2	REAGENT BLANK	R9407-5606	12		
3	SAMPLE 2291-1-3	R9408-5706	13		
4	FINAL LMCS CHECK STD	R9412-5506	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS CHECK STD	15C11-B/.10032 mL			NA
SAMPLES RERUN.				

A-6000-881 (03/92)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9408	Customer ID: 2291-1-3
Analysis: VISUAL CHECK AND OVER-THE-TOP READING	Sample Prep: UNDIGESTED

Instrument: N/A	Procedure/Rev: LA-519-151/D-1
Technologist: M. BIERMAN	Date: 06-14-91
Starting Time: 13:30	Temperature: 25degC
Ending Time: 15:00	Chemist: N/A

	Description	Lab ID		Description	Lab ID
1	SAMPLE 1-3	R9408-5000	11		
2	SAMPLE 2-3	R9409-5000	12		
3	SAMPLE 3-3	R9410-5000	13		
4	SAMPLE 4-3	R9411-5000	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
N/A				

A-6000-881 (03/92)

UNDIGESTED SAMPLE RESULTS

Tank: 102AW
Core: NA
Segment: R9410
Customer ID: 2291-3-3

	Check Standard		Blank		Sample		Duplicate Sample		Spike of Sample		Check Standard	
Lab ID:	R9409		R9409		R9410		R9410		R9410		R9411	
Lab ID: Cyanide (06-27-91)	100	%	<0.50E+0	ppm	R9410-5778 1.21E+0	ppm	NA		R9410-5978 100.8	%	97.9	%
Lab ID:	R9406		R9407		R9410		R9410		R9410		R9412	
Lab ID: Differential Thermal (09-15-91)	100	%	No Exotherm		R9410-5711 No Exotherm		NA		NA		100	%
Ion Chromatographic												
Lab ID: Fluoride (05-18-92)	96.4	%	1.11E+2	ppm	R9410-5771 4.09E+3	ppm	NA		NA		95.5	%
Lab ID: Chloride (05-18-92)	95.7	%	1.11E+2	ppm	R9410-5772 5.82E+2	ppm	NA		NA		94.8	%
Lab ID: Sulfate (09-25-91)	96.8	%	<1.00E+0	ppm	R9410-5775 2.55E+3	ppm	NA		NA		96.3	%
Lab ID: Phosphate (09-23-91)	103.7	%	<1.00E+0	ppm	R9410-5774 1.74E+2	ppm	NA		NA		101.5	%
Lab ID: Nitrate (09-25-91)	95.7	%	<1.00E+0	ppm	R9410-5773 1.41E+4	ppm	NA		NA		95.9	%
Lab ID: Nitrite (09-25-91)	100.96	%	<1.00E+0	ppm	R9410-5776 2.54E+3	ppm	NA		NA		99.4	%
Lab ID: Ammonia (08-23-91)	96.8	%	<1.79E+1	ppm	R9410-5728 5.72E+1	ppm	R9410-5628 6.80E+1	ppm	NA		95.3	%
Lab ID: Determination of Hydroxide Ions (09-10-91)	99.7	%	8.64E+0	ppm	R9410-5729 2.99E+3	ppm	R9410-5829 3.09E+3	ppm	NA		99.7	%
Lab ID: Total Inorganic Carbon (09-04-91)	102.2	%	3.80E+0	ug	R9410-5727 1.07E+0	g/L	R9410-5827 1.07E+0	g/L	NA		102.8	%
Lab ID: Total Organic Carbon (06-27-91)	101.8	%	4.70E+0	ug	R9410-5726 5.17E-1	g/L	NA		NA		101.9	%
Lab ID: Specific Gravity (08-12-91)	99.2	%	9.90E-1		R9410-5706 1.027		R9410-5806 1.027		NA		98.8	%

pH - NOT RUN

UNDIGESTED SAMPLE RESULTS

Tank: 102AW
Core: NA
Segment: R9408
Customer ID: 2291-1-3

	Check Standard		Blank		Sample		Duplicate Sample		Spike of Sample		Check Standard	
Lab ID:	R9406		R9407		R9408		R9408		R9408		R9412	
Lab ID: Cyanide (06-20-91)	100.5	%	<0.50E+0	ppm	R9408-5778 1.27E+0	ppm	R9408-5878 1.17E+0	ppm	R9408-5978 93.76	%	R9408-5978 99.1	%
Lab ID: Differential Thermal (09-15-91)	100	%	No Exotherm		R9408-5711 No Exotherm		R9408-5811 No Exotherm		NA		100	%
Ion Chromatographic												
Lab ID: Fluoride (05-18-92)	96.4	%	<1.11E+2	ppm	R9408-5771 4.28E+3	ppm	NA		NA		95.5	%
Lab ID: Chloride (05-18-92)	95.7	%	<1.11E+2	ppm	R9408-5772 6.23E+2	ppm	NA		NA		94.8	%
Lab ID: Sulfate (09-25-91)	96.8	%	<1.00E+0	ppm	R9408-5775 2.26E+3	ppm	R9408-5875 2.12E+3	ppm	NA		96.3	%
Lab ID: Phosphate (09-23-91)	103.7	%	<1.00E+0	ppm	R9408-5774 1.79E+2	ppm	R9408-5874 1.77E+2	ppm	NA		101.5	%
Lab ID: Nitrate (09-25-91)	95.7	%	<1.00E+0	ppm	R9408-5773 1.44E+4	ppm	R9408-5873 1.41E+4	ppm	NA		95.9	%
Lab ID: Nitrite (09-25-91)	100.96	%	<1.00E+0	ppm	R9408-5776 2.53E+3	ppm	R9408-5876 2.51E+3	ppm	NA		99.4	%
Lab ID: Ammonia (08-23-91)	96.8	%	<1.79E+1	ppm	R9408-5728 1.38E+2	ppm	NA		NA		95.3	%
Lab ID: Determination of Hydroxide Ions (09-10-91)	99.7	%	8.64E+0	ppm	R9408-5729 3.01E+3	ppm	NA		NA		99.7	%
Lab ID: Total Inorganic Carbon (09-04-91)	102.2	%	3.80E+0	ug	R9408-5727 6.84E-1	g/L	NA		NA		102.8	%
Lab ID: Total Organic Carbon (06-27-91)	101.8	%	4.70E+0	ug	R9408-5726 4.12E-1	g/L	R9408-5826 4.02E-1	g/L	R9408-5926 117.3	%	101.9	%
Lab ID: Specific Gravity (08-12-91)	99.2	%	9.90E-1		R9408-5706 1.024		NA		NA		98.8	%
pH - NOT RUN												

SUMMARY DATA REPORT

Project: 242-A EVAPORATOR FEED CHARACTERIZATION
Tank: 102AW
Customer ID: 2291-4-3

Undigested Sample Results

	Sample R9411		Sample Duplicate NA
Specific Gravity	1.026		NA
Differential Thermal	No Exotherm		NA
Total Organic Carbon	4.24E-1	g/L	NA
Total Inorganic Carbon	7.58E-1	g/L	NA
Ammonia	1.41E+2	ppm	NA
Cyanide	1.38E+0	ppm	NA
Ion Chromatographic			
Chloride	4.81E+2	ppm	NA
Fluoride	3.90E+3	ppm	NA
Nitrate	1.46E+4	ppm	NA
Nitrite	2.58E+3	ppm	NA
Phosphate	1.67E+2	ppm	NA

Note: pH analysis not run.

SUMMARY DATA REPORT

Project: 242-A EVAPORATOR FEED CHARACTERIZATION
Tank: 102AW
Customer ID: 2291-2-3

Undigested Sample Results

	Sample R9409		Sample Duplicate R9409	
Specific Gravity	1.024		NA	
Differential Thermal	No Exotherm		NA	
Total Organic Carbon	6.16E-1	g/L	NA	
Total Inorganic Carbon	8.56E-1	g/L	NA	
Ammonia	1.27E+2	ppm	NA	
Determination of Hydroxide Ion	2.62E+3	ppm	NA	
Cyanide	1.31E+0	ppm	1.33E+0	ppm
Ion Chromatographic				
Chloride	1.75E+2	ppm	NA	
Fluoride	3.87E+3	ppm	NA	
Nitrate	1.44E+4	ppm	NA	
Nitrite	2.64E+3	ppm	NA	
Phosphate	1.79E+2	ppm	NA	
Sulfate	2.62E+3	ppm	NA	

Note: pH analysis not run.

SAMPLE DATA SUMMARY

9 3 1 2 1 5 3 0 5 9 4

SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
R9372	2AW 61191-4		yes
INORGANIC 1	R9397		
2	9404		
3	9411		
4	9418		
SEMI VOA			
1 and 2	R 9427		
VOA			
1 and 2	R 9426		

9397, 9404, 9411, 9418
R9426, 9427,

LABORATORY ID

Date Sampled	Time Sampled

Sample Site or Sampling ID	Date Received at 222-S	Time Received at 222-S
2AW52291-4 (R9372) 102AW	6/13/91	13:15

Delivered by (Signature)	RPT Release (Signature)	Dose Rate
[signature]	[signature]	200 mrad/hr

Custodian (Signature)	Date Analysis Complete	Disposal Date
[signature]		

Comments

Stored in ref. 1,2,3

Payroll No.	Tech/Receiver (Signature)	Date	Entry Code	Comments
	INORGANIC 1	R9397		
	2	R9404		
	3	R9411		
	4	R9418		
			R9427	
	SVOA 1		~~R9423~~	
	" 2			
	VOA 1		~~R9422~~	
	" 2		R9426	

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BD-6000-347 (10/89)

SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
R9371	2AW61191-3		yes
INORGANIC 1	R9396		
2	9403		
3	9410		
4	9417		
SEMI-VOA			
1 AND 2	R9424		
VOA			
1 and 2	R9425		

9396, 9403, 9410, 9417
R9424, 9425 LABORATORY ID

Date Sampled	Time Sampled

Sample Site or Sampling ID	Date Received at 222-S	Time Received at 222-S
2AW52291-3 (R9371) 102AW	6/13/91	1315

Delivered by (Signature)	RPT Release (Signature)	Dose Rate
[signature]	J. Yeldy	200 [illegible]

Custodian (Signature)	Date Analysis Complete	Disposal Date
Vida Johansen		

Comments

Stored in ref. 1, 2

Payroll No.	Tech/Receiver (Signature)	Date	Entry Code	Comments
	INORGANIC 1	R9396		
	2	R9403		
	3	R9410		
	4	R9417		
	SVOA 1	R9424		
	2			
	VOA 1	R9425		
	2			

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SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
A 9229	2AW52291-2		yes

TANK FARM PLANT OPERATING PROCEDURE

WHC-SD-WM-DP-025
Addendum 3 Rev 0

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	CCPitkoff	Date 6-5-91		Time	1555
Sample Locations	241-AW -TANK 102-AW Riser # 22A				
Remarks	N/A				
Ice Chest or Sample Pig No.	G	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW52291-2	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: [signature]	Received by: T. L. Bacon	Date/Time: 6/10/91 1405
Relinquished by: Troy L. Bacon	Received by: [signature]	Date/Time: 6/10/91 15:05
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Wip #R9229

Document No.	Rev/Mod	Page
TO-080-030	C-1	15

12.9

(1 Per Shipping Container)
WHC-SD-WM-DP-025
Addendum 3 Rev 0

242-A Evaporator

Date/Time Received 6/10/91 Client Name Hand Farm

Project/Client # 241-AW-102AW Batch or Case # Riser 22-A 102-AW

Cooler ID (if noted on outside of cooler) G Seal 4210

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [ ] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - ___ clips (in cans)
   - X custody seals
   - ___ hazard labels
   - ___ tape
   - X appropriate sample labels
9. Samples are:
   - ___ in good condition
   - ___ broken
   - ___ other
   - ___ leaking
   - ___ have air bubbles
10. Samples received at N/A °C. Coolant type ___
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) Yes —
    Request for Analysis #(s) —
    Airbill # N/A Carrier Hand carried
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Vida Johansen Vida Johansen Date/Time 6/10/91 1530

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12.7

WHC-SD-WM-DP-025
Addendum 3 Rev 0

CHAIN OF CUSTODY

Company Contact:	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	C.C. Pitkoff	Date 6-5-91		Time	1555
Sample Locations	241-AW -TANK 102-AW Riser # 22A				
Remarks	N/A				
Ice Chest or Sample Pig No.	G	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW52291-2	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: [signature]	Received by: T.L. Bacon	Date/Time: 6/10/91 1405
Relinquished by: Troy L. Bacon	Received by: [signature]	Date/Time: 6/10/91 15:05
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Slip #19229

Document No.	Rev/Mod	Page
TO-080-030	C-1	15

(1 Per Shipping Container)
WHC-SD-WM-DP-025
Addendum 3 Rev 0

Date/Time Received 6-7-91 / 0210 hrs Client Name C.C. Pitcoff

Project/Client # 241-AW-TANK Batch or Case # 102-AW RISER # 22A
Company Contact: C.C. Pitcoff Sample No. 2AW522 91-1

~~Cooler~~ PIG ID (if noted on outside of cooler) B-18

1. Condition of shipping container? Good
2. Custody Seals on ~~cooler~~ Pig intact? Yes [ ] No [ ] none
3. Custody Seals dated and signed? Yes [ ] No [ ] none
4. Chain of Custody record is ~~taped on inside of cooler lid~~ hand carried? Yes [✓] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - NA clips (in cans)
   - NA tape
   - NO custody seals
   - ✓ appropriate sample labels
   - ✓ hazard labels
9. Samples are:
   - ✓ in good condition
   - NO leaking
   - NA broken
   - NA have air bubbles
   - NA other
10. Samples received at NA °C. Coolant type NA
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) C of C present
    Request for Analysis #(s) yes
    Airbill # NA Carrier Truck
12. Have any anomalies been identified above? Yes [ ] No [✓]
13. Memos have been initiated for all anomalies identified above? Yes [NA]

Printed Name/Signature DOT Honaker / Dot Honaker for J.A. Zuerin Date/Time 6-7-91

Page 1 of 2

12.3

SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
INORGANIC 1	R9394		
2	R 9401		
3	R 9408		
4	R 9415		
Semi VOA ORGANIC			
1, AND 2	R9420		
VOA.			
1 AND 2	R9421		

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12.1

9394, 9401, 9408 9415
9420, 9421 LABORATORY ID

Date Sampled	Time Sampled

Sample Site or Sampling ID	Date Received at 222-S	Time Received at 222-S
ORGANIC (R9227) INORGANIC (2AW52291-1 02AW)	10/13/91	1315

Delivered by (Signature)	RPT Release (Signature)	Dose Rate
[illegible]	[illegible]	200 mr/hr

Custodian (Signature)	Date Analysis Complete	Disposal Date
[illegible]		

Comments: Stored in 2B Refr #1,2,3

Payroll No.	Tech/Receiver (Signature)	Date	Entry Code	Comments
	INORGANIC 1	R9394		
	" 2	R9401		
	" 3	R9408		
	" 4	R9415		
	SEMI VOA OC 1	R9420		
	2			
	VOA 1	R9421		
	2			

SAMPLING AND CUSTODY DATA

9 3 1 2 3 5 3 0 3 7 0

Procedure LA-533-105
Anion Analysis on Dionex Model 4000i

Typical sample dilution was 0.000099g/mL

Fluoride
Detection Limit in solution = 0.09 ppm.

Chloride
Detection Limit in solution = 0.04 ppm.

Nitrate
Detection Limit in solution = 0.24 ppm.

Phosphate
Detection Limit in solution = 0.13 ppm.

Sulfate
Detection Limit in solution = 0.13 ppm.

Procedure LA-622-102
Determination of Carbonate in Solutions by Coulometry

Detection Limit = 5 ppm in solution
Typical sample dilution was 0.01g/mL

Procedure LA-344-105
Total Organic Carbon
Determination of Carbon Insolation by Combustion and Coulometry

Detection Limit = 5.5 ppm in solution
Typical sample dilution was 0.01 g/mL

Procedure LA-695-101
Cyanide = 0.1 ppm CN in solution
Spectrophotometric Determination of Cyanide

Procedure LA-634-102
Ammonia = 0.1 ppm NH_4^+ in solution
Ammonia by Kjeldahl

Procedure LA-645-001
Nitrite = 0.184 ppm NO_2 in solution
Spectrophotometric Determination of Nitrite

Procedure LA-265-101
Chromium VI = 0.1004 ppm Cr^{6+} in solution
Spectrophotometric Determination of Hexavalent Chromium

Procedure: LA-505-151 (Nominal Detection Limits)

Inductively Coupled Plasma (ICP) Emission Spectrometer Operations and Analysis.

Typical sample dilution for the Fusion Dissolution was 0.00019 g/mL.

Typical sample dilution for the Water Digestion was 0.000476 g/mL.

Typical sample dilution for the Acid Digestion was 0.000476 g/mL

Instrument Detection Limit ppm.

Aluminum	0.0745	Antimony	0.1424
Arsenic	0.0223	Barium	0.0026
Beryllium	0.0006	Bismuth	0.0839
Boron	0.0083	Cadmium	0.0039
Calcium	0.0002	Cerium	0.1359
Chromium	0.0039	Cobalt	0.0246
Copper	0.0158	Europium	0.0024
Iron	0.0073	Lanthanum	0.0141
Lead	0.0273	Lithium	0.0032
Magnesium	0.0001	Manganese	0.0011
Mercury	0.0036	Molybdenum	0.0049
Neodymium	0.2130	Nickel	0.0147
Phosphorous	0.0308	Potassium	0.2122
Samarium	0.1525	Selenium	0.0631
Silicon	0.0314	Silver	0.0183
Sodium	0.0483	Strontium	0.0010
Sulfur	0.0163	Tantalum	0.0273
Thallium	0.0646	Thorium	0.0122
Tin	0.0144	Titanium	0.0035
Tungsten	0.0273	Uranium	1.1405
Vanadium	0.0186	Zinc	0.0017
Zirconium	0.0141		

SINGLE SHELL TANK PROJECT
Analytical Detection Limits
October 12, 1990

The following detection limits are derived on ideal matrices. These values were derived by using either calibration standards or pure matrix standards. Detection limits on actual single shell tank samples are likely to be much higher. No information regarding procedure detection limits is available for procedures not listed in this report.

Procedure LA-355-131
Arsenic Analysis by Hydride Generation Atomic Absorption

Detection Limit = 0.005 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.

Procedure LA-325-102
Mercury Analysis by Atomic Absorption Manual Cold Vapor Technique

Detection Limit = 0.002 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.
Solids were analyzed directly.

Procedure LA-362-131
Selenium Analysis by Hydride Generation Atomic Absorption

Detection Limit = 0.005 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.

TABLE 7
ESTIMATED COSTS

CHARACTERIZATION OF WASTE STREAMS DICHSRGED TO DOUBLE SHELL TANKS	
Analysis for processing parameters	$500/sample
Analysis for hazwaste designation	$5000/sample
DOUBLE SHELL TANK CHARACTERIZATION	
Analysis for hazewaste designation	$10000/sample
ANALYSIS OF SAMPLES FROM 242-A EVAPORTOR	
Analysis of feed tank	$5000/sample
Analysis of Process Condensate	$2500/sample
Analysis of Slurry Product	$5000/sample
Analysis of Steam Condensate	$4000/sample
Analysis of Cooling Water	$4000/sample
Analysis of Vent Gases	$2000/sample

TABLE 6
VALIDATION CRITERIA - GENERIC DATA QUALITY OBJECTIVES

1. REQUESTED VERSUS REPORTED ANALYSES

   All requested analyses shall be reported of accounted for.

2. HOLDING TIMES

   Holding times shall be equivalent to RCRA defined times. If no RCRA holding time exists, holding times will be 6 months unless specifically defined in project specific documentation.

3. SURROGATE RECOVERY

   Sample and blank surrogate recoveries must be between 80 and 120%.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

   A matrix spike or matrix spike duplicate must be analyzed with every analytical batch of every 20 samples, whichever is more frequent. Control limits will be between 75 and 125% with ±20% relative percent differences.

5. DUPLICATE ANALYSIS

   Duplicate analysis must be performed with every analytical batch or every 20 samples, whichever is more frequent. Control limits will be ±20%. If both sample and duplicate results are below the method detection limit of sample quantitation limit, then no control limit applies.

6. ANALYTICAL BLANKS

   A minimum of one analytical blank must be analyzed for every batch or every 20 samples, whichever is more frequent. No contaminants should be detected in the blanks.

7. INITIAL AND CONTINUING CALIBRATION

   Analytical instrumentation shall be calibrated in accordance with requirements specific to the instrumentation and methods of procedures employed.

8. GC/MS TUNE

   Ion abundance results and tuning frequency requirements must be as specified in the method employed for analysis.

9. INTERNAL STANDARDS

   Internal Standard area counts and retention time differences from the associated calibration standard must be within the control limits specified by the methods or procedure used.

TABLE 4
SAMPLE RESULT TURNAROUND TIMES

Laboratory analysis and quality assurance documentation, excluding validation, shall be limited to the following schedule:

Transuranic and hot cell analyses - 100 days annual average, but not to exceed 140 days

Low-level and mixed waste (up to 100 mr/hr) analyses - 75 days annual average, but not to exceed 90 days

Nonradioactive waste analyses - 50 days

Validated data packages will be issued within 21 days of receipt of the results by the Office of Sample Management.

TABLE 3 (cont)

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Semivolatiles	CAS Number	Quantitation Limits* Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
34. Phenol	108-95-2	10	330	10000	(20)
35. bis(2-Chloroethyl) ether	111-44-4	10	330	10000	(20)
36. 2-Chlorophenol	95-57-8	10	330	10000	(20)
37. 1,3-Dichlorobenzene	541-73-1	10	330	10000	(20)
38. 1,4-Dichlorobenzene	106-46-7	10	330	10000	(20)
39. 1,2-Dichlorobenzene	95-50-1	10	330	10000	(20)
40. 2-Methylphenol	95-48-7	10	330	10000	(20)
41. 2,2'-oxybis (1-Chloropropane)#	108-60-1	10	330	10000	(20)
42. 4-Methylphenol	106-44-5	10	330	10000	(20)
43. N-Nitroso-di-n-dipropylamine	621-64-7	10	330	10000	(20)
44. Hexachloroethane	67-72-1	10	330	10000	(20)
45. Nitrobenzene	98-95-3	10	330	10000	(20)
46. Isophorone	78-59-1	10	330	10000	(20)
47. 2-Nitrophenol	88-75-5	10	330	10000	(20)
48. 2,4-Dimethylphenol	105-67-9	10	330	10000	(20)
49. bis(2-Chloroethoxy) methane	111-91-1	10	330	10000	(20)
50 2,4-Dichlorophenol	120-83-2	10	330	10000	(20)
51. 1,2,4-Trichlorobenzene	120-82-1	10	330	10000	(20)
52. Naphthalene	91-20-3	10	330	10000	(20)
53. 4-Chloroaniline	106-47-8	10	330	10000	(20)
54. Hexachlorobutadiene	87-68-3	10	330	10000	(20)
55. 4-Chloro-3-methylphenol	59-50-7	10	330	10000	(20)
56. 2-Methylnaphthalene	91-57-6	10	330	10000	(20)
57. Hexachlorocyclopentadiene	77-47-4	10	330	10000	(20)
58. 2,4,6-Trichlorophenol	88-06-2	10	330	10000	(20)
59. 2,4,5-Trichlorophenol	95-95-4	50	1700	50000	(100)
60. 2-Chloronaphthalene	91-58-7	10	330	10000	(20)
61. 2-Nitroaniline	88-74-4	50	1700	50000	(100)
62. Dimethylphthalate	131-11-3	10	330	10000	(20)
63. Acenaphthylene	208-96-8	10	330	10000	(20)
64. 2,6-Dinitrotoluene	606-20-2	10	330	10000	(20)
65. 3-Nitroaniline	99-09-2	50	1700	50000	(100)
66. Acenaphthene	83-32-9	10	330	10000	(20)
67. 2,4-Dinitrophenol	51-28-5	50	1700	50000	(100)
68. 4-Nitrophenol	100-02-7	50	1700	50000	(100)

Previously known by the name bis(2-Chloroisopropyl) ether

TABLE 3

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Pesticides/Aroclors	CAS Number	Quantitation Limits* Water ug/L	Soil ug/Kg	On Column (pg)
98. alpha-BHC	319-84-6	0.05	1.7	5
99. beta-BHC	319-85-7	0.05	1.7	5
100. delta-BHC	319-86-8	0.05	1.7	5
101. gamma-BHC (Lindane)	58-89-9	0.05	1.7	5
102. Heptachlor	76-44-8	0.05	1.7	5
103. Aldrin	309-00-2	0.05	1.7	5
104. Heptachlor epoxide	1024-57-3	0.05	1.7	5
105. Endosulfan I	959-98-8	0.05	1.7	5
106. Dieldrin	60-57-1	0.10	3.3	10
107. 4,4'-DDE	72-55-9	0.10	3.3	10
108. Endrin	72-20-8	0.10	3.3	10
109. Endosulfan II	33213-65-9	0.10	3.3	10
110. 4,4'-DDD	72-54-8	0.10	3.3	10
111. Endosulfan sulfate	1031-07-8	0.10	3.3	10
112. 4,4'-DDT	50-29-3	0.10	3.3	10
113. Methoxychlor	72-43-5	0.50	17.0	50
114. Endrin ketone	53494-70-5	0.10	3.3	10
115. Endrin aldehyde	7421-36-3	0.10	3.3	10
116. alpha-Chlordane	5103-71-9	0.05	1.7	5
117. gamma-Chlordane	5103-74-2	0.05	1.7	5
118. Toxaphene	8001-35-2	5.0	170.0	500
119. Aroclor-1016	12674-11-2	1.0	33.0	100
120. Aroclor-1221	11104-28-2	1.0	33.0	100
121. Aroclor-1232	11141-16-5	2.0	67.0	200
122. Aroclor-1242	53469-21-9	1.0	33.0	100
123. Aroclor-1248	12672-29-6	1.0	33.0	100
124. Aroclor-1254	11097-69-1	1.0	33.0	100
125. Aroclor-1260	11096-82-5	1.0	33.0	100

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of Pesticides/Aroclors.

TABLE 1
RECOMMENDED ANALYSIS MINIMUM QUANTITATION LEVELS for TANK FARM WASTE ANALYSES

Analyte	High Salt Liquid or Solid/Slurry	Low Salt Liquid	Analyte	High Salt Liquid or Solid/Slurry	Low Salt Liquid
Analyzed by Inductively Coupled Plasma Spectroscopy (ICP)					
Al	50	0.5	As	20	0.2
Ba	2	0.02	Bi	100	0.5
B	20	0.05	Cd	2	0.02
Ca	0.2	0.002	Ce	100	1
Cr	5	0.05	Co	20	0.2
Cu	20	0.2	Eu	2	0.02
Fe	10	0.01	La	20	0.2
Pb	30	0.3	Li	3	0.03
Mg	0.1	0.001	Mn	2	0.02
Hg	5	0.05	Mo	5	0.05
Nd	250	2.5	Ni	20	0.2
P	50	0.5	K	250	2.5
Sm	200	2	Se	100	1
Si	100	0.5	Ag	30	0.3
Na	60	0.6	Sr	2	0.02
S	60	0.6	Ta	50	0.5
Th	20	0.2	Sn	2	0.02
Ti	30	0.06	W	200	0.5
U	1500	15	Zn	2	0.02
Zr	80	0.1			
Analyzed by Specific Atomic Absorption Techniques					
As	5	0.05	Hg	3	0.03
Se	5	0.05			
Anion Analysis by DIONEX					
F	6000	10	Cl	4000	5
NO_3	20000	10	NO_2	20000	10
PO_4	10000	10	SO_4	10000	10
Specific Analysis					
CO_3	5000	50	TOC(carbon)	5000	50
CN	0.1	0.01	NH_4	5000	50
U	100	1	TOX(chlorine)	100	10
OH	0.2	0.002	DSC	*	*

Values for solids are as ug/g
Values for liquids are as ug/ml
*DSC will be used to screen for the presence of exothermic reactions. Specific quantitation limits are not required for this screening

Samples having greater than normal Pu^{238} (e.g., associated with previous irradiated thorium processing) activity will be detectable using the current procedures. In these cases, Pu^{238} activity can be quantified either using a special analysis or through determination of isotopic ratios based on mass spectral analysis.

Analysis of Samples for the 242-A Evaporator:

All analyses identified in the Internal Memo appear to be for hazardous waste designation needs. It should be noted that analysis of the vent stack will require the installation of specialized gas sampling equipment.

General Comments:

Analysis of two major hazardous waste designation groups were not requested for any of the streams; semivolatile organics and Toxicity Characteristic Leaching Procedure (TCLP). If these analyses have not been assessed for inclusion in the requested analysis, it is recommended that they are reviewed for inclusion.

The current schedule for implementation of organic analysis capacity at 222-S Laboratory is for early in 1991, most probably after March 1, 1991. Until capacity becomes available at 222-S Laboratory, organic analyses (VOA and TOX) will be performed by the Pacific Northwest Laboratories (PNL). This will require transhipping of samples sent to 222-S Laboratory, but should not seriously affect result turnaround or quality.

Estimated cost information for the requested analyses is shown in Table 7. These costs are based on analysis of organic components at PNL. When organic capability is available at 222-S Laboratory, costs will be reduced slightly. Addition of semivolatile organic analysis to the lists would increase costs $2000 per analysis. Addition of TCLP to the list would increase analysis costs $1500 for those samples containing greater than 1% solids. For liquid only samples, no additional preparation is required for TCLP and the analytes of concern are already included in the analysis requests.

Westinghouse
Hanford Company

Internal
Memo

From: Office of Sample Management
Phone: 3-3869 MO-346/200W T6-08
Date: November 26, 1990
Subject: RECOMMENDATIONS FOR TANK FARM WASTE ANALYSES

16500-90-090

To: T. D. Blankenship R1-62

cc: J. D. Briggs T6-14
J. A. Eacker R1-51
D. L. Halgren R1-51
J. H. Kessner T6-08
E. J. Kosiancic SO-61
C. R. Stroup T6-07
RLW File/LB

Reference: Internal Memo, T. D. Blankenship to E. J. Kosiancic, "Tank Farm Waste Analysis Requirements," dated September 10, 1990.

The referenced Internal Memo requests information regarding laboratory analytical capacity for a variety of analytes to support Tank Farm and Evaporator operations. Specific comments and suggestions for each have been prepared along with information on suggested minimum quantitation limits (MQLs) for the needed analyses and recommended reporting formats. With the exception of Nb^{94}, all requested analyses are currently performed on-site. Laboratory capacity exists to support these programs if sufficient prescheduling of activities is done to coordinate with times of high sample throughput in the laboratory (e.g., single shell tank sampling).

The discussions that follow are based on the assumption that the laboratory will be performing "standard" regulatory type analysis. Analysis MQLs are based on proven laboratory experience, turnaround times are based on requirements in the Tri-Party agreement, and reporting/validation formats based on WHC-CM-5-3, Section 2.0, "Data Validation for RCRA Analyses." This information is summarized in the following attached tables:

Table 1	MQLs for Inorganic Analysis
Table 2	MQLs for Radionuclide Analysis
Table 3	MQLs for Organic Analysis (these are CLP requirements but will form the basis for all organic analysis)
Table 4	Sample Turnaround Times
Table 5	Result Reporting/Validation
Table 6	Validation Criteria - Generic Data Quality Objectives (DQOs)

If specific needs different from this standard are required for a given program, these needs must be defined in the program's Waste Analysis Plan (WAP) or equivalent documentation and negotiated with the laboratory to assure

6.7

Radiochemical Analysis

Customer Sample#	Lab I.D.#
2291-1-4	R9415
2291-2-4	R9416
2291-3-4	R9417
2291-4-4	R9418

Radiochemical analysis was run on the above samples. Insufficient sample was found for the analysis of americium 241 for all of these samples. The americium 241 was analyzed on the riser sample submitted later during this work effort (see results for samples 2AW-BD-1 (R332) and 2AW-BD-2 (R333)). Duplicates were run on sample 2291-1-4 (R9415) and selected radionuclides were run in duplicate for samples 2291-2-4 (R416) and 2291-3-4 (R9417). The samplers, in an attempt to get the smallest sample possible, failed to get enough sample to perform all radiochemical analyses. Check standards results for cesium 137 on 2291-1-4 (R9415) were 101.1 and 102.5%. The RPD for the duplicates were within the limits. The spike recovery values for cesium 137 was 105.7%, Total Beta was 97.1% and Total Alpha was 94.8%. These values imply good precision and accuracy of the method.

Metals Analysis

Customer Sample #	Lab I.D. #
2291-1-1	R9394
2291-2-1	R9395
2291-3-1	R9396
2291-4-1	R3997

Inductively Coupled Plasma (ICP) was used to analyze for eleven metals in the above samples. Sample 2291-1-1 (R9394) was run in duplicate. The RPD for magnesium was 143%. The check standards were 110 and 111% respectively. This could imply matrix interference or contamination problems. The RPD for iron was 122% with check standard results at 150 and 162%. The high bias of the check standards imply contamination or spectral problems. Also, aluminum and sodium produced data showing extremely high check standard results, before and after sample analysis. These high values appear for all samples within this batch and imply contamination problems.

	Check Standard #1	Check Standard #2
aluminum	141.2%	139.8%
sodium	194.4%	196.5%

Riser #22A Radiochemical Analysis

Customer I.D. #	Lab I.D.#
2AW-BD-1 (R332)	R1626
2AW-BD-2 (R333)	R1627

Analyte	Detection Limit (ppm) Required	Actual
Arsenic (As)	5	.005
Cyanide (CN)	.10	.010
Mercury (Hg)	.20	.002
Ammonia (NH4)	500	.100
Hydroxide (OH-)	1700	17.000
Selenium (Se)	1	.005
Total Inorganic Carbon (TIC)	5000	5.000
Total Organic Carbon (TOC)	500	5.500
Fluoride (F)	6000	.090
Nitrate (NO3)	5000	.240
Chloride (Cl)	4000	.040
Nitrite (NO2)	5000	.180
Phosphate (PO4)	10000	.130
Sulfate (SO4)	10000	.130
Aluminum (Al)	50	.075
Barium (Ba)	2	.003
Cadmium (Cd)	1	.004
Chromium (Cr)	5	.004
Iron (Fe)	10	.007
Lead (Pb)	5	.030
Magnesium (Mg)	1	.0001
Manganese (Mn)	2	.001
Silver (Ag)	5	.018
Sodium (Na)	60	.048
Zinc (Zn)	2	.002

Detection limits for the analytes required in the Statement of Work are listed for each set of samples. These instrument detection limits vary according to the analyte and instrument and were generated in accordance with the Request for Special Analysis (RSA), the internal memo, "Recommendations for Tank Farm Waste Analysis" by T. D. Blankenship, dated November 26, 1990, and references the document, "Detection Limit Package, Appendix B" for the 241-U-110 Single Shell Tank Waste Characterization data package, dated August 9, 1991. The detection limit study performed for Core 5 followed recommended EPA protocol.

J. H. Tillman 9/5/92

J. H. Tillman, Manager
Inorganic Chemistry PAL

Metals (AAS)

Arsenic	As
Selenium	Se
Mercury	Hg

Conventionals (IC)

Fluoride	F
Chloride	Cl
Nitrite	NO2
Nitrate	NO3
Phosphate	PO4
Sulfate	SO4

Conventional (Specified Methods)

Total Organic Carbon	TOC
Total Inorganic Carbon	TIC
Cyanide	CN
Hydroxide	OH
Ph	
Specific Gravity	SpG
Differential Scanning Calorimetry	DSC

The analysis of the samples for Cyanide, Total Ammonia, Total Inorganic Carbon (TIC), Specific Gravity, and Differential Scanning Calorimetry (DSC) were performed using methods traceable to ASTM or EPA. All other analytes were determined based on EPA SW-846 methods or current approved WHC golden rod procedures.

The Quality Objectives and requirements for this work effort were set to achieve the highest quality data. Factors relevant to sample matrix and the applicability of the methods to these complex matrices of samples from the evaporator candidate and feed tanks may have lead to biased results for some analytes of concern. The Quality Objectives were:

1. Matrix Spike and Matrix Spike Duplicate per batch or for no more than 20 samples which ever is less. The calculated Percent Recovery for these analyses to be within 75 to 125% and the Relative Percent Difference (RPD) must not exceed ± 20%.

2. One sample in twenty was to be analyzed in duplicate where specified. The duplicate results must agree with an RPD of ± 20%.

3. A blank must be run for each batch or for every 20 samples.

John H. Tillman 9/5/92

J. H. Tillman, Manager
Inorganic Chemistry PAL

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Ammonia Analysis 139
Determination of Hydroxide Ion in Solution Analysis 141
Cyanide Analysis 150
Ion Chromatographic Analysis
Chloride 154
Fluoride 156
Phosphate 158
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Sample R9410
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Ammonia Analysis 214
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Cyanide Analysis 227
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Chloride 231
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Specific Gravity Analysis 263
Differential Thermal Analysis 266
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