Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

NORTON CHEMICAL PROCESS PRODUCTS CORPORATION

NORTON

216 Igou Ferry Road
Soddy-Daisy, Tennessee 37379-4912
(615) 332-3571

COPY

MAY 1994 RECEIVED

May 11, 1994

Mr. Skip Markham, Jr.
Chattanooga-Hamilton County
Air Pollution Control Bureau
3511 Rossville Boulevard
Chattanooga, Tennessee 37407

Dear Skip:

Enclosed is a copy of the report we received from Armstrong Environmental, the consultants who conducted the stack testing on our two kilns. As you will see, the emission levels are quite low. I'm sure this will please you as much it does us.

We are in the process of selecting a company to build the new kiln which we discussed with you in our meeting on March 28. Once we have made our selection, we will have all the information necessary in order to submit our permit application to you. The application should be in your hands within the next two weeks.

If you have any questions, please feel free to call me. I am currently at the Bryan, Texas Plant. The telephone number here is (409)779-1500. We very much appreciate the help you are giving us in this matter.

Sincerely;
NORTON CPPC

Joyce A. Wagner SH

Joyce A. Wagner
Environmental and Safety Specialist

cc: Walt Fluharty
Tom Salamon

MAR 1994
RECEIVED

NORTON CORPORATION - DAISY PLANT

TUNNEL KILN EMISSIONS

SO2 EMISSIONS

	GAS USAGE	WT. LBS./HR.	SULFUR CONTENT,WT%	SULFUR LBS./HR.	SULFUR TONS/YR.	SO2 TONS/YR.
TK#1	8333	301488	0.0000027	0.814	3.57	7.03
TK#2	3750	135684	0.0000027	0.366	1.6	3.15
TOTALS					5.17	10.18

	FIRING RATE LBS./HR.	AMT. XRM-111 LBS./HR.	SULFUR CONTENT,WT.%	SULFUR LBS./HR.	SULFUR TONS/YR.	SO2 TONS/YR.
TK#1	1696	1017	0.000045	0.64	2.01	3.96
TK#2	1067	640	0.000045	0.29	1.27	2.5
TOTALS				0.75	3.28	6.46

HF EMISSIONS

	FIRING RATE LBS./HR.	AMT. XRM-111 LBS./HR.	FLUORINE CONTENT,WT.%	FLUORINE LBS./HR.	FLUORINE TONS/YR.	HF TONS/YR.
TK#1	1696	1017	0.000045	0.64	2.01	2.11
TK#2	1067	640	0.000045	0.29	1.27	1.33
TOTALS				0.75	3.28	3.44

MAR 1994
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Rec'd 3/28/94

NORTON CORPORATION - DAISY PLANT

TUNNEL KILN EMISSIONS

SO2 EMISSIONS

	GAS USAGE	WT. LBS./HR.	SULFUR CONTENT,WT%	SULFUR LBS./HR.	SULFUR TONS/YR.	SO2 TONS/YR.
TK#1	8333	301488	0.0000027	0.814	3.57	7.03
TK#2	3750	135684	0.0000027	0.366	1.6	3.15
TOTALS					5.17	10.18

	FIRING RATE LBS./HR.	AMT. XRM-111 LBS./HR.	SULFUR CONTENT,WT.%	SULFUR LBS./HR.	SULFUR TONS/YR.	SO2 TONS/YR.
TK#1	1696	1017	0.000045	0.64	2.01	3.96
TK#2	1067	640	0.000045	0.29	1.27	2.5
TOTALS				0.75	3.28	6.46

calc. indicate that this should be 0.0378%
" " " " " 0.0272%

Identical sulfur and fluorine contents?

HF EMISSIONS

	FIRING RATE LBS./HR.	AMT. XRM-111 LBS./HR.	FLUORINE CONTENT,WT.%	FLUORINE LBS./HR.	FLUORINE TONS/YR.	HF TONS/YR.
TK#1	1696	1017	0.000045	0.64	2.01	2.11
TK#2	1067	640	0.000045	0.29	1.27	1.33
TOTALS				0.75	3.28	3.44

NO_x
CO
PM_{10}
TSP

MAY 1994
RECEIVED

Exhaust Emission Sampling
Norton Company
April 19-20, 1994
Armstrong Environmental, Inc.
Project W-1523-94

Report Prepared For:
Ms. Joyce Wagner
Norton Company
1500 Independence Avenue
Bryan, TX 77803-2096

Report Prepared April 22, 1994 By:
Armstrong Environmental, Inc.
7715 Sovereign Row
Dallas, Texas 75247
(214) 631-0021

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I. INTRODUCTION

A series of tests were performed on the Main Stack and the Dryer Exhaust of Kiln #1 and the Main Stack and the Cooler Exhaust of Kiln #2 at the Norton Company facility located in Soddy Daisy, TN on April 19-20, 1994.

The purpose of this test series was to determine emission levels of Particulate, CO, NOx as NO2, VOC as C3H8, SO2 and HFL in terms of lbs/hr.

Testing followed procedures detailed in Title 40: Code of Federal Regulations (40:CFR).

Sampling was performed by Joe Barrera, Matt Taylor and Jerry Salinas of Armstrong Environmental Inc. using two Apex Method 5 Sampling Trains, a Fuji Continuous NDIR CO analyzer, a TECO Model 10 Continuous NOx analyzer, a Beckman 400A Continuous FID Analyzer and a Fuji Continuous SO2 Analyzer.

Sampling was performed over two days, from April 19-20, 1994.

Submitted by:
Armstrong Environmental, Inc.

Jill Smith

Jill Smith
Environmental Specialist

Joe Barrera/os

Joe Barrera
Project Manager

II. SUMMARY

A series of tests were performed on the Main Stack and Dryer Exhaust of Kiln #1 and the Main Stack and the Cooler Exhaust of Kiln #2 at the Norton Company facility in Soddy Daisy, TN on April 19-20, 1994.

Sampling was performed following procedures detailed in Title 40: Code of Federal Regulations (40:CFR).

The results of this test series are summarized in Tables 1 - 4.

Results indicate the following emission rates:

Run#	1	2	3	Ave.
Kiln #1 Main Stack				
Particulate, lbs/hr	0.326	0.358	0.275	0.320
CO, lbs/hr	6.772	2.810	2.791	4.124
NOx as NO2, lbs/hr	0.450	0.307	0.290	0.349
VOC as C3H8, lbs/hr	0.380	0.261	0.320	0.320
SO2, lbs/hr	0.832	0.844	0.908	0.861
HFL, lbs/hr	0.376	0.334	0.288	0.333
Kiln #1 Dryer Exhaust				
Particulate, lbs/hr	3.987	1.651	0.317	1.985
Kiln #2 Main Stack				
Particulate, lbs/hr	0.470	0.455	0.455	0.460
CO, lbs/hr	0.549	0.532	1.720	0.934
NOx as NO2, lbs/hr	0.253	0.257	0.266	0.259
VOC as C3H8, lbs/hr	0.289	0.279	0.203	0.257
SO2, lbs/hr	3.763	2.878	3.824	3.488
HFL, lbs/hr	0.243	0.300	0.291	0.278
Kiln #2 Cooler Exhaust				
Particulate, lbs/hr	0.048	0.040	0.088	0.059

SUMMARY OF EMISSIONS TEST DATA

Table : 1
Plant : Norton Company, Soddy Daisy, TN
Location : Kiln #1, Main Stack
Operator : J.Salinas
Test Date : 19-Apr-94

Repetition :	1	2	3
STACK GAS			
Temperature, F	272.6	268.5	271.3
Velocity, fps	19.61	21.89	24.71
Volume Flow, acfm	8317.4	9285.3	10478.1
scfm	5693.7	6437.3	7268.2
scfh	341621	386237	436094
Moisture, %	3.97%	3.29%	2.85%
CO2, %	2.50	0.00	0.00
O2, %	20.50	20.00	16.00
SAMPLE			
Start Time, hrs:min	12:44 PM	2:23 PM	3:59 PM
Finish Time, hrs:min	1:44 PM	3:23 PM	4:59 PM
Sample Volume, scf	35.252	40.422	46.232
Isokinetic Ratio, %	95.66847	97.02566	98.28611
PARTICULATE			
Sample Weight, mg	15.26	16.99	13.23
Concentration, gr/scf	0.006679	0.006486	0.004415
Emissions, lbs/hr	0.326077	0.357965	0.27517
CARBON MONOXIDE			
Concentration, ppm	272.7	100.1	88.03
Emissions, lbs/hr	6.77176	2.810347	2.790501
NITROGEN OXIDE AS NO2			
Concentration, ppm	11.020	6.661	5.564
Emissions, lbs/hr	0.44957	0.307231	0.28976
VOC AS C3H8			
Concentration, ppm	9.744	5.920	6.418
Emissions, lbs/hr	0.380232	0.261181	0.319702
SULFUR DIOXIDE			
Concentration, ppm	14.65	13.15	12.53
Emissions, lbs/hr	0.831526	0.843866	0.907872
HYDROGEN FLUORIDE			
Sample Weight, mg	17.60	15.83	13.86
Concentration, ppm	21.20267	16.63148	12.73156
Emissions, lbs/hr	0.376079	0.333525	0.288274

SUMMARY OF EMISSIONS TEST DATA

Table : 2
Plant : Norton Company, Soddy Daisy, TN
Location : Kiln #1, Dryer Exhaust
Operator : M.Taylor
Test Date : 19-Apr-94

Repetition :	1	2	3
STACK GAS			
Temperature, F	114.5	116.3	110.0
Velocity, fps	38.66	39.15	38.58
Volume Flow, acfm	12554.1	12713.6	12528.2
scfm	11230.7	11362.0	11442.3
scfh	673839	681718	686541
Moisture, %	1.61%	1.45%	0.40%
CO2, %	0.00	0.00	0.00
O2, %	21.00	21.00	18.00
SAMPLE			
Start Time, hrs:min	12:45 PM	2:25 PM	4:00 PM
Finish Time, hrs:min	1:45 PM	3:25 PM	5:00 PM
Sample Volume, scf	42.929	42.793	42.116
Isokinetic Ratio, %	102.2984	100.7948	98.50341
PARTICULATE			
Sample Weight, mg	115.20	47.00	8.81
Concentration, gr/scf	0.041406	0.016947	0.003228
Emissions, lbs/hr	3.987159	1.650971	0.316667

SUMMARY OF EMISSIONS TEST DATA

Table : 3
Plant : Norton Company, Soddy Daisy, TN
Location : Kiln #2, Main Stack
Operator : M.Taylor
Test Date : 20-Apr-94

Repetition :	1	2	3
STACK GAS			
Temperature, F	167.7	168.4	168.8
Velocity, fps	29.12	29.74	30.66
Volume Flow, acfm	8575.9	8760.4	9030.8
scfm	6929.4	7043.2	7266.9
scfh	415762	422593	436013
Moisture, %	2.94%	3.31%	3.17%
CO2, %	1.00	1.00	0.00
O2, %	20.00	19.00	16.00
SAMPLE			
Start Time, hrs:min	10:42 AM	12:15 PM	1:43 PM
Finish Time, hrs:min	11:42 AM	1:15 PM	2:43 PM
Sample Volume, scf	44.459	44.859	45.630
Isokinetic Ratio, %	100.2064	99.47422	98.06893
PARTICULATE			
Sample Weight, mg	22.80	21.89	21.61
Concentration, gr/scf	0.007913	0.007529	0.007308
Emissions, lbs/hr	0.470144	0.454702	0.455318
CARBON MONOXIDE			
Concentration, ppm	18.15	17.32	54.26
Emissions, lbs/hr	0.548521	0.532037	1.719693
NITROGEN OXIDE AS NO2			
Concentration, ppm	5.10	5.10	5.10
Emissions, lbs/hr	0.253213	0.257373	0.265547
VOC AS C3H8			
Concentration, ppm	6.081	5.77	4.08
Emissions, lbs/hr	0.288793	0.278525	0.203201
SULFUR DIOXIDE			
Concentration, ppm	54.48	40.99	52.79
Emissions, lbs/hr	3.763359	2.878017	3.824236
HYDROGEN FLUORIDE			
Sample Weight, mg	11.77	14.45	13.81
Concentration, ppm	11.24304	13.67992	12.85318
Emissions, lbs/hr	0.242701	0.300157	0.290974

SUMMARY OF EMISSIONS TEST DATA

Table : 4
Plant : Norton Company, Soddy Daisy, TN
Location : Kiln #2, Cooler Exhaust
Operator : J.Salinas
Test Date : 20-Apr-94

Repetition :	1	2	3
STACK GAS			
Temperature, F	230.5	273.8	294.3
Velocity, fps	18.20	17.23	17.85
Volume Flow, acfm	3289.7	3114.4	3225.5
scfm	2442.4	2201.1	2196.4
scfh	146547	132067	131783
Moisture, %	1.64%	0.49%	1.45%
CO2, %	0.00	0.00	0.00
O2, %	21.00	21.00	21.00
SAMPLE			
Start Time, hrs:min	10:38 AM	12:11 PM	1:41 PM
Finish Time, hrs:min	11:38 AM	1:11 PM	2:41 PM
Sample Volume, scf	38.458	35.102	35.613
Isokinetic Ratio, %	102.758	104.0757	105.8171
PARTICULATE			
Sample Weight, mg	5.73	4.79	10.81
Concentration, gr/scf	0.002299	0.002106	0.004684
Emissions, lbs/hr	0.048146	0.039738	0.088204

III. PROCEDURES

The procedure for emissions sampling followed USEPA test methods as detailed in Title 40: Code of Federal Regulations. The following methods were used:

Method	Title
1	Sample and Velocity Traverses for Stationary Sources
2	Determination of Stack Gas Velocity and Volumetric Flow (Type S Pitot)
3	Gas Analysis for CO_2, O_2, Excess Air and Dry Molecular Weight
4	Determination of Moisture Content in Stack Gases
5	Determination of Particulate Emissions from Stationary Sources
6C	Determination of Sulfur Dioxide Emissions from Stationary Sources (Instrumental Analyzer Procedure)
7E	Determination of Nitrogen Oxide Emissions from Stationary Sources (Instrumental Analyzer Procedure)
10	Determination of Carbon Monoxide Emissions from Stationary Sources
25A	Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer
26A	Determination of Hydrogen Halides and Halogen Emissions from Stationary Sources

CO_2 and O_2 were determined using Fyrite analyzers.

Particulate sampling was performed using an Apex Method 5 Sampling Train with 100 mls H_2O in the first and second impingers, third empty and 200 grams Silica Gel in the fourth impinger.

Carbon Monoxide was determined using a Fuji Continuous NDIR CO Analyzer calibrated with 402 ppm and 98 ppm Certified CO gas standards.

NOx as NO_2 was determined using a Model 10 TECO Continuous NOx analyzer calibrated with 402.4 ppm, 98.2 ppm and 30.6 ppm Certified NOx gas standards.

VOC as propane was determined using a Beckman 400A Continuous FID Analyzer calibrated with 205 ppm and 29.98 ppm Certified C_3H_8 standards.

SO_2 was determined using a Fuji Continuous SO_2 Analyzer calibrated with 95.6 ppm and 48.2 ppm Certified SO_2 gas standards.

Hydrogen Fluoride was analyzed using a Dionex 4600 IC/HPLC. Analysis was performed on the back half of the Method 5 Sampling Train as detailed in 26A.

APPENDIX A

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 19-Apr-94
PLACE : Kiln #1, Main Stack
RUN# : 1

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	31
NOZZLE DIAMETER (INCH.) :	0.374	PARTICULATE WEIGHT (Front half mg	15.26
METER COEFFICIENT (Y) :	0.99513	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	-0.08
GAS METER VOL.(Cu.Ft.) :	37.946	PERCENT CO2 :	2.5
BAROMETRIC PRESSURE :	29.6	PERCENT O2 :	20.5
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	36	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	7.06858	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.00076	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 7.06858

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	35.2523
VOLUME OF WATER VAPOR (STD. CU.FT.):	1.4592
FRACTIONAL MOISTURE CONTENT (%):	0.0397
DRY BASE:	77.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	29.2200
MOLECULAR WT. OF STACK GAS (WET BASE):	28.7740
STACK PRESSURE (inch Hg):	29.5941
STACK GAS VELOCITY (ft/sec.):	19.6112
ACTUAL STACK GAS FLOW RATE (ACFM):	8317.38924
STANDARD STACK GAS FLOW RATE (SCFH):	341621.06

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0067
PARTICULATE CONCENTRATION (LBS/SCF):	9.55E-07
PARTICULATE EMISSION (LBS/HR):	0.3261

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	95.6685

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	280	0.14	0.37417	1.80	97	97	
2	281	0.17	0.41231	2.20	99	98	
3	277	0.21	0.45826	2.80	99	98	
4	280	0.17	0.41231	2.20	100	98	
5	273	0.12	0.34641	1.60	101	98	
6	278	0.11	0.33166	1.40	102	99	
7	269	0.04	0.2	0.53	102	99	
8	273	0.03	0.17321	0.40	101	99	
9	270	0.03	0.17321	0.40	101	99	
10	273	0.04	0.2	0.53	101	99	
11	269	0.02	0.14142	0.26	102	99	
12	251	0.02	0.14142	0.26	102	100	
13	281	0.24	0.4899	3.20	102	100	
14	279	0.20	0.44721	2.60	104	101	
15	278	0.21	0.45826	2.80	105	101	
16	264	0.20	0.44721	2.60	105	101	
17	273	0.17	0.41231	2.20	105	102	
18	276	0.16	0.4	2.10	105	102	
19	274	0.06	0.24495	0.80	105	102	
20	268	0.05	0.22361	0.67	104	102	
21	270	0.03	0.17321	0.40	104	102	
22	273	0.02	0.14142	0.26	104	102	
23	269	0.02	0.12247	0.20	104	101	METER T.
24	263	0.02	0.14142	0.26	103	101	AVERAGE
	272.5833		0.2944	1.3529	102.3750	100.0000	########

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 19-Apr-94
PLACE : Kiln #1, Main Stack
RUN# : 2

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	29.2
NOZZLE DIAMETER (INCH.) :	0.374	PARTICULATE WEIGHT (Front half mg	16.99
METER COEFFICIENT (Y) :	0.99513	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	-0.1
GAS METER VOL.(Cu.Ft.) :	43.356	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	29.6	PERCENT O2 :	20
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	36	STACK LENGTH(inches) :	
STACK AREA (Sq.Ft.) :	7.06858	STACK WIDTH(inches) :	
NOZZLE AREA (feet):	0.00076	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 7.06858

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	40.4217
VOLUME OF WATER VAPOR (STD. CU.FT.):	1.3744
FRACTIONAL MOISTURE CONTENT (%):	0.0329
DRY BASE:	80.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8000
MOLECULAR WT. OF STACK GAS (WET BASE):	28.4448
STACK PRESSURE (inch Hg):	29.5926
STACK GAS VELOCITY (ft/sec.):	21.8935
ACTUAL STACK GAS FLOW RATE (ACFM):	9285.34276
STANDARD STACK GAS FLOW RATE (SCFH):	386237.247

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0065
PARTICULATE CONCENTRATION (LBS/SCF):	9.27E-07
PARTICULATE EMISSION (LBS/HR):	0.3580

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	97.0257

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	264	0.21	0.45826	2.80	97	98	
2	273	0.24	0.4899	3.20	96	97	
3	270	0.22	0.46904	2.90	98	96	
4	269	0.23	0.47958	3.00	98	96	
5	269	0.20	0.44721	2.60	99	97	
6	268	0.16	0.4	2.10	100	97	
7	267	0.08	0.28284	1.00	100	97	
8	265	0.07	0.26458	0.94	99	97	
9	266	0.07	0.25495	0.95	99	97	
10	265	0.04	0.2	0.58	100	97	
11	256	0.04	0.2	0.58	99	97	
12	258	0.03	0.17321	0.44	100	97	
13	278	0.10	0.31623	1.40	100	98	
14	273	0.12	0.34641	1.70	101	98	
15	275	0.15	0.3873	2.20	102	98	
16	273	0.13	0.36056	1.90	103	99	
17	274	0.10	0.31623	1.40	103	99	
18	272	0.09	0.3	1.30	103	99	
19	274	0.07	0.26458	1.00	103	100	
20	270	0.08	0.28284	1.10	104	100	
21	268	0.05	0.22361	0.73	104	100	
22	267	0.09	0.3	1.30	104	100	
23	266	0.11	0.33166	1.60	105	100	METER T.
24	264	0.10	0.31623	1.40	105	101	AVERAGE
	268.5		0.3277	1.5883	100.9167	98.1250	99.5208

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 19-Apr-94
PLACE : Kiln #1, Main Stack
RUN# : 3

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	28.8
NOZZLE DIAMETER (INCH.) :	0.374	PARTICULATE WEIGHT (Front half mg	13.23
METER COEFFICIENT (Y) :	0.99513	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	-0.14
GAS METER VOL.(Cu.Ft.) :	49.642	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	29.6	PERCENT O2 :	16
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	36	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	7.06858	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.00076	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 7.06858

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	46.2324
VOLUME OF WATER VAPOR (STD. CU.FT.):	1.3556
FRACTIONAL MOISTURE CONTENT (%):	0.0285
DRY BASE:	84.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.6400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.3369
STACK PRESSURE (inch Hg):	29.5897
STACK GAS VELOCITY (ft/sec.):	24.7058
ACTUAL STACK GAS FLOW RATE (ACFM):	10478.087
STANDARD STACK GAS FLOW RATE (SCFH):	436093.593

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0044
PARTICULATE CONCENTRATION (LBS/SCF):	6.31E-07
PARTICULATE EMISSION (LBS/HR):	0.2752

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	98.2861

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	284	0.21	0.45826	3.00	98	97	
2	286	0.25	0.5	3.60	100	99	
3	287	0.26	0.5099	3.80	101	99	
4	287	0.26	0.5099	3.80	102	99	
5	284	0.25	0.5	3.60	102	99	
6	283	0.20	0.44721	2.90	101	99	
7	280	0.09	0.3	1.30	101	99	
8	277	0.07	0.26458	1.00	101	99	
9	273	0.06	0.24495	0.88	101	98	
10	271	0.05	0.22361	0.73	101	98	
11	260	0.03	0.17321	0.44	101	98	
12	261	0.03	0.17321	0.44	101	98	
13	270	0.11	0.33166	1.60	101	99	
14	272	0.13	0.36056	1.90	102	99	
15	272	0.13	0.36056	1.90	103	99	
16	271	0.14	0.37417	2.00	103	100	
17	268	0.14	0.36742	1.90	104	100	
18	268	0.17	0.41231	2.40	104	100	
19	260	0.17	0.4062	2.40	105	100	
20	259	0.15	0.3873	2.20	105	101	
21	257	0.15	0.3873	2.20	105	101	
22	264	0.15	0.3873	2.20	105	101	
23	262	0.15	0.3873	2.20	104	102	METER T.
24	256	0.14	0.37417	2.00	104	101	AVERAGE
	271.3333		0.3684	2.0996	102.2917	99.3750	########

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 19-Apr-94
PLACE : Kiln #1, Dryer Exhaust
RUN# : 1

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	14.9
NOZZLE DIAMETER (INCH.) :	0.24866	PARTICULATE WEIGHT (Front half mg	115.2
METER COEFFICIENT (Y) :	0.99716	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	0.015
GAS METER VOL.(Cu.Ft.) :	45.06	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	29.6	PERCENT O2 :	21
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	31.5	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	5.41188	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.00034	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 5.41188

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	42.9293
VOLUME OF WATER VAPOR (STD. CU.FT.):	0.7013
FRACTIONAL MOISTURE CONTENT (%):	0.0161
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.6658
STACK PRESSURE (inch Hg):	29.6011
STACK GAS VELOCITY (ft/sec.):	38.6620
ACTUAL STACK GAS FLOW RATE (ACFM):	12554.0633
STANDARD STACK GAS FLOW RATE (SCFH):	673839.489

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0414
PARTICULATE CONCENTRATION (LBS/SCF):	5.92E-06
PARTICULATE EMISSION (LBS/HR):	3.9872

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	102.2984

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	114	0.56	0.74833	2.10	79	80	
2	114	0.59	0.76811	2.30	82	80	
3	114	0.57	0.75498	2.20	84	81	
4	114	0.57	0.75498	2.20	85	81	
5	114	0.59	0.76811	2.30	85	83	
6	115	0.48	0.69282	1.80	87	84	
7	114	0.48	0.69282	1.80	87	83	
8	111	0.46	0.67823	1.80	89	84	
9	111	0.45	0.67082	1.70	93	88	
10	114	0.45	0.67082	1.70	93	88	
11	110	0.41	0.64031	1.60	93	88	
12	116	0.30	0.54772	1.20	93	88	
13	117	0.33	0.57446	1.30	93	88	
14	117	0.43	0.65574	1.60	94	89	
15	117	0.49	0.7	1.90	94	89	
16	116	0.52	0.72111	2.00	94	90	
17	116	0.53	0.72801	2.00	94	90	
18	115	0.49	0.7	1.90	94	90	
19	115	0.22	0.46904	0.85	94	90	
20	115	0.24	0.4899	0.90	94	90	
21	115	0.39	0.6245	1.50	94	90	
22	115	0.32	0.56569	1.20	94	90	
23	115	0.30	0.54772	1.10	94	90	METER T.
24	115	0.29	0.53852	1.10	94	90	AVERAGE
	114.5417		0.6543	1.6688	90.7083	86.8333	88.7708

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 19-Apr-94
PLACE : Kiln #1, Dryer Exhaust
RUN# : 2

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	13.4
NOZZLE DIAMETER (INCH.) :	0.24866	PARTICULATE WEIGHT (Front half mg	47
METER COEFFICIENT (Y) :	0.99716	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	0.23
GAS METER VOL.(Cu.Ft.) :	45.587	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	29.6	PERCENT O2 :	21
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	31.5	STACK LENGTH(inches) :	
STACK AREA (Sq.Ft.) :	5.41188	STACK WIDTH(inches) :	
NOZZLE AREA (feet):	0.00034	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 5.41188

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	42.7929
VOLUME OF WATER VAPOR (STD. CU.FT.):	0.6307
FRACTIONAL MOISTURE CONTENT (%):	0.0145
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.6825
STACK PRESSURE (inch Hg):	29.6169
STACK GAS VELOCITY (ft/sec.):	39.1534
ACTUAL STACK GAS FLOW RATE (ACFM):	12713.6266
STANDARD STACK GAS FLOW RATE (SCFH):	681717.716

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0169
PARTICULATE CONCENTRATION (LBS/SCF):	2.42E-06
PARTICULATE EMISSION (LBS/HR):	1.6510

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	100.7948

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	115	0.34	0.5831	1.30	93	93	
2	115	0.45	0.67082	1.70	93	93	
3	116	0.50	0.70711	1.90	94	93	
4	116	0.54	0.73485	2.00	94	93	
5	117	0.52	0.72111	2.00	95	92	
6	116	0.49	0.7	1.80	96	93	
7	116	0.23	0.47958	0.88	96	93	
8	116	0.22	0.46904	0.85	97	93	
9	116	0.38	0.61644	1.40	97	94	
10	116	0.33	0.57446	1.20	97	94	
11	116	0.34	0.5831	1.30	97	94	
12	117	0.32	0.56569	1.20	98	94	
13	117	0.58	0.76158	2.20	98	94	
14	117	0.62	0.7874	2.40	100	95	
15	116	0.58	0.76158	2.20	100	95	
16	116	0.57	0.75498	2.10	101	96	
17	116	0.60	0.7746	2.30	102	97	
18	117	0.51	0.71414	1.90	102	97	
19	117	0.45	0.67082	1.70	103	98	
20	117	0.47	0.68557	1.80	103	98	
21	117	0.48	0.69282	1.80	103	98	
22	117	0.45	0.67082	1.70	103	100	
23	117	0.40	0.63246	1.50	103	100	METER T.
24	116	0.33	0.57446	1.27	103	100	AVERAGE
	116.3333		0.6619	1.6833	98.6667	95.2917	96.9792

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 19-Apr-94
PLACE : Kiln #1, Dryer Exhaust
RUN# : 3

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	3.6
NOZZLE DIAMETER (INCH.) :	0.24866	PARTICULATE WEIGHT (Front half mg	8.81
METER COEFFICIENT (Y) :	0.99716	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	0.29
GAS METER VOL.(Cu.Ft.) :	45.168	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	29.6	PERCENT O2 :	18
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	31.5	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	5.41188	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.00034	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 5.41188

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	42.1160
VOLUME OF WATER VAPOR (STD. CU.FT.):	0.1695
FRACTIONAL MOISTURE CONTENT (%):	0.0040
DRY BASE:	82.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.7200
MOLECULAR WT. OF STACK GAS (WET BASE):	28.6770
STACK PRESSURE (inch Hg):	29.6213
STACK GAS VELOCITY (ft/sec.):	38.5824
ACTUAL STACK GAS FLOW RATE (ACFM):	12528.199
STANDARD STACK GAS FLOW RATE (SCFH):	686540.599

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0032
PARTICULATE CONCENTRATION (LBS/SCF):	4.61E-07
PARTICULATE EMISSION (LBS/HR):	0.3167

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	98.5034

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	110	0.55	0.74162	2.10	100	100	
2	110	0.57	0.75498	2.20	101	100	
3	110	0.58	0.76158	2.20	102	100	
4	110	0.57	0.75498	2.20	102	100	
5	109	0.56	0.74833	2.10	102	100	
6	110	0.55	0.74162	2.10	102	100	
7	110	0.49	0.7	1.80	101	101	
8	110	0.47	0.68557	1.80	101	100	
9	111	0.45	0.67082	1.70	101	100	
10	110	0.44	0.66332	1.70	101	100	
11	109	0.42	0.64807	1.60	101	100	
12	110	0.30	0.54772	1.10	101	100	
13	110	0.33	0.57446	1.20	101	100	
14	110	0.41	0.64031	1.50	101	100	
15	110	0.49	0.7	1.80	102	100	
16	110	0.55	0.74162	2.10	102	100	
17	110	0.50	0.70711	1.90	102	100	
18	110	0.48	0.69282	1.80	101	100	
19	110	0.20	0.44721	0.76	101	100	
20	110	0.24	0.4899	0.92	102	100	
21	110	0.40	0.63246	1.50	102	100	
22	111	0.35	0.59161	1.30	102	100	
23	111	0.30	0.54772	1.10	102	99	METER T.
24	110	0.31	0.55678	1.20	101	99	AVERAGE
	110.0417		0.6559	1.6533	101.4167	99.9583	########

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 20-Apr-94
PLACE : Kiln #2, Main Stack
RUN# : 1

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	28.6
NOZZLE DIAMETER (INCH.) :	0.31	PARTICULATE WEIGHT (Front half mg	22.8
METER COEFFICIENT (Y) :	0.99716	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	0.15
GAS METER VOL.(Cu.Ft.) :	46.84	PERCENT CO2 :	1
BAROMETRIC PRESSURE :	29.6	PERCENT O2 :	20
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	30	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	4.90874	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.00052	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 4.90874

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	44.4588
VOLUME OF WATER VAPOR (STD. CU.FT.):	1.3462
FRACTIONAL MOISTURE CONTENT (%):	0.0294
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.9600
MOLECULAR WT. OF STACK GAS (WET BASE):	28.6379
STACK PRESSURE (inch Hg):	29.6110
STACK GAS VELOCITY (ft/sec.):	29.1179
ACTUAL STACK GAS FLOW RATE (ACFM):	8575.92158
STANDARD STACK GAS FLOW RATE (SCFH):	415762.031

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0079
PARTICULATE CONCENTRATION (LBS/SCF):	1.13E-06
PARTICULATE EMISSION (LBS/HR):	0.4701

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	100.2064

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	170	0.15	0.3873	1.20	85	85	
2	173	0.25	0.5	2.00	85	86	
3	175	0.28	0.52915	2.20	87	87	
4	175	0.24	0.4899	1.90	89	89	
5	175	0.25	0.5	2.00	90	89	
6	175	0.24	0.4899	1.90	90	89	
7	175	0.23	0.47958	1.80	91	89	
8	175	0.25	0.5	2.00	91	89	
9	173	0.21	0.45826	1.70	92	89	
10	173	0.22	0.46904	1.70	92	89	
11	172	0.21	0.45826	1.68	92	90	
12	168	0.19	0.43589	1.50	92	90	
13	157	0.14	0.37417	1.10	92	91	
14	164	0.15	0.3873	1.20	92	91	
15	164	0.14	0.37417	1.10	93	92	
16	157	0.17	0.41231	1.30	93	92	
17	168	0.19	0.43589	1.50	93	92	
18	168	0.22	0.46904	1.70	93	92	
19	167	0.30	0.54772	2.40	94	92	
20	165	0.31	0.55678	2.50	94	92	
21	164	0.31	0.55678	2.50	95	93	
22	163	0.27	0.51962	2.10	95	93	
23	154	0.24	0.4899	1.90	95	93	METER T.
24	155	0.24	0.4899	1.90	95	93	AVERAGE
	167.7083		0.4713	1.7825	91.6667	90.2917	90.9792

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 20-Apr-94
PLACE : Kiln #2, Main Stack
RUN# : 2

TEST DURATION (MINUTES)	:	60	LIQUID COLLECTED (mls)	:	32.6
NOZZLE DIAMETER (INCH.)	:	0.31	PARTICULATE WEIGHT (Front half mg		21.89
METER COEFFICIENT (Y)	:	0.99716	PARTICULATE WEIGHT (Back half mg)		0
PITOT COEFFICIENT (Cp)	:	0.84	STATIC PRESSURE (in. H2O)	:	0.1
GAS METER VOL.(Cu.Ft.)	:	47.754	PERCENT CO2	:	1
BAROMETRIC PRESSURE	:	29.6	PERCENT O2	:	19
			PERCENT CO	:	0

FOR CIRCULAR STACK			FOR RECTANGULAR STACK		
STACK DIAMETER (inch)	:	30	STACK LENGTH(inches)	:	
STACK AREA (Sq.Ft.)	:	4.90874	STACK WIDTH(inches)	:	
NOZZLE AREA (feet)	:	0.00052	STACK AREA (Sq.Ft.)	:	0

ENTER THE STACK AREA SHOWN ABOVE: 4.90874

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	44.8590
VOLUME OF WATER VAPOR (STD. CU.FT.):	1.5345
FRACTIONAL MOISTURE CONTENT (%):	0.0331
DRY BASE:	80.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.9200
MOLECULAR WT. OF STACK GAS (WET BASE):	28.5588
STACK PRESSURE (inch Hg):	29.6074
STACK GAS VELOCITY (ft/sec.):	29.7443
ACTUAL STACK GAS FLOW RATE (ACFM):	8760.41993
STANDARD STACK GAS FLOW RATE (SCFH):	422592.512

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0075
PARTICULATE CONCENTRATION (LBS/SCF):	1.08E-06
PARTICULATE EMISSION (LBS/HR):	0.4547

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	99.4742

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	170	0.16	0.4	1.28	93	94	
2	168	0.24	0.4899	1.90	95	94	
3	167	0.30	0.54772	2.40	95	94	
4	168	0.26	0.5099	2.00	96	94	
5	170	0.25	0.5	2.00	96	94	
6	169	0.24	0.4899	1.90	97	95	
7	168	0.24	0.4899	1.90	97	95	
8	167	0.26	0.5099	2.00	97	95	
9	167	0.21	0.45826	1.70	97	95	
10	167	0.22	0.46904	1.70	98	95	
11	167	0.20	0.44721	1.60	98	95	
12	167	0.18	0.42426	1.40	98	96	
13	168	0.13	0.36056	1.00	98	96	
14	168	0.20	0.44721	1.60	98	96	
15	169	0.15	0.3873	1.20	98	96	
16	167	0.19	0.43589	1.50	98	97	
17	168	0.21	0.45826	1.70	99	97	
18	169	0.22	0.46904	1.70	99	97	
19	169	0.29	0.53852	2.30	99	97	
20	169	0.30	0.54772	0.24	99	97	
21	170	0.31	0.55678	2.50	99	97	
22	169	0.32	0.56569	2.50	99	97	
23	170	0.29	0.53852	2.30	99	98	METER T.
24	170	0.24	0.4899	1.90	100	98	AVERAGE
	168.375		0.4805	1.7592	97.5833	95.7917	96.6875

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 20-Apr-94
PLACE : Kiln #2, Main Stack
RUN# : 3

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	31.7
NOZZLE DIAMETER (INCH.) :	0.31	PARTICULATE WEIGHT (Front half mg	21.61
METER COEFFICIENT (Y) :	0.99716	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	0.1
GAS METER VOL.(Cu.Ft.) :	48.992	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	29.6	PERCENT O2 :	16
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	30	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	4.90874	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.00052	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 4.90874

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	45.6297
VOLUME OF WATER VAPOR (STD. CU.FT.):	1.4921
FRACTIONAL MOISTURE CONTENT (%):	0.0317
DRY BASE:	84.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.6400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.3031
STACK PRESSURE (inch Hg):	29.6074
STACK GAS VELOCITY (ft/sec.):	30.6625
ACTUAL STACK GAS FLOW RATE (ACFM):	9030.84927
STANDARD STACK GAS FLOW RATE (SCFH):	436012.894

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0073
PARTICULATE CONCENTRATION (LBS/SCF):	1.04E-06
PARTICULATE EMISSION (LBS/HR):	0.4553

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	98.0689

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	170	0.16	0.4	1.28	98	98	
2	170	0.25	0.5	2.00	100	98	
3	170	0.29	0.53852	2.30	100	98	
4	170	0.30	0.54772	2.40	102	99	
5	170	0.27	0.51962	2.10	102	99	
6	170	0.26	0.5099	2.00	103	99	
7	169	0.24	0.4899	1.90	103	99	
8	170	0.25	0.5	2.00	103	99	
9	168	0.27	0.51962	2.10	103	99	
10	168	0.23	0.47958	1.80	104	100	
11	168	0.21	0.45826	1.70	104	100	
12	168	0.21	0.45826	1.70	104	100	
13	167	0.15	0.3873	1.20	103	100	
14	167	0.21	0.45826	1.70	103	100	
15	168	0.20	0.44721	1.60	104	100	
16	168	0.19	0.43589	1.50	104	100	
17	168	0.24	0.4899	1.90	105	101	
18	168	0.30	0.54772	2.40	106	101	
19	168	0.29	0.53852	2.30	106	101	
20	169	0.31	0.55678	2.48	106	101	
21	169	0.30	0.54772	2.40	106	101	
22	169	0.25	0.5	2.00	106	101	
23	169	0.24	0.4899	1.90	106	101	METER T.
24	169	0.26	0.5099	2.00	106	101	AVERAGE
	168.75		0.4929	1.9442	103.6250	99.8333	########

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 20-Apr-94
PLACE : Kiln #2, Cooler Exhaust
RUN# : 1

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	13.6
NOZZLE DIAMETER (INCH.) :	0.37566	PARTICULATE WEIGHT (Front half mg	5.73
METER COEFFICIENT (Y) :	0.99515	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	0.065
GAS METER VOL.(Cu.Ft.) :	40.827	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	29.53	PERCENT O2 :	21
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	23.5	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	3.01206	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.00077	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 3.01206

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	38.4577
VOLUME OF WATER VAPOR (STD. CU.FT.):	0.6402
FRACTIONAL MOISTURE CONTENT (%):	0.0164
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.6625
STACK PRESSURE (inch Hg):	29.5348
STACK GAS VELOCITY (ft/sec.):	18.2028
ACTUAL STACK GAS FLOW RATE (ACFM):	3289.66894
STANDARD STACK GAS FLOW RATE (SCFH):	146546.767

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0023
PARTICULATE CONCENTRATION (LBS/SCF):	3.29E-07
PARTICULATE EMISSION (LBS/HR):	0.0481

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	102.7580

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	215	0.07	0.26458	1.20	88	89	
2	238	0.07	0.26458	1.20	88	88	
3	243	0.08	0.27386	1.28	89	88	
4	242	0.08	0.28284	1.37	90	89	
5	237	0.08	0.28284	1.37	91	89	
6	234	0.09	0.3	1.54	91	89	
7	233	0.08	0.28284	1.37	93	90	
8	239	0.07	0.26458	1.20	93	90	
9	237	0.07	0.26458	1.20	93	90	
10	216	0.06	0.24495	1.03	93	91	
11	203	0.06	0.23452	0.94	94	91	
12	138	0.03	0.17321	0.51	94	92	
13	230	0.11	0.33166	1.89	93	92	
14	237	0.12	0.34641	2.06	94	92	
15	244	0.13	0.36056	2.23	95	92	
16	239	0.12	0.34641	2.06	95	92	
17	246	0.10	0.31623	1.71	95	93	
18	256	0.09	0.3	1.54	95	93	
19	255	0.08	0.28284	1.37	95	93	
20	246	0.08	0.28284	1.37	95	93	
21	247	0.08	0.28284	1.37	95	93	
22	242	0.07	0.26458	1.20	96	93	
23	215	0.07	0.26458	1.20	96	94	METER T.
24	200	0.05	0.22361	0.85	95	94	AVERAGE
	230.5		0.2807	1.3775	93.1667	91.2500	92.2083

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 20-Apr-94
PLACE : Kiln #2, Cooler Exhaust
RUN# : 2

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	3.7
NOZZLE DIAMETER (INCH.) :	0.37566	PARTICULATE WEIGHT (Front half mg	4.79
METER COEFFICIENT (Y) :	0.99515	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	0.07
GAS METER VOL.(Cu.Ft.) :	37.638	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	29.53	PERCENT O2 :	21
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	23.5	STACK LENGTH(inches) :	
STACK AREA (Sq.Ft.) :	3.01206	STACK WIDTH(inches) :	
NOZZLE AREA (feet):	0.00077	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 3.01206

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	35.1024
VOLUME OF WATER VAPOR (STD. CU.FT.):	0.1742
FRACTIONAL MOISTURE CONTENT (%):	0.0049
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.7865
STACK PRESSURE (inch Hg):	29.5351
STACK GAS VELOCITY (ft/sec.):	17.2331
ACTUAL STACK GAS FLOW RATE (ACFM):	3114.4293
STANDARD STACK GAS FLOW RATE (SCFH):	132067.013

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0021
PARTICULATE CONCENTRATION (LBS/SCF):	3.01E-07
PARTICULATE EMISSION (LBS/HR):	0.0397

BACK HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	104.0757

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	272	0.10	0.31623	1.71	94	95	
2	285	0.10	0.31623	1.71	95	95	
3	288	0.12	0.34641	2.06	96	95	
4	292	0.11	0.33166	1.89	97	95	
5	285	0.10	0.31623	1.71	98	95	
6	282	0.09	0.3	1.54	98	95	
7	282	0.07	0.26458	1.20	98	95	
8	282	0.07	0.26458	1.20	97	95	
9	280	0.07	0.26458	1.20	98	95	
10	279	0.06	0.24495	1.03	98	96	
11	251	0.05	0.22361	0.85	99	96	
12	210	0.03	0.17321	0.51	99	96	
13	270	0.06	0.24495	1.03	98	97	
14	280	0.07	0.25495	1.11	99	97	
15	288	0.06	0.24495	1.03	100	97	
16	293	0.06	0.24495	1.03	100	97	
17	297	0.07	0.26458	1.20	100	97	
18	298	0.08	0.28284	1.37	100	98	
19	296	0.06	0.24495	1.03	100	98	
20	293	0.06	0.23452	0.94	100	98	
21	287	0.05	0.22361	0.85	100	98	
22	280	0.05	0.22361	0.85	100	98	
23	229	0.04	0.2	0.68	100	98	METER T.
24	173	0.03	0.17321	0.51	100	98	AVERAGE
	273.8333		0.2583	1.1767	98.5000	96.4167	97.4583

EMISSION TEST SUMMARY

PLANT : Norton Company, Soddy Daisy, TN
DATE : 20-Apr-94
PLACE : Kiln #2, Cooler Exhaust
RUN# : 3

TEST DURATION (MINUTES) :	60	LIQUID COLLECTED (mls) :	11.1
NOZZLE DIAMETER (INCH.) :	0.37566	PARTICULATE WEIGHT (Front half mg	10.81
METER COEFFICIENT (Y) :	0.99515	PARTICULATE WEIGHT (Back half mg)	0
PITOT COEFFICIENT (Cp) :	0.84	STATIC PRESSURE (in. H2O) :	0.06
GAS METER VOL.(Cu.Ft.) :	38.377	PERCENT CO2 :	0
BAROMETRIC PRESSURE :	29.53	PERCENT O2 :	21
		PERCENT CO :	0

FOR CIRCULAR STACK		FOR RECTANGULAR STACK	
STACK DIAMETER (inch):	23.5	STACK LENGTH(inchs) :	
STACK AREA (Sq.Ft.) :	3.01206	STACK WIDTH(inchs) :	
NOZZLE AREA (feet):	0.00077	STACK AREA (Sq.Ft.) :	0

ENTER THE STACK AREA SHOWN ABOVE: 3.01206

FLOWS

SAMPLED VOLUME (STD. CU.FT.):	35.6128
VOLUME OF WATER VAPOR (STD. CU.FT.):	0.5225
FRACTIONAL MOISTURE CONTENT (%):	0.0145
DRY BASE:	79.0000
MOLECULAR WT. OF STACK GAS (DRY BASE):	28.8400
MOLECULAR WT. OF STACK GAS (WET BASE):	28.6833
STACK PRESSURE (inch Hg):	29.5344
STACK GAS VELOCITY (ft/sec.):	17.8476
ACTUAL STACK GAS FLOW RATE (ACFM):	3225.4869
STANDARD STACK GAS FLOW RATE (SCFH):	131782.77

PARTICULATE

FRONT HALF

PARTICULATE CONCENTRATION (GR./SCF):	0.0047
PARTICULATE CONCENTRATION (LBS/SCF):	6.69E-07
PARTICULATE EMISSION (LBS/HR):	0.0882

BACK HALF

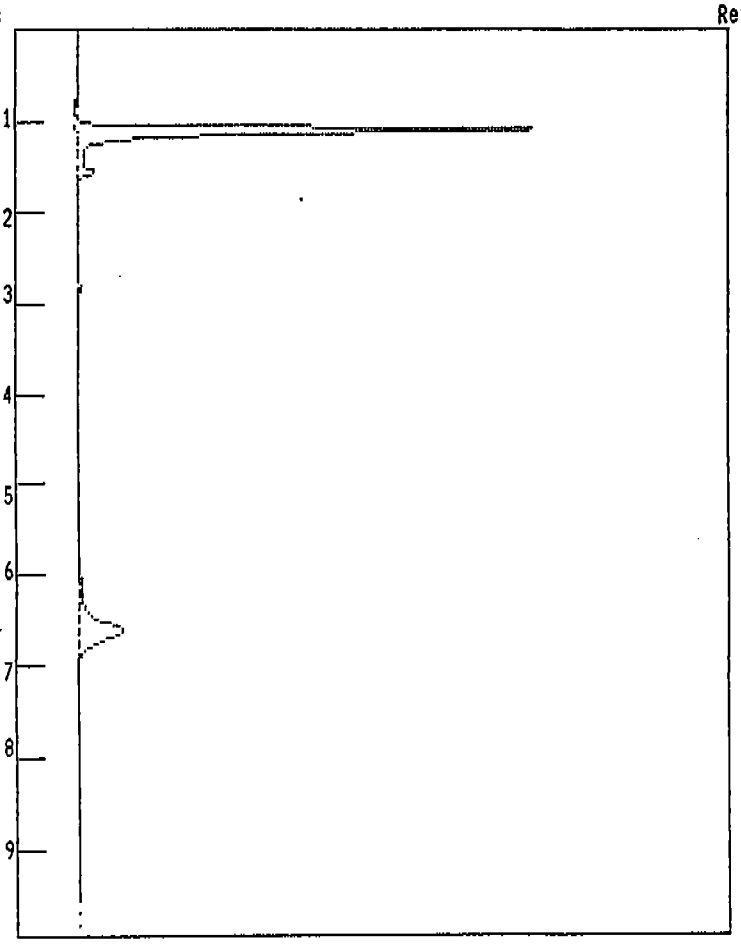
PARTICULATE CONCENTRATION (GR./SCF):	0.0000
PARTICULATE CONCENTRATION (LBS/SCF):	0.00E+00
PARTICULATE EMISSION (LBS/HR):	0.0000
ISOKINETIC RATIO (%):	105.8171

POINTS	STACK T. deg F	DELTA P	SQUAR D.P	DELTA H	METER T. INLET	METER T. OUTLET	
1	301	0.10	0.31623	1.71	97	96	
2	312	0.11	0.33166	1.89	98	97	
3	318	0.11	0.33166	1.89	99	97	
4	315	0.11	0.33166	1.89	100	97	
5	317	0.10	0.31623	1.71	101	98	
6	318	0.09	0.3	1.54	101	98	
7	316	0.08	0.28284	1.37	102	98	
8	321	0.07	0.26458	1.20	101	98	
9	310	0.06	0.24495	1.03	101	98	
10	312	0.06	0.24495	1.03	101	98	
11	300	0.05	0.22361	0.85	102	98	
12	280	0.04	0.2	0.68	102	99	
13	305	0.06	0.24495	1.03	100	98	
14	300	0.06	0.24495	1.03	101	99	
15	295	0.08	0.28284	1.37	102	99	
16	301	0.08	0.28284	1.37	103	99	
17	305	0.07	0.26458	1.20	103	99	
18	292	0.07	0.26458	1.20	104	100	
19	295	0.06	0.24495	1.03	104	100	
20	297	0.06	0.24495	1.03	104	100	
21	280	0.06	0.23452	0.94	105	101	
22	259	0.05	0.22361	0.85	105	101	
23	230	0.04	0.2	0.68	105	101	METER T.
24	185	0.04	0.2	0.68	104	101	AVERAGE
	294.3333		0.2634	1.2167	101.8750	98.7500	########

APPENDIX B

Description : Channel 1
Conditions : Norton
: Main Kiln #1
: R1 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 11:25:53

-25.600mV 256.000mV

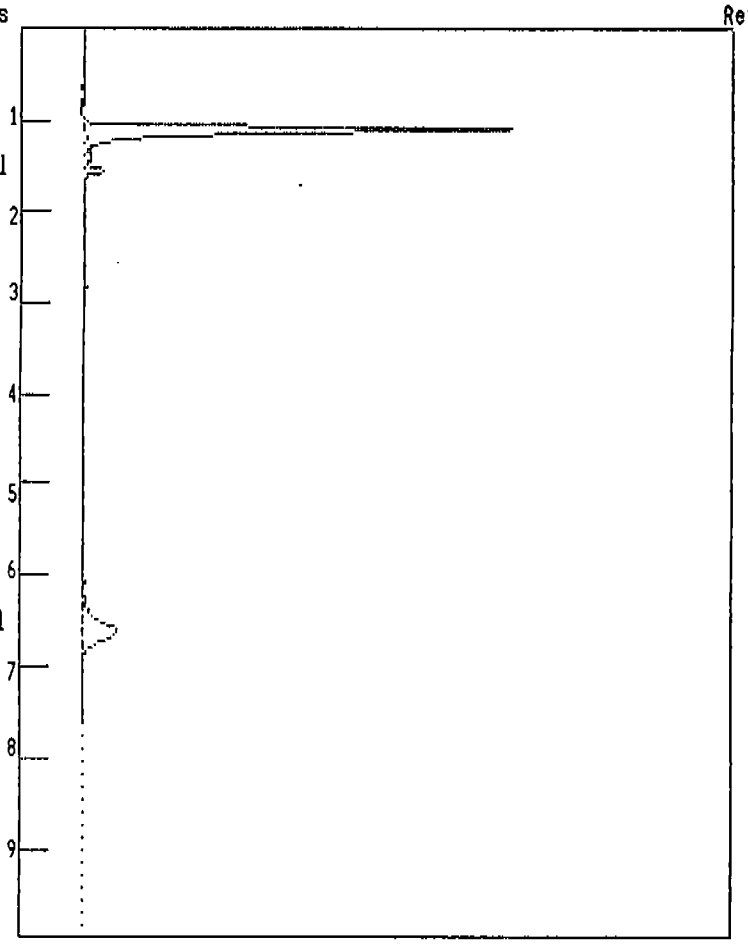


Component	External	Units	Retention	Height	Area
(unknown)	N/A		0.300	0.111	14.65
F- 17.60mg total	68.24	ug/	1.075	181.798	993.08
Cl-	4.51	ug/ml	1.541	7.806	48.74
SO4	41.59	ug/ml	6.600	17.933	302.70

Description : Channel 1
Conditions : Norton
: Main Kiln #1
: R2 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 11:38:16

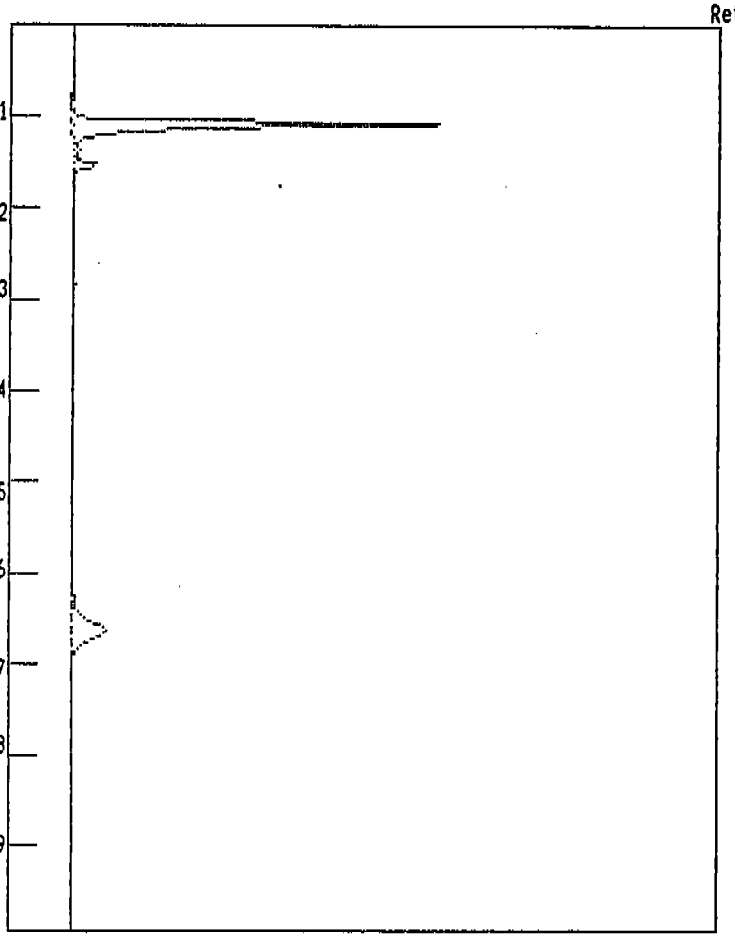
-25.600mV 256.000mV

Component	External	Units	Retention	Height	Area
(unknown)	N/A		0.325	0.111	14.20
F- 15.83mg total	63.35	ug/	1.075	170.308	923.10 M
Cl-	2.20	ug/ml	1.541	6.639	25.16 M
SO4	29.08	ug/ml	6.608	13.646	208.05



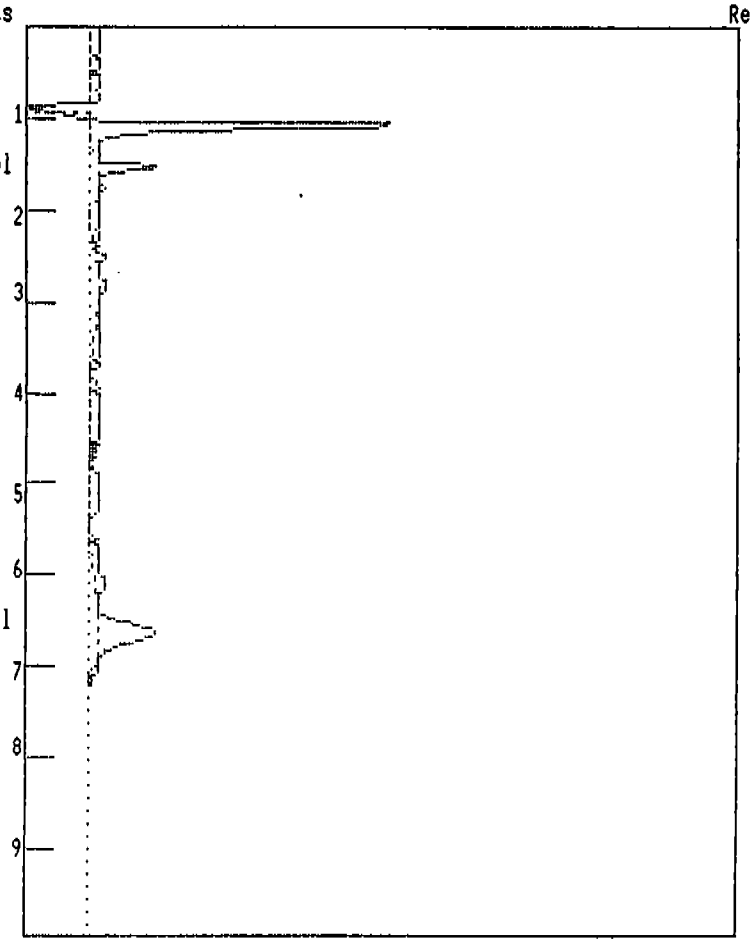
Description : Channel 1
Conditions : Norton
: Main Kiln #1
: R3 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 11:47:03

-25.600mV 256.000mV



Component	External	Units	Retention	Height	Area
F- 13.86 mcg	55.44	ug/	1.075	150.340	810.01
Cl-	4.96	ug/ml	1.541	9.933	53.28
SO4	28.37	ug/ml	6.616	13.080	202.70

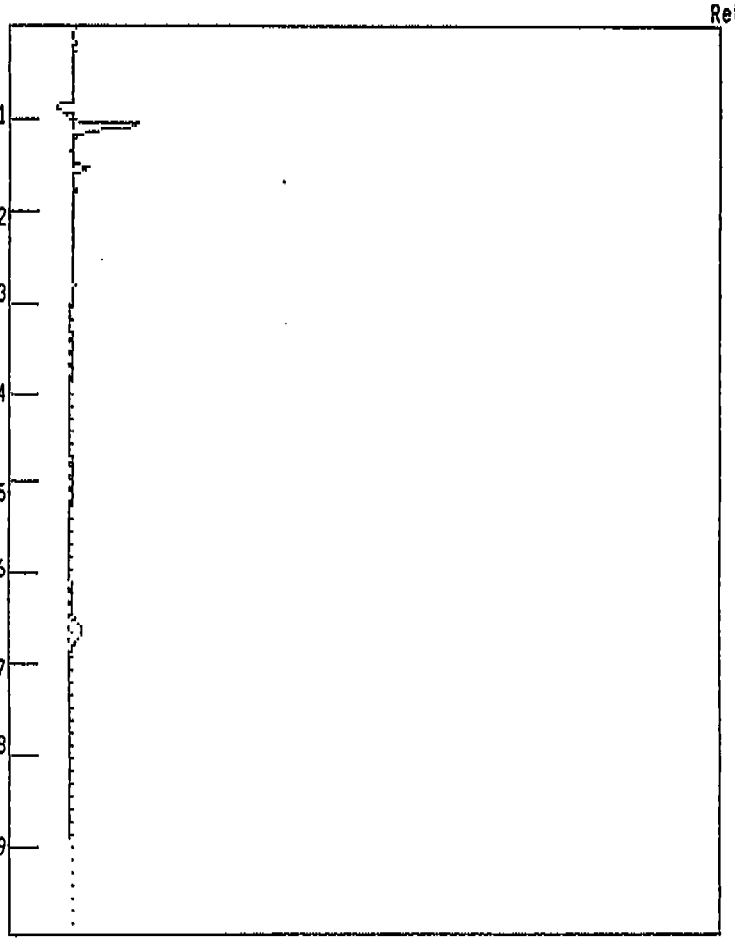
Description : Channel 1
Conditions : Norton
: Dryer #1
: R1 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 12:53:32



Component	External	Units	Retention	Height	Area
F- 0.255 mg/L	1.02	ug/	1.058	4.300	18.85 M
Cl-	0.17	ug/ml	1.508	0.800	3.85
SO4	1.56	ug/ml	6.600	0.700	10.55

Description : Channel 1
Conditions : Norton
: Dryer #1
: R2 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 12:34:24

-3.200mV 32.000mV

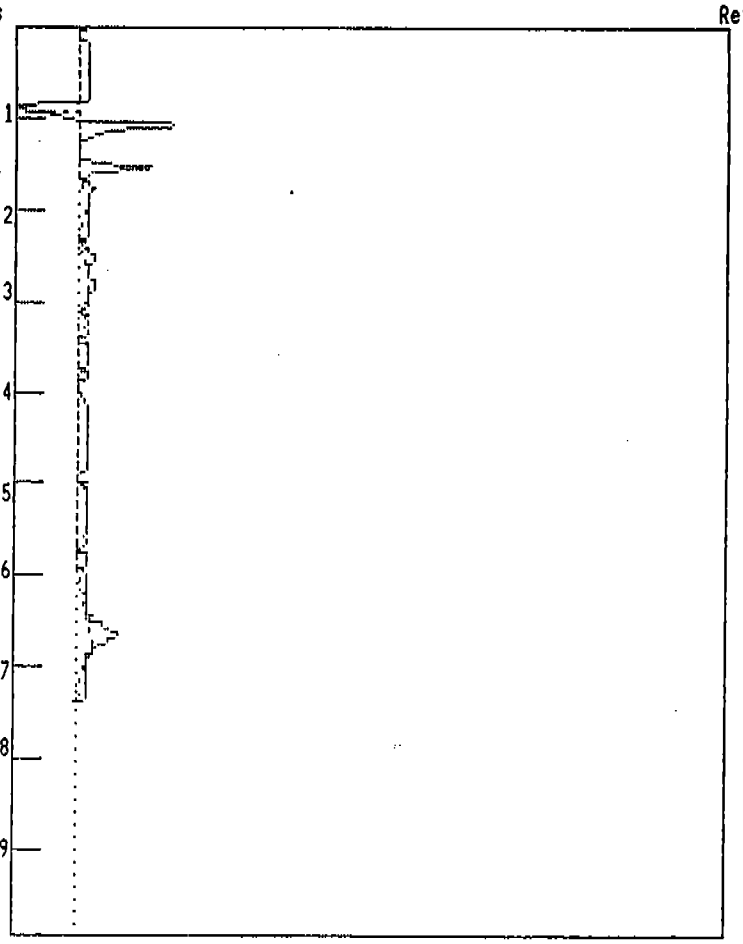


Component	External	Units	Retention	Height	Area
(unknown)	N/A		0.425	0.000	8.20 M
F- 0.192 mg	0.77	ug/	1.050	3.700	14.70 M
Cl-	0.23	ug/ml	1.525	0.855	4.50
(unknown)	N/A		4.741	0.173	5.38
SO4	2.25	ug/ml	6.600	0.625	15.22

Description : Channel 1
Conditions : Norton
: Dryer #1
: R3 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 12:44:54

-0.800mV 8.000mV

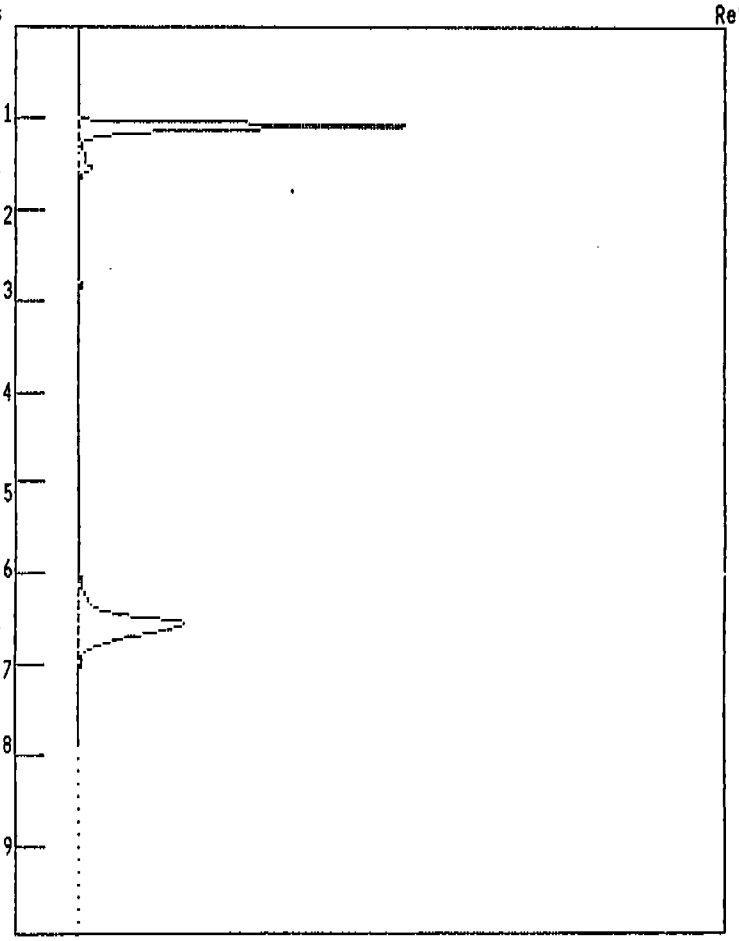
Component	External	Units	Retention	Height	Area
(unknown)	N/A		0.141	0.100	2.95
F- 0.040mg total	0.16	ug/	1.050	1.400	4.25 M
Cl-	0.23	ug/ml	1.516	0.900	4.50
(unknown)	N/A		4.158	0.100	4.40
SO4	0.81	ug/ml	6.608	0.357	5.50



Description : Channel 1
Conditions : Norton
: Main Kiln #2
: R1 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 11:58:03

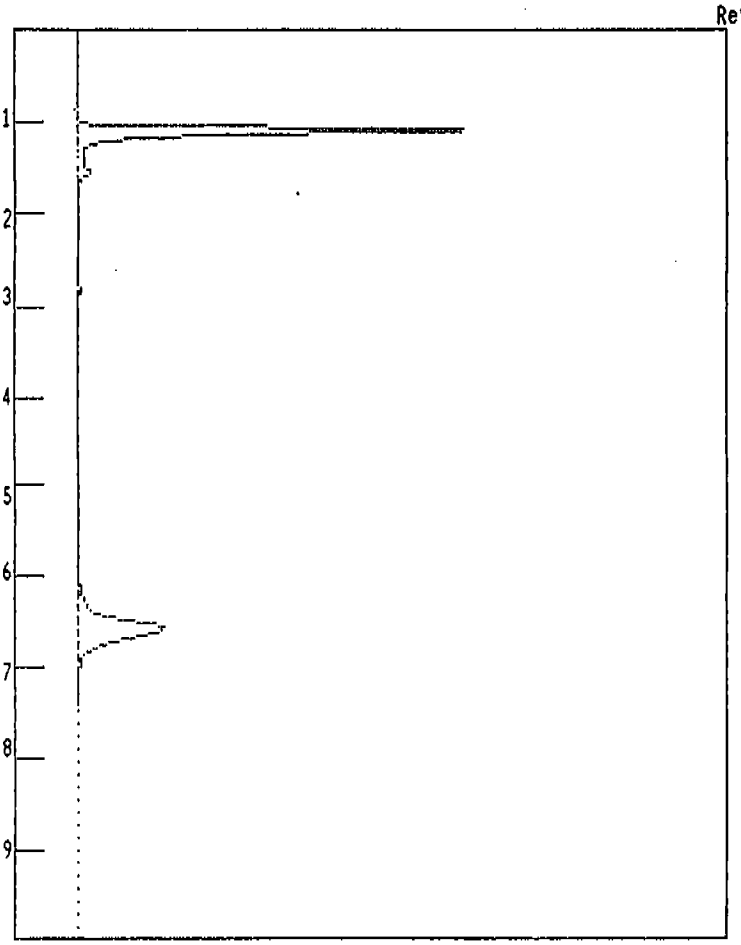
-25.600mV 256.000mV

Component	External	Units	Retention	Height	Area
F- 11.77mg total	47.10	ug/	1.075	134.224	690.66
Cl-	3.31	ug/ml	1.533	5.719	36.72
SO4	91.86	ug/ml	6.550	42.398	693.15



Description : Channel 1
Conditions : Norton
: Main Kiln #2
: R2 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 12:07:32

-25.600mV 256.000mV

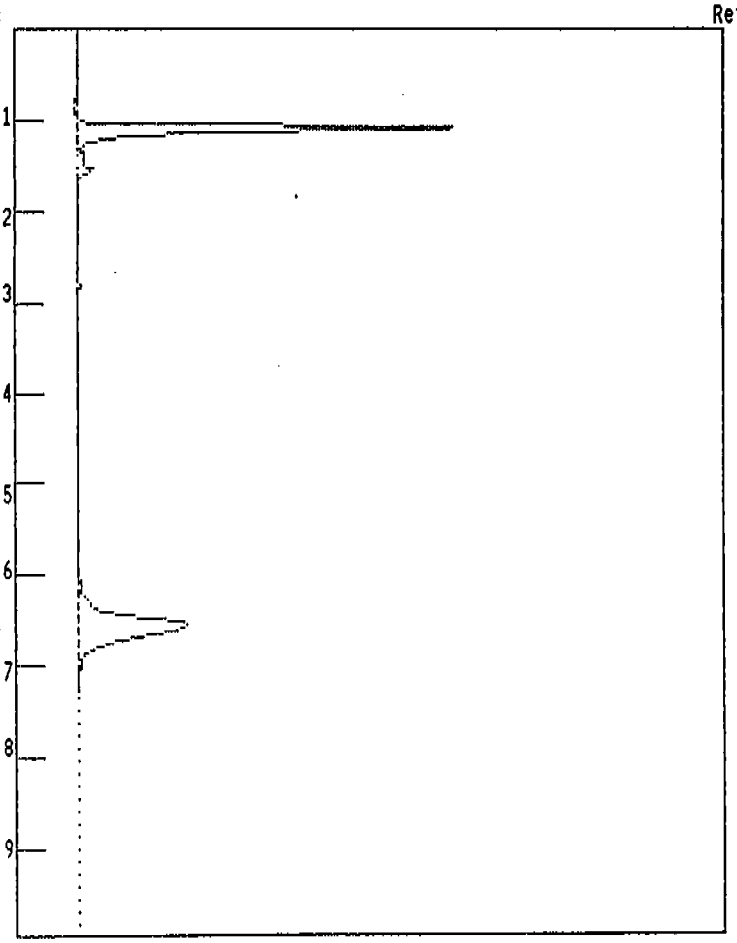


Component	External	Units	Retention	Height	Area
F- 14.45 mg total	57.80	ug/	1.075	156.188	843.78
Cl-	2.66	ug/ml	1.541	6.049	29.96
SO4	74.70	ug/ml	6.566	34.015	553.25

Description : Channel 1
Conditions : Norton
: Main Kiln #2
: R3 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 12:16:29

-25.600mV 256.000mV

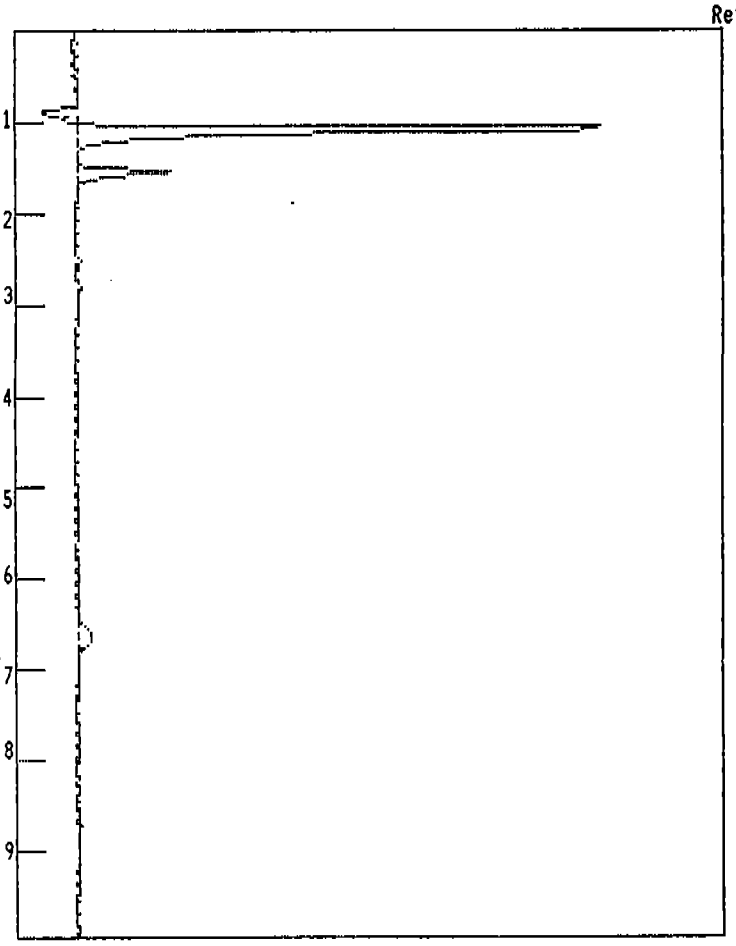
Component	External	Units	Retention	Height	Area
(unknown)	N/A		0.425	0.000	10.12
F- 13.81 mg total	55.24	ug/	1.066	152.355	807.11
Cl-	3.44	ug/ml	1.541	7.474	37.99
SO4	96.62	ug/ml	6.550	43.703	732.00



Description : Channel 1
Conditions : Norton
: Quick Cooler EX #2
: R1 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 13:47:58

-1.600mV 16.000mV

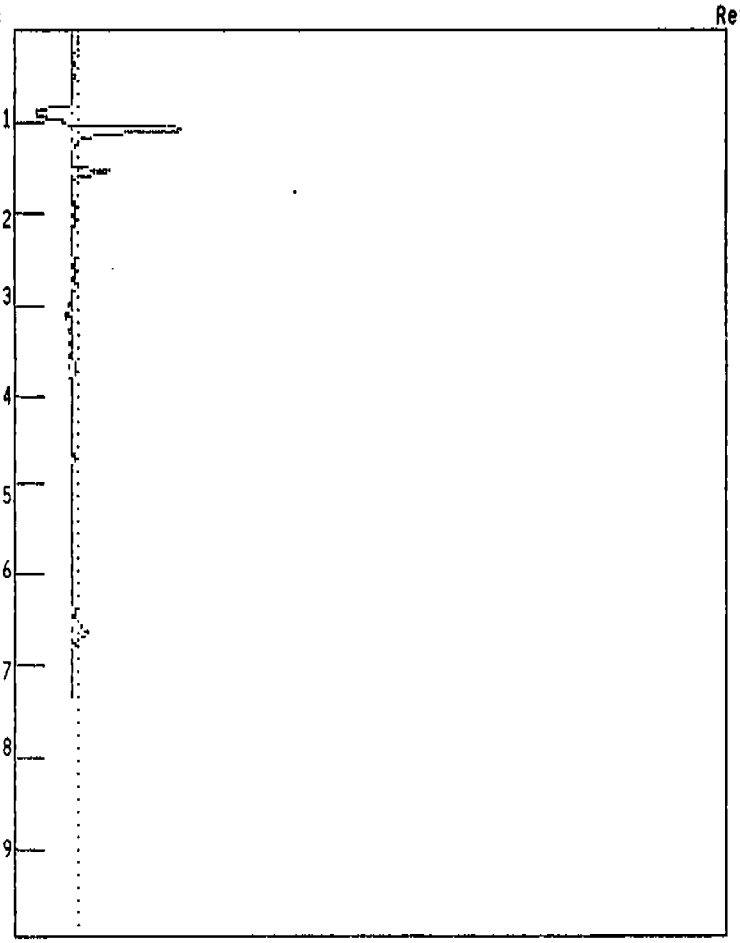
Component	External	Units	Retention	Height	Area
F-	1.09mg ~~1.36~~	ug/	1.058	15.200	71.95 M
Cl-	0.93	ug/ml	1.516	2.400	11.85
(unknown)	N/A		3.783	0.100	4.10
PO4-	1.43	ug/	5.000	0.100	3.60
SO4	1.16	ug/ml	6.641	0.421	7.88



Description : Channel 1
Conditions : Norton
: Quick Cooler EX #2
: R2 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 13:26:41

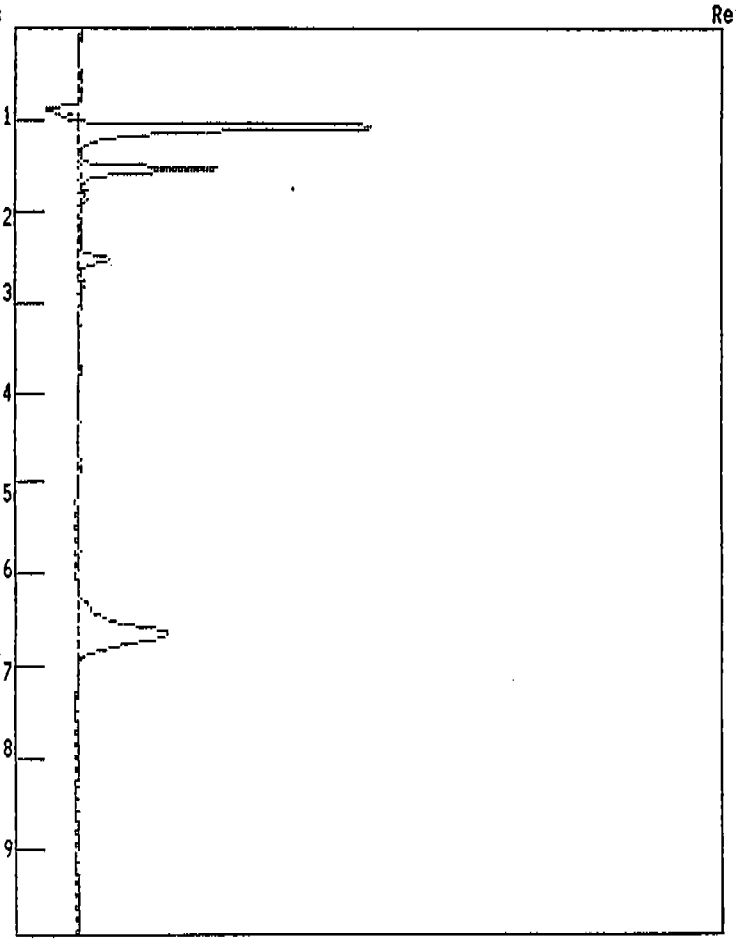
-1.600mV 16.000mV

Component	External	Units	Retention	Height	Area
F- 0.177mcg total	0.71	ug/	1.058	3.300	13.70 M
Cl-	0.25	ug/ml	1.516	1.000	4.65
SO4	0.81	ug/ml	6.616	0.400	5.50



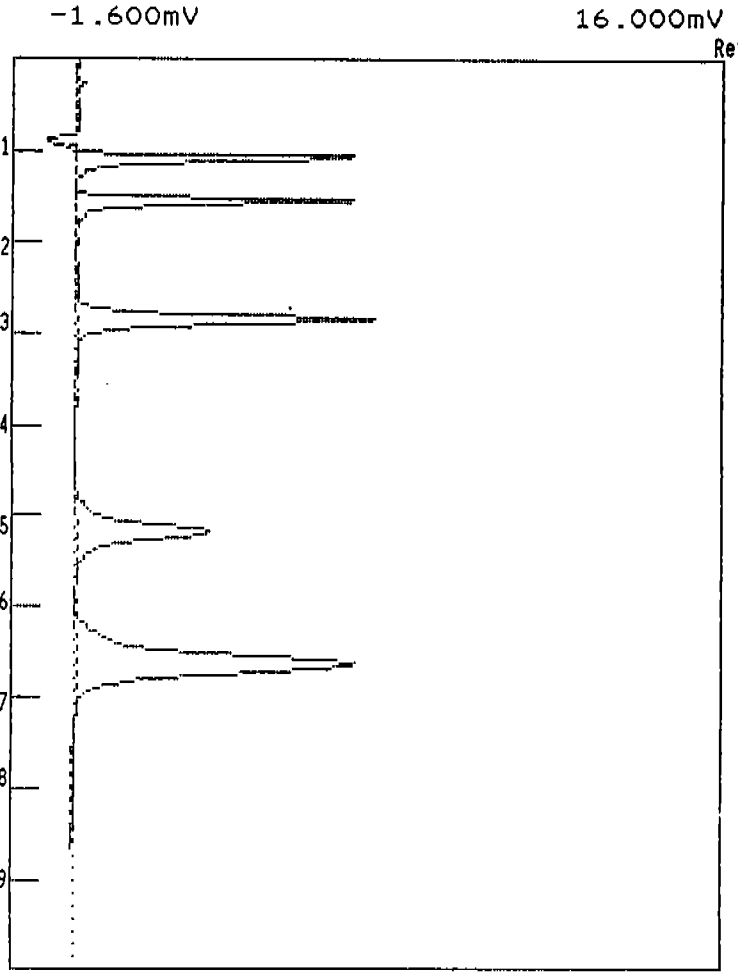
Description : Channel 1
Conditions : Norton
: Quick Cooler EX #2
: R3 Imps 1-2
: vol 250
Date : 04/25/1994
Time : 13:35:37

-1.600mV 16.000mV



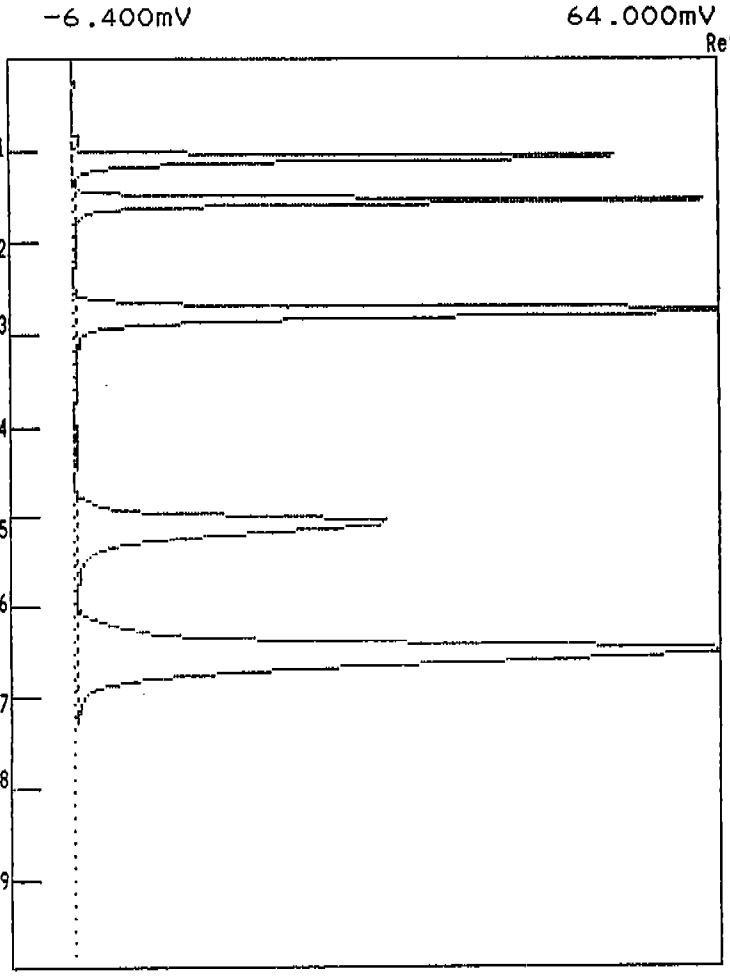
Component	External	Units	Retention	Height	Area
F- 0.625mg	2.50	ug/	1.058	8.900	42.90 M
Cl-	1.49	ug/ml	1.525	3.458	17.73
Br-	1.53	ug/ml	2.508	0.800	7.25
(unknown)	N/A		5.741	0.200	4.60
SO4	5.24	ug/ml	6.658	2.300	35.45
(unknown)	N/A		9.425	0.100	3.50

Description : Channel 1
Conditions : 5 anion std 1/10
Date : 04/25/1994
Time : 11:13:58



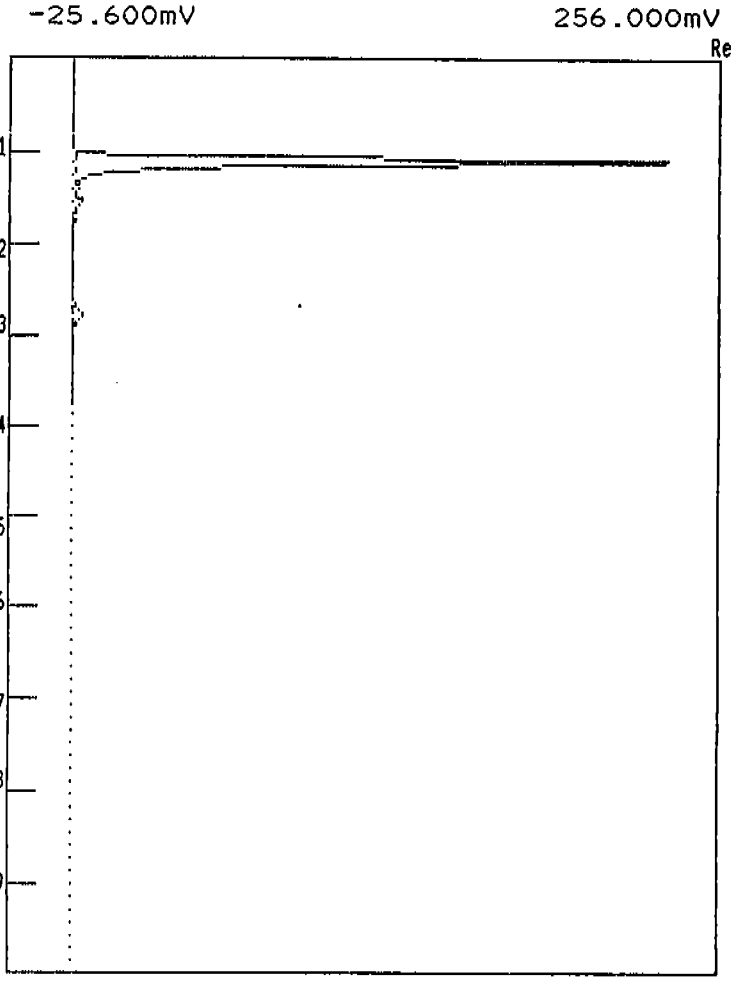
Component	External	Units	Retention	Height	Area
F-	2.00	ug/	1.050	7.500	35.10 M
Cl-	3.27	ug/ml	1.525	6.900	36.30
NO4-	10.51	ug/	2.841	7.360	55.42
PO4-	17.60	ug/	5.150	3.253	45.70
SO4	16.41	ug/ml	6.633	6.940	112.17

Description : Channel 1
Conditions : 5 anion std
Date : 04/25/1994
Time : 14:25:28



Component	External	Units	Retention	Height	Area
F-	20.00	ug/	1.050	56.600	302.40 M
Cl-	30.31	ug/ml	1.525	63.558	319.15 M
NO4-	98.19	ug/ml	2.733	72.048	583.60
PO4-	148.64	ug/	5.050	31.744	473.75
SO4	150.00	ug/ml	6.475	64.324	1119.40

Description : Channel 1
Conditions : 90 ug/ml F-
Date : 04/25/1994
Time : 14:39:10



Component	External	Units	Retention	Height	Area
F-	90.75	ug/	1.075	238.384	1308.40
Cl-	0.71	ug/ml	1.508	2.749	9.50
NO4-	4.63	ug/	2.783	3.400	24.30

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R1

Location: MAIN KILN EX # 1 Density(Pa.)

Date: 4-19-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 205

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 93.4088 gr

Date of Weighing 4/26/94 Gross Wt. 93.4088

Average Gross Wt. 93.4088

Less Blank Residue(Wa) 0

Tare Wt. 93.3999

Weight of Particulate in Rinse 8.9 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.45713

Date of Weighing 4/26/94 Gross Filter Wt. .45715

Average Gross Wt. .45714

Filter Tare Wt. 0.45075

Weight of Particulate on Filter 6.36 mg

Total Weight of Particulate 15.26 mg

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R2

Location: MAIN KILN EX. # 1 Density(Pa.)

Date: 4-19-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 227

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 105.6325 gr

Date of Weighing 4/26/94 Gross Wt. 105.6325

Average Gross Wt. 105.6325

Less Blank Residue(Wa) 0

Tare Wt. 105.6221

Weight of Particulate in Rinse 10.4 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.45893

Date of Weighing 4/26/94 Gross Filter Wt. .45890

Average Gross Wt. .45892

Filter Tare Wt. 0.45233

Weight of Particulate on Filter 6.59 mg

Total Weight of Particulate 16.99 mg

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R3

Location: MAIN KILN EX. #1 Density(Pa.)

Date: 4-19-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 165

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 112.9167

Date of Weighing 4/26/94 Gross Wt. 112.9167

Average Gross Wt. 112.9167

Less Blank Residue(Wa) 0

Tare Wt. 112.9107

Weight of Particulate in Rinse 6.0 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.45828

Date of Weighing 4/26/94 Gross Filter Wt. .45830

Average Gross Wt. .45829

Filter Tare Wt. 0.45106

Weight of Particulate on Filter 7.23 mg

Total Weight of Particulate 13.23 mg

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R1

Location: DRYER KILN EX # 1 Density(Pa.)

Date: 4-19-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 183

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 105.6172 gr

Date of Weighing 4/26/94 Gross Wt. 105.6172

Average Gross Wt. 105.6172

Less Blank Residue(Wa) 0

Tare Wt. 105.5324

Weight of Particulate in Rinse 84.8 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.48344

Date of Weighing 4/26/94 Gross Filter Wt. .48348

Average Gross Wt. .48346

Filter Tare Wt. 0.45306

Weight of Particulate on Filter 30.4

Total Weight of Particulate 115.2

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R2

Location: DRYER KILN EX #1 Density(Pa.)

Date: 4-19-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 125

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 109.4421

Date of Weighing 4/26/94 Gross Wt. 109.4421

Average Gross Wt. 109.4421

Less Blank Residue(Wa) 0

Tare Wt. 109.4282

Weight of Particulate in Rinse 13.90

Date of Weighing 4-25-94 Gross Filter Wt. 0.45132

Date of Weighing 4/26/94 Gross Filter Wt. 0.45130

Average Gross Wt. 0.45131

Filter Tare Wt. 0.44800

Weight of Particulate on Filter 33.1

Total Weight of Particulate 47.0 mg

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R3

Location: DRYER KILN Ex # 1 Density(Pa.)

Date: 4-19-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 85

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 106.1057 gr

Date of Weighing 4/26/94 Gross Wt. 106.1057

Average Gross Wt. 106.1057

Less Blank Residue(Wa) 0

Tare Wt. 106.0977

Weight of Particulate in Rinse 8.0 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.45803 gr

Date of Weighing 4/26/94 Gross Filter Wt. 0.45808

Average Gross Wt. 0.45806

Filter Tare Wt. 0.45725

Weight of Particulate on Filter 0.81

Total Weight of Particulate 8.81 mg

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R1

Location: MAIN KILN EX # 2 Density(Pa.)

Date: 4-20-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 178

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 101.0112 gr

Date of Weighing 4/26/94 Gross Wt. 101.0113

Average Gross Wt. 101.01125

Less Blank Residue(Wa) 0

Tare Wt. 100.9910

Weight of Particulate in Rinse 20.25 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.45931 gr

Date of Weighing 4/26/94 Gross Filter Wt. 145931

Average Gross Wt. 145931

Filter Tare Wt. 0.45676

Weight of Particulate on Filter 2.55 mg

Total Weight of Particulate 22.80

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R2

Location: MAIN KILN EX #2 Density(Pa.)

Date: 4-20-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 168

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 102.2668 gr

Date of Weighing 4/26/94 Gross Wt. 102.2667

Average Gross Wt. 102.26675

Less Blank Residue(Wa) 0

Tare Wt. 102.2549

Weight of Particulate in Rinse 11.85 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.46335 gr

Date of Weighing 4/26/94 Gross Filter Wt. .46338

Average Gross Wt. .46337

Filter Tare Wt. 0.45333

Weight of Particulate on Filter 10.04

Total Weight of Particulate 21.89 mg

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R3

Location: MAIN KILN EX # 2 Density(Pa.)

Date: 4-20-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 138

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 106.4253

Date of Weighing 4/26/94 Gross Wt. 106.4253

Average Gross Wt. 106.4253

Less Blank Residue(Wa) 0

Tare Wt. 106.4118

Weight of Particulate in Rinse 13.5 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.46309

Date of Weighing 4/26/94 Gross Filter Wt. .46311

Average Gross Wt. .46310

Filter Tare Wt. 0.45499

Weight of Particulate on Filter 8.11

Total Weight of Particulate 21.61 mg

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R1

Location: QUICKCOOLER KILN EX #2 Density(Pa.)

Date: 4-20-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 192

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 96.8822 gr

Date of Weighing 4/26/94 Gross Wt. 96.8822

Average Gross Wt. 96.8822

Less Blank Residue(Wa) 0

Tare Wt. 96.8774

Weight of Particulate in Rinse 4.8 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.46221 gr

Date of Weighing 4/26/94 Gross Filter Wt. .46221

Average Gross Wt. .46221

Filter Tare Wt. 0.46128

Weight of Particulate on Filter 0.93 mg

Total Weight of Particulate 5.73 mg

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R2

Location: QUICKCOOLER KILN Ex#2 Density(Pa.)

Date: 4-20-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 236

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 103.5556 gr

Date of Weighing 4/26/94 Gross Wt. 103.5556

Average Gross Wt. 103.5556

Less Blank Residue(Wa) 0

Tare Wt. 103.5509

Weight of Particulate in Rinse 4.7 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.45948

Date of Weighing 4/26/94 Gross Filter Wt. .45950

Average Gross Wt. .45949

Filter Tare Wt. 0.45940

Weight of Particulate on Filter 0.09 mg

Total Weight of Particulate 4.79 mg

PARTICULATE ANALYTICAL DATA FORM

Company: NORTON Run Number: R3

Location: QUICKCOOLER KILN EX #2 Density(Pa.)

Date: 4-20-94

Liquid Level Marked? ✓

Blank Concentation(Ca) 0

Rinse Volume(Vaw) 205

Residue in Rinse(Wa)=Ca*Vaw*Pa 0

Date of Weighing 4/26/94 Gross Wt. 96.0228

Date of Weighing 4/26/94 Gross Wt. 96.0228

Average Gross Wt. 96.0228

Less Blank Residue(Wa) 0

Tare Wt. 96.0189

Weight of Particulate in Rinse 3.9 mg

Date of Weighing 4-25-94 Gross Filter Wt. 0.46951

Date of Weighing 4/26/94 Gross Filter Wt. .46953

Average Gross Wt. .46952

Filter Tare Wt. 0.46261

Weight of Particulate on Filter 6.91

Total Weight of Particulate 10.81 mg

BLANK ANALYTICAL DATA FORM

PLANT: Norton
SAMPLE LOCATION: Kilns 1+2
LIQUID LEVEL MARKED? ✓
BLANK VOLUME (Pa): 100

DATE OF WEIGHING 4/26/94 GROSS WEIGHT 101.2736
DATE OF WEIGHING 4/26/94 GROSS WEIGHT 101.2736
AVERAGE GROSS WEIGHT 101.2736
TARE WEIGHT 101.2736
WEIGHT OF BLANK (ma) 0

$$Ca = \frac{ma}{Va\ Pa} = 0 \text{ mg/g}$$

Note: In no case should a blank residue greater than 0.01 mg/g or 0.001% of the blank weight be subtracted from the sample weight.

APPENDIX C

NORTON CHEMICAL 4-19-94
SODDY DAISY, TN KILN #1 - SO_2, VOC

Run #1 12:40 - 1:40		Run #2 2:24 - 3:24		Run #3 4:00 - 5:00		
SO_2	VOC	SO_2	VOC	SO_2	VOC	
9	10	4	3	4	3	
10	8	4	3	3	3	
8	9	4	3	3	3	
8	8	4	3	3	3	
9	7	4	3	3	3	
8	7	4	3	3	3	
8	7	12	3	2	2.5	
8	7	12	3	10	2.5	
8	6	9	3	9	2.5	
10 6	6	9	3	5	2.5	
6	4	6	3	5	2.5	
5	3	4	3	4	2.5	
7	3	3	3	4	2.5	
6	3	3	3	3	2	
6	3	3	2	3	2	
5	4	13	3	3	2	
5	3	12	3	3	2	
11	3	9	3	3	2	
10	3	11	2	8	2	
20 9	2	10	2	14	2	
9	2	8	2	11	2	
9	2	10	2	17	2	
9	2	9	2	11	3	
8	2	8	2	8	3	
8	2	8	2	9	3	
8	2	8	2	8	3	
7	2	7	2	8	3	
7	2	7	2	7	3	
7	2	8	2	7	3	
30 7.724	2	8	2	6.241	2.569	
	4.20	7.367	2.567			
1.897	2.320	1.785	2.306	2.008	2.498	
14.65	9.744	13.15	5.920	12.53	6.418	PPM

Norton Chemical 4-19-94
Kiln #2 - SO_2, VOC

Run #1 10:40 - 11:40		Run #2 12:14 - 1:14		Run #3 1:44 - 2:44	
SO_2	VOC	SO_2	VOC	SO_2	VOC
21	3	19	2	19	0
26	3	20	2	21	0
24	3	21	2.5	21	0
23	3	20	3	22	0
22	3	20	2.5	23	0
23	3	20	2	23	0
27	3	19	2	24	0
28	3	20	2	28	0
26	3	19	2	27	0
10 26	2.5	17	2	24	.2
30	2.5	23	2	23	.2
30	2.5	23	2	24	.5
28	2.5	20	2	24	.5
27	2.5	21	2	24	.5
27	2.5	19	2	23	.5
29	2.2	20	2	24	.5
27	2.2	19	2	25	.5
28	2.2	17	2	28	.5
27	2	20	2	27	1
20 26	2	19	2	28	1
27	2	19	2	27	1
30	2	22	2	28	1
36	2	22	2	27	1
24	2	20	2	30	1
34	2	22	2	31	2
33	2	22	2	41	2
32	2	23	2	44	5
29	2	23	2.5	48	6
28	2	23	2.5	49	11
30 27.52	2.434	20.41	2.5	27.83	9
			2.117		1.497
1.980	2.498	2.008	2.725	1.897	2.725
54.48	6.081	40.99	5.770	52.79	4.080

Motor Current / Vibration / Speed
Motor Current = 36 amps
Speed = 1800 rpm
Vibration = 0.25 mm
Speed = 0 - 1800 rpm
Vibration = 0 - 100 mm
Speed = 0 - 1800 rpm
Motor Current = 0 - 100 amps
Vibration
Speed
Motor Current
Time
10
5
0
0
5
10
15
20
25
30
35
40
45
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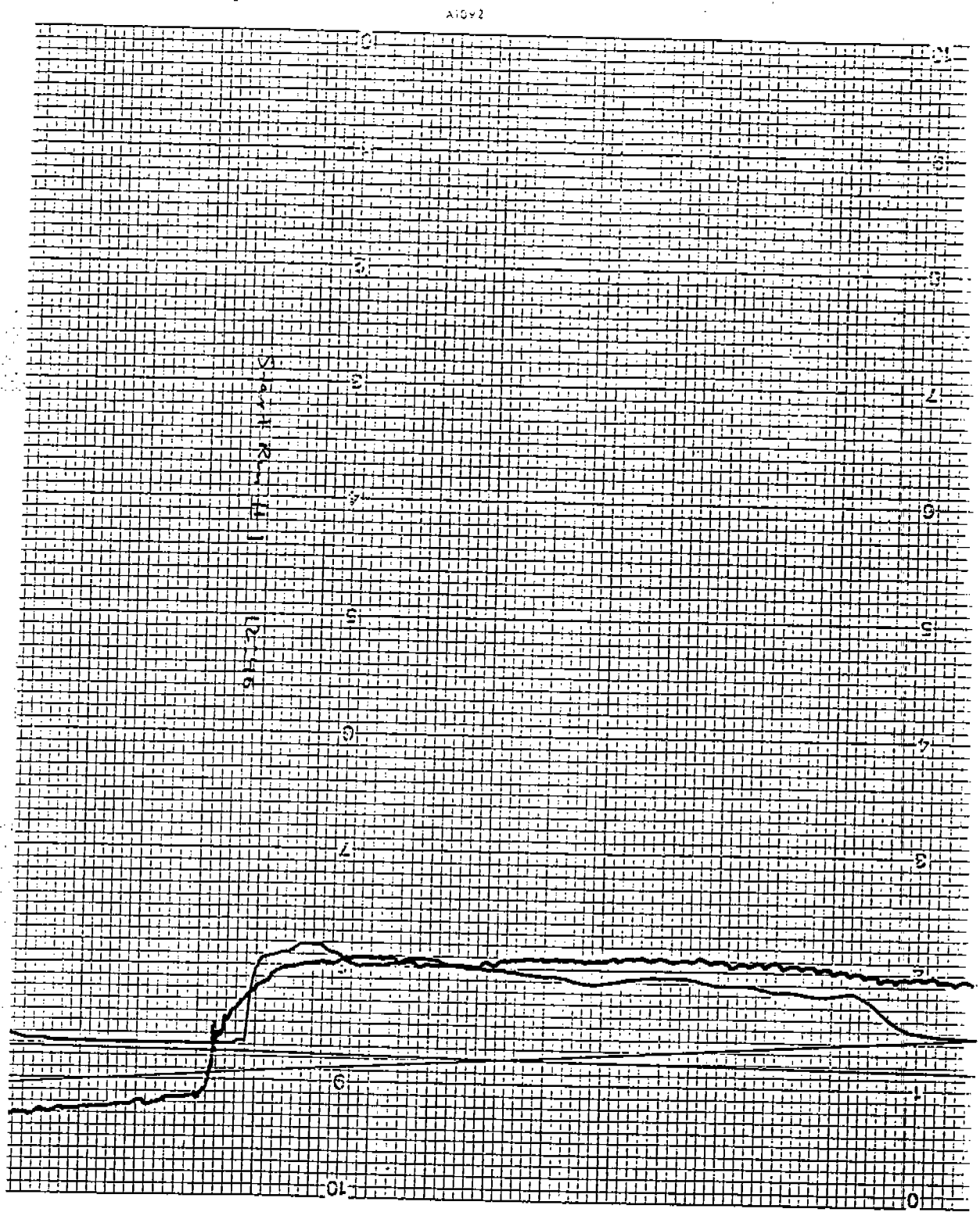
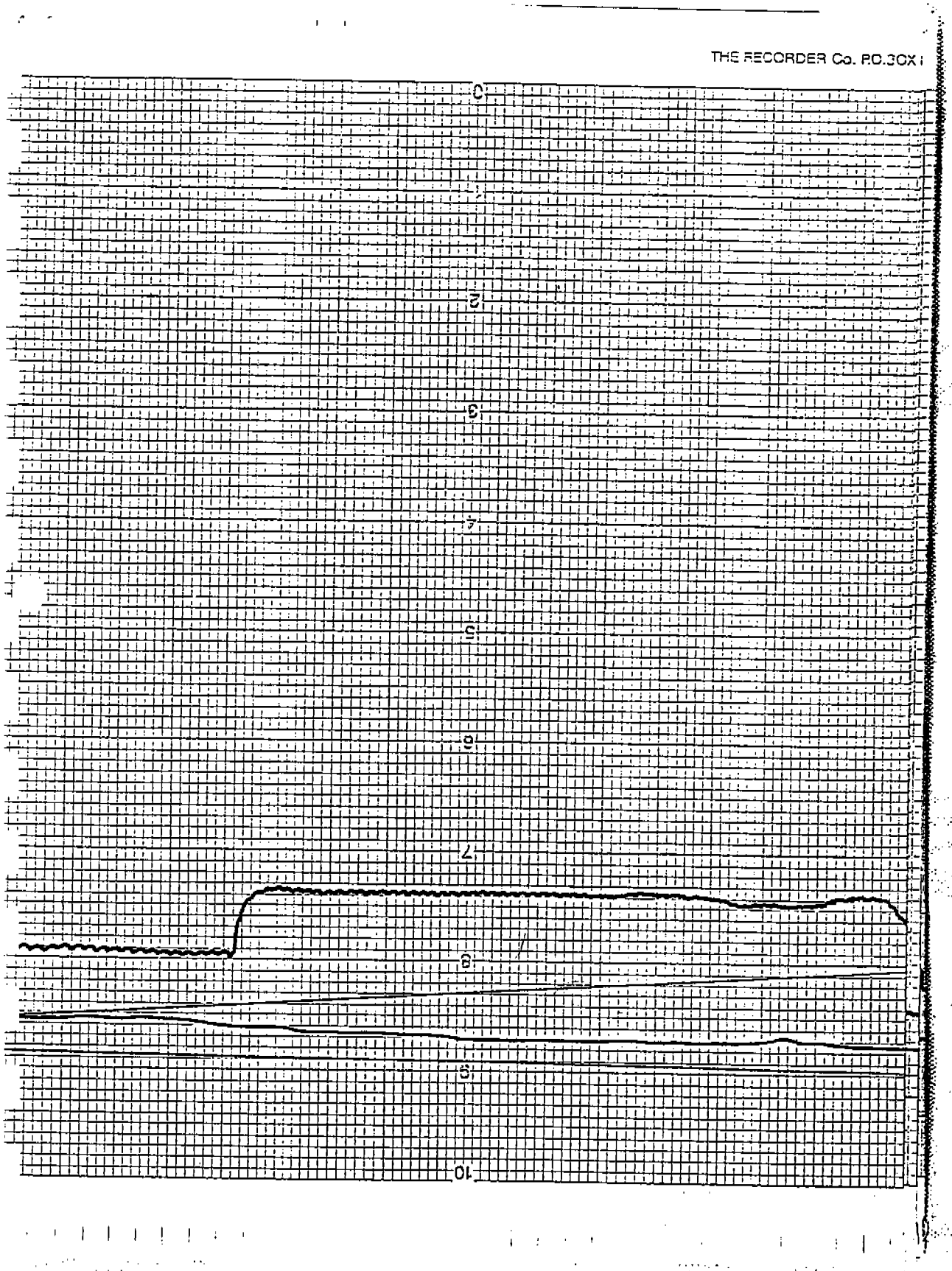
CHART NO. RC-3135




THE RECORDER Co. P.O.BOX
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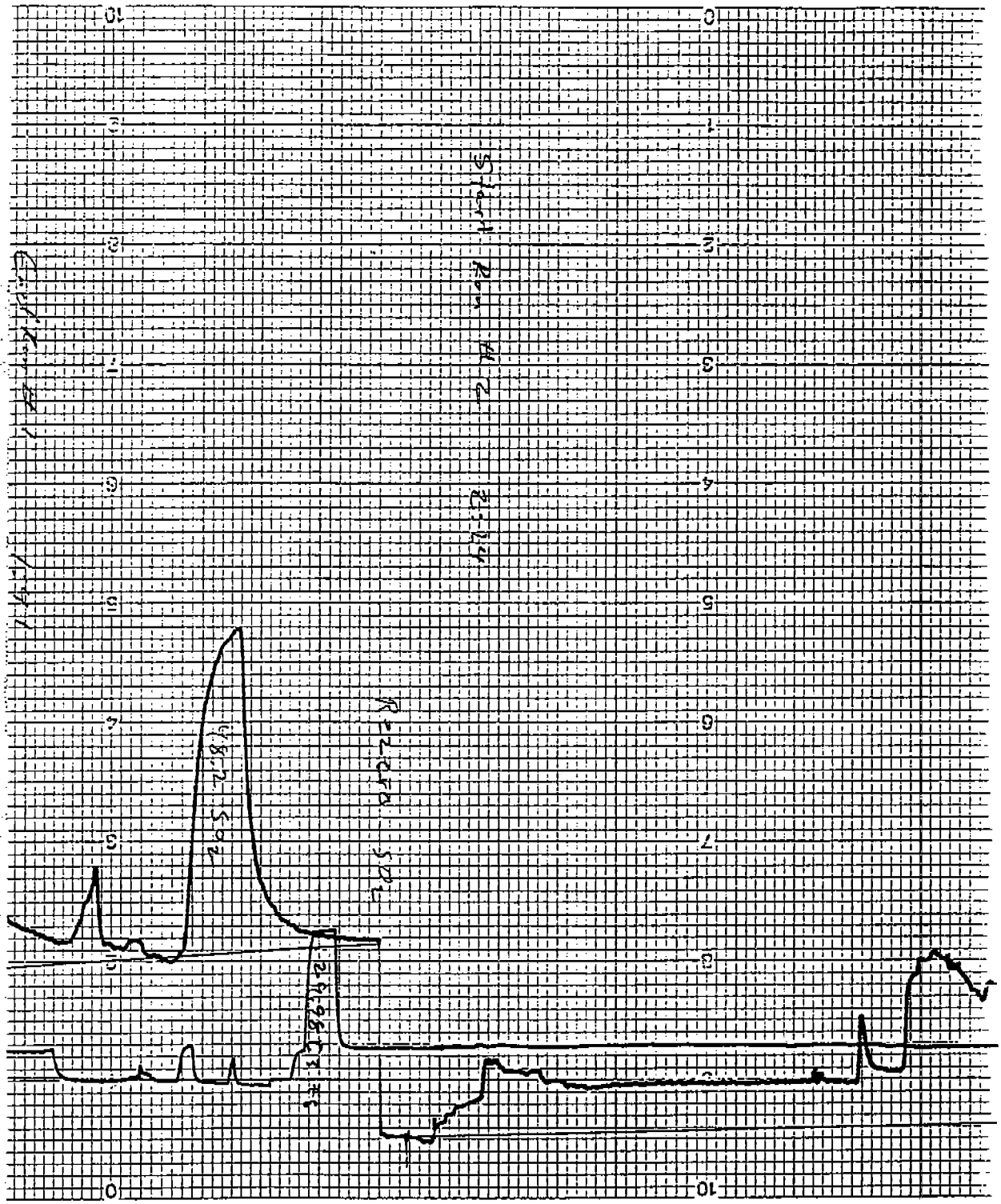

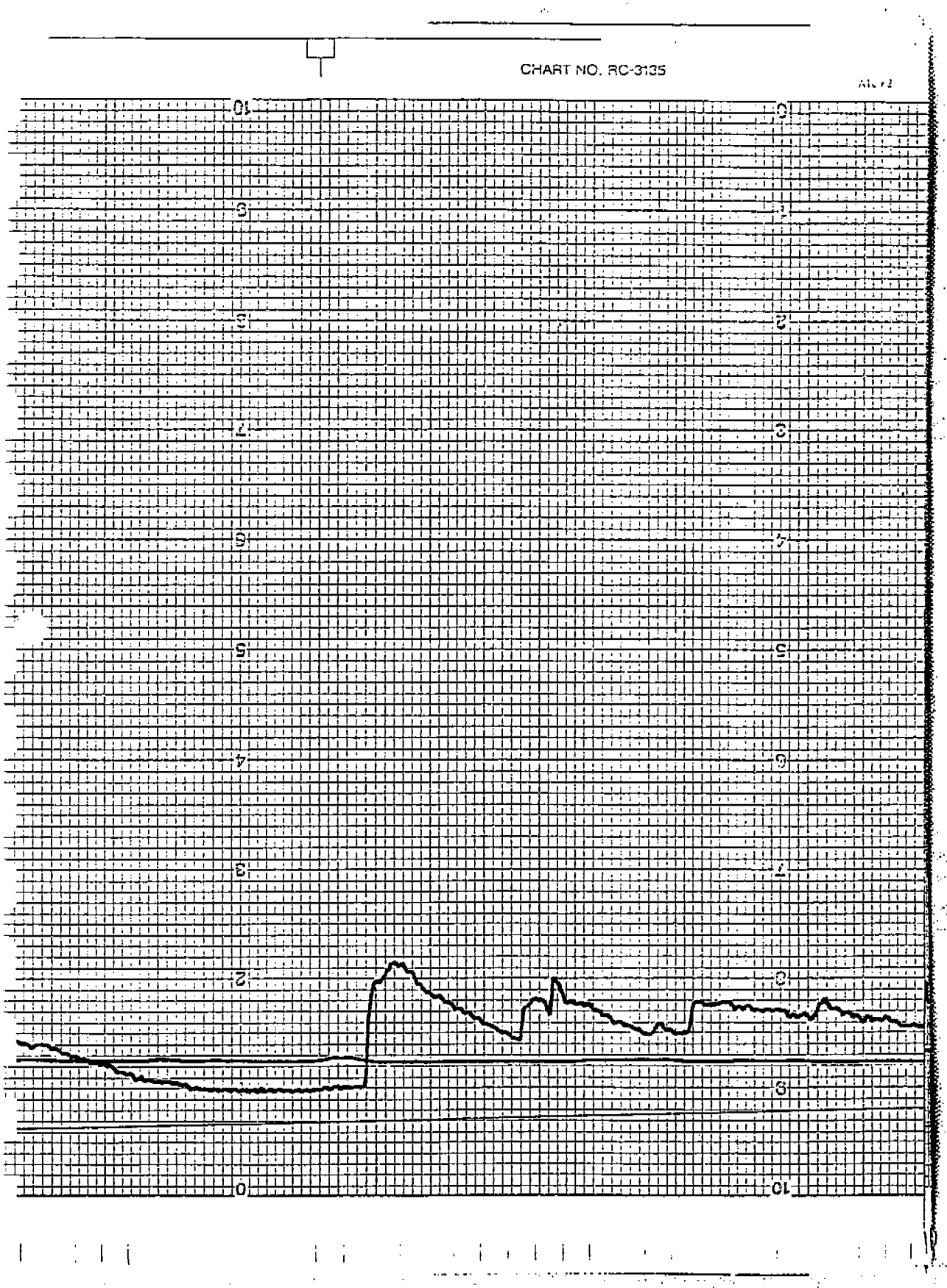
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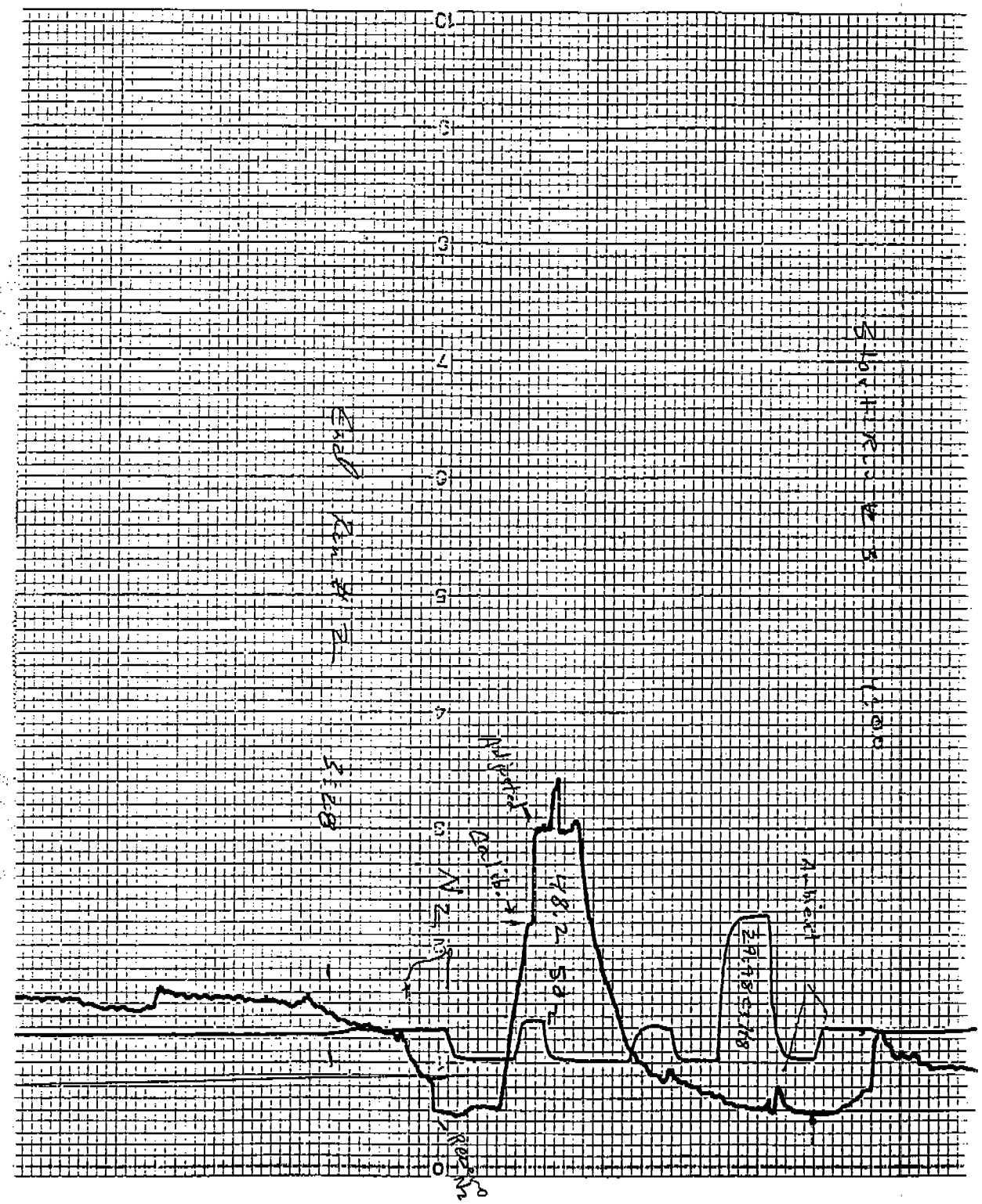
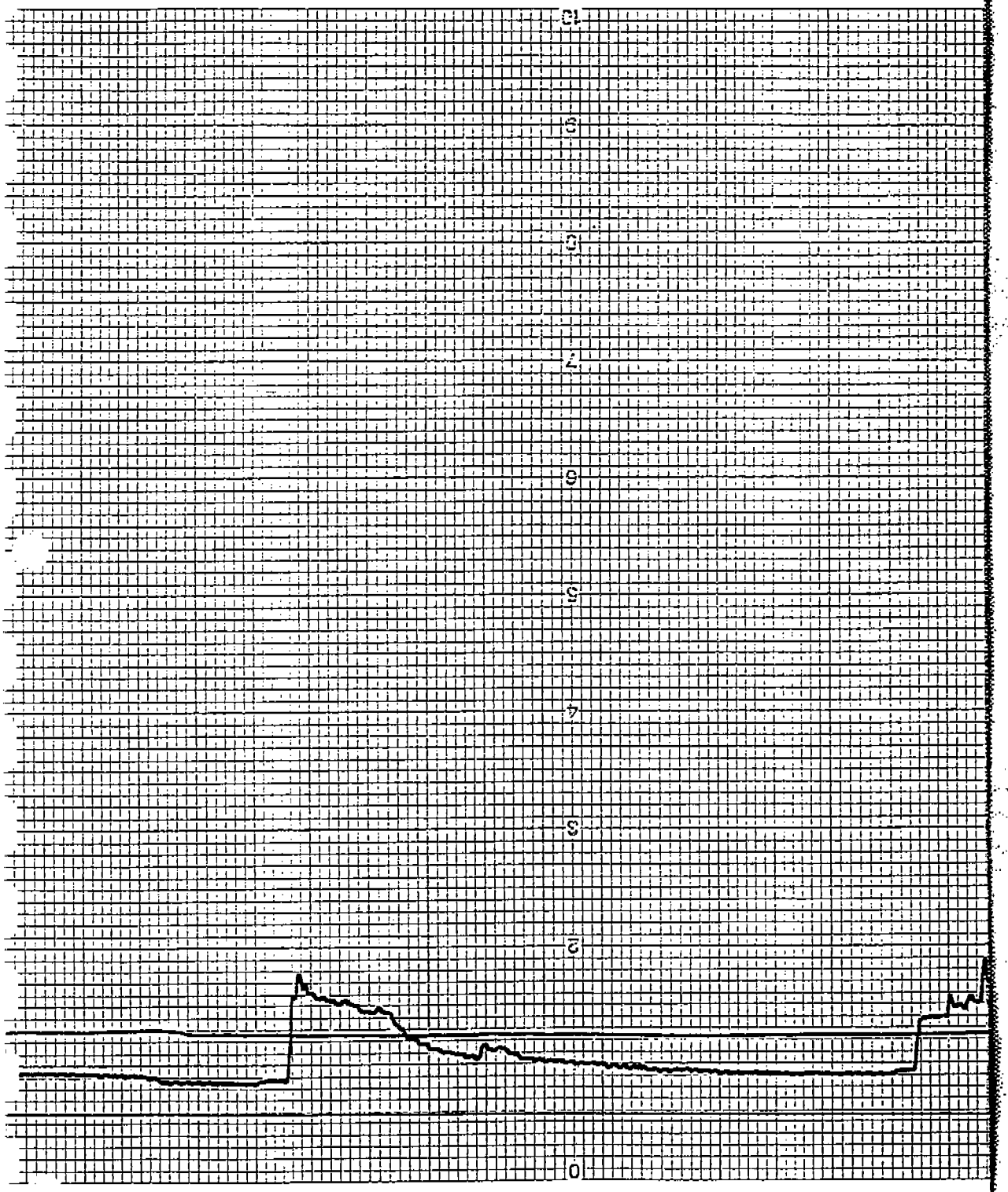
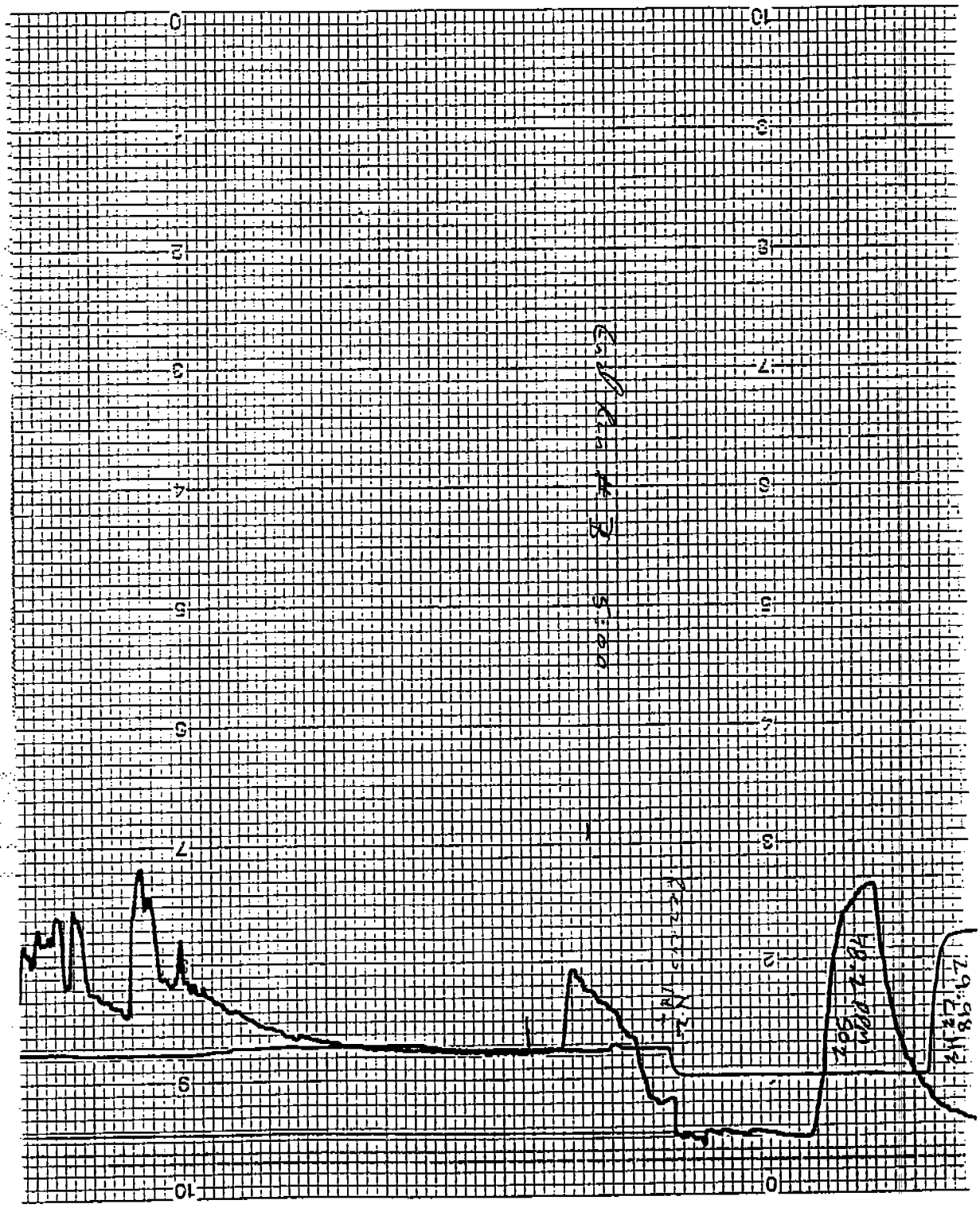

Adjusted
Calib.
Reserve
Ambient

THE RECORDER Co. P.O.BOX 8, San Marcos, Tx 78667 Tel. 512-6291400





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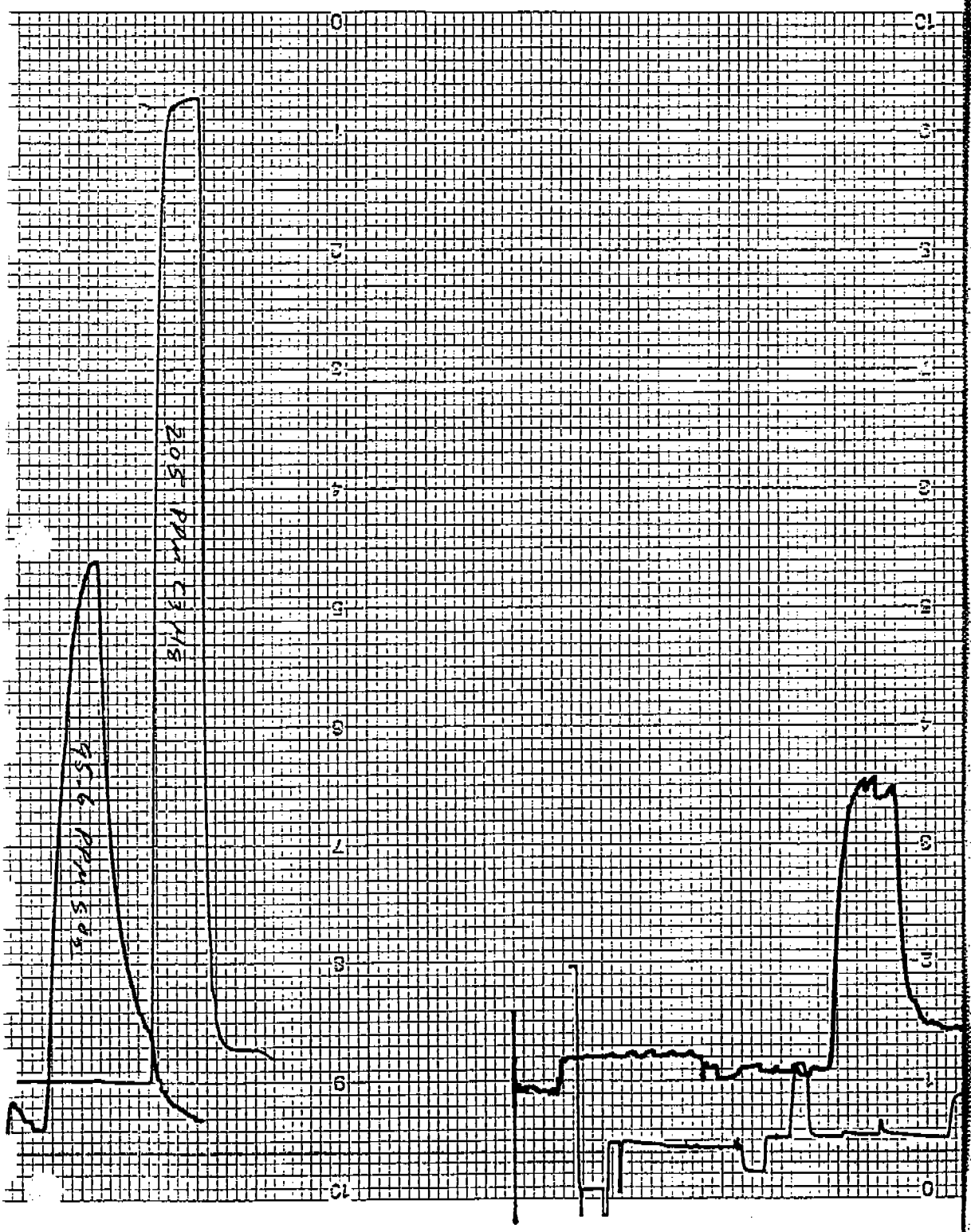
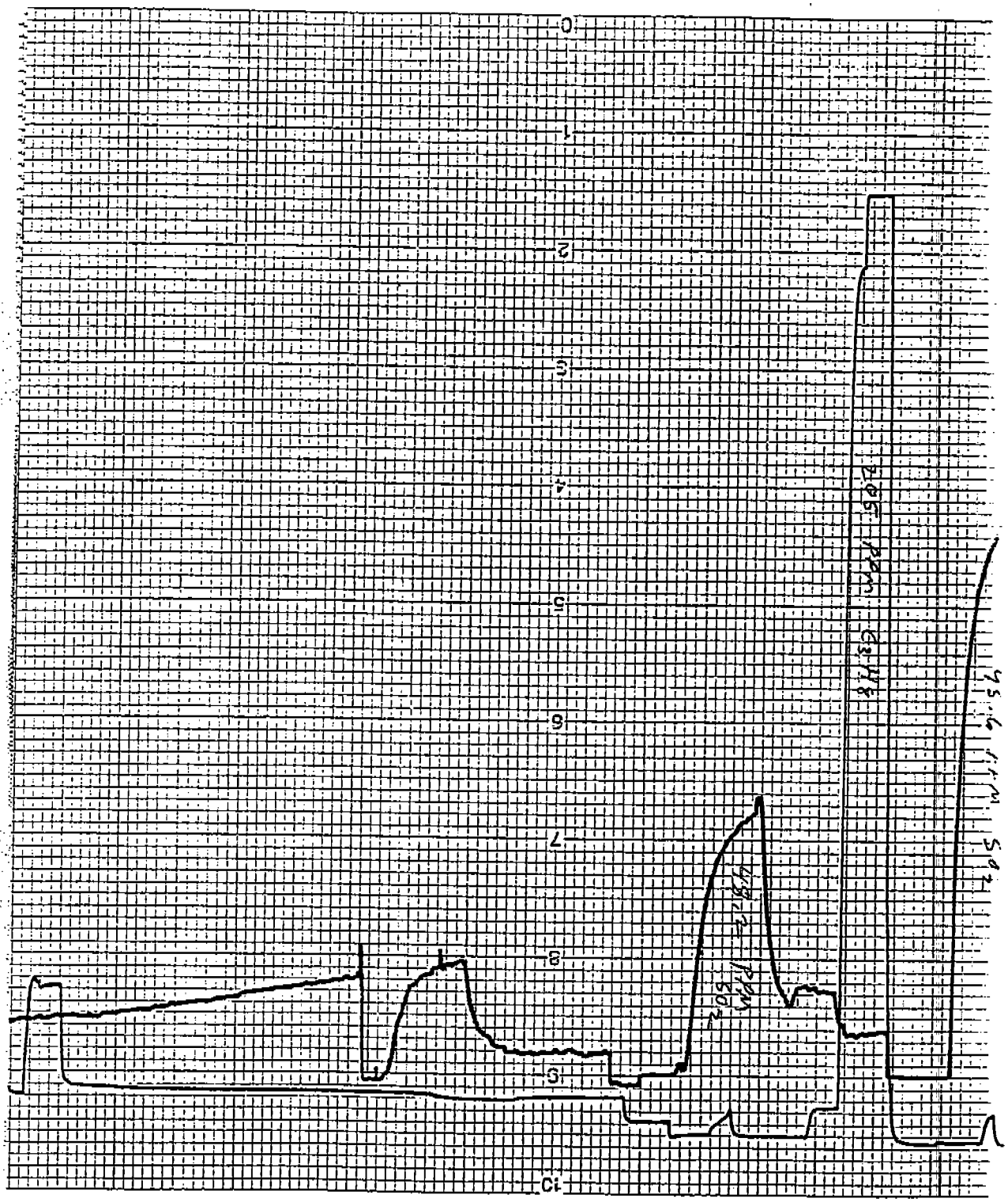
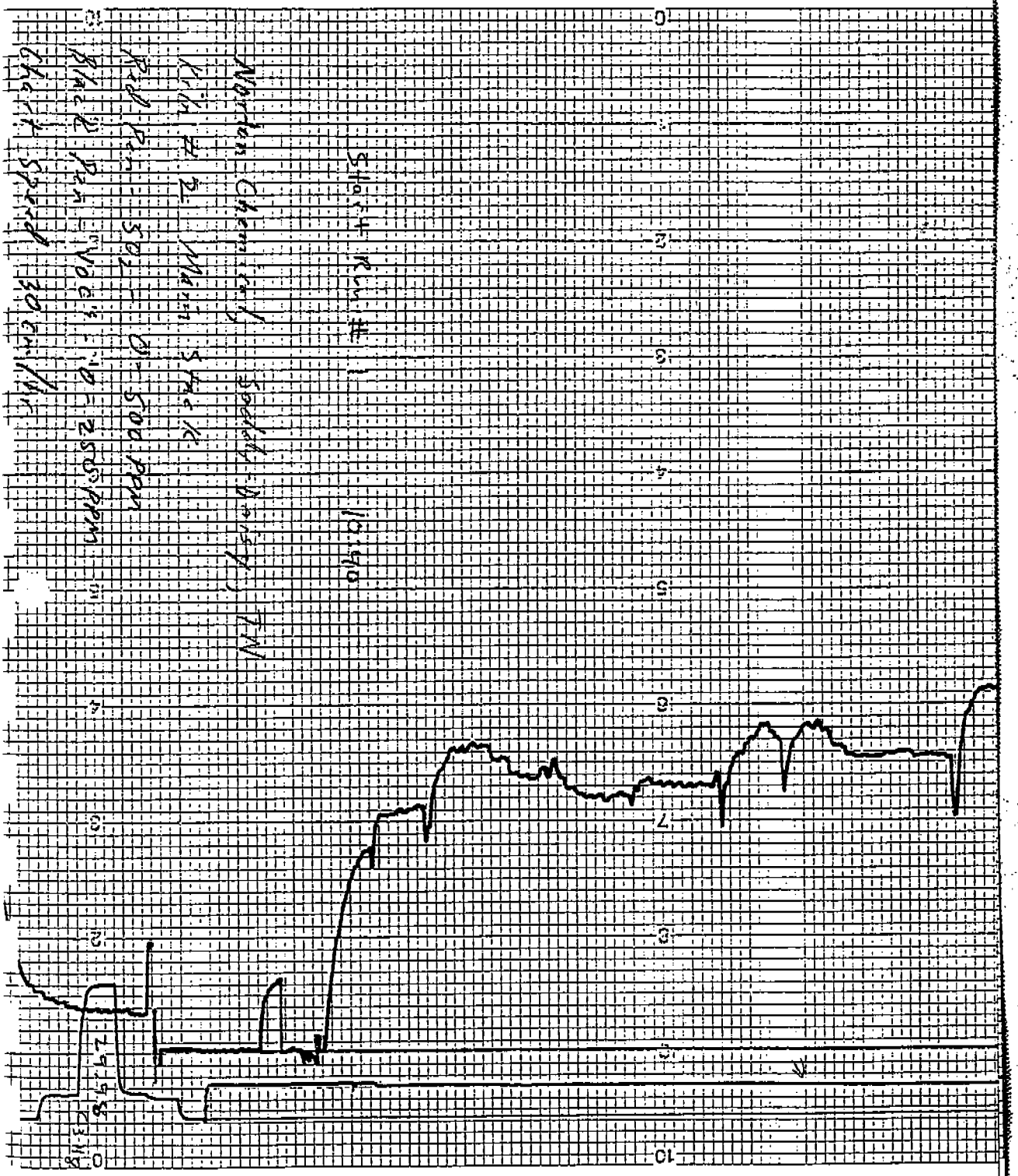



0
1
2
3
4
5
6
7
8
9
10
205 PPM C3H8
43.2 PPM SO2
75.6 PPM SO2

n Marcos, Tx 78667 Tel. 512-6291400



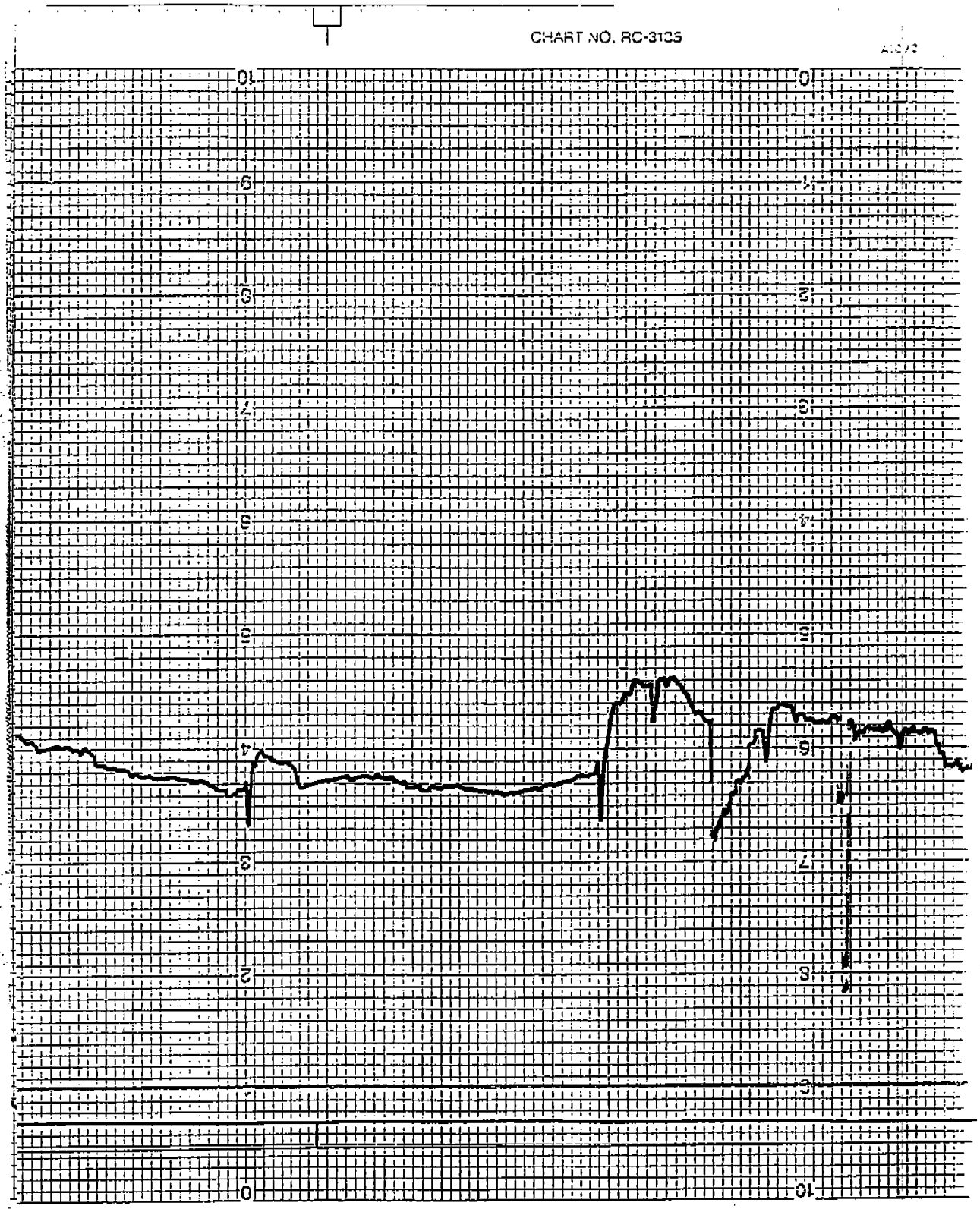


CHART NO. RC-3125
10
9
8
7
6
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4
3
2
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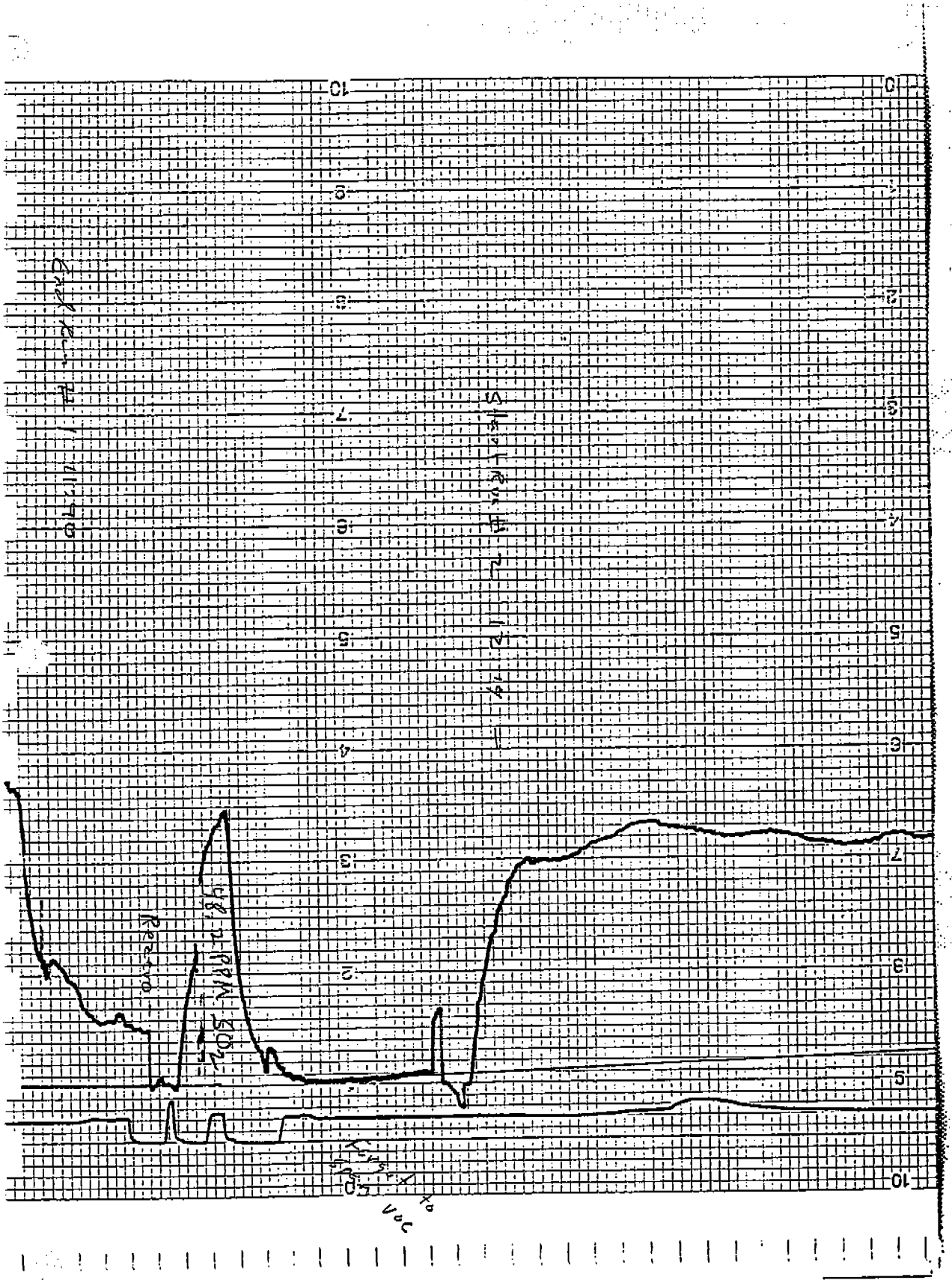
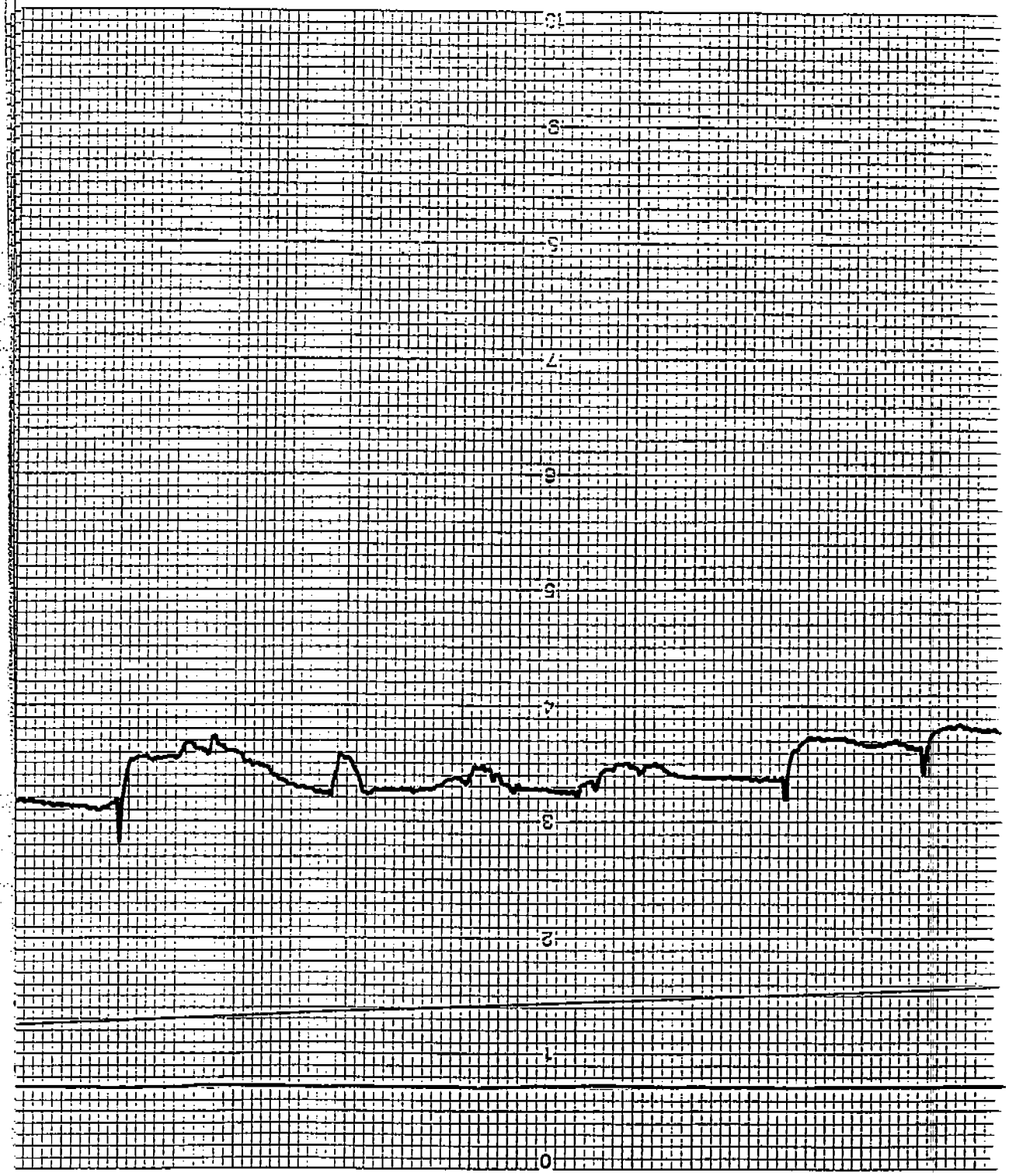
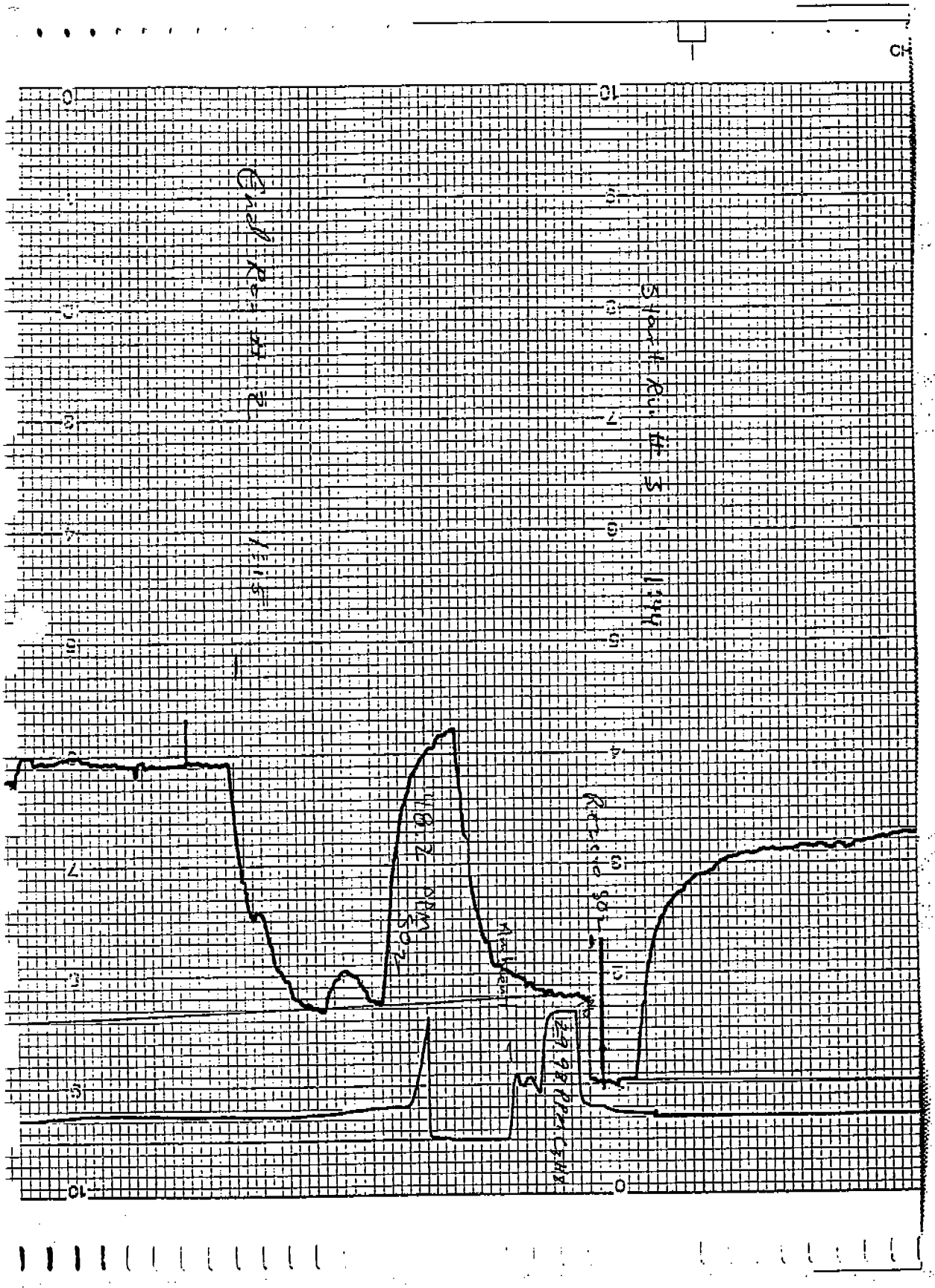
0
0
1
2
3
4
5
6
7
8
9
10



THE RECORDER Co. P.O.BOX 8, San Marcos, Tx 78667 Tel. 512-6291400





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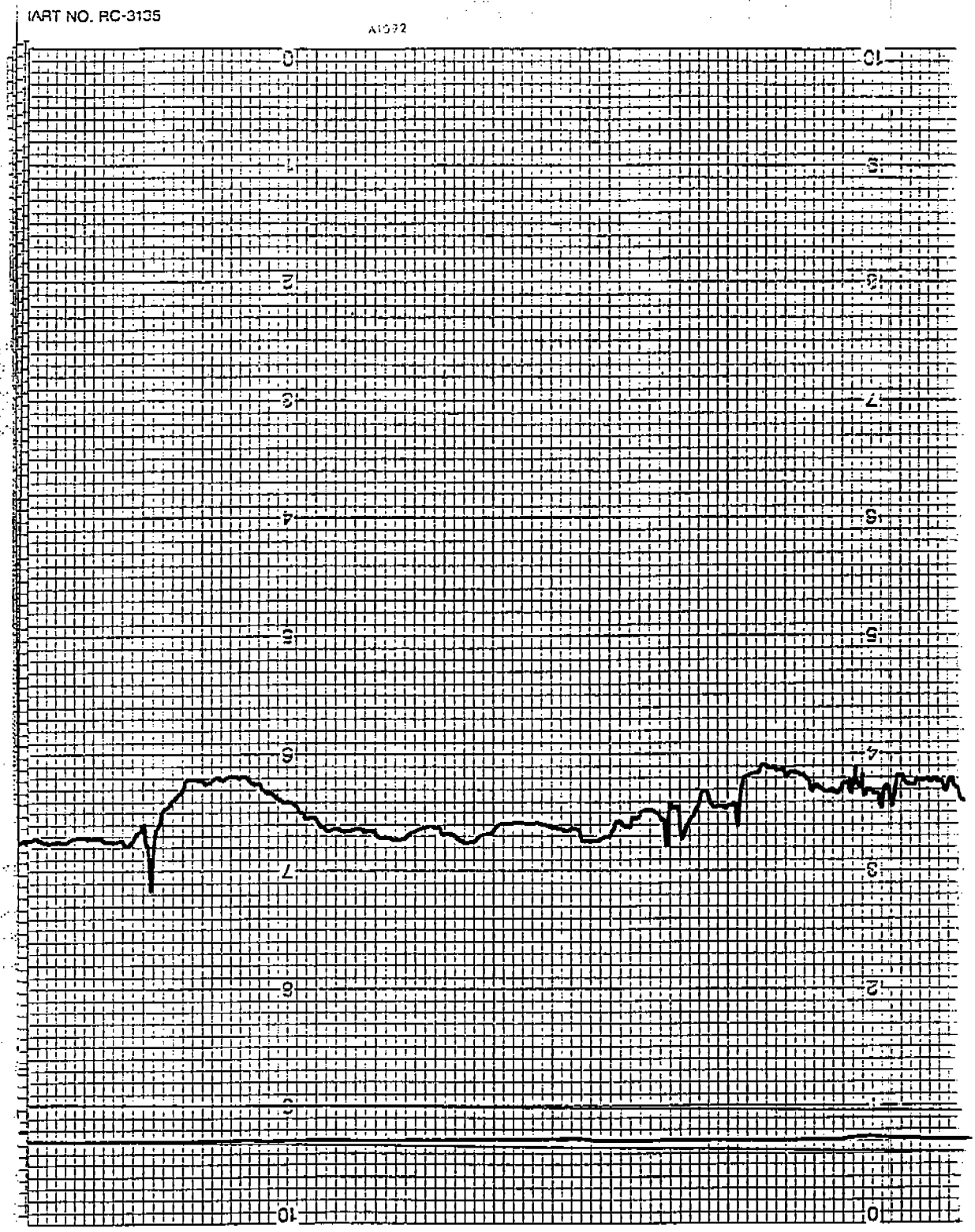
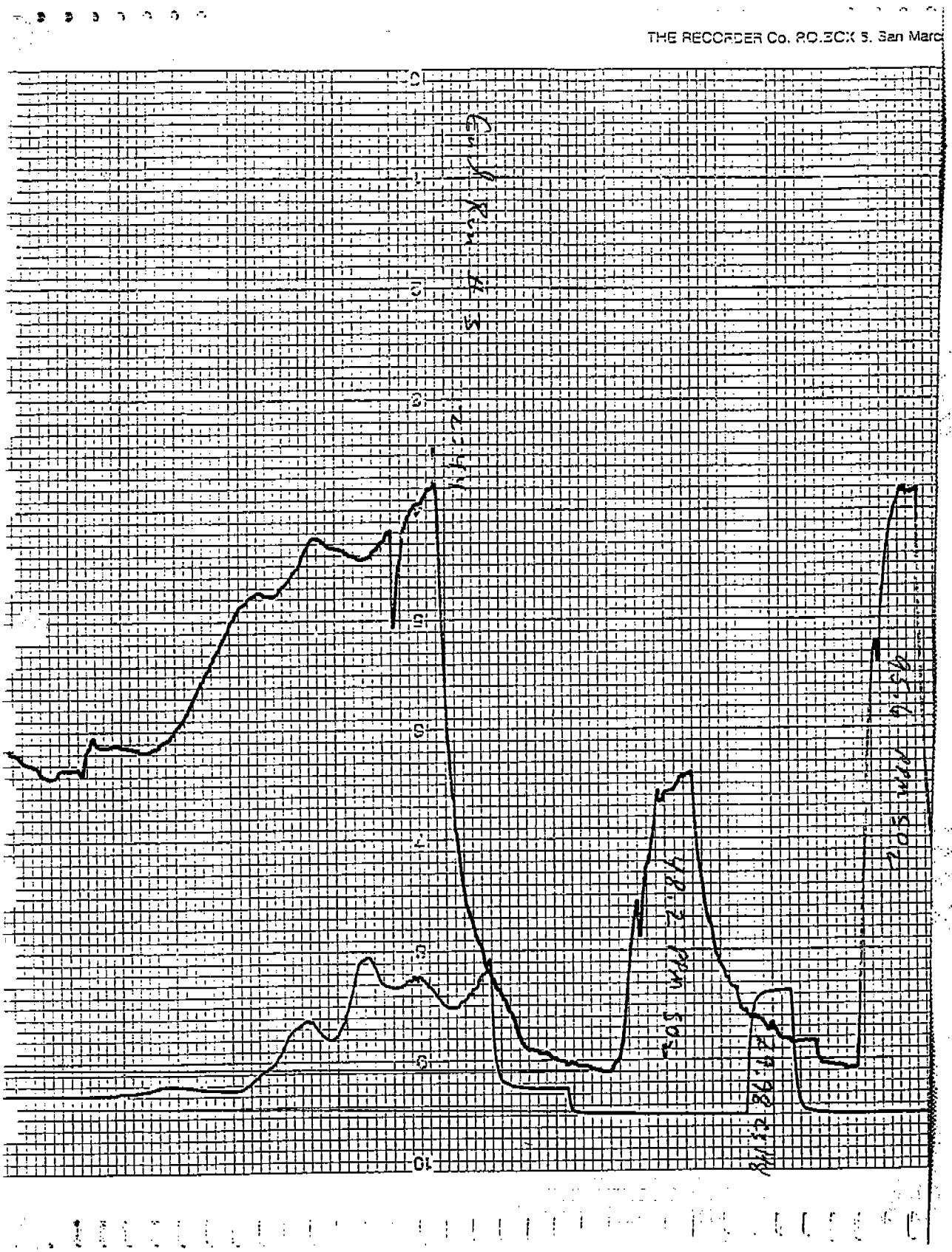
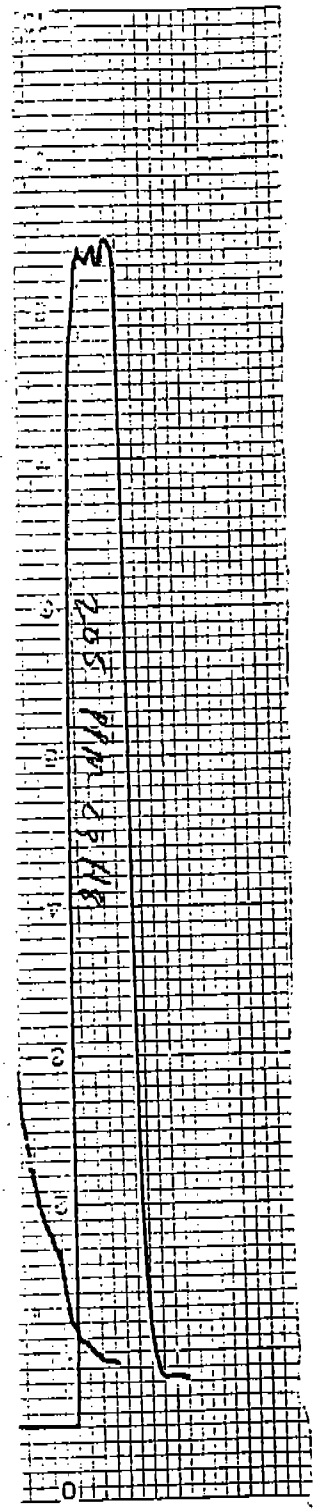



THE RECORDER Co. P.O.BOX 5. San Marc

cs. Tx 78667 Tel. 512-629140

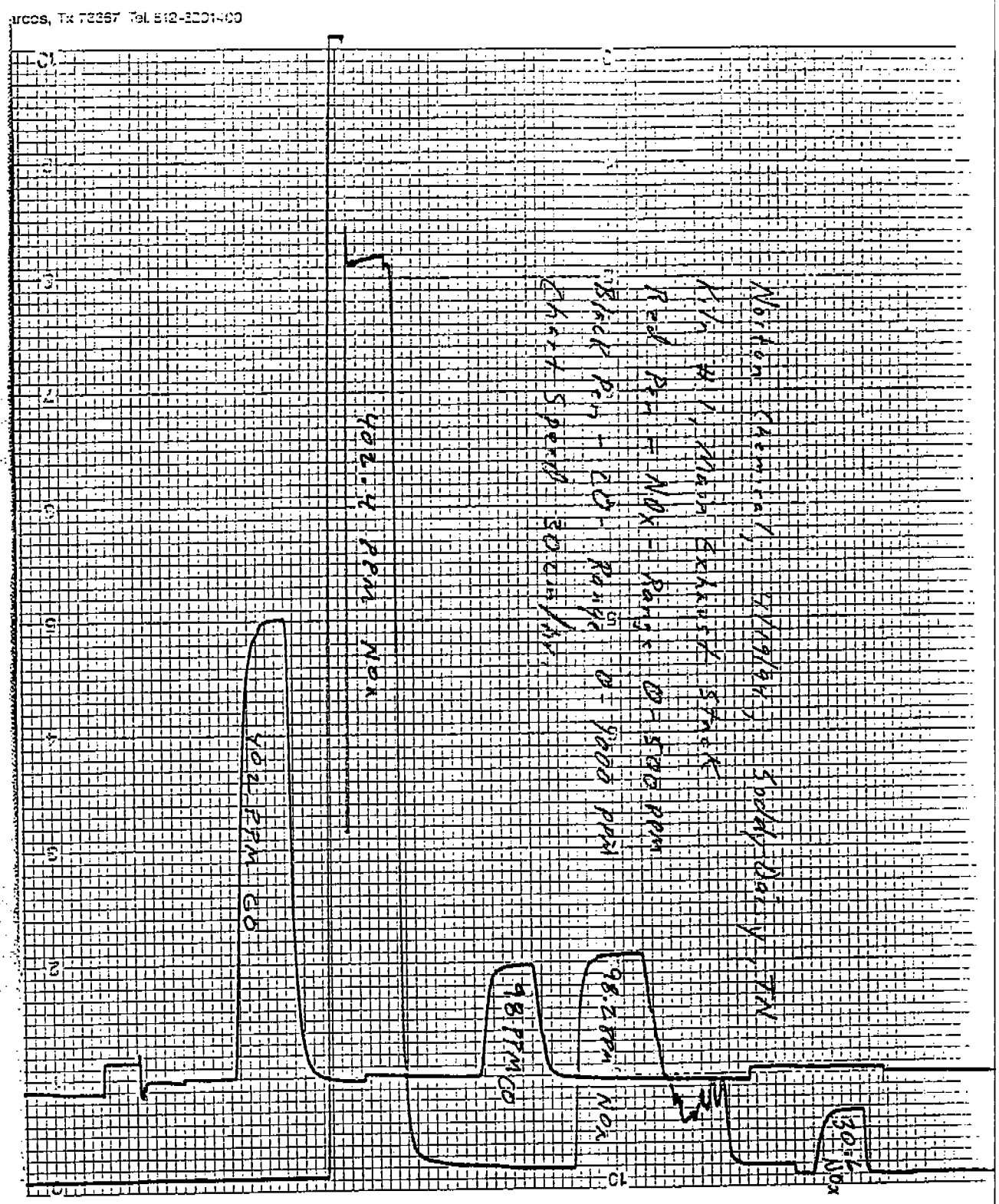


NORTON CHEMICAL 4-19-94
SODDY DAISY, TN
KILN #1 - NOx, CO

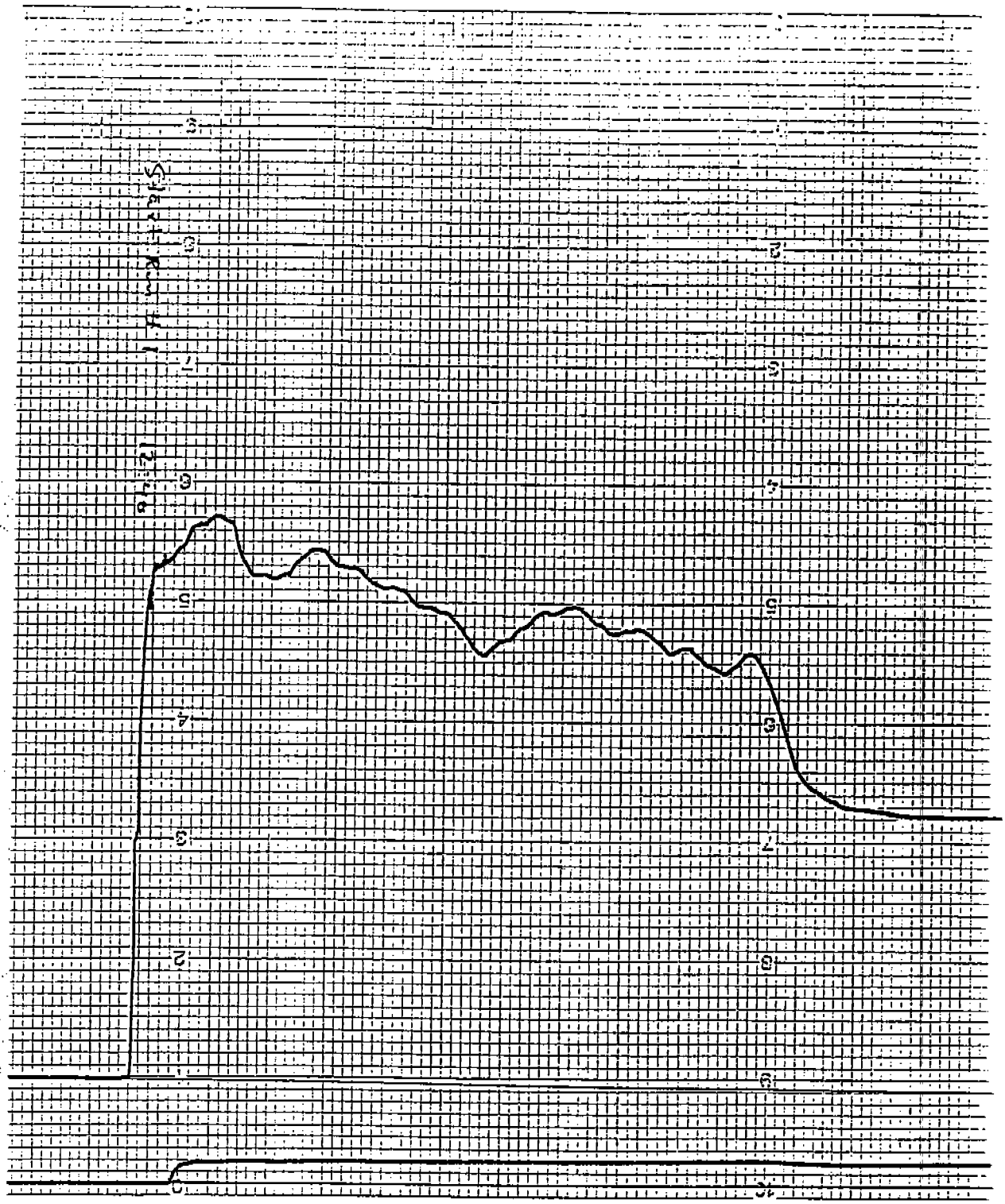
Run #1 (12:40 - 1:40)		Run #2 (2:24 - 3:24)				Run #3 (4:00 - 5:00)	
NOx	CO	NOx		CO		NOx	CO
2	47	1	1.2	15	9	1	10
2	42	1	1.2	15	9	1	9
2	44	1.2		14	10.09	1	9
2	41	1.2	1.209	12		1	9
2	39	1.5		12		1	9
2	37	1.5		12		1	9
2	40	1.5		11		1	9
2	39	1.5		12		1	9
2	37	1.5		11		1	9
10 2	36	1.2		10		1	9
2	27	1.2		10		1	9
2	24	1.2		10		1	9.5
2	23	1.2		10		1	9.5
2	23	1		9		1	9.5
2	23	1		9		1	9
2	23	1		8		1	9.5
2	23	1		9		1	9.5
1.5	20	1.2		9		1	9
2	20	1.2		9		1	9
20 2	19	1.2		9		1	9
2	19	1.2		8		1	9
2	18	1.2		9		1	9
2	18	1.2		9		1	10
2	17	1.2		9		1	10
2	17	1.2		9		1	11
2	17	1.2		9		1	10
2	17	1.2		9		1	10
2	19	1.2		9		1	9
2	18	1.2		9		1	8
30 2		1.2		9		1	8.983
1.98	27.14						
5.564	10.05	5.510		9.925		5.564	9.8
11.02	272.7	6.661		100.1		5.564	88.03 PPM

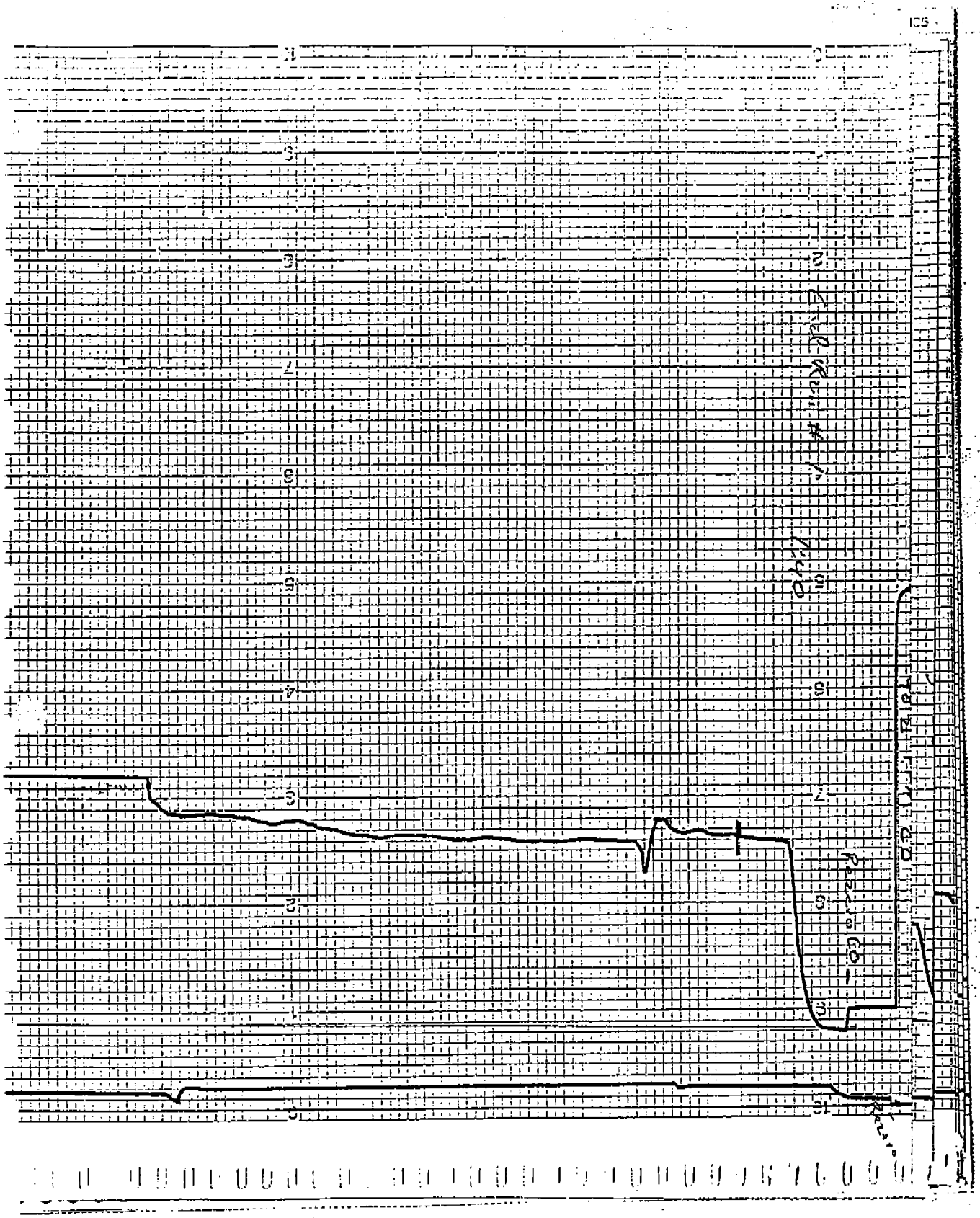
NORTON CHEMICAL 4-20-94
SOCOY DAISY, TN KILN # 2 - NOx, CO

Run #1 10:40 - 11:40		Run #2 12:14 - 1:14		Run #3 1:44 - 2:44	
NOx	CO	NOx	CO	NOx	CO
1	4	1	3	1	3
	4		3		3
	4		3		3
	4		3		3
	4		3		3
	4		3		3
	4		3		3
	4		3		3
	4		3		2.5
	4		3		2.5
	4		3		3
	4		3		3
	3		3		3
	3		3.5		3
	3		3.5		3
	3		3.5		3
	3		3.5		3
	3		3.5		3
	3		3.5		3
	3		3.5		3
	3		3.5		3
	3		3.5		3
	3		3.5		3
	3		3.5		3
	3		3		5
	3		3		5
	3		3		20
	3		4		34
	3		4		52
	2		4		60
	2		3		55
1	3.333	1	3.267	1	9.967
5.10	6.444	5.10	5.301	5.10	5.444
5.10	18.15	5.10	17.32	5.10	54.26



Norton Chemical, 4/19/94, Soddy Daisy, TN
Kiln #1, Main Exhaust Stack
Red Pen - NOx - Range 0-500 PPM
Black Pen - CO - Range 0-9000 PPM
Chart Speed 30 cm/hr
402.4 PPM NOx
402 PPM CO
98 PPM CO
98.2 PPM NOx
30.6 NOx





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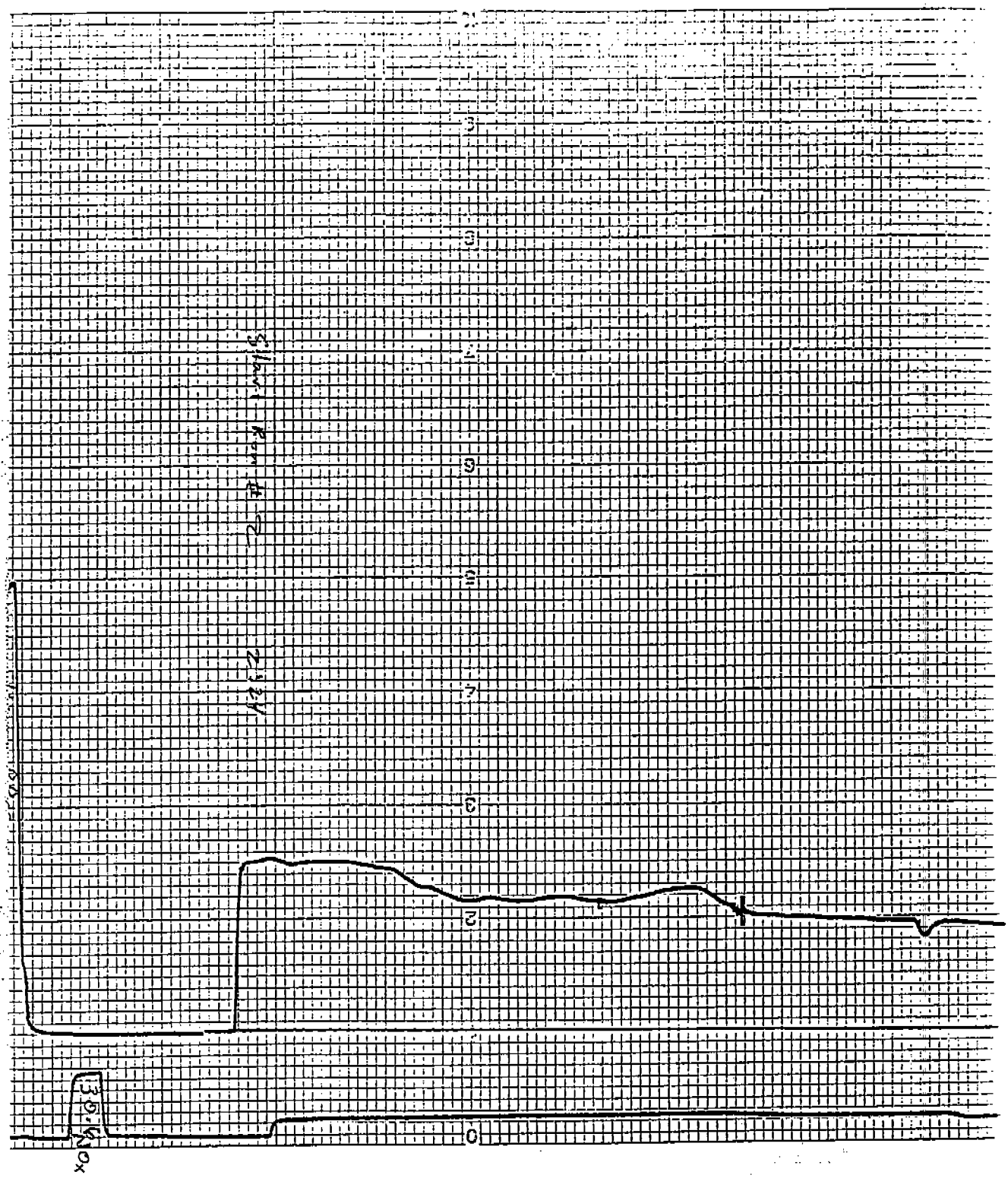

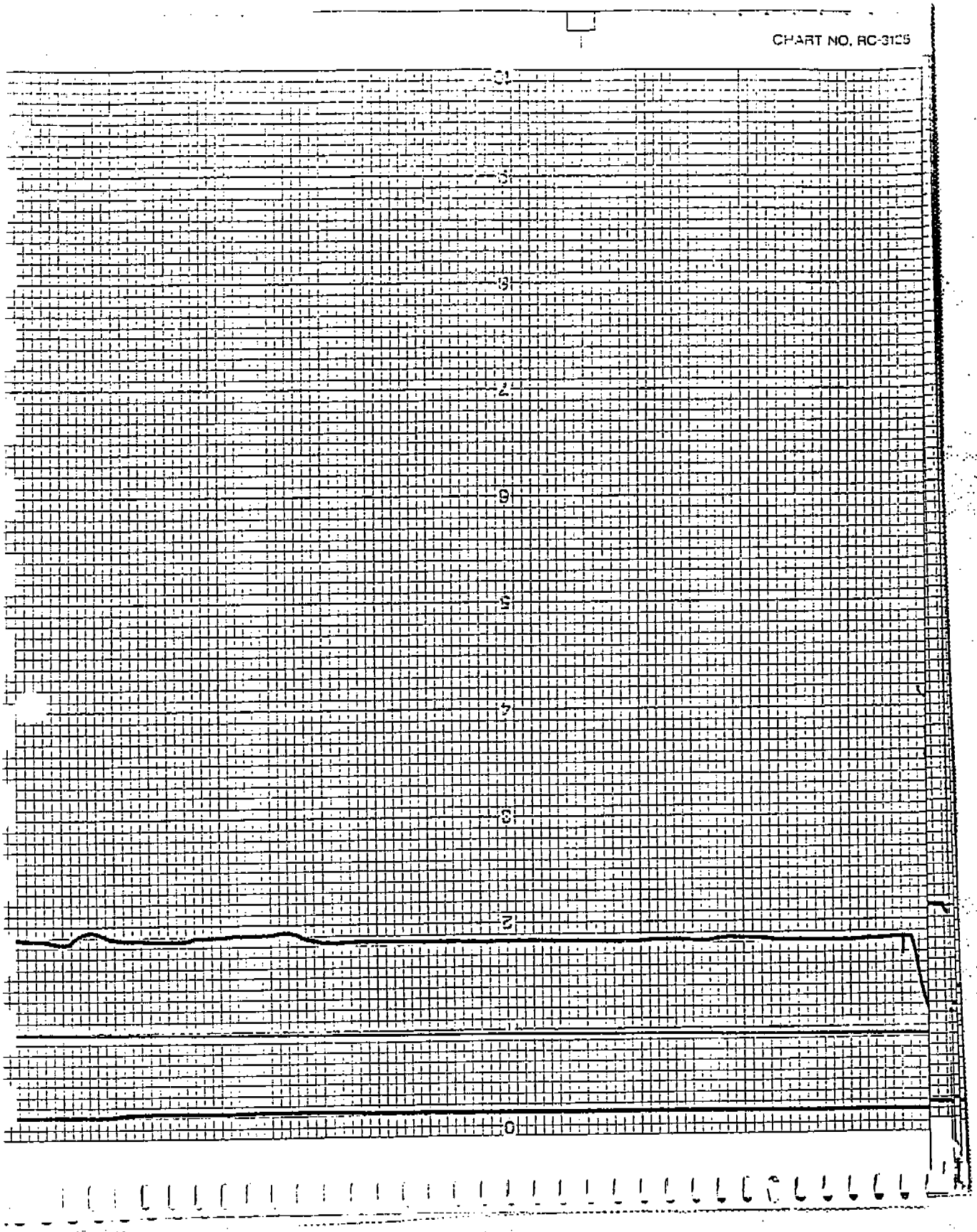
CHART NO. RC-3125
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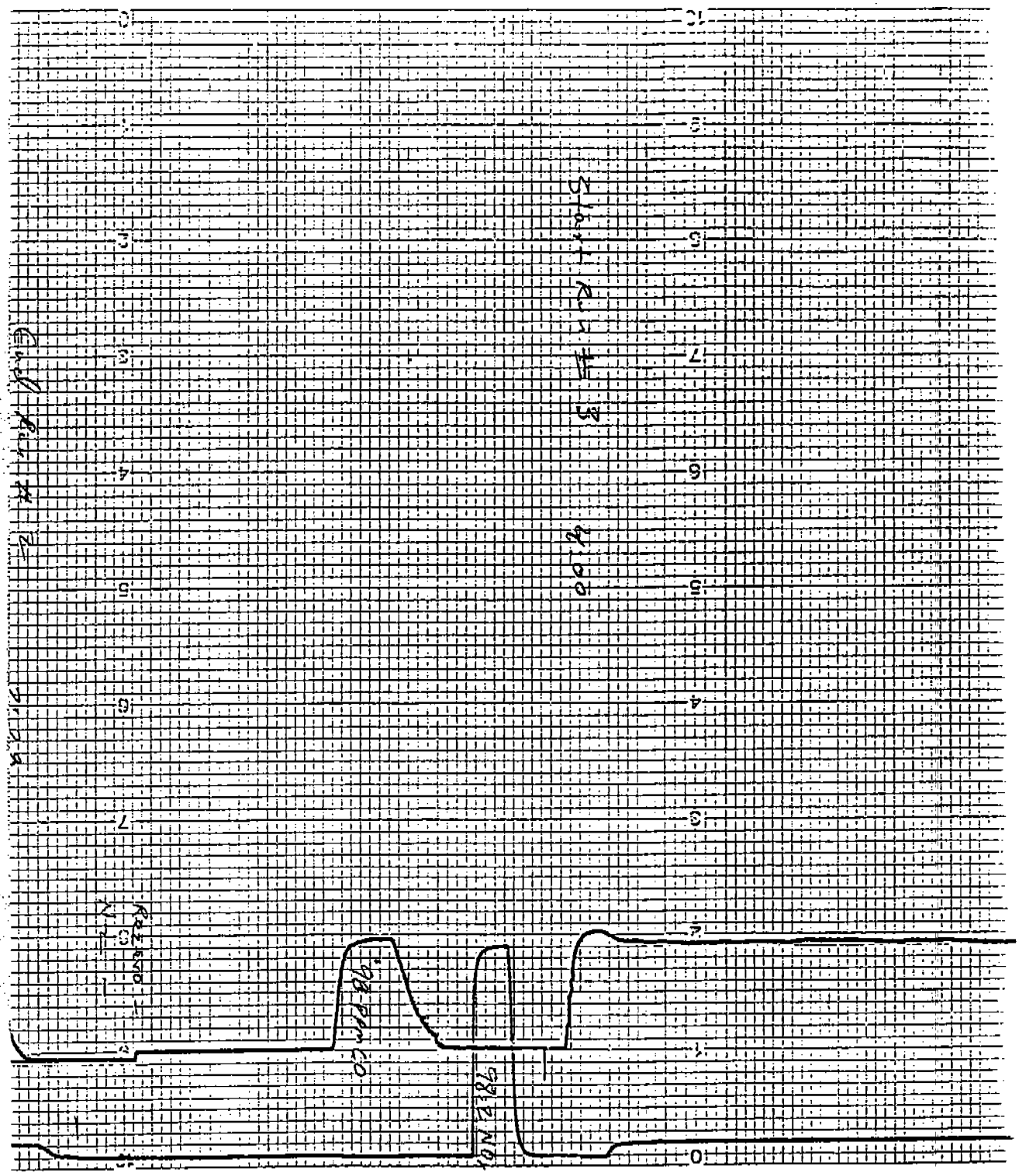
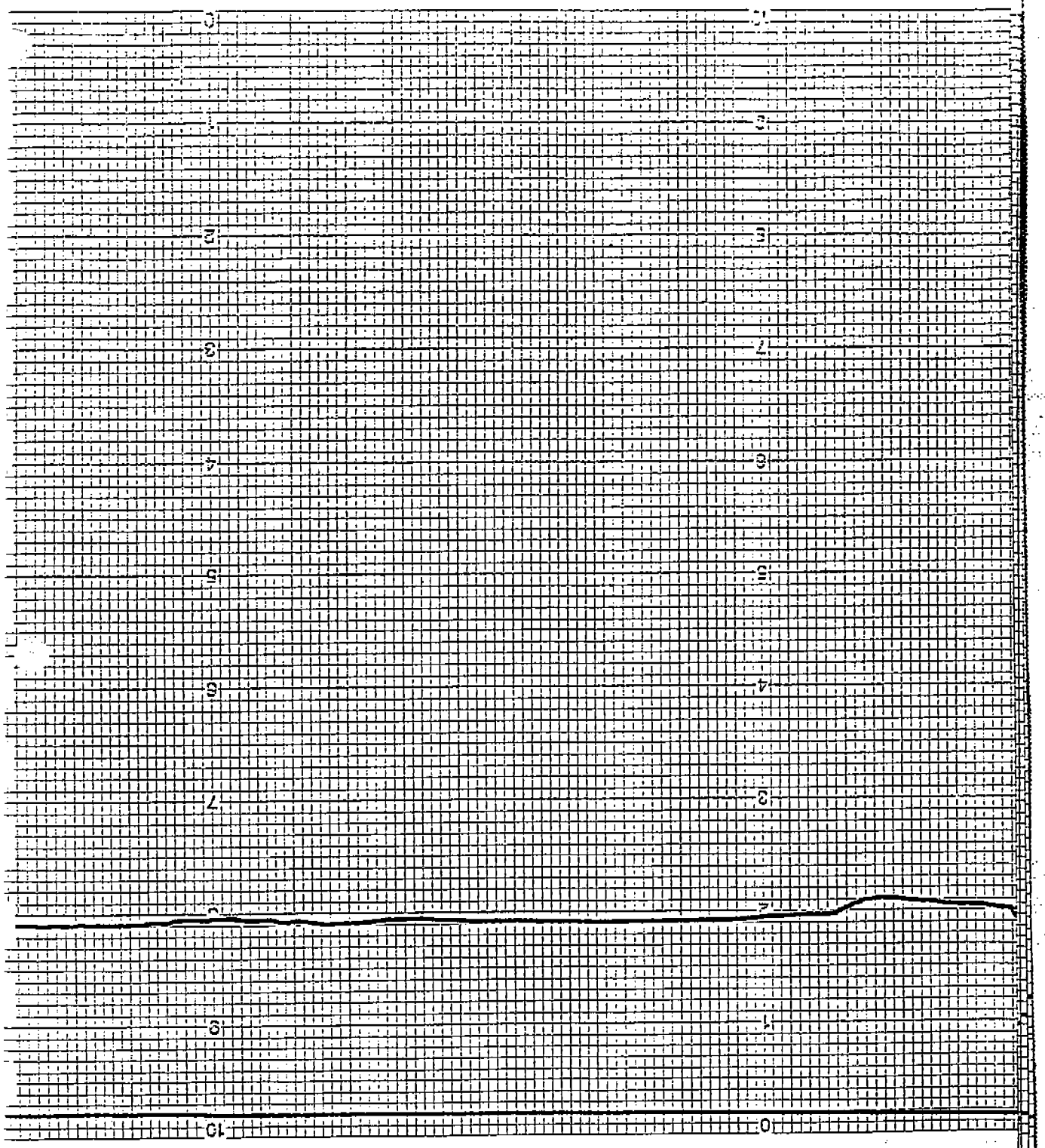
7
6
5
4
3
2
1
0


Start Run # 3
Cold Run # 2
Rezero
98 ppm CO
98.2 NOx


0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6
7
8
9
10

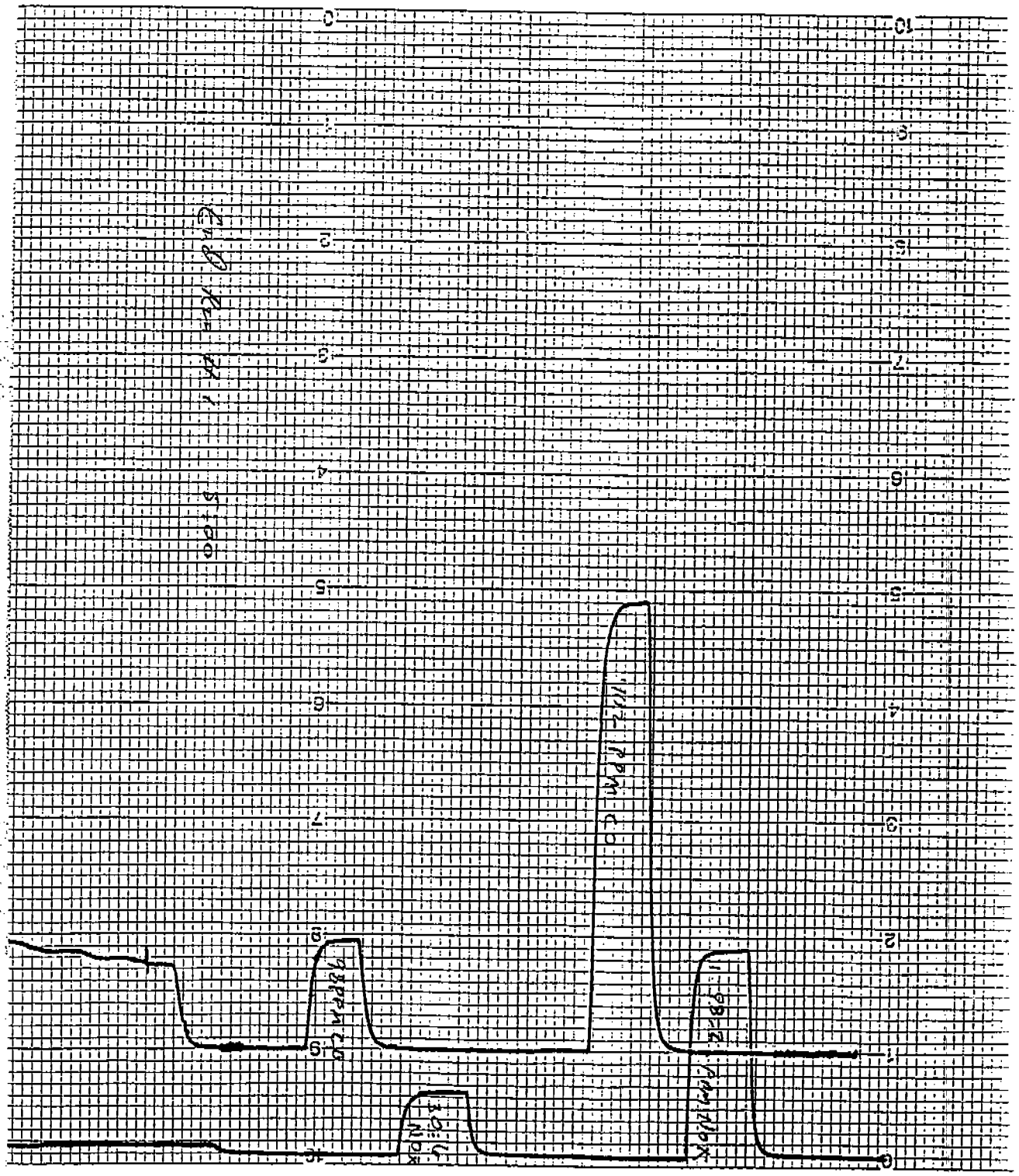
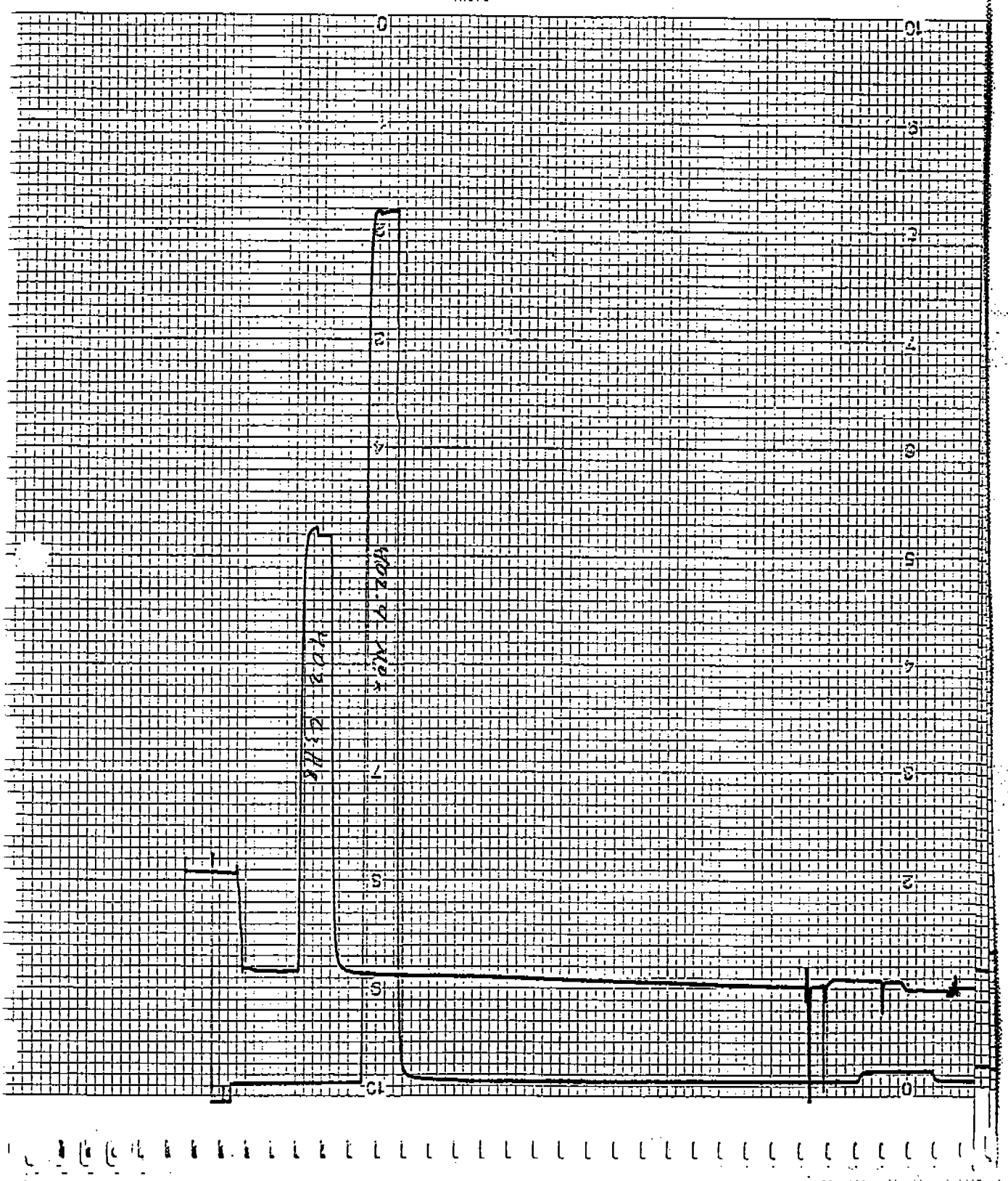
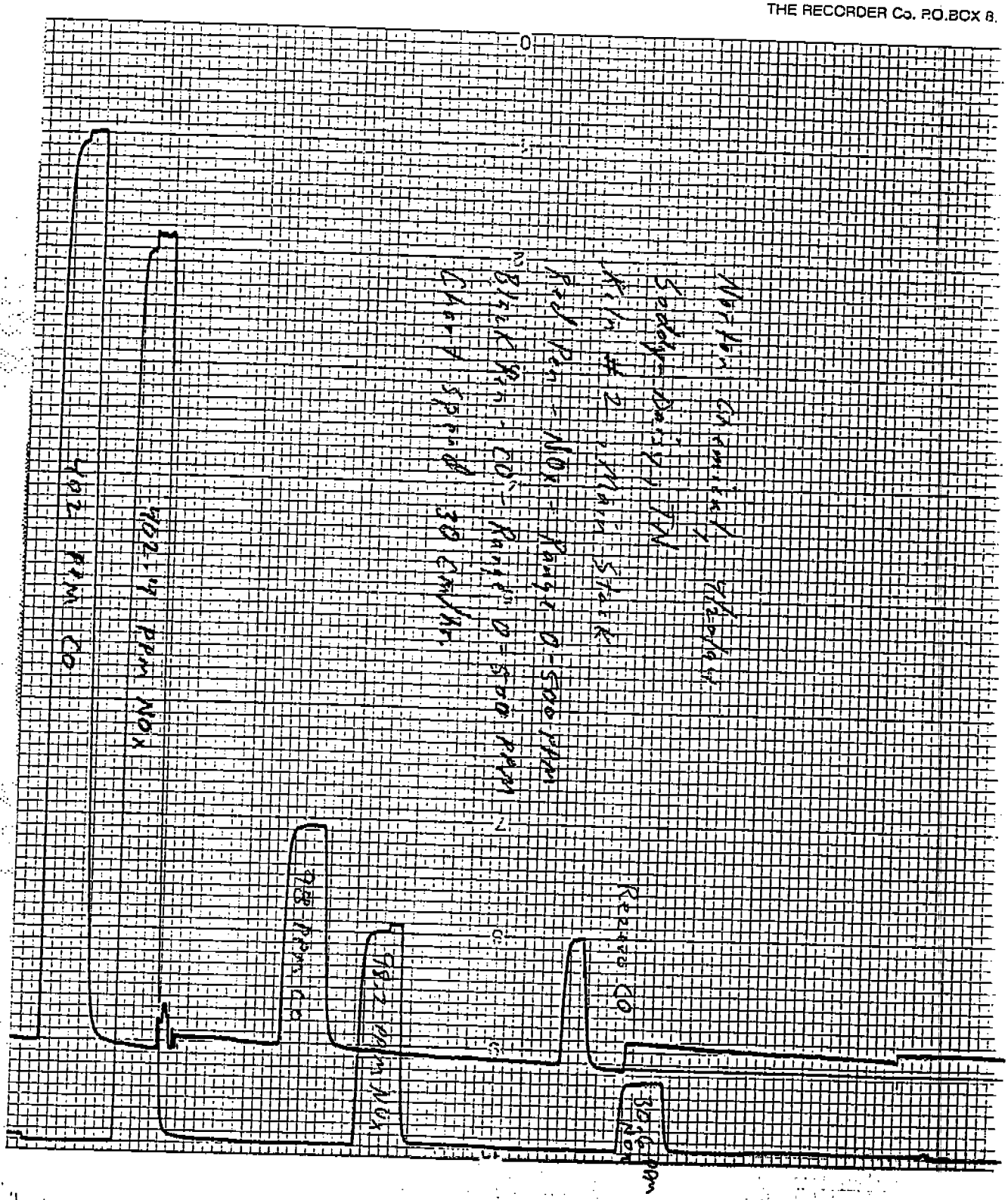


CHART NO. RC-3105

A1092



THE RECORDER Co. P.O.BOX 8.



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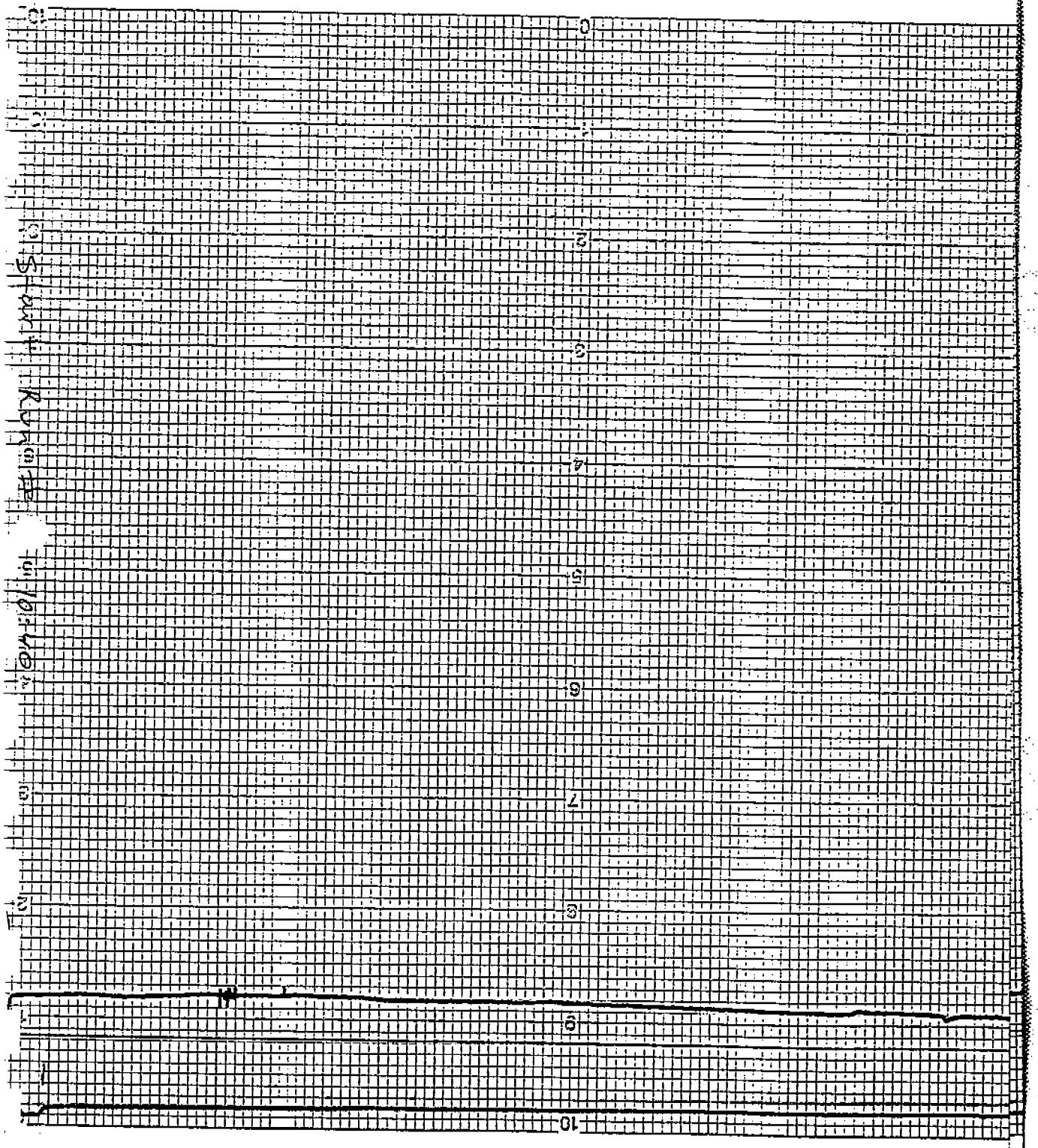
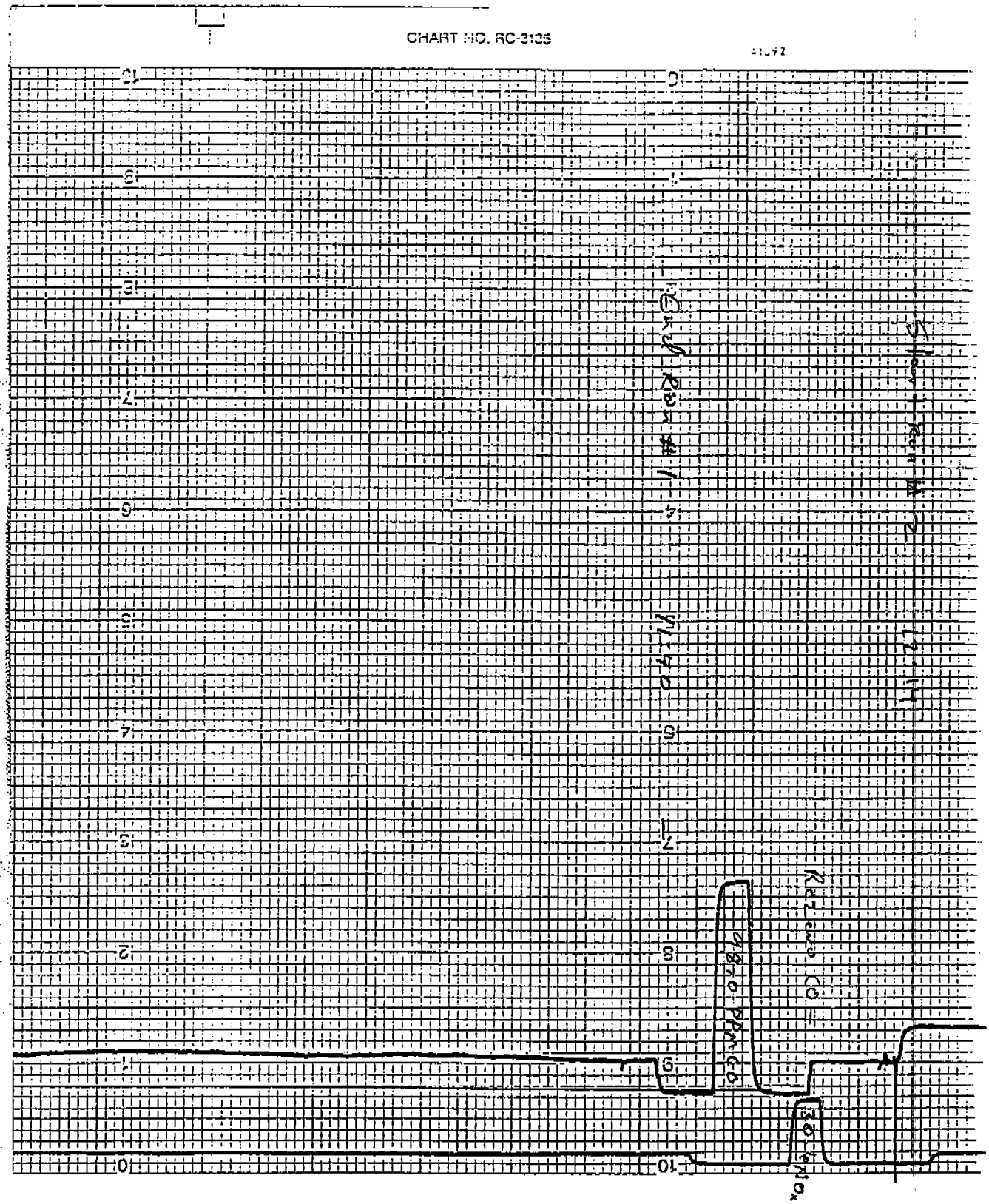
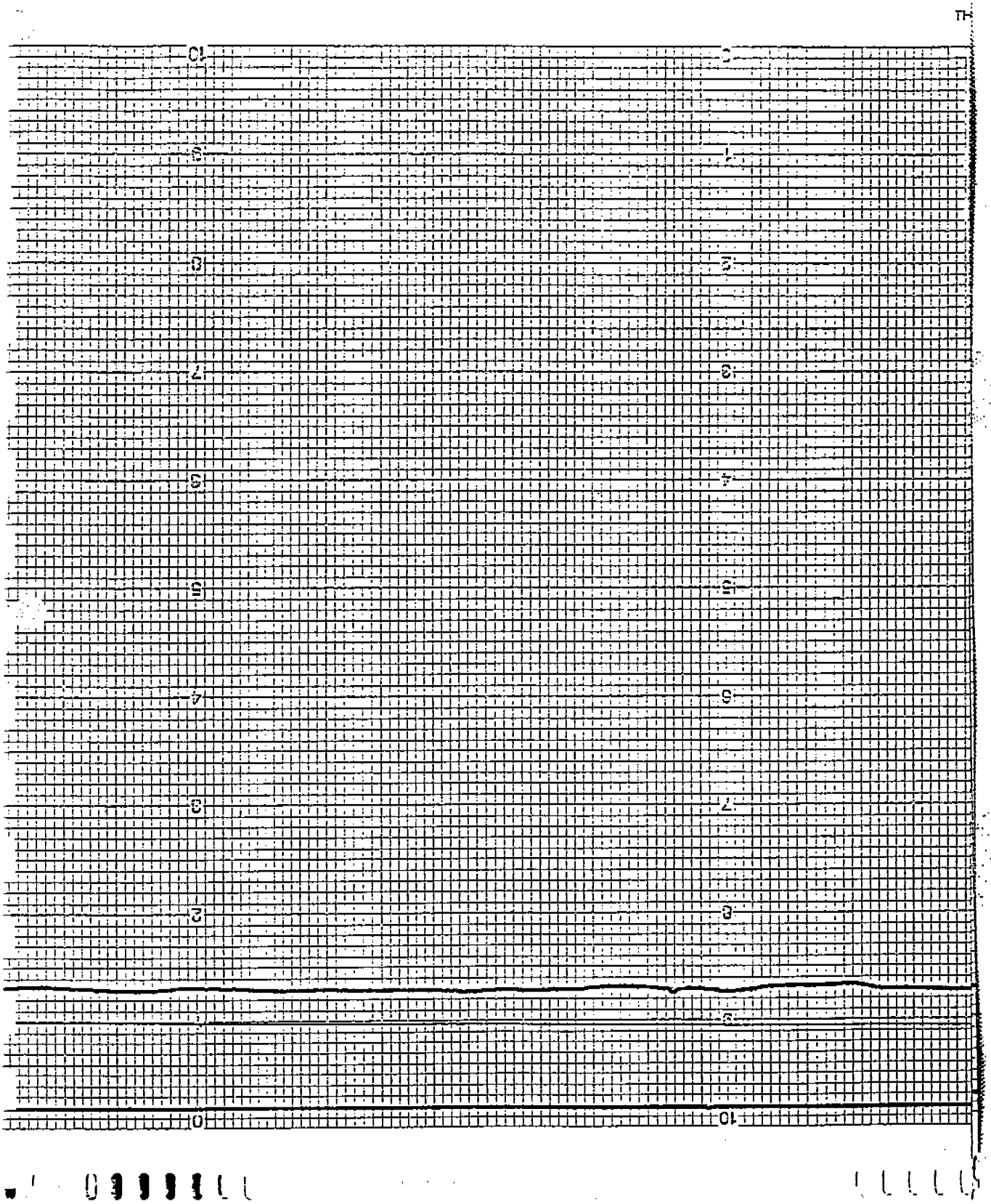
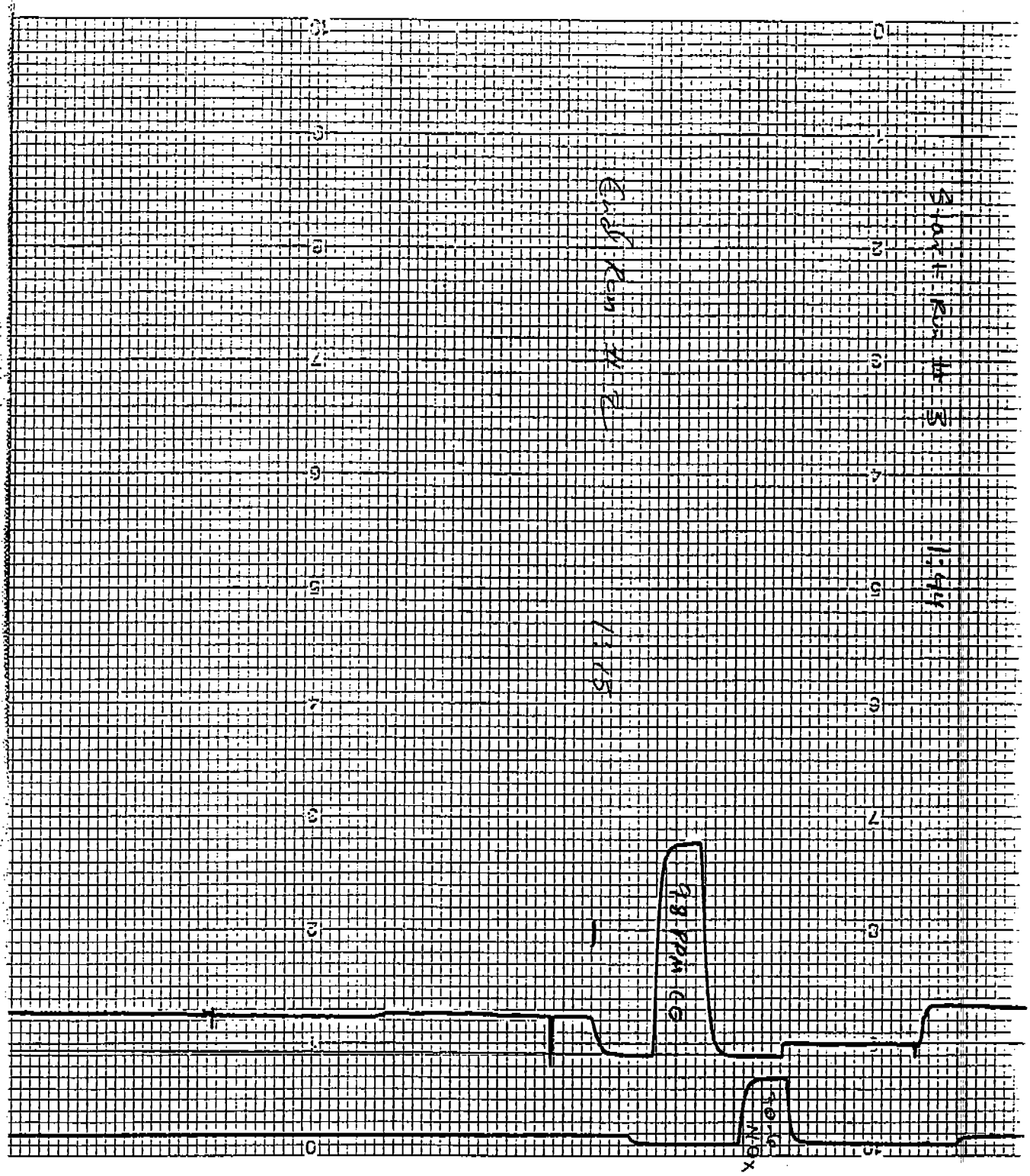


CHART NO. RC-3135





IE RECORDER Co. P.O.BOX 8, San Marcos, Tx 73667 Tel. 512-3291400



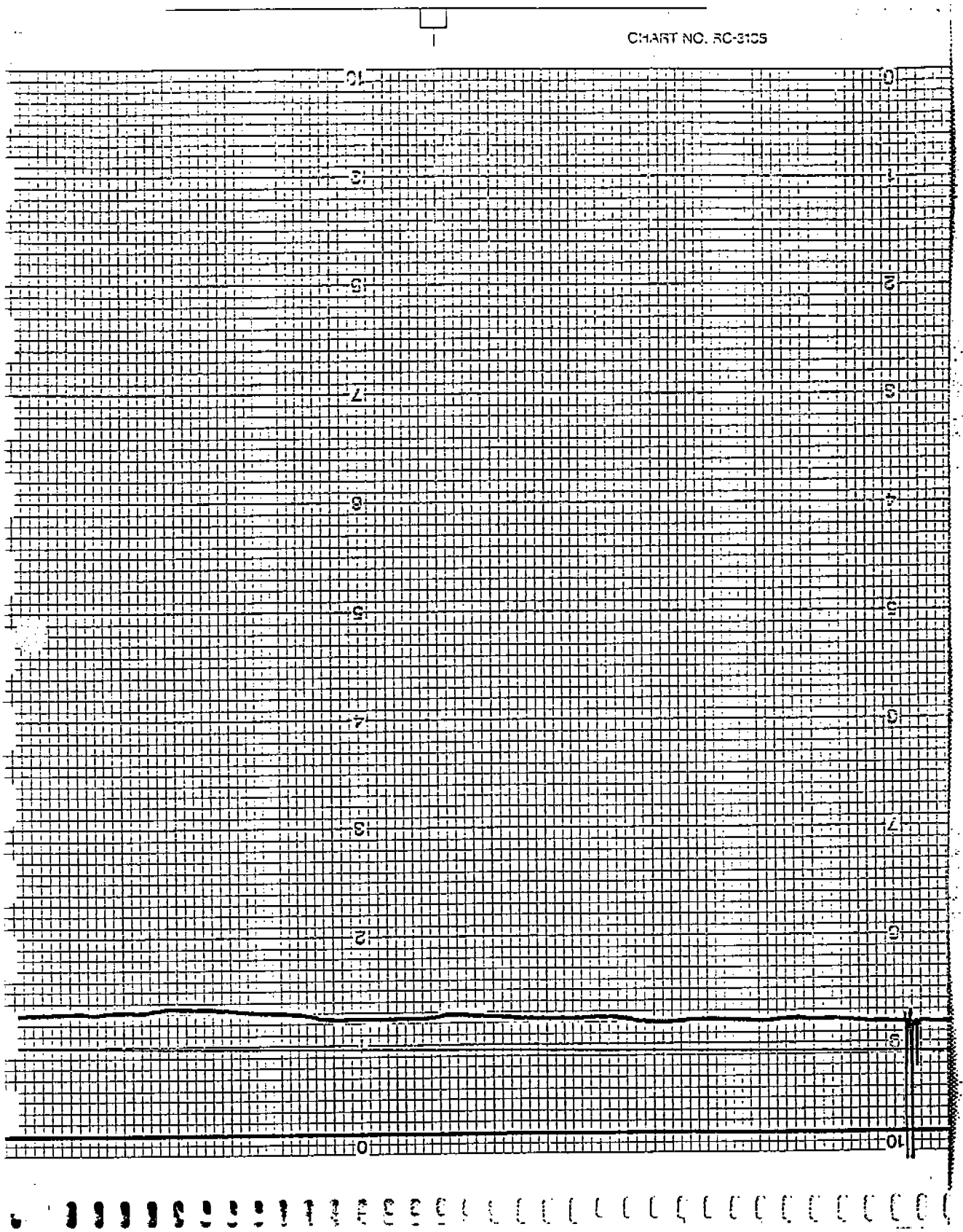
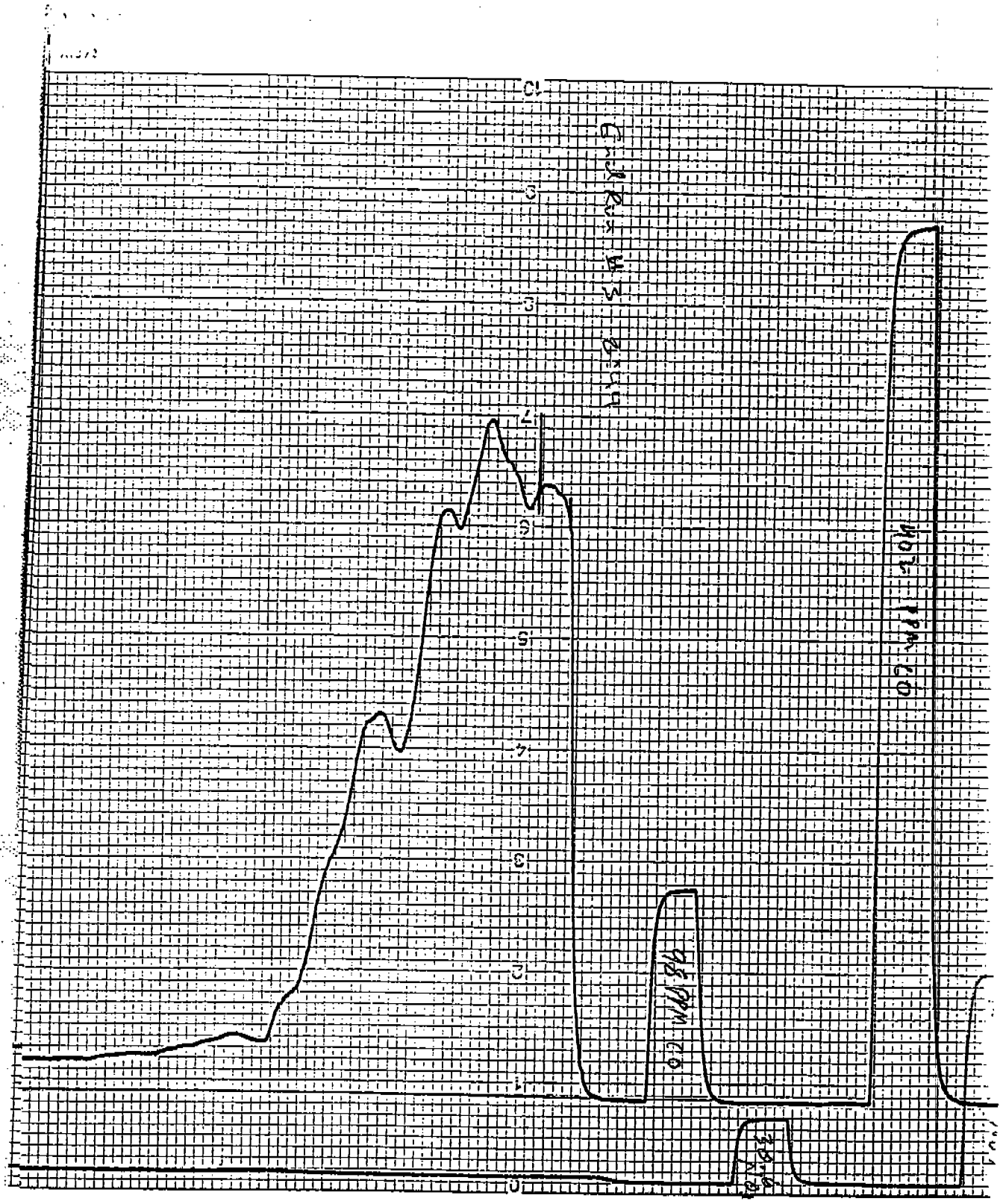
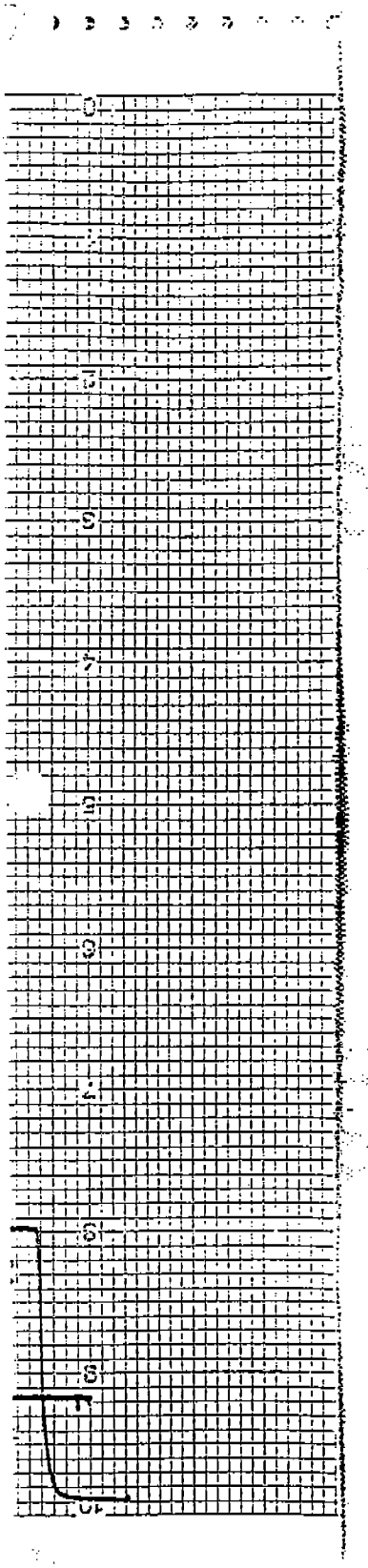


CHART NO. RC-3105





APPENDIX D

PARTICULATE FIELD DATA

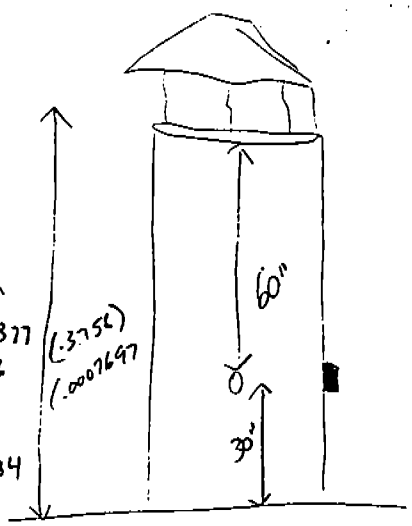
.75
2.1
4.2
6.3
9.0
12.8
23.18
27
29.6
31.7
33.6
33.24

0: 2.148
1: 2.915
2: 2.5

PLANT: Norton
DATE: 4-19-94
REPETITION: 1

LOCATION: Kiln #1
OPERATOR: JS
STACK #: Main Ex.
SAMPLE BOX #: 9
METER BOX #: 9
AMBIENT TEMPERATURE: 75°
BAROMETRIC PRESSURE: 29.6
ASSUMED MOISTURE: 10%
PROBE LENGTH: 6-48"
NOZZLE IDAMETER: .374, .376, .377
STACK DIAMETER: 36" (1.0686
METER H : 1.654443
C FACTOR: .84
METER CO-EFFICIENT: .9951534

(.3756)
(.0007697



IMPINGERS

	Initial	Final
#1:	100 ml H2O	111
#2:	100	110
#3:	–	
#4:	200 grms S.G	210.0
#5:		31

COMMENTS

CO_2	O_2
2.5%	20.5%

FILTER TARE: .45075

PRE-TEST LEAK CHECK
Meter: 0.00 cu. ft. .15 in. HG
Pitots: ✓ .85 in. H20
.75

POST-TEST LEAK CHECK
Meter: 0.00 ✓ cu.ft. 7 in. HG
Pitots: in. H20

P #	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VA (IN Hg
B1	12:44	-.08	280	.14	.23	1.8	688.592	97	97	255	60	2
2			281	.17	.19	2.2	690.6	99	98	260	60	2
3			277	.21	.21	2.8	692.8	99	98	258	61	2
4			280	.17	.21	2.2	695.2	100	98	257	61	2
5			273	.12	.18	1.6	697.4	101	98	245	61	2
6			278	.11	.15	1.4	699.3	102	99	251	61	2
7			269	.04	.05	.53	701.1	102	99	250	61	1
8			273	.03	.05	.40	702.2	101	99	258	61	1
9			270	.03	.02	.40	703.1	101	99	261	61	1
10			273	.04	.02	.53	704.0	101	99	257	61	1
11			269	.02	.02	.26	705.1	102	99	254	61	1
12			251	.02	.02	.26	705.8	102	100	255	61	1
B1			281	.24	.14	3.2	706.658	102	100	260	62	3
2			279	.20	.15	2.6	709.2	104	101	261	62	2
3			278	.21	.13	2.8	711.9	105	101	257	63	3
4			264	.20	.13	2.6	714.1	105	101	255	63	3
5			273	.17	.12	2.2	716.5	105	102	261	63	3
6			276	.16	.10	2.1	718.7	105	102	261	63	3
7			274	.06	.06	.80	720.9	105	102	251	63	1
8			268	.05	.05	.67	722.2	104	102	253	63	1
9			270	.03	.03	.40	723.4	104	102	251	63	1
10			273	.02	.035	.26	724.3	104	102	249	63	1
11			269	.015	.03	.20	725.1	104	101	245	63	1
12			263	.02	.02	.26	725.7	103	101	250	63	1
						100	726.538					
AV			272.6	.2944	.2894	1.303	37.946		101.2			

PARTICULATE FIELD DATA

PLANT: Norton
DATE: 4-19-94
REPETITION: 2

2.246

LOCATION: Kiln #1
OPERATOR: J. Salinas
STACK #: Main Ex
SAMPLE BOX #: 9
METER BOX #: 9
AMBIENT TEMPERATURE: 80°
BAROMETRIC PRESSURE: 29.6
ASSUMED MOISTURE: 10%
PROBE LENGTH: C-48"
NOZZLE IDAMETER: 3/16"
STACK DIAMETER: 36"
METER H : 1.654443
C FACTOR: .84
METER CO-EFFICIENT: .9951534

FILTER TARE: .45233

PRE-TEST LEAK CHECK
Meter: 0.00 cu. ft. 15 in. HG
Pitots: ✓ in. H2O

IMPINGERS

	Initial	Final
#1:	100 mls H_2O	112
#2:	100	108
#3:	—	
#4:	200 grms S.Gel	209.2
#5:		29.2

COMMENTS

CO_2	O_2
0%	20%

POST-TEST LEAK CHECK
Meter: 0.04 cu.ft. 5 in. HG
Pitots: ✓ in. H2O

P	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VA CIN He
A1	2:23		264	.21		2.8	726.949	97	98	249	65	2
2			273	.24		3.2	29.4	96	97	250	64	2
3			270	.22		2.9	32.0	98	96	256	64	2
4			269	.23		3.0	34.5	98	96	249	64	3
5			269	.20		2.6	37.1	99	97	245	64	2
6			268	.16		2.1	39.5	100	97	258	64	2
7		-.10	267	.09		1.0	41.6	100	97	251	64	1
8			265	.07		.94	43.2	99	97	252	64	1
9			266	.065		.95	44.6	99	97	249	64	1
10			265	.04		.58	46.0	100	97	254	64	1
11			256	.04		.58	47.1	99	97	250	64	1
12			258	.03		.44	48.3	100	97	253	64	1
B1			278	.10		1.4	749.273	100	98	251	64	2
2			273	.12		1.7	51.0	101	98	249	65	2
3			275	.15		2.2	52.9	102	98	246	65	3
4			273	.13		1.9	55.1	103	99	248	65	2
5			274	.10		1.4	57.1	103	99	252	65	2
6			272	.09		1.3	58.9	103	99	253	65	2
7			274	.07		1.0	60.6	103	100	248	65	2
8			270	.08		1.1	62.1	104	100	251	65	1
9			268	.05		.73	63.7	104	100	255	65	1
10			267	.09		1.3	64.9	104	100	257	65	2
11			266	.11		1.6	66.6	105	100	251	64	2
12			264	.10		1.4	68.5	105	101	246	64	2
	3:23					101	770.305					
AV							43.356					

PARTICULATE FIELD DATA

PLANT: Norton
DATE: 4-19-94
REPETITION: 3

LOCATION: Kiln #1
OPERATOR: J.S
STACK #: Main Ex
SAMPLE BOX #: 9
METER BOX #: 9
AMBIENT TEMPERATURE: 85°
BAROMETRIC PRESSURE: 29.6
ASSUMED MOISTURE: 10%
PROBE LENGTH: C-4
NOZZLE DIAMETER: 3/8"
STACK DIAMETER: 36.0
METER H : 1.654443
C FACTOR: .84
METER CO-EFFICIENT: .9951534

IMPINGERS

	Initial	Final
#1:	100	113
#2:	100	106
#3:	—	
#4:	200 grms S.G	209.8
#5:		
		28.8

mls H_2O

COMMENTS

CO_2 0% O_2 16%

FILTER TARE: .45106

PRE-TEST LEAK CHECK
Meter: 0.00 cu. ft. .15 in. HG
Pitots: ✓ .75 in. H2O
.65

POST-TEST LEAK CHECK
Meter: 0.00 cu.ft. 7 in. HG
Pitots: ✓ in. H2O

P #	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM Hg
A1	3:59		284	.21		3.0	770.752	98	97	249	65	3
2			286	.25		3.6	773.3	100	99	245	65	3
3			287	.26		3.8	76.1	101	99	248	65	3.5
4			287	.26		3.8	79.0	102	99	256	65	3.5
5		F.14	284	.25		3.6	81.8	102	99	254	65	3
6			283	.20		2.9	84.6	101	99	250	65	3
7			280	.09		1.3	87.2	101	99	256	65	2
8			277	.07		1.0	88.8	101	99	251	65	2
9			273	.06		.88	90.3	101	98	252	65	2
10			271	.05		.73	91.7	101	98	258	65	1
11			260	.03		.44	93.0	101	98	255	65	1
12			261	.03		.44	93.9	101	98	255	66	1
B1	4:~~29~~ 4:29		270	.11		1.6	794.953	101	99	251	65	2
2			272	.13		1.9	796.8	102	99	256	65	3
3			272	.13		1.9	798.8	103	99	254	65	3
4			271	.14		2.0	800.8	103	100	248	65	3
5			268	.135		1.9	802.9	104	100	258	65	3
6			268	.17		2.4	805.0	104	100	251	65	3
7			260	.165		2.4	807.3	105	100	250	65	3
8			259	.15		2.2	809.6	105	101	249	65	3
9			257	.15		2.2	811.7	105	101	253	65	3
10			264	.15		2.2	813.9	105	101	251	65	3
11			262	.15		2.2	816.1	104	102	250	65	3
12			256	.14		2.0	818.3	104	101	248	65	3
						102	820.424					
AV							49.042					

PARTICULATE FIELD DATA

PLANT: Norton
DATE: 4-19-94
REPETITION: 1

0 - 0.389995
1 - 2.9216
2 - 2.5

LOCATION: Sedgy Daisy
OPERATOR: MT
STACK #: Kiln #1, Dryer Ex.
SAMPLE BOX #: 10
METER BOX #: 10
AMBIENT TEMPERATURE: 75°
BAROMETRIC PRESSURE: 29.6
ASSUMED MOISTURE: 2%
PROBE LENGTH: 5'
NOZZLE IDAMETER: .249, .249, .248 (.24866) (.0003373)
STACK DIAMETER: 31.5"
METER H : 1.658334
C FACTOR: .84
METER CO-EFFICIENT: .9971648

IMPINGERS

	Initial	Final
#1:	100 ml H_2O	98
#2:	100	104
#3:	—	
#4:	200 grms S.G	212.9
#5:	—	
		14.9

COMMENTS

CO_2	O_2
0%	21%

FILTER TARE: .45306

PRE-TEST LEAK CHECK
Meter: 0.001 cu. ft. 15 in. HG
Pitots: ✓ in. H20

POST-TEST LEAK CHECK
Meter: 0.001 cu. ft. 5 in. HG
Pitots: ✓ in. H20

ΔP / ΔH

P #	Θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM (IN Hg)
A1	12:45	+.015	114	.56		2.1	41.061	79	80	250	60°	3
2	47.5		114	.59		2.3	43.2	82	80	256	60	3
3	50		114	.57		2.2	45.4	84	81	250	60	3
4	52.5		114	.57		2.2	47.6	85	81	250	59	3
5	55		114	.59		2.3	49.7	85	83	250	59	3
6	57.5		115	.48		1.8	51.9	87	84	250	59	3
7	1:00		114	.48		1.8	53.9	87	83	250	59	3
8	02.5		111	.46		1.8	55.9	89	84	250	59	3
9	05		111	.45		1.7	57.9	93	88	250	59	3
10	*07.5		114	.45		1.7	59.8	93	88	247	59	3
11	10		110	.41		1.6	61.7	93	88	257	59	3
12	12.5		116	.30		1.2	63.6	93	88	254	59	3
B1	12:15/12:1		117	.33		1.3	965.131	93	88	250	59	3
2	17.5		117	.43		1.6	66.8	94	89	256	59	3
3	20		117	.49		1.9	68.7	94	89	256	59	3
4	22.5		116	.52		2.0	70.7	94	90	253	59	3
5	25		116	.53		2.0	72.7	94	90	250	59	3
6	27.5		115	.49		1.9	74.8	94	90	251	59	3
7	30		115	.22		.85	76.8	94	90	250	60	3
8	32.5		115	.24		.90	78.1	94	90	250	60	3
9	35		115	.39		1.5	79.5	94	90	249	60	3
10	37.5		115	.32		1.2	81.4	94	90	249	60	3
11	40		115	.30		1.1	83.0	94	90	245	60	3
12	42.5		115	.29		1.1	84.6	94	90	240	60	3
	1:45						986.121					
Av			114.5				45.060		92.46			

T12129

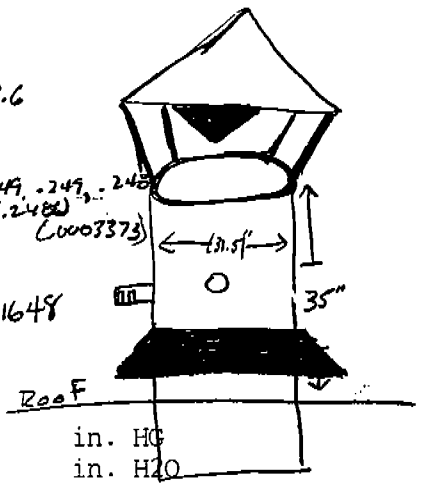
PARTICULATE FIELD DATA

PLANT: Norton
DATE: 4-19-94
REPETITION: 2

1.20
100.4

LOCATION: Soddy Daisy
OPERATOR: MT
STACK #: Kiln #1, Dryer Ex.
SAMPLE BOX #: 9
METER BOX #: 10
AMBIENT TEMPERATURE: 80°
BAROMETRIC PRESSURE: 29.6
ASSUMED MOISTURE: 1%
PROBE LENGTH: 5'
NOZZLE IDAMETER: 1/4" .249, .249, .248 (.2486) (.0003373)
STACK DIAMETER: 31.5"
METER H : 1.658334
C FACTOR: .84
METER CO-EFFICIENT: .9971648

D: 1.14782
I: 2.9216



IMPINGERS

	Initial	Final
#1	100 mls	105 mls
#2	100 mls	101 mls
#3	—	
#4	200g. SG.	
#5		

H_2O

209.4
13.4

COMMENTS

CO_2	O_2
0%	21%

FILTER TARE: .44800

PRE-TEST LEAK CHECK
Meter: 0.001 cu. ft. 15" in. HG
Pitots: ✓ in. H2O

POST-TEST LEAK CHECK
Meter: 0.000 cu.ft. 5" in. HG
Pitots: ✓ in. H2O

P #	Θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM (IN Hg)
1	2:25		115°	.34		1.3	986.760	93	93	250	58	3
2	27.5		115	.45		1.7	88.4	93	93	250	58	3
3	30		116	.50		1.9	90.35	94	93	250	58	3
4	32.5		116	.54		2.0	92.4	94	93	250	58	3
5	35		117	.52		2.0	94.5	95	92	248	58	3
6	37.5		116	.49		1.8	96.5	96	93	250	58	3
7	40		116	.23		.88	98.6	96	93	252	58	3
8	42.5		116	.22		.85	99.9	97	93	256	58	3
9	45		116	.38		1.4	001.3	97	94	250	57	3
~~10~~	47.5		116	.33		1.2	003.06	97	94	252	58	3
11	50		116	.34		1.3	004.7	97	94	250	54	3
12	52.5		117	.32		1.2	006.4	98	94	250	58	3
1	55		117	.58		2.2	008.0	98	94	252	58	3
2	57.5		117	.62		2.4	10.2	100	95	250	58	3
3	3:00		116	.58		2.2	12.4	100	95	252	58	3
4	02.5		116	.57		2.1	14.6	101	96	250	58	3
5	05		116	.60		2.3	16.8	102	97	249	58	3
6	07.5	+.23	117	.51		1.9	19.0	102	97	250	58	3
7	10		117	.45		1.7	21.0	103	98	250	58	3
8	12.5		117	.47		1.8	23.0	103	98	249	58	3
9	15		117	.48		1.8	24.9	103	98	250	57	3
10	17.5		117	.45		1.7	26.9	103	100	249	58	3
11	20		117	.40		1.5	28.8	103	100	250	59	3
12	22.5		116	.33		1.27	30.7	103	100	245	59	3
	3:25					104	032.347					
AV			116.3	.6619		1.683	45.587		96.98			

PARTICULATE FIELD DATA

PLANT: NORTON
DATE: 4.19.94
REPETITION: 3

LOCATION: Soddy Daisy
OPERATOR: MT
STACK #: Kiln #1, Dryer Ex
SAMPLE BOX #: 9
METER BOX #: 10
AMBIENT TEMPERATURE: 80°
BAROMETRIC PRESSURE: 29.6
ASSUMED MOISTURE: 1%
PROBE LENGTH: 5'
NOZZLE IDAMETER: 1/4", .249, .248, .249 (24866)
STACK DIAMETER: 31.5
METER H: 1.658334
C FACTOR: .84
METER CO-EFFICIENT: .9971648

150°
99%

IMPINGERS

	Initial	Final
#1:	100	100
#2:	100	98
#3:	—	
#4:	200g 5.6	205.6
#5:		3.6

ml H_2O

COMMENTS

CO_2 0% O_2 18%

FILTER TARE: .45725

PRE-TEST LEAK CHECK
Meter: 0.000 cu. ft. 15 in. HG
Pitots: ✓ in. H2O

POST-TEST LEAK CHECK
Meter: 0.000 cu.ft. 5 in. HG
Pitots: ✓ in. H2O

P #	Θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.³	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM (IN Hg)
1	4:00		110	.55		2.1	32.979	100	100	250	57	2.5
2	02.5		110	.57		2.2	35.1	101	100	250	57	2.5
3	05		110	.58		2.2	37.2	102	100	250	57	2.5
4	07.5		110	.57		2.2	39.45	102	100	250	57	2.5
5	10		109	.56		2.1	41.6	102	100	250	57	2.5
6	12.5	.29	110	.55		2.1	43.7	102	100	250	57	2.5
7	15		110	.49		1.8	45.9	101	101	256	57	2.5
8	17.5		110	.47		1.8	47.9	101	100	256	57	2.5
9	20		111	.45		1.7	49.8	101	100	250	57	2.5
10	22.5		110	.44		1.7	51.8	101	100	250	57	2.5
11	25		109	.42		1.6	53.7	101	100	250	57	2.5
12	27.5		110	.30		1.1	55.5	101	100	257	57	2.5
1	30		110	.33		1.2	57.1	101	100	254	57	2.5
2	32.5		110	.41		1.5	58.8	101	100	250	57	3.0
3	35		110	.49		1.8	60.6	102	100	250	57	3.0
4	37.5		110	.55		2.1	62.6	102	100	250	57	2.0
5	40		110	.50		1.9	64.7	102	100	250	57	2.0
6	42.5		110	.48		1.8	66.8	101	100	250	57	2.0
7	45		110	.20		.76	68.7	101	100	250	57	2.0
8	47.5		110	.24		.92	70.05	102	100	250	57	2.0
9	50		110	.40		1.5	71.4	102	100	254	57	2.0
10	52.5		111	.35		1.3	73.2	102	100	249	57	2.0
11	55		111	.30		1.1	74.9	102	99	245	57	2.0
12	57.5		110	.31		1.2	76.5	101	99	240	57	2.0
	5:00					105	78.147					
AV			110.0		.6559	1.653	45.168		100.7			

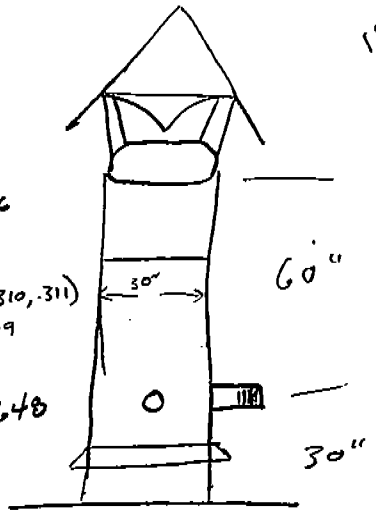
PARTICULATE FIELD DATA

FPS = 29.1
ACFM = 8571
ISO 99.9%

0 - 1.6565
1 = 2.9216

PLANT: NORTON
DATE: 4-20-94
REPETITION: 1

LOCATION: Kiln # 2
OPERATOR: MT
STACK #: Main Stack
SAMPLE BOX #: 9
METER BOX #: 10
AMBIENT TEMPERATURE: 79°
BAROMETRIC PRESSURE: 29.6
ASSUMED MOISTURE: 5%
PROBE LENGTH: 5'
NOZZLE IDAMETER: 5/16 (.309, .310, .311)
STACK DIAMETER: 30" 4.909
METER H : 1.608334
C FACTOR: .84
METER CO-EFFICIENT: .9971648



IMPINGERS

	Initial	Final
#1:	100 mls H_2O	112
#2:		102
#3:	—	03
#4:	200g. S6.	211.6
#5:		
		28.6

COMMENTS

CO_2 / 1 O_2 / 20

FILTER TARE: .45676

PRE-TEST LEAK CHECK
Meter: 0.001 cu. ft. 15 in. HG
Pitots: ✓ in. H2O

POST-TEST LEAK CHECK
Meter: 0.000 cu.ft. 5 in. HG
Pitots: ✓ in. H2O

P #	Θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VACUUM (IN Hg)
A 1	10.42		170	.15		1.2	78.908	85	85	250	60	3
2	44.5		173	.25		2.0	80.51	85	86	250	60	4
3	47		175	.28		2.2	82.6	87	87	250	60	4
4	49.5		175	.24		1.9	84.77	89	89	255	59	3
5	52		175	.25		2.0	86.8	90	89	254	59	3
6	54.5		175	.24		1.9	88.8	90	89	252	59	3
7	57		175	.23		1.8	90.90	91	89	250	59	3
8	59.5		175	.25		2.0	92.88	91	89	250	59	3
9	11:02		173	.21		1.7	94.95	92	89	253	59	3
10	04.5		173	.22		1.7	96.45	92	89	254	59	3
11	07		172	.21		1.68	98.79	92	90	250	59	3
12	09.5		168	.19		1.5	100.69	92	90	250	59	3
B 1	11:12/17		157	.14		1.1	102.501	92	91	254	59	3
2	16.5		164	.15		1.2	04.05	92	91	255	59	2.5
3	19		164	.14		1.1	05.65	93	92	252	59	2.5
4	21.5		157	.17		1.3	07.20	93	92	250	59	2.5
5	24		168	.19		1.5	08.9	93	92	250	59	2.5
6	26.5	+.15	168	.22		1.7	10.71	93	92	255	59	2.5
7	29		167	.30		2.4	12.66	94	92	250	59	2.5
8	31.5		165	.31		2.5	14.9	94	92	250	59	2.5
9	34		164	.31		2.5	17.23	95	93	245	59	2.5
10	36.5		163	.27		2.1	19.54	95	93	245	59	2.5
11	39		154	.24		1.9	21.7	95	93	240	59	2.0
12	41.5		155	.24		1.9	23.7	95	93	240	59	2.5
	11:44					106	125.748					
AV			167.7		.4713	1.783	46.84		90.98			

PARTICULATE FIELD DATA

PLANT: Norton
DATE: 4-20-94
REPETITION: 2

LOCATION Soddy Daisy
OPERATOR: MT
STACK #: Kiln #2 Main Ex
SAMPLE BOX #: 9
METER BOX #: 10
AMBIENT TEMPERATURE: 80
BAROMETRIC PRESSURE: 29.60
ASSUMED MOISTURE:
PROBE LENGTH: 5'
NOZZLE IDAMETER: 5/16
STACK DIAMETER: 30"
METER H : 1.659334
C FACTOR: .84
METER CO-EFFICIENT: .9971648

IMPINGERS

	Initial	Final
#1:	100mls H_2O	114
#2:		108
#3:	—	
#4:	200g. SG.	
#5:		
		210.6
		32.6

COMMENTS

CO_2	O_2
1%	19%

FILTER TARE: .45333

PRE-TEST LEAK CHECK
Meter: 0.000 cu. ft/s — in. HG
Pitots: ✓ ✓ — in. H2O

POST-TEST LEAK CHECK
Meter: 0.000 cu.ft.s — in. HG
Pitots: ✓ ✓ — in. H2O

P #	Θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.³	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VA CIN Hg
1	12:15		170	.16		1.28	127.541	93	94	250	59	3
2	17.5		168	.24		1.9	29.2	95	94	250	59	3
3	20		167	.30		2.4	31.2	95	94	253	59	3
4	22.5		168	.26		2.0	33.5	96	94	254	58	3
5	25		170	.25		2.0	35.6	96	94	255	58	3
6	27.5		169	.24		1.9	37.6	97	95	255	58	3
7	30		168	.24		1.9	39.7	97	95	252	58	3
8	32.5		167	.26		2.0	41.7	97	95	250	58	3
9	35		167	.21		1.7	43.8	97	95	250	58	3
10	37.5	+.10	167	.22		1.7	45.7	98	95	250	58	3
11	40		167	.20		1.6	47.7	98	95	249	58	3
12	42.5		167	.18		1.4	49.5	98	96	250	58	3
1	12:45/12:45		168	.13		1.0	51.3	98	96	251	58	3
2	47.5		168	.20		1.6	52.8	98	96	253	58	3
3	50		169	.15		1.2	54.6	98	96	254	58	3
4	52.5		167	.19		1.5	56.2	98	97	252	58	3
5	55		168	.21		1.7	58.04	99	97	247	58	3
6	57.5		169	.22		1.7	59.9	99	97	250	57	3
7	1:00		169	.29		2.3	61.8	99	97	250	57	3
8	02.5		169	.30		.24	64.1	99	97	250	57	3
9	05		170	.31		2.5	66.4	99	97	250	57	3
10	07.5		169	.32		2.5	68.7	99	97	251	57	3
11	10		170	.29		2.3	71.0	99	98	250	57	3
12	12.5		170	.24		1.9	73.2	100	98	250	57	3
	15					107	175.295					
AV							47.754					

PARTICULATE FIELD DATA

PLANT: NORTON
DATE: 4-20-94
REPETITION: 3

LOCATION: Soddy Daisy
OPERATOR: MT
STACK #: Kiln #2 Main Ex
SAMPLE BOX #: 9
METER BOX #: 10
AMBIENT TEMPERATURE: 85°
BAROMETRIC PRESSURE:
ASSUMED MOISTURE:
PROBE LENGTH: 5'
NOZZLE IDAMETER: 3/16"
STACK DIAMETER: 30"
METER H : 1.658334
C FACTOR: .84
METER CO-EFFICIENT: .9971648

FILTER TARE: .45499

PRE-TEST LEAK CHECK
Meter: 0.000 cu. ft. 15 in. HG
Pitots: ✓ ✓ in. H2O

IMPINGERS

	Initial	Final
#1:	100 mls	115
#2:	100 mls	104
#3:	–	02 mls
#4:	200g. SG.	
#5:		
		210.7
		31.7

COMMENTS

CO_2 0% O_2 16%

POST-TEST LEAK CHECK
Meter: 0.00 cu.ft. 10 in. HG
Pitots: ✓ ✓ in. H2O

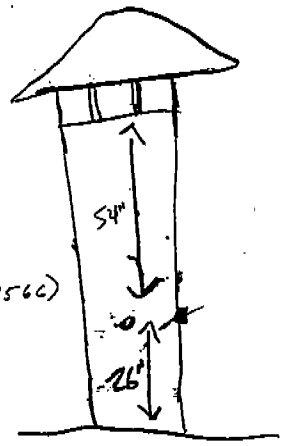
P #	Θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VA CIN HG
1	143		170	.16		1.28	175.519	98	98	250	59	3
2	45.5		170	.25		2.0	77.1	100	94	250	59	3
3	48		170	.29		2.3	79.2	100	98	250	59	3
4	50.5		170	.30		2.4	81.4	102	99	250	59	3
5	53		170	.27		2.1	83.7	102	99	250	59	3
6	55.5	+.10	170	.26		2.0	85.9	103	99	250	59	3
7	58		169	.24		1.9	88.00	103	99	255	59	3
8	2:00.5		170	.25		2.0	90.03	103	99	255	59	3
9	2:03		168	.27		2.1	92.1	103	99	254	59	3
10	05.5		168	.23		1.8	94.2	104	100	250	59	3
11	08		168	.21		1.7	96.2	104	100	249	59	3
12	10.5		168	.21		1.7	98.1	104	100	250	59	3
1	2:13		167	.15		1.2	200.0	103	100	254	59	3
2	15.5		167	.21		1.7	01.6	103	100	250	59	3
3	18		168	.20		1.6	03.5	104	100	250	59	3
4	20.5		168	.19		1.5	05.4	104	100	250	59	3
5	23		168	.24		1.9	07.2	105	101	251	59	3
6	25.5		168	.30		2.4	09.2	106	101	249	59	3
7	28		168	.29		2.3	11.5	106	101	250	59	3
8	30.5		169	.31		2.48	13.7	106	101	251	59	3
9	33		169	.30		2.4	16.0	106	101	251	59	3
10	35.5		169	.25		2.0	18.3	106	101	250	59	3
11	38		169	.24		1.9	20.8	106	101	249	59	3
12	40.5		169	.26		2.0	22.4	106	101	240	59	3
	2:43						224.511		/			
AV							48.992					

PARTICULATE FIELD DATA

FPS = 18.2
ACFM = 3283
ISO 102.4 0 = 2.42854
1 = 2.91478

PLANT: Norton
DATE: 4-20-94
REPETITION: 1
LOCATION: Quick Cooler Exhaust
OPERATOR: J.S
STACK #: Kiln #2
SAMPLE BOX #: 9
METER BOX #: 9
AMBIENT TEMPERATURE: 70°
BAROMETRIC PRESSURE: 29.53
ASSUMED MOISTURE:
PROBE LENGTH: 6-48"
NOZZLE IDAMETER: .374, .376, .377 (.37566)
STACK DIAMETER: 23.5" (30121)
METER H : 1.654443
C FACTOR: .84
METER CO-EFFICIENT: .9951534

4-#7



IMPINGERS

	Initial	Final
#1:	100	94
#2:	100	105
#3:	–	5
#4:	200 grms S.Gel	209.6
#5:	–	13.6

mls H_2O

COMMENTS

CO_2	O_2
0%	21%

.49
1.5
2.7
4.1
5.8
8.3
15.1
17.6
19.3
20.7
21.9
23.0

FILTER TARE: .46128

PRE-TEST LEAK CHECK
Meter: 0.001 cu. ft. 15 in. HG
Pitots: in. H2O

POST-TEST LEAK CHECK
Meter: 0.000 cu.ft. 7 in. HG
Pitots: ✓ in. H2O

P #	Θ	STATIC PRES.	Ts °F	ΔP	$\sqrt{\Delta P}$ A	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VA CIN HG
B1	10:38		215	.07	179/.13	1.20	820.843	88	89	251	60	1
2			238	.07	180/.14	1.20	22.4	88	88	253	60	1
3			243	.075	183/.13	1.28	24.0	89	88	248	60	1
4			242	.08	184/.13	1.37	25.7	90	89	255	60	1.5
5			237	.08	182/.12	1.37	27.4	91	89	250	60	1.5
6			234	.09	183/.115	1.54	29.1	91	89	248	60	2
7			233	.08	183/.09	1.37	30.9	93	90	248	60	2
8			239	.07	184/.09	1.20	32.6	93	90	253	60	1
9			237	.07	183/.09	1.20	34.2	93	90	256	60	1
10			216	.06	182/.09	1.03	35.9	93	91	258	60	1
11			203	.055	176/.07	.94	37.3	94	91	252	60	1
12			138	.03	164/.04	.51	38.8	94	92	257	60	1
B1			230	.11	189/.08 B	1.89	839.866	93	92	246	60	2
2			237	.12	192/.075	2.06	41.8	94	92	250	60	2
3			244	.13	193/.07	2.23	43.9	95	92	257	60	2
4			239	.12	195/.085	2.06	46.1	95	92	255	60	2
5			246	.10	196/.09	1.71	48.2	95	93	248	60	2
6		+.065	256	.09	198/.095	1.54	50.1	95	93	247	60	2
7			255	.08	201/.08	1.37	52.0	95	93	254	60	1.5
8			246	.08	202/.09	1.37	53.7	95	93	255	60	1.5
9			247	.08	201/.07	1.37	55.4	96	93	251	60	1.5
10			242	.07	200/.07	1.20	57.1	96	93	251	60	1
11			215	.07	190/.06	1.20	58.7	96	94	253	60	1
12			200	.05	158/.04	.85	60.3	95	94	249	60	1
	11:38				--	109	861.670					
AV			230.5	.2807	.2944	1.378	40.827		92.21			

PARTICULATE FIELD DATA

0 = 2.42854
1 = 2.91478

PLANT: Norton
DATE: 4-19-94
REPETITION: 2
LOCATION: Quick Cooler Exhaust Kiln #2
OPERATOR: J.S
STACK #:
SAMPLE BOX #: 9
METER BOX #: 9
AMBIENT TEMPERATURE: 77°
BAROMETRIC PRESSURE: 29.53
ASSUMED MOISTURE: 5%
PROBE LENGTH: C-48"
NOZZLE IDAMETER: 3/8"
STACK DIAMETER: 23.5"
METER H : 1.654443
C FACTOR: .84
METER CO-EFFICIENT: .9951534

FILTER TARE: .45940

IMPINGERS

	Initial	Final
#1:	100	97
#2:	100	100
#3:	-	
#4:	200 ms Silica	206.7
#5:		3.7

COMMENTS

CO_2	O_2
0%	21%

PRE-TEST LEAK CHECK
Meter: 0.00 cu. ft. 15 in. HG
Pitots: ✓ in. H2O

POST-TEST LEAK CHECK
Meter: 0.00 cu.ft. 7 in. HG
Pitots: ✓ in. H2O

P #	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VA (IN Hg
A1	12:11		272	.10		1.71	861.970	94	95	248	62	2
2			285	.10		1.71	63.8	95	95	252	62	2
3			288	.12		2.06	65.8	96	95	247	62	2
4			292	.11		1.89	67.9	97	95	252	62	2
5			285	.10		1.71	69.9	98	95	248	62	2
6			282	.09		1.54	71.8	98	95	253	62	2
7		+.07	282	.07		1.20	73.6	98	95	254	62	1.5
8			282	.07		1.20	75.2	97	95	257	62	1.5
9			280	.07		1.20	76.8	98	95	249	62	1.5
10			279	.06		1.03	78.4	98	96	246	62	1
11			251	.05		.85	79.9	99	96	249	62	1
12			216	.03		.51	81.3	99	96	259	62	1
B1			270	.06		1.03	882.383	98	97	256	62	1
2			280	.065		1.11	83.8	99	97	258	62	1
3			288	.06		1.03	85.4	100	97	259	62	1
4			293	.06		1.03	86.9	100	97	257	62	1
5			297	.07		1.20	88.3	100	97	258	62	1
6			298	.08		1.37	89.9	100	98	259	62	1.5
7		+.03	296	.06		1.03	91.7	100	98	256	62	1.0
8			293	.055		.94	93.2	100	98	256	62	1
9			287	.05		.85	94.6	100	98	252	62	1
10			280	.05		.85	95.9	100	98	250	62	1
11			229	.04		.68	97.3	100	98	248	62	1
12			173	.03		.51	98.5	100	98	246	62	1
	1:12					110	899.608					
AV							37.638					

PARTICULATE FIELD DATA

PLANT: Norton
DATE: 4-19-94
REPETITION: 3
LOCATION: Quick Cooler Exhaust Kiln #2
OPERATOR: JS
STACK #:
SAMPLE BOX #: 9
METER BOX #: 9
AMBIENT TEMPERATURE: 85°
BAROMETRIC PRESSURE: 29.53
ASSUMED MOISTURE:
PROBE LENGTH: 6-48"
NOZZLE IDAMETER: 3/8"
STACK DIAMETER: 23.5"
METER H : 1.654443
C FACTOR: .84
METER CO-EFFICIENT: .9951534

IMPINGERS

	Initial	Final
#1:	100	99
#2:	100 gms H_2O	103
#3:	—	
#4:	200 grms S.Gel	209.1
#5:		
		11.1

COMMENTS

CO_2 0% O_2 21%

FILTER TARE: .46261

PRE-TEST LEAK CHECK
Meter: 0.00 cu. ft. 12 in. HG
Pitots: ✓ in. H2O

POST-TEST LEAK CHECK
Meter: 0.00 cu.ft. 7 in. HG
Pitots: ✓ in. H2O

P #	θ	STATIC PRES.	Ts °F	ΔP	√ΔP	ΔH	Vm FT.3	Tm INLET	Tm OUTLET	OVEN TEMP.	IMP OUTLET TEMP.	VA (IN Hg)
A1	1:41		301	.10		1.71	900.238	97	96	256	65	2
2			312	.11		1.89	2.1	98	97	252	64	2
3			318	.11		1.89	4.1	99	97	251	64	2
4			315	.11		1.89	6.1	100	97	251	65	2
5			317	.10		1.71	8.1	101	98	253	65	2
6			318	.09		1.54	10.1	101	98	248	65	2
7			316	.08		1.37	11.9	102	98	246	65	2
8			321	.07		1.20	13.6	101	98	260	64	1.5
9			310	.06		1.03	15.2	101	98	253	65	1
10			312	.06		1.03	16.7	101	98	249	65	1
11			300	.05		.85	18.2	102	98	254	64	1
12			280	.04		.68	19.5	102	99	251	64	1
B1			305	.06		1.03	920.809	100	98	259	65	1.5
2			300	.06		1.03	22.2	101	99	249	65	1.5
3		+.06	295	.08		1.37	23.7	102	99	249	65	1.5
4			301	.08		1.37	25.5	103	99	256	65	1.5
5			305	.07		1.20	27.2	103	99	252	65	1.5
6			292	.07		1.20	28.8	104	100	255	65	1.5
7			295	.06		1.03	30.4	104	100	252	65	1
8			297	.06		1.03	31.9	104	100	254	65	1
9			280	.055		.94	33.4	105	101	258	65	1
10			259	.05		.85	34.8	105	101	256	65	1
11			230	.04		.68	36.1	105	101	252	65	1
12			185	.04		.68	37.4	104	101	248	65	1
	2:42					111	938.615					
AV							38.377					

APPENDIX E

AIR PRODUCTS AND CHEMICALS, INC.
3415 BANNING STREET
DALLAS, TX 75233
FT. WORTH CUSTOMERS CALL
1-800-453-APCI
TELEPHONE (214) 929-8325

DATE: 05/13/93
TIME: 15:49
PAGE: 1

****
* CERTIFICATE OF ANALYSIS *
****

ARMSTRONG ENVIRONMENTAL
4747 IRVING BLVD. #206
DALLAS TX 75247

CUSTOMER ACCOUNT : R7818
CUSTOMER ORDER NO : TA93-1233
ORDER NO : 36A-000244
ORDER DETAIL SEQ : 3
SHIPPER NUMBER : 360-S-22164

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SGO FIELD DIRECTIVE BOOK I PART A-3.

CERTIFIED GAS MIXTURE: CARBON MONOXIDE IN NITROGEN

BATCH NO	ANALYSIS DATE	BAR CODE	CYLINDER NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT MEASU.
04500	04/08/93	8UY706	SG9114773BAL	CARBON MONOXIDE	400	402.0	MOLAR
				Nitrogen		BALANCE	

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

Lisa Overman
AUTHORIZED SIGNATURE

Scott Specialty Gases, Inc.

Shipped From: 3714 LAPAS DRIVE
HOUSTON TX 77023
Phone: 713-644-4820 Fax: 713-644-0244

CERTIFICATE OF ANALYSIS

ARMSTRONG ENVIRONMENTAL
OPHELIA SALINAS
7715 SOVEREIGN ROW

DALLAS TX 75247

PROJECT #: 04-31169-001
PO#: 1360
ITEM #: 04021453 2AL
DATE: 3/25/94

CYLINDER #: ALM016556

ANALYTICAL ACCURACY: +/-1%
PRODUCT EXPIRATION: 3/25/95

BLEND TYPE : ACUBLEND MASTER GAS

COMPONENT	REQUESTED GAS CONC MOLES		ANALYSIS (MOLES)	
CARBON MONOXIDE	100.	PPM	98.0	PPM
NITROGEN		BAL		BAL

2000 PSI

ANALYST: _____ APPROVED BY: _____

PLUMSTEADVILLE, PENNSYLVANIA / TROY, MICHIGAN / HOUSTON, TEXAS / DURHAM, NORTH CAROLINA
SOUTH PLAINFIELD, NEW JERSEY / FREMONT, CALIFORNIA / WAKEFIELD, MASSACHUSETTS / LONGMONT, COLORADO

AIR PRODUCTS
4822 INDUSTRY LANE
DURHAM, NC 27713

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-23546 CYLINDER #: SG9113356 CYL. PRESSURE: 2000PSIG

EXPIRATION DATE: 4-14-95 LAST ANALYSIS DATE: 4-14-93
BATCH# 05865
CUSTOMER: AIR PRODUCTS P.O.#
DALLAS, TX. 75233 METHOD: EPA PROTOCOL # 1 3.0.4. G-1

STANDARD:

SRM #: 1694A

CYL #: CLM5174

CONC.: 93.7PPM
VALID DATE: 10-26-92
EXPIR. DATE: 10-26-94

INSTRUMENT:

COMPONENT: BECKMAN NDIR

MODEL #: 880

SERIAL #: 2000477

LAST CAL.: 4-2-93

COMP: SO2
MEAN CONC: 95.6PMM

REPLICATE CONC.

DATE: 4-7-93	DATE: 4-14-93
95.4PPM	95.5PPM
95.5PPM	95.6PPM
95.6PPM	95.7PPM

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

BALANCE GAS: N2

REPLICATE DATA

DATE: 4-7-93

Z	0	R	330	C	336
R	330.1	Z	0	C	336.4
Z	0	C	336.6	R	329.9

COMPONENT:SO2

DATE: 4-14-93

Z	0	R	342	C	348.6
R	342.1	Z	0	C	349
Z	0	C	349.2	R	341.9

REPLICATE DATA

DATE:

Z	R	C
R	Z	C
Z	C	R

COMPONENT:

DATE:

Z	R	C
R	Z	C
Z	C	R

REPLICATE DATA

DATE:

Z	R	C
R	Z	C
Z	C	R

COMPONENT:

DATE:

Z	R	C
R	Z	C
Z	C	R

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: APPROVED BY:

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED; HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, AIR PRODUCTS SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

AIR PRODUCTS
4822 INDUSTRY LANE
DURHAM, NC 27713

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-23547 CYLINDER #: SG9113444 CYL. PRESSURE: 2000PSIG

EXPIRATION DATE: 4-14-95 LAST ANALYSIS DATE: 4-14-93
BATCH# 05864
CUSTOMER: AIR PRODUCTS P.O.#
DALLAS, TX. 75233 METHOD: EPA PROTOCOL # 1 3.0.4. G-1

STANDARD:

SRM #: 1693A

CYL #: CLM4215

CONC.: 46.9PPM
VALID DATE: 10-26-92
EXPIR. DATE: 10-26-94

INSTRUMENT:

COMPONENT: BECKMAN NDIR

MODEL #: 880

SERIAL #: 2000477

LAST CAL.: 4-2-93

COMP: SO2
MEAN CONC: 48.2PPM

REPLICATE CONC.

DATE: 4-7-93	DATE: 4-14-93
48.0PPM	48.1PPM
48.1PPM	48.2PPM
48.2PPM	48.3PPM

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

BALANCE GAS: N2

REPLICATE DATA

DATE: 4-7-93

Z	0	R	263	C	269.2
R	263.1	Z	0	C	269.8
Z	0	C	270.2	R	262.9

COMPONENT:SO2

DATE: 4-14-93

Z	0	R	271	C	277.9
R	271.1	Z	0	C	278.6
Z	0	C	279	R	270.9

REPLICATE DATA

DATE:

Z	R	C
R	Z	C
Z	C	R

COMPONENT:

DATE:

Z	R	C
R	Z	C
Z	C	R

REPLICATE DATA

DATE:

Z	R	C
R	Z	C
Z	C	R

COMPONENT:

DATE:

Z	R	C
R	Z	C
Z	C	R

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: APPROVED BY:

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED; HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, AIR PRODUCTS SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

Scott Specialty Gases, Inc.
1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ARMSTRONG ENVIROMENTAL
7715 SOVEREIGN ROW
DALLAS TX 75247-9004

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 1317
Scott Project # 556803

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure # G1, Section Number 3.0.4

Cylinder Number AAL18218
Cylinder Pressure 1900 psig

Certification Date 10-11-93
Previous Certification Dates None

General Exp. Date 10-11-95
Acid Rain Exp. Date 10-11-95

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Nitric Oxide	30.60 ppm	±1% NIST Directly Traceable
Total Oxides of Nitrogen	31.00 ppm	Reference Value Only

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
CRM 1684	9-17-94	ALM-024698	95.6 PPM NO IN N_2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
NO: Horiba/OPE-235/483814	9-13-93	Chemiluminescence

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components: Nitric Oxide

First Triad Analysis

Date: 10-4-93 Response Units: mv
Z1=0.00 R1=95.60 T1=30.60
R2=95.60 Z2=0.00 T2=30.60
Z3=0.00 T3=30.60 R3=95.60
Avg. Conc. of Cust. Cyl. 30.60 ppm

Second Triad Analysis

Date: 10-11-93 Response Units: mv
Z1=0.00 R1=95.60 T1=30.60
R2=95.60 Z2=0.00 T2=30.60
Z3=0.00 T3=30.60 R3=95.60
Avg. Conc. of Cust. Cyl. 30.60 ppm

Calibration Curve

Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$
r=0.99999 SRM 1684B
Constants: A=-0.000967384
B=1.000115 C=0
D=0 E=0

Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$

Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$

Special Notes
If this product is used for Acid Rain Rule Compliance, the *Acid Rain Expiration Date* noted above applies per 40 CFR Part 75, Appendix H. Otherwise, the *General Expiration Date* applies.

Analyst Frank P. Doran

· Products and Chemicals, Inc.
CIALTY GAS DEPARTMENT
22 S. WENTWORTH AVENUE
CAGO, IL 60628

Certificate of Analysis - EPA Protocol #1 Gases

PERFORMED ACCORDING TO SECTION 3.0.4 (Procedure #G1)
Certified Accuracy 1% NIST Traceable

tomer:
PCI
415 BANNING ST
ALLAS,TX. TX 75233

Notes:

Order No: 855-016677-01
Batch No: 861-11964

Cylinder No: SG9113468BAL
Cylinder Pressure: 2000 psig
Certification Date: 04/26/93
Expiration Date: 04/26/95

O: Rel:

Certified Concentration ***		********* Reference Standards *********			********** Analytical Instrumentation **********			
ponent	Certified Concentration	Cylinder #	Standard Number	Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement Principal
ric Oxide	98.2 PPM	SG9103337BAL	GMIS	94.0000 PPM	Rosemount 951a	0101877	04/08/93	CHEMILUMINESCENCE

ance Gas: Nitrogen

Analytical Data*

ponent: Nitric Oxide

st Analysis Date: 04/15/93					Second Analysis Date: 04/26/93				
ro	*** Test Gas ***		*** Ref. Gas ***		Zero	*** Test Gas ***		*** Ref. Gas ***	
V	mV	PPM	mV	PPM	mV	mV	PPM	mV	PPM
030	39.9	98.3	38.2	94.0	.040	39.7	98.2	38.0	94.0
020	39.9	98.2	38.2	94.0	.040	39.7	98.2	38.0	94.0
020	39.9	98.4	38.2	94.0	.060	39.7	98.2	38.0	94.0
erage:		98.3			Average:		98.2		

* Calculations performed per Section 3.0.4 subsection 4.1.7

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Approved By:

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ARMSTRONG ENVIROMENTAL
7715 SOVEREIGN ROW
DALLAS TX 75247-9004

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 1317
Scott Project # 556803

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure # G1, Section Number 3.0.4

Cylinder Number	ALM037096	Certification Date	10-11-93	General Exp. Date	10-11-95
Cylinder Pressure	1900 psig	Previous Certification Dates	None	Acid Rain Exp. Date	10-11-95

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Nitric Oxide	402.4 ppm	±1% NIST Directly Traceable
Total Oxides of Nitrogen	402.9 ppm	Reference Value Only

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 1687	7-23-95	ALM-022382	951 PPM NO IN NITROGEN

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
NO: Beckman/951A/270-082899B	9-8-93	Chemiluminescence

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Nitric Oxide	Date: 10-4-93 Response Units: mv Z1=0.00 R1=95.10 T1=40.30 R2=95.10 Z2=0.00 T2=40.30 Z3=0.00 T3=40.30 R3=95.10 Avg. Conc. of Cust. Cyl. 402.9 ppm	Date: 10-11-93 Response Units: mv Z1=0.00 R1=95.10 T1=40.20 R2=95.10 Z2=0.00 T2=40.20 Z3=0.00 T3=40.20 R3=95.10 Avg. Conc. of Cust. Cyl. 401.9 ppm	Concentration=A+Bx+Cx^2+Dx^3+Ex^4 r=0.99999 NTRM1687 Constants: A=-0.1377292 B=10.00145 C=0 D=0 E=0
			Concentration=A+Bx+Cx^2+Dx^3+Ex^4
			Concentration=A+Bx+Cx^2+Dx^3+Ex^4

Special Notes
If this product is used for Acid Rain Rule Compliance, the *Acid Rain Expiration Date* noted above

AIR PRODUCTS
4822 INDUSTRY LANE
DURHAM, NC 27713

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-20913 CYLINDER #: SG9114178 CYL PRESSURE: 2000PSIG

EXPIRATION DATE: 5-13-94 LAST ANALYSIS DATE: 11-13-92

BATCH# 04151
CUSTOMER:
ARMSTRONG ENVIRONMENTAL
DALLAS, TX. 75247

P.O.# 1216
METHOD: EPA PROTOCOL # 3.0.4.G-1

STANDARD:

SRM #: 2644

CYL #: CAL4414

CONC.: 244.2PPM

INSTRUMENT:

COMPONENT: BECKMAN THC

MODEL #: 400

SERIAL #: 1003052

LAST CAL.: 10-1-92

COMP: C3H8
MEAN CONC: 205PPM

REPLICATE CONC.
DATE: 11-13-92 DATE:
205PPM
203PPM
206PPM

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

COMP:
MEAN CONC:

REPLICATE CONC.
DATE: DATE:

BALANCE GAS: N2

REPLICATE DATA

DATE: 11-13-92

Z	0	R	407.5	C	342.1
R	407.9	Z	0	C	339.1
Z	0	C	343.2	R	406.8

COMPONENT: C3H8

DATE:

Z	R	C
R	Z	C
Z	C	R

REPLICATE DATA

DATE:

Z	R	C
R	Z	C
Z	C	R

COMPONENT:

DATE:

Z	R	C
R	Z	C
Z	C	R

REPLICATE DATA

DATE:

Z	R	C
R	Z	C
Z	C	R

COMPONENT:

DATE:

Z	R	C
R	Z	C
Z	C	R

Z=ZERO C=CANDITATE R=REFERENCE

ANALYST: Tina Rowe

APPROVED BY: Patrick T. Kitchen

"THIS REPORT STATED ACCURATELY THE RESULTS OF THE INVESTIGATION MADE UPON THE MATERIAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY, THE INFORMATION REQUESTED; HOWEVER, IN CONNECTION WITH ITS RENDERING OF THIS REPORT, AIR PRODUCTS SHALL HAVE NO LIABILITY IN EXCESS OF ITS ESTABLISHED CHARGE FOR THE SERVICE. ANY USE OF THIS REPORT OR THE INFORMATION CONTAINED HEREIN SHALL BE AT THE SOLE RISK OF THE USER."

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
ARMSTRONG ENVIROMENTAL
7715 SOVEREIGN ROW
DALLAS TX 75247

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 1349
Scott Project # 561294

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number ALM013040
Cylinder Pressure 1900 psig
Certification Date 2-2-94
Previous Certification Dates None
Expiration Date 2-2-97

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Propane	29.98 ppm	±1% NIST Directly Traceable

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
SRM 2643A	10-14-95	SX-20305	99.12 ppm Propane in N_2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
Prop: Beckman/400/1002059	1-8-94	Flame Ionization Detector

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Propane	Date: 2-2-94 Response Units: mv Z1=0.00 R1=99.10 T1=30.00 R2=99.10 Z2=0.00 T2=30.00 Z3=0.00 T3=30.00 R3=99.10 Avg. Conc. of Cust. Cyl. 29.98 ppm		Concentration=A+Bx+Cx^2+Dx^3+Ex^4 r=0.99999 SRM 2643A Constants: A=-0.03442105 B=1.000549 C=0 D=0 E=0
			Concentration=A+Bx+Cx^2+Dx^3+Ex^4
			Concentration=A+Bx+Cx^2+Dx^3+Ex^4

Special Notes NO OTHER HYDROCARBONS DETECTED ON G.C.

Analyst Frank P. Doran

APPENDIX F

SUMMARY OF PRE METER BOX CALIBRATION

METER BOX NUMBER: 9
CALIBRATION DATE:04/15/94
CALIBRATED BY:Dan Barrera
BAROMETRIC PRESSURE: 29.8

```
*********************************************************
*                                                       *
*      DELTA H = ORFICE PRESSURE                        *
*      VW = VOLUME OF WET GAS METER                     *
*      TW = AVERAGED TEMPERATURE OF WET METER           *
*      VD = VOLUME OF DRY GAS METER                     *
*      TD = AVERAGED TEMPERATURE OF DRY GAS METER       *
*      TIME = DURATION OF EACH POINT RUN                *
*                                                       *
*********************************************************
```

POINT 1
DELTA H = .5 VW = 5 TW = 78
VD = 4.956 TD = 75.5 TIME = 11.93 TEST METER Y = .9804
METER BOX Y = .9832949
METER BOX H = 1.636662

POINT 2
DELTA H = 1 VW = 5 TW = 78.5
VD = 4.934 TD = 76 TIME = 8.310001 TEST METER Y = .9804
METER BOX Y = .9864679
METER BOX H = 1.589687

POINT 3
DELTA H = 1.5 VW = 10 TW = 79
VD = 9.819 TD = 77.25 TIME = 14.05 TEST METER Y = .9804
METER BOX Y = .9915607
METER BOX H = 1.703288

POINT 4
DELTA H = 2 VW = 10 TW = 79
VD = 9.004 TD = 78.25 TIME = 12.1 TEST METER Y = .9804
METER BOX Y = 1.081995
METER BOX H = 1.681269

POINT 5
DELTA H = 3 VW = 10 TW = 79.5
VD = 10.554 TD = 79.25 TIME = 9.84 TEST METER Y = .9804
METER BOX Y = .9216839
METER BOX H = 1.667813

POINT 6
DELTA H = 4 VW = 11 TW = 80
VD = 10.626 TD = 80.5 TIME = 9.32 TEST METER Y = .9804
METER BOX Y = 1.005918
METER BOX H = 1.64794

AVERAGE Y = .9951534
AVERAGE H = 1.654443

ARMSTRONG ENVIRONMENTAL, INC.

DRY GAS METER #:

DATE:

ΔH	VW	TW	VD	TDT	TDO	ΔTD	θ
.5 (5FT.3)	391.0	78/78	643.362	75	75		
	386.0	78/78	638.406	77	75		
	5	78	4.956		→	75.5	11:93
1.0 (5FT3)	396.0	78/78	648.296	76	75		
	391.0	79/79	643.362	78	75		
	5	78.5	4.934		→	76	8:31
1.5 (10 FT3)	406.0	78/79	658.115	77	76		
	396.0	79/79	648.296	80	76		
	10	79	9.819		→	77.25	14:05
2.0 (10FT3)	416.0	79/79	667.119	79	76		
	406.0	79/79	658.115	81	77		
	10	79	9.004		→	78.25	12:10
3.0 (10FT3)	426.0	79/79	677.673	80	77		
	416.0	80/80	667.119	82	78		
	10	79.5	10.554		→	79.25	9.84
4.0 (10FT3)	437.0	80/80	688.299	81	78		
	426.0	80/80	677.673	84	79		
	11	80	10.626		→	80.5	9:32

Meter Box Calibration

Dry Gas Meter #: 9
Calibrated by: Dan Baikie
Date: 4-15-94
Barometric Pressure: 29.8

Orifice ΔH	Test Meter Volume V_w	Dry Gas Meter Volume V_d	Temperature: Test Meter T_w	Temperature: Dry Gas Meter Inlet T_{di}	Temperature: Dry Gas Meter Outlet T_{do}	Temperature: Dry Gas Meter Ave T_d	Time θ	γ	ΔH@
.5	5	4.956	78	75/77	75/75	75.5	11:93	.9804	
1.0	5	4.934	78.5	76/78	75/75	76	8:31	.9804	
1.5	10	9.819	79	77/80	76/76	77.25	14:05	.9804	
2.0	10	9.004	79	79/81	76/77	78.25	12:10	.9804	
3.0	10	10.554	79.5	80/82	77/78	79.25	9:84	.9804	
4.0	11	10.626	80	81/84	78/79	85	9:32	.9804	

$$\gamma = \frac{V_w P_{bar} (T_d + 460)}{V_d \left(P_{bar} + \frac{\Delta H}{13.6}\right) (T_w + 460)}$$

$$\Delta H@ = \frac{0.0317\ \Delta H}{P_{bar}(T_d + 460)} \left[\frac{(T_w + 460)\ \theta}{V_w} \right]^2$$

P_{bar} = Barometric Pressure

SUMMARY OF PRE METER BOX CALIBRATION

METER BOX NUMBER: 10
CALIBRATION DATE:3/22/94
CALIBRATED BY:Jerry Salinas
BAROMETRIC PRESSURE: 29.69

```
*****************************************************
*                                                   *
*      DELTA H = ORFICE PRESSURE                    *
*      VW = VOLUME OF WET GAS METER                 *
*      TW = AVERAGED TEMPERATURE OF WET METER       *
*      VD = VOLUME OF DRY GAS METER                 *
*      TD = AVERAGED TEMPERATURE OF DRY GAS METER   *
*      TIME = DURATION OF EACH POINT RUN            *
*                                                   *
*****************************************************
```

POINT 1
DELTA H = .5 VW = 5 TW = 64.5
VD = 4.96 TD = 62.25 TIME = 12.213 TEST METER Y = .9804
METER BOX Y = .9828498
METER BOX H = 1.677785

POINT 2
DELTA H = 1.1 VW = 5 TW = 65.5
VD = 4.926 TD = 64.5 TIME = 8.261 TEST METER Y = .9804
METER BOX Y = .9905357
METER BOX H = 1.687979

POINT 3
DELTA H = 1.5 VW = 10 TW = 66
VD = 9.82 TD = 67 TIME = 13.961 TEST METER Y = .9804
METER BOX Y = .9965666
METER BOX H = 1.638832

POINT 4
DELTA H = 2 VW = 10 TW = 66.5
VD = 9.787 TD = 68.75 TIME = 12.05 TEST METER Y = .9804
METER BOX Y = 1.00106
METER BOX H = 1.625547

POINT 5
DELTA H = 3 VW = 10 TW = 67.5
VD = 9.757 TD = 70.5 TIME = 9.918 TEST METER Y = .9804
METER BOX Y = 1.003079
METER BOX H = 1.652639

POINT 6
DELTA H = 4 VW = 10 TW = 68
VD = 9.686 TD = 71.5 TIME = 8.627 TEST METER Y = .9804
METER BOX Y = 1.008898
METER BOX H = 1.667221

AVERAGE Y = .9971648
AVERAGE H = 1.658334

Meter Box Calibration

Dry Gas Meter #: 10
Calibrated by: J. Salinas
Date: 3/22/94
Barometric Pressure: 29.69

Orifice ΔH	Test Meter Volume V_w	Dry Gas Meter Volume V_d	Temperature: Test Meter T_w	Temperature: Dry Gas Meter Inlet T_{di}	Temperature: Dry Gas Meter Outlet T_{do}	Temperature: Dry Gas Meter Ave T_d	Time θ	γ	ΔH@
.5	5.0	4.96	64.5	61/66	60/62	62.25	12.213	.9804	
1.1	5.0	4.926	65.5	63/70	62/63	64.5	8.261	.9804	
1.5	10.0	9.82	66	66/73	64/65	67	13.961	.9804	
2.0	10.0	9.787	66.5	68/75	65/67	68.75	12.05	.9804	
3.0	10.0	9.757	67.5	70/77	67/68	70.5	9.918	.9804	
4.0	10.0	9.686	68	72/78	68/68	71.5	8.627	.9804	

$$\gamma = \frac{V_w P_{bar} (T_d + 460)}{V_d \left(P_{bar} + \frac{\Delta H}{13.6}\right) (T_w + 460)}$$

$$\Delta H@ = \frac{0.0317\ \Delta H}{P_{bar}(T_d + 460)} \left[\frac{(T_w + 460)\ \theta}{V_w} \right]^2$$

P_{bar} = Barometric Pressure

ARMSTRONG ENVIRONMENTAL, INC.

DRY GAS METER #: 10

DATE: 3-14-94

ΔH	VW	TW	VD	TDT	TDO	ΔTD	θ
.5 (5FT.3)	800.000	64/64	325.259	61	60		
	795.000	65/65	320.299	66	62		
	5.000	64.5	4.96		→	62.25	12.213
1.0 (5FT3)	805.000	65/65	330.185	63	62		
	800.000	66/66	325.259	70	63		
	5.000	65.5	4.926		→	64.5	8.261
1.5 (10 FT3)	815.000	66/66	340.005	66	64		
	805.000	66/66	330.185	73	65		
	10.000	66	9.82		→	67	13.961
2.0 (10FT3)	825.000	66/66	349.792	68	65		
	815.000	67/67	340.005	75	67		
	10.000	66.5	9.787		→	68.75	12.05
3.0 (10FT3)	835.000	67/67	359.549	70	67		
	825.000	68/68	349.792	77	68		
	10.000	67.5	9.757		→	70.5	9.918
4.0 (10FT3)	845.000	68/68	369.235	72	68		
	835.000	68/68	359.549	78	68		
	10.000	68	9.686		→	71.5	8.627