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.

AP-42 Section 12.2
Reference
Report Sect. 4
Reference 171

PARTICULATE EVALUATION

OF

BATTERY NO. 1 COKE PUSH SHED PARTICULATE EMISSION CONTROL SYSTEM

AT

SHENANGO INCORPORATED
NEVILLE ISLAND PLANT
PITTSBURGH, PENNSYLVANIA 15225

BCM NO. 00-4810-24

PREPARED BY:

Paul Jadlowiec
PAUL JADLOWIEC
PROJECT SCIENTIST

BCM EASTERN INC.
5777 BAUM BOULEVARD
PITTSBURGH, PENNSYLVANIA 15206

BCM

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

2.0 SCOPE AND OBJECTIVES

3.0 PROCEDURES

- 3.1 Field Work
- 3.2 Analysis
- 3.3 Calibrations
- 3.4 Process Data

4.0 SUMMARY OF RESULTS

TABLE 1 - Summary of Results

APPENDICES

- Appendix A BCM Proposal
- Appendix B Stack Test Data
- Appendix C Visible Emissions Data
- Appendix D Calculations
- Appendix E Calibrations
- Appendix F Process Data

1.0 EXECUTIVE SUMMARY

Shenango Incorporated retained BCM Eastern Inc. to perform particulate emission tests on the Battery No. 1 Coke Push Shed Baghouse. Testing and analyses were conducted according to EPA Methods 1 through 5 and 9 of the Federal Register, Volume 42, August 1977, latest revision. The compliance limits and measured particulate emissions were as follows:

Test No.	Compliance Limit	Measured Concentration
1	0.01 gr/dscf	0.0043 gr/dscf
2	0.01 gr/dscf	0.0037 gr/dscf
3	0.01 gr/dscf	0.0028 gr/dscf
Average	0.01 gr/dscf	0.0036 gr/dscf

2.0 SCOPE AND OBJECTIVES

The scope of this proposal was outlined in BCM Proposal No. 13-8074-06 which is contained in Appendix A. The following parameters were determined for each test:

- Gas Flow — ACFM and DSCFM
- Gas Temperature — °F
- Gas Moisture — % by Volume
- Particuate Concentration — gr/dscf
- Opacity — %

3.0 PROCEDURES

The field sampling program was performed on January 18, 19, and 20, 1988. The BCM test personnel consisted of Messrs. Paul Jadlowiec, Anthony Porta, Daniel Petrovay, and Thomas Emelo. Mr. James Zwikl served as plant coordinator. The tests were witnessed by Messrs. Mark Hughes, James Fanning, Carl Kaye, William Clark, Philip Lawrence, and William Gubba, of the Allegheny County Health Department.

3.1 FIELD WORK

All test and analytical procedures and field data sheets are contained in Appendix B.

3.2 ANALYSIS

All analytical data sheets and calculations are contained in Appendix D.

3.3 CALIBRATIONS

Field equipment calibrations are contained in Appendix E.

3.4 PROCESS DATA

All process data are contained in Appendix F.

4.0 SUMMARY OF RESULTS

Table 1 presents a summary of the results of the particulate testing. The opacity observations are contained in Appendix C. The particulate grain loading ranged from 0.0028 gr/dscf to 0.0043 gr/dscf. The average of the three test runs was 0.0036 gr/dscf. The compliance limitation is 0.01 gr/dscf.

TABLE 1

SUMMARY OF RESULTS

BATTERY NO. 1 COKE PUSH SHED EMISSION CONTROL SYSTEM

Parameter	Coke Push Shed Emission Control Outlet Run No. 1	Run No. 2	Run No. 3	Average
Gas Flow (ACFM)	331055	320932	318752	323580
Gas Flow (DSCFM)	318513	321363	295406	311761
Gas Temp. (^{o}F)	68	59	82	70
Gas Moisture (%)	1.1	0.2	1.1	0.8
Isokinetic (%)	93	97	95	95
Part. Emission (gr/dscf)	0.0043	0.0037	0.0028	0.0036

APPENDIX A

BCM PROPOSAL

PROPOSAL

TO

SHENANGO INCORPORATED
NEVILLE ISLAND
PITTSBURGH, PENNSYLVANIA 15225

FOR

NO. 4 COKE OVEN BATTERY
PUSH SHED PARTICULATE EMISSION CONTROL SYSTEM

BCM PROPOSAL NO. 13-8074-06

JANUARY 5, 1988

PREPARED BY

Paul Jadlowiec
PAUL JADLOWIEC
PROJECT SCIENTIST

BCM EASTERN INC.
5777 BAUM BOULEVARD
PITTSBURGH, PENNSYLVANIA 15206

1.0 TECHNICAL SCOPE

1.1 PROJECT SUMMARY

Shenango Incorporated requires particulate emissions testing on the coke push emission stack at its Neville Island plant. The data collected will be used to determine compliance with Allegheny County and Consent Decree regulations. BCM Eastern Inc. (BCM) will evaluate the particulate loading and opacity during the sampling program. The following proposal presents BCM's approach to fulfilling Shenango's needs.

1.2 PROJECT PLANNING

BCM will contact Shenango's personnel upon bid approval to:

- Establish lines of communication
- Finalize the project objectives to ensure agreement between BCM and Shenango
- Ensure that requirements for sampling will be completed by the scheduled testing date (see Section entitled Client Responsibility)

1.2.2 Field Testing Program

BCM will supply four men to conduct the sampling program in accordance with EPA and Allegheny County requirements. Opacities will be determined simultaneously during each particulate test run by EPA-certified visual emissions observers. Two men will be required on the exhaust stack to perform the emission test. One man will observe the exhaust stack for opacity emissions and one man will observe the push shed for opacity emissions and to coordinate the sampling activities. We propose to sample and observe 24 pushes for a duration of 2-1/2 minutes per push. This will provide a 60-minute sampling run and a minimum 50 dscf sample required by Allegheny County. If necessary, BCM can provide additional manpower to complete this project.

This program will yield the following data:

- Gas flow - acfm and dscfm
- Gas temperature - ^{o}F
- Gas moisture content - % by volume
- Gas analysis - % by volume CO_2, O_2, and N_2
- Particulate emissions - grains/dscf
- Opacities - %

BCM will provide the following options for Shenango's consideration:

Option 1 - BCM will supply four men for two, ten-hour days to conduct one sampling run.

Option 2 - BCM will supply four men for three and one-half, ten-hour days to conduct two sampling runs.

Option 3 - BCM will supply four men for five, ten-hour days to conduct three sampling runs.

1.2.3 Data Evaluation and Report Preparation

BCM personnel will review and will incorporate into their written report the testing data and pertinent operating data supplied by Shenango. This report will include, but will not be limited to, the following:

- Discussion of the sampling and analytical techniques employed
- Tabulation of field and laboratory data
- All calibration sheets for each appropriate piece of sampling equipment used in the program

Shenango will receive five copies of the final report for regulatory agency and in-house distribution.

1.3 SAFETY

BCM personnel always endeavor to conduct field activities in such a manner as to protect themselves and others from accidents and injury. When special safety equipment is required, the client should so specify. BCM personnel use their own safety equipment (hard hats, goggles, etc.) unless otherwise instructed.

1.4 PROJECT MANAGEMENT

BCM will assign a project manager experienced in conducting similar studies. Mr. Paul Jadlowiec, Project Scientist, is responsible for all field testing activities involving the Air Quality Section. He will be the primary plant contact.

2.0 BUSINESS TERMS

2.1 COMPENSATION

We propose that the outlined project scope be performed on a lump sum basis. This fee is firm and cannot be changed unless it is mutually agreed that the scope of work has changed from that outlined in this proposal.

LUMP SUM COST

Option 1 - 1 Test Run . . . . . $

Option 2 - 2 Test Runs . . . . . $

Option 3 - 3 Test Runs . . . . . $

Field Delays . . . . . $

Any billable charges incurred by BCM prior to last-minute project postponement or termination by you will be billed at hourly rates plus expenses, in accordance with the BCM Schedule of Billing Charges in effect at that time.

2.2 INVOICES

Invoices will be submitted on a monthly basis for work completed and are due upon receipt. Past-due balances are subject to interest at the rate of one-and-one-half percent per month, effective 30 days after date of invoice. This represents an annual interest charge of 18 percent.

If full payment is not made within this schedule, BCM has the option of ceasing work on the project until full payment is received.

2.3 WORK SCHEDULE

Upon receipt of your notification that BCM has been selected, we will meet with personnel from your company to finalize the project scope (if necessary) and determine a performance schedule and a target completion date which meet your needs. The week of January 18, 1988 is the tentative testing time.

2.4 DELAYS/OVERTIME

Delays in project completion caused by conditions beyond BCM's control, such as unfavorable weather conditions, partial or complete plant shutdowns, strikes, floods, or fires, constitute a change of scope. We will notify you of any delays and bill you for any additional work resulting from such delays at the field delay rate specified in Section 5.0. BCM will build a temporary shelter on the stack to minimize any weather delays.

2.5 VALIDITY

This proposal is valid for 60 days. Subsequent to that date, BCM may review the basis of payment to allow for changing costs and adjust starting and completion dates to conform to our workload.

2.6 INSURANCE

BCM will maintain insurance coverage in the following amounts and, at the client's request, will provide a Certificate of Insurance so indicating:

Type of Policy	Limits of Liability
(a) Standard Workers' Compensation	Statutory
Employer's Liability	$100,000
(b) General Liability	
Combined Single Limit (Bodily Injury and Property Damage	$1,000,000 Each Occurrence
(c) Automobile Liability	
Combined Single Limit (Bodily Injury and Property Damage)	$1,000,000 Each Occurrence

2.7 CLIENT RESPONSIBILITY

To ensure that the proposed project is completed successfully, it will be the responsibility of Shenango Incorporated to provide the following:

1. Plant liaison for the BCM field team for the duration of the program
2. Safe access to the sampling locations
3. Pertinent operating data, if applicable, for inclusion in the final test report

APPENDIX B

STACK TEST DATA

BCM

1.0 SAMPLING PROCEDURES

The following sampling procedures will be utilized during the testing of Shenango Inc.'s No. 4 Coke Oven Battery Coke Push Emission Baghouse Stack.

1.1 TESTING STATION AND TRAVERSE LOCATIONS

The following is an explanation of the sampling points to be utilized during the project.

The 10-foot diameter baghouse stack test location is situated 12 diameters downstream and greater than 2 diameters upstream of the nearest flow distrubance, which yields a minimum requirement of 12 traverse points, 3 traverse points per each of 4 test ports. The samples will be pulled for 5 minutes (2 pushes at 2.5 minutes each) at each traverse point in order to obtain the minimum requirement of 50 cubic feet. A total of 24 coke pushes will be sampled.

1.2 GAS FLOW AND GAS TEMPERATURE MEASUREMENTS

The flow rate and temperature profiles for the gas stream is measured by conducting simultaneous velocity and temperature traverses. Gas velocity head is measured with a calibrated "S"-type Pitot tube which is connected to an inclined manometer. The static pressure is measured using the same Pitot tube and manometer. A Chrome-Alumel thermocouple attached to a digital potentiometer is used to measure the gas temperature at each of the traverse points. The gas flow and gas temperature measurements follow Method Two as published in the Federal Register*.

1.3 MOLECULAR WEIGHT DETERMINATION

A Bacharach Fyrite analyzer is used to determine the molecular weight of the flue gas. Fyrite Gas analyzers give accurate readings within +/- 0.5% Carbon Dioxide or Oxygen up to 538 degrees. Readings are unaffected by most other gases. The average of three samples is used for each test run. The following parameters are measured in order to calculate molecular weight: volume percent carbon dioxide and volume percent oxygen: the volume percentage of carbon monoxide and nitrogen is determined by difference. These parameters are measured using the principle of gas absorption in specific absorbing solutions.

* Federal Register, Vol. 42, No. 160, August 18, 1977

BCM

1.4 MOISTURE CONTENT SAMPLING

Moisture sampling is conducted employing the principles presented in EPA Method Four and concurrently with particulate sampling. Parameters evaluated in order to determine the gas stream moisture content are: sample gas volume, sample gas temperature, sample gas pressure, impinger moisture gain, and silica gel moisture gain. Some minor modifications are made to the Method Four train to allow concurrent particulate and moisture content sampling; these modifications involve no deviations from sampling principles. Modifications such as the substitution of a glass fiber filter for Pyrex wool as a filtering medium and the substitution of a calibrated orifice for a rotameter as a flow metering device are incorporated.

1.5 DETERMINATION OF PARTICULATE EMISSION

The following method is used in this test program. Sampling procedures follow those described in Method Five of the Federal Register*. Due to space constraints, one exception to the method will exist. A heated teflon flex line will be used to connect the rigid glass-lined probe with the heated filter box.

Approximately 200 grams of silica gel are weighed in a sealed impinger prior to each test. Glass fiber filters** (3-inch diameter) are desiccated for at least 24 hours and weighed to the nearest 0.1 mg on an analytical balance. One hundred ml of distilled water is placed in each of the first two impingers; the third impinger is initially empty; and the impinger containing the silica gel is placed next in series. The train is set up with the probe as shown in Figure 1. The sampling train is leak checked at the sampling site prior to each test run by plugging the inlet to the nozzle and pulling a 15-inch Hg vacuum, and at the conclusion of the test by plugging the inlet to the nozzle and pulling a vacuum equal to the highest vacuum reached during the test run.

The Pitot tube and lines are leak checked at the test site prior to and following the initial velocity traverse. The check is made by blowing into the impact opening of the Pitot tube until 3 or more inches of water are recorded on the manometer and then capping the impact opening and holding it for 15 seconds to assure it is leak free. The static pressure side of the Pitot tube is leak checked using the same procedure, except suction is used to obtain the 3-inch H_2O manometer reading. Crushed ice is placed around the impingers to keep the temperature of the gases leaving the last impinger at 68°F or less.

* Federal Register, Vol. 42, No. 160, August 18, 1977
** Whatman Type 934 AH

During sampling, stack gas and sampling train data are recorded at each sampling point and when significant changes in stack flow conditions occur. Isokinetic sampling rates are set throughout the sampling period with the aid of a nomograph or calculator. All sampling data are recorded on the Particulate Field Data Sheet.

1.5.1 Sample Recovery Procedure

The sampling train is moved carefully from the test site to the cleanup area. Samples of the acetone and distilled water used in the sample recovery are taken for use as blanks. The volume of water from the first three impingers is measured. Sample frac- tions are recovered as follows:

Container No. 1 - The filter is removed from its holder and placed in a petri dish and sealed.

Container No. 2 - Loose particulate and acetone washings from all sample-exposed surfaces prior to the filter are placed in a glass jar, and sealed and labeled. Particulate is removed from the probe with the aid of a brush and acetone rinsing. The liquid level is marked after the container is sealed.

Container No. 3 - A minimum of 200 ml of acetone is taken for the blank analysis. The blank is obtained and treated in a similar manner as the acetone washing.

The silica gel from the fourth impinger is weighed and recorded on the Particulate Field Data Sheet with other pertinent data.

1.5.2 Analytical Procedures

Container No. 1 - The filter and any loose particulate matter from this sample container are placed into a dessicator and desiccated for 24 hours and weighed to a constant weight to the nearest 0.1 mg.

Container No. 2 - The acetone washings are transferred to a tared beaker and evaporated to dryness at ambient temperature and pressures, desiccated for 24 hours to a constant weight, and weighed to the nearest 0.1 mg.

Container No. 3 - The acetone blank is transferred to a tared beaker and evaporated to dryness at ambient temperature and pressure. The blank is then desiccated for 24 hours to a constant weight and weighed to the nearest 0.1 mg.

The term "constant weight" means a difference of no more than 0.5 mg or 1 percent of total weight less tare weight, whichever is greater, between two consecutive readings, with no less than 6 hours of desiccation between weighings. All analytical data are recorded on the Analytical Particulate Data Sheet. Acetone blank data are recorded on the Acetone Blank Data Sheet.

1.6 VISIBLE EMISSIONS

During compliance testing, visible emission observations will be made simultaneously by a certified observer using EPA Method 9.

1.7 PROCESS DATA

During compliance testing, the following process data will be gathered and inserted into the final report:

- Daily pusher log
- Dust collector ΔP recordings
- Baghouse compartment ΔPs
- Inlet pressure on fans 1 and 2

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

. LANT Shenango
DATE 1-17-88
SAMPLING LOCATION Push Shed Baghouse Outlet
INSIDE OF FAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE A) 124 1/8"
INSIDE OF NEAR WALL TO
OUTSIDE OF NIPPLE, (DISTANCE B) 4 1/2"
STACK I.D., (DISTANCE A - DISTANCE B) 120"
NEAREST UPSTREAM DISTURBANCE ~ 8Φ
NEAREST DOWNSTREAM DISTURBANCE ~ 2Φ
CALCULATOR PS

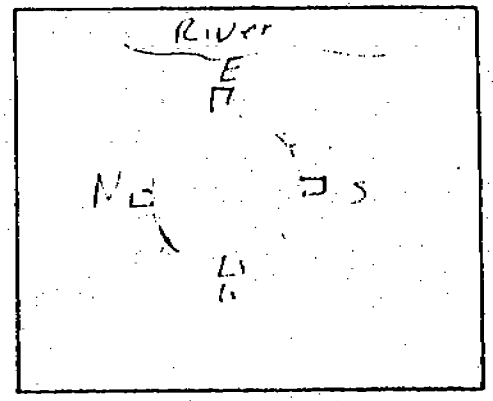
SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1/8 INCH)	DISTANCE B	TRAVERSE POINT LOCAT FROM OUTSIDE OF NIPP (SUM OF COLUMNS 4 &
1	0.044	120"	5.3	4.5	9.8
2	0.186	↓	17.5	↓	22.0
3	0.296	↓	35.5	↓	40.0

EPA (Dur) 232
4/72

EPA METHOD 5
FIELD DATA

PLANT Shawnigo
DATE 1-15-78
SAMPLING LOCATION #1 Battery
SAMPLE TYPE [illegible]
RUN NUMBER 1
OPERATOR [illegible]
AMBIENT TEMPERATURE [illegible]
BAROMETRIC PRESSURE [illegible]
STATIC PRESSURE, (P_s) 21.10
FILTER NUMBER (s) 531
PITOT TUBE No. & Cp. 5-1



PROBE LENGTH AND TYPE 5 Ft S.S
NOZZLE I.D. .220
ASSUMED MOISTURE, % 2
SAMPLE BOX NUMBER H-1
METER BOX NUMBER 522-125
METER ΔH@ 1.8977
K FACTOR 1.0
PRE-TEST LEAK CHECK RATE .005 CFM @ 15 "Hg
POST TEST LEAK CHECK RATE .006 CFM @ 10 "Hg
REFERENCE Δp 0.70 @ 50°F
205 ml moisture → 18.8

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 1½ MINUTES

TRAVERSE POINT NUMBER	ELAPSED SAMPLING TIME, min	CLOCK TIME (24 hr. CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PROBE TEMPERATURE, °F
1	1½	[illegible]	[illegible]	1.5 1.225	4.0	4.0	73	56	63	6	[illegible]	46	[illegible]
1	5	[illegible]	[illegible]	1.5 1.225	4.0	4.0	73	72	63	6	[illegible]	40	↓
[illegible]	7½	[illegible]	935.12	1.5 1.225	4.0	4.0	[illegible]	57	57	6	233	38	
[illegible]	10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	56	57	6	231	[illegible]	
[illegible]	12½	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	57	53	6	[illegible]	36	
[illegible]	15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6	[illegible]	37	
N 1	[illegible]	[illegible]	146.61	1.5 1.225	4.0	4.0	74	57	67	6	243	[illegible]	
1	[illegible]	[illegible]	147.35	1.3 1.140	3.5	3.5	67	77	77	6	258	38	
2	[illegible]	1021 [illegible]	149.27	1.3 1.140	3.5	3.5	67	63	57	5	253	37	
[illegible]	[illegible]	[illegible]	[illegible]	1.4 1.183	3.8	3.8	67	63	58	6	247	37	
[illegible]	[illegible]	1039 [illegible] 1042	956.37	1.5 1.225	4.0	4.0	69	67	63	6	247	37	
[illegible]	[illegible]	1111 [illegible] 1115 [illegible]	[illegible]	1.5 1.225	4.0	4.0	69	73	63	6	237	37	

PLANT [illegible] DATE 1-18-87 RUN NO. 1

TRAVERSE POINT NUMBER	ELAPSED SAMPLING TIME, min	CLOCK TIME (24 hr. CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PROBE TEMPERATURE, °F
					DESIRED	ACTUAL		INLET ($T_{m_{in}}$), °F	OUTLET ($T_{m_{out}}$), °F				
W 1	2½	[illegible]	960.[illegible]	1.[illegible]	3.5	3.5	72	[illegible]	51	5	223	39	
1	5	[illegible]	963.[illegible]	1.3[illegible]	3.5	3.5	72	63	51	5	[illegible]	38	
2	7½	1240 1243	965.46	1.5[illegible]	4.[illegible]	[illegible]	70	67	51	6	223	36	
2	10	[illegible]	[illegible]	1.5[illegible]	4.0	4.0	60	[illegible]	51	6	[illegible]	[illegible]	
3	12½	[illegible]	968.98	1.7[illegible]	4.6	[illegible]	[illegible]	6[illegible]	[illegible]	7	[illegible]	36	
3	15	[illegible]	973.13	1.7[illegible]	4.6	4.6	66	63	57	7	[illegible]	[illegible]	
E 1	2½	1331 1335	976.51	1.6[illegible]	4.3	4.3	68	67	51	6	251	[illegible]	
1	5	[illegible] 1400 00	977.19	1.6[illegible]	4.3	4.3	[illegible]	62	51	6	26[illegible]		
2	7½	1416 00 1419 [illegible]	981.72	1.7[illegible]	4.6	4.6	67	63	57	6	263	[illegible]	
2	10	1514 1517	984.70	1.6[illegible]	4.3	4.3	63	57	48	6	233	31	
2	12½	[illegible]	987.32	1.6[illegible]	4.3	4.3	61	57	53	6	247	31	
2	15	[illegible]	990.001	1.6[illegible]	4.3	4.3	63	57	53	6	253	31	
			60.023	1.23		4.07	67.7		51.1				

EPA METHOD 5
FIELD DATA

PLANT [illegible]
DATE [illegible]
SAMPLING LOCATION [illegible]
SAMPLE TYPE [illegible]
RUN NUMBER [illegible]
OPERATOR [illegible]
AMBIENT TEMPERATURE [illegible]
BAROMETRIC PRESSURE [illegible]
STATIC PRESSURE, (P_s) [illegible]
FILTER NUMBER (s) [illegible]
PITOT TUBE No. & Cp. [illegible]

PROBE LENGTH AND TYPE [illegible]
NOZZLE I.D. [illegible]
ASSUMED MOISTURE, % [illegible]
SAMPLE BOX NUMBER [illegible]
METER BOX NUMBER [illegible]
METER ΔH@ [illegible]
K FACTOR [illegible]
PRE-TEST LEAK CHECK RATE [illegible] CFM @ [illegible] "Hg
POST TEST LEAK CHECK RATE .000 CFM @ 10 "Hg
REFERENCE Δp [illegible]

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 2 1/2 MINUTES

Moisture 3.2

TRAVERSE POINT NUMBER	ELAPSED SAMPLING TIME, min	CLOCK TIME (24 hr. CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PROBE TEMPERATURE, °F
1		[illegible]	[illegible]	1.3 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]		7	[illegible]	23	
1		[illegible]	4.975	1.2 [illegible]	3.0	[illegible]	51	[illegible]	[illegible]	6	[illegible]	[illegible]	↓
		0954 00 0956 30	7.66	1.6 1.265	4.3	4.3	54	67	63	8	247	18	
		1005 30 1008 00	10.58	1.8 [illegible]	[illegible]	[illegible]	55	[illegible]	[illegible]	[illegible]	253	18	
		[illegible]	[illegible]	1.6 [illegible]	[illegible]	[illegible]	59	[illegible]	57	6	[illegible]	[illegible]	
		[illegible]	18.[illegible]	1.7 [illegible]	4.5	[illegible]	57	63	57	8	257	23	
		[illegible]	[illegible]	1.3 [illegible]	3.6	3.6	52	57	53	7	227	18	
1	5	1150 15 1152 45	26.18	1.3 1.141	3.6	3.6	59	58	53	8	273	17	
		1211 15 1213 45	28.87	1.6 1.265	4.3	4.3	63	58	53	8	253	23	
		1222 00 1224 30	31.57	1.6 1.265	4.3	4.3	61	63	57	9	243	23	
		1244 00 1246 30	34.36	1.7 1.304	4.5	4.5	61	63	57	9	243	23	
	15	1253 45 1256 15	37.11	1.7 1.304	4.5	4.5	61	67	51	[illegible]	243	27	

PLANT [illegible] DATE [illegible] RUN NO. 2

TRAVERSE POINT NUMBER	ELAPSED SAMPLING TIME, min	CLOCK TIME (24 hr. CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PROBE TEMPERATURE, °F
N 1	2½	1316 30 1319 00	39.343	1.1 1.044	3.0	3.0	61	63	58	6	263	27	
1	5	1325 45 1328 15	41.81	1.3 1.141	3.5	3.5	61	67	58	8	257	27	
2	7½	1349 30 1351 00	44.43	1.5 1.225	4.0	4.0	65	67	58	8	257	27	
2	10	1404 00 1406 30	47.04	1.5 1.225	4.0	4.0	60	67	58	8	263	33	
3	12½	1426 00 1428 30	49.69	1.7 1.304	4.5	4.5	64	67	58	9	263	27	
3	15	1515 45 1518 15	52.45	1.6	4.3	4.3	61	67	63	9	268	33	
W 1	2½	1523 30 1526 00	54.94	1.2	3.2	3.2	63	68	63	6	260	33	
1	5	1545 30 1548 00	57.27	1.2	3.2	3.2	61	63	63	5	257	33	
2	7½	1553 30 1556 00	59.88	1.4	3.8	3.8	60	68	63	5	253	33	
2	10	1616 00 1618 30	62.59	1.5	4.0	4.0	60	67	63	6	253	33	
3	12½	1626 00 1628 30	65.36	1.6	4.3	4.3	62	73	67	8	253	33	
3	15	1648 30 1651 30	67.045	1.5	4.0	4.0	57	67	67	7	253	33	
			1.105	1.314		3.922	[illegible]	63.221					
			2.104										
			2.150										
			2.347										
			44.318										
			62.048										

EPA METHOD 5
FIELD DATA

PLANT Shenango
DATE 1-20-85
SAMPLING LOCATION No1 [illegible]
SAMPLE TYPE [illegible]
RUN NUMBER 3
OPERATOR [illegible]
AMBIENT TEMPERATURE [illegible]
BAROMETRIC PRESSURE 28.85
STATIC PRESSURE, (P_s) -.83/ 28.79
FILTER NUMBER (s) 5.5"
PITOT TUBE No. & Cp. 5-1 0.8[illegible]

PROBE LENGTH AND TYPE 5 Ft S.S.
NOZZLE I.D. .220
ASSUMED MOISTURE, % 2
SAMPLE BOX NUMBER 1
METER BOX NUMBER 582-128
METER ΔH@ 1.[illegible] avg 1.02[illegible]
K FACTOR 1.05
PRE-TEST LEAK CHECK RATE _____ CFM @ [illegible] "Hg
POST TEST LEAK CHECK RATE .004 CFM @ 10 "Hg
REFERENCE Δp 0.7 @ 80°F

Moisture 195ml
moisture total 13.2

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 2½ MINUTES

TRAVERSE POINT NUMBER	ELAPSED SAMPLING TIME, min	CLOCK TIME (24 hr. CLOCK)	GAS METER READING (V_m), ft³	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PROBE TEMPERATURE, °F
W1			[illegible]	1.0 1.000			86	67	67	5			248±25
[illegible]			[illegible]	1.1 1.000			86	67	67	5	270		↓
2		0839 [illegible]	75.13	1.5	3.6	3.6	73	67	67	8	236	33	
2		0844 [illegible] 0849 30	77.72	1.4 1.163	3.6	3.6	72	67	67	7	243	[illegible]	
2		0924 00 0926 30	79.614 81.98	1.5 1.225	3.8	3.8	67	67	67	7	247	33	
2		0936 45 0941 15	84.68	1.5 1.225	3.8	3.8	65	67	67	8	253	37	
[illegible]		0957 13 [illegible]	87.14	1.2 [illegible]	3.2	[illegible]	74	68	67	7	25[illegible]	3[illegible]	
[illegible]		[illegible]		1.3 [illegible]	3.5	3.5	74	73	67	8	25[illegible]	3[illegible]	
2		[illegible]	91.66	1.4 [illegible]	3.6	3.6	80	67	67	8	237	3[illegible]	
[illegible]		1034 [illegible] 1039 30	[illegible] 34.44[illegible]	1.4 [illegible]	4.0	4.0	82	79	72	8	227	37	
[illegible]		1130 [illegible] 1133 [illegible]	92.431 94.72	1.5 1.225	3.8	3.8	77	67	63	8	237	47	
[illegible]	15	1129 15 1141 45	96.98	1.5 1.225	3.8	3.8	82	77	63	8	227	43	

PLANT She[illegible] DATE [illegible] RUN NO. 3

TRAVERSE POINT NUMBER	ELAPSED SAMPLING TIME, min	CLOCK TIME (24 hr. CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m_{in}}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m_{out}}$), °F	PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	PROBE TEMPERATURE, °F
E 1	2½	12[illegible] 45	[illegible]	1.1 1.049	2.8	2.8	89	73	63	5	243	4[illegible]	
1	5	[illegible]	101.37	1.1 1.049	[illegible]	[illegible]	90	67	63	7	243	[illegible]	
2	7½	12[illegible] 00	103.79	1.4 1.183	3.6	3.6	89	73	67	8	247	4[illegible]	
2	[illegible]	12 40 15 / 12 42 45	106.62	1.5 1.225	4.0	4.0	92	88	77	8	263	58	
3	12½	12 57 [illegible] / 13 00 15	109.27	1.5 1.225	4.0	4.0	88	77	67	8	247	43	
3	15	13 13 45 / 13 16 15	111.97	1.5 1.225	4.0	4.0	85	77	67	8	247	47	
S 1	[illegible]	13 41 30 / 13 44 00	114.55	1.4 1.183	3.6	3.6	86	73	67	7	248	47	
1	5	13 5[illegible] / 13 54 30	116.91	1.2 1.045	3.2	3.2	85	83	67	7	253	47	
2	7½	14 12 15 / 14 14 45	119.54	1.5 1.225	4.0	4.0	90	77	63	8	253	47	
2	10	15 15 15 / 15 17 45	122.13	1.4 1.183	3.6	3.6	91	77	68	7	253	48	
3	12½	15 24 45 / 15 27 15	124.17	1.1 1.049	2.8	2.8	91	78	68	7	253	48	
3	15	15 49 30 / 15 51 00	126.859	1.6 1.265	4.5	4.5	83	83	73	8	257	48	
			9.539 / 11.852	1.1630		3.56	82.4		70.2				
		4% / 10%	2.469 ✓ / ~~[illegible]~~										
			34.428										
		Y = 1.019	58.303										

.040

APPENDIX C

VISIBLE EMISSIONS DATA

VISIBLE EMISSIONS OBSERVATION FORM

SERVER ~~Shenango~~ DANIEL PETROVAY

TE 1-18-88

CILITY SHENANGO

SERVATION PERIOD: START: 7 50

FINISH: 10 50

SERVATION POINT: TOP SIDE COKE #29 7:20

C. EN

URCE: 752.30

DISTANCE FROM: 150 YDS

DIRECTION FROM: EAST #34 801

HEIGHT: 250 FT.

ND:

SPEED: 5 mph TO 15 mph

DIRECTION: SOUTH EAST #126 813.20

MPERATURE: 46°

Y CONDITION: CLOUDY 100% OVERCAST 815.10

CKGROUND: GRAY + WHITE #44 825.20

ADING CONDITIONS: GOOD 8 28 00

#59

LOR OF EMISSIONS: BLACK 837.5

MMENTS: 8 39 45

#126

8 48 20

8 51 00

#2

OF READINGS ≥ 20%: 0

OF READINGS ≥ 60%: 0

ERAGE OPACITY: 0

ATUS: #12

GNATURE: Daniel Petrovay

	0	15	30	45
0	O	O	O	O
1	O	O	O	O
2	O	O	X	X
3	—	—	—	—
4	O	O	O	O
5	O	O	O	O
6	O	O	X	X
7	—	—	—	—
8	O	O	O	O
9	O	O	O	O
10	O	O	X	X
11	—	—	—	—
12	O	O	O	O
13	O	O	O	O
14	O	O	X	X
15	—	—	—	—
16	O	O	O	O
17	O	O	O	O
18	O	O	X	X
19	—	—	—	—
20	O	O	O	O
21	O	O	O	O
22	O	O	X	X
23	—	—	—	—
24	O	O	O	O
25	O	O	O	O
26	O	O	X	X
27	—	—	—	—
28	O	O	O	O
29	O	O	O	O

#12 9 19 00

#146 9 27 30

9 30 00

#9 47 22

9 49 40

9 50 40 #32

9 59 00

#118 10 0 30

10 12 00

#42 10 0 30

10 24 00

10 37 45

#52

10 39 00

10 47 45

#128

10 50 15

	0	15	30	45
30	O	O	X	X
31	—	—	—	—
32	O	O	O	O
33	O	O	O	O
34	O	O	X	X
35	—	—	—	—
36	O	O	O	O
37	O	O	O	O
38	O	O	X	X
39	—	—	—	—
40	O	O	O	O
41	O	O	O	O
42	O	O	X	X
43	—	—	—	—
44	O	O	O	O
45	O	O	O	O
46	O	O	X	X
47	—	—	—	—
48	O	O	O	O
49	O	O	O	O
50	O	O	X	X
51	—	—	—	—
52	O	O	O	O
53	O	O	O	O
54	O	O	X	X
55	—	—	—	—
56	O	O	O	O
57	O	O	O	O
58	O	O	X	X
59				

VISIBLE EMISSIONS OBSERVATION FORM

SERVER Daniel Petrovay

ATE 1-18-88

CILITY Shenango Steel

BSERVATION PERIOD: START: 10 50

FINISH: 1408

SERVATION POINT: Top side coke oven

URCE:

DISTANCE FROM: 150 YDS

DIRECTION FROM: East

HEIGHT: 250 ft

ND:

SPEED: South East 10 to 15 mph

DIRECTION: South East

MPERATURE: 47°

Y CONDITION: Cloudy 100% overcast

CKGROUND: Gray & white clouds

ADING CONDITIONS: Good

LOR OF EMISSIONS: Black

MMENTS: Start back at 1:45

. OF READINGS ≥ 20%: 0

. OF READINGS ≥ 60%: 0

ERAGE OPACITY: 0

ATUS:

GNATURE: Daniel Petrovay

	X	0	15	30	45		X	0	15	30	4
10 54 30	0	O	O	O	O	12 5[illegible]	30	O	O	X	X
#62	1	O	O	O	O		31	—	—	—	—
10 02 00	2	O	O	X	X	13 06 3[illegible]	32	O	O	O	O
	3	—	—	—	—	#121	33	O	O	O	O
11 [illegible]	4	O	O	O	O	13 09 00	34	O	O	X	X
#4	5	O	O	O	O		35	—	—	—	—
11 33 30	6	O	O	X	X	13 17 [illegible]	36	O	O	O	O
	7	—	—	—	—	#54	37	O	O	O	O
11 33 15	8	O	O	O	O	13 20 [illegible]	38	O	O	X	X
#138	9	O	O	O	O		39	—	—	—	—
11 55 [illegible]	10	O	O	X	X	13 28 [illegible]	40	O	O	O	O
	11	—	—	—	—	#6	41	O	O	O	O
12 [illegible]	12	O	O	O	O	13 30 [illegible]	42	O	O	X	X
#14	13	O	O	O	O		43	—	—	—	—
12 07 [illegible]	14	O	O	X	X	13 37 2[illegible]	44	O	O	O	O
	15	—	—	—	—	#131	45	O	O	O	O
12 15 30	16	O	O	O	O	13 34 55	46	O	O	X	X
#24	17	O	O	O	O		47	—	—	—	—
12 18 00	18	O	O	X	X	13 49 [illegible]	48	O	O	O	O
	19	—	—	—	—	#16	49	O	O	O	O
12 28 30	20	O	O	O	O	13 51 [illegible]	50	O	O	X	X
#14[illegible]	21	O	O	O	O		51	—	—	—	—
12 31 00	22	O	O	X	X	13 57 30	52	O	O	O	O
	23	—	—	—	—	#26	53	O	O	O	O
12 [illegible]	24	O	O	O	O	[illegible]	54	O	O	X	X
#34	25	O	O	O	O		55	—	—	—	—
12 [illegible]	26	O	O	X	X	[illegible]	56	O	O	O	O
	27	—	—	—	—	#141	57	O	O	O	O
12 [illegible]	28	O	O	O	O	[illegible]	58	O	O	X	X
#44	29	O	O	O	O		59	—	—	—	—

VISIBLE EMISSIONS OBSERVATION FORM

OBSERVER Daniel Petroway

DATE 1-18-95

FACILITY Sharon Steel

OBSERVATION PERIOD: START: 1615

FINISH: 1639

OBSERVATION POINT: Top side Coke oven #36

SOURCE:

DISTANCE FROM: 150 yds

DIRECTION FROM: East #151

HEIGHT:

WIND:

SPEED: 15 to 20 mph

DIRECTION: South East

TEMPERATURE: 42° #46

SKY CONDITION: 100% cloud cover

BACKGROUND: Gray + white #56

READING CONDITIONS: Good

COLOR OF EMISSIONS: Black #123

COMMENTS:

NO. OF READINGS ≥ 20%: 0

NO. OF READINGS ≥ 60%: 0 #133

AVERAGE OPACITY: 0

STATUS:

SIGNATURE: Daniel Petroway #173

	0	15	30	45
0	O	O	O	O
1	O	O	O	O
2	O	O	X	X
3	—	—	—	—
4	O	O	O	O
5	O	O	O	O
6	O	O	X	X
7	—	—	—	—
8	O	O	O	O
9	O	O	O	O
10	O	O	X	X
11	—	—	—	—
12	O	O	O	O
13	O	O	O	O
14	O	O	X	X
15	—	—	—	—
16	O	O	O	O
17	O	O	O	O
18	O	O	X	X
19	—	—	—	—
20	O	O	O	O
21	O	O	O	O
22	O	O	X	X
23	—	—	—	—
24	O	O	O	O
25	O	O	O	O
26	O	O	X	X
27	—	—	—	—
28	O	O	O	O
29	O	O	O	O

	0	15	30
30	O	O	X
31	—	—	—
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
54			
55			
56			
57			
58			
59			

VISIBLE EMISSIONS OBSERVATION FORM

SERVER Daniel Petroway

ATE 1-19-85

ILITY Shenango Steel

BSERVATION PERIOD: START: 8:50

FINISH: 1223

SERVATION POINT: Top side coke stack

Crew #128

URCE: Baghouse outlet stack 8:50-10

DISTANCE FROM: 150 yds

DIRECTION FROM: East 9:00-

HEIGHT: 250 ft #36

ND: 9:05-

SPEED: East

DIRECTION: 3-7 mph 9:20-50

MPERATURE: 37° #46

Y CONDITION: ~~Clear~~ 100% overcast 9:30-

CKGROUND: Blue sky Gray + white 9:40-

CLOUDS #58

ADING CONDITIONS: Good 9:45-

LOR OF EMISSIONS: Black 9:53-50

#56

MMENTS: 9:56-10

#8

10:25-50

#48

10:35-50

#1

10:45-50

#58

10:55-50

#18

	X	0	15	30	45
0		O	O	O	O
1		O	O	O	O
2		O	O	X	X
3		—	—	—	—
4		O	O	O	O
5		O	O	O	O
6		O	O	X	X
7		—	—	—	—
8		O	O	O	O
9		O	O	O	O
10		O	O	X	X
11		—	—	—	—
12		O	O	O	O
13		O	O	O	O
14		O	O	X	X
15		—	—	—	—
16		O	O	O	O
17		O	O	O	O
18		O	O	X	X
19		—	—	—	—
20		O	O	O	O
21		O	O	O	O
22		O	O	X	X
23		—	—	—	—
24		O	O	O	O
25		O	O	O	O
26		O	O	X	X
27		—	—	—	—
28		O	O	O	O
29		O	O	O	O

	X	0	15	30	45
30		O	O	X	X
31		—	—	—	—
32		O	O	O	O
33		O	O	O	O
34		O	O	X	X
35		—	—	—	—
36		O	O	O	O
37		O	O	O	O
38		O	O	X	X
39		—	—	—	—
40		O	O	O	O
41		O	O	O	O
42		O	O	X	X
43		—	—	—	—
44		O	O	O	O
45		O	O	O	O
46		O	O	X	X
47		—	—	—	—
48		O	O	O	O
49		O	O	O	O
50		O	O	X	X
51		—	—	—	—
52		O	O	O	O
53		O	O	O	O
54		O	O	X	X
55		—	—	—	—
56		O	O	O	O
57		O	O	O	O
58		O	O	X	X
59		—	—	—	—

. OF READINGS ≥ 20%: 0

. OF READINGS ≥ 60%: 0

VERAGE OPACITY: 0

ATUS:

GNATURE: Daniel Petroway

VISIBLE EMISSIONS OBSERVATION FORM

SERVER Daniel Petrovay

DATE 1-19-88

CILITY Shenango Steel

BSERVATION PERIOD: START: 1231

FINISH: 1550

BSERVATION POINT: Top side Coke Oven

OURCE: Baghouse outlet stack

DISTANCE FROM: 150 yds

DIRECTION FROM: East

HEIGHT: 250 ft.

IND:

SPEED: 5 to 10 mph

DIRECTION: North

MPERATURE: 45°

KY CONDITION: 100% overcast

ACKGROUND: Grayish white clouds

EADING CONDITIONS: Good

OLOR OF EMISSIONS: None

OMMENTS:

O. OF READINGS ≥ 20%: 0

O. OF READINGS ≥ 60%: 0

VERAGE OPACITY: 0

TATUS:

IGNATURE: Daniel Petrovay

	0	15	30	45
0	O	O	O	O
1	O	O	O	O
2	O	O	X	X
3	—	—	—	—
4	O	O	O	O
5	O	O	O	O
6	O	O	X	X
7	—	—	—	—
8	O	O	O	O
9	O	O	O	O
10	O	O	X	X
11	—	—	—	—
12	O	O	O	O
13	O	O	O	O
14	O	O	X	X
15	—	—	—	—
16	O	O	O	O
17	O	O	O	O
18	O	O	X	X
19	—	—	—	—
20	O	O	O	O
21	O	O	O	O
22	O	O	X	X
23	—	—	—	—
24	O	O	O	O
25	O	O	O	O
26	O	O	X	X
27	—			
28	O	O	O	O
29	O	O	O	O

	0	15	30	
30	O	O	X	X
31	—	—	—	—
32	O	O	O	O
33	O	O	O	O
34	O	O	X	X
35	—	—	—	—
36	O	O	O	O
37	O	O	O	O
38	O	O	X	X
39	—	—	—	—
40	O	O	O	O
41	O	O	O	O
42	O	O	X	X
43	—	—	—	
44	O	O	O	O
45	O	O	O	O
46	O	O	X	X
47	—	—	—	—
48	O	O	O	O
49	O	O	O	O
50	O	O	X	X
51	—	—	—	—
52	O	O	O	
53	O	O	O	
54	O	O	X	X
55	—	—	—	—
56	O	O	O	O
57	O	O	O	O
58	O	O	X	X
59	—	—		

VISIBLE EMISSIONS OBSERVATION FORM

SERVER Daniel Petroway

ATE 1-19-88

CILITY Shenango Steel

BSERVATION PERIOD: START: 1545

FINISH: 1154

BSERVATION POINT: Top Side Coke Oven

URCE:

DISTANCE FROM: 150 yds

DIRECTION FROM: East

HEIGHT: 250 ft

ND:

SPEED: 3-5 mph

DIRECTION: North East

MPERATURE: 43°

Y CONDITION: 100% overcast sky

CKGROUND: Grey white clouds

ADING CONDITIONS: Good

LOR OF EMISSIONS: Black

MMENTS:

O. OF READINGS ≥ 20%: 0

L. OF READINGS ≥ 60%: 0

VERAGE OPACITY: 0

ATUS:

GNATURE: Daniel Petroway

	0	15	30	45
0	O	O	O	O
1	O	O	O	O
2	O	O	X	X
3	—	—	—	—
4	O	O	O	O
5	O	O	O	O
6	O	O	X	X
7	—	—	—	—
8	O	O	O	O
9	O	O	O	O
10	O	O	X	X
11	—	—	—	—
12	O	O	O	O
13	O	O	O	O
14	O	O	X	X
15	—	—	—	—
16	O	O	O	O
17	O	O	O	O
18	O	O	X	X
19	—	—	—	—
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				

	0	15	30	45
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				

VISIBLE EMISSIONS OBSERVATION FORM

SERVER Daniel Petrovay

TE 1-20-88

CILITY Shenango Steel

BSERVATION PERIOD: START: 801

FINISH: 1048

SERVATION POINT: Top side Coke Oven #31

URCE: Baghouse outlet stack

DISTANCE FROM: 150 yds

DIRECTION FROM: East

HEIGHT: 250 ft

ND:

SPEED: 3 to 5 mph

DIRECTION: South East

MPERATURE: 51°

Y CONDITION: 100% overcast

CKGROUND: Gray + white clouds #51

ADING CONDITIONS: Good

LOR OF EMISSIONS: Black #61

MMENTS:

#121

#3

#13

. OF READINGS ≥ 20%: 0

. OF READINGS ≥ 60%: 0

VERAGE OPACITY: 0

ATUS:

GNATURE: Daniel Petrovay

	Time	0	15	30	45
0	801	O	O	O	O
1		O	O	O	O
2	803:30	O	O	X	X
3		—	—	—	—
4	810:00	O	O	O	O
5		O	O	O	O
6	813:30	O	O	X	X
7		—	—	—	—
8	819:00	O	O	O	O
9		O	O	O	O
10	821:30	O	O	X	X
11		—	—	—	—
12	834:15	O	O	O	O
13		O	O	O	O
14	836:45	O	O	X	X
15		—	—	—	—
16	844:15	O	O	O	O
17		O	O	O	O
18	846:45	O	O	X	X
19		—	—	—	—
20	852:15	O	O	O	O
21		O	O	O	O
22	854:45	O	O	X	X
23		—	—	—	—
24	900:30	O	O	O	O
25		O	O	O	O
26	902:00	O	O	X	X
27		—	—	—	—
28	908:30	O	O	O	O
29		O	O	O	O

	Time	0	15	30	45
30	910:00	O	O	X	X
31		—	—	—	—
32	912:00 #131	O	O	O	O
33		O	O	O	O
34	917:30	O	O	X	X
35		—	—	—	—
36	951:15	O	O	O	O
37	#23	O	O	O	O
38	959:45	O	O	X	X
39		—	—	—	—
40	1004:00	O	O	O	O
41	#33	O	O	O	O
42	1008:30	O	O	X	X
43		—	—	—	—
44	1015:15	O	O	O	O
45	#141	O	O	O	O
46	1017:45	O	O	X	X
47		—	—	—	—
48	1022:45	O	O	O	O
49	#43	O	O	O	O
50	1025:15	O	O	X	X
51		—	—	—	—
52	1030:45	O	O	O	O
53	#53	O	O	O	O
54	1039:15	O	O	X	X
55		—	—	—	—
56	1045:00	O	O	O	O
57	#151	O	O	O	O
58	1047:30	O	O	X	X
59		—	—	—	—

VISIBLE EMISSIONS OBSERVATION FORM

SERVER Daniel Petrovay

TE 1-20-88

CILITY Shenango Steel

SERVATION PERIOD: START: 1130

FINISH: 1404

SERVATION POINT: Top side coke oven

URCE:

DISTANCE FROM: 150 yds

DIRECTION FROM: East

HEIGHT: 250 ft

ND:

SPEED: 5 to 7 mph

DIRECTION: South East

MPERATURE: 55°

Y CONDITION: 50% overcast

CKGROUND: Blue, Gray-white clouds

ADING CONDITIONS: Good

LOR OF EMISSIONS: Black

MMENTS:

. OF READINGS ≥ 20%: 0

. OF READINGS ≥ 60%: 0

ERAGE OPACITY: 0

ATUS:

GNATURE: Daniel Petrovay

	X	0	15	30	45		X	0	15	30	4
1130	0	O	O	O	O	1242 40	30	O	O	X	X
#5	1	O	O	O	O		31	—	—	—	—
1133	2	O	O	X	X	1249 30	32	O	O	O	O
	3	—	—	—	—	#143	33	O	O	O	O
1140 10	4	O	O	O	O	1252 00	34	O	O	X	X
#15	5	O	O	O	O		35	—	—	—	—
1142 40	6	O	O	X	X	1259 30	36	O	O	O	O
	7	—	—	—	—	#7	37	O	O	O	O
1145 00	8	O	O	O	O	1302 00	38	O	O	X	X
#123	9	O	O	O	O		39	—	—	—	—
1147 30	10	O	O	X	X	1313 30	40	O	O	O	O
	11	—	—	—	—	#17	41	O	O	O	O
1150 00	12	O	O	O	O	1315 00	42	O	O	X	X
#25	13	O	O	O	O		43	—	—	—	—
1200 30	14	O	O	X	X	1321 30	44	O	O	O	O
	15	—	—	—	—	#153	45	O	O	O	O
1200 30	16	O	O	O	O	1324 45	46	O	O	X	X
#35	17	O	O	O	O		47	—	—	—	—
1204 00	18	O	O	X	X	1341 15	48	O	O	O	O
	19	—	—	—	—	#27	49	O	O	O	O
1215 00	20	O	O	O	O	1345 45	50	O	O	X	X
#133	21	O	O	O	O		51	—	—	—	—
1217 30	22	O	O	X	X	1351 30	52	O	O	O	O
	23	—	—	—	—	#37	53	O	O	O	O
1230 10	24	O	O	O	O	1354 00	54	O	O	X	X
#45	25	O	O	O	O		55	—	—	—	—
1232 40	26	O	O	X	X	1401 00 #125	56	O	O	O	O
	27	—					57	O	O	O	O
1240	28	O	O	O	O	1404 00	58	O	O	X	X
#55	29	O	O	O	O		59	—	—	—	

VISIBLE EMISSIONS OBSERVATION FORM

OBSERVER Daniel Fitzway

DATE 1-20-88

FACILITY Shenango Steel

OBSERVATION PERIOD: START: 1413

FINISH: 1710

OBSERVATION POINT: Top side Coke Oven

SOURCE: Baghouse outlet stack

DISTANCE FROM: 150 yds

DIRECTION FROM: East

HEIGHT: 250 ft

WIND:

SPEED: 10 to 18 mph

DIRECTION: South

TEMPERATURE: 56°

SKY CONDITION: 75% overcast

BACKGROUND: Gray water + blue sky

READING CONDITIONS: Good

COLOR OF EMISSIONS: Black

COMMENTS:

NO. OF READINGS ≥ 20%: 0

NO. OF READINGS ≥ 60%: 0

AVERAGE OPACITY: 0

STATUS:

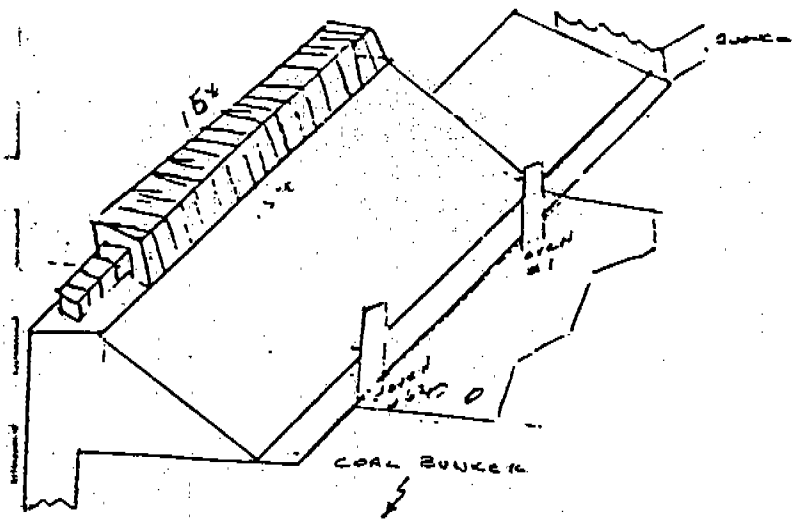
SIGNATURE: Daniel Fitzway

	X	0	15	30	45
0		O	O	O	O
1		O	O	O	O
2		O	O	X	X
3		—	—	—	—
4		O	O	O	O
5		O	O	O	O
6		O	O	X	X
7		—	—	—	—
8		O	O	O	O
9		O	O	O	O
10		O	O	X	X
11		—	—	—	—
12		O	O	O	O
13		O	O	O	O
14		O	O	X	X
15		—	—	—	—
16		O	O	O	O
17		O	O	O	O
18		O	O	X	X
19		—	—	—	—
20		O	O	O	O
21		O	O	O	O
22		O	O	X	X
23		—	—	—	—
24		O	O	O	O
25		O	O	O	O
26		O	O	X	X
27		—	—	—	—
28		O	O	O	O
29		O	O	O	O

	X	0	15	30
30		O	O	X
31		—	—	—
32		O	O	O
33		O	O	O
34		O	O	X
35		—	—	—
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				

#1 Battery

RUN #1



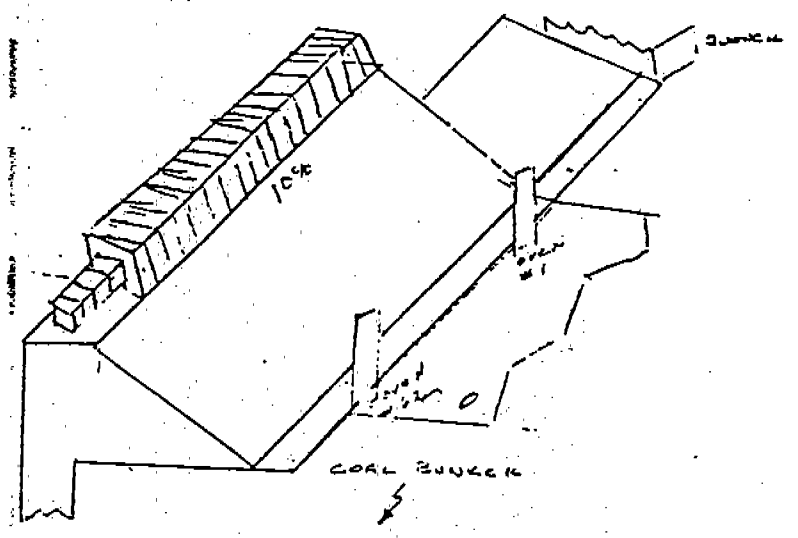
OVEN # 29 : #29

TIME OF PUSH : 750

TIME ≥ 20% : 0

MAX OPACITY : 15%

DATE : 1-18-88



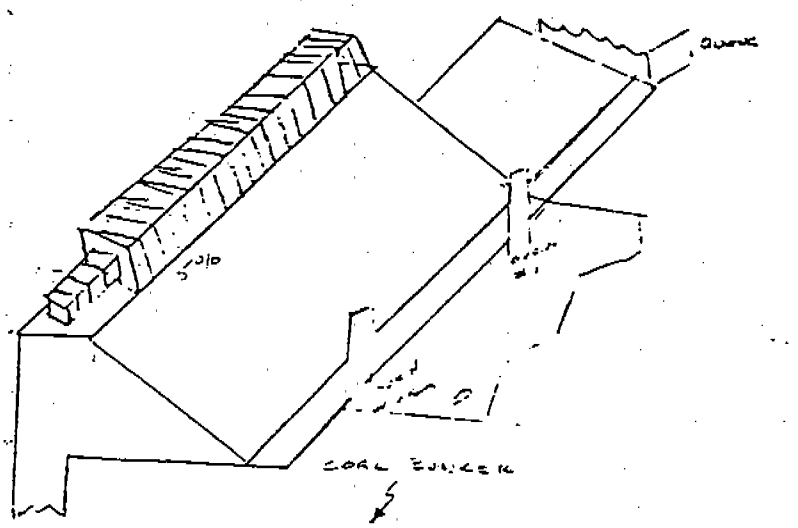
OVEN # : #39

TIME OF PUSH : 801

TIME ≥ 20% : 0

MAX OPACITY : 10%

DATE : 1-18-88



OVEN # : #49

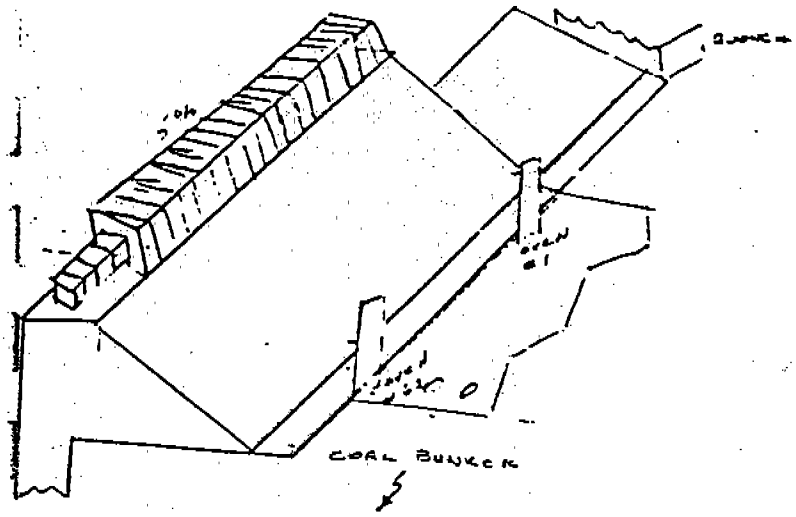
TIME OF PUSH : 8.25.30

TIME ≥ 20% : 0

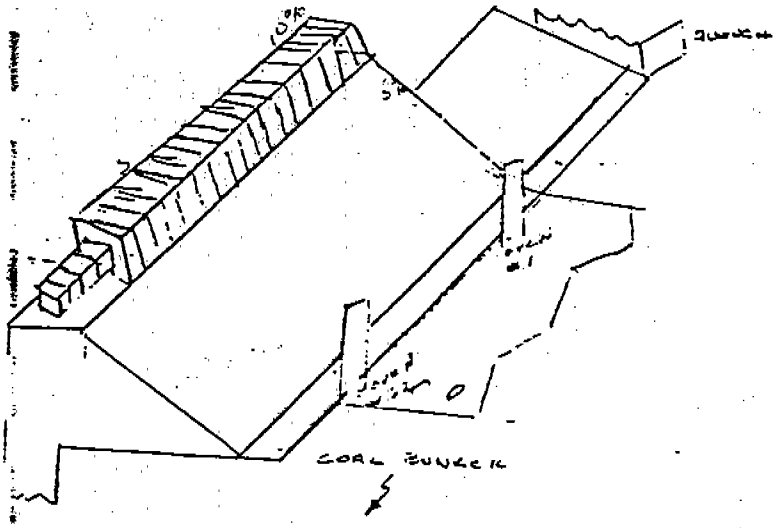
MAX OPACITY : 5%

DATE : 1-18-88

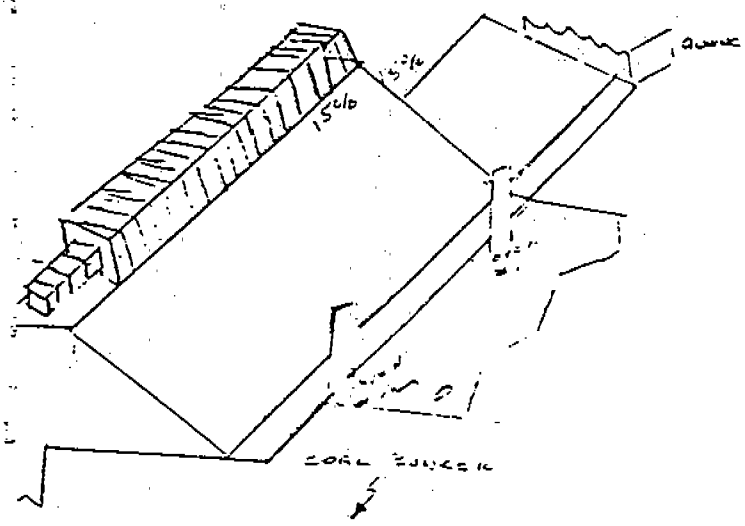
#1 BATTERY
RUN 1



OVEN # : # 59
TIME OF PUSH : 8 37 15
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-18-88

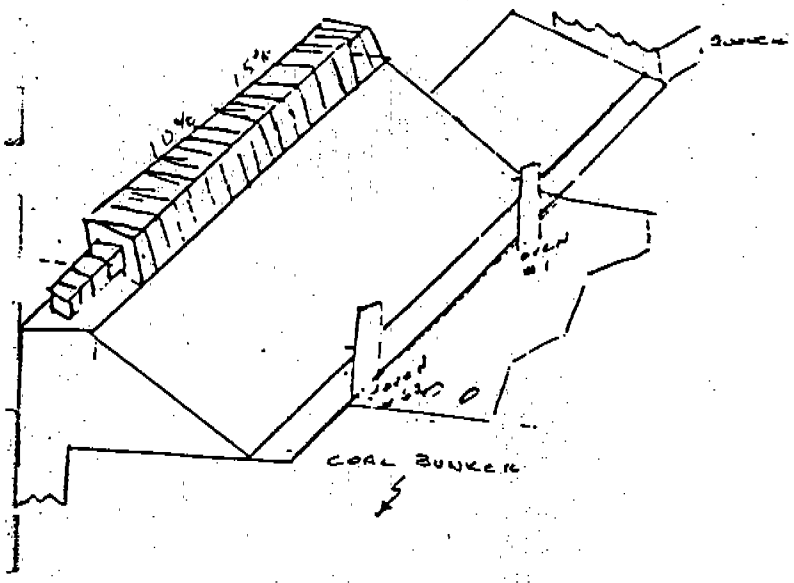


OVEN # : #2
TIME OF PUSH : 9 03 00
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-18-88

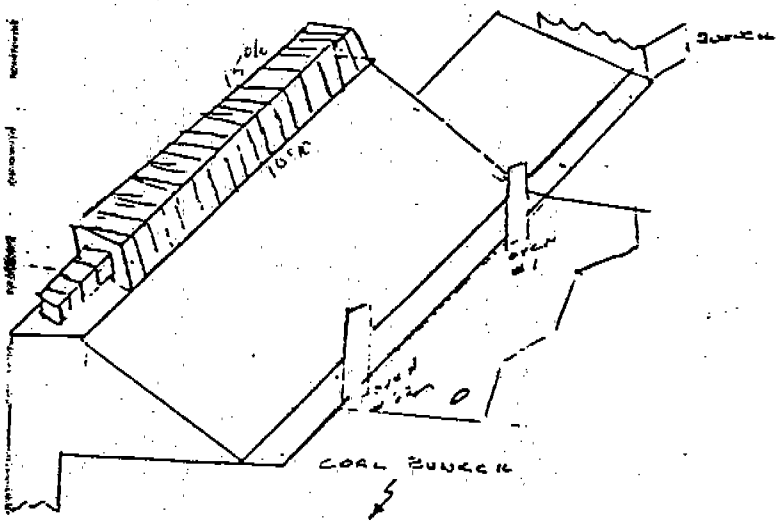


OVEN # : #12
TIME OF PUSH : 9 16 30
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-18-88

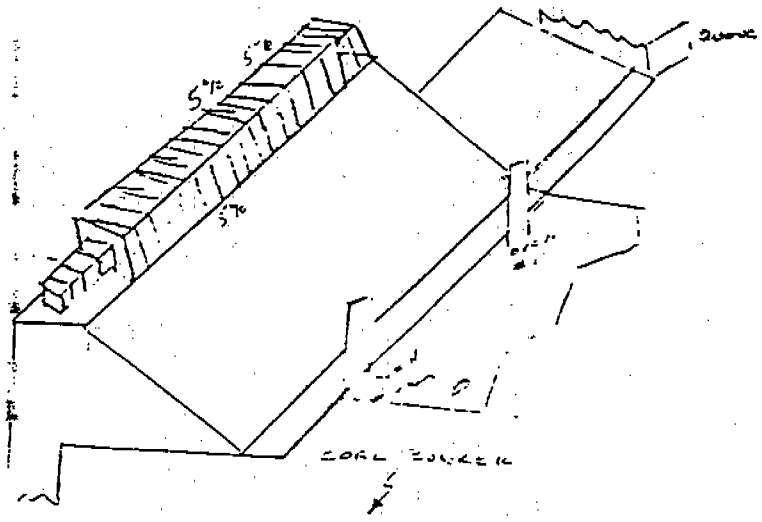
1 BATTERY
RUN #1



OVEN # : [redacted] #22
TIME OF PUSH : 9 47 10
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-18-88

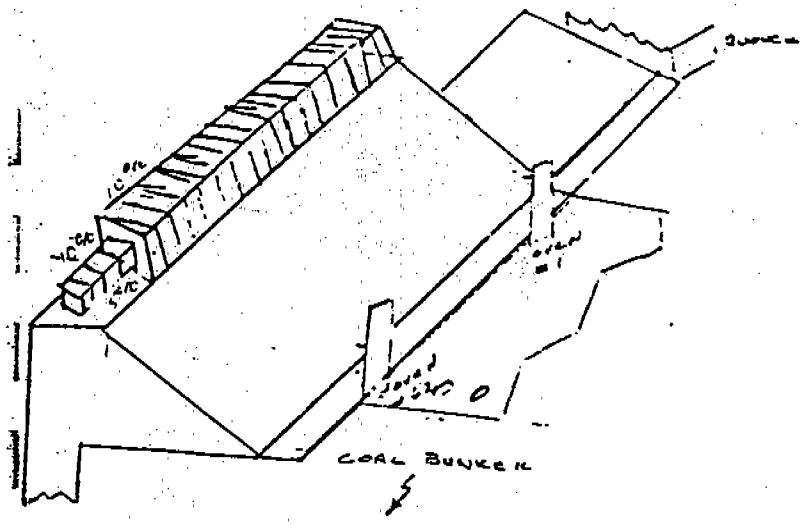


OVEN # : #32
TIME OF PUSH : 9 56 30
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-18-88

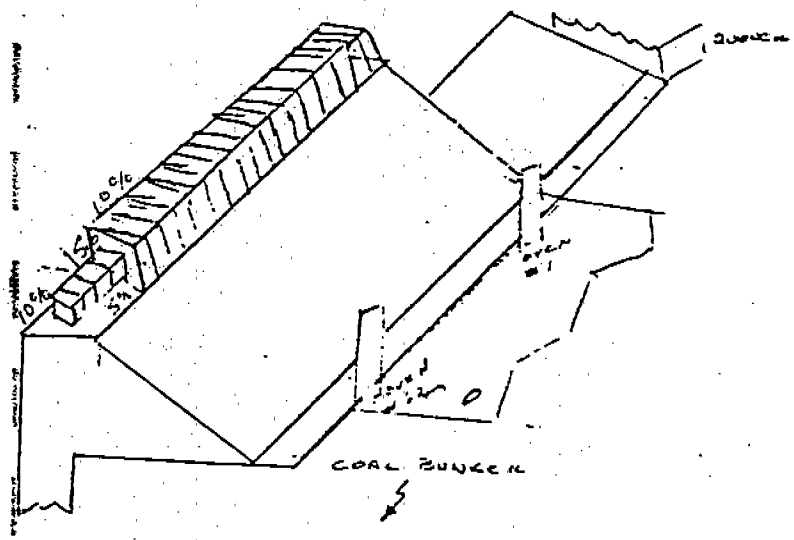


OVEN # : # 42
TIME OF PUSH : 10 21 30
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-18-88

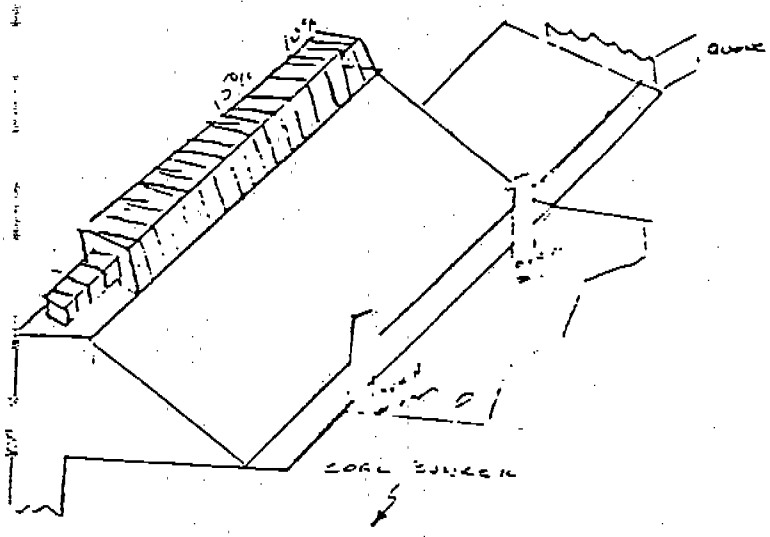
#1 BATTERY
RUN #1



OVEN # : 52
TIME OF PUSH : 10:38:45
TIME ≥ 20% : Ø
MAX OPACITY : 10%
DATE : 1-18-88

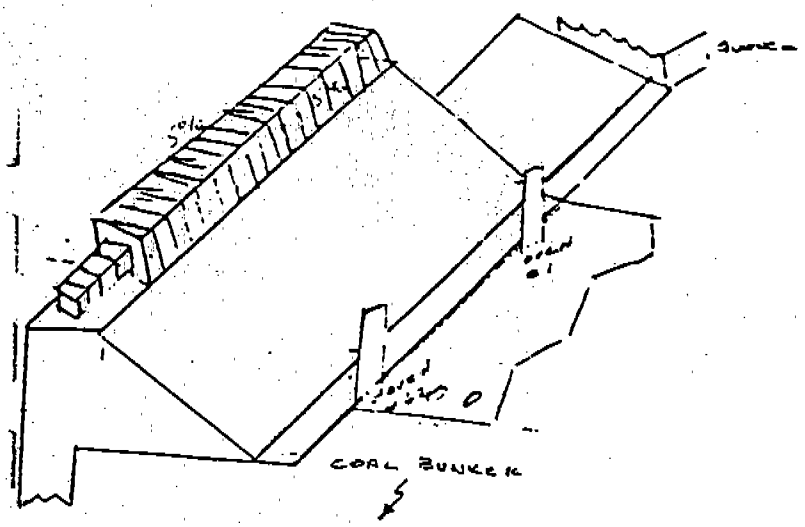


OVEN # : 62
TIME OF PUSH : 10:54:30
TIME ≥ 20% : Ø
MAX OPACITY : 15%
DATE : 1-18-88

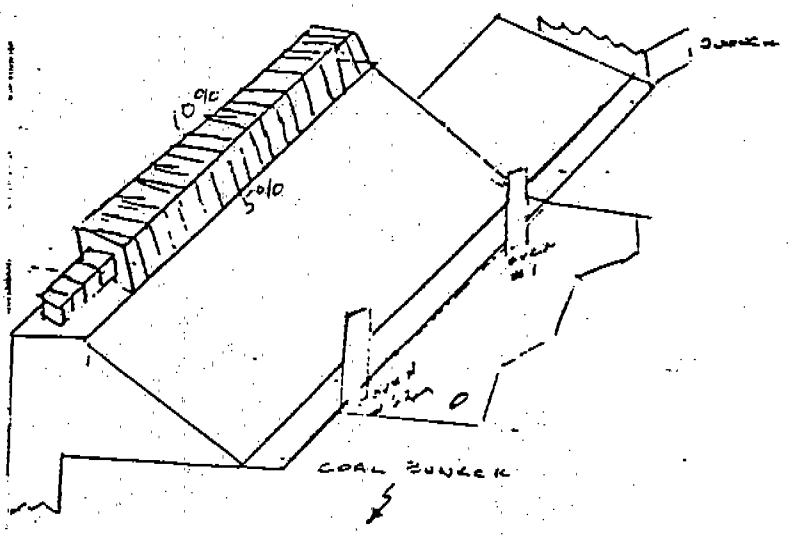


OVEN # : 4
TIME OF PUSH : 11:11:00
TIME ≥ 20% : Ø
MAX OPACITY : 15%
DATE : 1-18-88

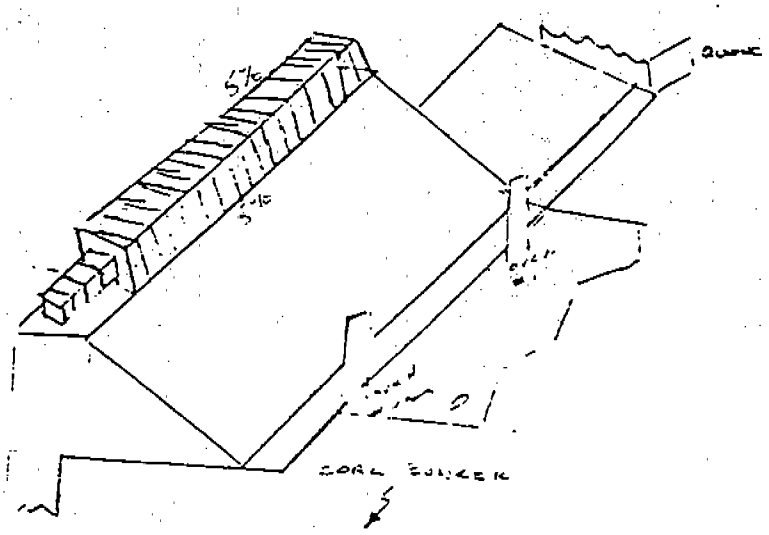
RUN #1



OVEN # : 14
TIME OF PUSH : 12:05:20
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE: 1-18-88

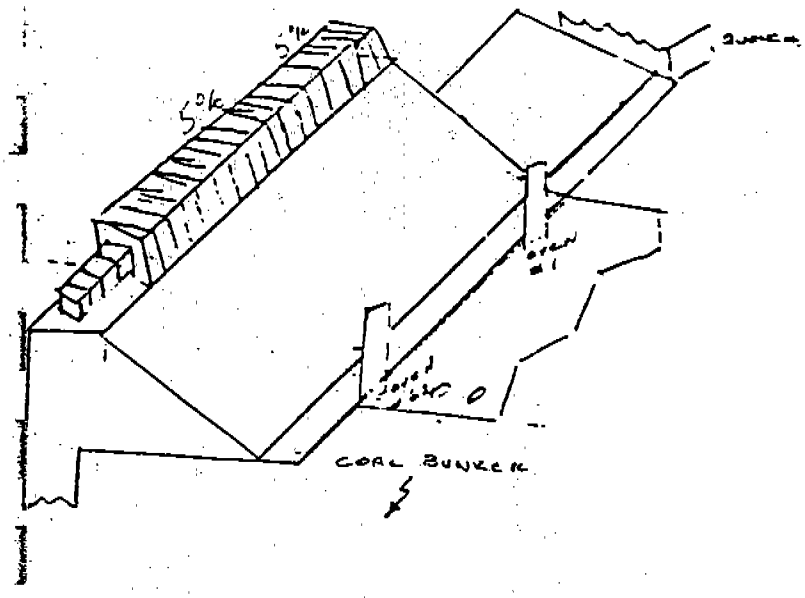


OVEN # : 24
TIME OF PUSH : 12:15:30
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE: 1-18-88

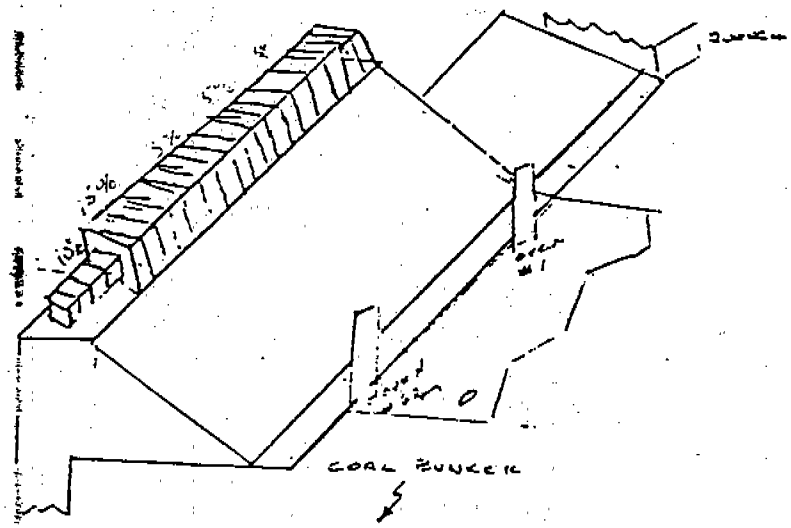


OVEN # : 34
TIME OF PUSH : 12:40:35
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE: 1-18-88

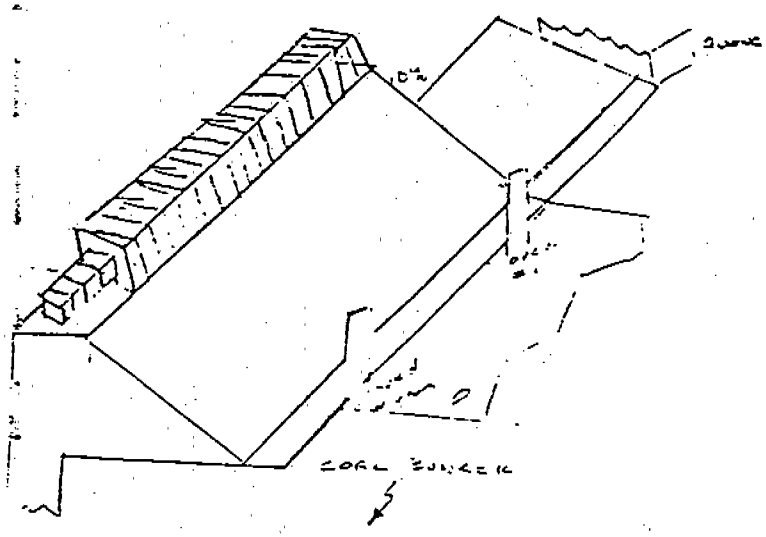
#1 BATTERY
RUN #1



OVEN # : 44
TIME OF PUSH : 12 56 30
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE : 1-18-88

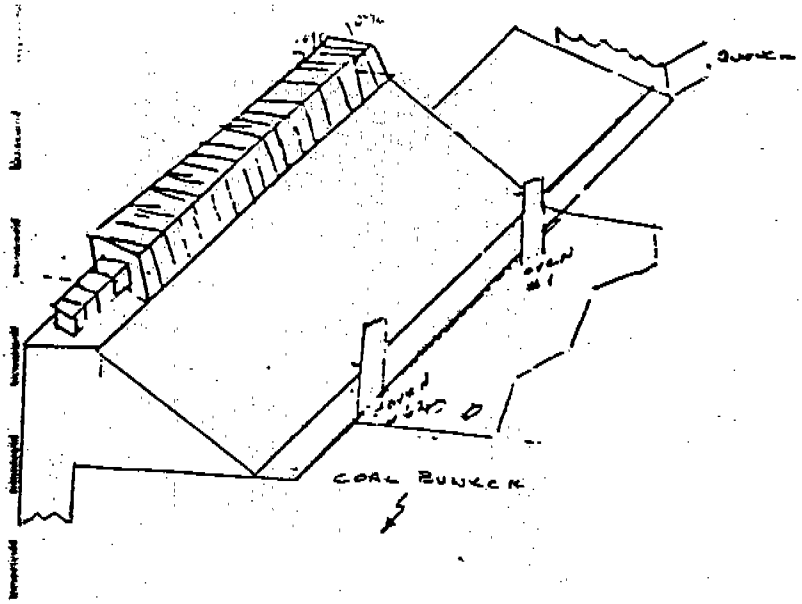


OVEN # : 54
TIME OF PUSH : 13 17 45
TIME ≥ 20% : Ø
MAX OPACITY : 15%
DATE : 1-18-88

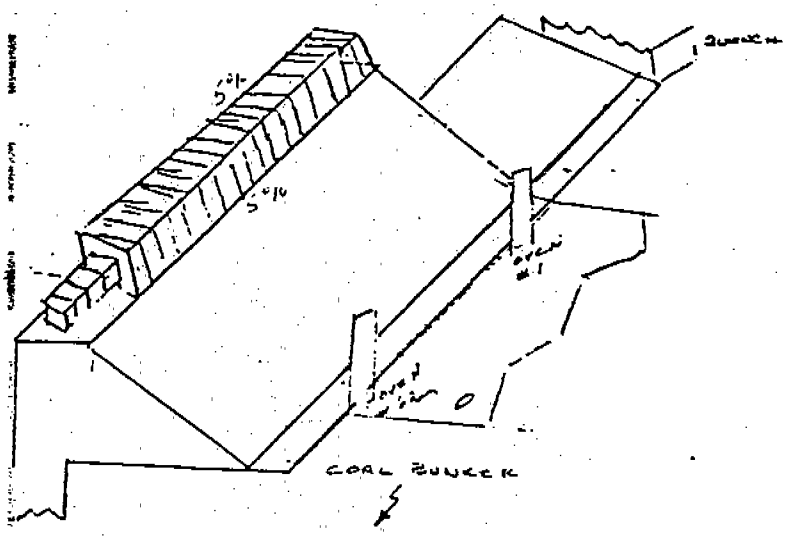


OVEN # : 6
TIME OF PUSH : 13 28 [illegible]
TIME ≥ 20% : Ø
MAX OPACITY : 10%
DATE : 1-18-88

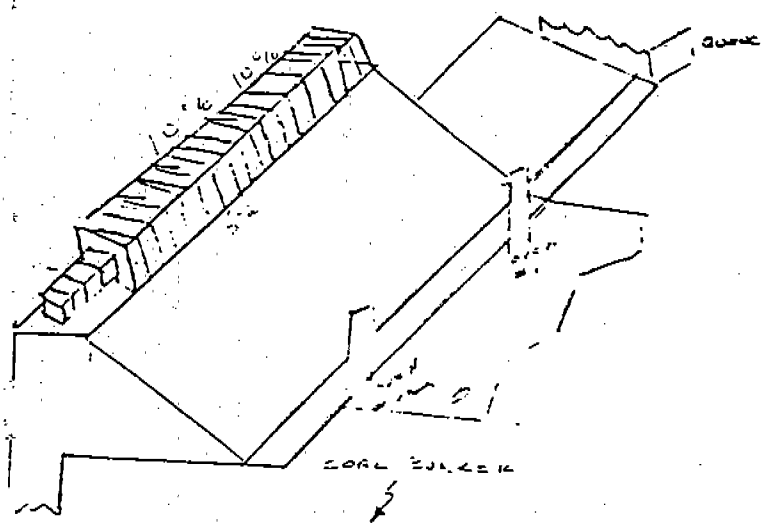
1 BATTERY
RUN # 1



OVEN # : 16
TIME OF PUSH : 13 49 10
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-18-88

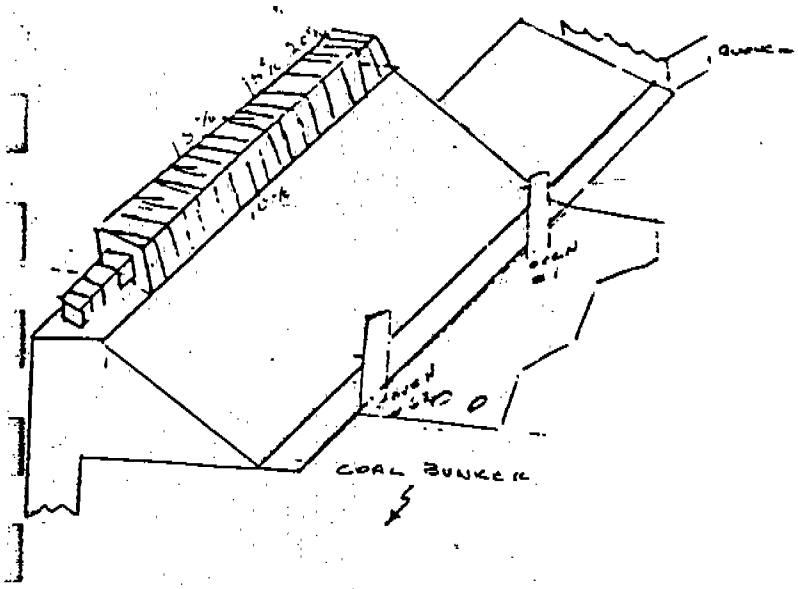


OVEN # : 26
TIME OF PUSH : 13 58 30
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-18-88

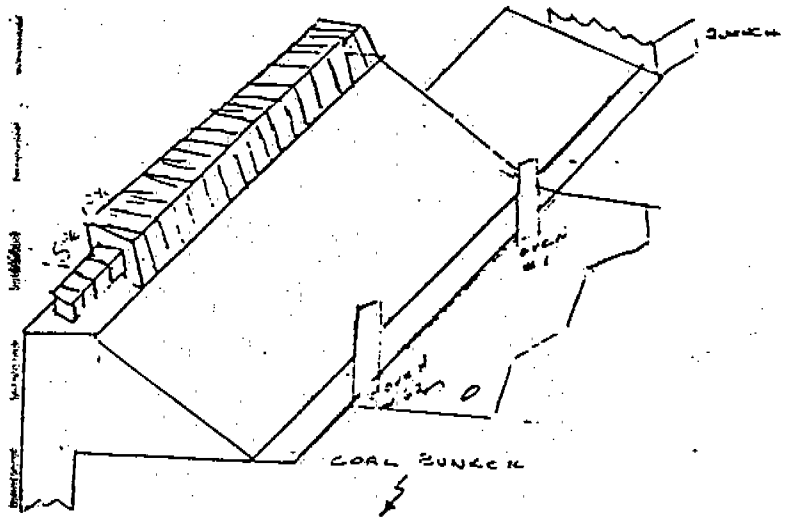


OVEN # : 36
TIME OF PUSH : 14 15 45
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-18-88

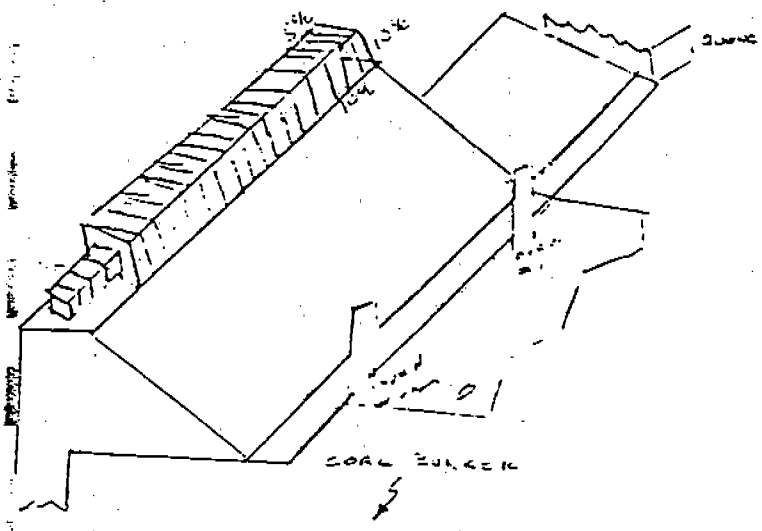
#1 BATTERY
RUN #1



OVEN # : 46
TIME OF PUSH : 15:14:46
TIME ≥ 20% : 2 sec.
MAX OPACITY : 20%
DATE: 1-18-88



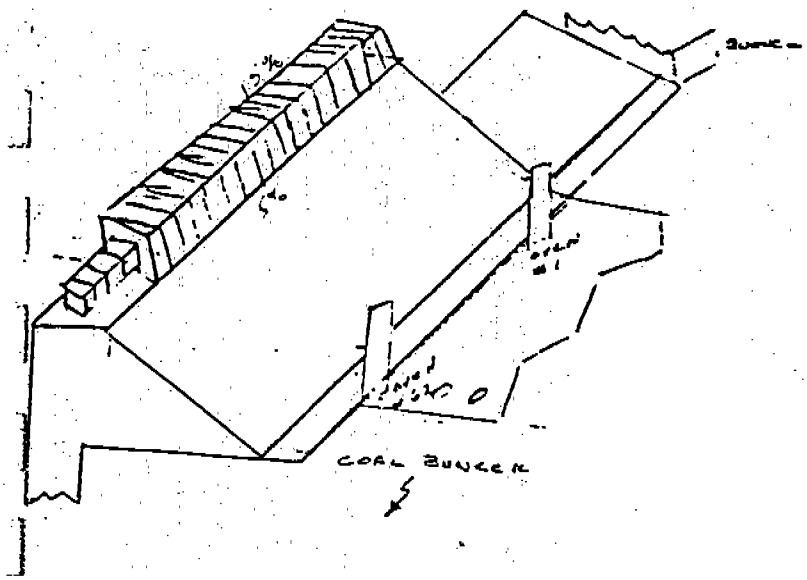
OVEN # : 56
TIME OF PUSH : 15:23:30
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE: 1-18-88



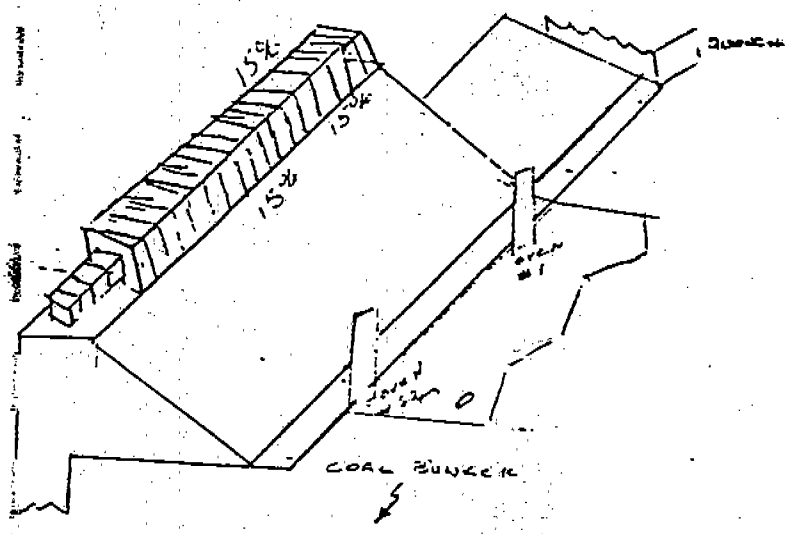
OVEN # : 8
TIME OF PUSH : 15:46:15
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE: 1-18-88

STOP

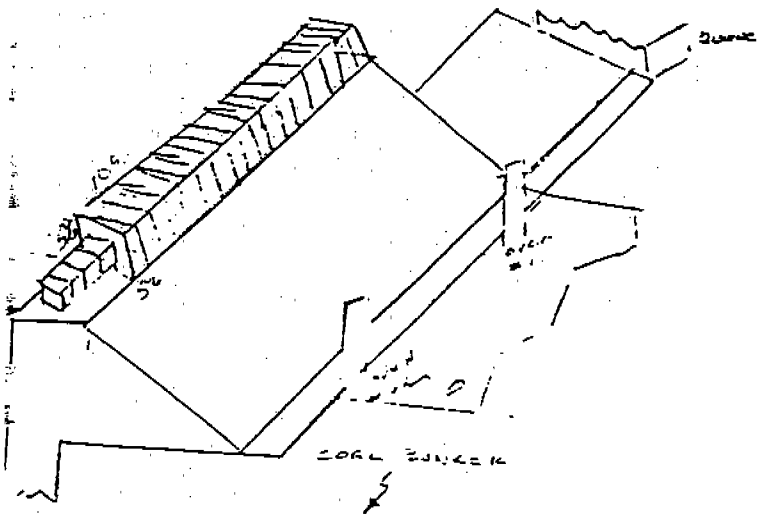
1 Battery
Run 2



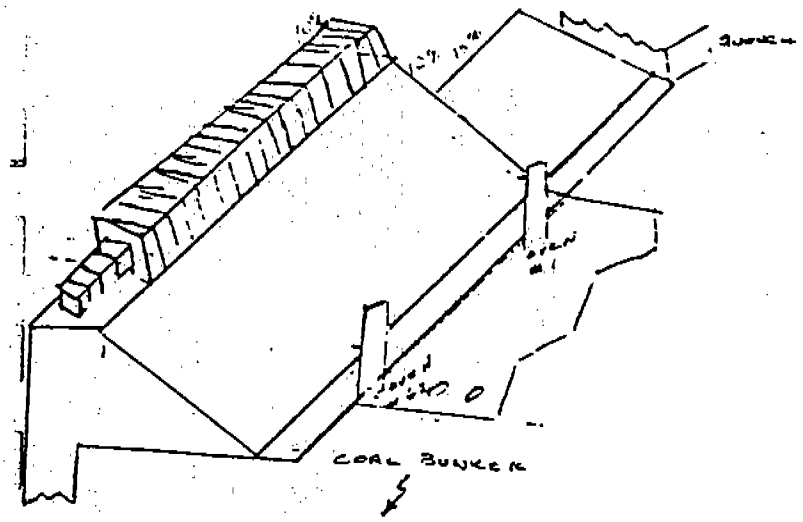
OVEN # : 36
TIME OF PUSH : 9 16.00
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE: 1-19-88



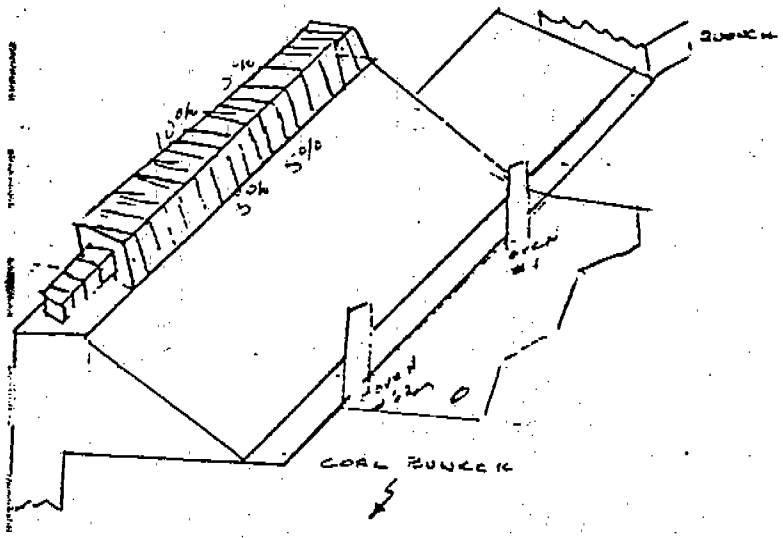
OVEN # : 46
TIME OF PUSH : 9.26.05
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE: 1-19-88



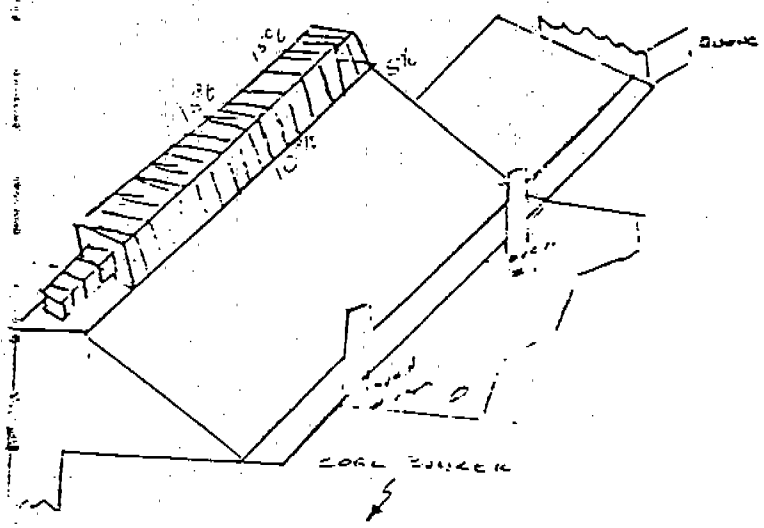
OVEN # : 56
TIME OF PUSH : 9.53.50
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE: 1-19-88



OVEN # : 8
TIME OF PUSH : 1005.20
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-19-88

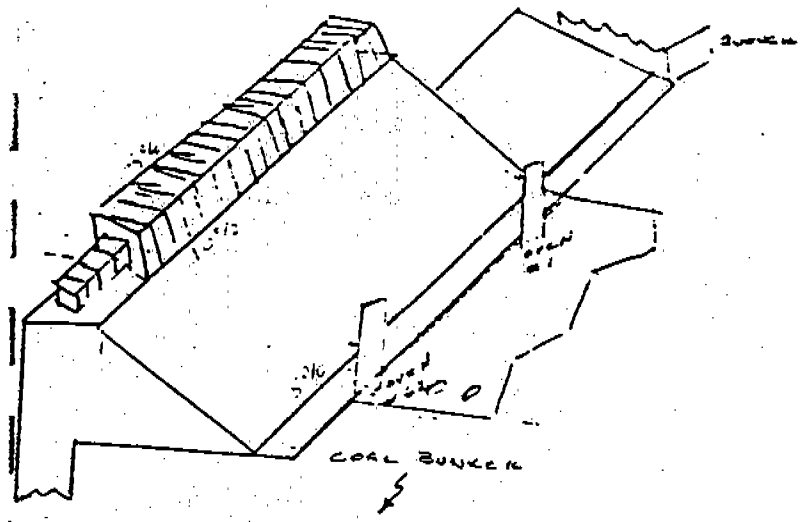


OVEN # : 18
TIME OF PUSH : 1028.10
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-19-88

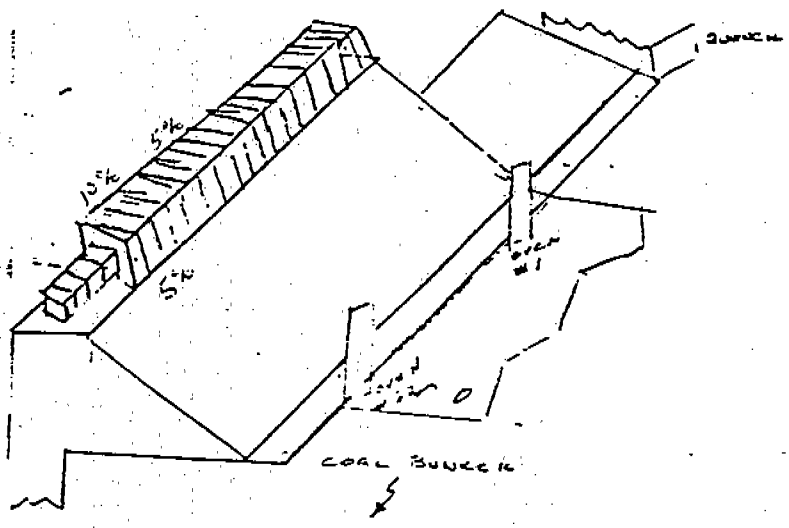


OVEN # : 28
TIME OF PUSH : 1038.30
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-19-88

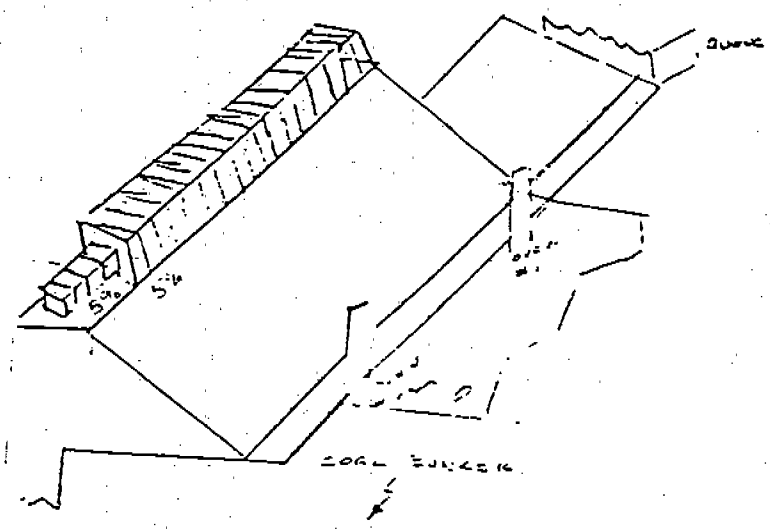
1 Battery
K-N 2



OVEN # : # 38
TIME OF PUSH : 1125.00
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-19-88

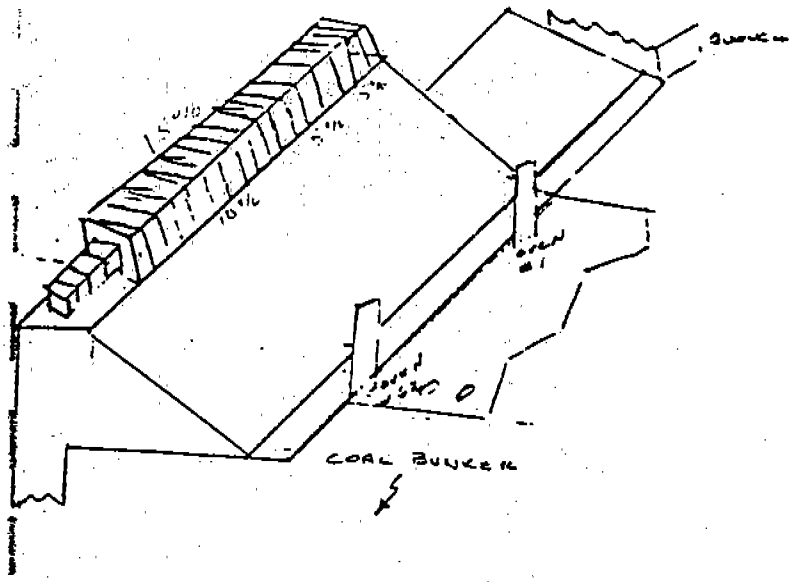


OVEN # : 48
TIME OF PUSH : 1150.10
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-19-88



OVEN # : 58
TIME OF PUSH : 1211.00
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-19-88

#1 Battery Round



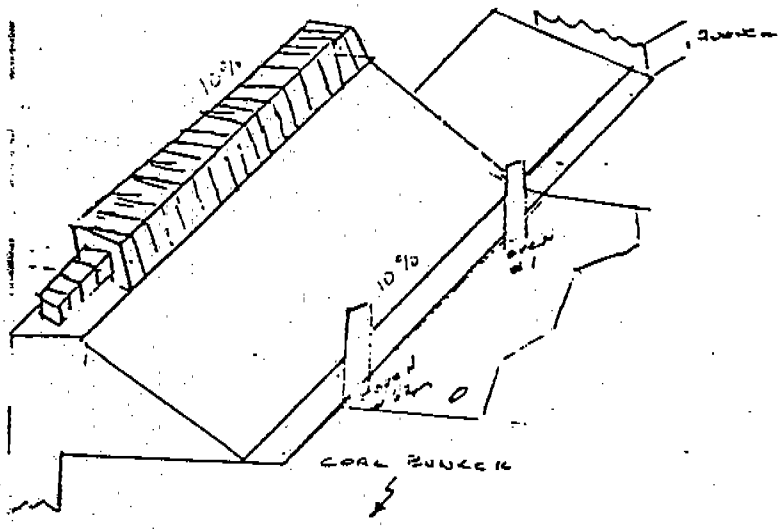
OVEN # : 31

TIME OF PUSH : 1316.30

TIME ≥ 20% : Ø

MAX OPACITY : 15%

DATE: 1-19-88



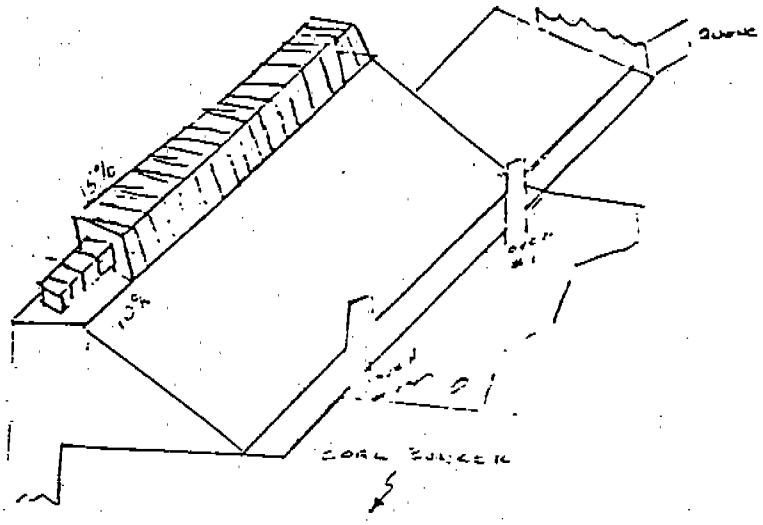
OVEN # : 41

TIME OF PUSH : 1325.45

TIME ≥ 20% : Ø

MAX OPACITY : 10%

DATE: 1-19-88



OVEN # : 51

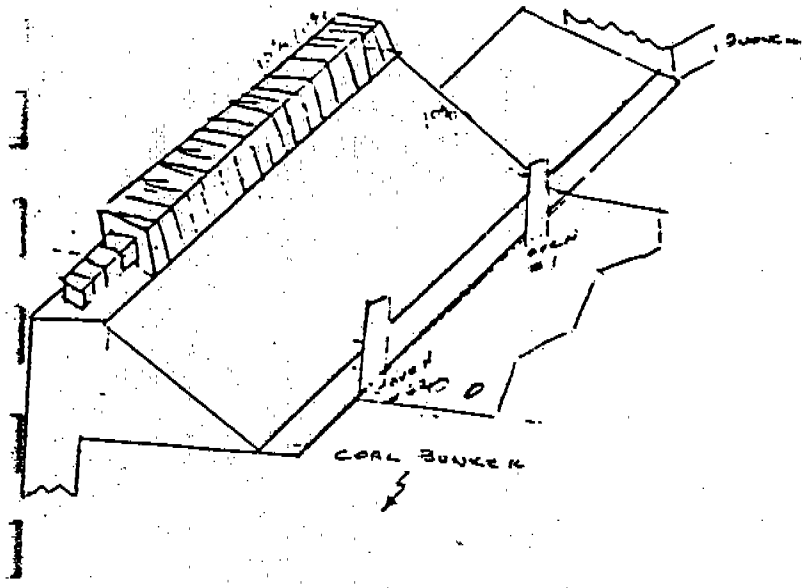
TIME OF PUSH : 1348.15

TIME ≥ 20% : Ø

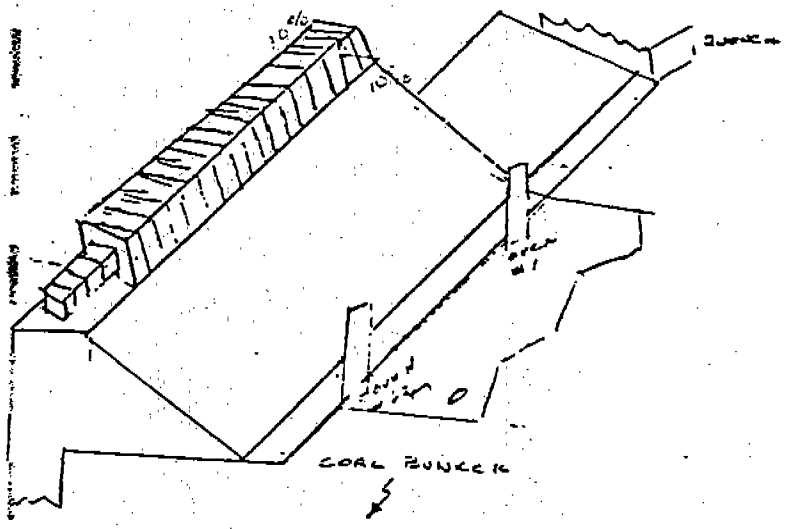
MAX OPACITY : 15%

DATE: 1-19-88

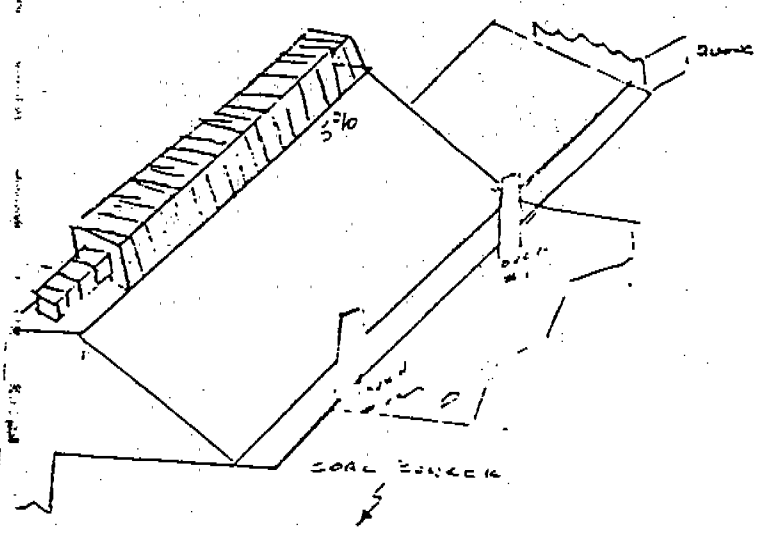
#1 Battery
Run #:



OVEN # : 1
TIME OF PUSH : 122150
TIME ≥ 20% : Ø
MAX OPACITY : 15%
DATE: 1-19-88

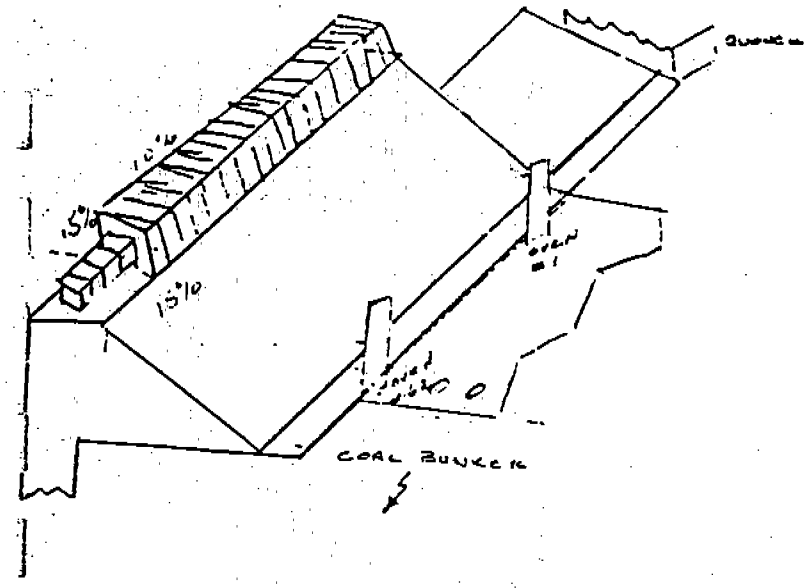


OVEN # : 11
TIME OF PUSH : 1243.45
TIME ≥ 20% : Ø
MAX OPACITY : 10%
DATE: 1-19-88

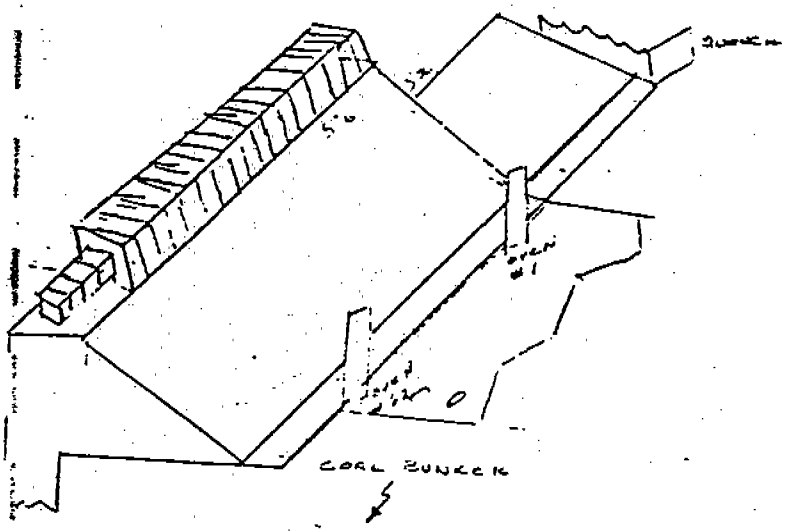


OVEN # : 21
TIME OF PUSH : 1253.55
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE: 1-19-88

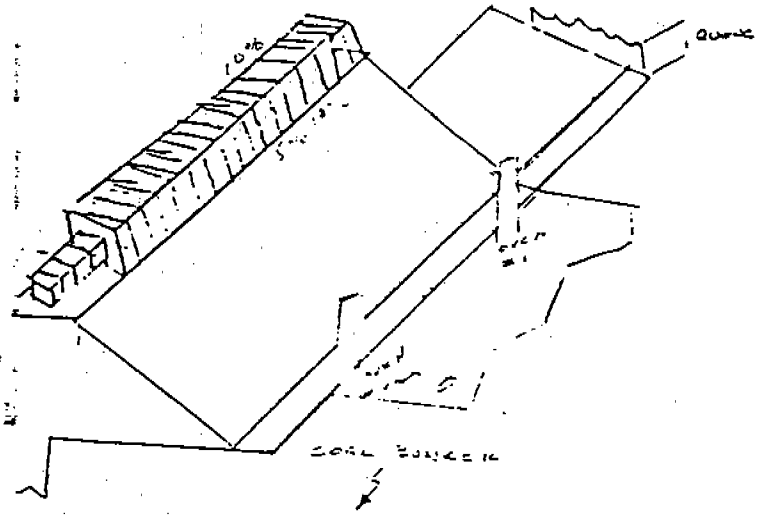
#1 Battery
Run 2



OVEN # : 61
TIME OF PUSH : 1403 45
TIME ≥ 20% : Ø
MAX OPACITY : 15%
DATE : 1-19-88

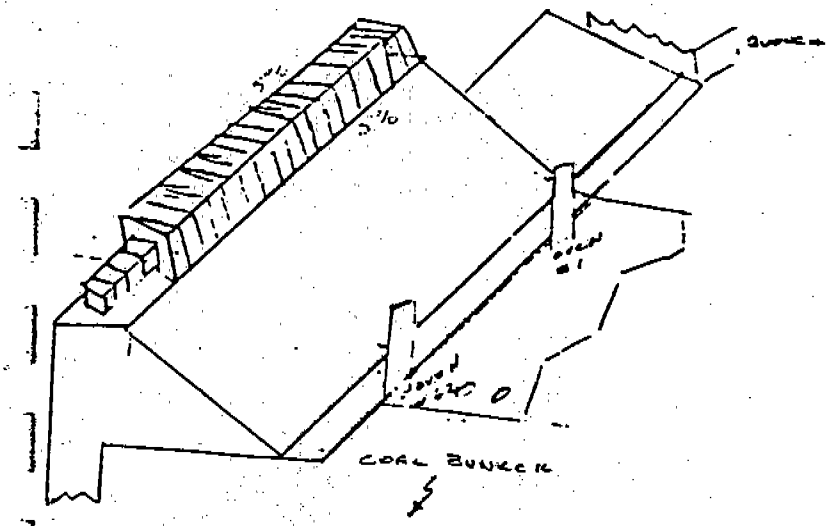


OVEN # : 3
TIME OF PUSH : 1426 00
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE : 1-19-88

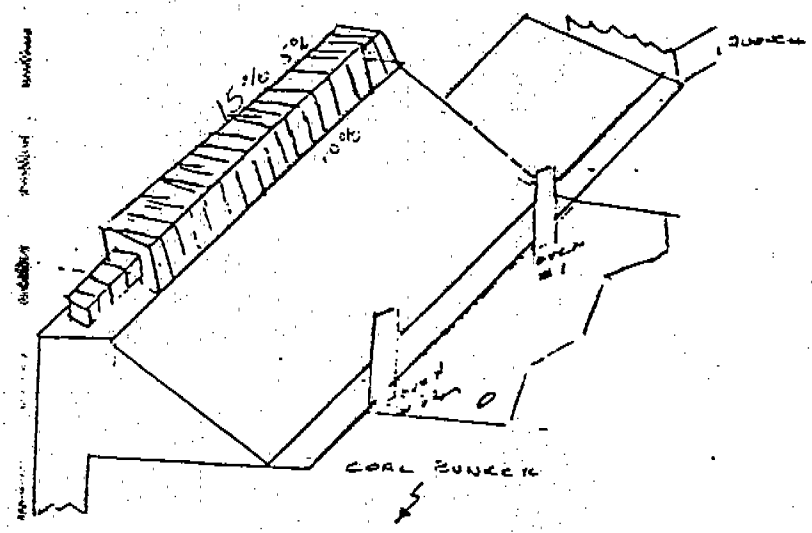


OVEN # : 13
TIME OF PUSH : 1515 15
TIME ≥ 20% : Ø
MAX OPACITY : 10%
DATE : 1-19-88

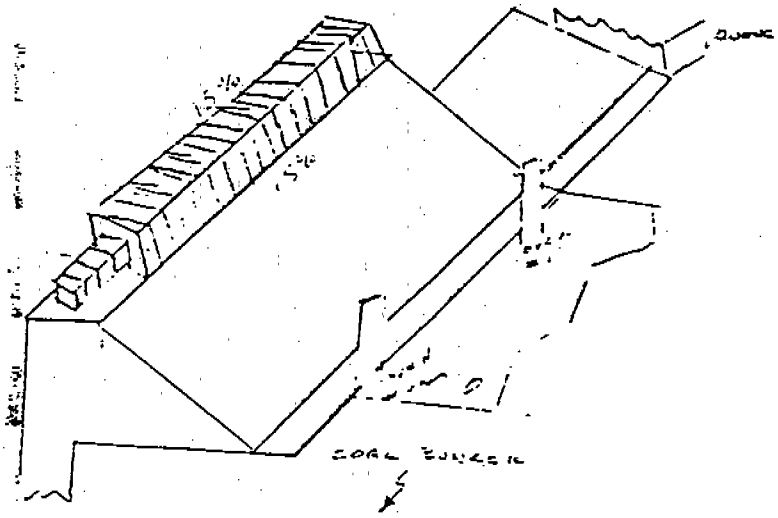
Battery
Run #2



OVEN # : #23
TIME OF PUSH : 15:23:30
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE: 1-19-88

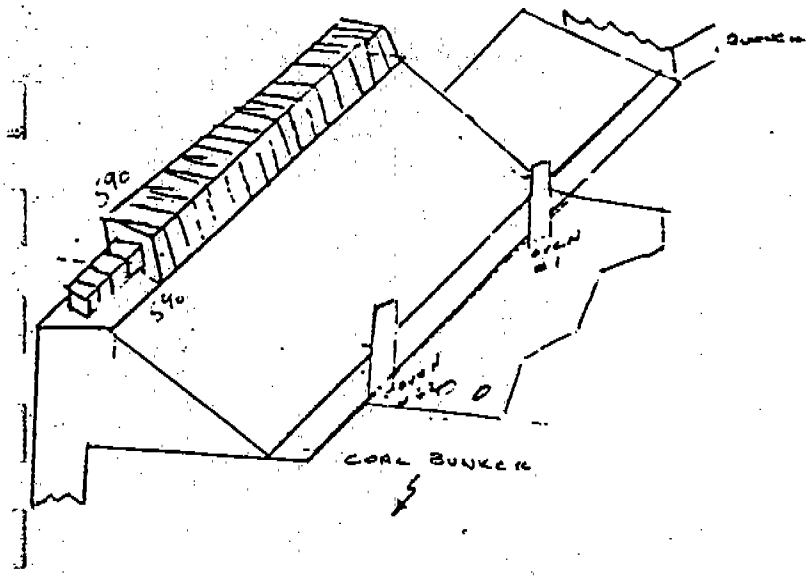


OVEN # : #33
TIME OF PUSH : 15:45:00
TIME ≥ 20% : Ø
MAX OPACITY : 15%
DATE: 1-19-88

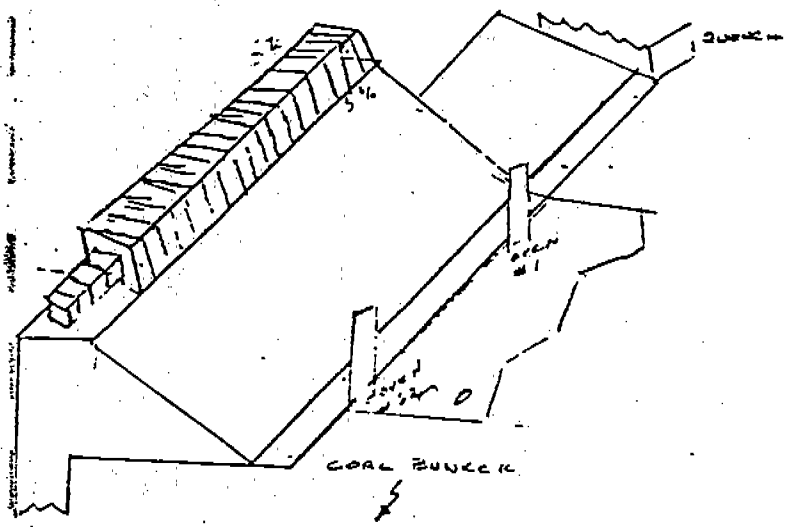


OVEN # : #43
TIME OF PUSH : 15:52:00
TIME ≥ 20% : Ø
MAX OPACITY : 15%
DATE: 1-19-88

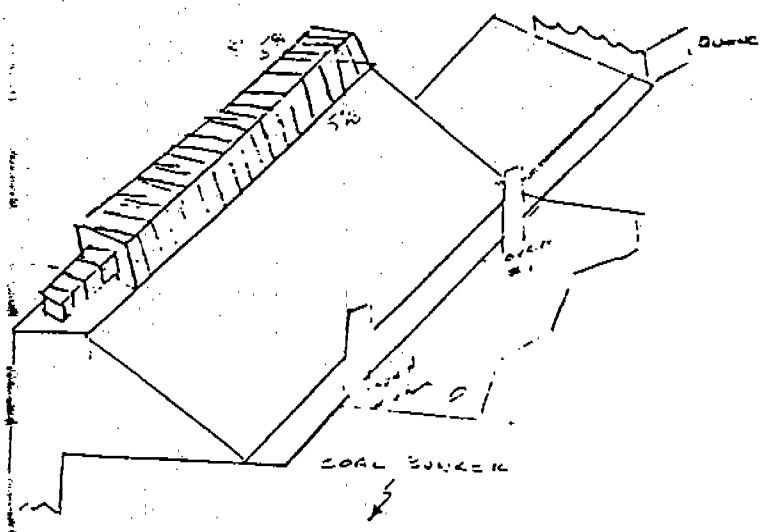
#1 Battery
Run #2



OVEN # : 53
TIME OF PUSH : 1615.45
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-19-88

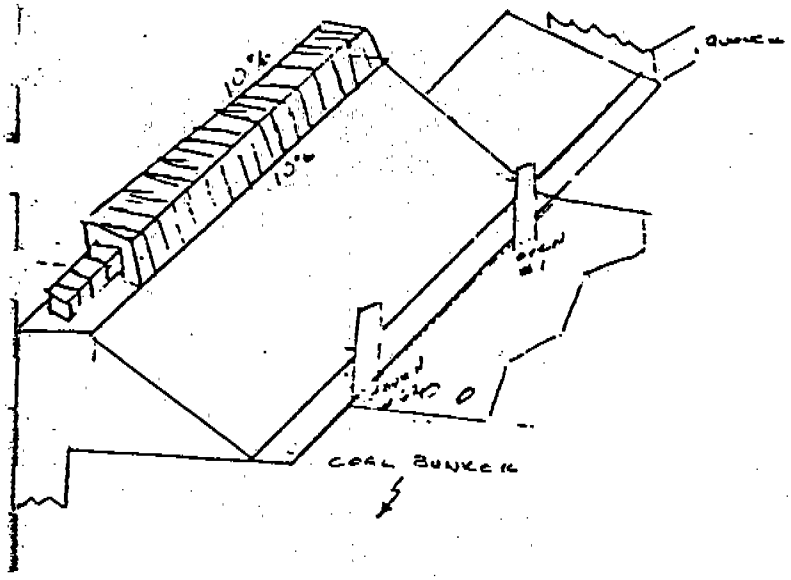


OVEN # : 5
TIME OF PUSH : 1626.00
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-19-88

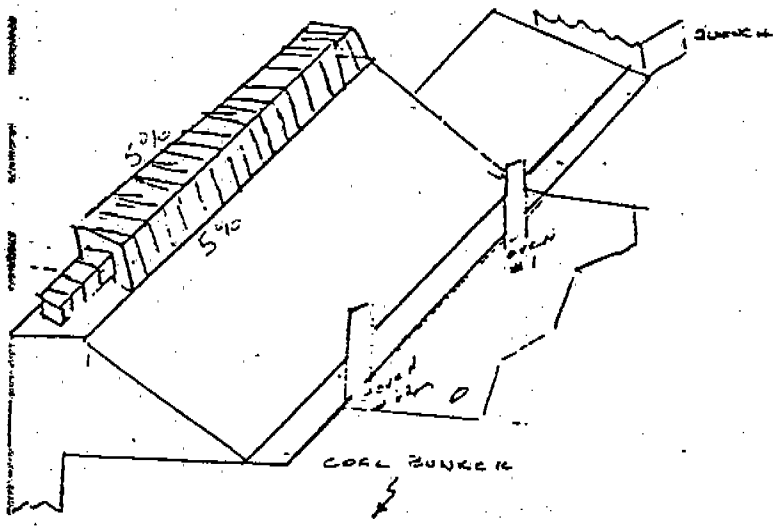


OVEN # : 15
TIME OF PUSH : 1648.55
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-19-88

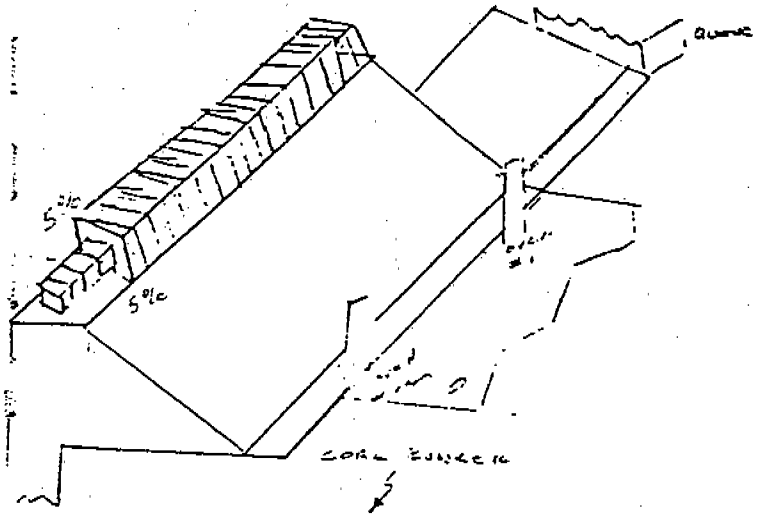
1 Battery
Run # 3



OVEN # : 31
TIME OF PUSH : 801 00
TIME ≥ 20% : Ø
MAX OPACITY : 10%
DATE : 1-20-88

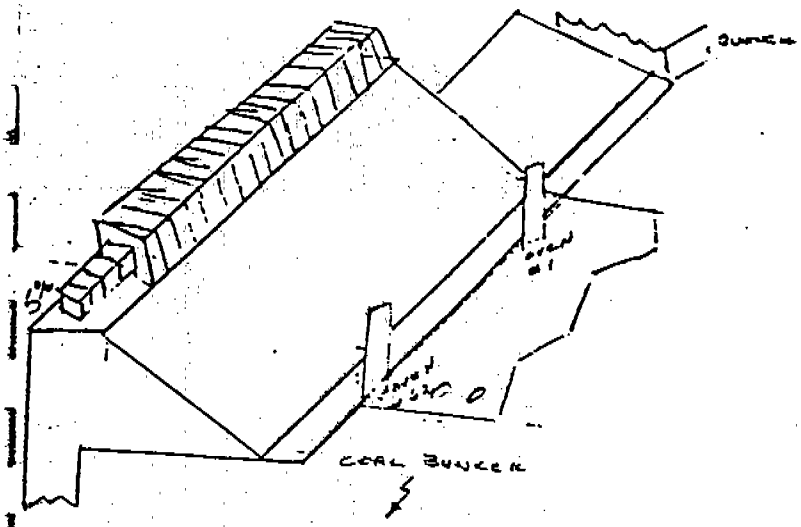


OVEN # : 41
TIME OF PUSH : 810.00
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE : 1-20-88

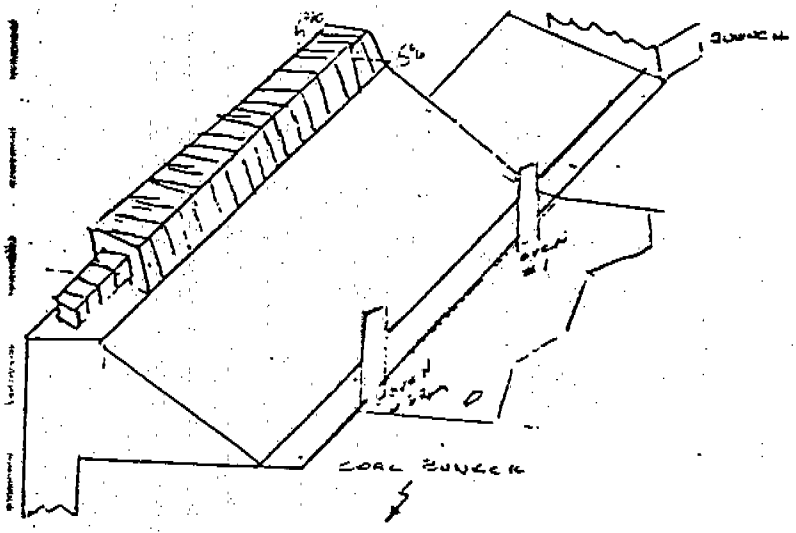


OVEN # : 51
TIME OF PUSH : 834 15
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE : 1-20-88

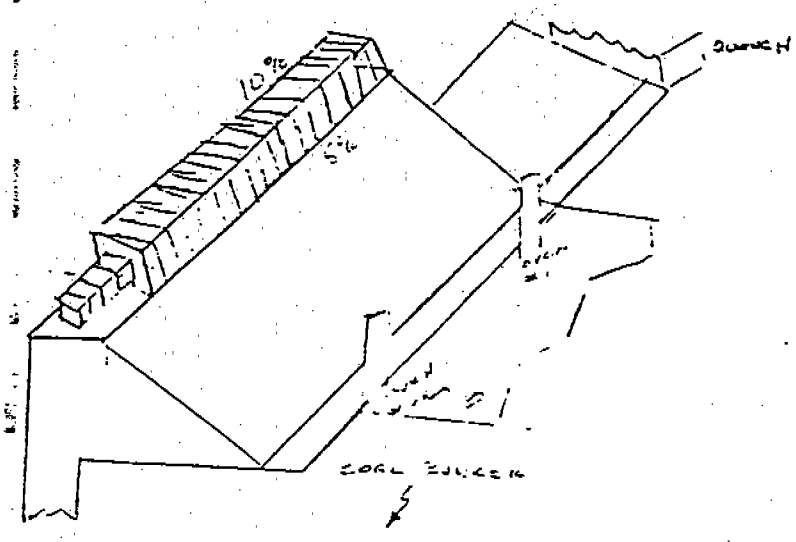
DRP
#1 BATTERY
RUN #3



OVEN # : 61
TIME OF PUSH : 844.15
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE: 1-20-88

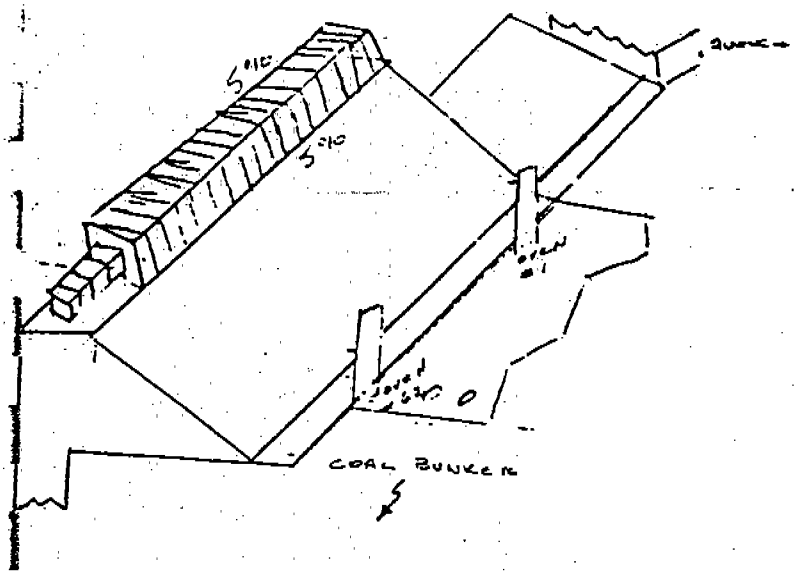


OVEN # : 3
TIME OF PUSH : ~~907.15~~ 924.30
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE: 1-20-88

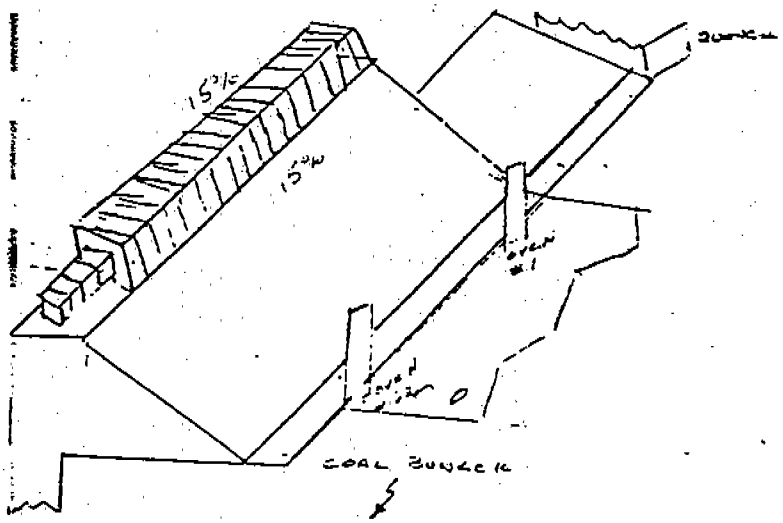


OVEN # : 13
TIME OF PUSH : 938.30
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE: 1-20-88

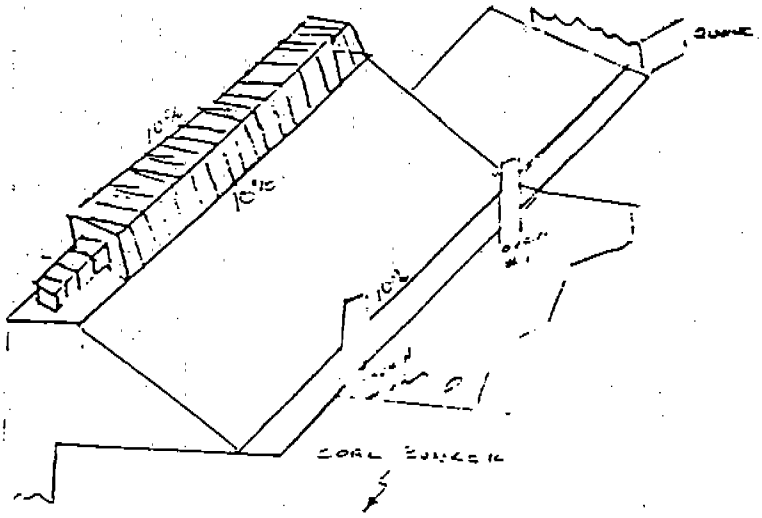
#1 Battery
Run #3
DRA



OVEN # : 23
TIME OF PUSH : 957.15
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-20-88

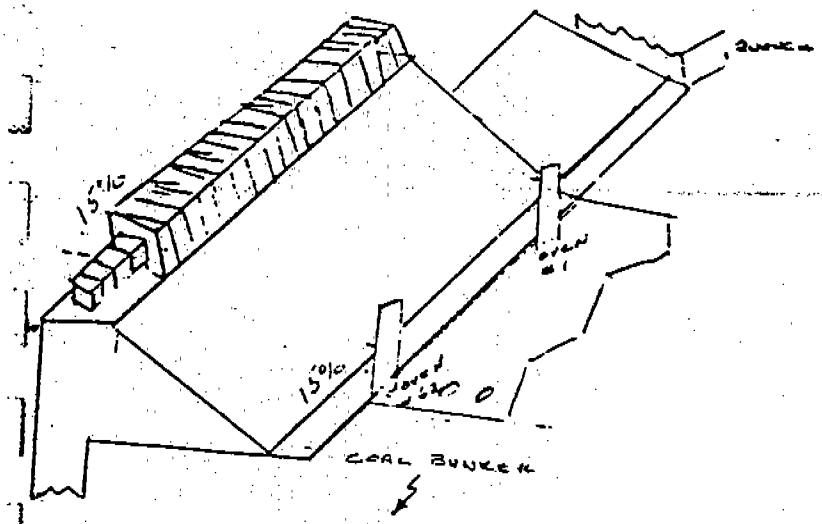


OVEN # : 33
TIME OF PUSH : 1006.00
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-20-88

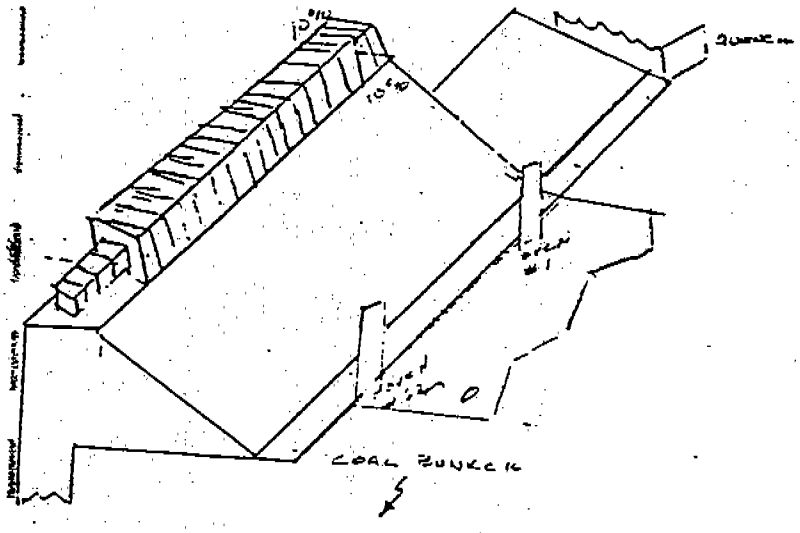


OVEN # : 43
TIME OF PUSH : 1022.45
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-20-88

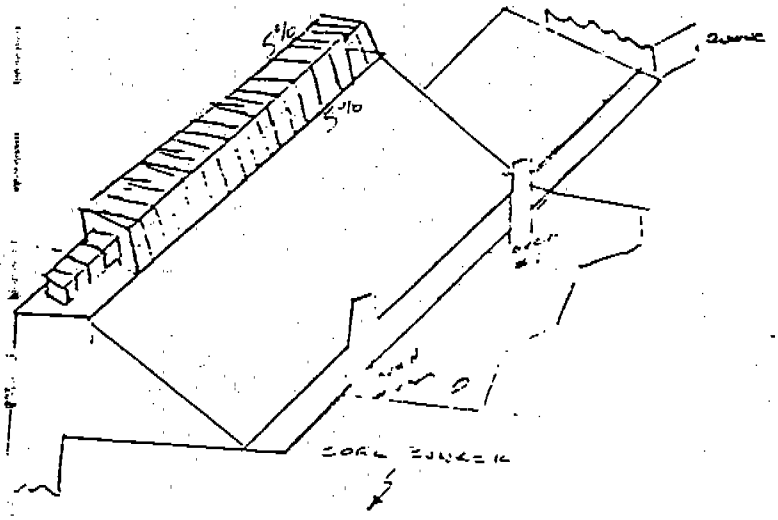
#1 BATTC.
RUN 3
DKP



OVEN # : 53
TIME OF PUSH : 1036 45
TIME ≥ 20% : Ø
MAX OPACITY : 15%
DATE : 1-20-88

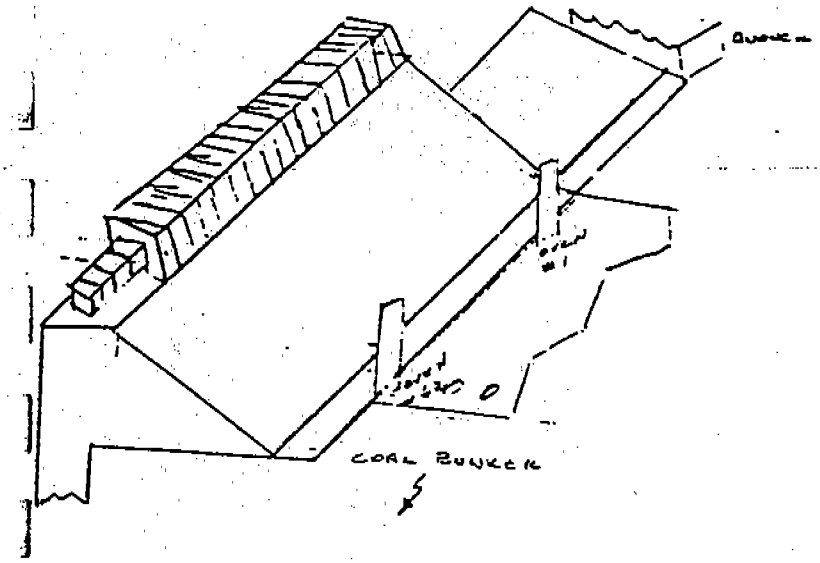


OVEN # : 5
TIME OF PUSH : 1130.35
TIME ≥ 20% : Ø
MAX OPACITY : 10%
DATE : 1-20-88

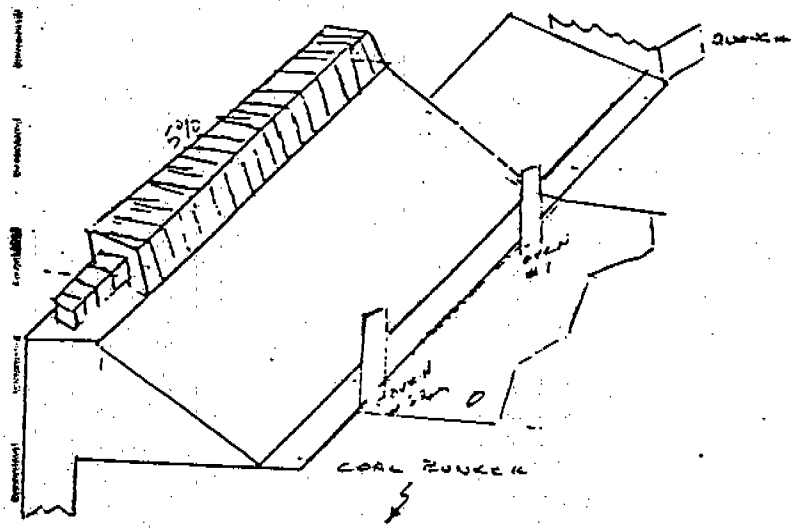


OVEN # : 15
TIME OF PUSH : 1140 10
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE : 1-20-88

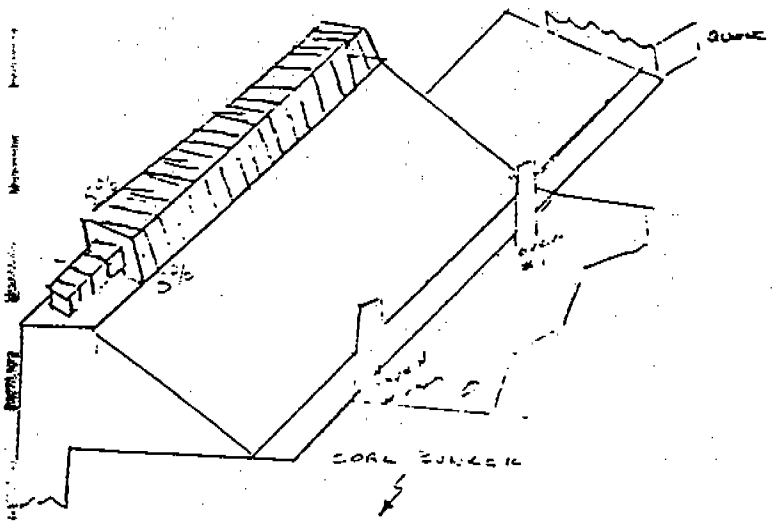
#1 BATTERY
RUN #3
DKP



OVEN # : 25
TIME OF PUSH : 1158.00
TIME ≥ 20% : Ø
MAX OPACITY : Ø
DATE: 1-20-88

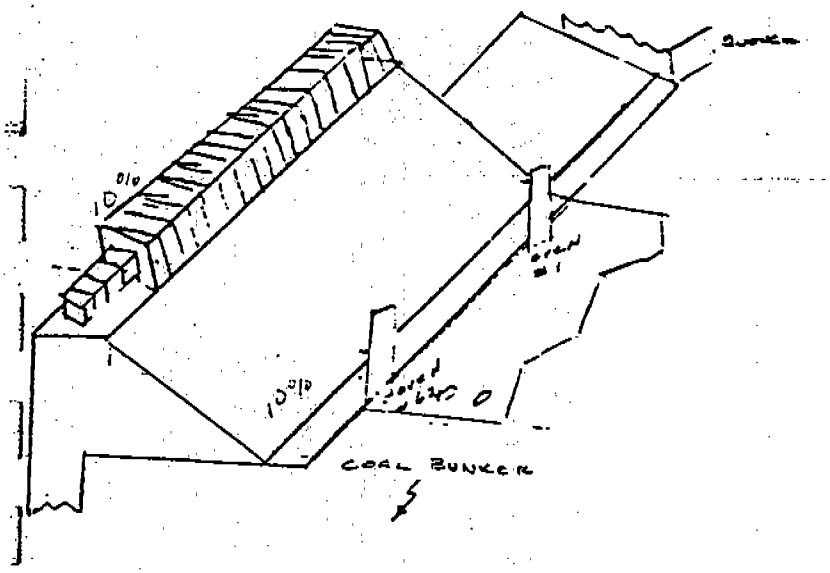


OVEN # : 35
TIME OF PUSH : 1206.30
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE: 1-20-88

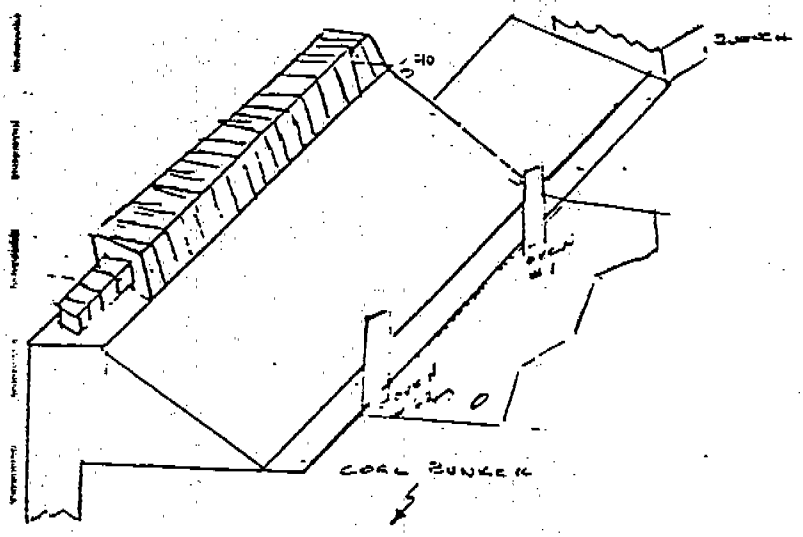


OVEN # : 45
TIME OF PUSH : 1230.10
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE: 1-20-88

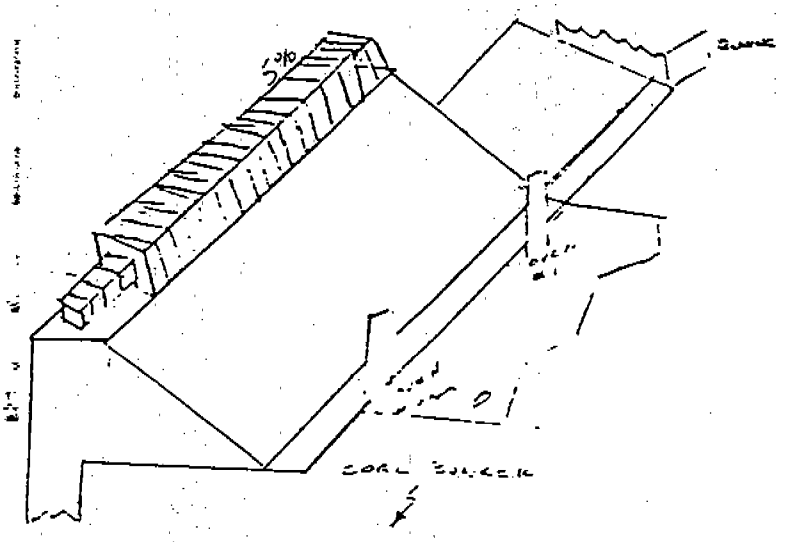
#1 BATTERY
RUN #3
DEF



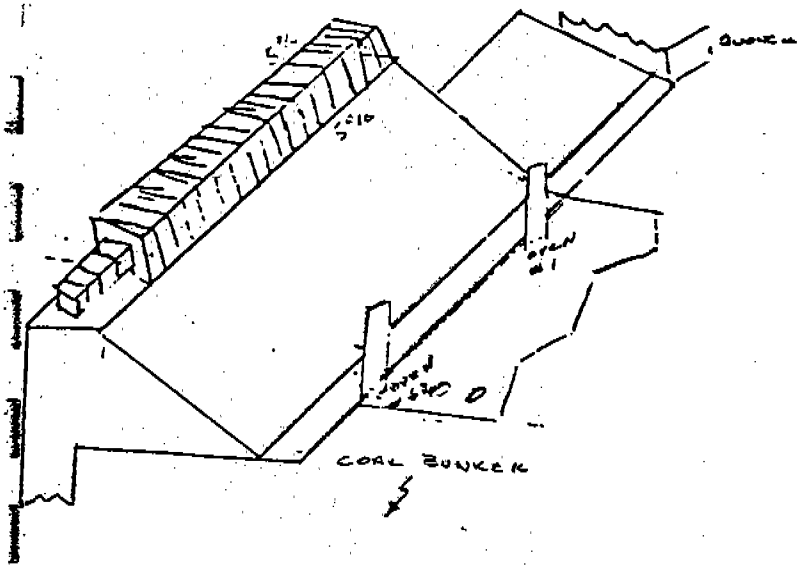
OVEN # : 55
TIME OF PUSH : 1240 10
TIME ≥ 20% : Ø
MAX OPACITY : 10%
DATE: 1-20-88



OVEN # : 7
TIME OF PUSH : 1259.30
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE: 1-20-88



OVEN # : 17
TIME OF PUSH : 131330
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE: 1-20-88



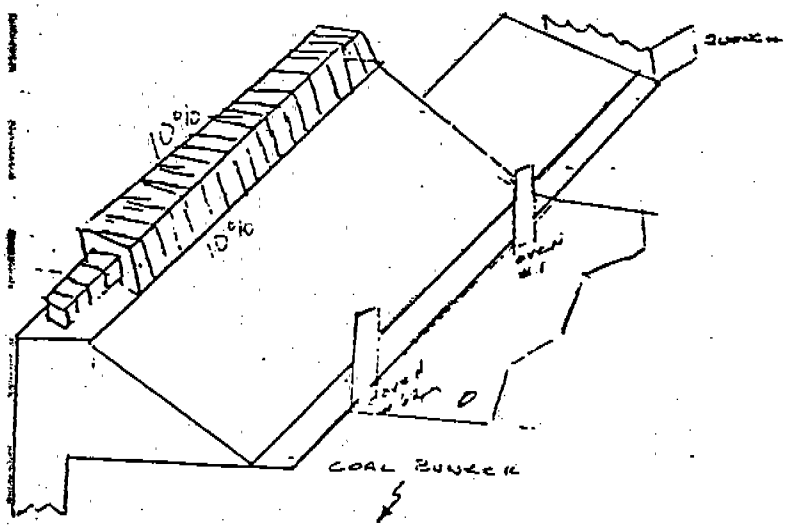
OVEN # : 27

TIME OF PUSH : 1341 15

TIME ≥ 20% : Ø

MAX OPACITY : 5%

DATE : 1-20-88



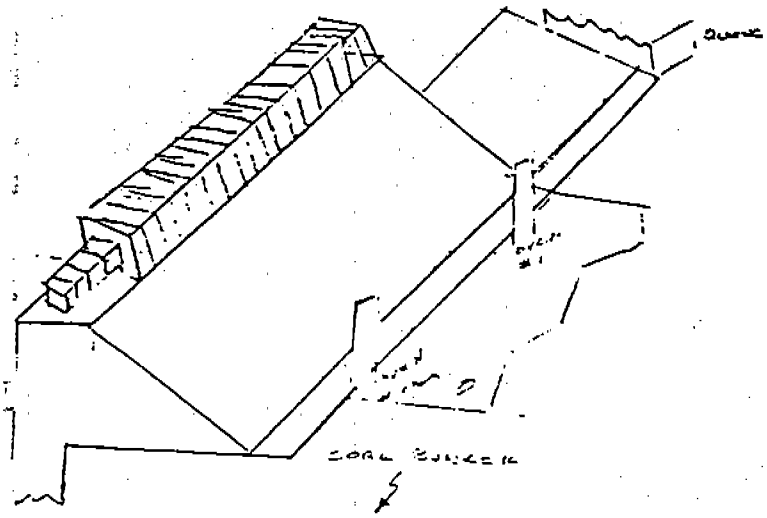
OVEN # : 37

TIME OF PUSH : 1351 30

TIME ≥ 20% : Ø

MAX OPACITY : 10%

DATE : 1-20-88



OVEN # : 47

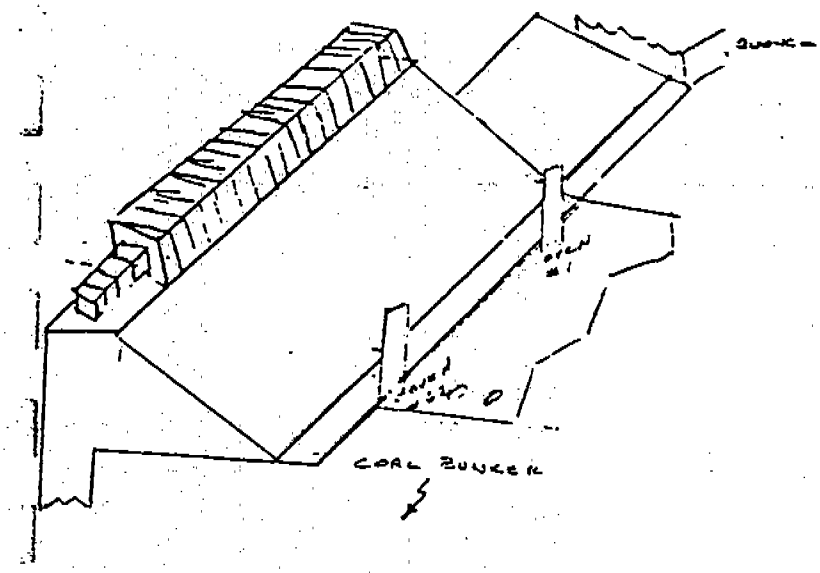
TIME OF PUSH : 1462 00

TIME ≥ 20% : Ø

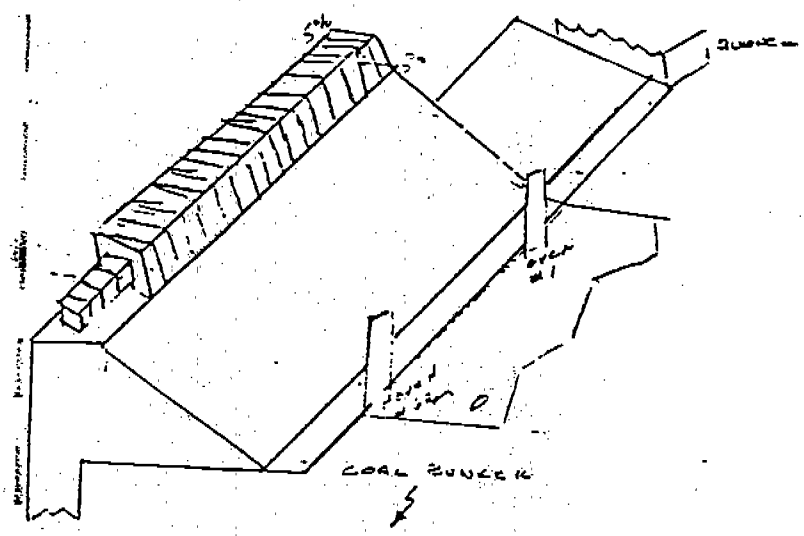
MAX OPACITY : Ø

DATE : 1-20-88

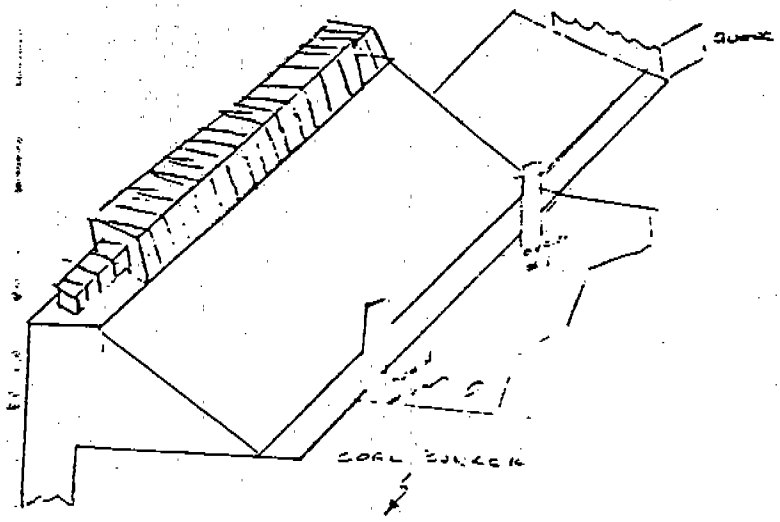
#1 BATTERY
RUN 3
OFF



OVEN # : 57
TIME OF PUSH : 151500
TIME ≥ 20% : Ø
MAX OPACITY : Ø
DATE: 1-20-88

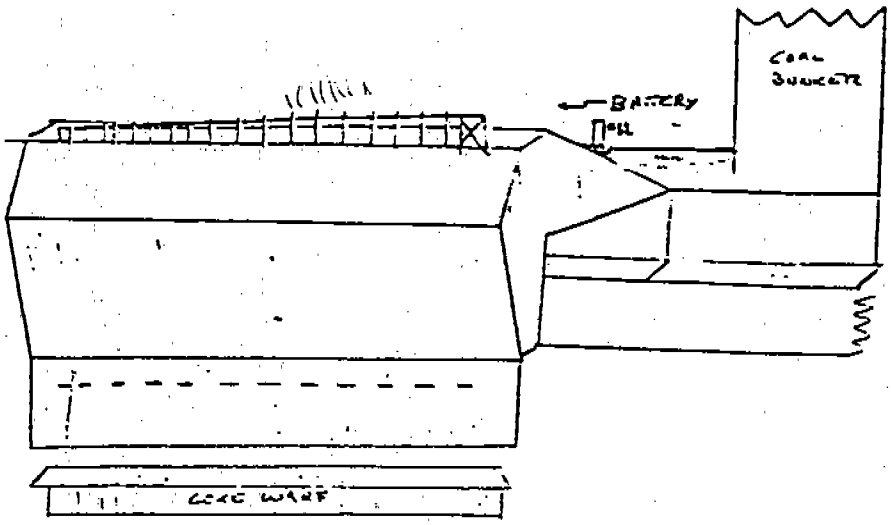


OVEN # : 9
TIME OF PUSH : 152530
TIME ≥ 20% : Ø
MAX OPACITY : 5%
DATE: 1-20-88

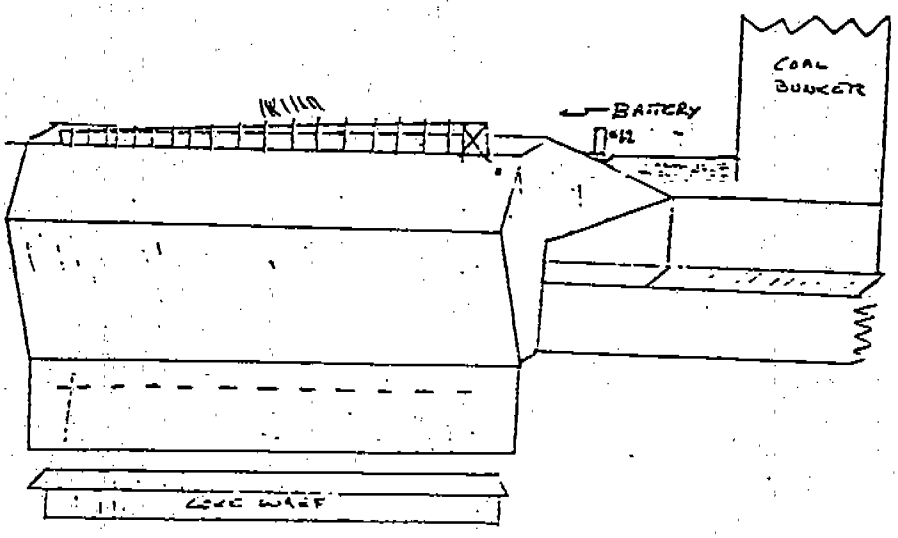


OVEN # : 19
TIME OF PUSH : 154815
TIME ≥ 20% : Ø
MAX OPACITY : Ø
DATE: 1-20-88
LAST PUSH FOR TEST

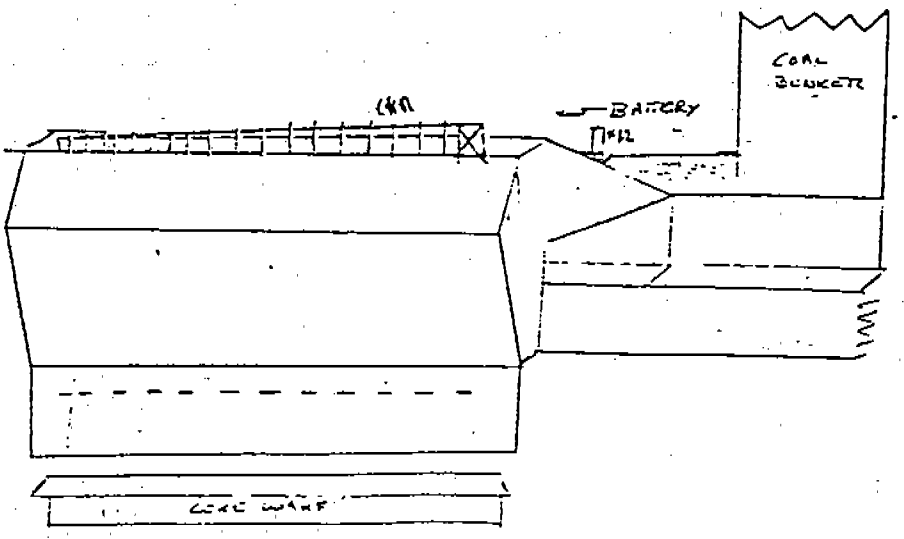
#1
Battery



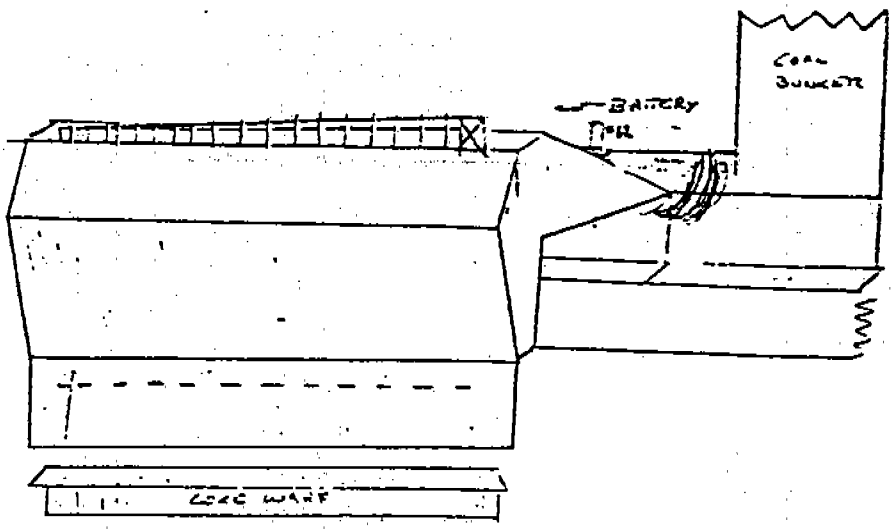
OVEN # : 29
TIME OF PUSH : 7^{53}
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-18-88



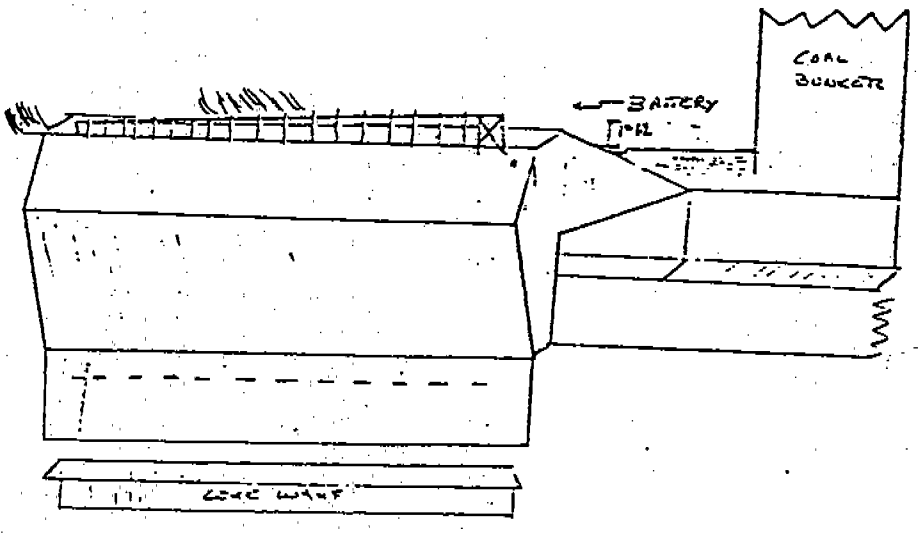
OVEN # : 39
TIME OF PUSH : 8^{04}
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-18-88



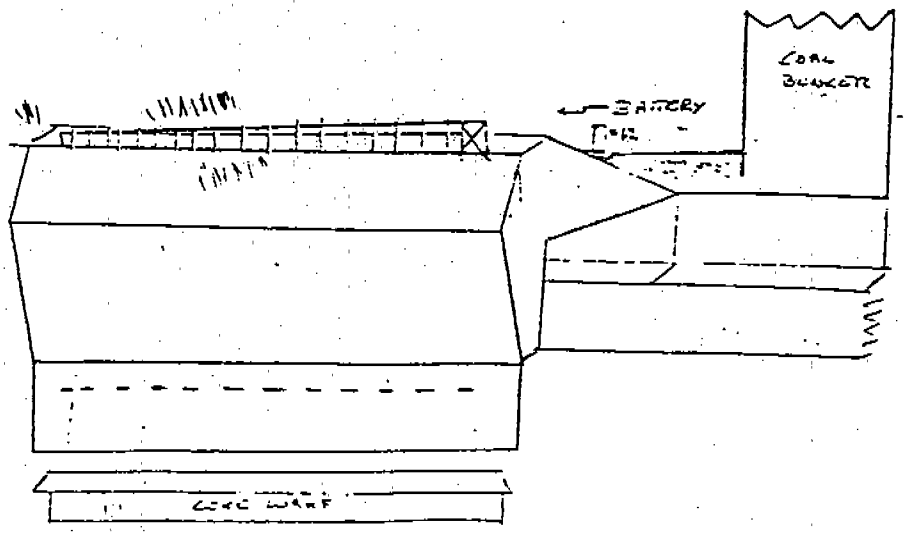
OVEN # : 49
TIME OF PUSH : 8^{29}
TIME ≥ 20% : 0*
MAX OPACITY : 5%
DATE : 1-19-88



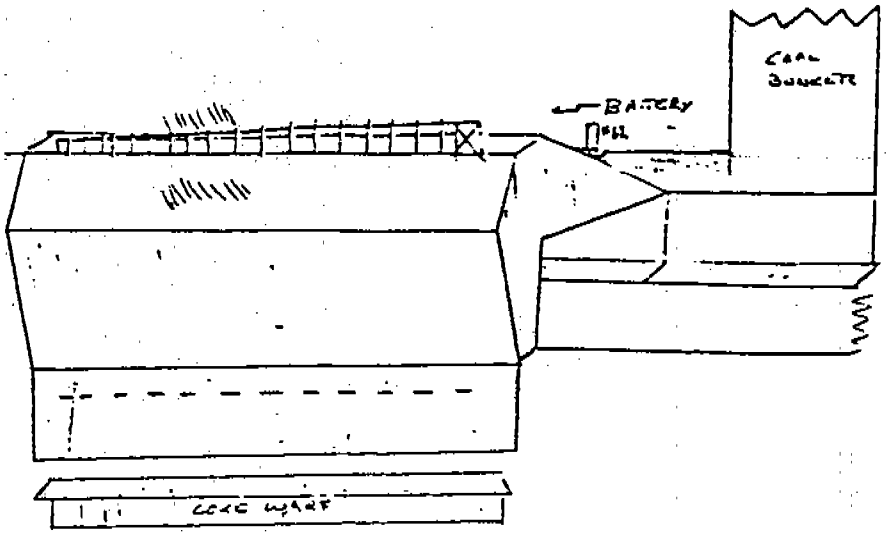
OVEN # : 59
TIME OF PUSH : 8^{31}
TIME ≥ 20% : :21 SEC
MAX OPACITY : 20%
DATE : 1-18-88



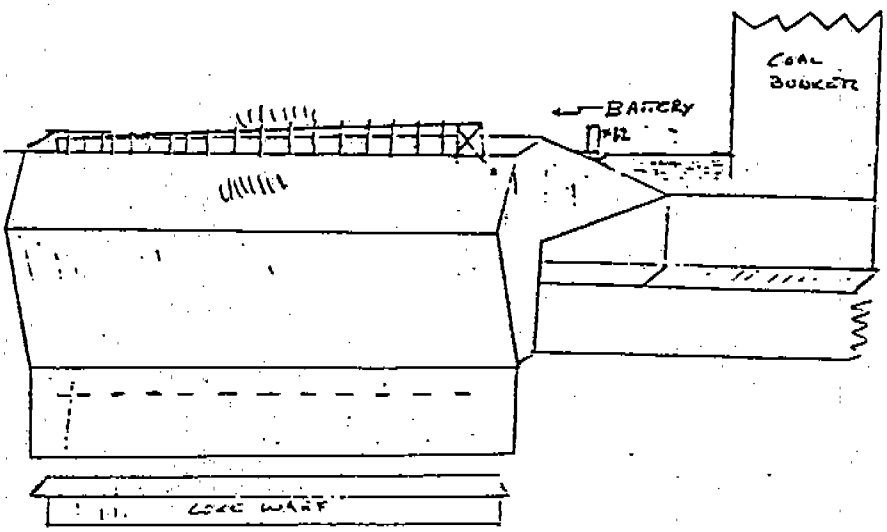
OVEN # : 2
TIME OF PUSH : 9^{06}
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-18-88



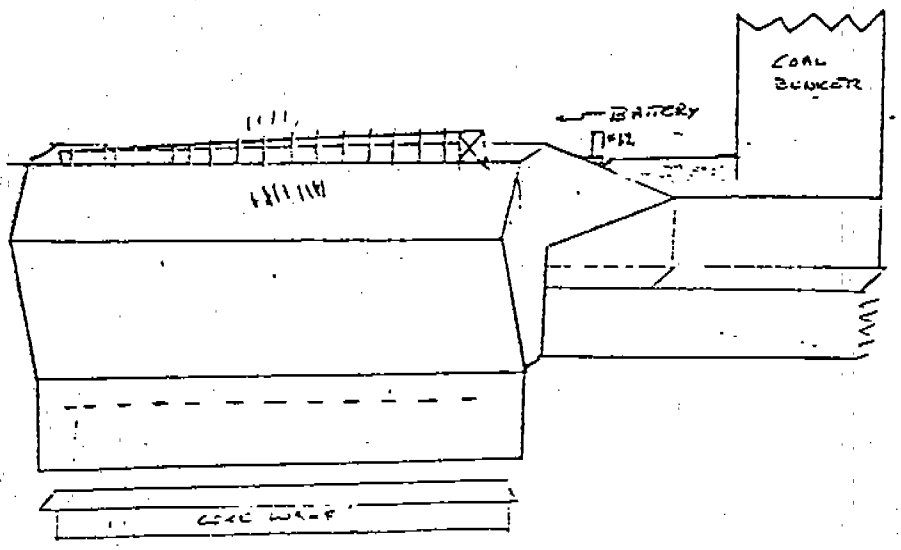
OVEN # : 12
TIME OF PUSH : 9'9
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-18-88



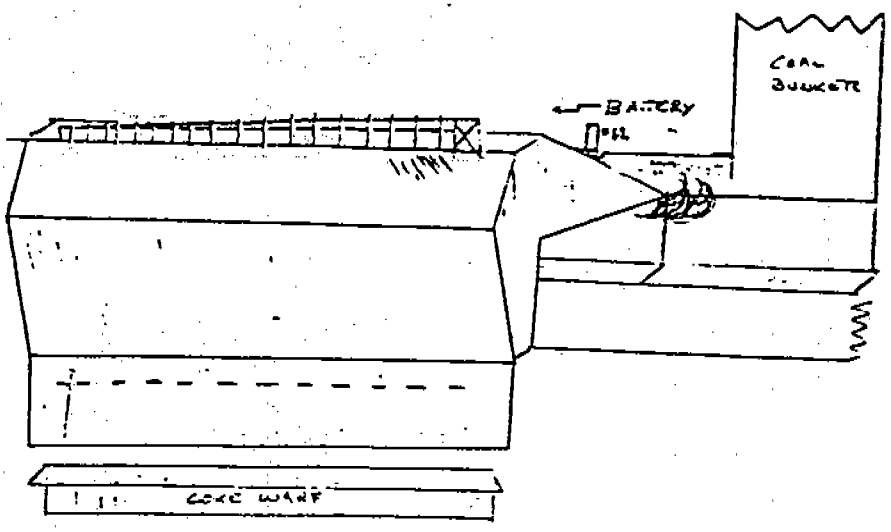
OVEN # : 2
TIME OF PUSH : 9
TIME ≥ 20% : (
MAX OPACITY : 1
DATE: 1-18-88



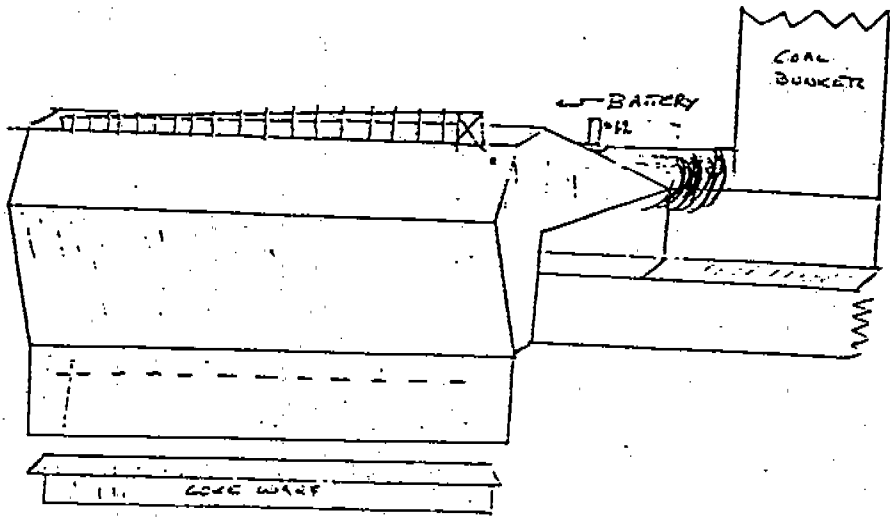
OVEN # :
TIME OF PUSH : 9
TIME ≥ 20% :
MAX OPACITY : 1
DATE: 1-18-



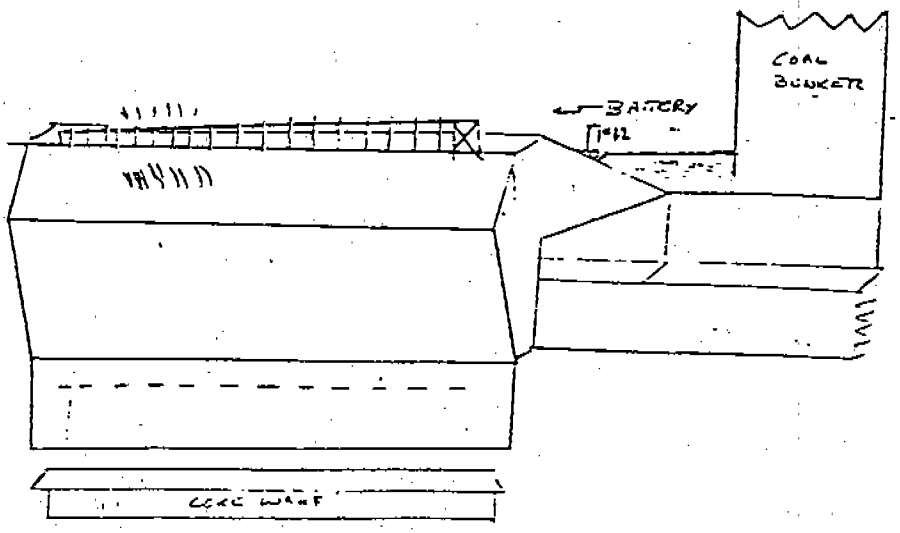
OVEN # :
TIME OF PUSH : 1
TIME ≥ 20% :
MAX OPACITY : 1
DATE: 1-18



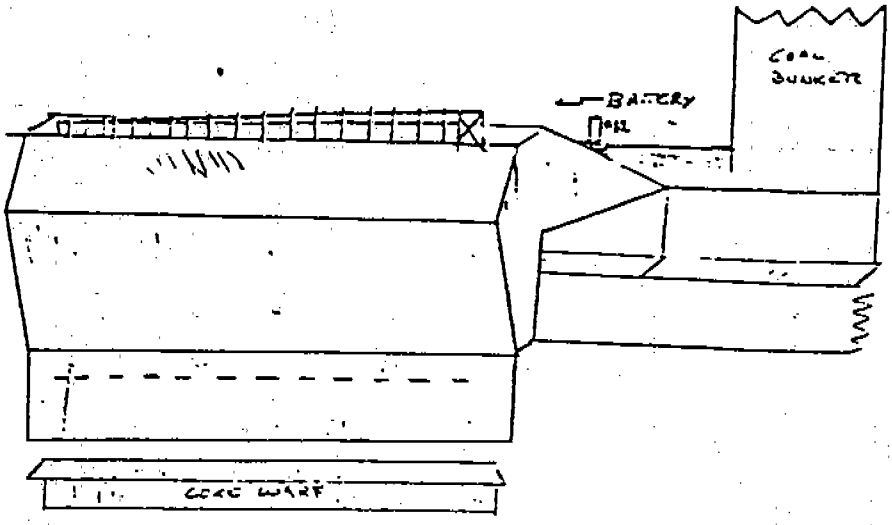
OVEN # : 52
TIME OF PUSH : 10^{40}
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-18-88



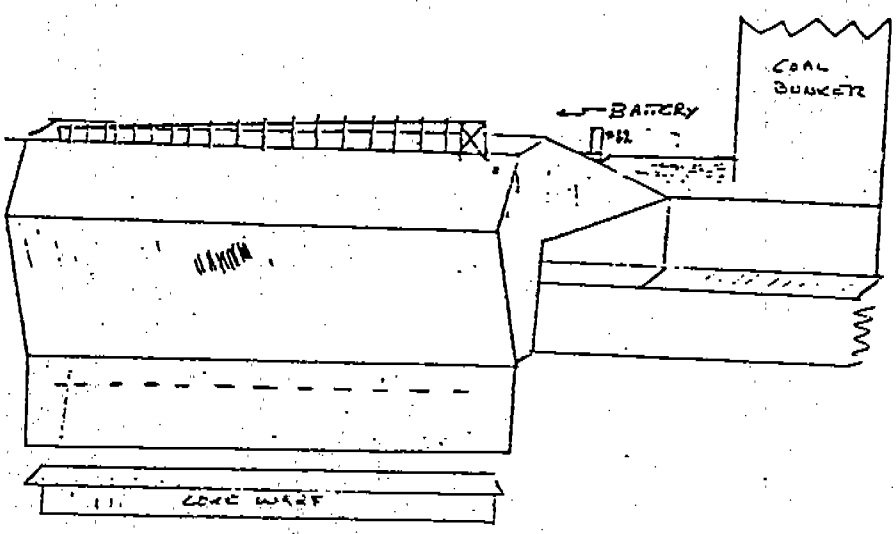
OVEN # : 62
TIME OF PUSH : 11^{01}
TIME ≥ 20% : :07 SEC.
MAX OPACITY : 20%
DATE : 1-18-88



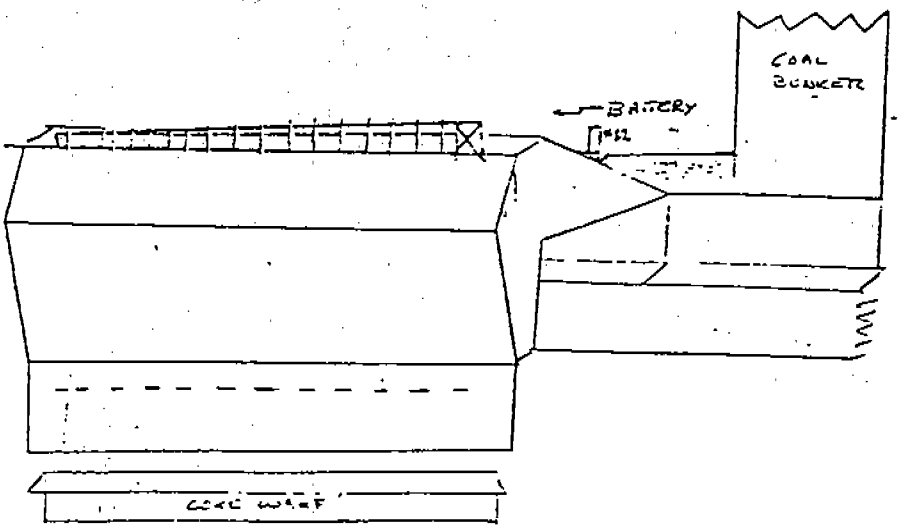
OVEN # : 4
TIME OF PUSH : 11^{14}
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-18-88



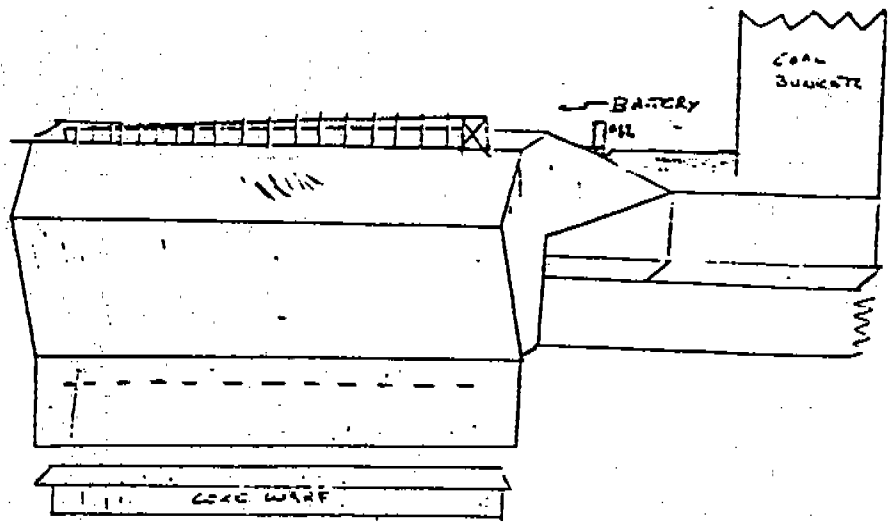
OVEN # :	14
TIME OF PUSH :	12^{08}
TIME ≥ 20% :	0
MAX OPACITY :	5%
DATE :	1-19-88



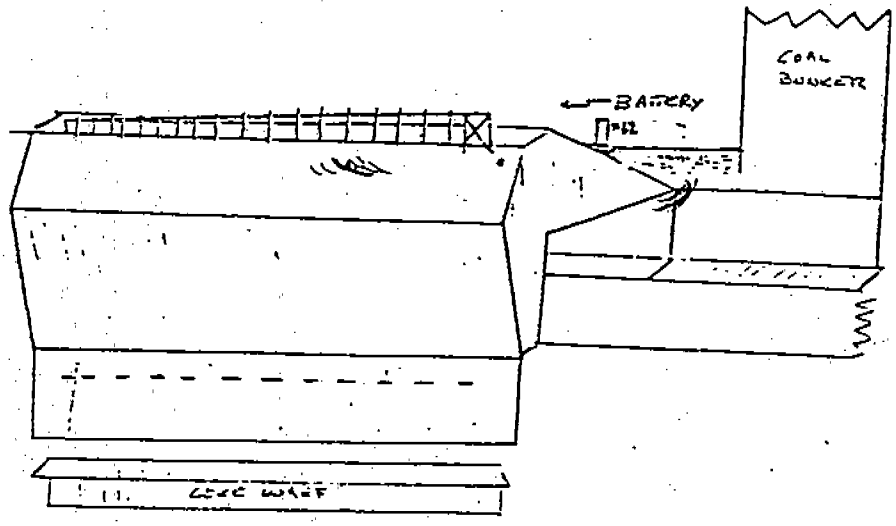
OVEN # :	24
TIME OF PUSH :	12^{18}
TIME ≥ 20% :	0
MAX OPACITY :	5%
DATE :	1-19-88



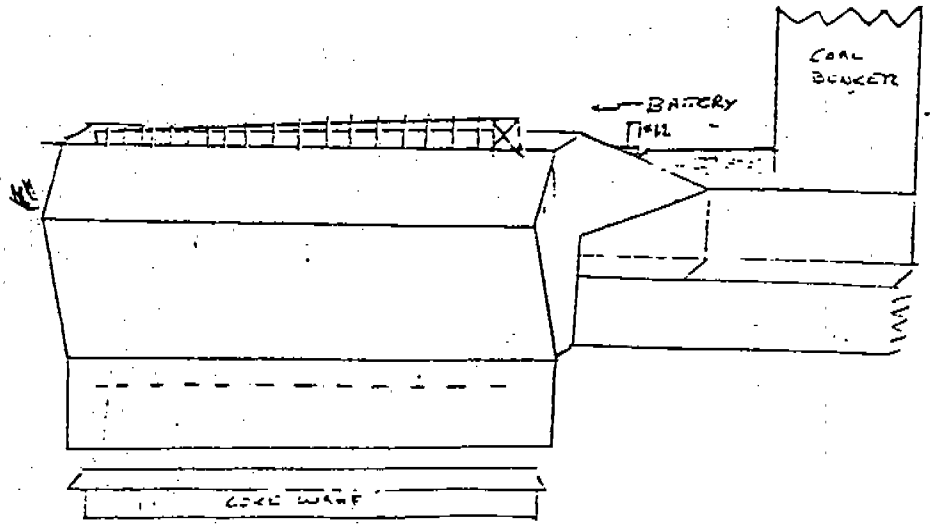
OVEN # :	34
TIME OF PUSH :	12^{43}
TIME ≥ 20% :	0
MAX OPACITY :	0%
DATE :	1-18-88



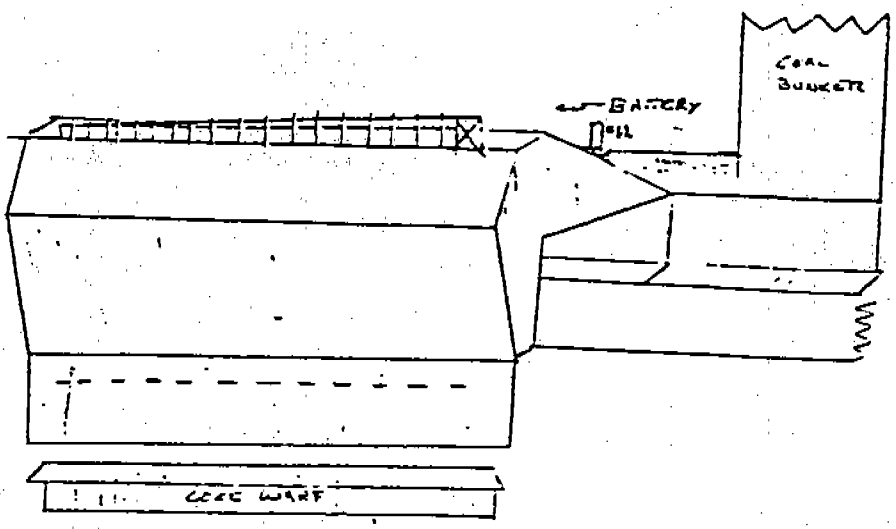
OVEN #	: 44
TIME OF PUSH	: 12^{59}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE	: 1-19-89



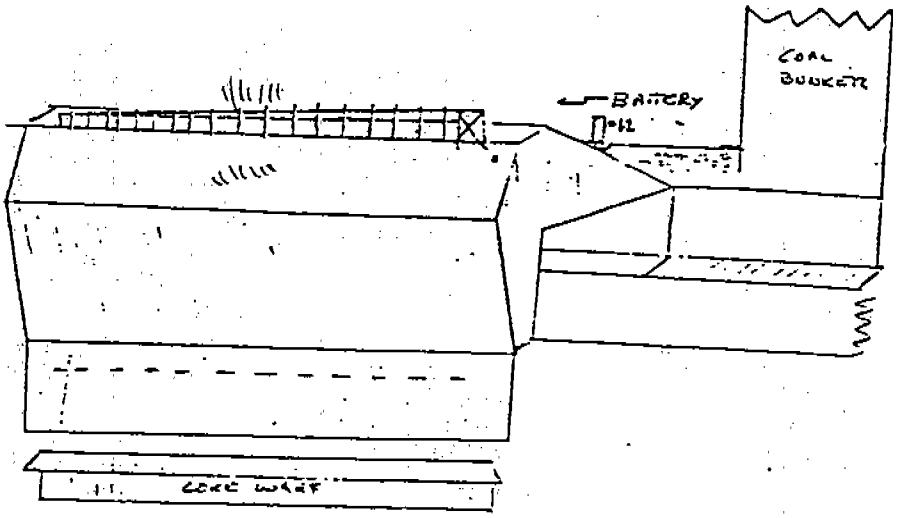
OVEN #	: 54
TIME OF PUSH	: 1^{21}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE	: 1-18-89



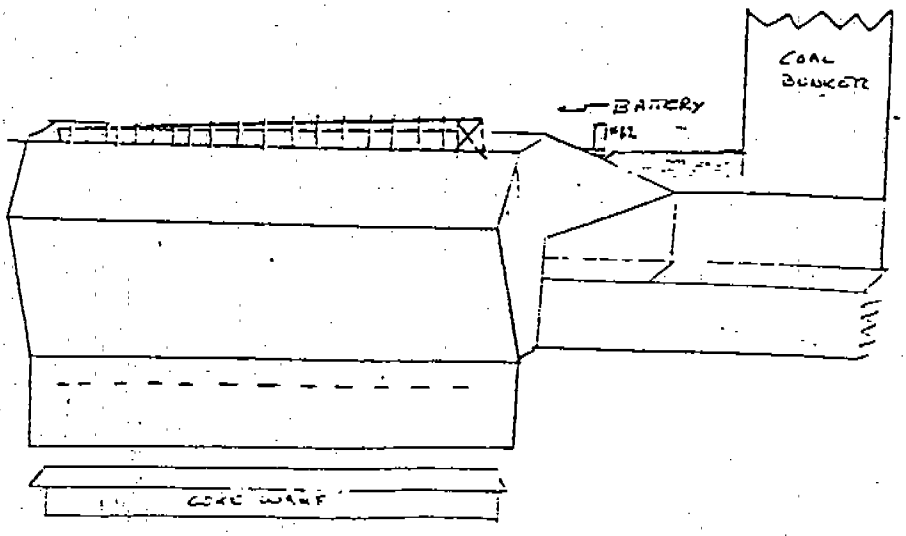
OVEN #	: 6
TIME OF PUSH	: 1^{31}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE	: 1-18-88



OVEN # : 16
TIME OF PUSH : 1:52
TIME ≥ 20% : 0
MAX OPACITY : 0%
DATE : 1-18-88

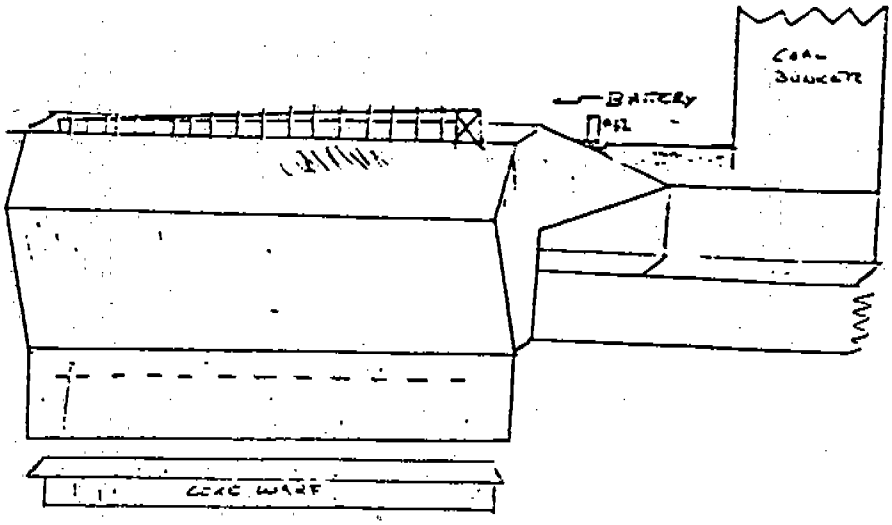


OVEN # : 26
TIME OF PUSH : 2:00
TIME ≥ 20% : 0
MAX OPACITY : 10%
DATE : 1-18-88

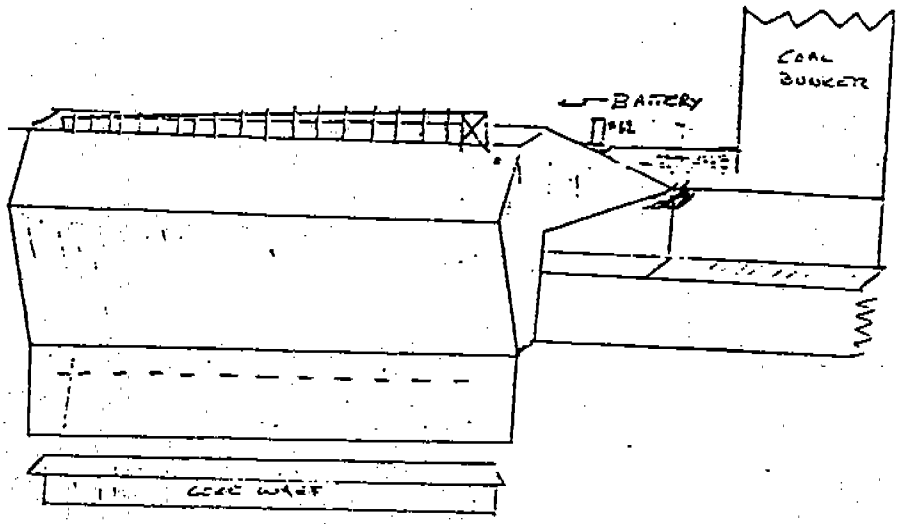


OVEN # : 36
TIME OF PUSH : 2:19
TIME ≥ 20% : 0
MAX OPACITY : 0%
DATE : 1-18-88

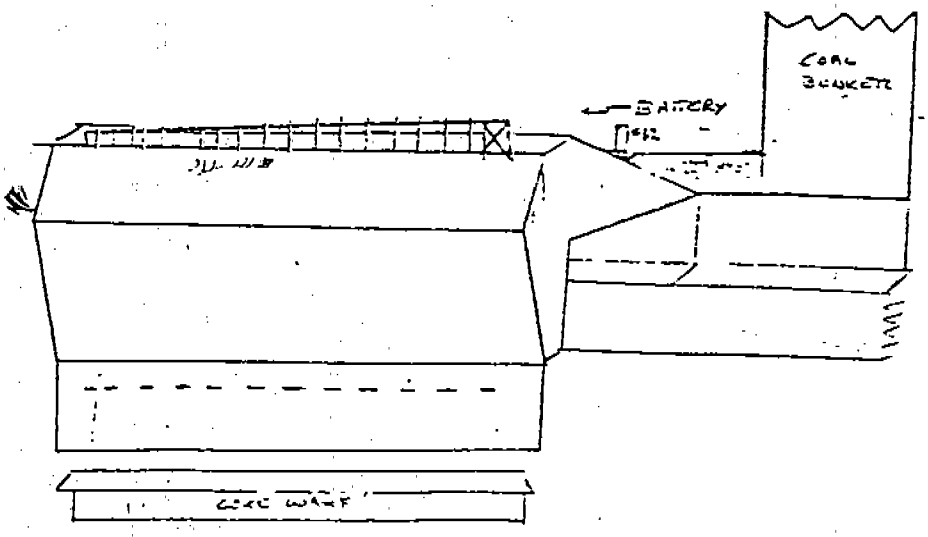
3 TO 11 SHIFT



OVEN #	: 46
TIME OF PUSH	: 3^{14}
TIME ≥ 20%	: 0
MAX OPACITY	: 10%
DATE:	1-18-88

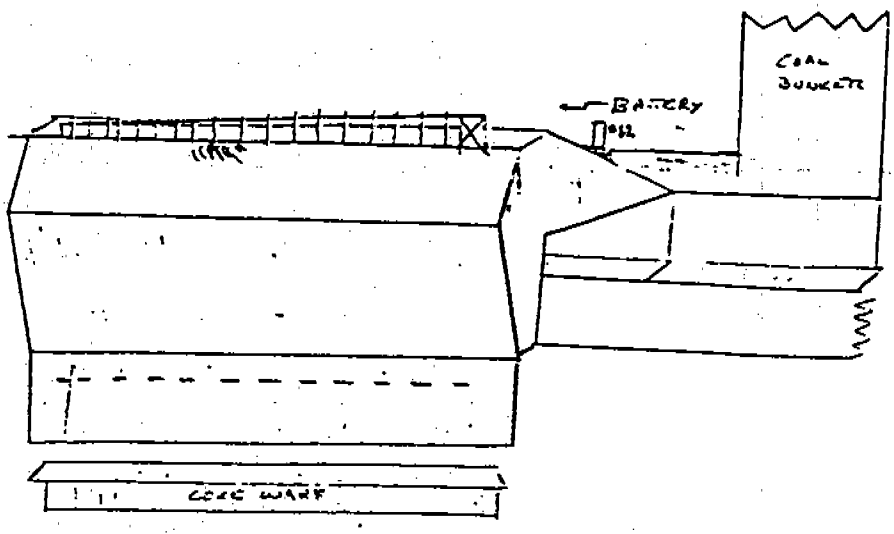


OVEN #	: 56
TIME OF PUSH	: 3^{23}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE:	1-18-88

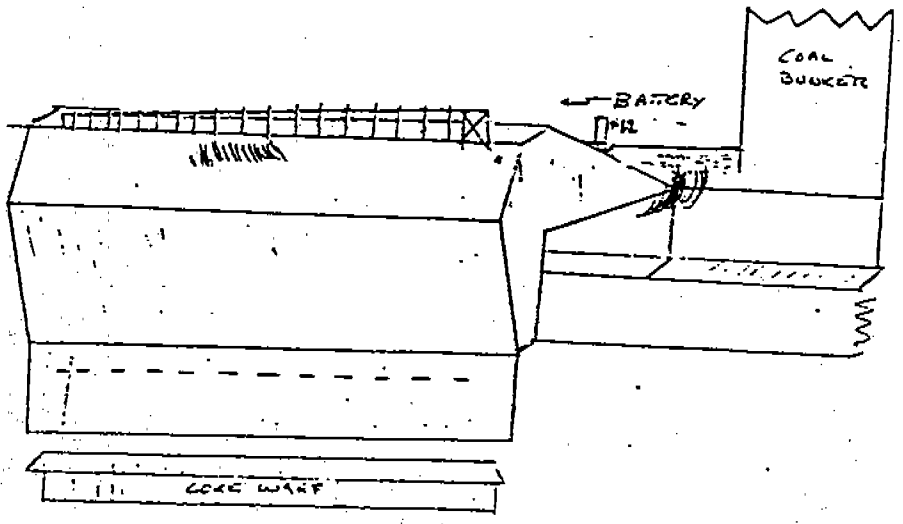


OVEN #	: 8
TIME OF PUSH	: 346
TIME ≥ 20%	: 0.
MAX OPACITY	: 5%
DATE:	1-18-88

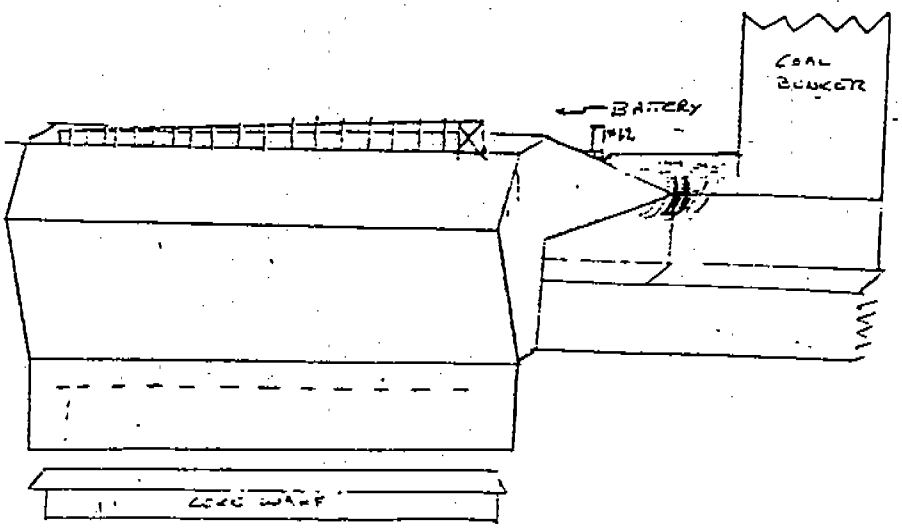
7-3 TUEN



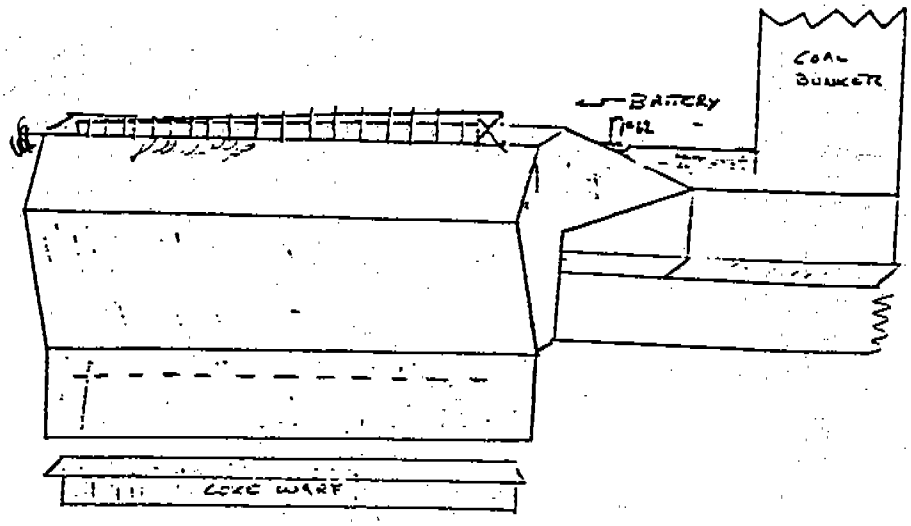
OVEN # :	36
TIME OF PUSH :	9:16
TIME ≥ 20% :	0
MAX OPACITY :	5%
DATE :	1-19-88



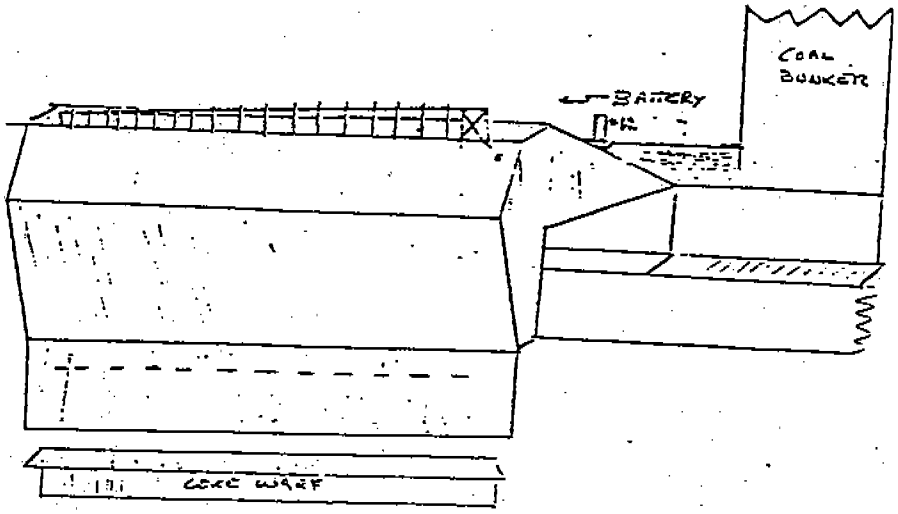
OVEN # :	46
TIME OF PUSH :	9:26
TIME ≥ 20% :	0
MAX OPACITY :	15%
DATE :	1-19-88



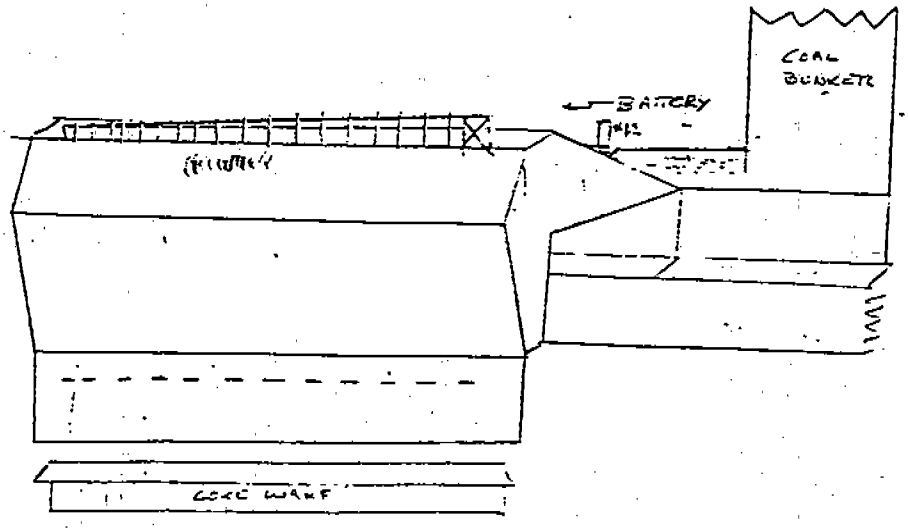
OVEN # :	56
TIME OF PUSH :	9:54
TIME ≥ 20%	0
MAX OPACITY :	10%
DATE :	1-19-88



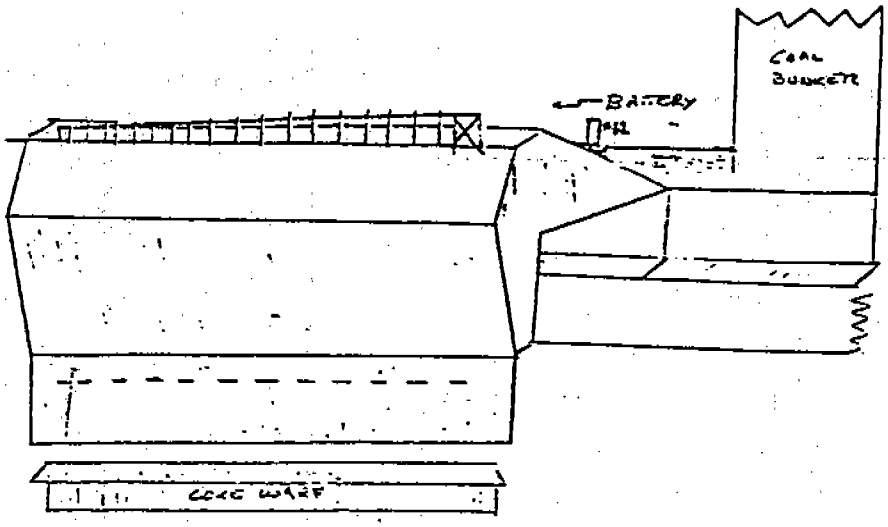
OVEN #	: 8
TIME OF PUSH	: 10^{05}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE:	1-19-88



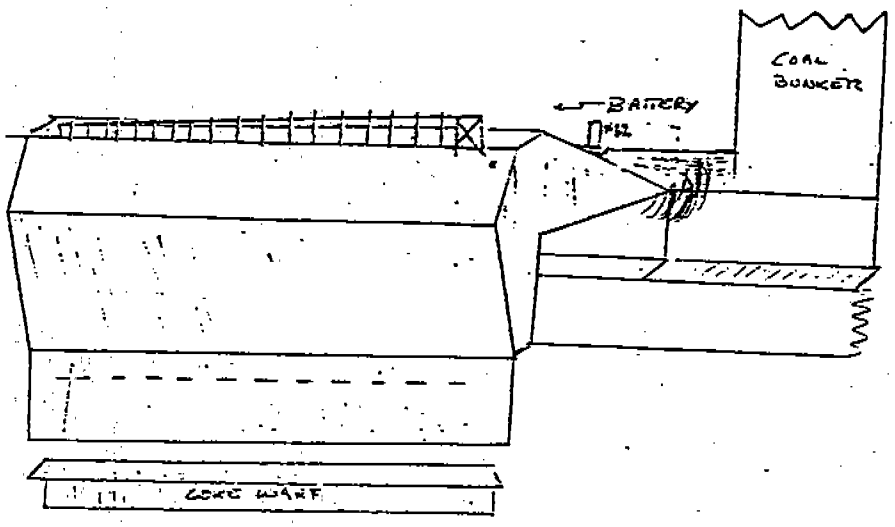
OVEN #	: 18
TIME OF PUSH	: 10^{28}
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE:	1-19-88



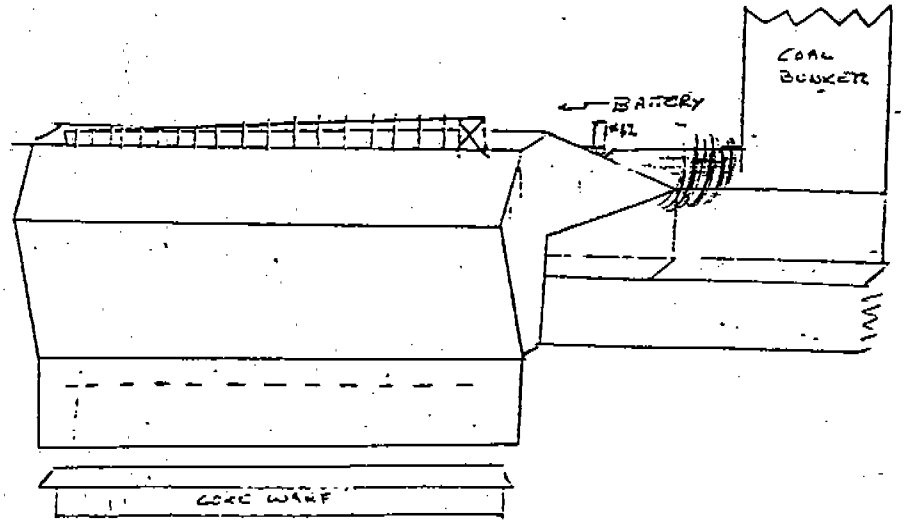
OVEN #	: 28
TIME OF PUSH	: 10^{38}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE:	1-19-88



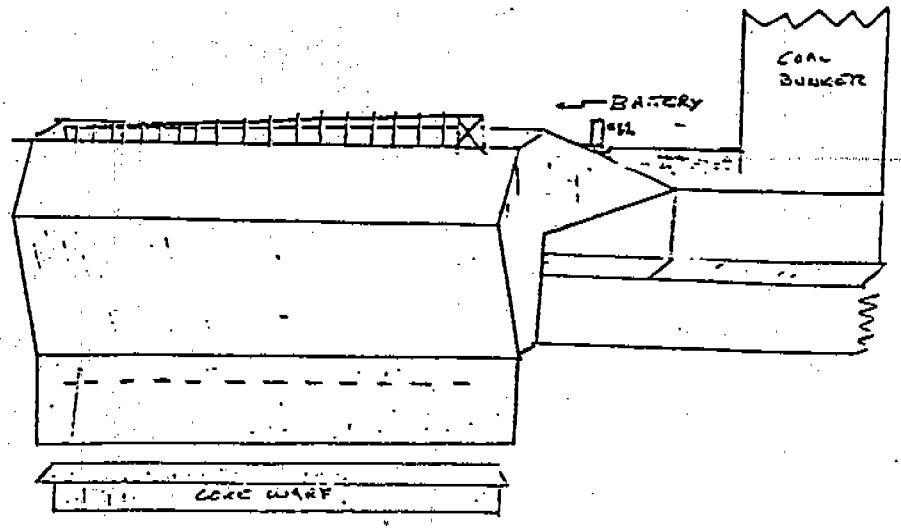
OVEN #	: 38
TIME OF PUSH	: 11^{35}
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE:	1-19-88



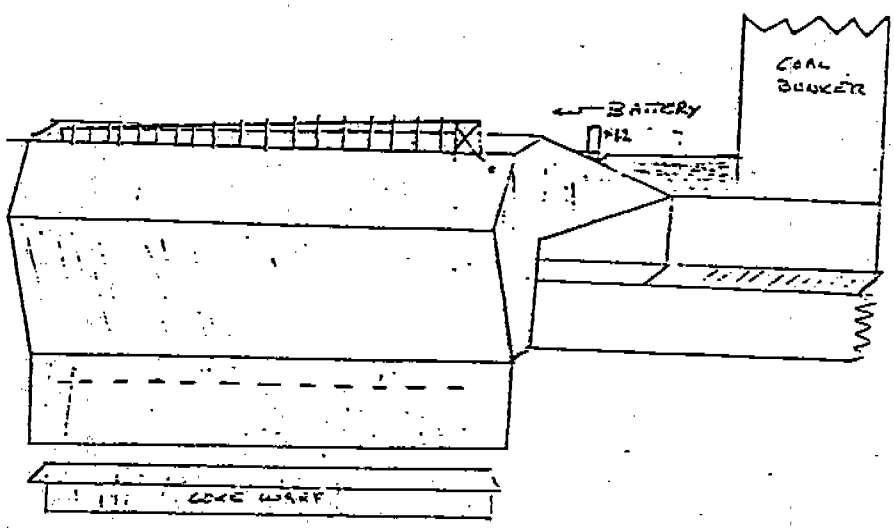
OVEN #	: 48
TIME OF PUSH	: 11^{50}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE:	1-19-88



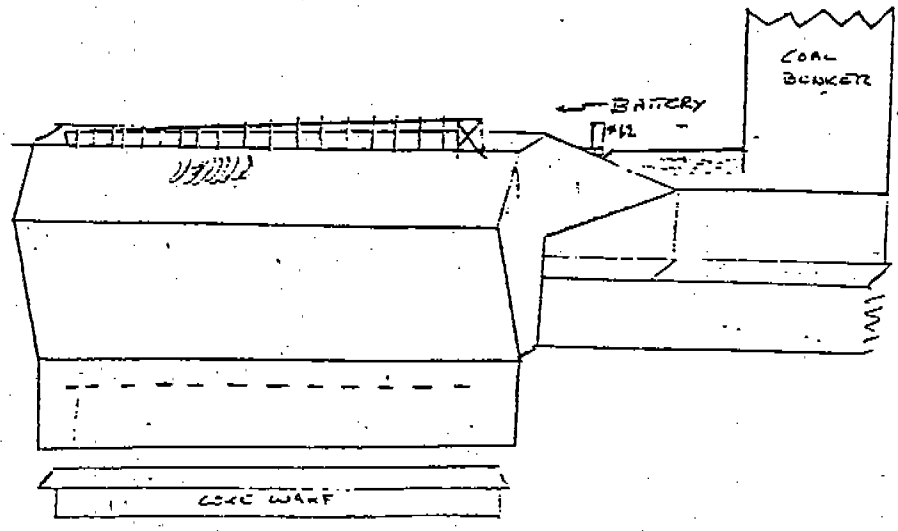
OVEN #	: 58
TIME OF PUSH	: 12"
TIME ≥ 20%	: 0
MAX OPACITY	: 15%
DATE:	1-19-88



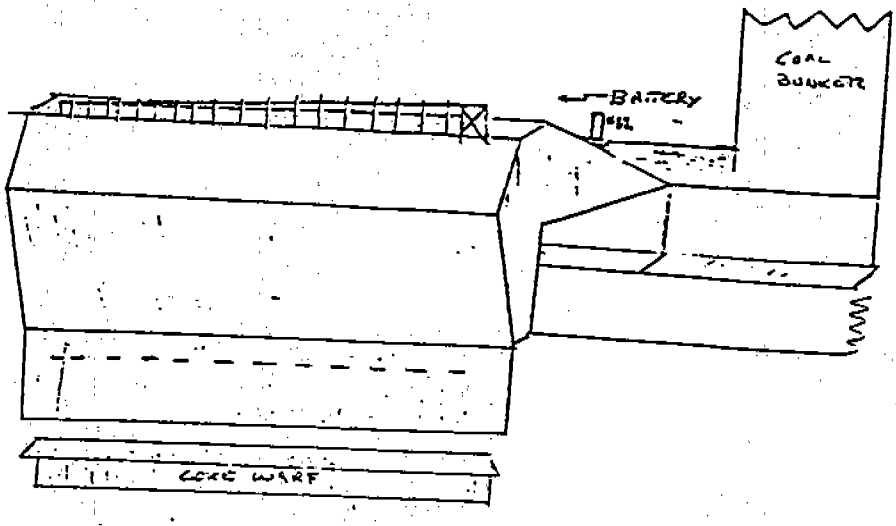
OVEN # : 1
TIME OF PUSH : 12^{21}
TIME ≥ 20% : 0
MAX OPACITY : 0%
DATE : 1-19-88



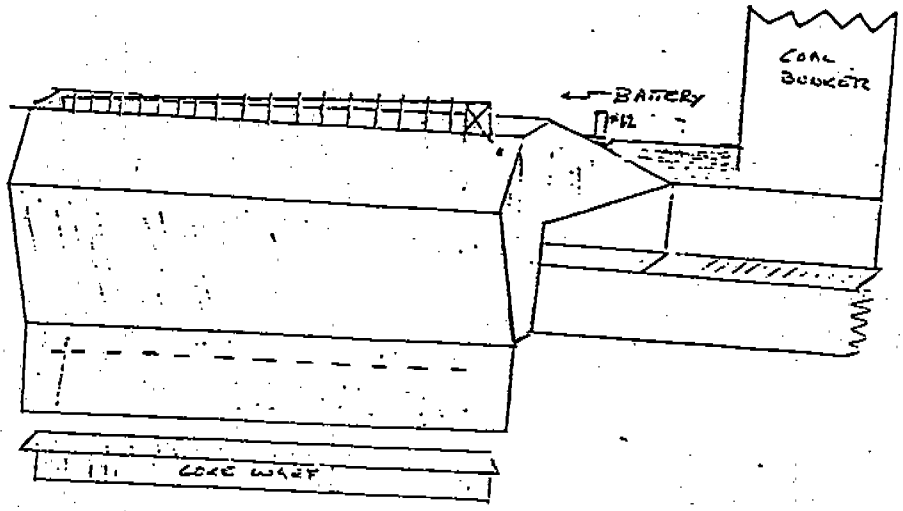
OVEN # : 11
TIME OF PUSH : 12^{44}
TIME ≥ 20% : 0
MAX OPACITY : 0%
DATE : 1-19-88



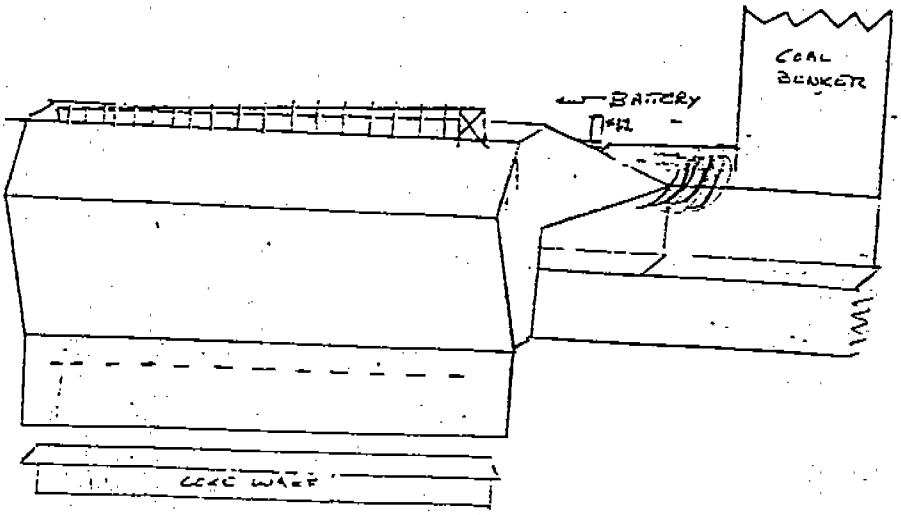
OVEN # : 21
TIME OF PUSH : 12^{53}
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-19-88



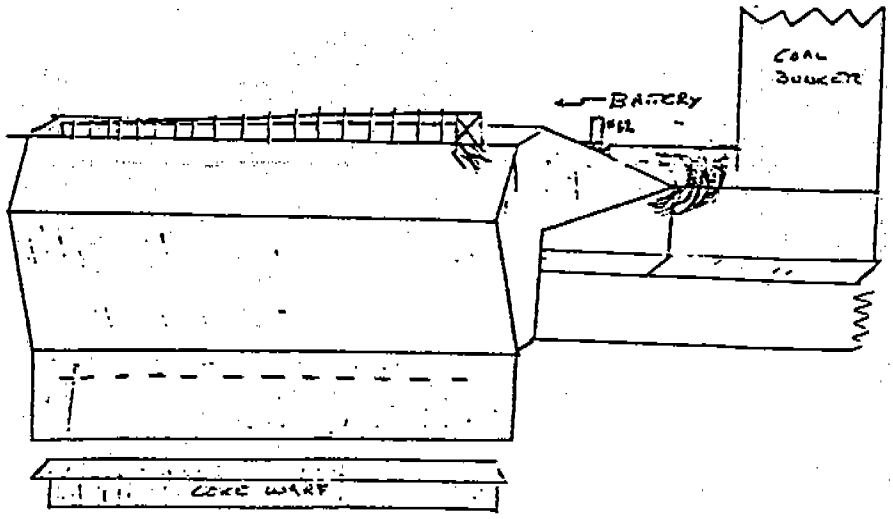
OVEN # : 31
TIME OF PUSH : 1:16
TIME ≥ 20% : 0
MAX OPACITY : 0%
DATE : 1-19-88



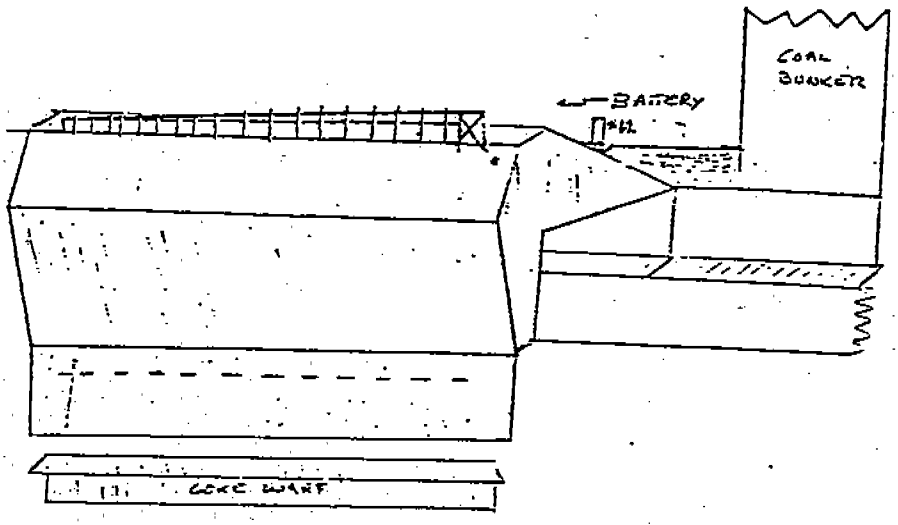
OVEN # : 41
TIME OF PUSH : 1:25
TIME ≥ 20% : 0
MAX OPACITY : 0%
DATE : 1-19-88



OVEN # : 51
TIME OF PUSH : 1:48
TIME ≥ 20% : 0
MAX OPACITY : 0%
DATE : 1-19-87

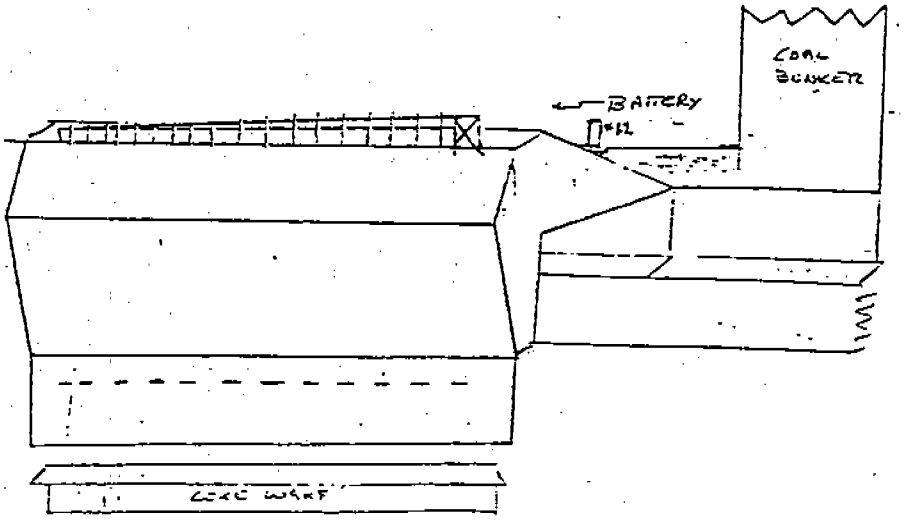


OVEN #	: 61
TIME OF PUSH	: 2^{04}
TIME ≥ 20%	: 0
MAX OPACITY	: 10%
DATE:	1-19-88



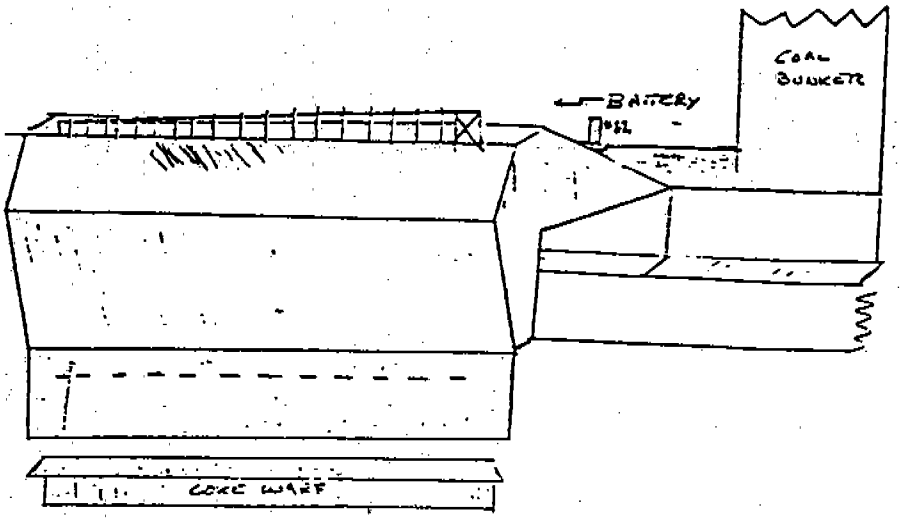
OVEN #	: 3
TIME OF PUSH	: 2^{26}
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE:	1-19-88

3 & 11 Tuen

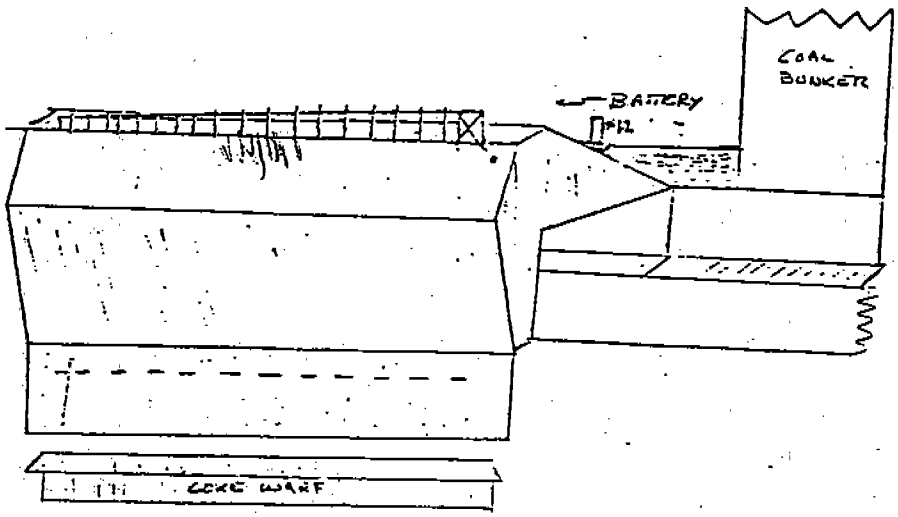


OVEN #	: 13
TIME OF PUSH	: 315
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE:	1-19-88

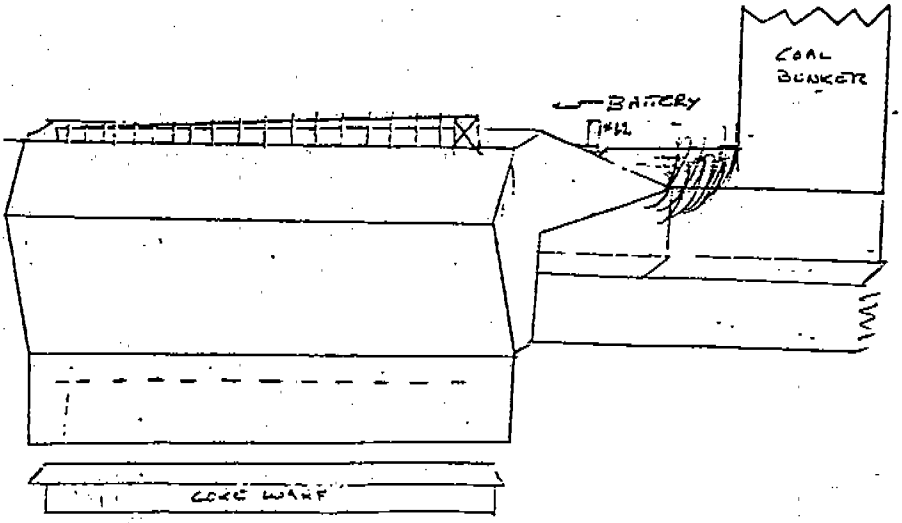
P6-4



OVEN #	: 23
TIME OF PUSH	: 3:23
TIME ≥ 20%	: 0
MAX OPACITY	: 10%
DATE:	1-19-88

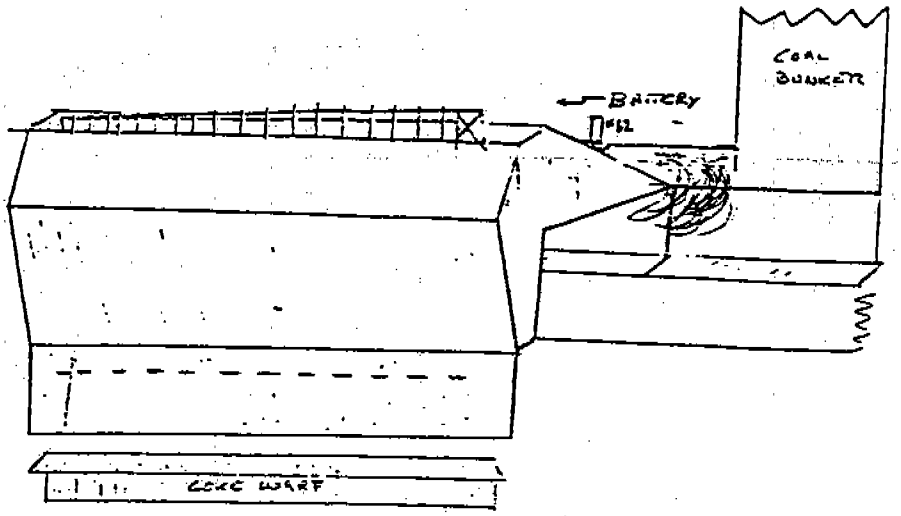


OVEN #	: 33
TIME OF PUSH	: 3:45
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE:	1-19-88

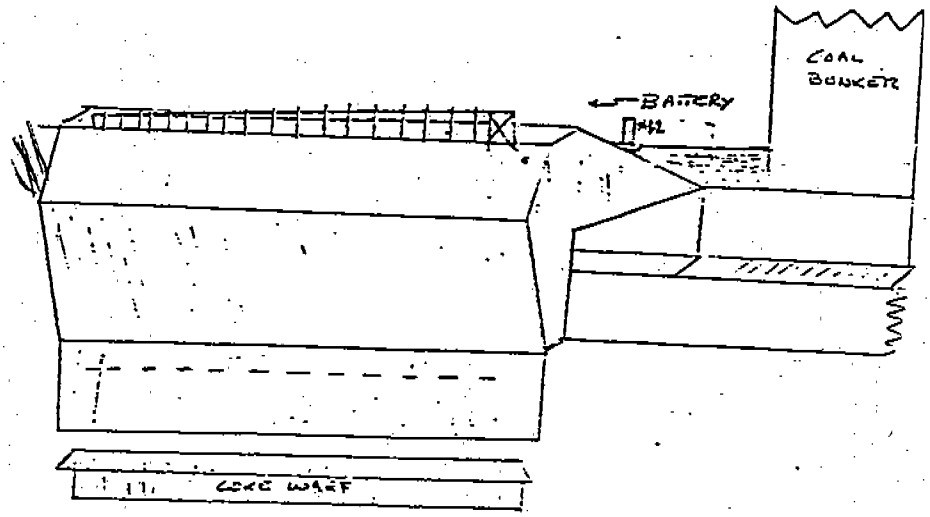


OVEN #	: 43
TIME OF PUSH	: 3:53
TIME ≥ 20%	: 0
MAX OPACITY	: 10%
DATE:	1-19-88

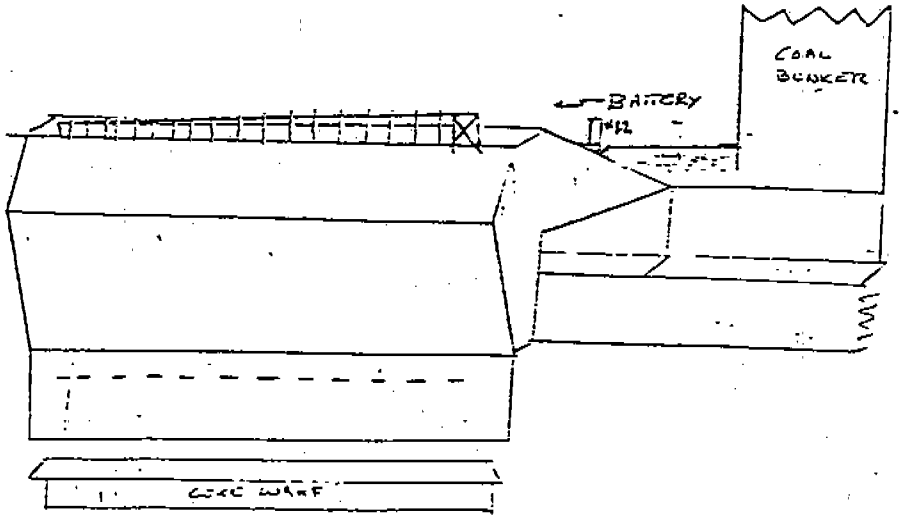
P6 15



OVEN #	: 53
TIME OF PUSH	: 4'15
TIME ≥ 20%	: 0
MAX OPACITY	: 15%
DATE	: 1-19-88

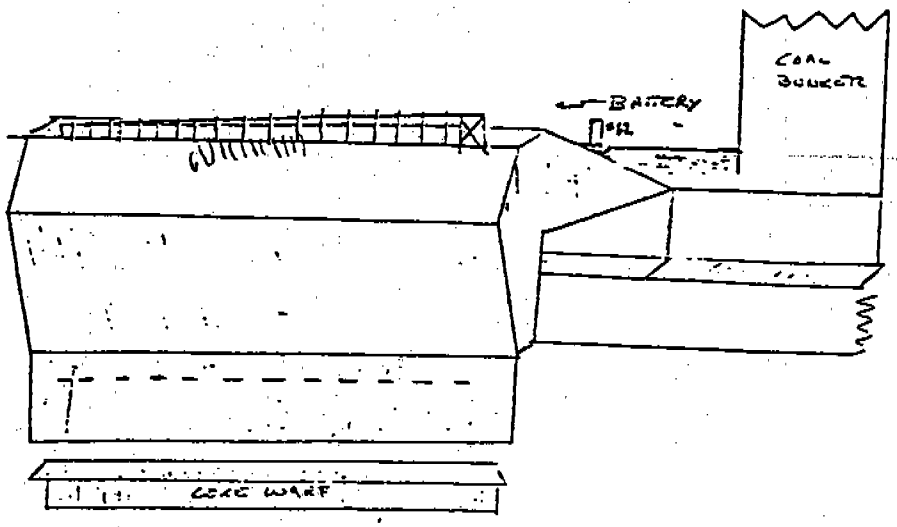


OVEN #	: 5
TIME OF PUSH	: 4'26
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE	: 1-19-88

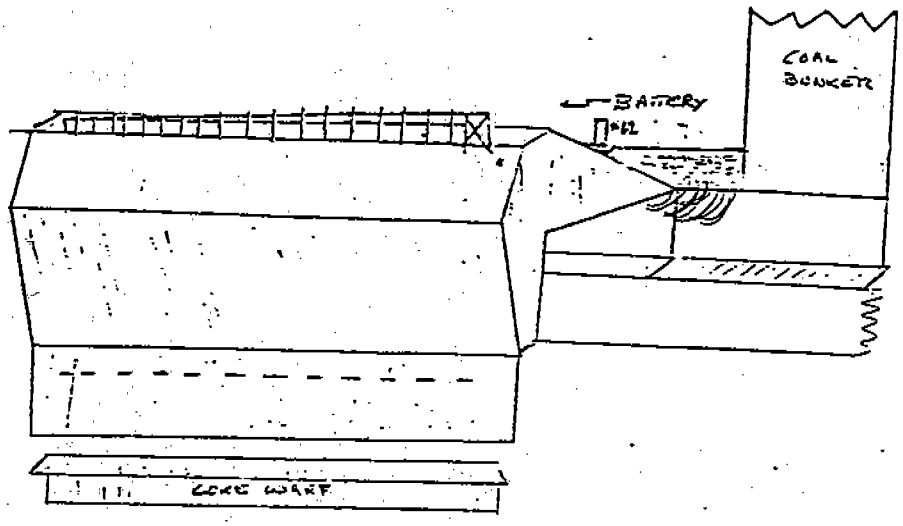


OVEN #	: 15
TIME OF PUSH	: 4'49
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE	: 1-19-88

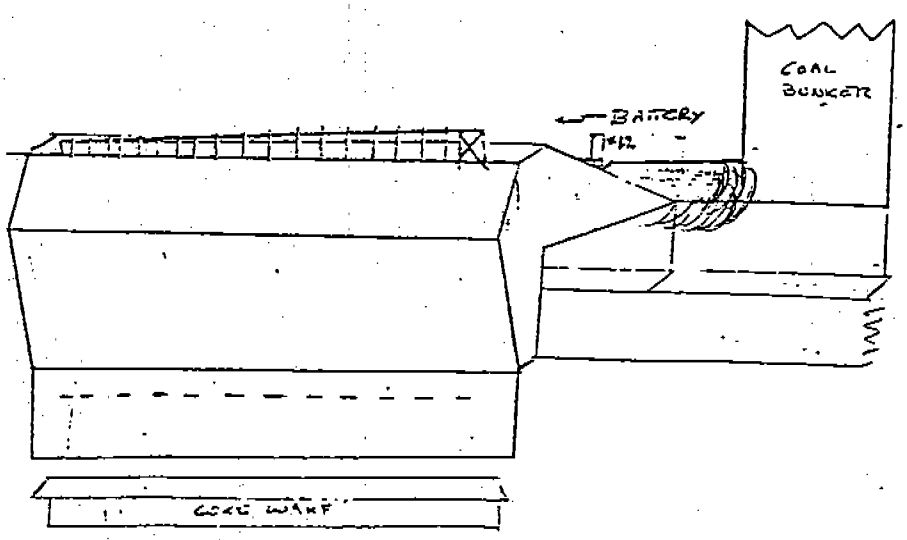
7-3 TOLN



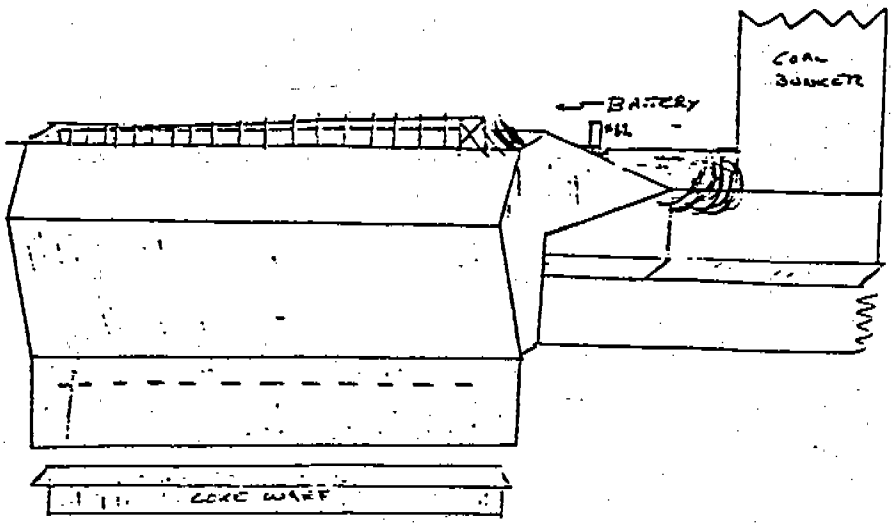
OVEN #	: 31
TIME OF PUSH	: 8^{01}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE	: 1-20-88



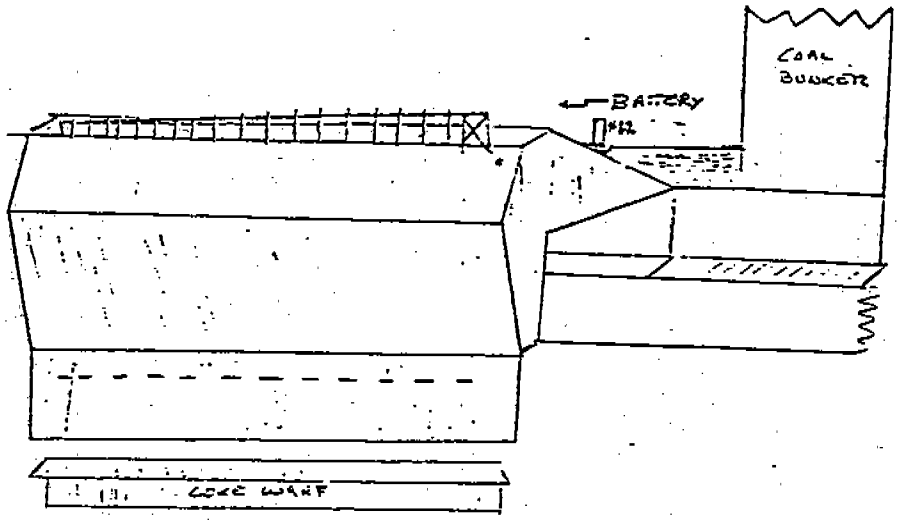
OVEN #	: 41
TIME OF PUSH	: 8^{10}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE	: 1-20-88



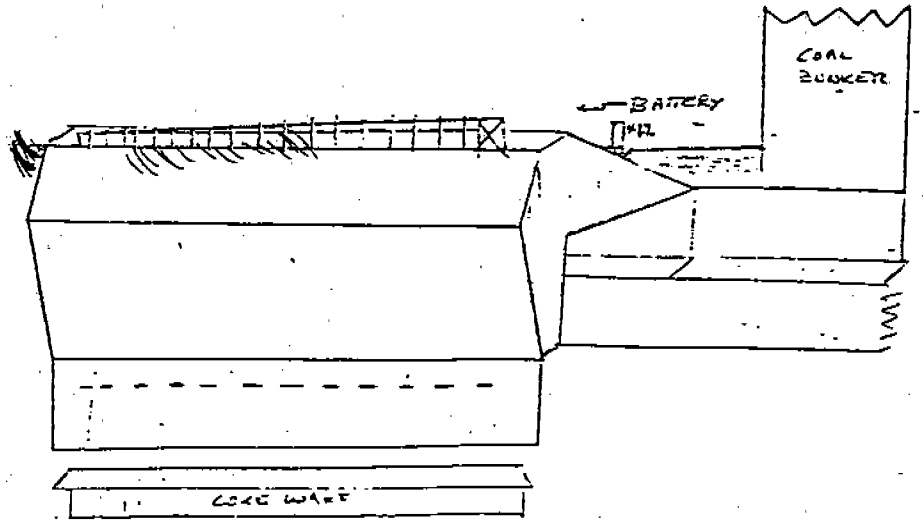
OVEN #	: 51
TIME OF PUSH	: 8^{34}
TIME ≥ 20%	: 0
MAX OPACITY	: 10%
DATE	: 1-20-88



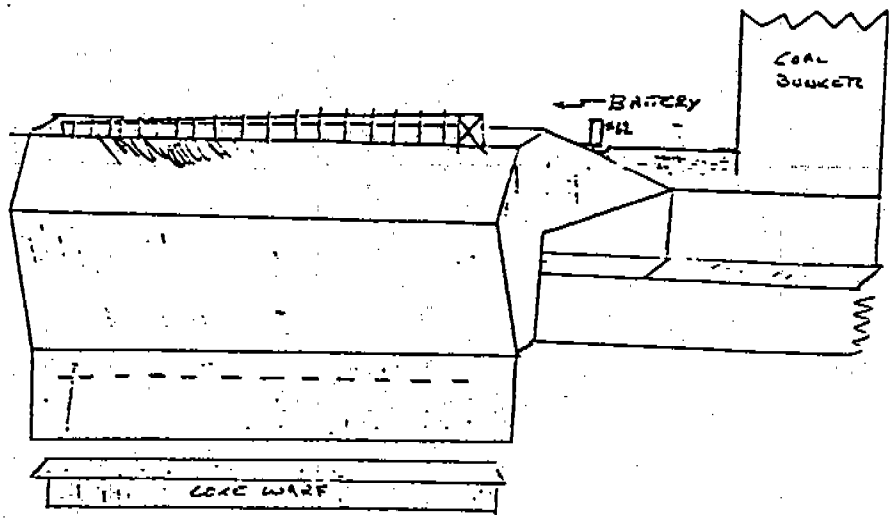
OVEN #	: 61
TIME OF PUSH	: 8^{44}
TIME ≥ 20%	: 0
MAX OPACITY	: 10%
DATE:	1-20-88



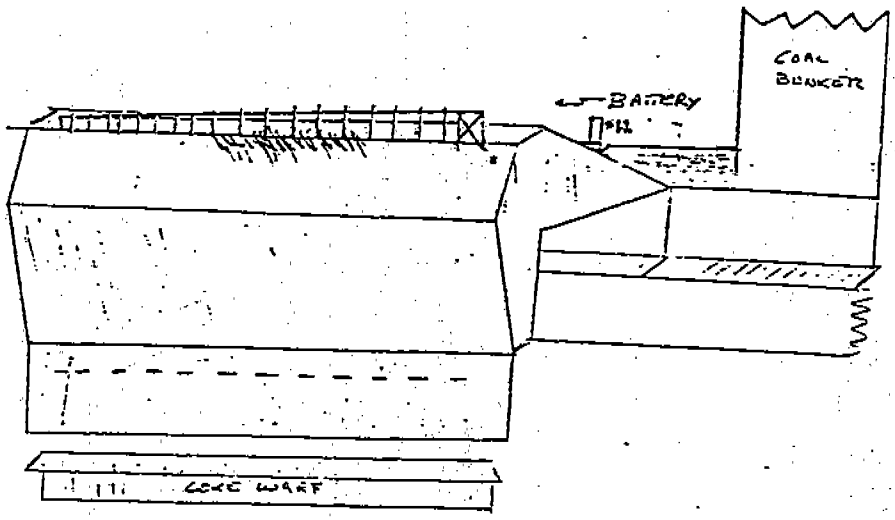
OVEN #	: 3
TIME OF PUSH	: 9^{24}
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE:	1-20-88



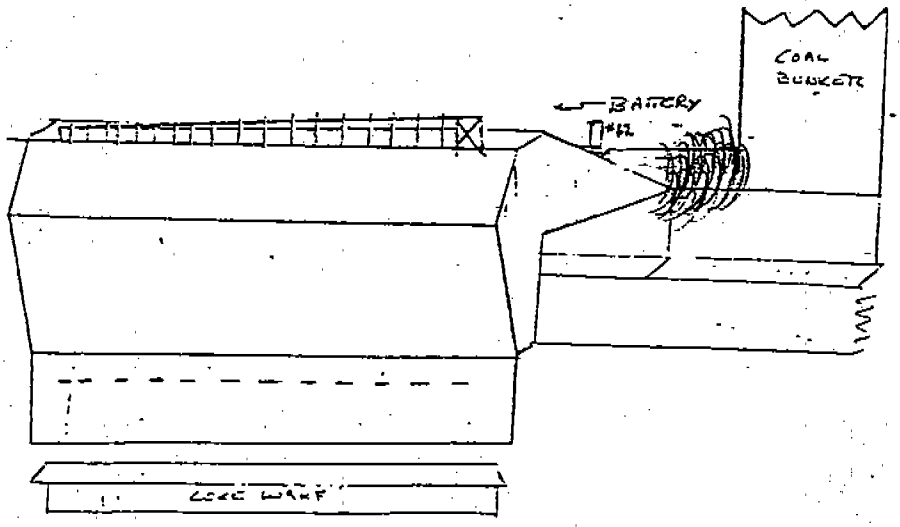
OVEN #	: 13
TIME OF PUSH	: 9^{38}
TIME ≥ 20%	: 0.
MAX OPACITY	: 5%
DATE:	1-20-88



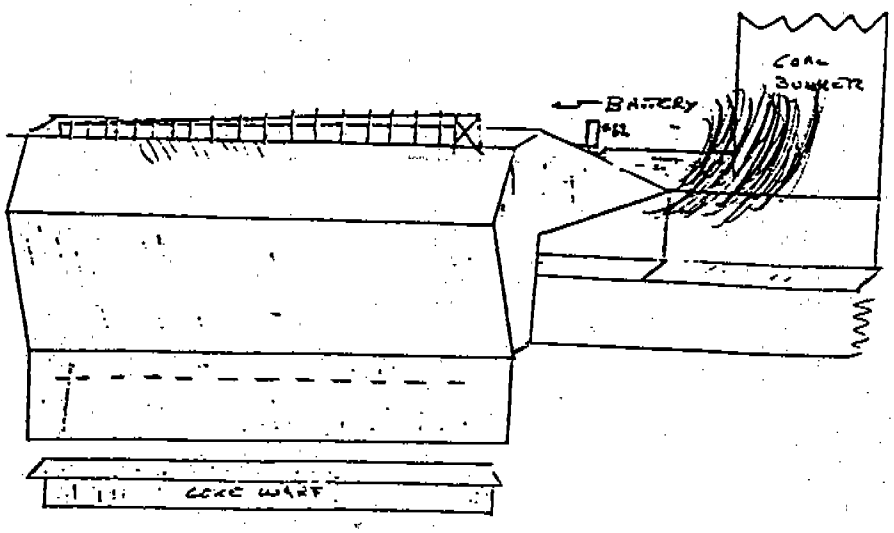
OVEN # : 23
TIME OF PUSH : 957
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-20-88



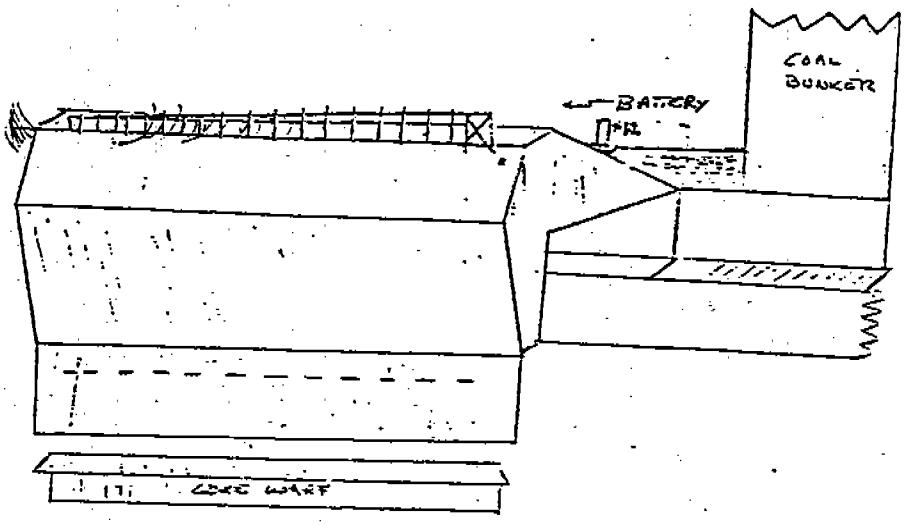
OVEN # : 33
TIME OF PUSH : 1006
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-20-88



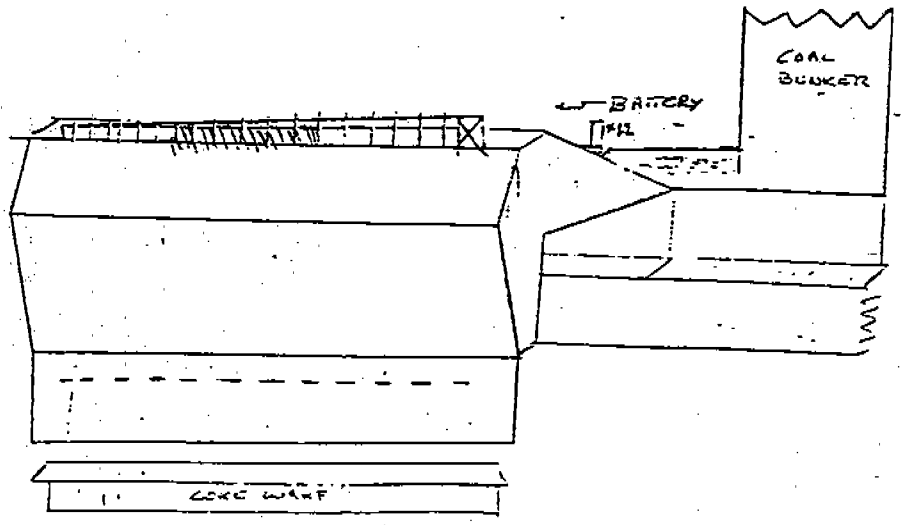
OVEN # : 43
TIME OF PUSH : 1055
TIME ≥ 20% : 0
MAX OPACITY : 15%
DATE : 1-20-88



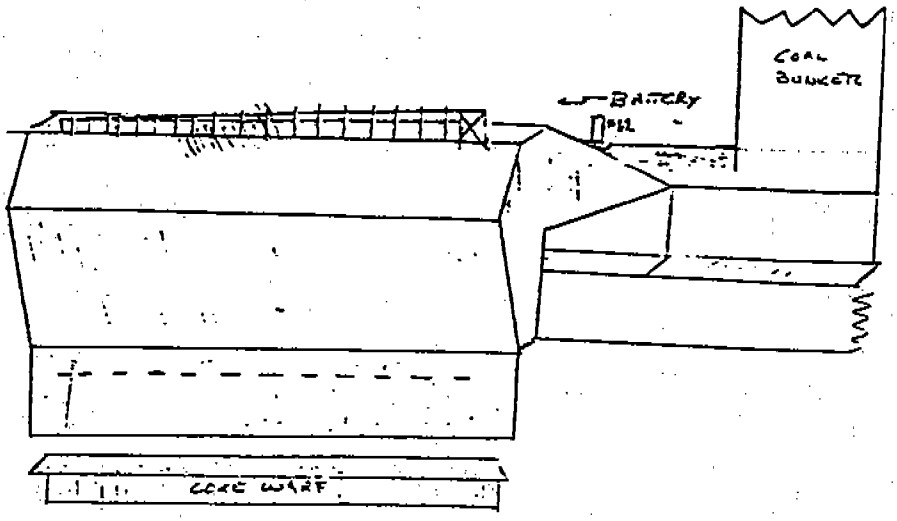
OVEN # : 53
TIME OF PUSH : 10^{36}
TIME ≥ 20% : :26sec
* MAX OPACITY : 35%
DATE : 1-20-88



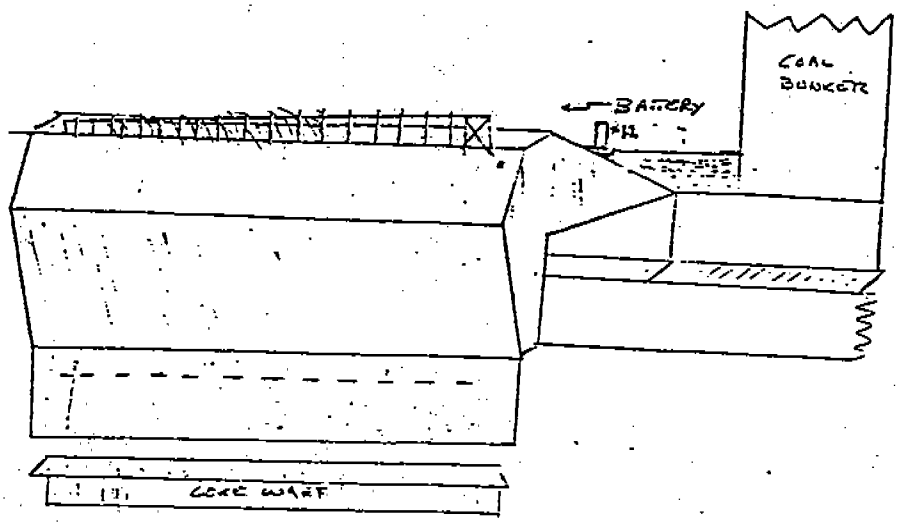
OVEN # : 5
TIME OF PUSH : 11^{31}
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-20-88



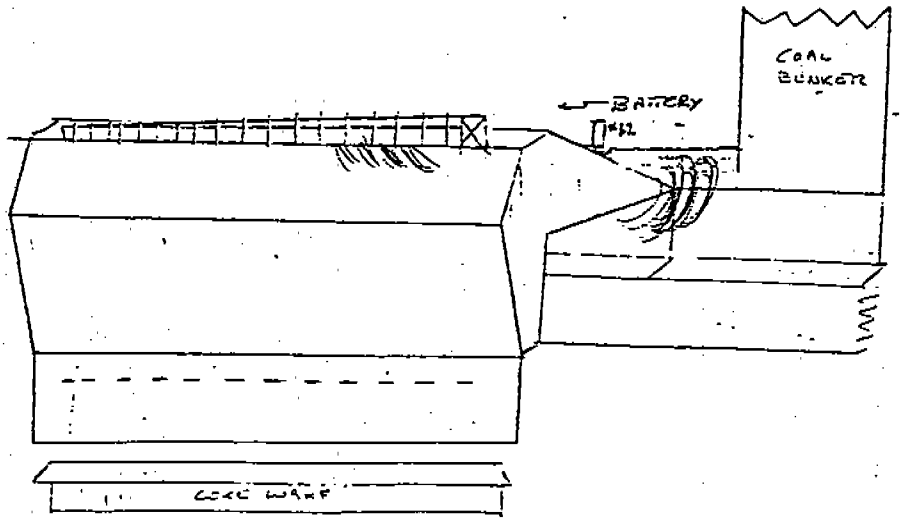
OVEN # : 15
TIME OF PUSH : 11^{39}
TIME ≥ 20% : 0
MAX OPACITY : 5%
DATE : 1-20-88



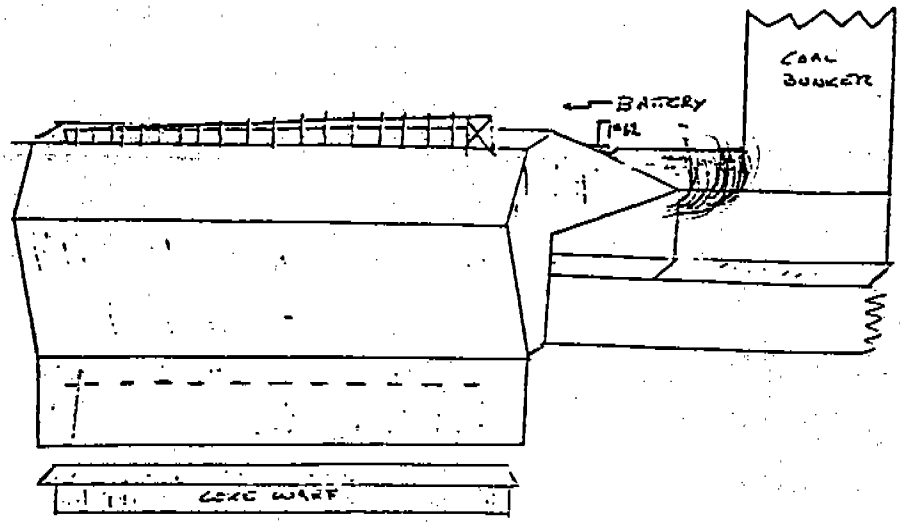
OVEN #	: 25
TIME OF PUSH	: 11^{59}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE:	1-20-88



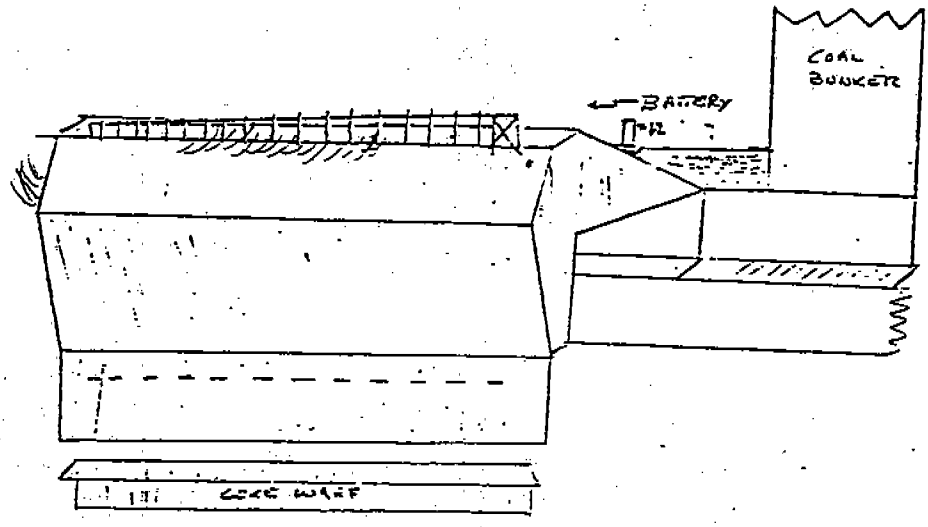
OVEN #	: 35
TIME OF PUSH	: 12^{06}
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE:	1-20-88



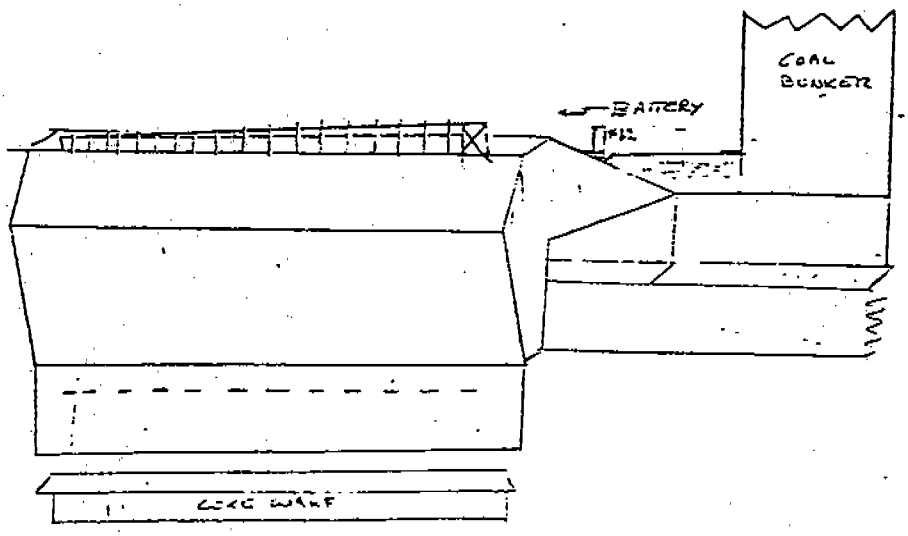
OVEN #	: 45
TIME OF PUSH	: 12^{30}
TIME ≥ 20%	: 0.
MAX OPACITY	: 15%
DATE:	1-20-88



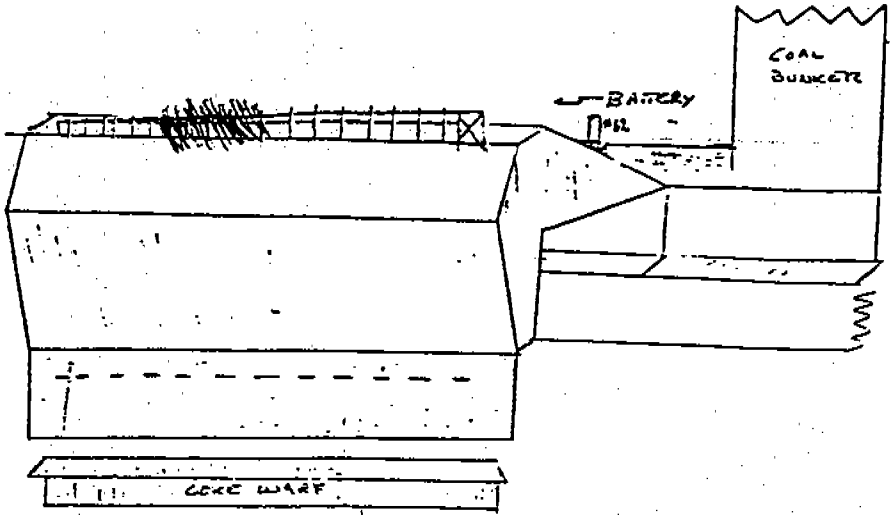
OVEN #	: 55
TIME OF PUSH	: 2.40
TIME ≥ 20%	: 0
MAX OPACITY	: 15%
DATE	: 1-20-88



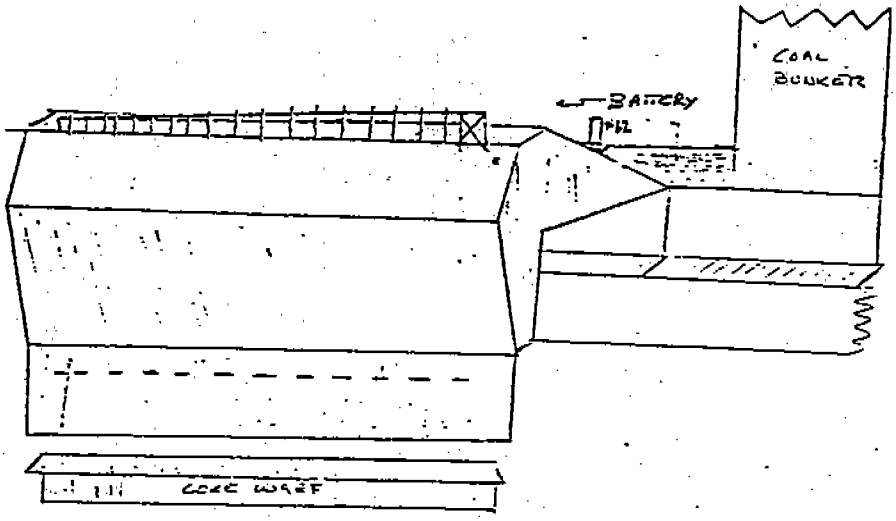
OVEN #	: 7
TIME OF PUSH	: 1.00
TIME ≥ 20%	: 0
MAX OPACITY	: 5%
DATE	: 1-20-88



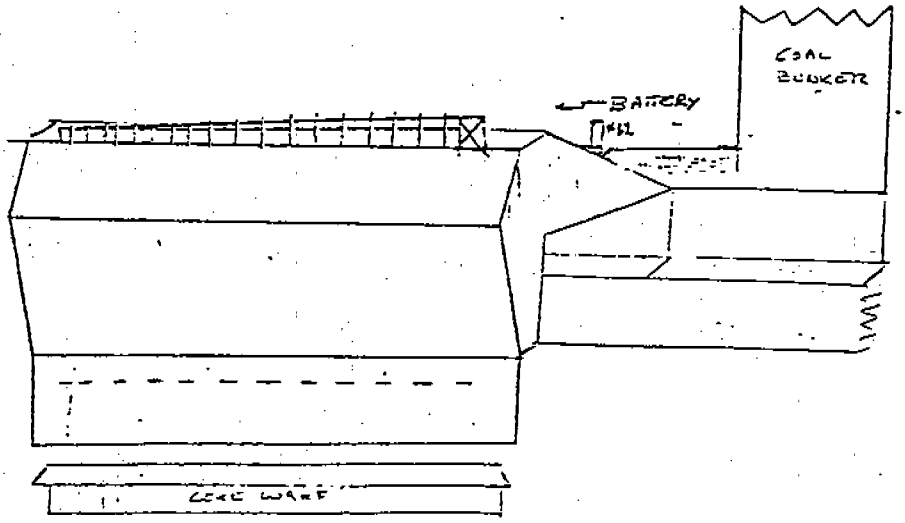
OVEN #	: 17
TIME OF PUSH	: 1.14
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE	: 1-20-88



OVEN #	: 27
TIME OF PUSH	: 141
TIME ≥ 20%	: 0
MAX OPACITY	: 10%
DATE	: 1-20-88

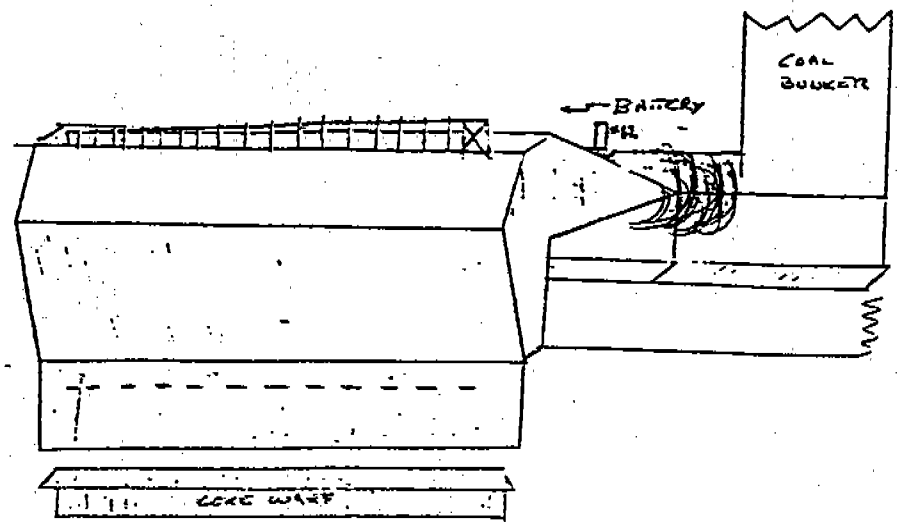


OVEN #	: 37
TIME OF PUSH	: 151
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE	: 1-20-88

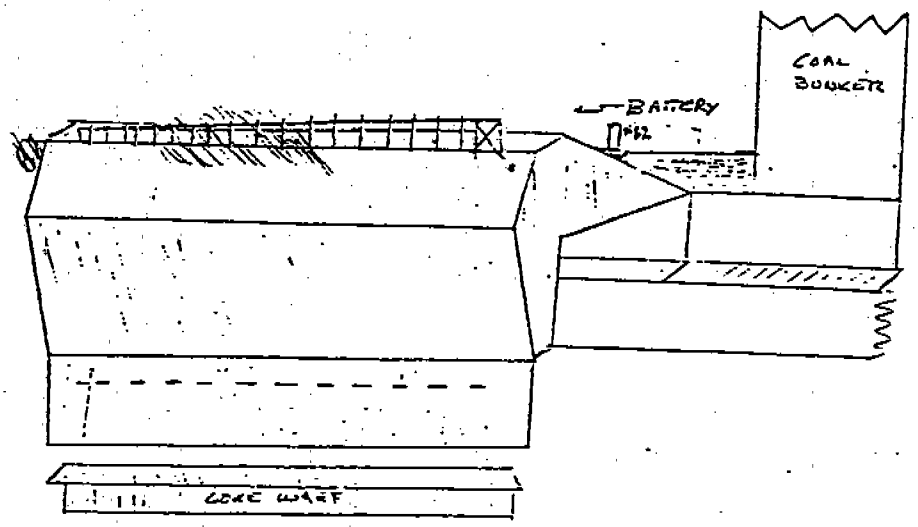


OVEN #	: 47
TIME OF PUSH	: 212
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE	: 1-20-88

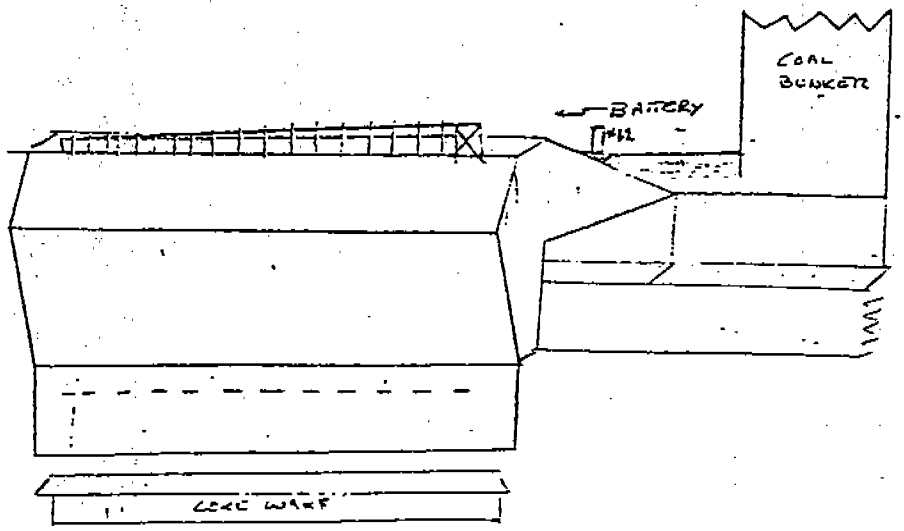
3 to 11 TURN



OVEN #	: 57
TIME OF PUSH	: 3:15
TIME ≥ 20%	: 0
MAX OPACITY	: 10%
DATE	: 1-20-88



OVEN #	: 9
TIME OF PUSH	: 3:24
TIME ≥ 20%	: 0
MAX OPACITY	: 10%
DATE	: 1-20-88



OVEN #	: 19
TIME OF PUSH	: 3:49
TIME ≥ 20%	: 0
MAX OPACITY	: 0%
DATE	: 1-20-88

APPENDIX D

CALCULATIONS

SHENANGO
NO. 1 COKE OVEN BATTERY
PUSH SHED BAGHOUSE

1-18-88
RUN 1

EPA METHOD 5
BACK HALF ANALYSIS

SYMBOL		DESCRIPTION		VALUE
Theta	=	Duration of test, min.	=	60
Vm	=	Dry sample volume (meter conditions), cu. ft.	=	60.073
SQRT(dP)	=	Average of square roots of pitot pressure differential, in. H2O	=	1.231
dH	=	Orifice pressure drop, in. water	=	4.07
Ts	=	Average stack temperature, deg. F	=	67.7
Tm	=	Average dry gas meter temperature, deg. F	=	61.1
CO2	=	CO2 in stack gas, %	=	0
O2	=	O2 in stack gas, %	=	20.9
CO	=	CO in stack gas, %	=	0
N2	=	N2 in stack gas, %	=	79.1
Pb	=	Barometric pressure, in. Hg	=	29.16
Ps	=	Stack pressure (absolute), in. Hg.	=	29.1
Cp	=	Pitot correction factor, dimensionless	=	0.84
Y	=	Dry gas meter correction factor	=	1.029
Dn	=	Diameter of nozzle, in.	=	0.22
Ds	=	Diameter of stack, in.	=	120
Vwc	=	Volume of liquid collected in impingers and silica gel, ml	=	15
Fh	=	Front half particulate catch, mg	=	16.9
Bh	=	Back half particulate catch, mg	=	0.21
Wt	=	Total particulate catch, mg	=	17.11
Bh sol	=	back half soluble catch, mg	=	2.83
An	=	Area of the nozzle, sq. ft.	=	0.00026
As	=	Area of the stack, sq.ft.	=	78.54
Mo	=	Dry molecular weight of stack gas, lb/lb-mole	=	28.84
Vw(std)	=	Volume of liquid collected, cu .ft.	=	0.707
Ms	=	Molecular weight of stack gas, lb/lb-mole	=	28.71
Vm(std)	=	Dry sample volume (standard conditions), cu .ft.	=	61.644
Vs	=	Stack velocity, ft/sec	=	70.25

SHENANGO
NO. 1 COKE OVEN BATTERY
PUSH SHED BAGHOUSE

1-18-88
RUN 1

EPA METHOD 5
BACK HALF ANALYSIS

SYMBOL		DESCRIPTION		VALUE
Qs	=	Stack gas flow, acfm	=	331054.8
Qs(std)	=	Stack gas flow, dscfm	=	318513.3
Ts	=	Average stack temperature, deg. F	=	67.7
Bws	=	Moisture content of the gas stream, %	=	1.13
CO2	=	CO2 in stack gas, %	=	0
O2	=	O2 in stack gas, %	=	20.9
CO	=	CO in stack gas, %	=	0
N2	=	N2 in stack gas, %	=	79.1
I	=	Isokinetic ratio, percent	=	93.4
C's	=	Particulate concentration, gr/dscf	=	0.0043
E	=	Particulate emission rate, lb/hr	=	11.67

PADER INFORMATION

Cfh	=	Part. conc., front half, gr/dscf	=	0.004221
Cbh	=	Part. conc., back half, gr/dscf	=	0.000052
SOLbh	=	Soluble back half, gr/dscf	=	0.000706

SHENANGU
NO. 1 COKE OVEN BATTERY
PUSH SHED BAGHOUSE

1-19-88
RUN 2

EPA METHOD 5
BACK HALF ANALYSIS

SYMBOL		DESCRIPTION		VALUE
Theta	=	Duration of test, min.	=	60
Vm	=	Dry sample volume (meter conditions), cu. ft.	=	62.048
SQRT(dP)	=	Average of square roots of pitot pressure differential, in. H2O	=	1.214
dH	=	Orifice pressure drop, in. water	=	3.98
Ts	=	Average stack temperature, deg. F	=	59.2
Tm	=	Average dry gas meter temperature, deg. F	=	63
CO2	=	CO2 in stack gas, %	=	0
O2	=	O2 in stack gas, %	=	20.9
CO	=	CO in stack gas, %	=	0
N2	=	N2 in stack gas, %	=	79.1
Pb	=	Barometric pressure, in. Hg	=	29.59
Ps	=	Stack pressure (absolute), in. Hg.	=	29.53
Cp	=	Pitot correction factor, dimensionless	=	0.84
Y	=	Dry gas meter correction factor	=	1.029
Dn	=	Diameter of nozzle, in.	=	0.22
Ds	=	Diameter of stack, in.	=	120
Vwc	=	Volume of liquid collected in impingers and silica gel, ml	=	3.2
Fh	=	Front half particulate catch, mg	=	14.95
Bh	=	Back half particulate catch, mg	=	0.45
Wt	=	Total particulate catch, mg	=	15.4
Bh sol	=	Back half soluble catch, mg	=	8.41
An	=	Area of the nozzle, sq. ft.	=	0.00026
As	=	Area of the stack, sq.ft.	=	78.54
Md	=	Dry molecular weight of stack gas, lb/lb-mole	=	28.84
Vw(std)	=	Volume of liquid collected, cu .ft.	=	0.151
Ms	=	Molecular weight of stack gas, lb/lb-mole	=	28.81
Vm(std)	=	Dry sample volume (standard conditions), cu .ft.	=	64.352
Vs	=	Stack velocity, ft/sec	=	58.10

SHENANGO
NO. 1 COKE OVEN BATTERY
PUSH SHED BAGHOUSE

1-19-88
RUN 2

EPA METHOD 5
BACK HALF ANALYSIS

SYMBOL		DESCRIPTION		VALUE
Qs	=	Stack gas flow, acfm	=	320932.2
Qs(std)	=	Stack gas flow, dscfm	=	321363.8
Ts	=	Average stack temperature, deg. F	=	59.2
Bws	=	Moisture content of the gas stream, %	=	0.23
CO2	=	CO2 in stack gas, %	=	0
O2	=	O2 in stack gas, %	=	20.9
CO	=	CO in stack gas, %	=	0
N2	=	N2 in stack gas, %	=	79.1
I	=	Isokinetic ratio, percent	=	96.6
C's	=	Particulate concentration, gr/dscf	=	0.0037
E	=	Particulate emission rate, lb/hr	=	10.15

PADER INFORMATION

Cfh	=	Part. conc., front half, gr/dscf	=	0.003577
Cbh	=	Part. conc., back half, gr/dscf	=	0.000107
SOLbh	=	Soluble back half, gr/dscf	=	0.002012

SHENANGU
NO. 1 COKE OVEN BATTERY
PUSH SHED BAGHOUSE

1-20-88
RUN 3

EPA METHOD 5
BACK HALF ANALYSIS

SYMBOL		DESCRIPTION		VALUE
Theta	=	Duration of test, min.	=	60
Vm	=	Dry sample volume (meter conditions), cu. ft.	=	58.303
SQRT(dP)	=	Average of square roots of pitot pressure differential, in. H2O	=	1.163
dH	=	Orifice pressure drop, in. water	=	3.56
Ts	=	Average stack temperature, deg. F	=	82.4
Tm	=	Average dry gas meter temperature, deg. F	=	70.2
CO2	=	CO2 in stack gas, %	=	0
O2	=	O2 in stack gas, %	=	20.9
CO	=	CO in stack gas, %	=	0
N2	=	N2 in stack gas, %	=	79.1
Pb	=	Barometric pressure, in. Hg	=	28.85
Ps	=	Stack pressure (absolute), in. Hg.	=	28.79
Cp	=	Pitot correction factor, dimensionless	=	0.84
Y	=	Dry gas meter correction factor	=	1.028
Dn	=	Diameter of nozzle, in.	=	0.22
Ds	=	Diameter of stack, in.	=	120
Vwc	=	Volume of liquid collected in impingers and silica gel, ml	=	13.2
Fh	=	Front half particulate catch, mg	=	10.4
Bh	=	Back half particulate catch, mg	=	0.09
Wt	=	Total particulate catch, mg	=	10.49
Bh sol	=	Back half soluble catch, mg	=	4.37
An	=	Area of the nozzle, sq. ft.	=	0.00026
As	=	Area of the stack, sq.ft.	=	78.54
Md	=	Dry molecular weight of stack gas, lb/lb-mole	=	28.84
Vw(std)	=	Volume of liquid collected, cu .ft.	=	0.622
Ms	=	Molecular weight of stack gas, lb/lb-mole	=	28.72
Vm(std)	=	Dry sample volume (standard conditions), cu .ft.	=	58.051
Vs	=	Stack velocity, ft/sec	=	67.64

SHENANGO
NO. 1 COKE OVEN BATTERY
PUSH SHED BAGHOUSE

1-20-88
RUN 3

EPA METHOD 5
BACK HALF ANALYSIS

SYMBOL		DESCRIPTION		VALUE
Qs	=	Stack gas flow, acfm	=	318752.3
Qs(std)	=	Stack gas flow, dscfm	=	295406.3
Ts	=	Average stack temperature, deg. F	=	82.4
Bws	=	Moisture content of the gas stream, %	=	1.06
CO2	=	CO2 in stack gas, %	=	0
O2	=	O2 in stack gas, %	=	20.9
CO	=	CO in stack gas, %	=	0
N2	=	N2 in stack gas, %	=	79.1
I	=	Isokinetic ratio, percent	=	94.9
C's	=	Particulate concentration, gr/dscf	=	0.0028
E	=	Particulate emission rate, lb/hr	=	7.05

PADER INFORMATION

Cfh	=	Part. conc., front half, gr/dscf	=	0.002758
Cbh	=	Part. conc., back half, gr/dscf	=	0.000023
SOLbh	=	Soluble back half, gr/dscf	=	0.001159

METHOD 5 TRAIN ANALYTICAL PARTICULATE DATA

Plant Shenango Date 1-25-88 Run No. 1

Sample location #1 Battery Baghouse Relative humidity <10%

Density of acetone (pa) .7847 g/ml
Acetone rinse container No. 24H Beaker
Acetone rinse volume (Vaw) 103+17=120 ml
Acetone blank residue concentration (Ca) 0 mg/g
Wa = Ca Vaw pa = ( ) ( ) ( ) = 0 mg
Date and time of wt 1-29-88 1551 Gross wt 100855.9 mg
Date and time of wt 2-1-88 0812 Gross wt 100855.9 mg
Average Gross wt 100855.9 mg
Tare wt 100840.1 mg
Less acetone blank wt (Wa) — mg
Weight of particulate in acetone rinse 15.8 mg

Water rinse container No. _____
Water rinse volume (Vww) _____ ml
Water blank residue concentration (Cw) _____ mg/g
Ww = Ca Vww pa = ( ) ( ) ( ) = _____ mg
Date and time of wt _____ Gross wt _____ mg
Date and time of wt _____ Gross wt _____ mg
Average Gross wt _____ mg
Tare wt _____ mg
Less water blank wt (Ww) _____ mg
Weight of particulate in water rinse _____ mg

Filter No. 551
Date and time of wt. 1-25-88 1650 Gross wt 377.0 mg
Date and time of wt. 1-26-88 0836 Gross wt 377.0 mg
Average Gross wt 377.0 mg
Tare wt 375.9 mg
Weight of particulate on filter(s) 1.1 mg
Weight of particulate in acetone rinse 15.8 mg
Weight of particulate in water rinse — mg
Total weight of particulate 16.9 mg

METHOD 5 TRAIN ANALYTICAL PARTICULATE DATA

Plant SHENANGO Date 1-25-88 Run No. 2

Sample location No 1 BATTERY BAGHOUSE Relative humidity < 10%

Density of acetone (pa) .7847 g/ml
Acetone rinse container No. 230
Acetone rinse volume (Vaw) 102+10=112 ml
Acetone blank residue concentration (Ca) 0 mg/g
Wa = Ca Vaw pa = ( ) ( ) ( ) = 0 mg
Date and time of wt 1-27-88 0848 Gross wt 99820.0 mg
Date and time of wt 1-27-88 1529 Gross wt 99820.0 mg
Average Gross wt 99820.0 mg
Tare wt 99805.95 mg
Less acetone blank wt (Wa) — mg
Weight of particulate in acetone rinse 14.05 mg

Water rinse container No.
Water rinse volume (Vww) ml
Water blank residue concentration (Cw) mg/g
Ww = Ca Vww pa = ( ) ( ) ( ) = mg
Date and time of wt Gross wt mg
Date and time of wt Gross wt mg
Average Gross wt mg
Tare wt mg
Less water blank wt (Ww) mg
Weight of particulate in water rinse mg

Filter No. 553
Date and time of wt. 1-25-88 0843 Gross wt 375.0 mg
Date and time of wt. 1-25-88 1656 Gross wt 374.5 mg
Average Gross wt 374.75 mg
Tare wt 373.85 mg
Weight of particulate on filter(s) .90 mg
Weight of particulate in acetone rinse 14.05 mg
Weight of particulate in water rinse — mg
Total weight of particulate 14.95 mg

METHOD 5 TRAIN ANALYTICAL PARTICULATE DATA

Plant Shenango Date 1-25-88 Run No. 3

Sample location No 1 Battery Baghouse Relative humidity < 10%

Density of acetone (pa) .7847 g/ml
Acetone rinse container No. 238
Acetone rinse volume (Vaw) 136+12 = 148 ml
Acetone blank residue concentration (Ca) 0 mg/g
Wa = Ca Vaw pa = ( ) ( ) ( ) = 0 mg
Date and time of wt 1-27-88 0846 Gross wt 99355.8 mg
Date and time of wt 1-27-88 1534 Gross wt 99355.4 mg
Average Gross wt 99355.4 mg
Tare wt 99345.0 mg
Less acetone blank wt (Wa) — mg
Weight of particulate in acetone rinse 10.4 mg

Water rinse container No.
Water rinse volume (Vww) ml
Water blank residue concentration (Cw) mg/g
Ww = Ca Vww pa = ( ) ( ) ( ) = mg
Date and time of wt Gross wt mg
Date and time of wt Gross wt mg
Average Gross wt mg
Tare wt mg
Less water blank wt (Ww) mg
Weight of particulate in water rinse mg

Filter No. 555
Date and time of wt. 1-25-88 1659 Gross wt 371.7 mg
Date and time of wt. 1-26-88 0840 Gross wt 371.8 mg
Average Gross wt 371.75 mg
Tare wt 373.55 mg
Weight of particulate on filter(s) -1.80 mg
Weight of particulate in acetone rinse 10.4 mg
Weight of particulate in water rinse — mg
Total weight of particulate 10.4 mg

METHOD 5 TRAIN ANALYTICAL PARTICULATE DATA

Back Half Soluble

Plant SHENANGO Date 1-25-88 Run No. 1

Sample location #1 BATTERY BAGHOUSE Relative humidity < 10%

Density of acetone (pa) .7947 g/ml

Acetone rinse container No. 24A

Acetone rinse volume (Vaw) 63+12=75 ml

Acetone blank residue concentration (Ca) 0 mg/g

Wa = Ca Vaw pa = ( ) ( ) ( ) = 0 mg

Date and time of wt	1-27-88	0839	Gross wt	100032.1 mg
Date and time of wt	1-27-88	1515	Gross wt	100032.5 mg
			Average Gross wt	100032.3 mg
			Tare wt	100029.75 mg
			Less acetone blank wt (Wa)	— mg
			Weight of particulate in acetone rinse	2.55 mg
			" " " " water catch	.28 mg
			Total	2.83 mg

METHOD 5 TRAIN ANALYTICAL PARTICULATE DATA

Back Half Soluble

Plant SHENANGO Date 1-25-88 Run No. 2

Sample location #1 BOILER / BAGHOUSE Relative humidity <10%

Density of acetone (pa) .7847 g/ml
Acetone rinse container No. 24N
Acetone rinse volume (Vaw) 64+11=75 ml
Acetone blank residue concentration (Ca) 0 mg/g
Wa = Ca Vaw pa = ( ) ( ) ( ) = 0 mg
Date and time of wt 1-27-88 0832 Gross wt 101634.3 mg
Date and time of wt 1-27-88 ~1500 Gross wt 101634.6 mg
Average Gross wt 101634.45 mg
Tare wt 101630.95 mg
Less acetone blank wt (Wa) — mg
Weight of particulate in acetone rinse 3.50 mg
" " " " water catch 4.91
Total 8.41

METHOD 5 TRAIN ANALYTICAL PARTICULATE DATA

Back Half Soluble

Plant SHENANGO Date 1-25-88 Run No. 3

Sample location #1 BATTERY EXHAUST Relative humidity <10%

Density of acetone (pa) .7247 g/ml

Acetone rinse container No. 24L

Acetone rinse volume (Vaw) 59+10=69 ml

Acetone blank residue concentration (Ca) 0 mg/g

Wa = Ca Vaw pa = ( ) ( ) ( ) = 0 mg

Date and time of wt 1-28-88 0825 Gross wt 99746.3 mg

Date and time of wt 1-28-88 1547 Gross wt 99746.3 mg

Average Gross wt 99746.30 mg

Tare wt 99744.85 mg

Less acetone blank wt (Wa) — mg

Weight of particulate in acetone rinse 1.45 mg

" " " " water catch 2.92

Total 4.37

BLANK ANALYTICAL DATA

Plant Shenango Project No. 00-4810-24

Sample location No 1 + 4 Coke Oven Battery Push Shed Baghouse

Type of blank Acetone

Container number 24 M

Liquid level at mark and container sealed ✓ Yes ____ No

Density of blank (pa) 0.7847 g/ml

Blank volume (Va) 200 ml ml

Date and time of wt. 1-27-88 0828 Gross wt. 100779.9 mg

Date and time of wt. 1-27-88 1505 Gross wt. 100780.2 mg

Average gross wt. 100780.05 mg

Tare wt. 100780.95 mg

Weight of blank (ma) -0.90 mg

$$Ca = \frac{ma}{Va\ pa} = \frac{(\quad)}{(\quad)(\quad)} = \_\_\_\_\_ mg/g$$

Remarks:

Signature of analyst Paul Jadlowiec

AIR QUALITY SERVICES, INC.

4527 Clairton Boulevard
Pittsburgh, PA 15236
(412) 881-5630

RECEIVED
JAN 2 9 1988
BCM Eastern Inc.
Pittsburgh

RESULTS FOR THE ANALYSIS OF SOLUBLE AND INSOLUBLE SOLIDS
BCM EASTERN INC.
5777 BAUM BOULEVARD
PITTSBURGH, PA 15206
SAMPLES COLLECTED BY BCM
SAMPLES RECEIVED: JANUARY 25, 1988

BCM SAMPLE I.D.	AQS LABORATORY NUMBER	SAMPLE VOLUME ML	INSOLUBLE SOLIDS MG	SOLUBLE SOLIDS MG
BATTERY #1 RUN #1	42501	200	0.36	1.9
BATTERY #1 RUN #2	42502	192	0.60	7.0
BATTERY #1 RUN #3	42503	200	0.24	5.1
BATTERY #4 RUN #1	42504	200	0.16	3.4
BATTERY #4 RUN #2	42505	194	0.28	3.2
BATTERY #4 RUN #3	42506	196	0.36	15.3
BLANK	42507	156	0.12	1.7

THE DATA HAS NOT BEEN CORRECTED FOR THE BLANK.

AIR QUALITY SERVICES, INC.

JANUARY, 1988
BCMIN188-330

BCM

COMPUTATION SHEET

Sheet Number 1 of 1
Date 1-29-88
J.O. Number 00 - 4510 - 2
Computed by PJ
Checked by

Name of Client Shenango
Project No. 1 + 4 Push Shed Emission Control System
Description Calculations - Backhalf Analysis

Insoluble Blank

$0.12\,mg/156\,ml = 7.69\times10^{-4}\,mg/ml$

Soluble Blank

$1.7\,mg/156\,ml = 1.09\times10^{-2}\,mg/ml$

Battery No 1

Run No	Insoluble Sample - Blank = Total	Soluble Sample - Blank = Total
1	$.36 - (7.69\times10^{-4}\times200) = .21$	$1.9 - (1.09\times10^{-2})\times200 = 0.2$
2	$.60 - (7.69\times10^{-4}\times192) = .45$	$7.0 - (1.09\times10^{-2})\times192 = 4.9$
3	$.24 - (7.69\times10^{-4}\times200) = .09$	$5.1 - (1.09\times10^{-2})\times200 = 2.9$

Battery No 4

1	$.16 - (7.69\times10^{-4}\times200) = .01$	$3.4 - (1.09\times10^{-2}\times200) = 1.2$
2	$.28 - (7.69\times10^{-4}\times194) = .13$	$3.2 - (1.09\times10^{-2}\times194) = 1.09$
3	$.36 - (7.69\times10^{-4}\times196) = .21$	$15.3 - (1.09\times10^{-2}\times196) = 7.15$

APPENDIX E

CALIBRATIONS

TYPE S PITOT CALIBRATION STANDARDS

Construction Standards:

1. Dt - between 0.48 and 0.95 centimeters

2. Pa = Pb $1.05\ Dt \leq P \leq 1.50\ Dt$

3. a1, a2 < 10°

4. B1, B2 < 5°

5. $Z \leq 0.32$ cm

6. $W \leq 0.08$ cm

Pitot Alignment Standards:

1. $X \geq 1.90$ cm

2. Ip must be higher than Np

3. $W \geq 7.62$ cm

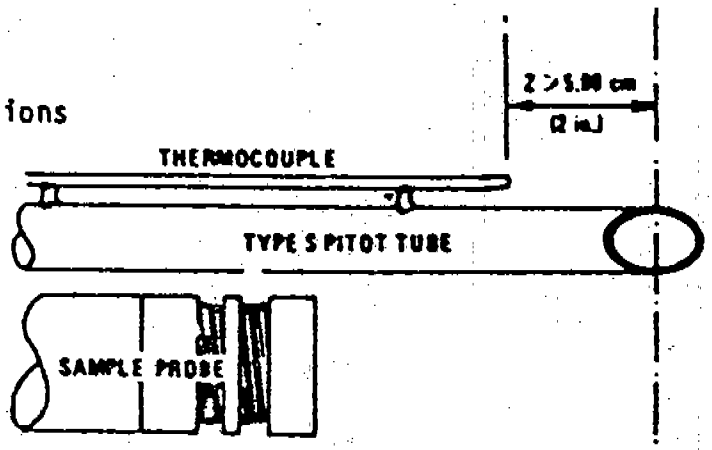
4. $Z \geq 1.90$ cm

5. $Y \geq 7.62$ cm

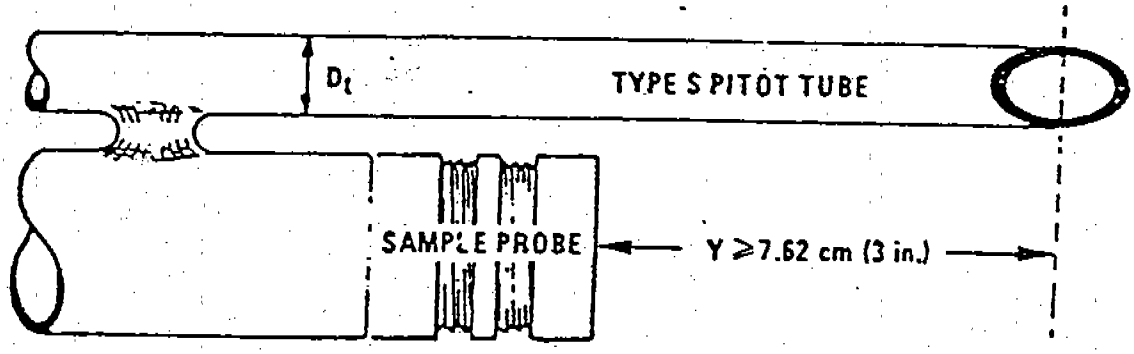
TYPE S PITOT TUBE CALIBRATION SHEET

Pitot I.D. No. 5-1 Date 1-16-88 Performed BY PJ

Pitot Alignment Calibrations



Z = 2"



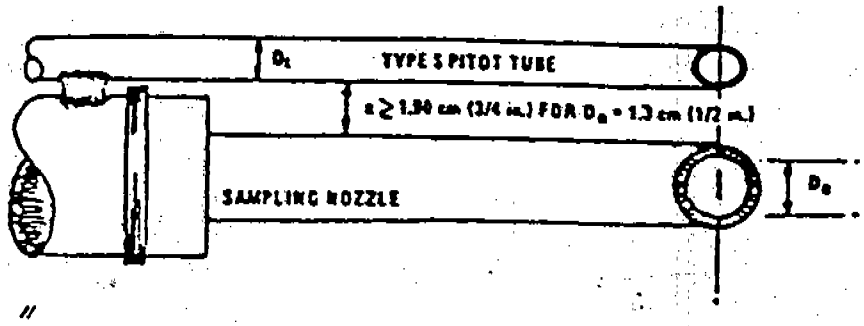
Y = 3"

Determined Coefficient 0.84

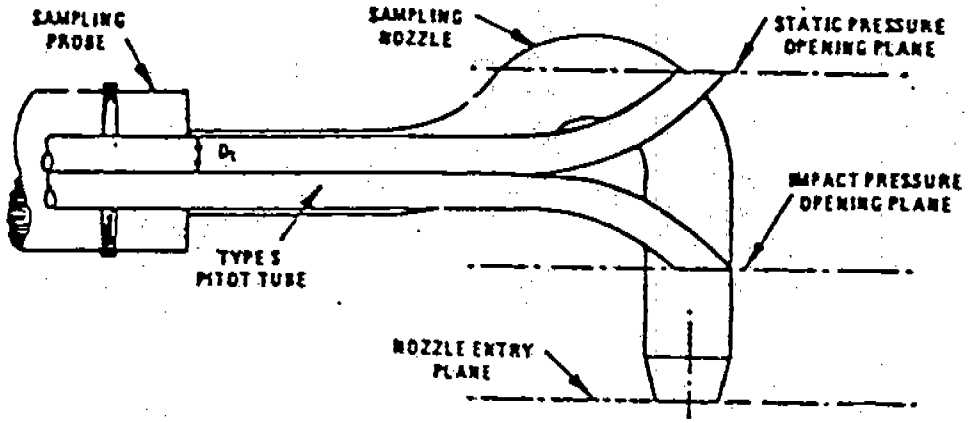
TYPE S PITOT TUBE CALIBRATION SHEET

Pitot I.D. No. 5-1 Date 1-16-88 Performed By PJ

Pitot Alignment Calibrations



X = ≥ 3/4"

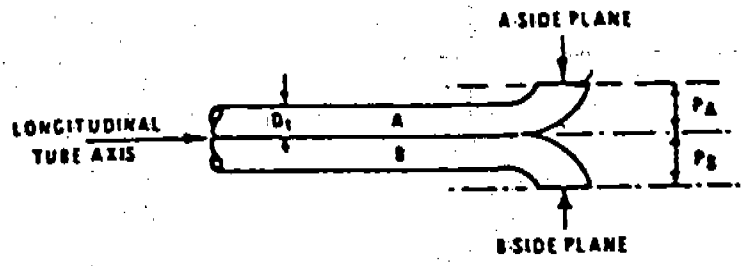


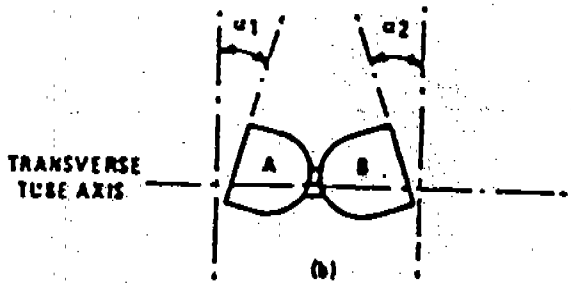
Is Ip higher than Np = Yes

TYPE S PITOT CALIBRATION SHEET

Pitot I.D. No. 5-1 Date 1-16-88 Performed By PJ

Construction Calibrations





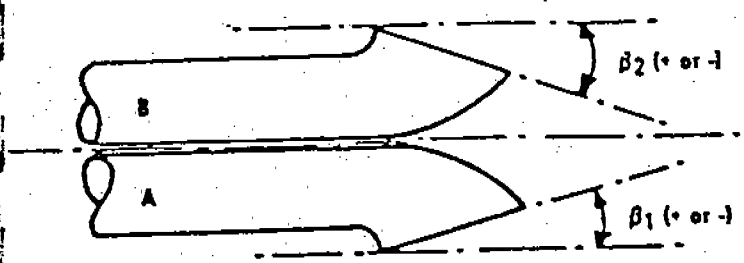
Dt = 0.95 cm

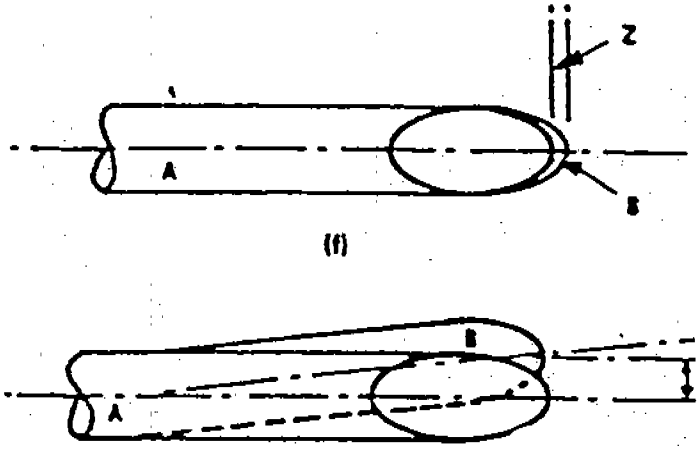
Pa = 1.26 cm

Pb = 1.26 cm

a1 = 0

a2 = 0





B1 = 0

B2 = 0

Z = 0

W = 0

THERMOCOUPLE CALIBRATION DATA SHEET

Date: 12-8-86 Thermocouple No.: 5-1

Ambient Temperature: 68 °F Barometric pressure: 29.32

Calibrator: Paul Jadlowiec Reference: Mercury-in-glass: ✓

Other: _____

Reference point No.	Source*, (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Difference, %
1	Water	49	53	8.2
2		87	83	4.5
3		212	212	0.0
			Average % difference	4.2

* Source: 1) Ice bath 3) BOILING WATER BATH
2) AMBIENT 4) HEATED OIL BATH

Percent difference

$$\frac{\text{Ref. temp. °F} - \text{thermocouple temp. °F}}{\text{Ref. temp. °F}} \times 100$$

DRY GAS METER AND ORIFICE SYSTEM CALIBRATION

DATE 12-30-87 OPERATOR DANIEL PETROWAY CONSOLE NUMBER 582-125

* Orifice Manometer Setting in. H_2O ΔH	Minimum Volume of Gas ft^3	Wet Test Meter Gas Volumes and Temperatures: Initial ft^3 V_{w_i}	Initial Temp. °F T_{w_i}	Final ft^3 V_{w_f}	Final Temp. °F T_{w_f}	Net Volume ft^3 V_w	Avg. Temp. °F T_w	Dry Test Meter Gas Volumes and Temperatures: Initial ft^3 V_{d_i}	Final ft^3 V_{d_f}	Temp. °F T_{d_i}	Temp. °F T_{d_f}	Net Volume ft^3 V_d	Avg. Temp. °F T_d	Total Test Time Minutes θ	Barometer Reading, Inches Hg P_b
0.5	5	0.000	58.5	5.000	58.5	5.000	58.5	849.307	849.498	82	62	5.191	72	13.66	29.58
0.75	5	0.000	58.5	5.001	58.5	5.001	58.5	849.710	855.014	94	68	5.244	81	11.38	29.58
1.00	5	0.000	58.5	5.002	58.5	5.002	58.5	855.300	860.566	97	72	5.266	84.5	9.98	29.58
1.50	~~10~~ 5	0.000	59	5.001	59	5.001	59	860.904	866.219	101	75	5.315	88	7.98	29.58
2.00	~~10~~ 5	0.000	59	5.003	59	5.003	59	866.448	871.786	105	76	5.338	90.5	7.11	29.58
2.50	10														

* Check at least every 2 minutes and adjust if needed.

CALCULATIONS

$$\gamma = \frac{(V_w)(P_b)(T_d + 460)}{(V_d)(P_b + \frac{\Delta H}{13.6})(T_w + 460)}$$

$$\Delta H@ = \frac{0.0317\ (\Delta H)}{(P_b)(T_{d_a} + 460)} \left[\frac{(T_w + 460)\ \theta}{(V_w)} \right]^2$$

Calc. By:

Checked By:

Date:

ΔH	Gamma Calculations	γ	$\Delta H@$ Calculations	$\Delta H@$
0.5	$\frac{(\quad)(\quad)(\quad + 460)}{(\quad)(\quad + \frac{\quad}{13.6})(\quad + 460)}$	.987	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)} \left[\frac{(\quad + 460)(\quad)}{(\quad)} \right]^2$	2.021
0.75	$\frac{(\quad)(\quad)(\quad + 460)}{(\quad)(\quad + \frac{\quad}{13.6})(\quad + 460)}$	.995	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)} \left[\frac{(\quad + 460)(\quad)}{(\quad)} \right]^2$	2.068
1.00	$\frac{(\quad)(\quad)(\quad + 460)}{(\quad)(\quad + \frac{\quad}{13.6})(\quad + 460)}$	.995	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)} \left[\frac{(\quad + 460)(\quad)}{(\quad)} \right]^2$	2.106
1.50	$\frac{(\quad)(\quad)(\quad + 460)}{(\quad)(\quad + \frac{\quad}{13.6})(\quad + 460)}$	.990	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)} \left[\frac{(\quad + 460)(\quad)}{(\quad)} \right]^2$	2.012
2.00	$\frac{(\quad)(\quad)(\quad + 460)}{(\quad)(\quad + \frac{\quad}{13.6})(\quad + 460)}$	.989	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)} \left[\frac{(\quad + 460)(\quad)}{(\quad)} \right]^2$	2.118
2.50	$\frac{(\quad)(\quad)(\quad + 460)}{(\quad)(\quad + \frac{\quad}{13.6})(\quad + 460)}$		$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)} \left[\frac{(\quad + 460)(\quad)}{(\quad)} \right]^2$	
	AVERAGE	.9910		AVERAGE 2.065

(1) Gamma = ratio W_t to D_t

$\Delta H@$ = orifice pressure differential that gives

DRY GAS METER AND ORIFICE SYSTEM CALIBRATION

DATE 12/23/87 OPERATOR DANIEL PETROJAY CONSOLE NUMBER 582-128 ANDERSON

* Orifice Manometer Setting In. H_2O ΔH	Minimum Volume of Gas ft^3	Wet Test Meter Gas Volumes and Temperatures: Initial ft^3 V_{w_i}	Initial Temp. °F T_{w_i}	Final ft^3 V_{w_f}	Final Temp. °F T_{w_f}	Net Volume ft^3 V_w	Avg. Temp. °F T_w	Dry Test Meter Gas Volumes and Temperatures: Initial ft^3 V_{d_i}	Final ft^3 V_{d_f}	Temp. °F T_{d_i}	Temp. °F T_{d_o}	Net Volume ft^3 V_d	Avg. Temp. °F T_d	Total Test Time Minutes θ	Barometer Reading, Inches Hg P_b
0.5	5	0.000	58	5.000	58	5.000	58	779.845	784.897	97	68	5.052	82.5	12.13	29.39
0.75	5	0.000	58	4.999	58	4.999	58	785.177	790.311	103	77	5.134	90	10.58	29.39
1.00	5	0.000	58.5	5.002	58.5	5.000	58.5	790.843	796.033	108	83	5.190	95.5	9.38	29.39
1.50	10 5	0.000	58.5	5.002	58.5	5.002	58.5	796.728	801.978	113	87	5.240	100	7.46	29.39
2.00	10 5	0.000	58.5	5.007	58.5	5.007	58.5	802.201	807.481	117	87	5.280	102	6.50	29.39
2.50	10 5	0.000	59	5.000	59	5.000	59	807.723	813.0[illegible]	121	93	5.213	107	6.08	29.39

* Check at least every 2 minutes and adjust if needed.

CALCULATIONS

$$Y = \frac{(V_w)(P_b)(T_d + 460)}{(V_d)\left(P_b + \frac{\Delta H}{13.6}\right)(T_w + 460)}$$

$$\Delta H@ = \frac{0.0317\ (\Delta H)}{(P_b)(T_{d_o} + 460)}\left[\frac{(T_w + 460)\ \theta}{(V_w)}\right]^2$$

Calc. By:

Checked By:

Date:

ΔH	GAMMA CALCULATIONS	Y	$\Delta H@$ CALCULATIONS	$\Delta H@$
0.5	$\frac{(5.000)(29.39)(82.5 + 460)\ 543.5}{(5.052)(29.39 + \frac{.5}{13.6})(58 + 460)\ 518}$	1.035	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)}\left[\frac{(\quad + 460)(\quad)}{(\quad)}\right]^2$	1.862
0.75	$\frac{(4.999)(29.39)(90 + 460)\ 550}{(5.134)(29.39 + \frac{.75}{13.6})(58 + 460)\ 518}$	1.032	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)}\left[\frac{(\quad + 460)(\quad)}{(\quad)}\right]^2$	1.897
1.00	$\frac{(5.000)(29.39)(95.5 + 460)\ 555.5}{(5.190)(29.39 + \frac{1.0}{13.6})(58.5 + 460)\ 518.5}$	1.030	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)}\left[\frac{(\quad + 460)(\quad)}{(\quad)}\right]^2$	1.936
1.50	$\frac{(5.002)(29.39)(100 + 460)\ 560}{(5.240)(29.39 + \frac{1.5}{13.6})(58.5 + 460)\ 518.5}$	1.027	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)}\left[\frac{(\quad + 460)(\quad)}{(\quad)}\right]^2$	1.869
2.00	$\frac{(5.007)(29.39)(102 + 460)\ 562}{(5.280)(29.39 + \frac{2.0}{13.6})(58.5 + 460)\ 518.5}$	1.023	$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)}\left[\frac{(\quad + 460)(\quad)}{(\quad)}\right]^2$	1.920
2.50	$\frac{(5.000)(29.39)(107 + 460)\ 567}{(5.243)(29.39 + \frac{2.5}{13.6})(59 + 460)\ 519}$		$\frac{0.0317\ (\quad)}{(\quad)(\quad + 460)}\left[\frac{(\quad + 460)(\quad)}{(\quad)}\right]^2$	
	AVERAGE	1.029	AVERAGE	1.897

(1) Gamma = ratio W_t to D_t

Tol. = ±.01

$\Delta H@$ = orifice pressure differential that gives 0.75 cfm of air at 68°F and 29.92" Hg. Average $\Delta H@$ value between 1.59-2.09 is acceptable. In addition, the $\Delta H@$ must not vary by more than [illegible]

NOZZLE CALIBRATION

Date 1-17-88 Calibrated by PJ

Nozzle identification number	D_1, in.	D_2, in.	D_3, in.	ΔD, in.	D_{avg}
#1 Battery	.220	.220	.219	.001	.220
#4 Battery	.220	.221	.220	.001	.220

where:

$D_{1,2,3}$ = nozzle diameter measured on a different diameter, in.
Tolerance = measure within 0.001 in.

ΔD = maximum difference in any two measurements, in.
Tolerance = 0.004 in.

D_{avg} = average of D_1, D_2, and D_3.

Nozzle calibration data.

APPENDIX F

PROCESS DATA

SHENANGO INCORPORATED

BATTERY NO. 1 NEVILLE PLANT PUSHERS REPORT DATE 18

	OVEN NO.	TIME PUSHED	TIME CHARGED	AMPS TO PUSH		OVEN NO.	TIME PUSHED	TIME CHARGED	AMPS TO PUSH		OVEN NO.	TIME PUSHED	TIME CHARGED
1	47	[illegible]	7:10	[illegible]		1	36		3:06				
2	57	7:02	[illegible]	1:19		2	46	3:19	[illegible]				
3	19	23	3:9	2:0		3	56	[illegible]	[illegible]				
4	19	23	4:6	2:0		4							
5	29	50	8:0	2:0									
6	39	8:0	6:0	2:0									

SHENANGO INCORPORATED

NEVILLE PLANT
PUSHERS REPORT

BATTERY NO. _____ DATE _____ 18

	OVEN NO.	TIME PUSHED	TIME CHARGED	AMPS TO PUSH			OVEN NO.	TIME PUSHED	TIME CHARGED	AMPS TO PUSH			OVEN NO.	TIME PUSHED	TIME CHARGED	AMPS TO PUSH
1	47		7:10			1	36		3:06			1	25		11:04	
2	5	1:02	17	190		2	44	3:18	35	200		2	35	11:34	:39	
3	9	:23	39	200		3	56	28	44	190		3	45	:34	:49	
4	19	:33	46	200		4	8	48	4.11	190		4	55	:58	12:32	
5	29	:50	8:06	200		5	18	4.02	:19	200		5	7	12:07	:31	
6	39	8:01	:19	200		6	28	:22	:40	200		6	17	:37	:52	
7	49	:26	:46	200		7	38	:31	:48	190		7	27	:46	1:00	
8	59	:38	:55	200		8	48	:54	5.12	200		8	37	1:09	:25	
9	2	9:03	9:25	190		9	58	5.04	:22	210		9	47	:20	:34	
10	12	:17	:31	200		10	1	:27	:46	200		10	57	:41	2:01	
11	22	:43	10:06	200		11	11	:38	:58	190		11	9	:51	:09	
12	32	:57	:12	200		12	21	6.05	6.20	190		12	19	2:17	:38	
13	42	10:32	:46	200		13	31	:15	:30	200		13	29	:33	:45	
14	52	:38	:55	180		14	41	:39	:52	200		14	39	:52	3:05	
15	62	11:00	11:24	200		15	51	:46	7.28	200		15	49	3:00	:31	
16	4	:12	:56	190		16	61	7.48	8.09	190		16	59	:45	4:01	
17	14	12:06	12:25	190		17	3	8.00	:20	190		17	2	:56	:10	
18	24	:19	:31	180		18	13	:33	:40	200		18	12	4:18	:32	
19	34	:41	1:07	190		19	23	:34	:50	200		19	22	:27	:46	
20	44	:52	:3	180		20	32	:55	9.10	200		20	32	:47	5:01	
21	54	1:19	:40	190		21	43	9.05	:17	190		21	42	:56	:10	
22	6	:30	:46	190		22	53	:24	:37	200		22	52	5:18	:33	
23	16	:52	2:07	200		23	5	:39	:45	190		23	62	:28	:40	
24	26	2:00	:14	200		24	15	:56	10:16	190		24	4	:49	6:14	
25	36	:20		200		25	25	10:05		200		25	14	6:07		
26						26						26				
27						27						27			24	
28			24			28			24			28				
29						29						29				
30	Willard Holbrook					30						30				
31						31						31				
32						32						32				
33						33						33				
34						34						34				
35						35						35				
36						36						36				
37						37						37				
38						38						38				
39						39						39				
40						40						40				
41						41						41				
42						42						42				
43						43						43				
44						44						44				
45						45						45				
46						46						46				
47						47						47				
48						48						48				
49						49						49				
50						50						50				

COAL	COAL	COAL
CHARGE	CHARGE	CHARGE
SPILLAGE	SPILLAGE	SPILLAGE
FOREMAN	FOREMAN	FOREMAN
REMARKS:	REMARKS:	REMARKS:

72 pu

SHENANGO INCORPORATED

NEVILLE PLANT
PUSHER REPORT

BATTERY NO. _____ DATE _____

	OVEN NO.	TIME PUSHED	TIME CHARGED	MIN'S TO PUSH			OVEN NO.	TIME PUSHED	TIME CHARGED	MIN'S TO PUSH			OVEN NO.	TIME PUSHED	TIME CHARGED
1	14		11:14			1	3		3:09			1	2		11:02
2	24	1:02	:21	9	0	2	13	3:15	:31	190		2	12	11:39	:39
3	34	:25	:39	9	0	3	23	3:26	:46	190		3	22	:31	:48
4	44	:33	:45	9	0	4	33	:43	4:00	200		4	32	:56	12:11
5	54	5:08	8:11	8	0	5	43	:59	:10	180		5	42	12:06	:18
6	6	8:01	:19	8	0	6	53	4:16	:35	180		6	52	:29	:43
7	16	:23	:34	7	0	7	5	:25	:45	200		7	62	:38	:52
8	26	:34	:56	8	0	8	15	:50	5:10	190		8	72	1:12	1:25
9	36	9:18	9:44	9	0	9	25	5:00	:20	190		9	14	:20	:32
10	46	:28	:51	8	0	10	35	:25	:49	200		10	24	:39	:52
11	56	:55	10:16	9	0	11	45	:35	:50	190		11	34	:47	2:00
12	8	10:07	:22	9	0	12	55	:66	6:20	190		12	44	2:06	:20
13	18	:30	:47	9	0	13	7	6:10	:30	200		13	54	:15	:27
14	28	:39	11:31	7	0	14	17	:35	:51	190		14	16	:42	3:00
15	38	11:36	:59	20	0	15	27	:46	7:35	180		15	16	:54	:31
16	48	:51	12:06	21	0	16	37	7:41	:55	200		16	26	3:50	4:03
17	58	12:12	:31	20	0	17	47	:50	8:05	190		17	36	:58	:12
18	1	:23	:38	8	0	18	57	8:10	:30	180		18	46	4:23	:47
19	11	:44	1:03	8	0	19	9	:21	:36	200		19	56	:42	:54
20	21	:54	:11	9	0	20	19	:45	:59	190		20	8	5:00	5:14
21	31	1:17	:36	9	0	21	29	:51	9:10	190		21	18	:09	:22
22	41	:26	:40	20	0	22	39	9:15	:31	200		22	28	:29	:43
23	51	:49	2:11	19	0	23	49	:25	:42	190		23	38	:38	:51
24	61	2:05	:21	19	0	24	59	:50	10:15	200		24	48	:57	6:16
25	3	:26		20	0	25	2	10:08		190		25	58	6:09	
26						26						26			
27			24			27			24			27			24
28						28						28			
29						29						29			
30						30						30			
31	Willie Holday					31	F Hills					31	Otis Stevens		
32						32						32			
33						33						33			
34						34						34			
35						35						35			
36						36						36			
37						37						37			
38						38						38			
39						39						39			
40						40						40			
41						41						41			
42						42						42			
43						43						43			
44						44						44			
45						45						45			
46						46						46			
47						47						47			
48						48						48			
49						49						49			
50						50						50			

COAL	COAL	COAL
CHARGE	CHARGE	CHARGE
SPILLAGE	SPILLAGE	SPILLAGE
FOREMAN H. Ellis	FOREMAN	FOREMAN Bill Hart
REMARKS:	REMARKS:	REMARKS:

72 fin

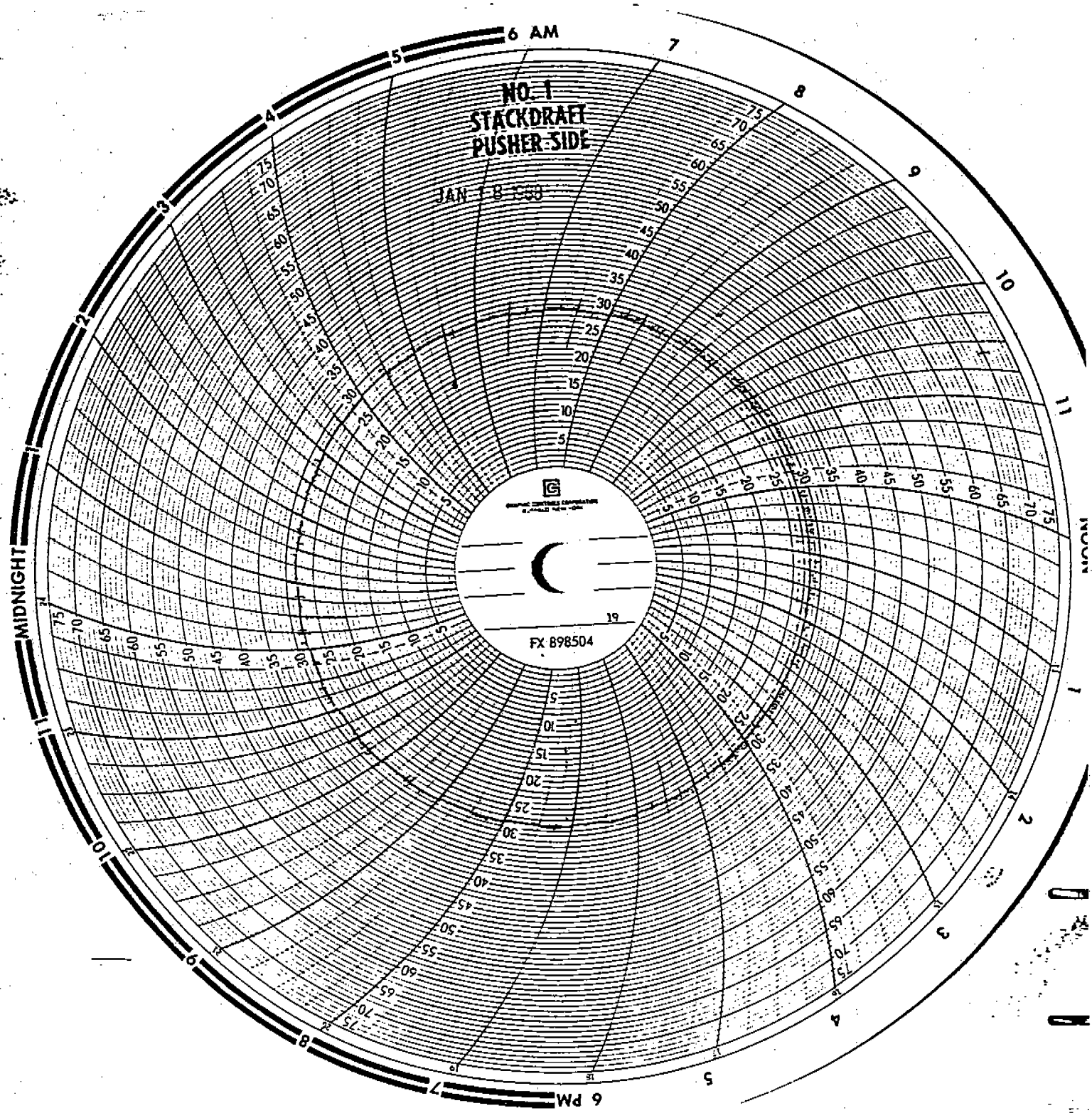
SHENANGO INCORPORATED

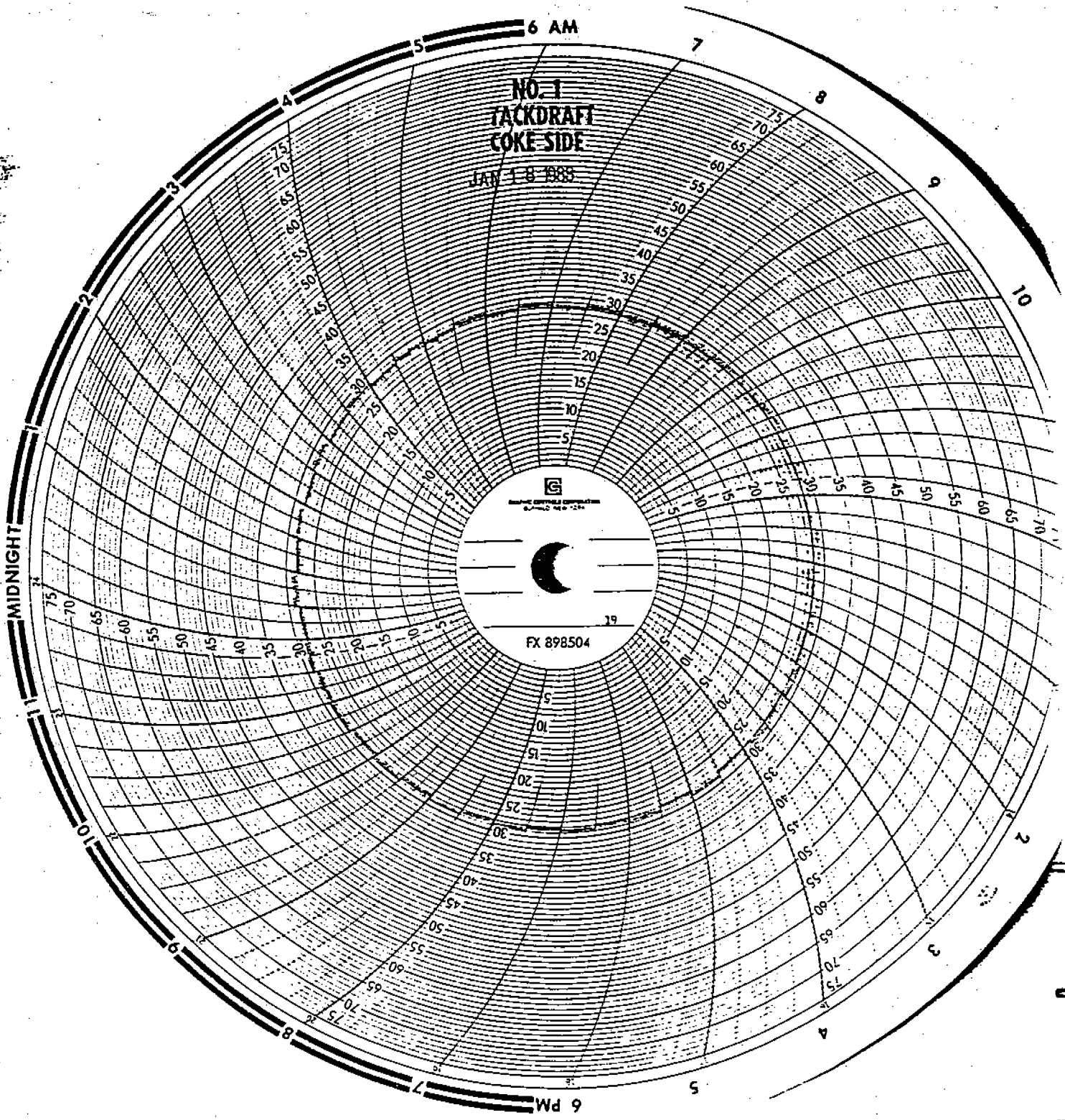
NEVILLE PLANT
PUSHERS REPORT

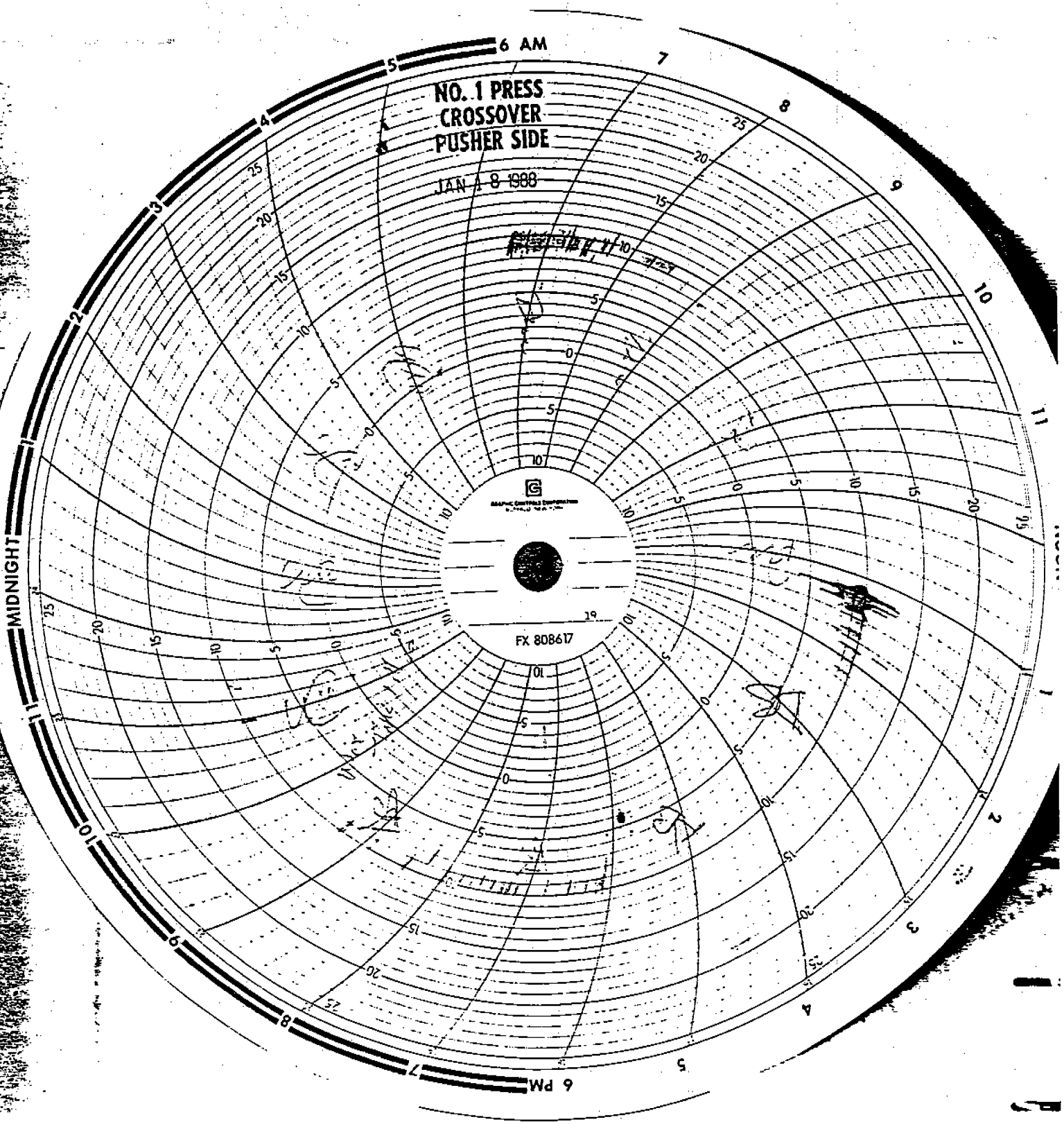
BATTERY NO. 1 DATE 1 — 20 198

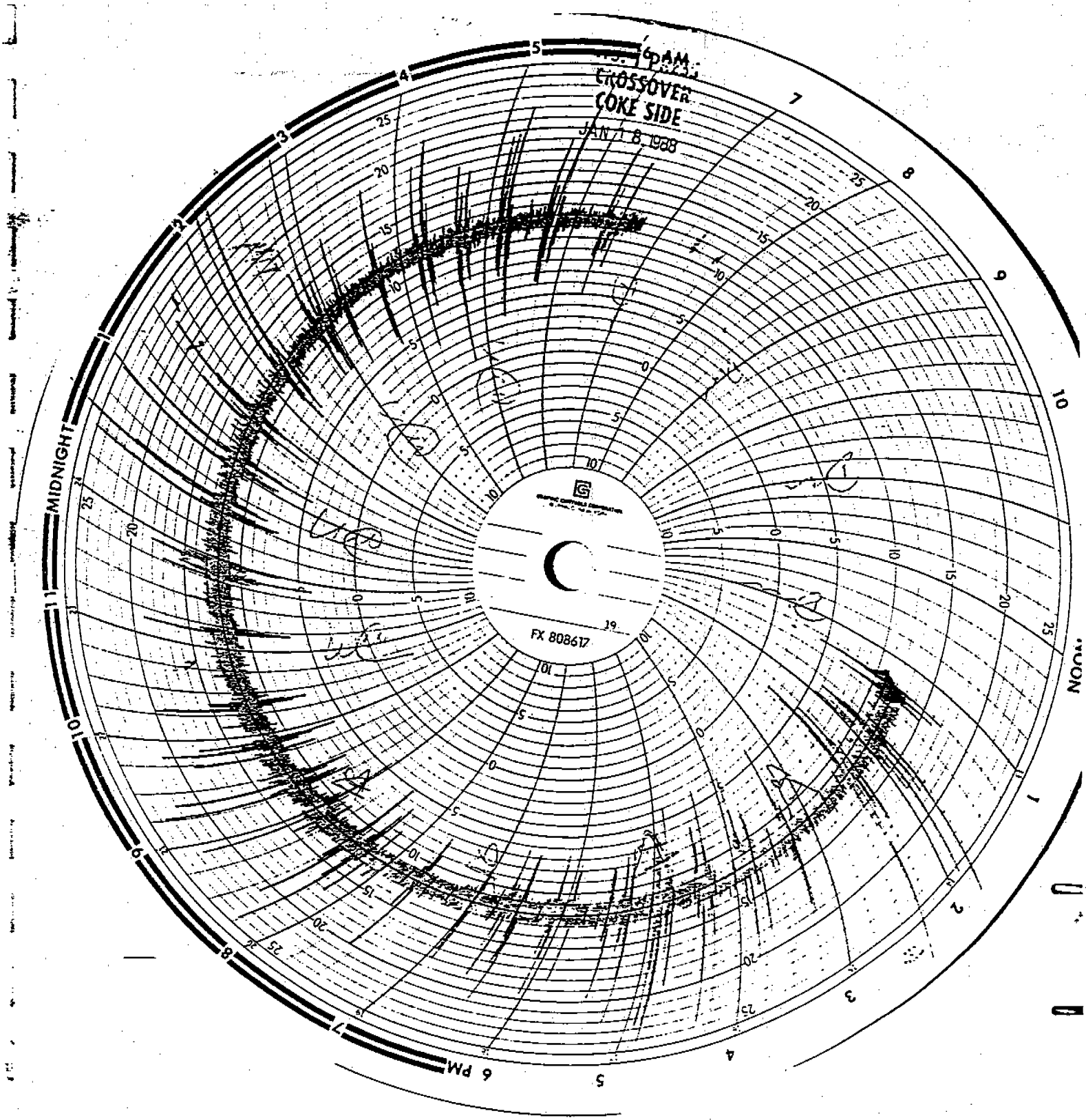
	OVEN NO.	TIME PUSHED	TIME CHARGED	AMPS TO PUSH			OVEN NO.	TIME PUSHED	TIME CHARGED	AMPS TO PUSH			OVEN NO.	TIME PUSHED	TIME CHARGED	AMPS TO PUSH
1	58		7:17			1	47		3:09			1	36		11:03	
2	1	1:09	:26	190		2	57	3:15	:35	190		2	46	11:17	:32	1
3	11	:30	:49	190		3	9	:26	:45	200		3	56	:37	:40	19
14	21	:40	:56	200		4	19	:51	4:10	190		4	8	:47	12:01	9
15	31	8:02	8:22	200		5	29	4:00	:15	180		5	18	:56	:10	19
16	41	:11	:30	200		6	39	:21	:40	200		6	28	12:17	:31	26
17	51	:35	:54	200		7	49	:30	:45	190		7	38	:26	:40	19
18	61	:45	9:01	190		8	59	:51	5:09	190		8	48	:54	1:10	19
19	3	9:08	:47	190		9	2	5:00	:13	200		9	58	1:05	:18	20
10	13	:40	:54	190		10	12	:24	:42	200		10	1	:30	:44	1
11	23	:58	10:18	180		11	22	:35	:49	190		11	11	:39	:56	19
12	33	10:07	:24	200		12	32	:55	6:10	200		12	21	2:09	2:24	20
13	43	:29	:44	200		13	42	6:05	:15	180		13	31	:19	:32	19
14	53	:48	11:22	200		14	52	:30	:43	190		14	41	:45	3:00	20
15	5	11:32	:48	180		15	62	:40	7:30	200		15	51	:55	:30	1
16	15	:41	:54	190		16	4	7:40	:55	190		16	61	3:44	4:11	0
17	25	:59	12:18	200		17	14	:42	8:05	190		17	3	:56	:19	19
18	35	12:08	:24	190		18	24	8:20	:34	200		18	13	4:27	:41	20
19	45	:29	:49	190		19	34	:30	:45	180		19	23	:36	:48	19
20	55	:41	:55	200		20	44	:51	9:04	180		20	33	:55	5:10	19
21	7	1:01	1:24	180		21	54	9:00	:17	200		21	43	5:04	:18	19
22	17	:16	:31	190		22	6	:16	:30	190		22	53	:27	:48	20
23	27	:49	2:05	200		23	16	:24	:39	190		23	5	:37	:57	19
24	37	:52	:10	190		24	26	:57	10:14	190		24	15	:55	6:13	1
25	47	2:14		190		25	36	10:03		190		25	25	6:08		1
26						26						26				
27						27						27				
28						28						28				
29						29						29				
30						30						30				
31	Willard Holody					31	F Gillis					31	Otis Stevens			
32						32						32				
33						33						33				
34						34						34				
35						35						35				
36						36						36				
37						37						37				
38			24			38			24			38			24	
39						39						39				
40						40						40				
41						41						41				
42						42						42				
43						43						43				
44						44						44				
45						45						45				
46						46						46				
47						47						47				
48						48						48				
49						49						49				
50						50						50				

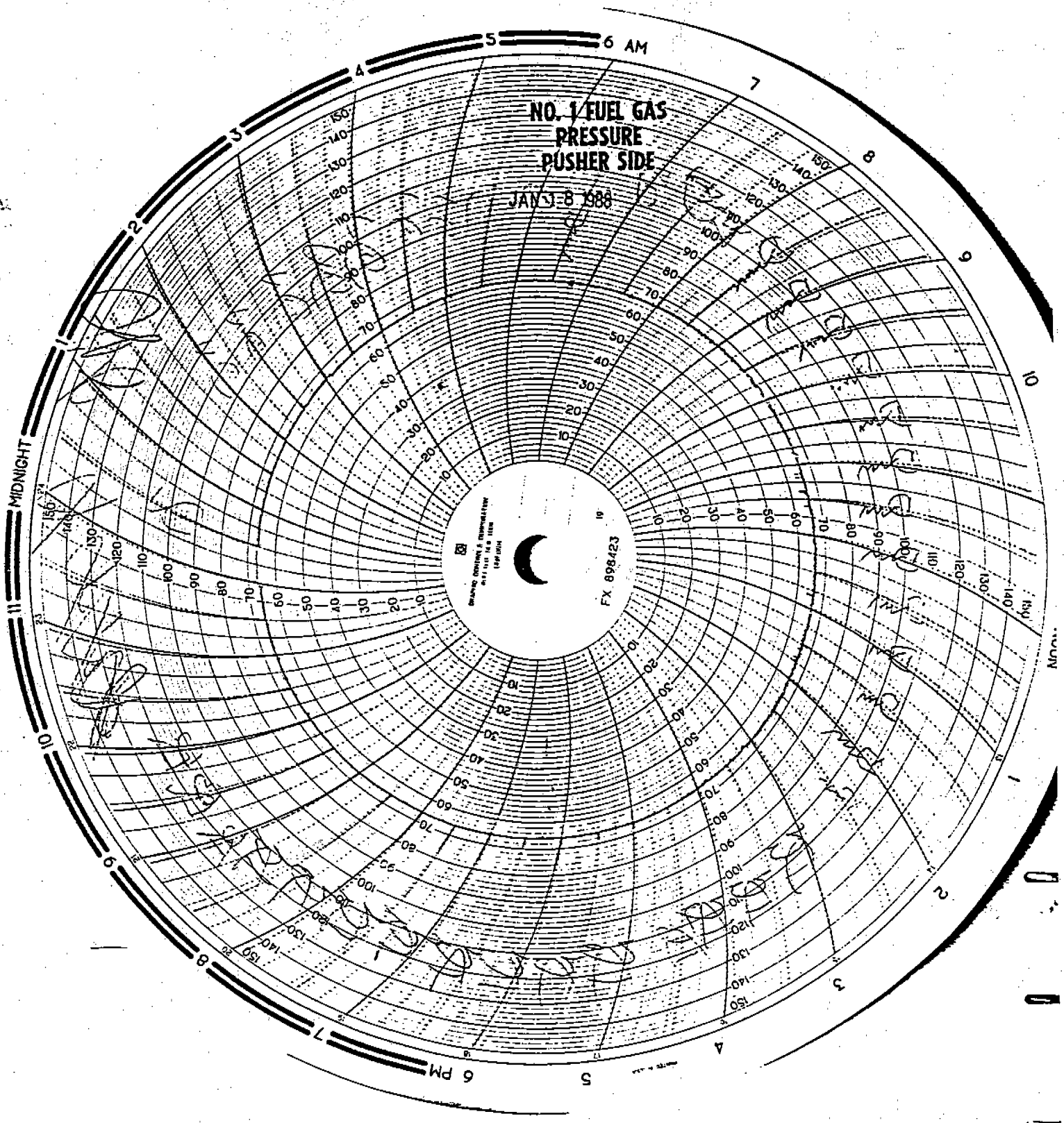
COAL	COAL	COAL
CHARGE	CHARGE	CHARGE
SPILLAGE	SPILLAGE	SPILLAGE
FOREMAN	FOREMAN	FOREMAN Bill Fitz
REMARKS:	REMARKS:	REMARKS:


NO. 1
STACKDRAFT
PUSHER SIDE
JAN 1 8 1958
FX 898504
6 AM
6 PM
MIDNIGHT
NOON

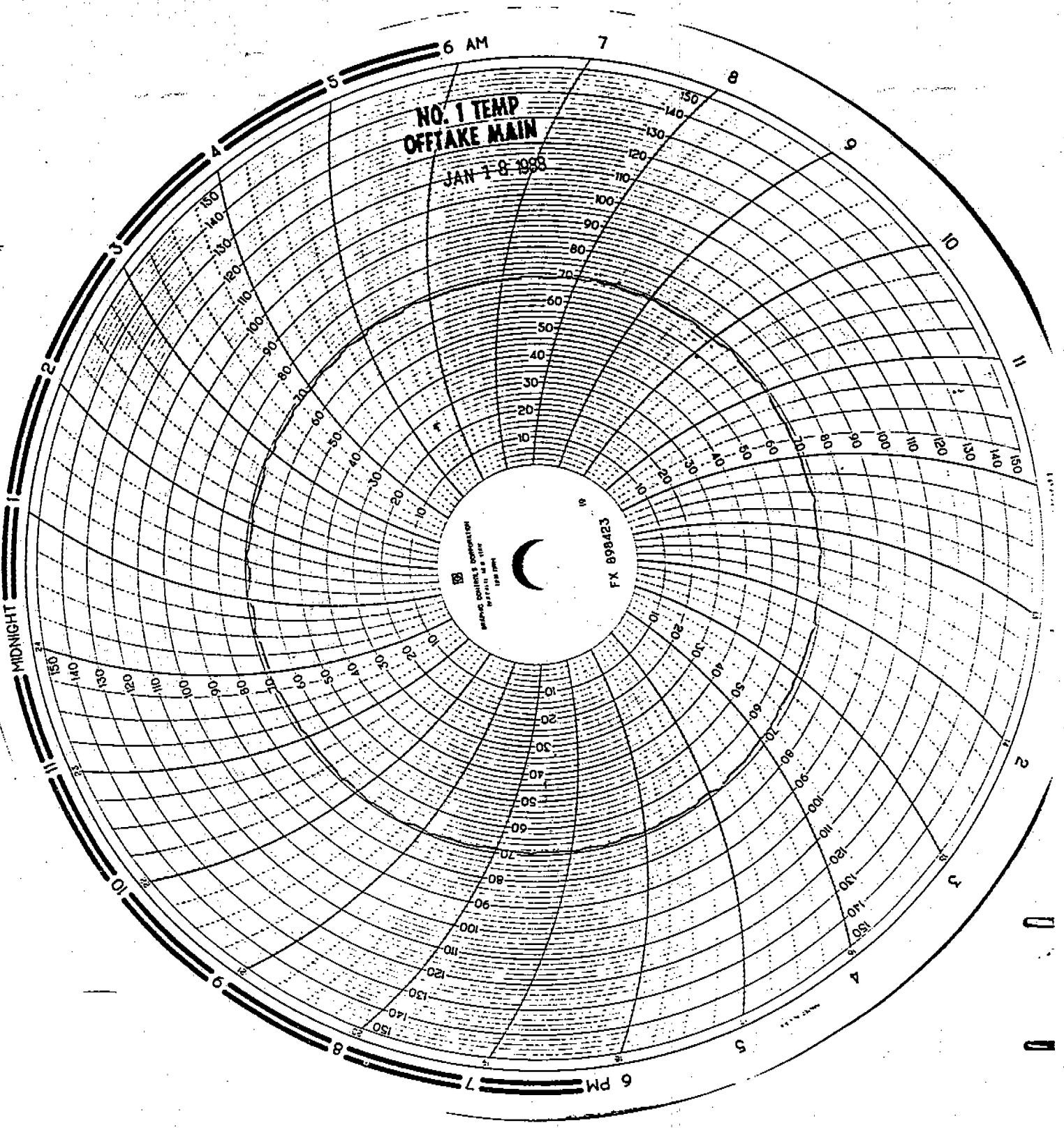

NO. 1
TACKDRAFT
COKE SIDE
JAN 1 8 1985
6 AM
6 PM
MIDNIGHT
FX 898504

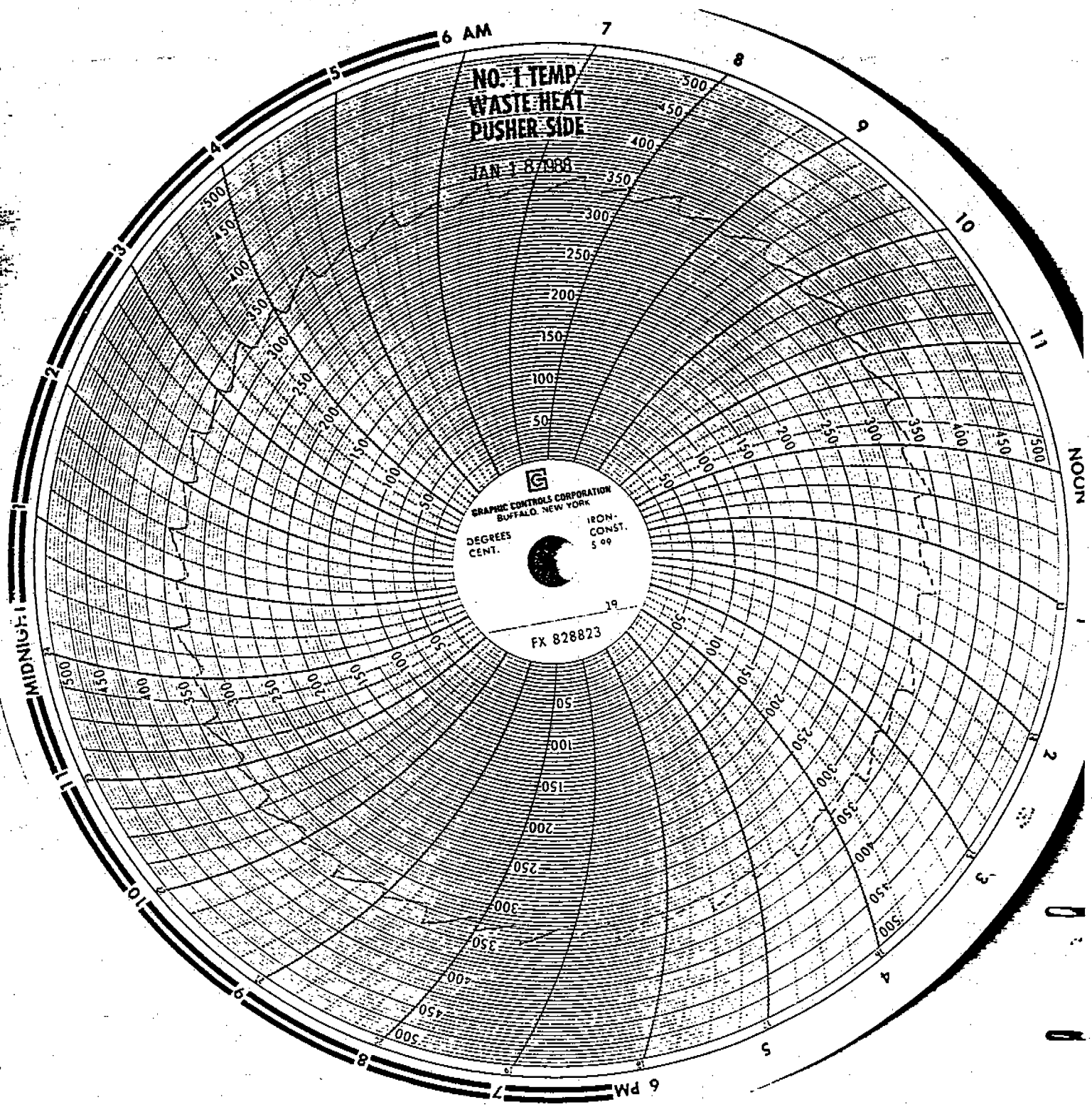

NO. 1 PRESS
CROSSOVER
PUSHER SIDE
JAN 8 1988
6 AM
6 PM
MIDNIGHT
FX 808617

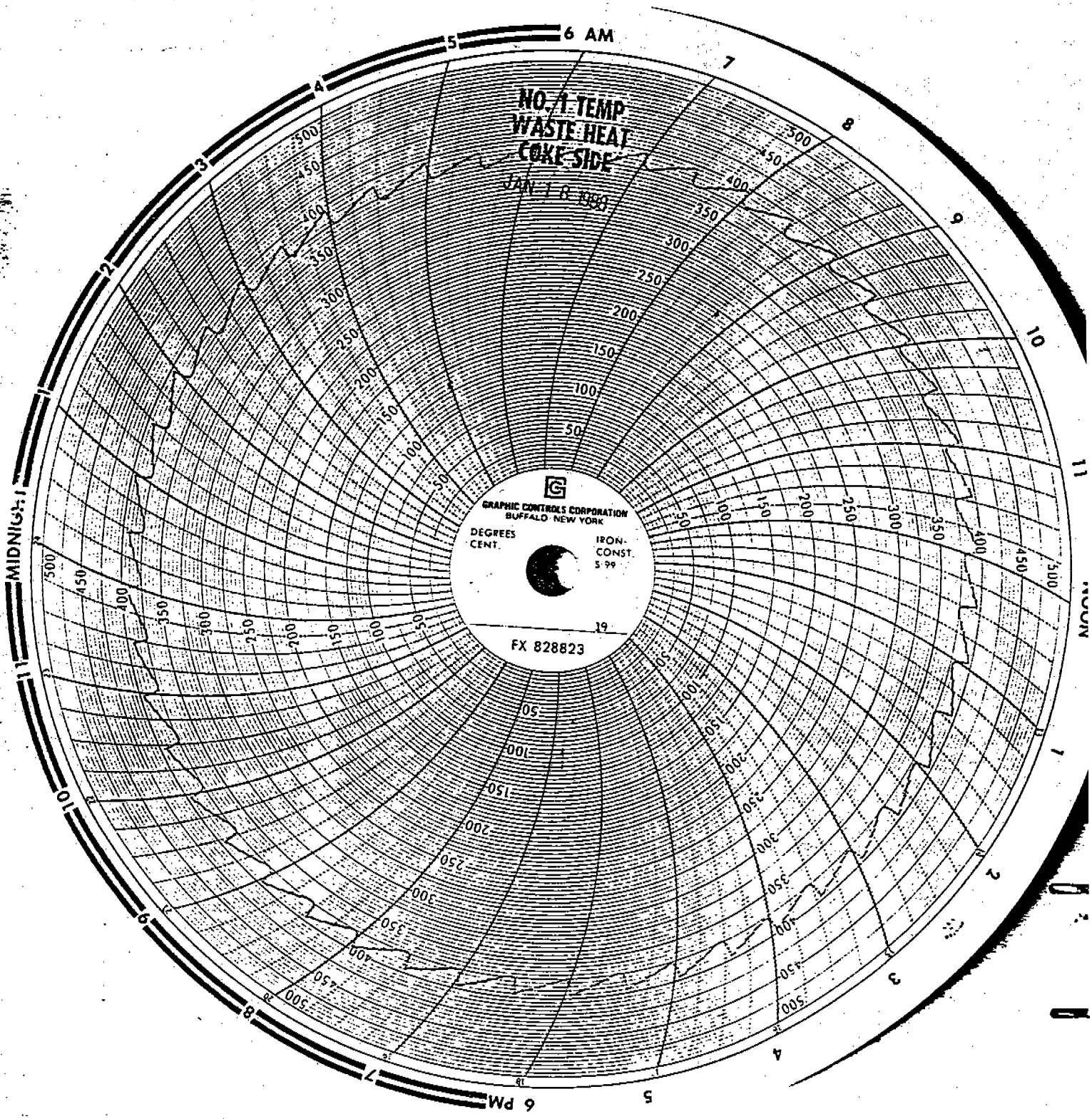

CROSSOVER
COKE SIDE
JAN 18, 1988
FX 808617
MIDNIGHT
NOON
6 PM

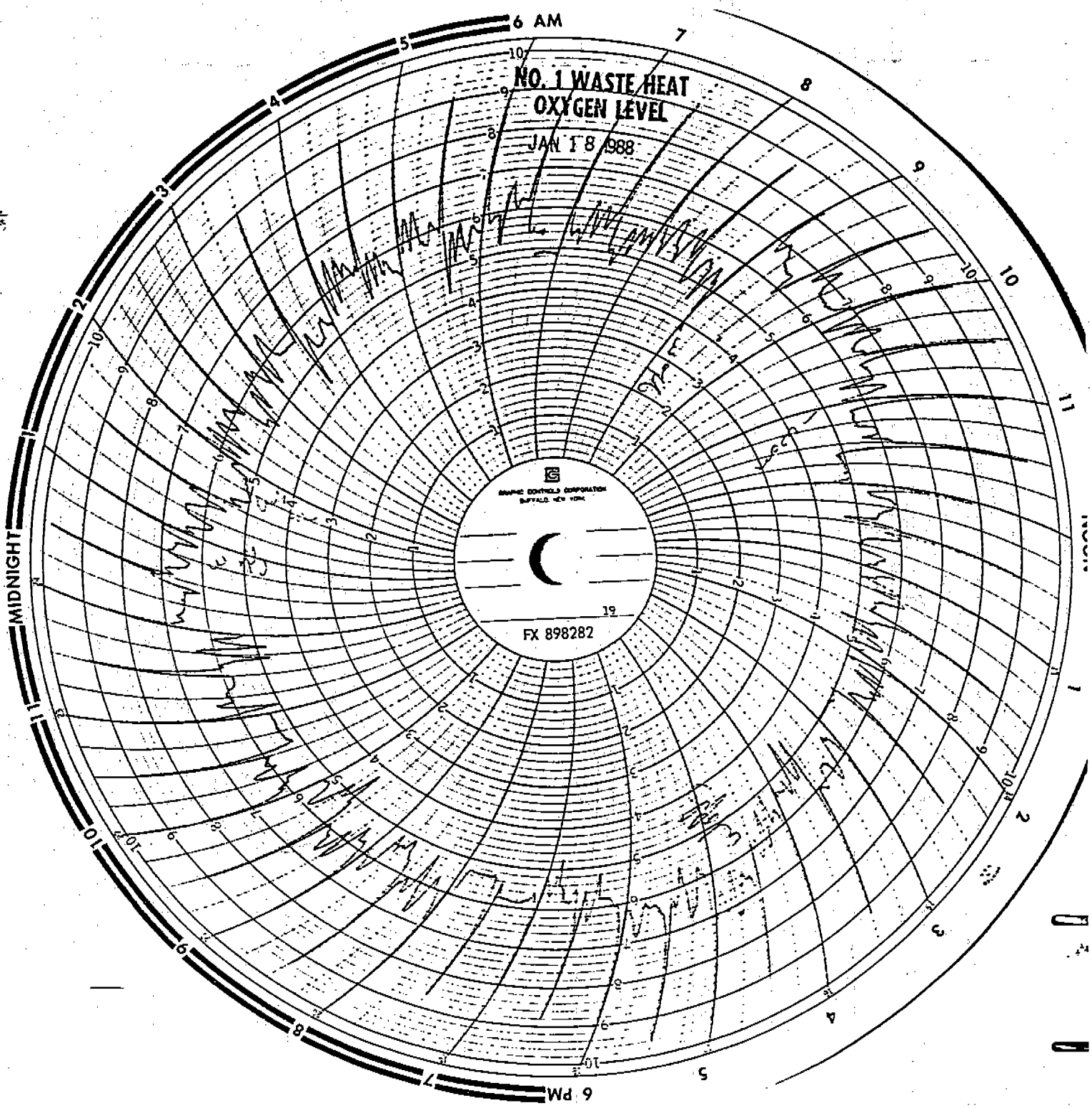

NO. 1 FUEL GAS
PRESSURE
PUSHER SIDE
JAN 1-8 1988
MIDNIGHT
6 AM
6 PM
FX 898423

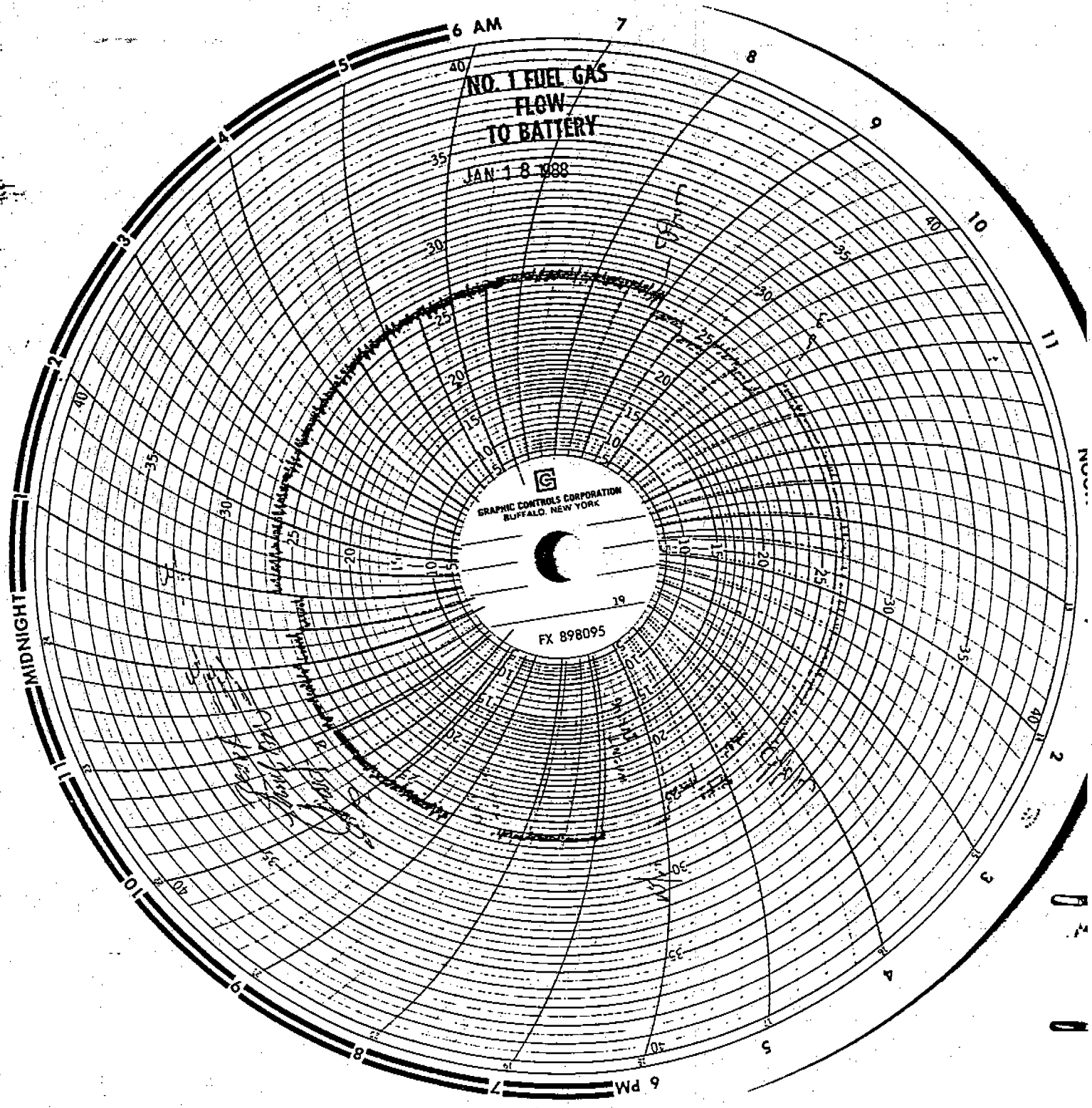
NO. 1 FUEL GAS
PRESSURE
COKE SIDE
JAN. 18 1988
6 AM
NOON
6 PM
MIDNIGHT

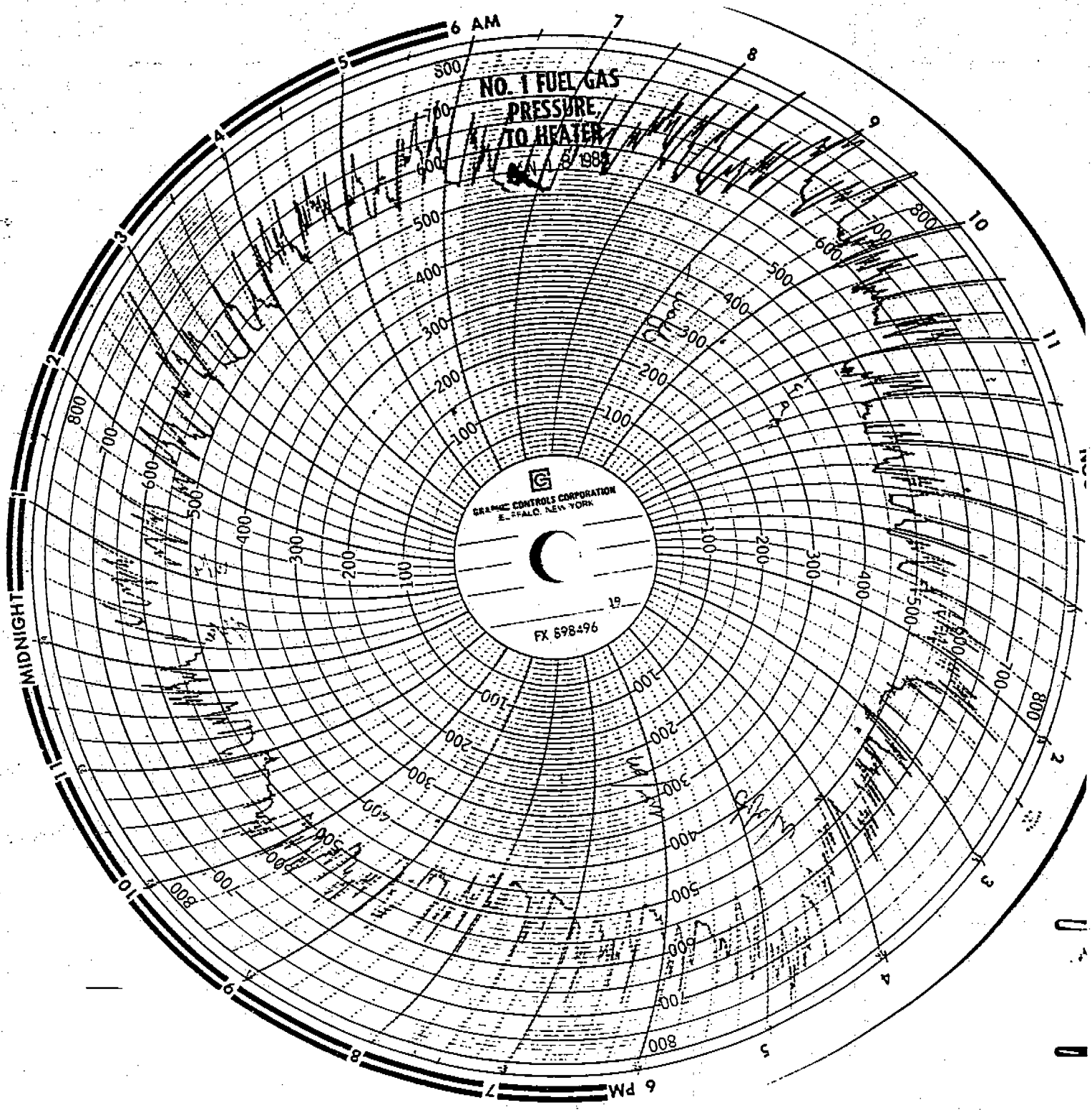

NO. 1 TEMP
OFFTAKE MAIN
JAN 7-8 1998
6 AM
6 PM
MIDNIGHT
FX 898423

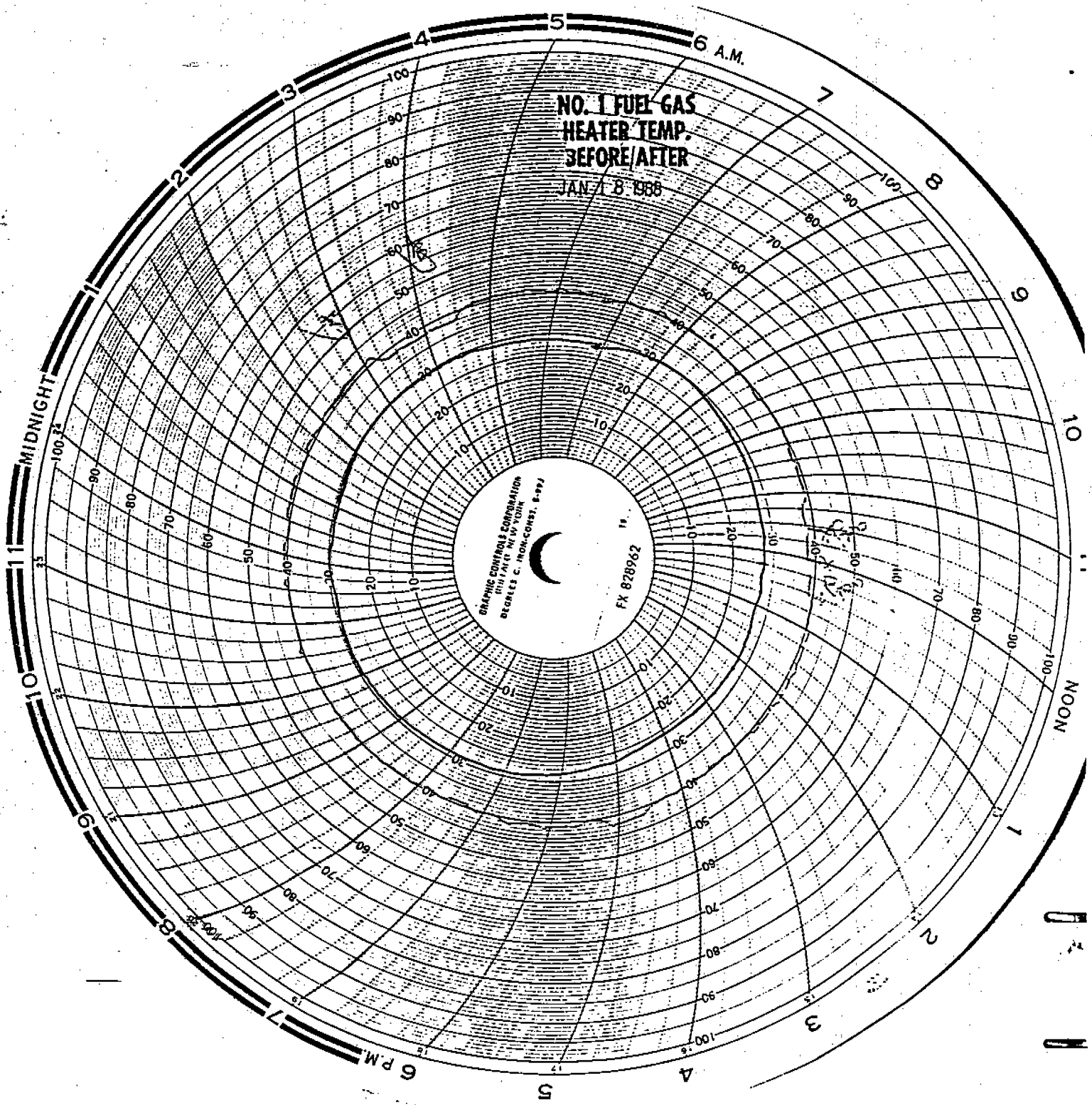

NO. 1 TEMP
WASTE HEAT
PUSHER SIDE
JAN 1 8 1988
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
DEGREES
CENT.
IRON-
CONST.
5 00
FX 828823
6 AM
NOON
6 PM
MIDNIGHT

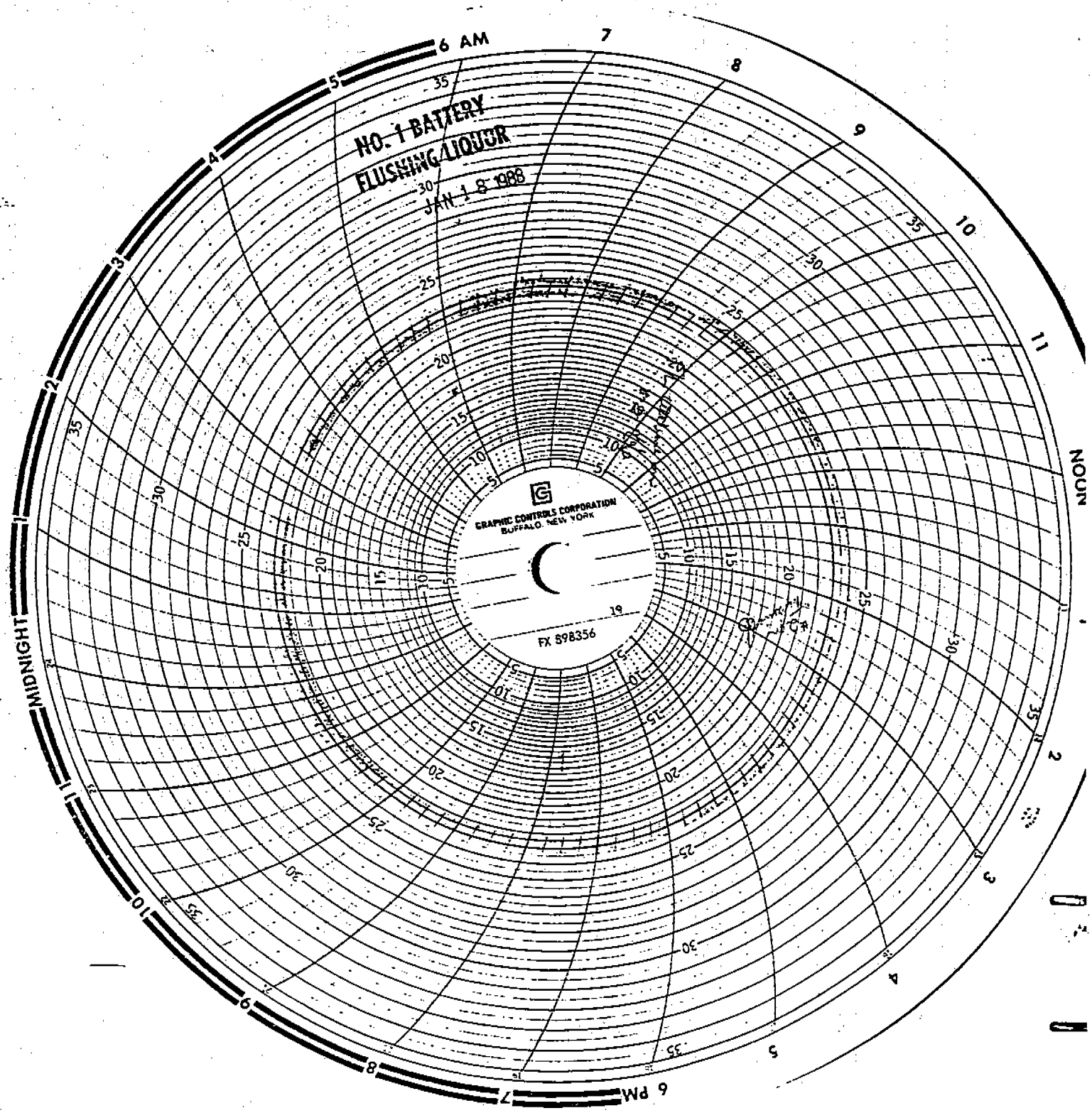

NO. 1 TEMP
WASTE HEAT
COKE SIDE
JAN 1 8 1980
6 AM
MIDNIGHT
NOON
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
DEGREES
CENT.
IRON-
CONST.
5-99
FX 828823

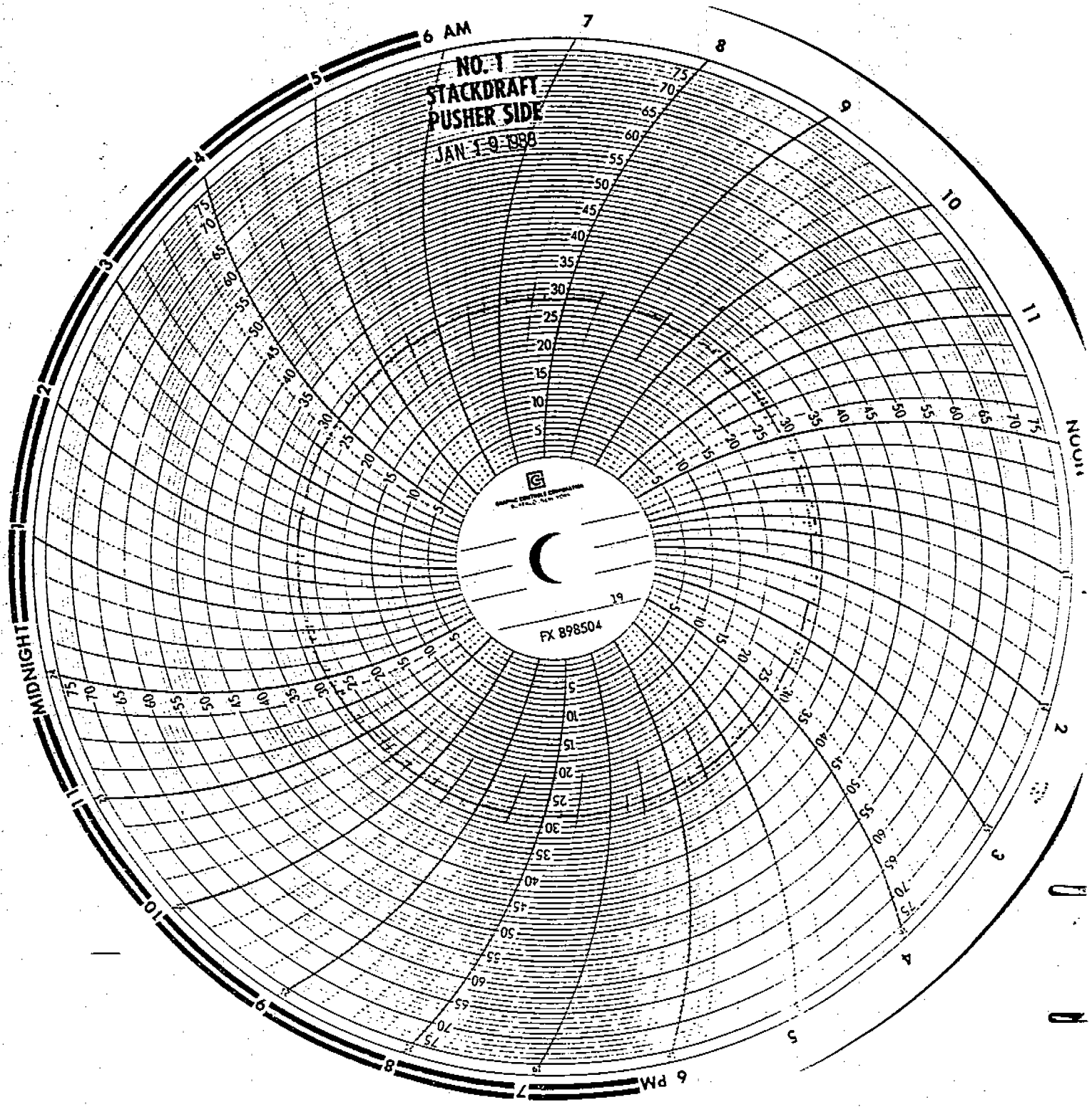

NO. 1 WASTE HEAT
OXYGEN LEVEL
JAN 18 1988
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
FX 898282
MIDNIGHT
6 AM
6 PM

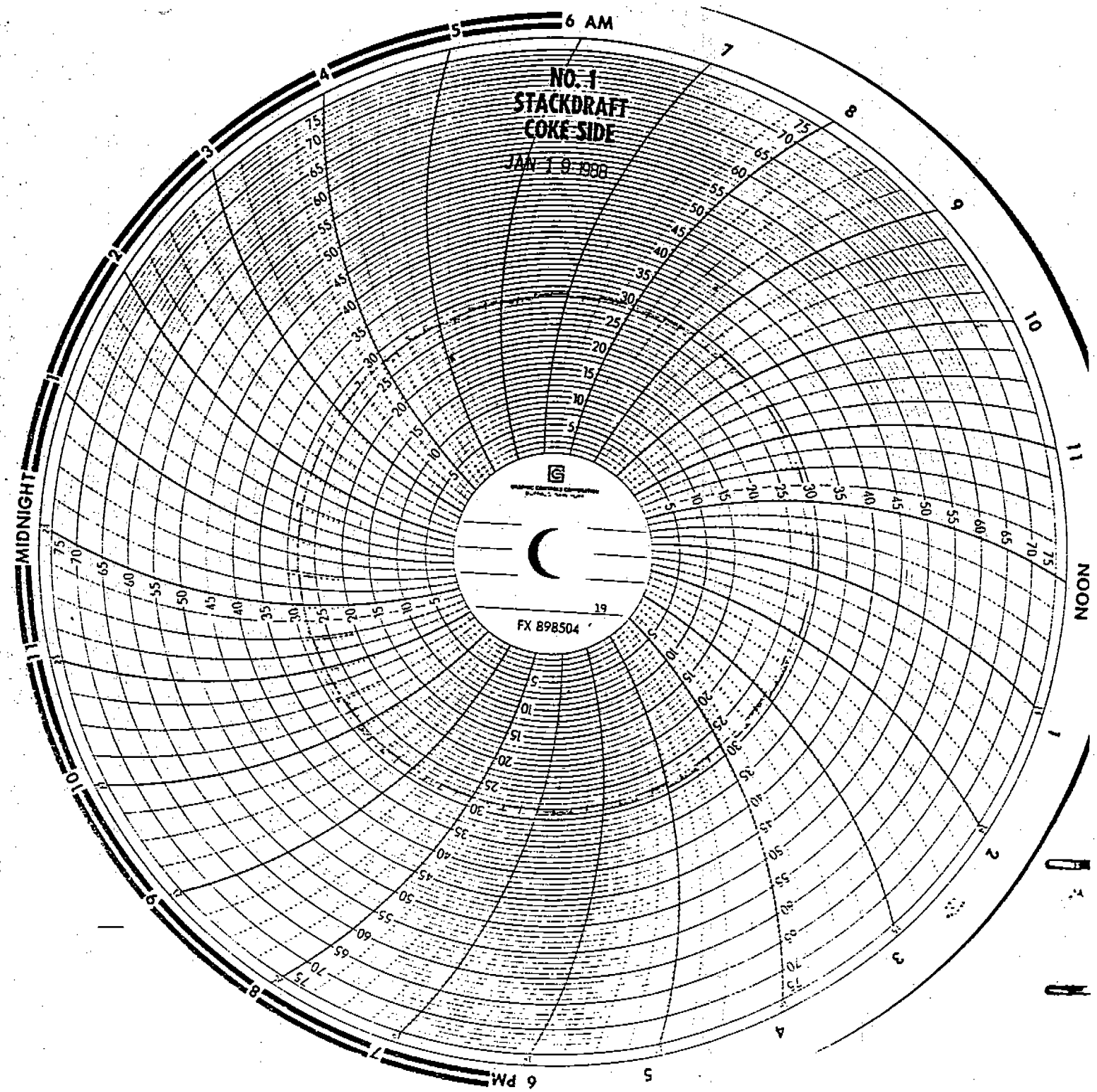

NO. 1 FUEL GAS
FLOW
TO BATTERY
JAN 1 8 1988
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
FX 898095
MIDNIGHT
6 AM
6 PM

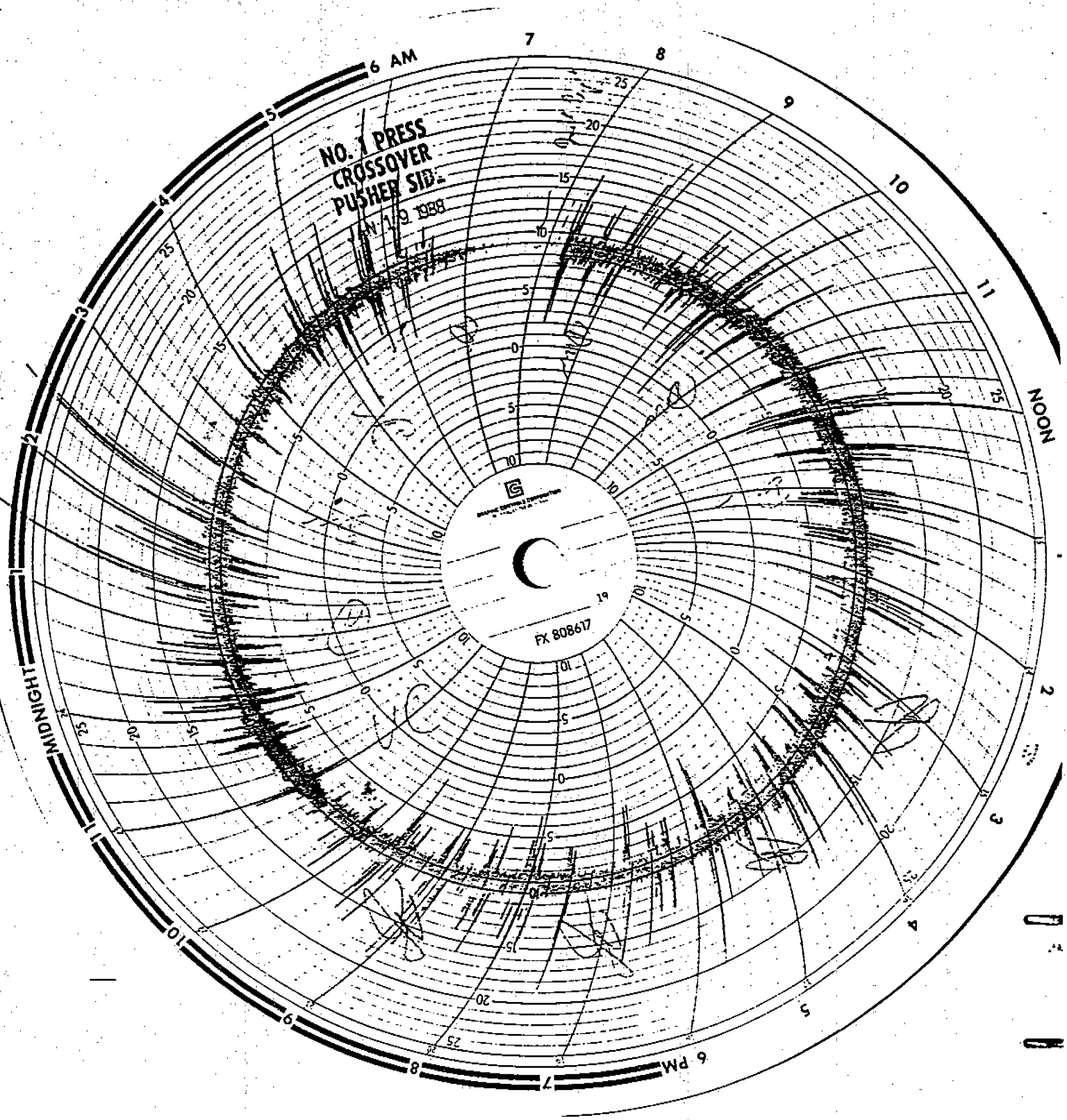

NO. 1 FUEL GAS
PRESSURE,
TO HEATER
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
FX 598496
MIDNIGHT
6 AM
6 PM

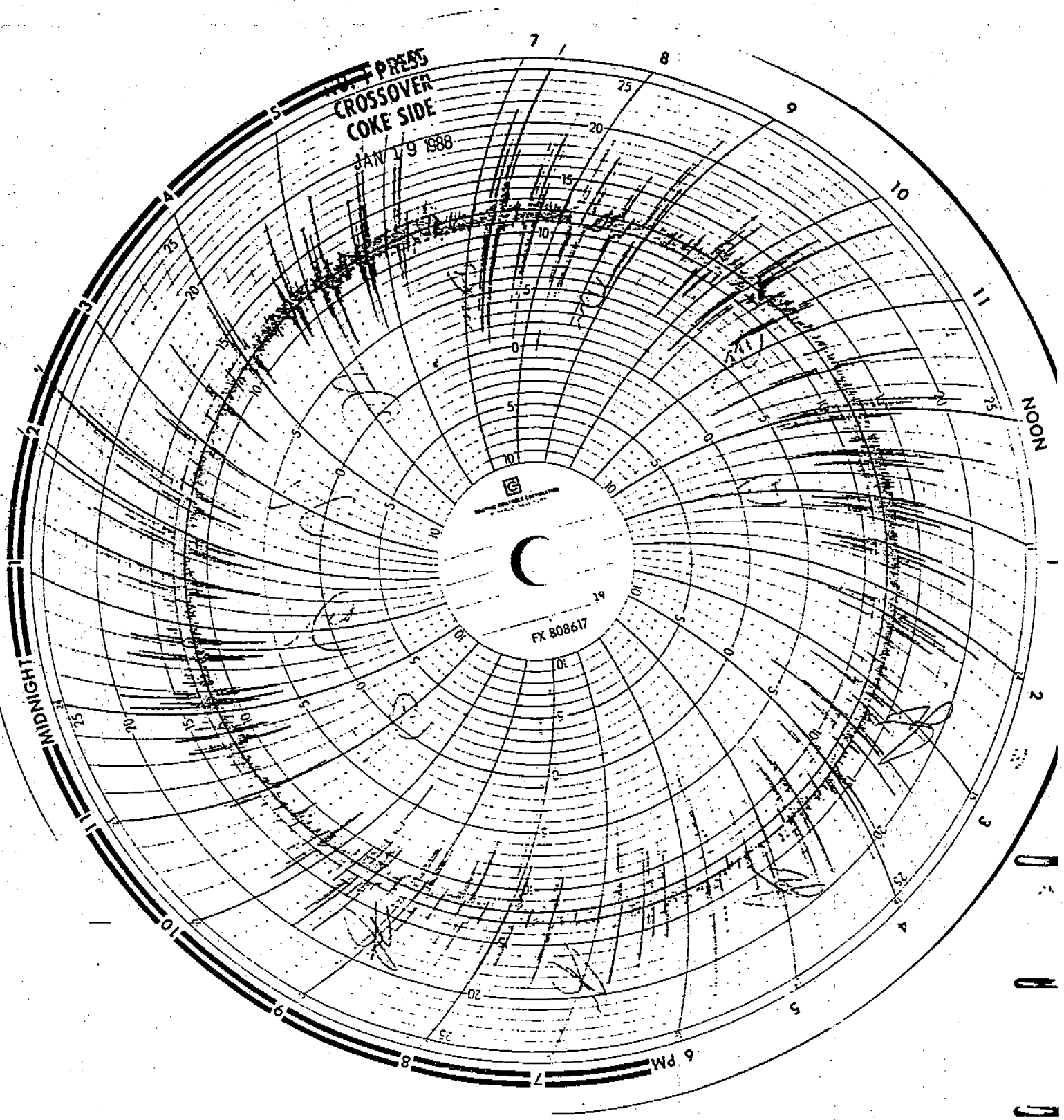

NO. 1 FUEL GAS
HEATER TEMP.
BEFORE/AFTER
JAN 7 8 1988
MIDNIGHT
NOON
A.M.
P.M.
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
FX 828962

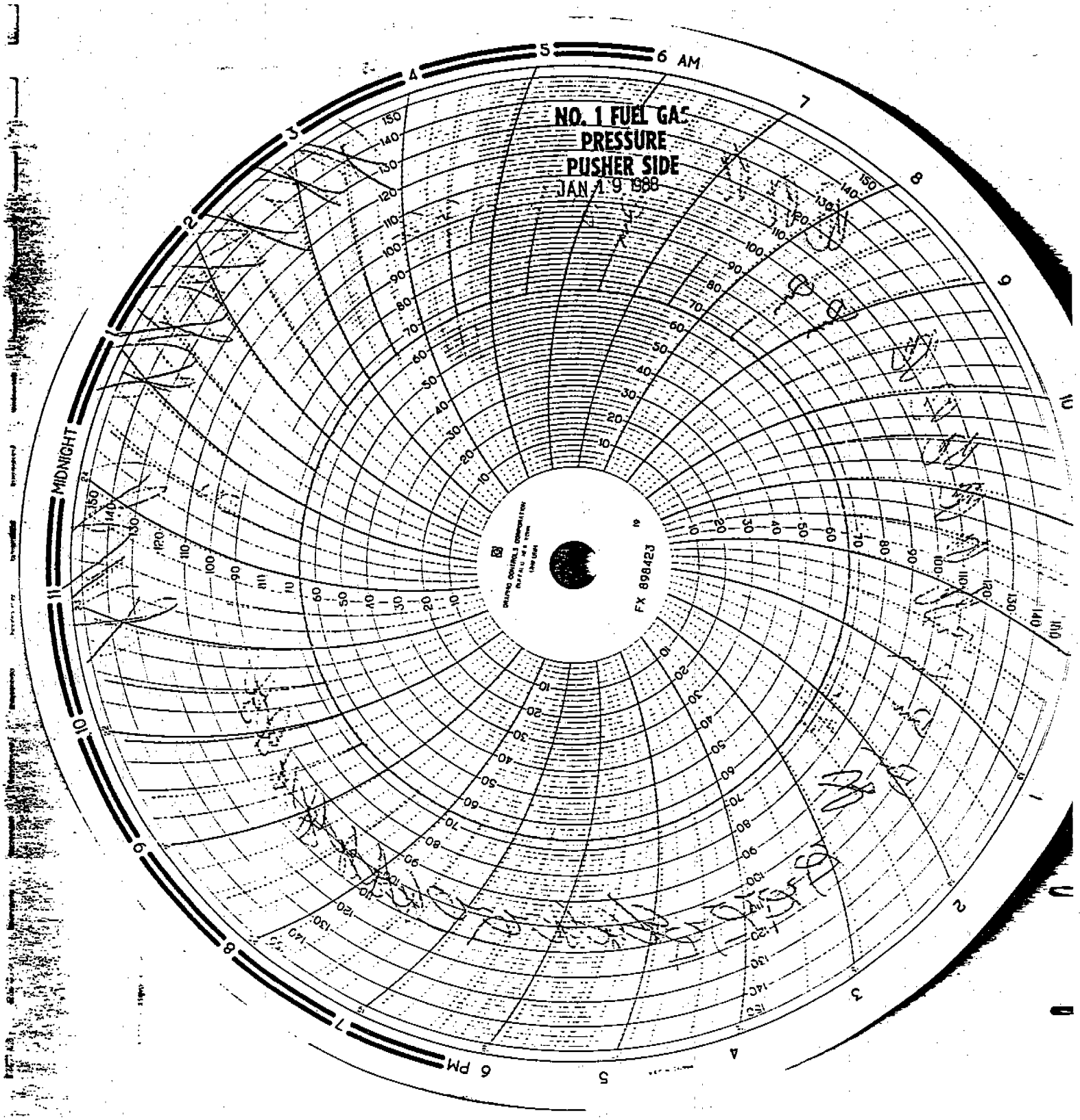

NO. 1 BATTERY
FLUSHING LIQUOR
JAN 1 8 1988
GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
FX 898356
MIDNIGHT
6 AM
NOON
6 PM

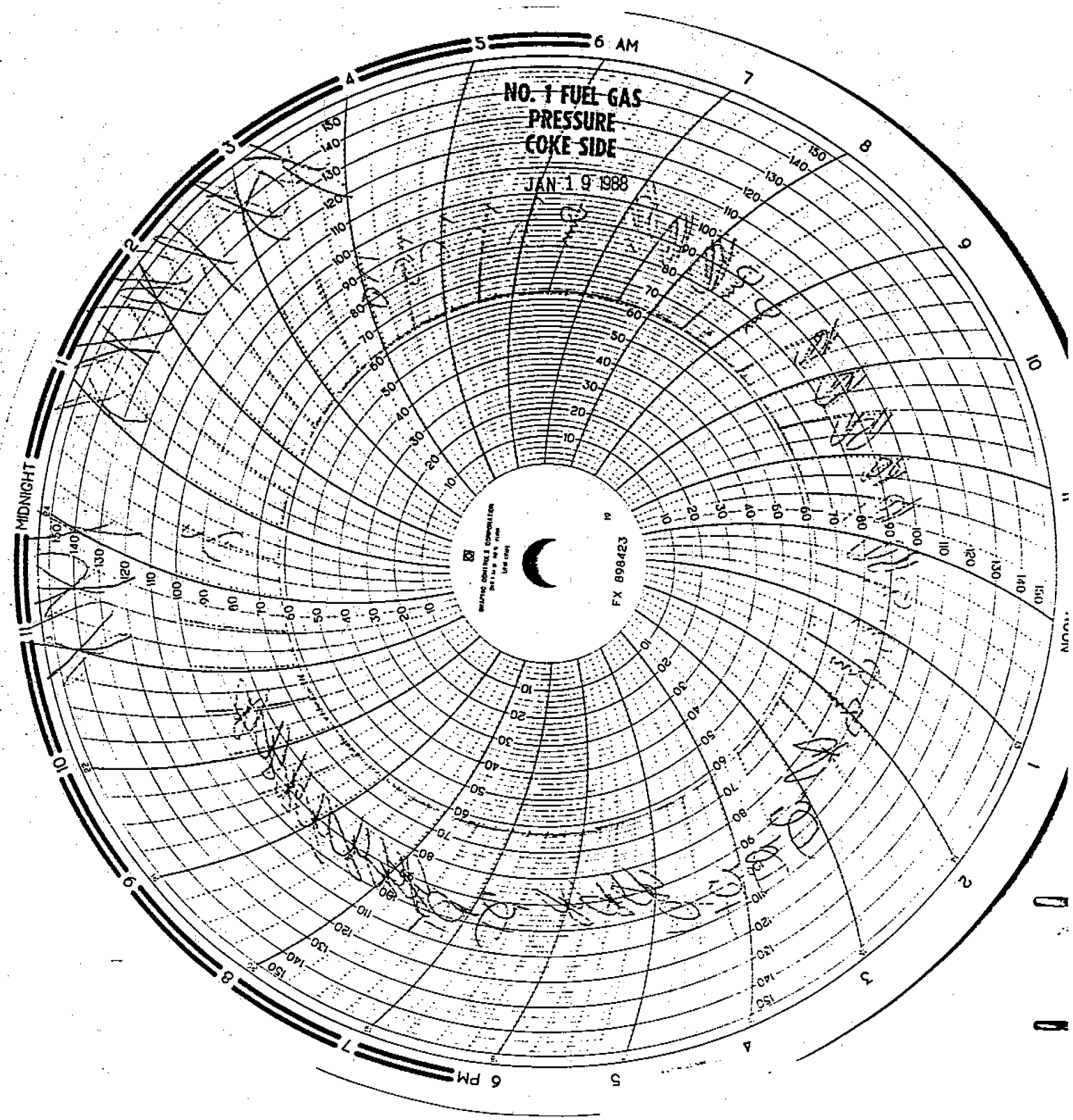

NO. 1
STACKDRAFT
PUSHER SIDE
JAN 1 9 1988
6 AM
NOON
6 PM
MIDNIGHT
FX 898504

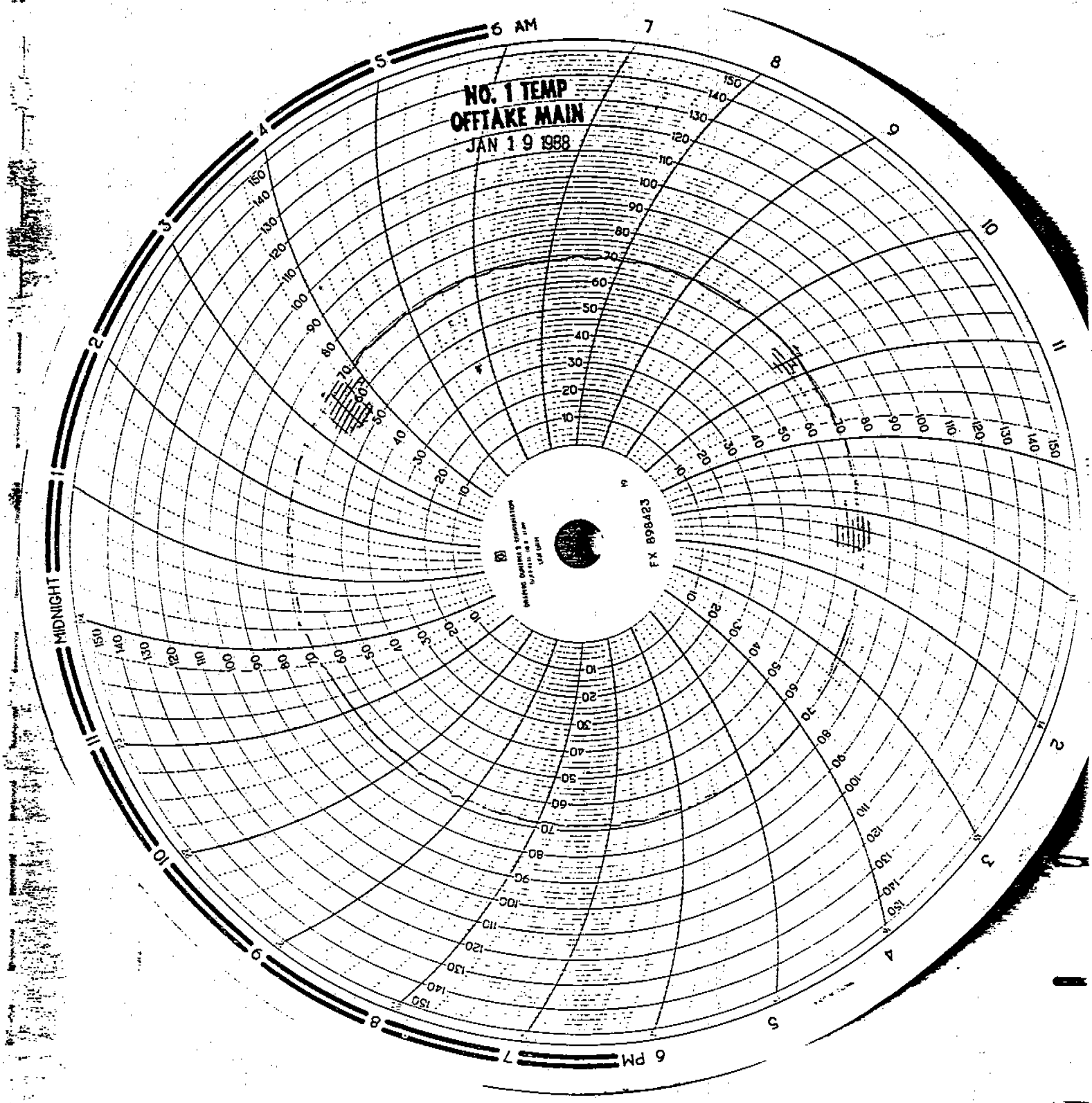

NO. 1
STACKDRAFT
COKE SIDE
JAN 19 1988
FX 898504
19
MIDNIGHT
NOON
6 AM
6 PM

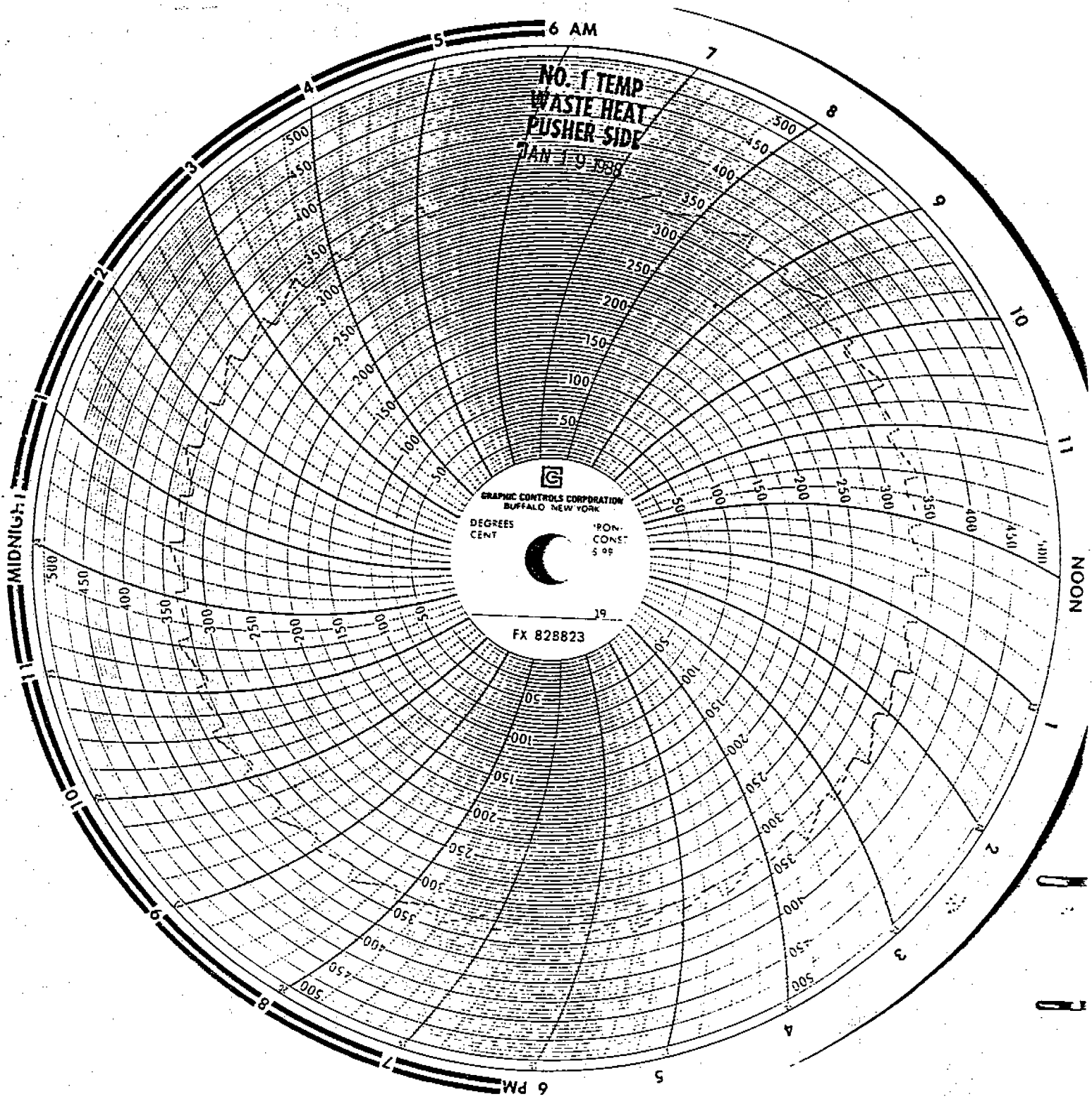

NO. 1 PRESS
CROSSOVER
PUSHER SIDE
JAN 19 1988
6 AM
7
8
9
10
11
NOON
2
3
4
5
6 PM
7
8
9
10
11
MIDNIGHT
12
1
FX 808617

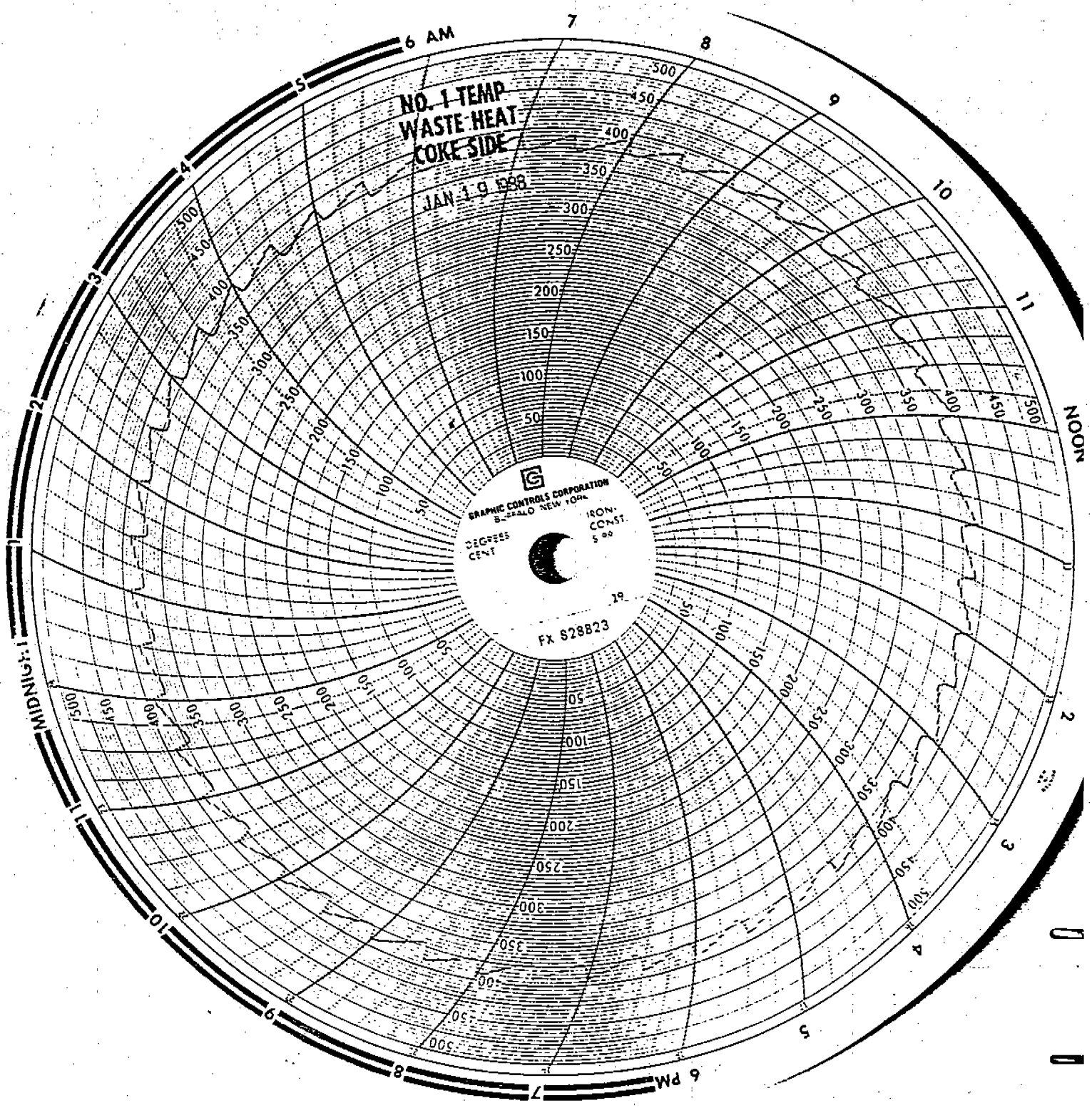

PRESS
CROSSOVER
COKE SIDE
JAN 19 1988
MIDNIGHT
NOON
6 PM
FX 808617

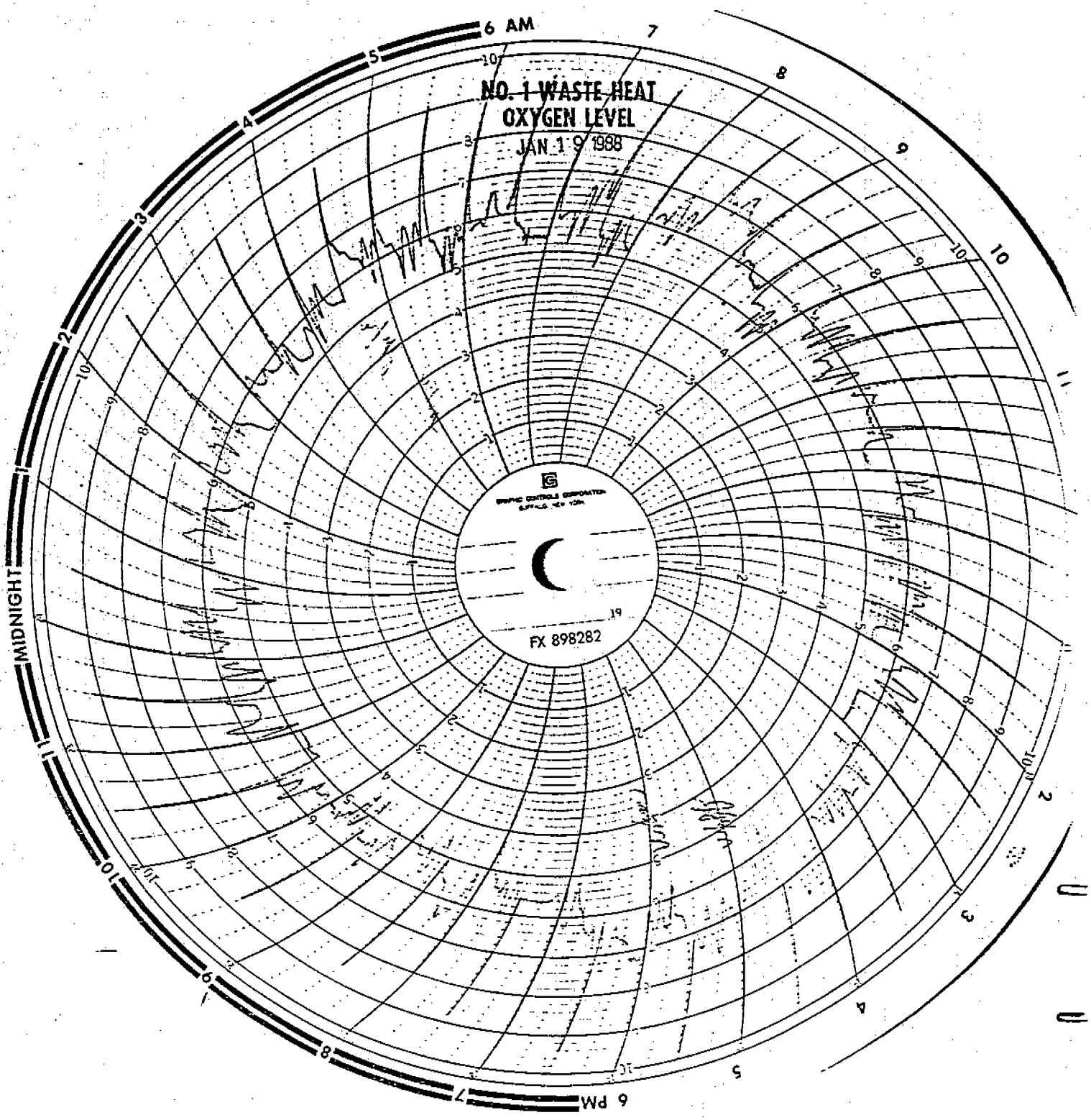

NO. 1 FUEL GAS
PRESSURE
PUSHER SIDE
JAN 19 1988
MIDNIGHT
6 AM
6 PM
FX 898423

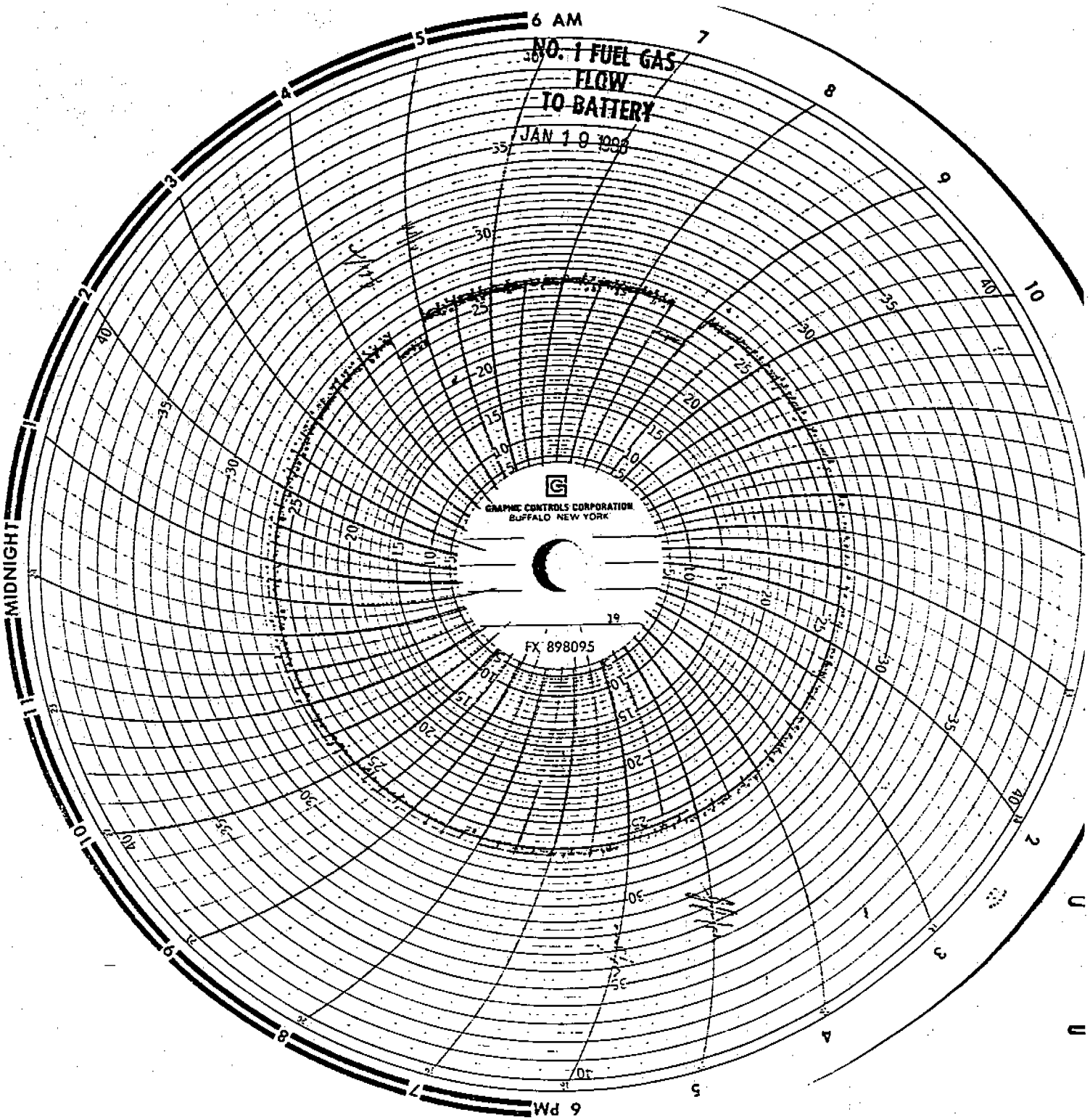

NO. 1 FUEL GAS
PRESSURE
COKE SIDE
JAN 19 1988
MIDNIGHT
6 AM
6 PM
NOON
FX 898423

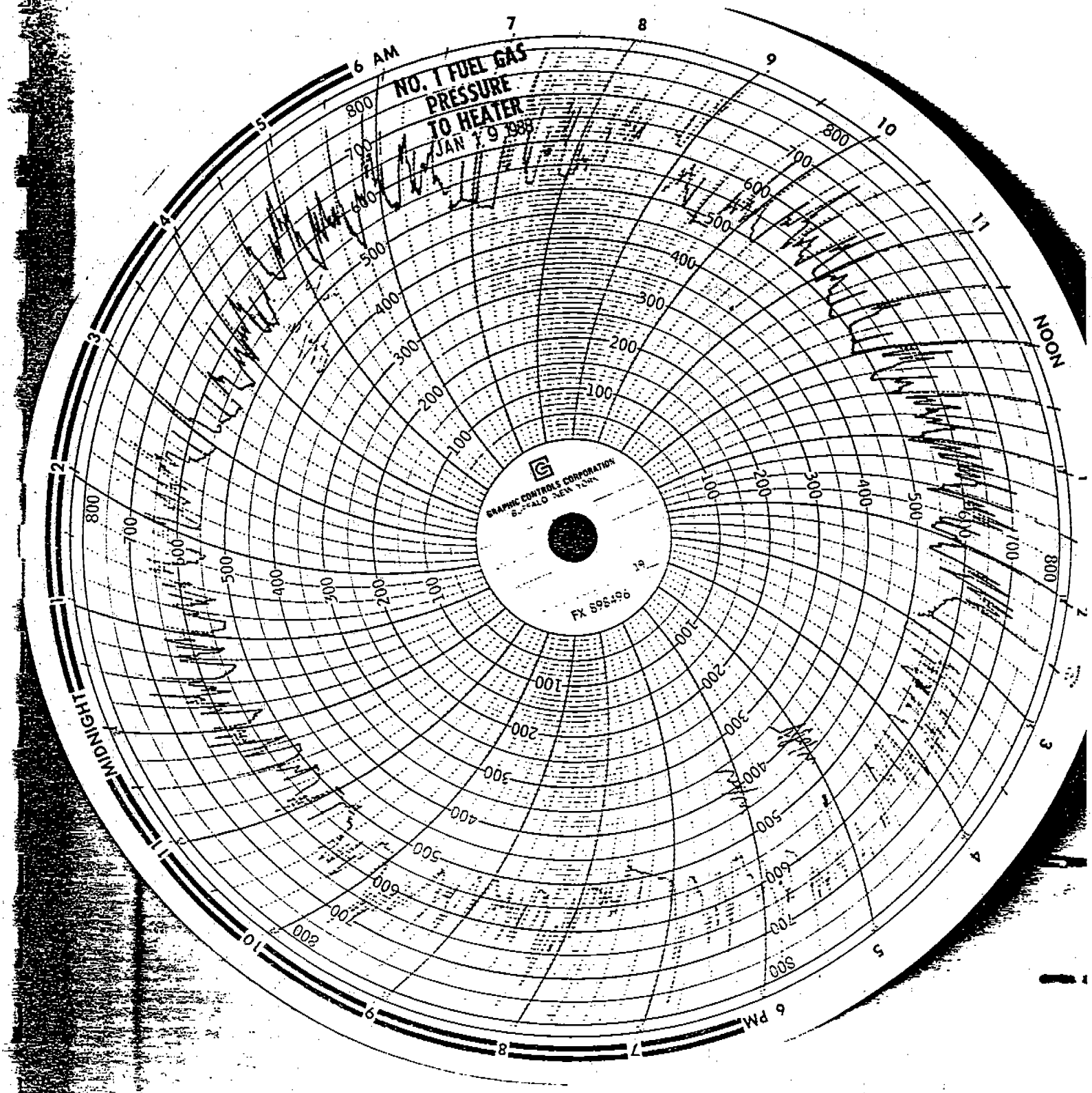

NO. 1 TEMP
OFFTAKE MAIN
JAN 19 1988
6 AM
6 PM
MIDNIGHT
FX 898423

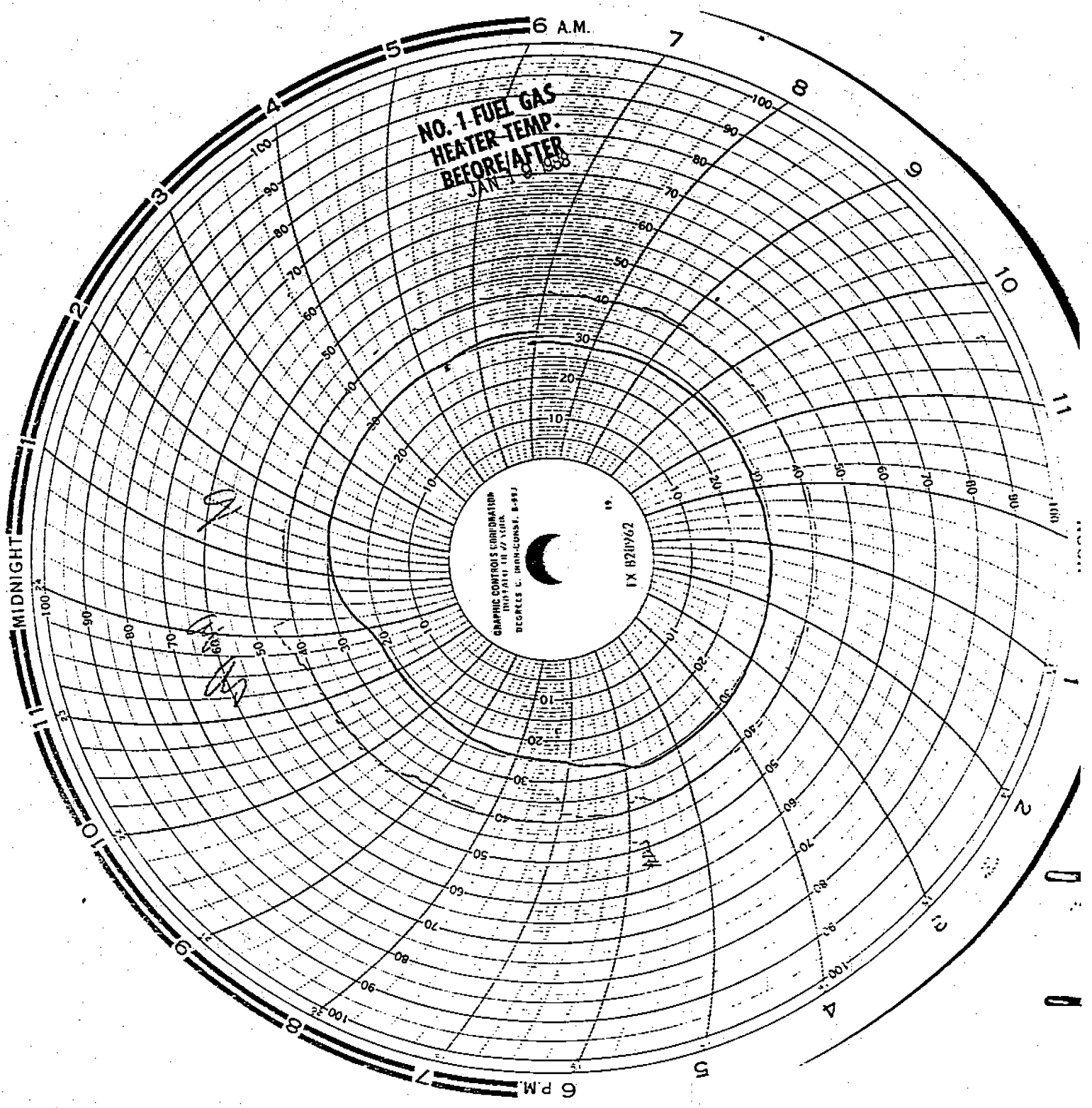

NO. 1 TEMP
WASTE HEAT
PUSHER SIDE
JAN 1 9 1988
6 AM
6 PM
MIDNIGHT
NOON
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
DEGREES
CENT
FX 828823

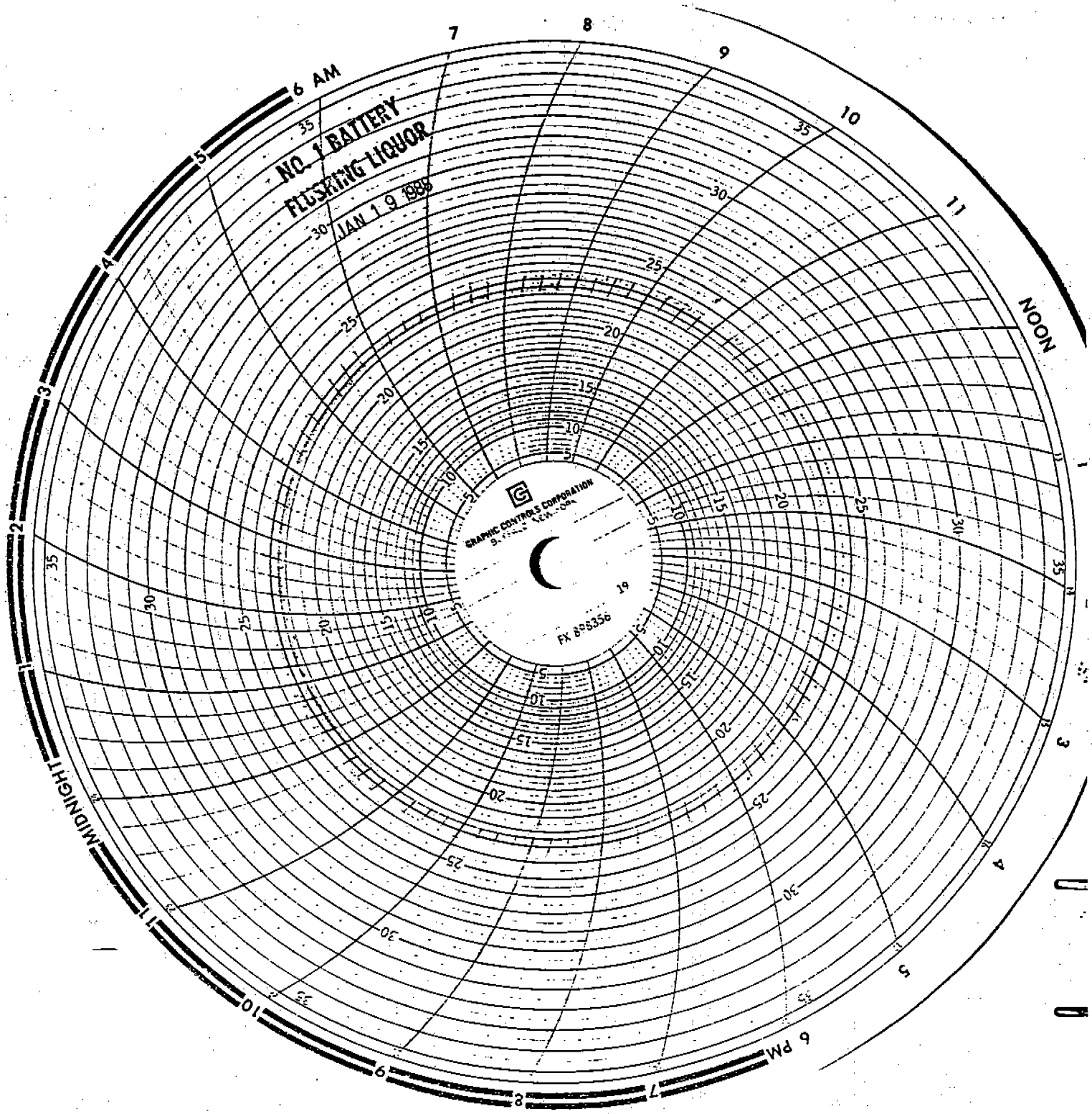

NO. 1 TEMP
WASTE HEAT
COKE SIDE
JAN 19 1988
6 AM
7
8
9
10
11
NOON
1
2
3
4
5
6 PM
7
8
9
10
11
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
DEGREES CENT
IRON-CONST.
FX S28823

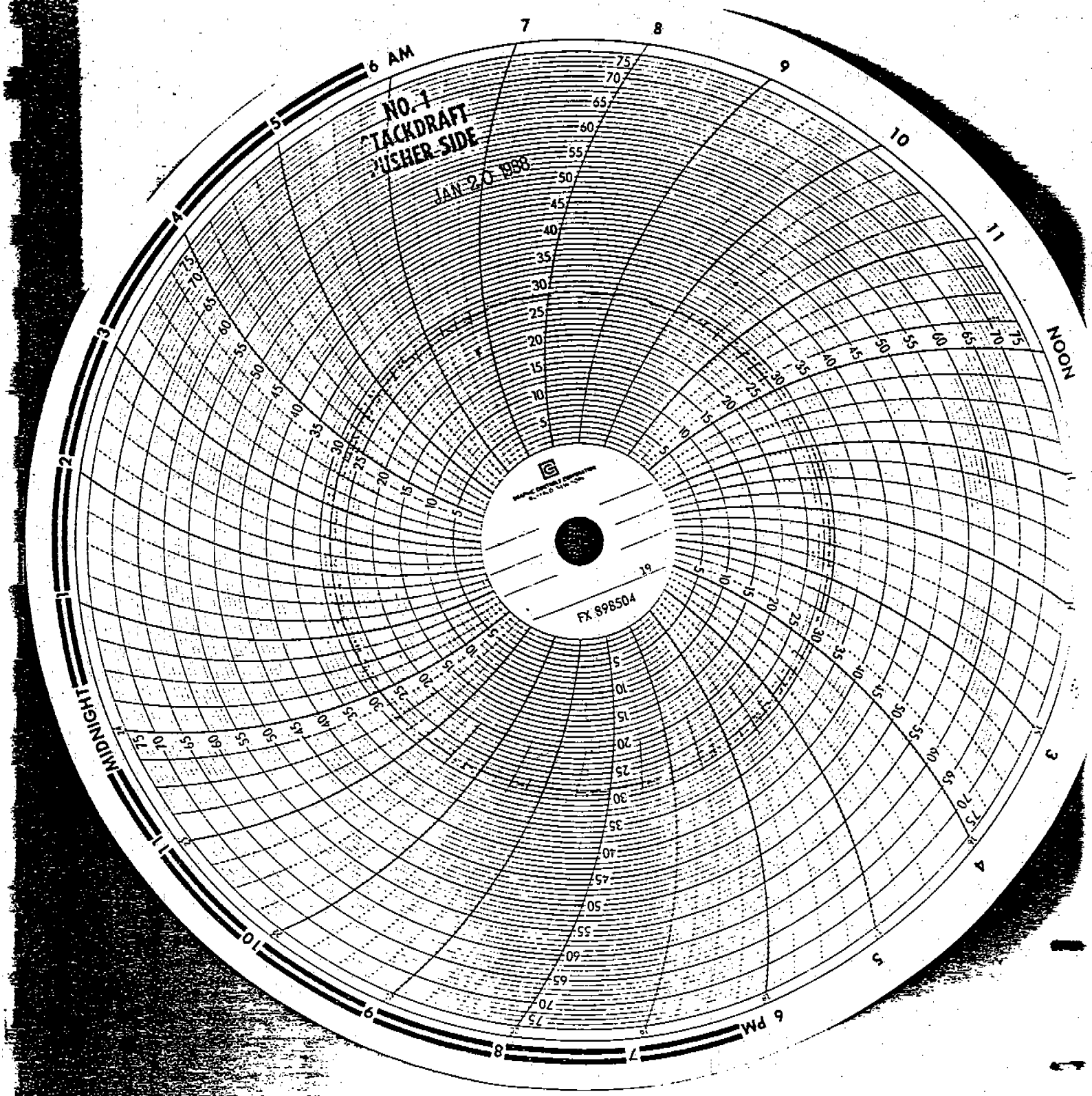

NO. 1 WASTE HEAT
OXYGEN LEVEL
JAN 19 1988
6 AM
6 PM
MIDNIGHT
FX 898282

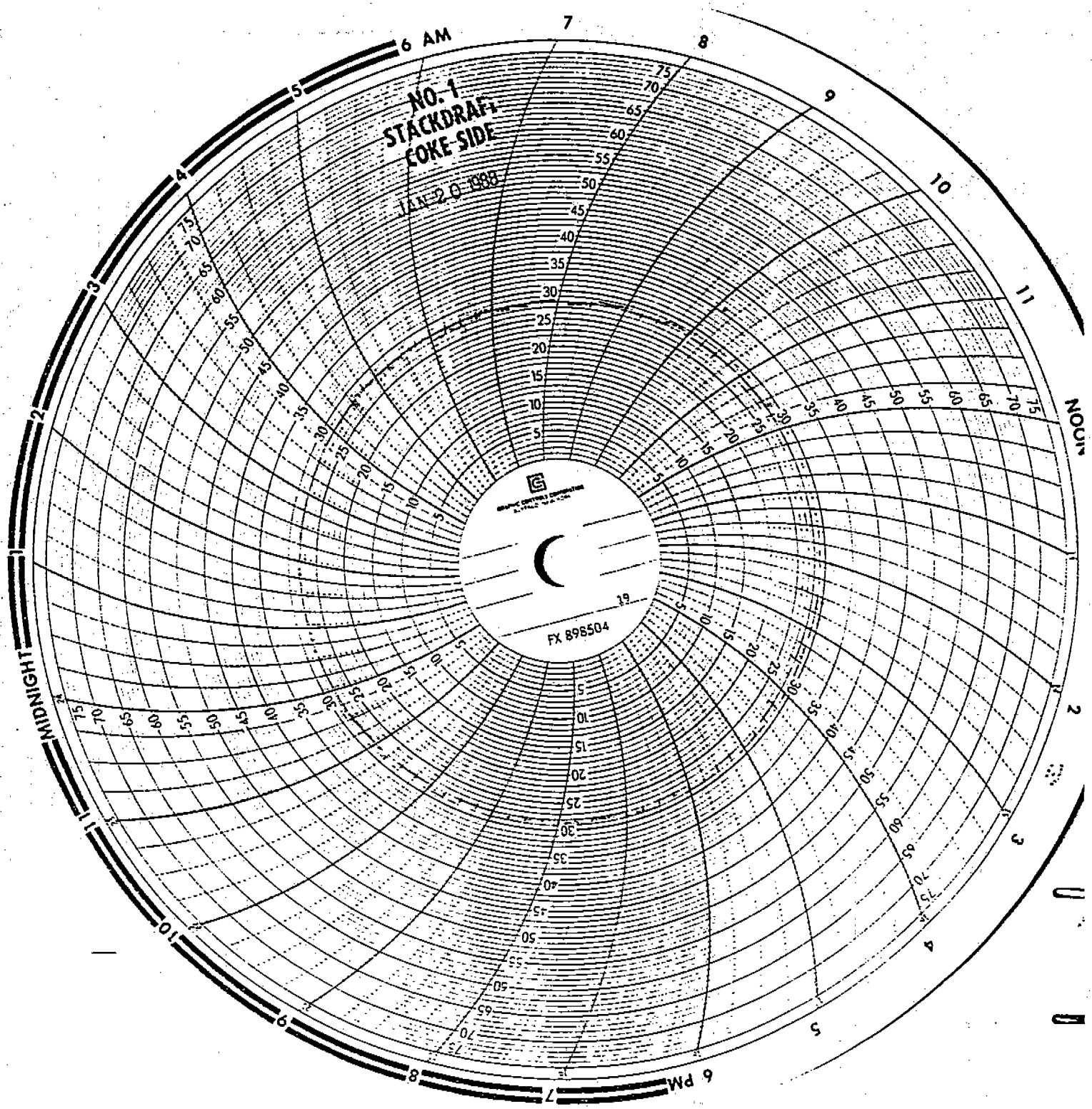

6 AM
NO. 1 FUEL GAS
FLOW
TO BATTERY
JAN 1 0 1988
MIDNIGHT
6 PM
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
FX 898095

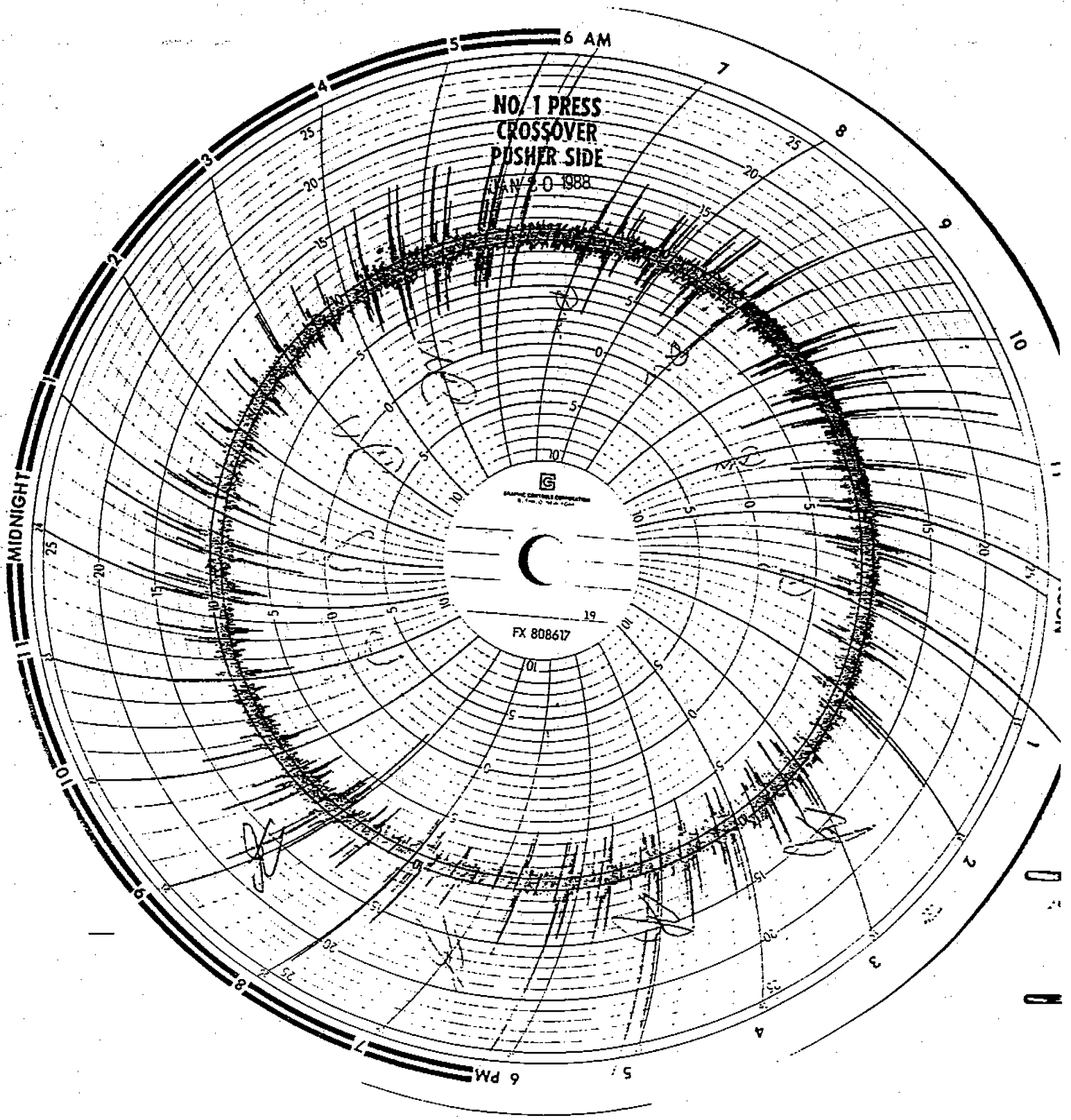

NO. 1 FUEL GAS
PRESSURE
TO HEATER
JAN 19 1988
6 AM
NOON
6 PM
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
FX 898496


NO. 1 FUEL GAS
HEATER TEMP.
BEFORE/AFTER
JAN 1 9 1958
6 A.M.
6 P.M.
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
DEGREES C. IRON-CONST. B-99J
TX 820962

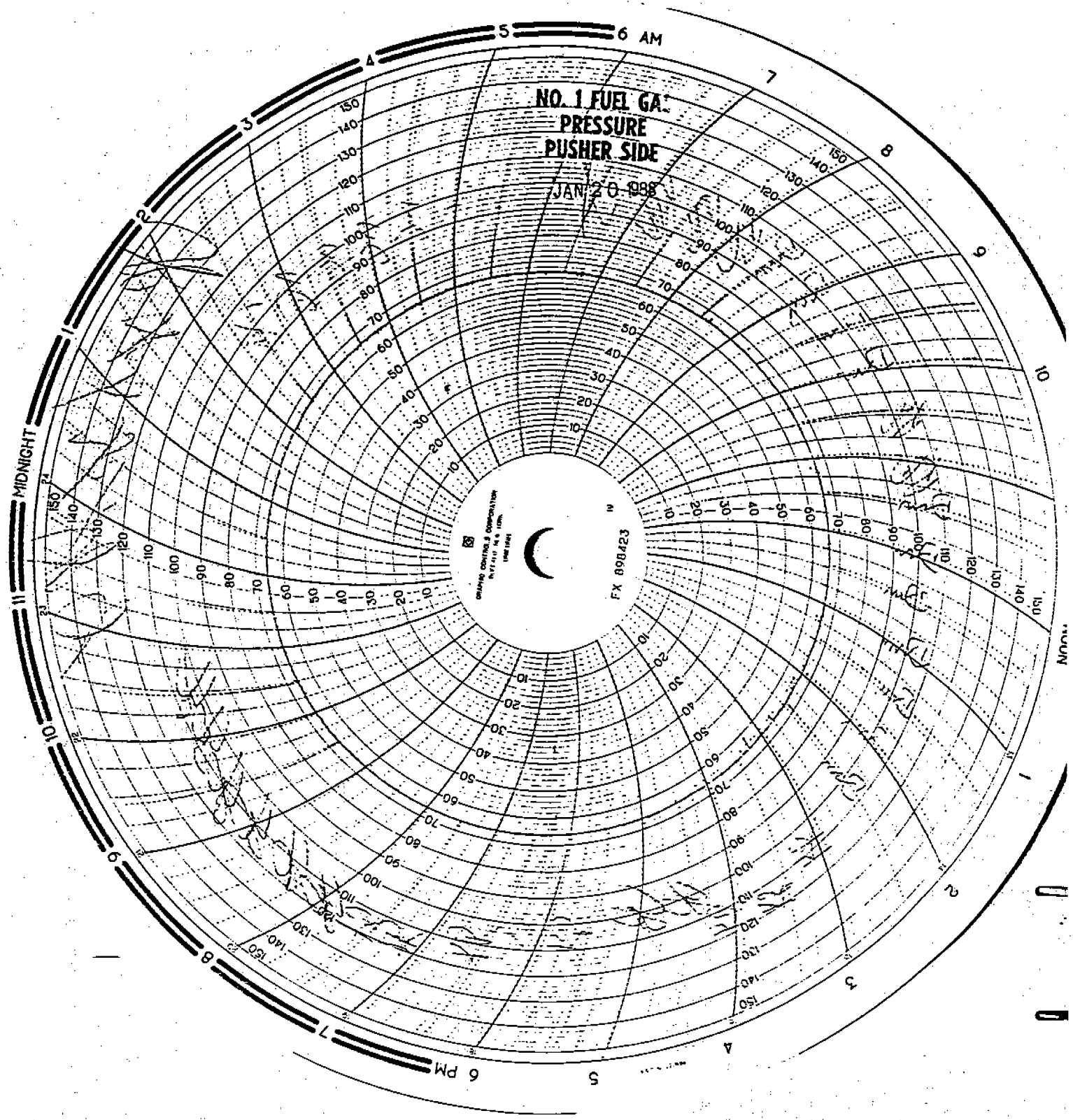

NO. 1 BATTERY
FLUSHING LIQUOR
JAN 19 1988
6 AM
NOON
6 PM
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
FX 888356

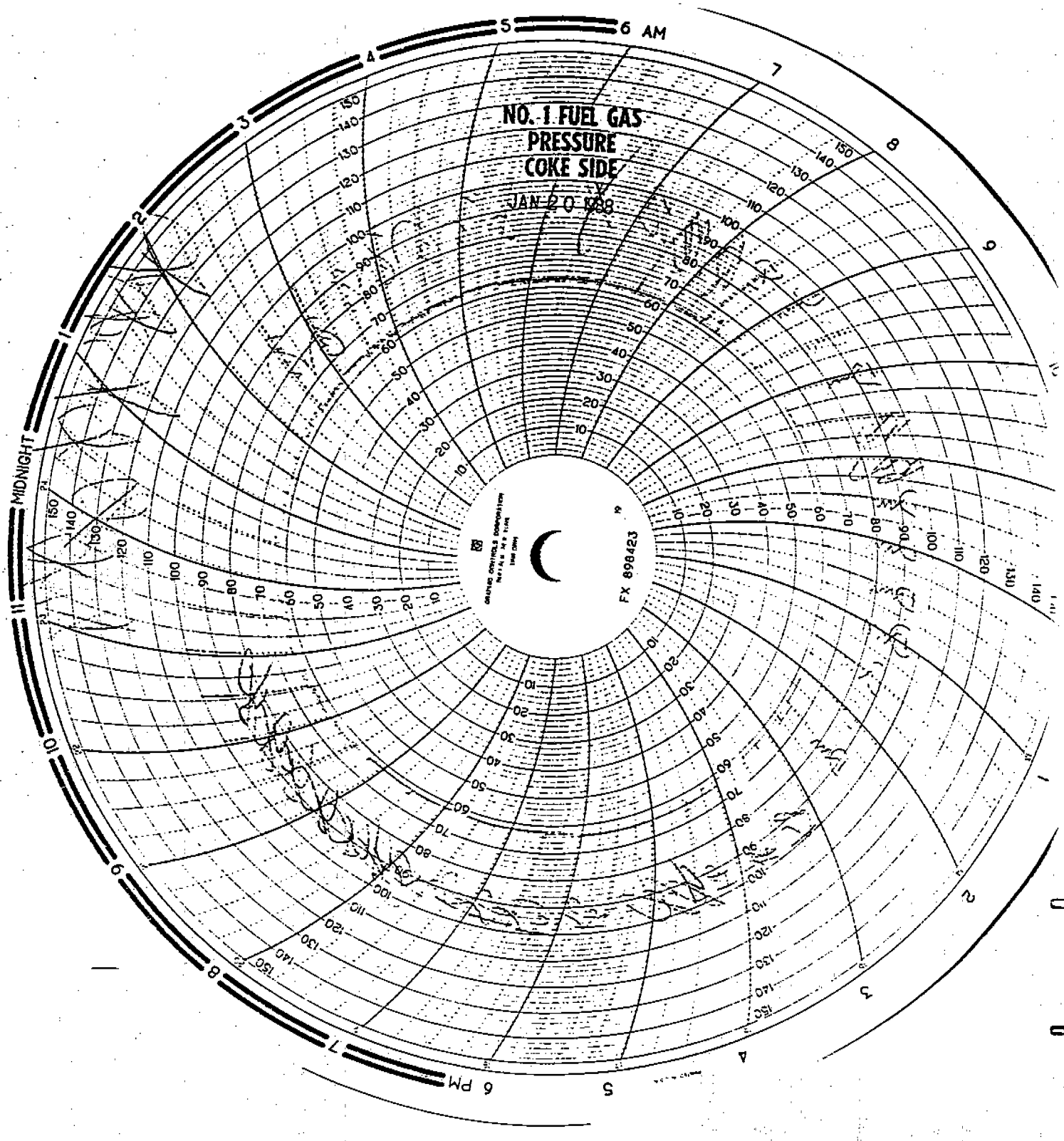

NO. 1
STACKDRAFT
PUSHER-SIDE
JAN 20 1988
6 AM
NOON
6 PM
MIDNIGHT
FX 898504

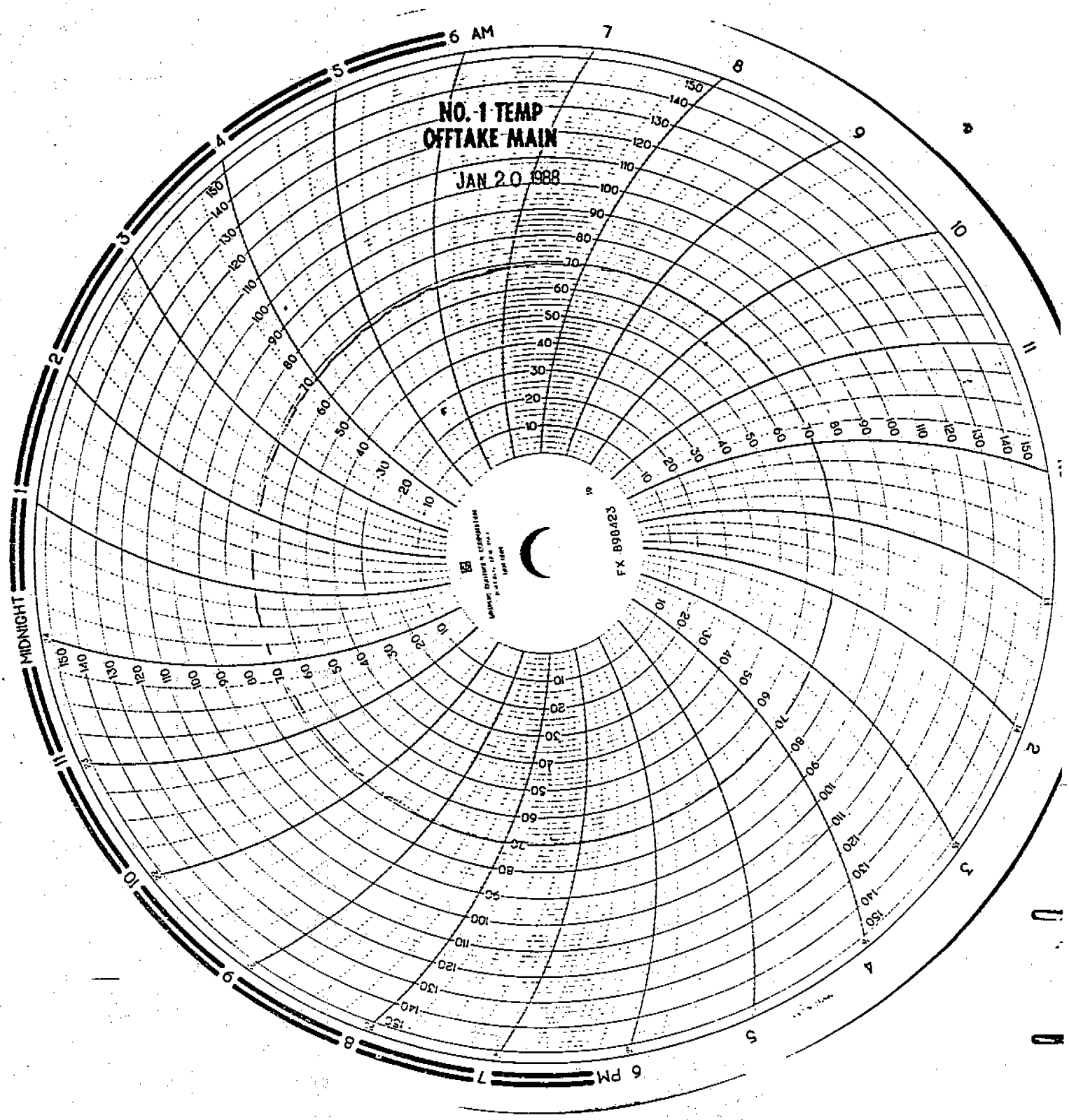

NO. 1
STACKDRAFT
COKE SIDE
JAN 20 1988
6 AM
6 PM
MIDNIGHT
NOON
FX 898504

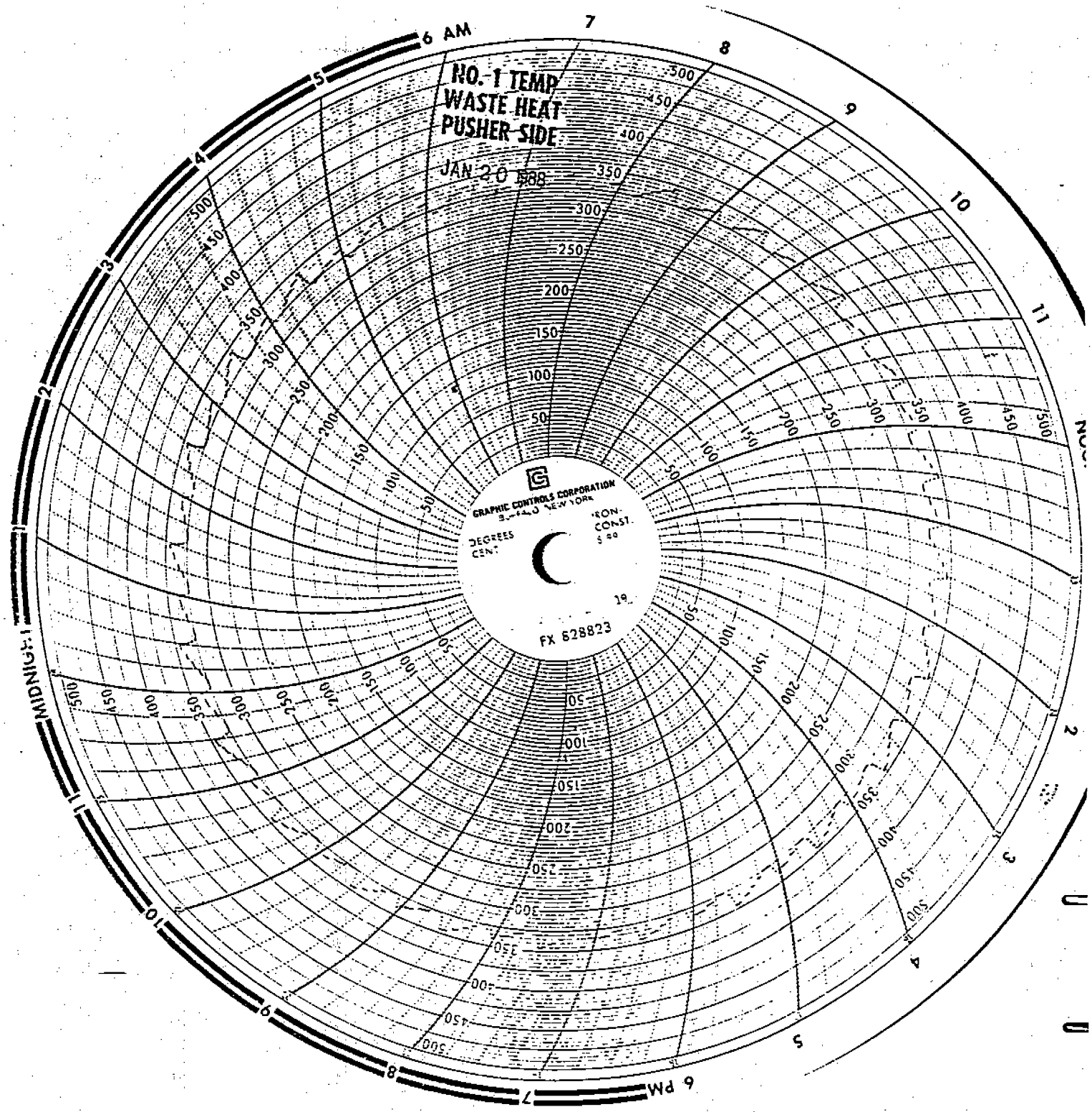

NO. 1 PRESS
CROSSOVER
PUSHER SIDE
JAN 20 1988
6 AM
6 PM
MIDNIGHT
FX 808617

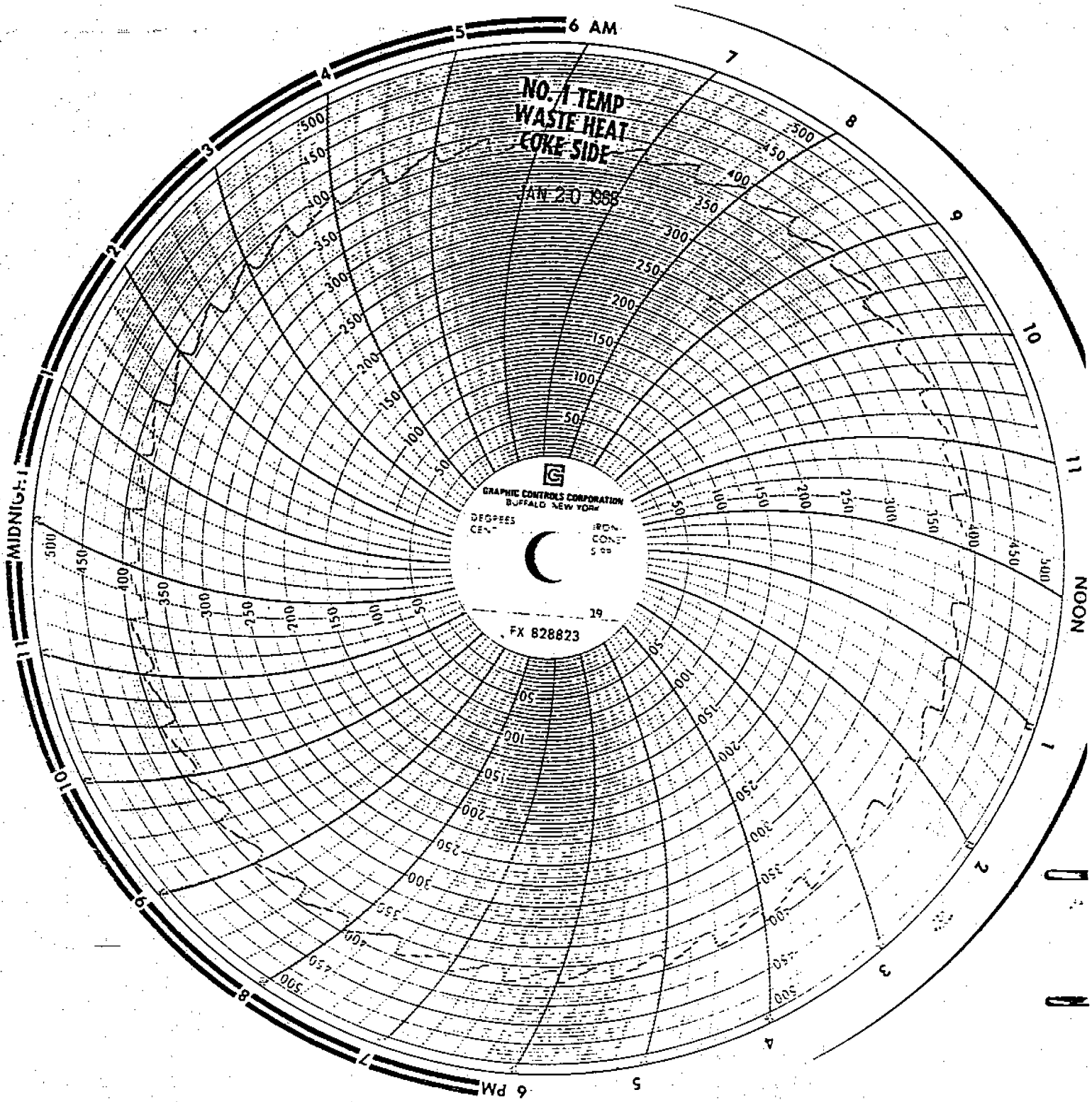
6 AM
NO. 1 PRESS
CROSSOVER
COKE SIDE
JAN 20 1900
MIDNIGHT
NOON
6 PM
FX 808617

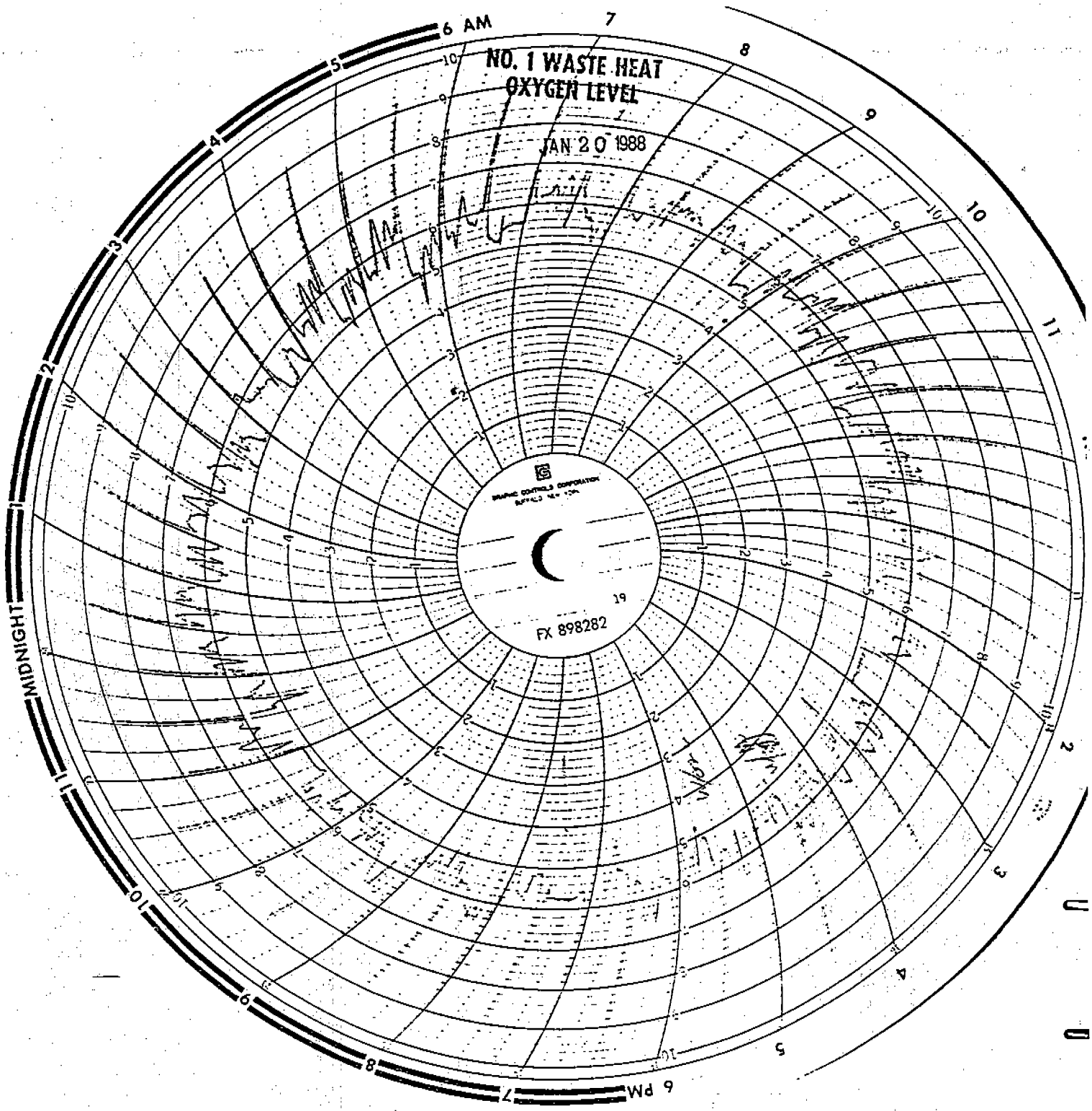

NO. 1 FUEL GAS
PRESSURE
PUSHER SIDE
JAN 20 1988
MIDNIGHT
6 AM
6 PM
NOON
FX 898423

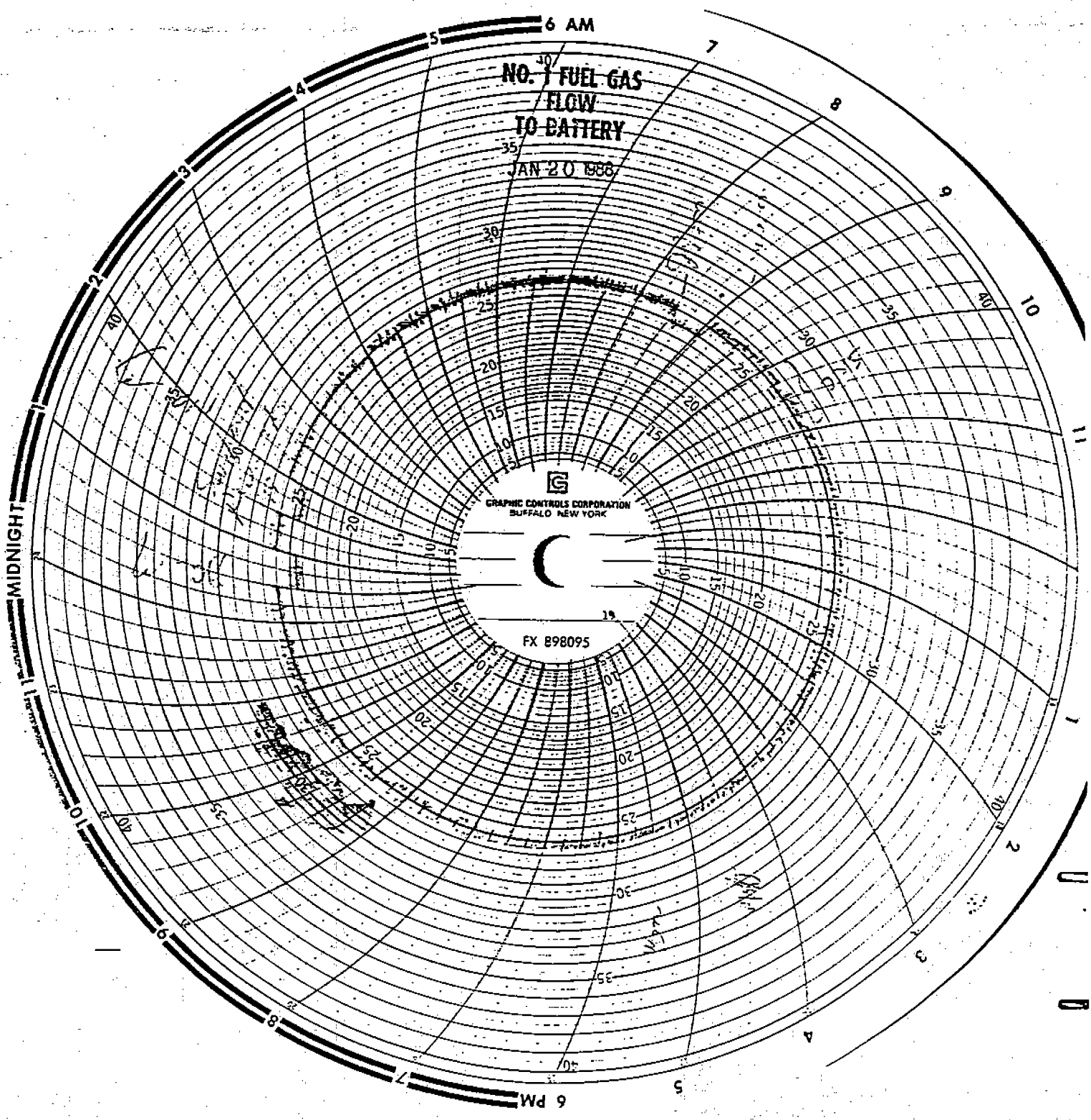

NO. 1 FUEL GAS
PRESSURE
COKE SIDE
JAN 20 1988
MIDNIGHT
6 AM
6 PM
FX 898423

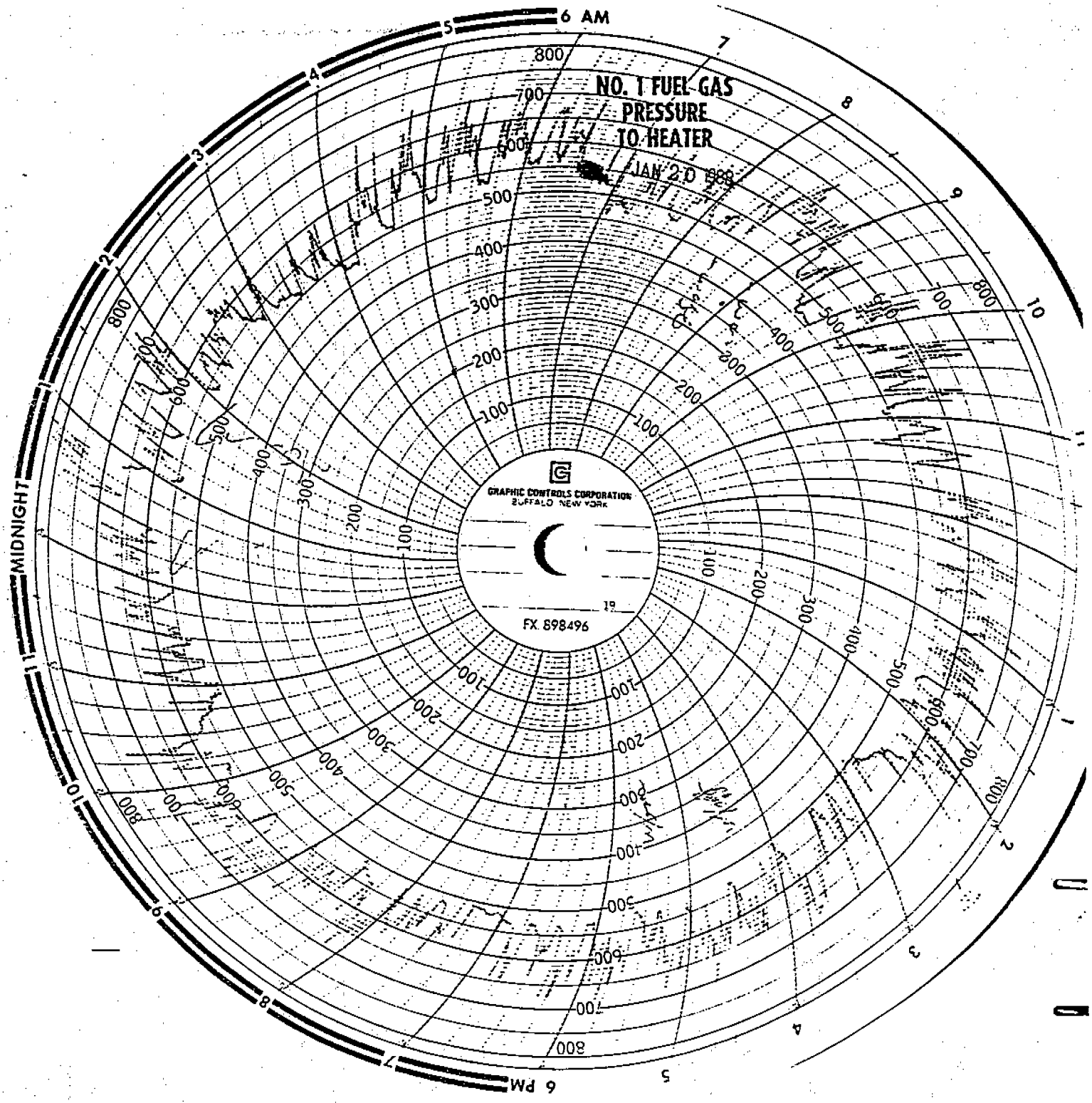

NO. 1 TEMP
OFFTAKE MAIN
JAN 20 1988
6 AM
6 PM
MIDNIGHT
FX 898423


NO. 1 TEMP
WASTE HEAT
PUSHER SIDE
JAN 20 1988
6 AM
7
8
9
10
11
6 PM
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
DEGREES CENT
FX 628823

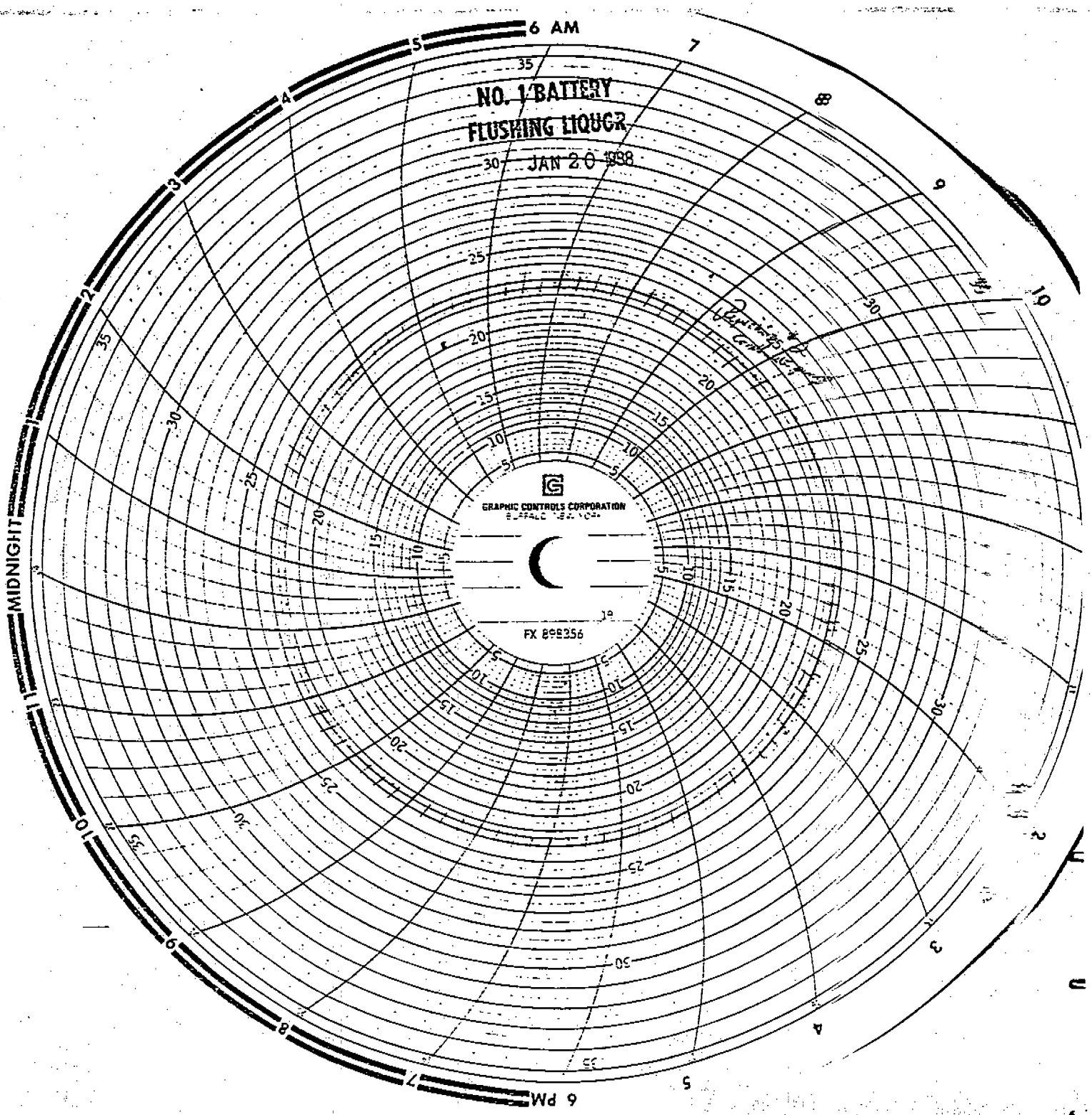

NO. 1 TEMP
WASTE HEAT
COKE SIDE
JAN 20 1968
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
FX 828823
6 AM
NOON
6 PM
MIDNIGHT

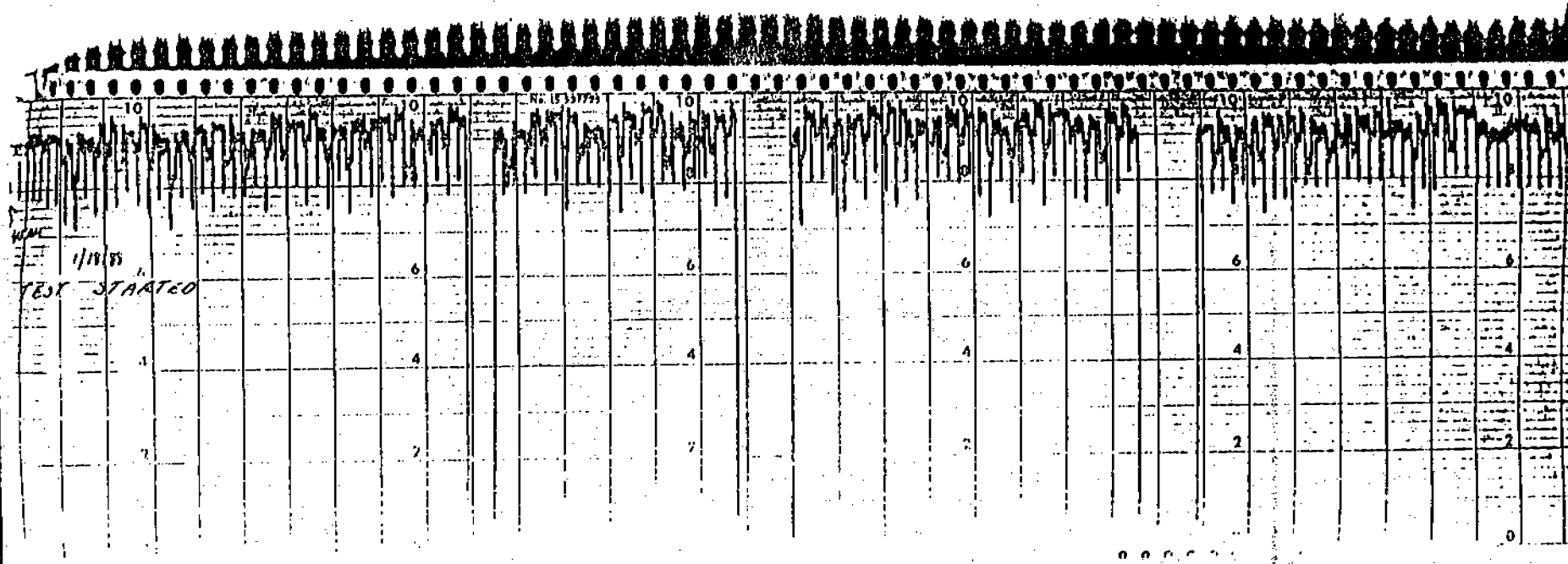

NO. 1 WASTE HEAT
OXYGEN LEVEL
JAN 20 1988
6 AM
6 PM
MIDNIGHT
FX 898282

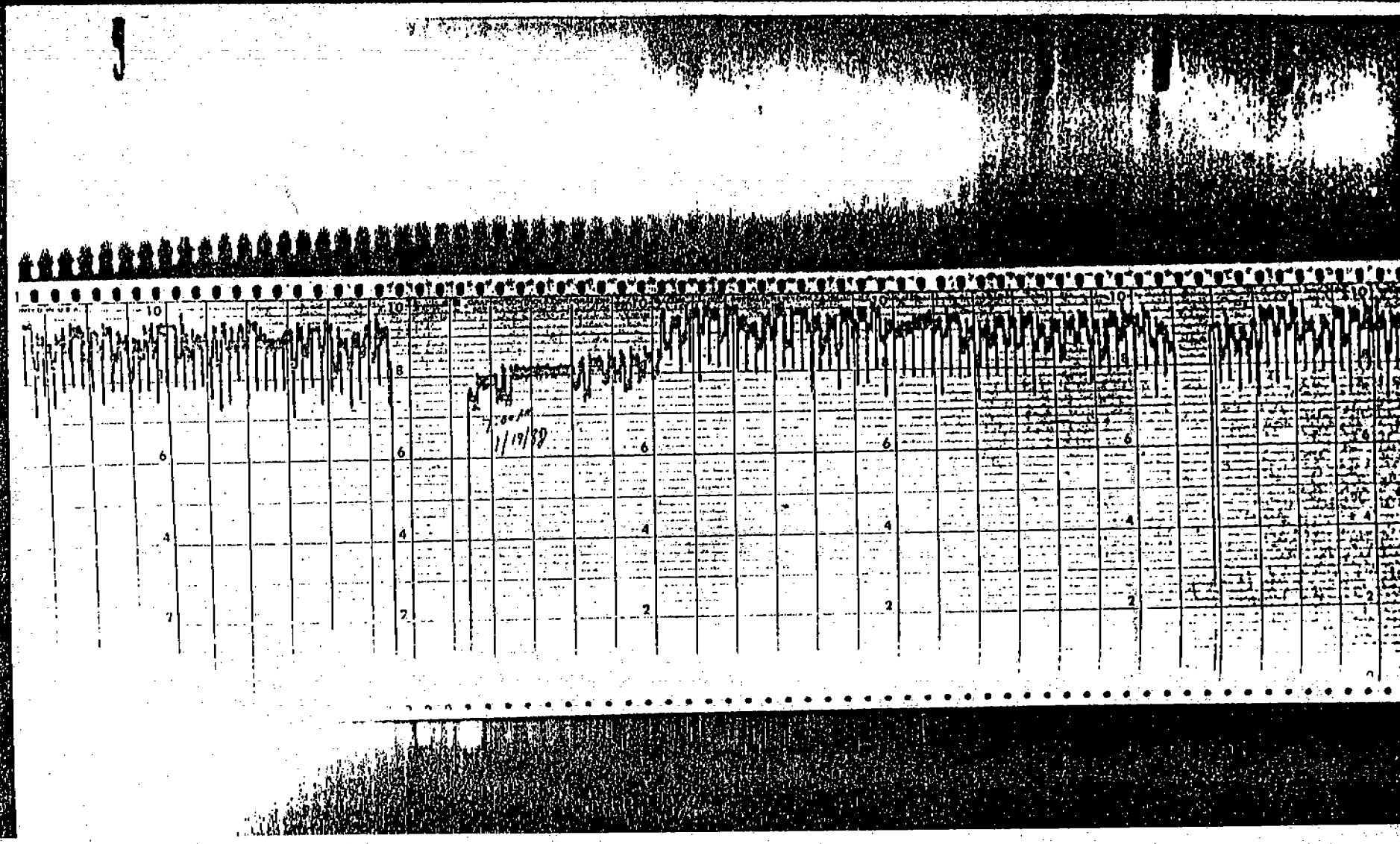

NO. 1 FUEL GAS
FLOW
TO BATTERY
JAN 20 1988
6 AM
6 PM
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
FX 898095

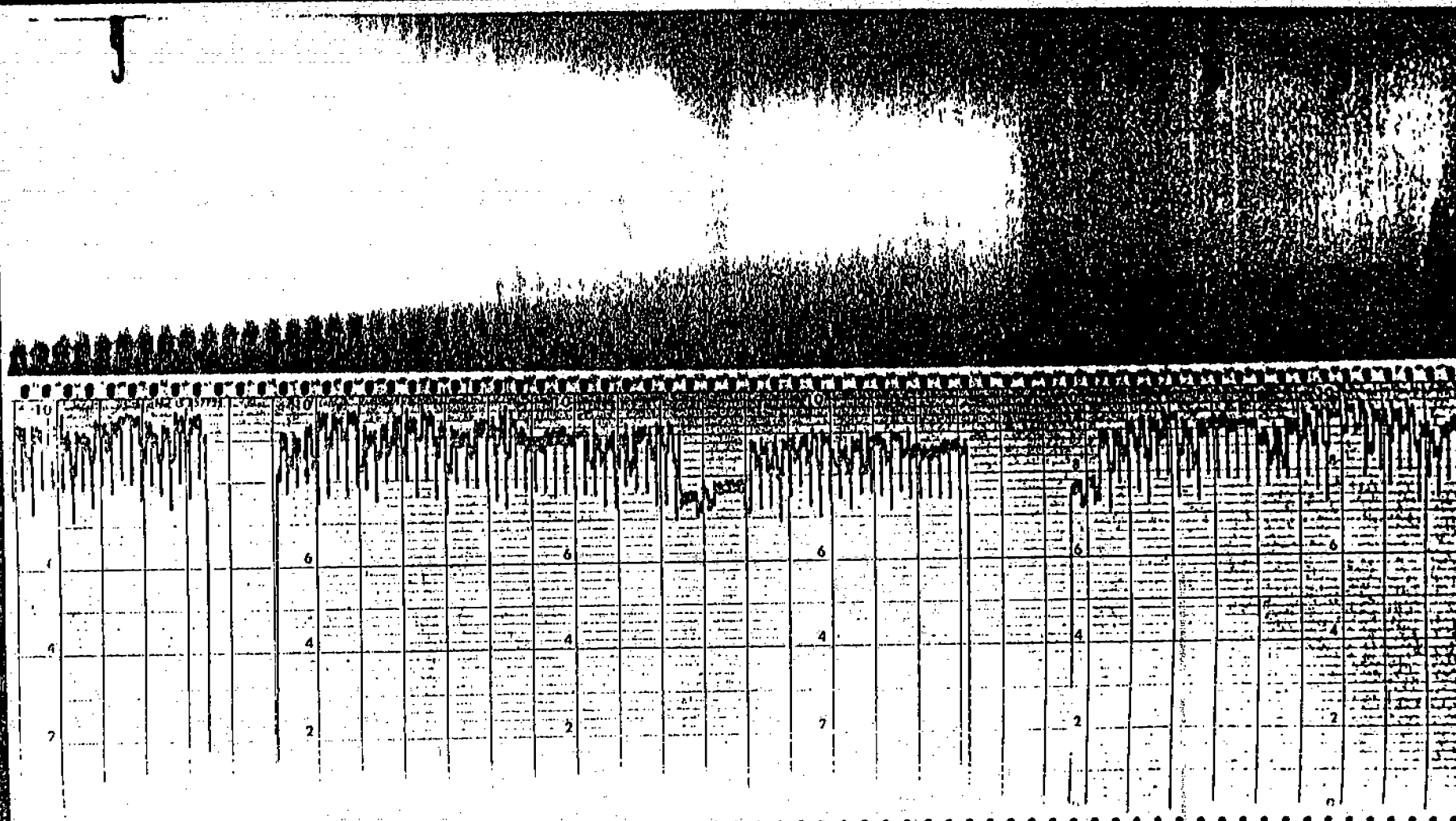

NO. 1 FUEL GAS
PRESSURE
TO HEATER
JAN 20 1988
6 AM
6 PM
MIDNIGHT
GRAPHIC CONTROLS CORPORATION
BUFFALO NEW YORK
FX 898496

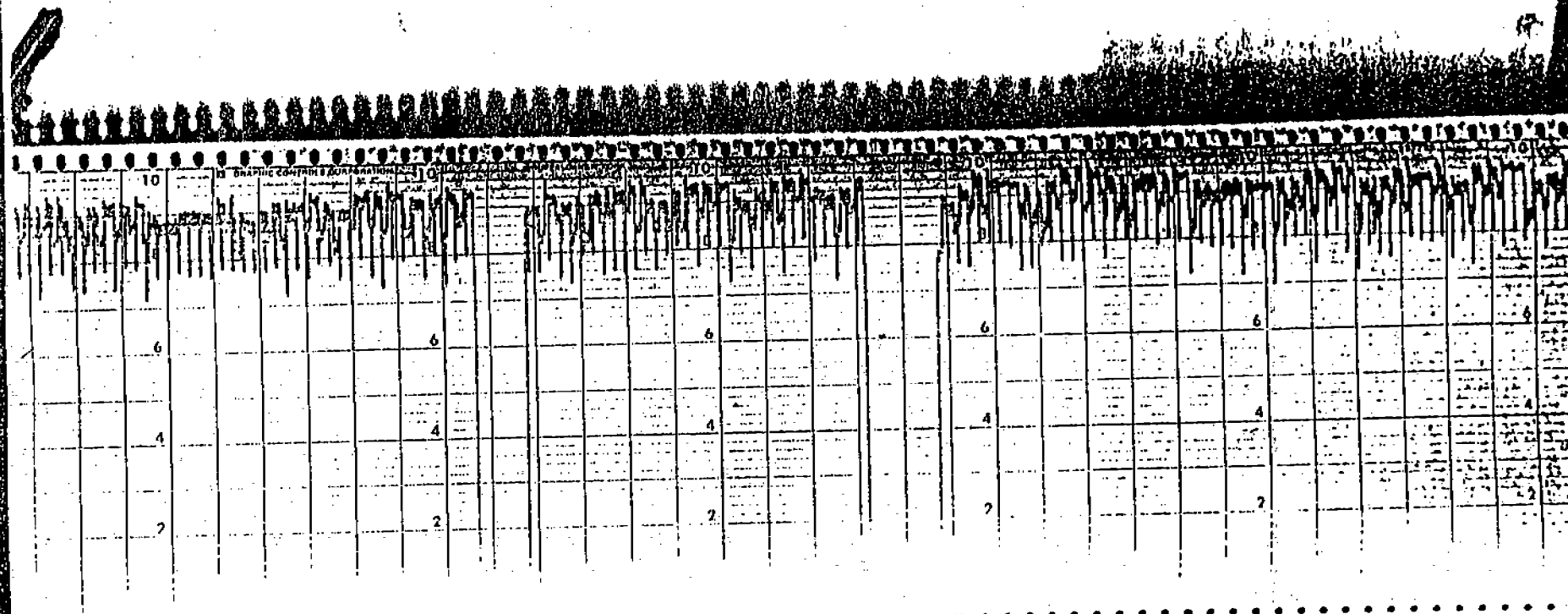
NO. 1 FUEL GAS
HEATER TEMP.
BEFORE/AFTER
JAN 20 1988
NOON
MIDNIGHT
6 A.M.
6 P.M.
FX 828962

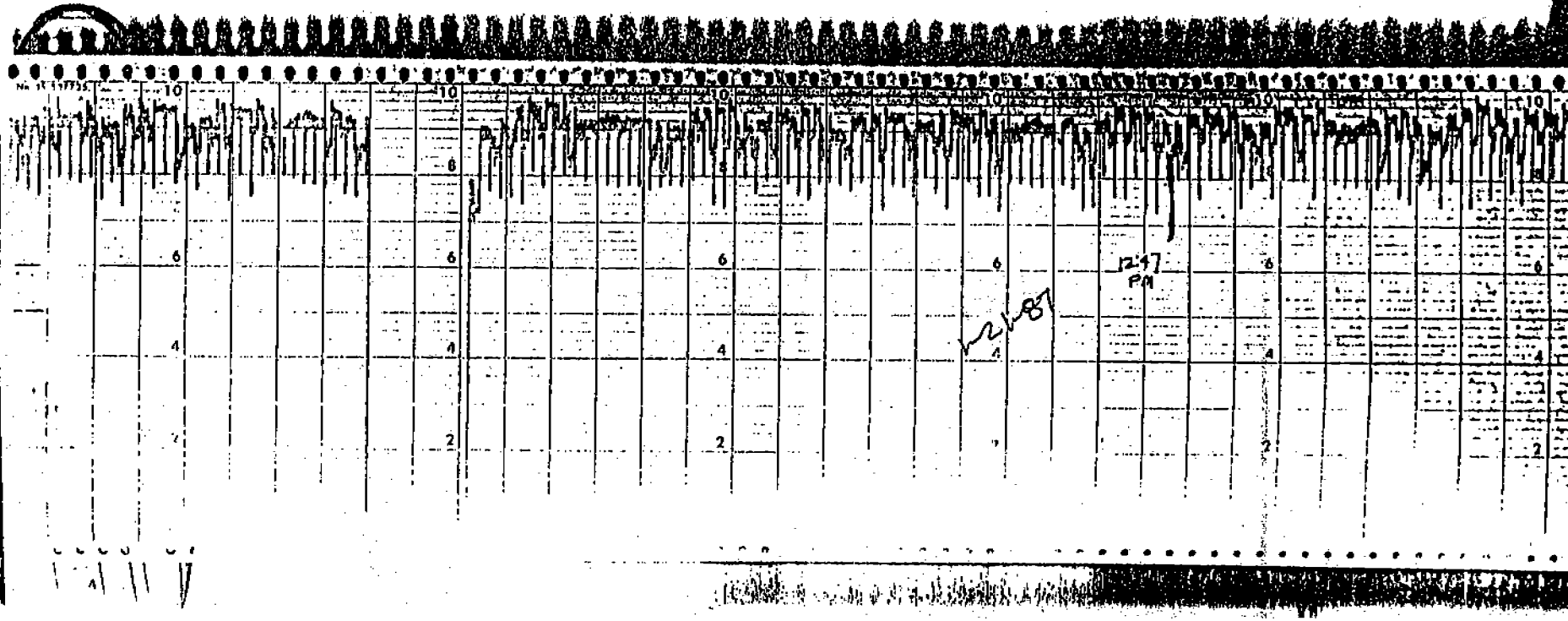

6 AM
NO. 1 BATTERY
FLUSHING LIQUOR
JAN 20 1988
MIDNIGHT
6 PM
GRAPHIC CONTROLS CORPORATION
FX 898256

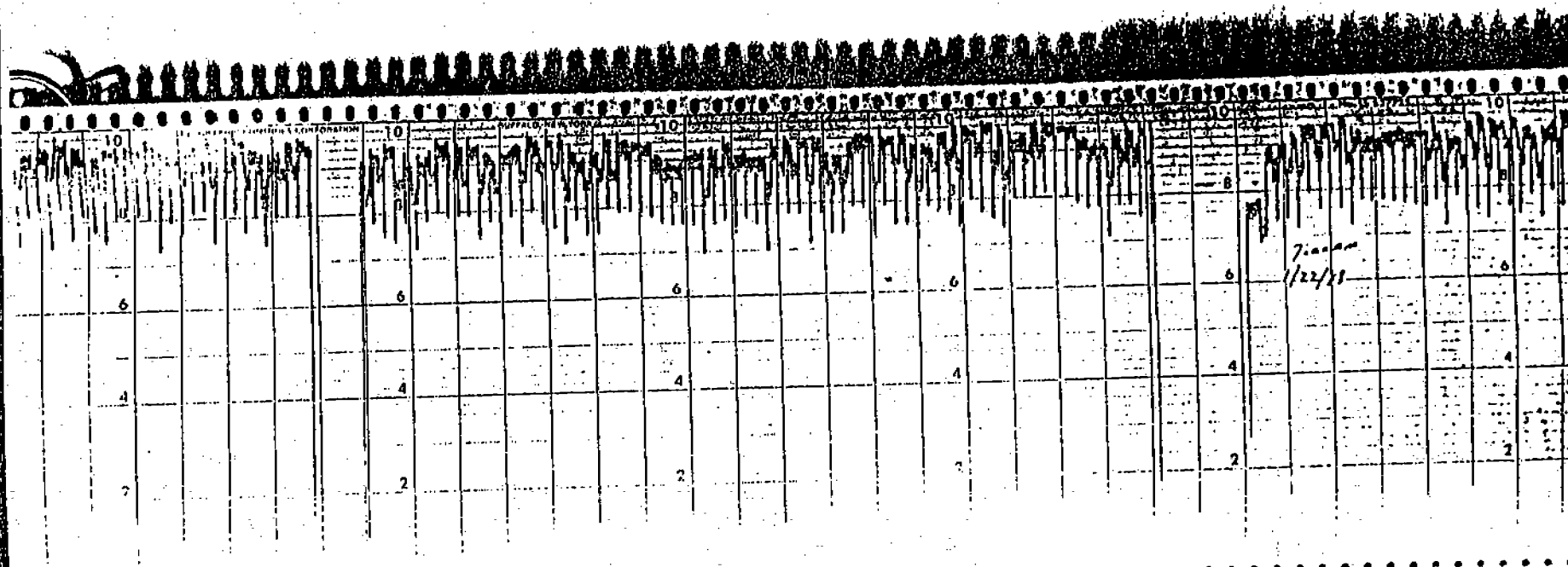

1/11/11
TEST STARTED

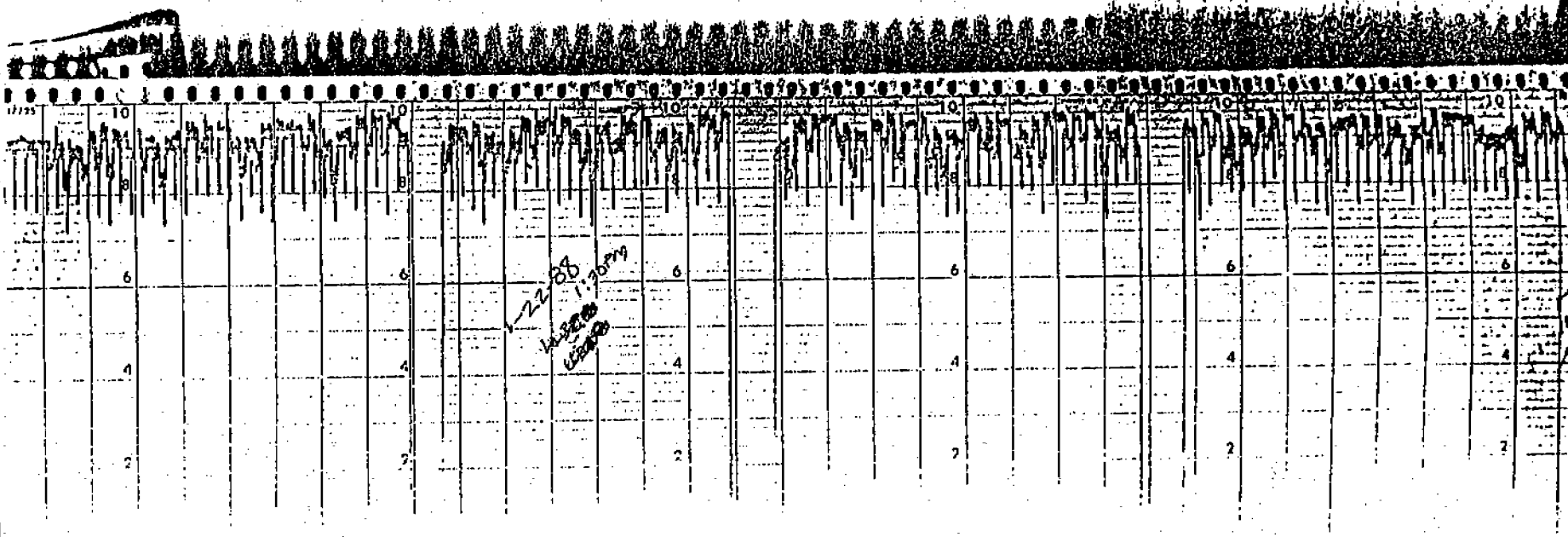


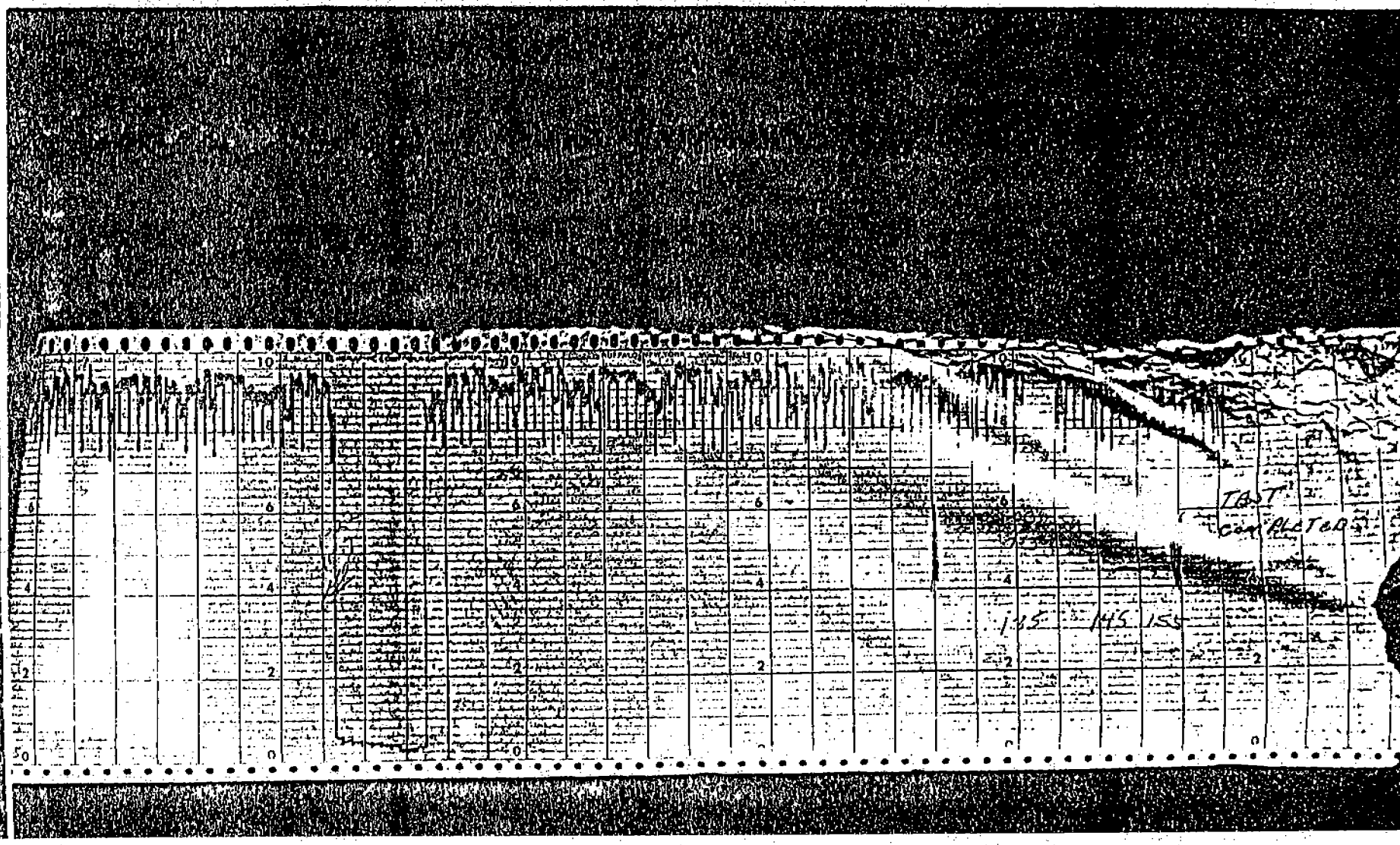


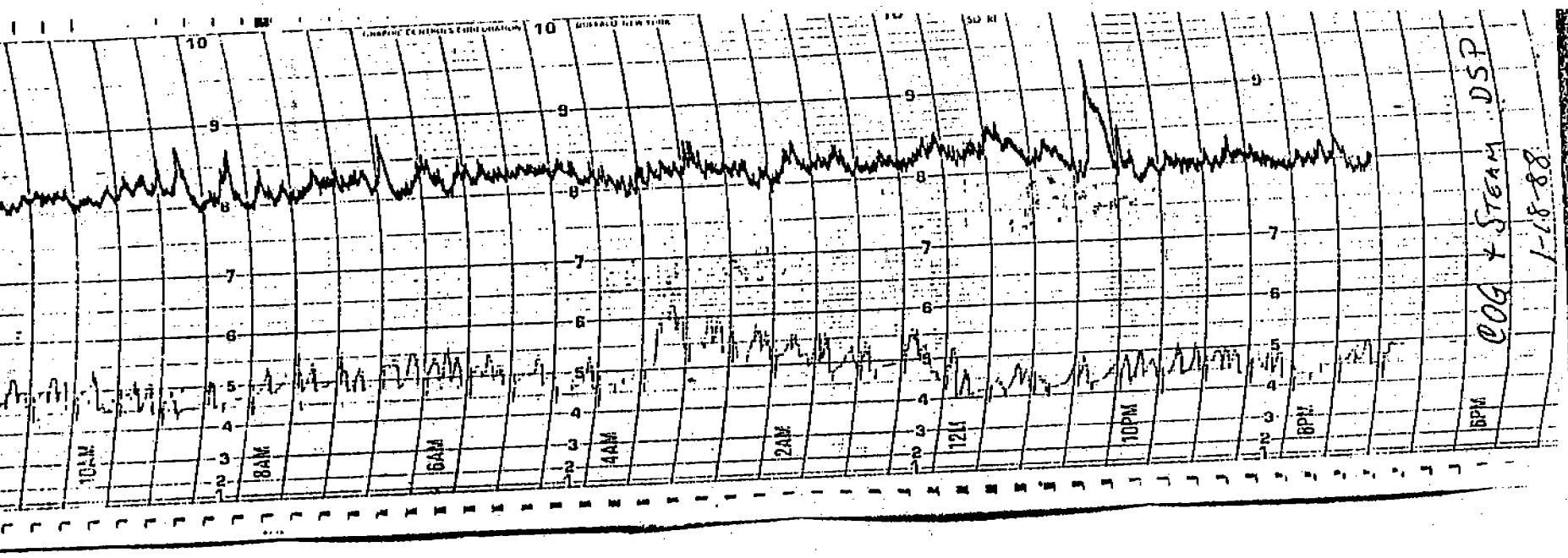


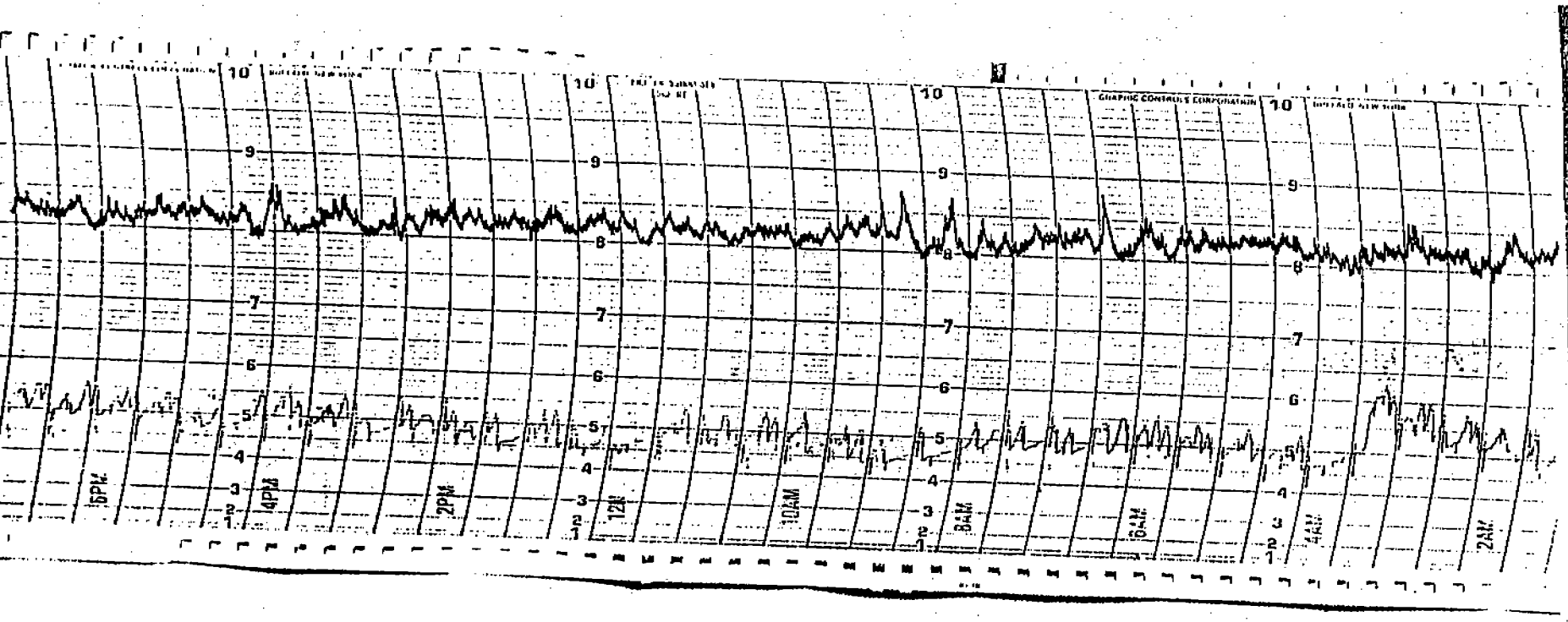

12:47
PM

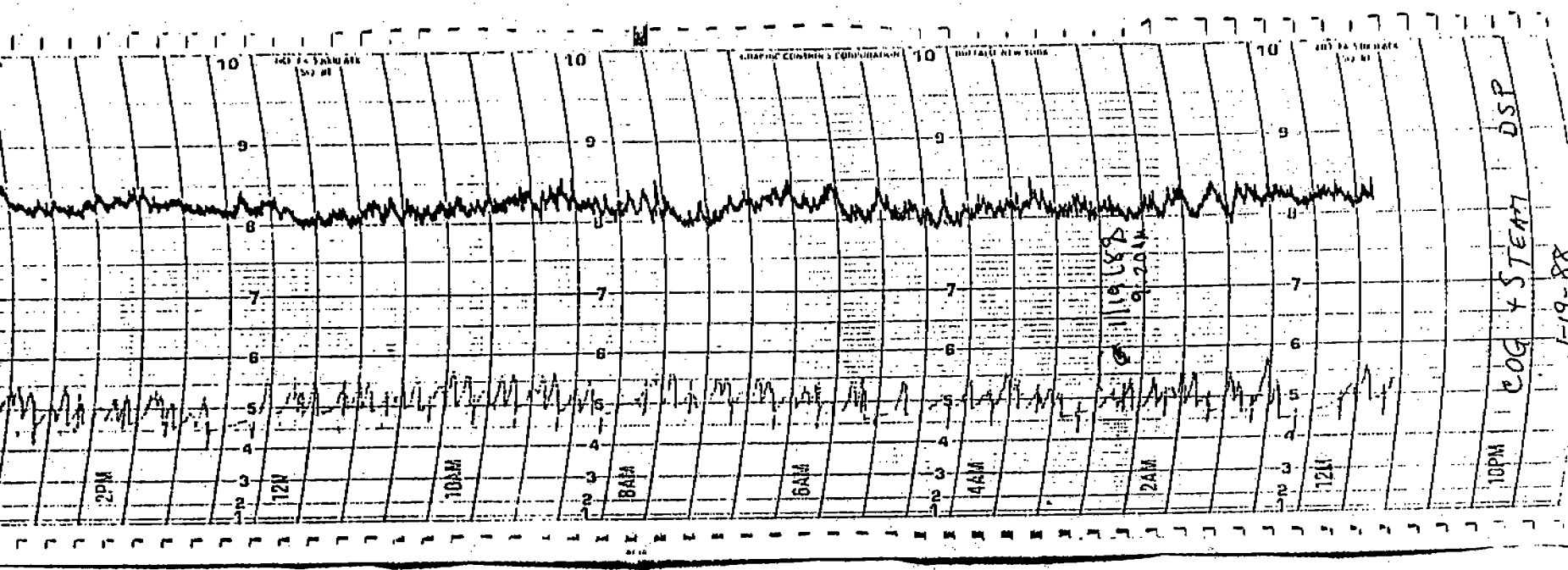



1-22-88
1:30PM

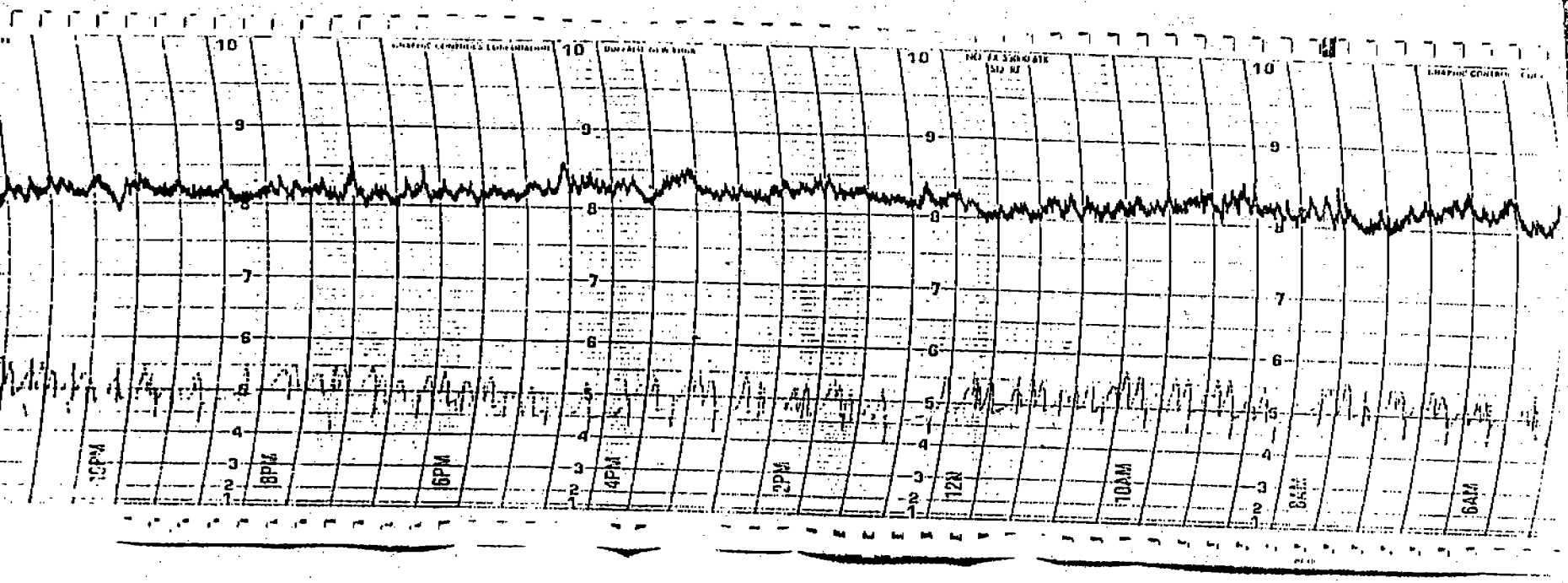

TEST
COMPLETED
135
145
155


10AM
8AM
6AM
4AM
2AM
12M
10PM
8PM
6PM
COG + STEAM DSP
1-18-88

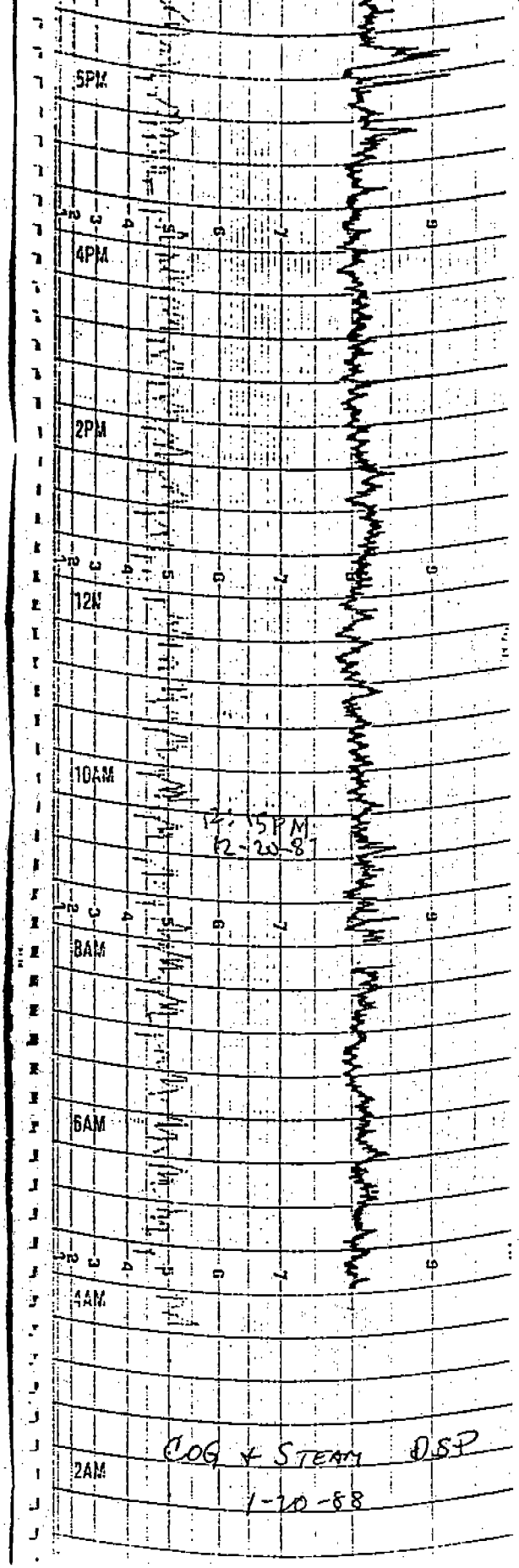

GRAPHIC CONTROLS CORPORATION
6PM
4PM
2PM
12M
10AM
8AM
6AM
4AM
2AM

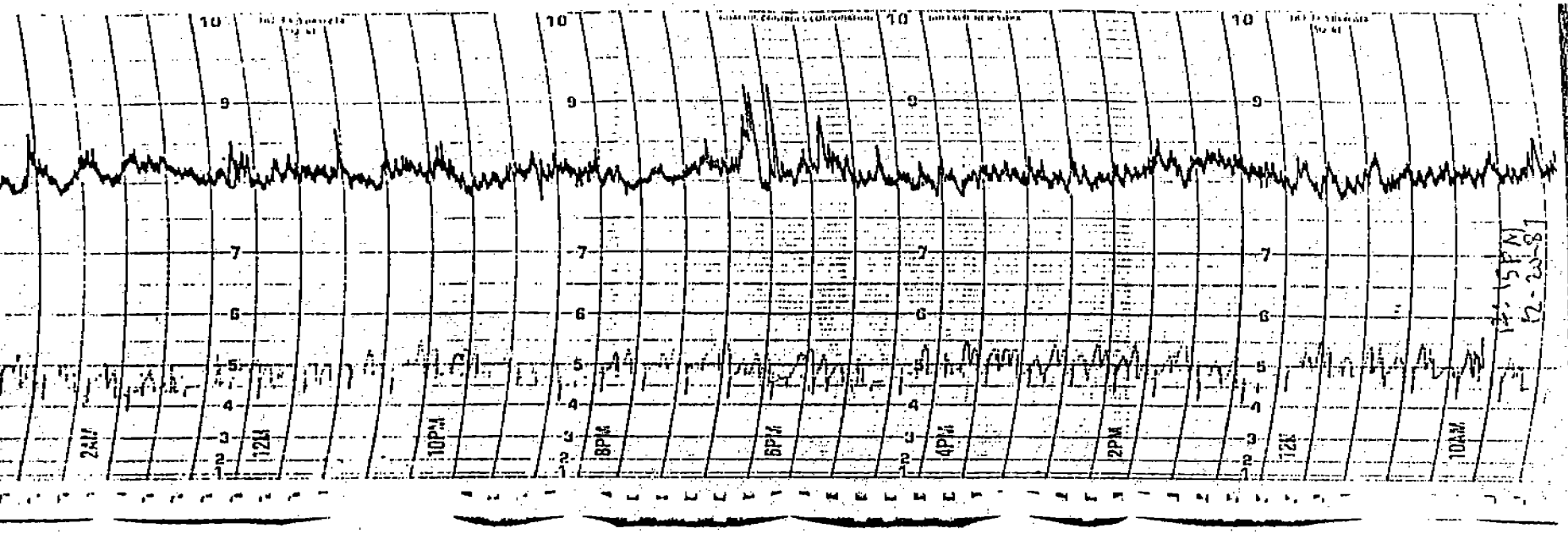


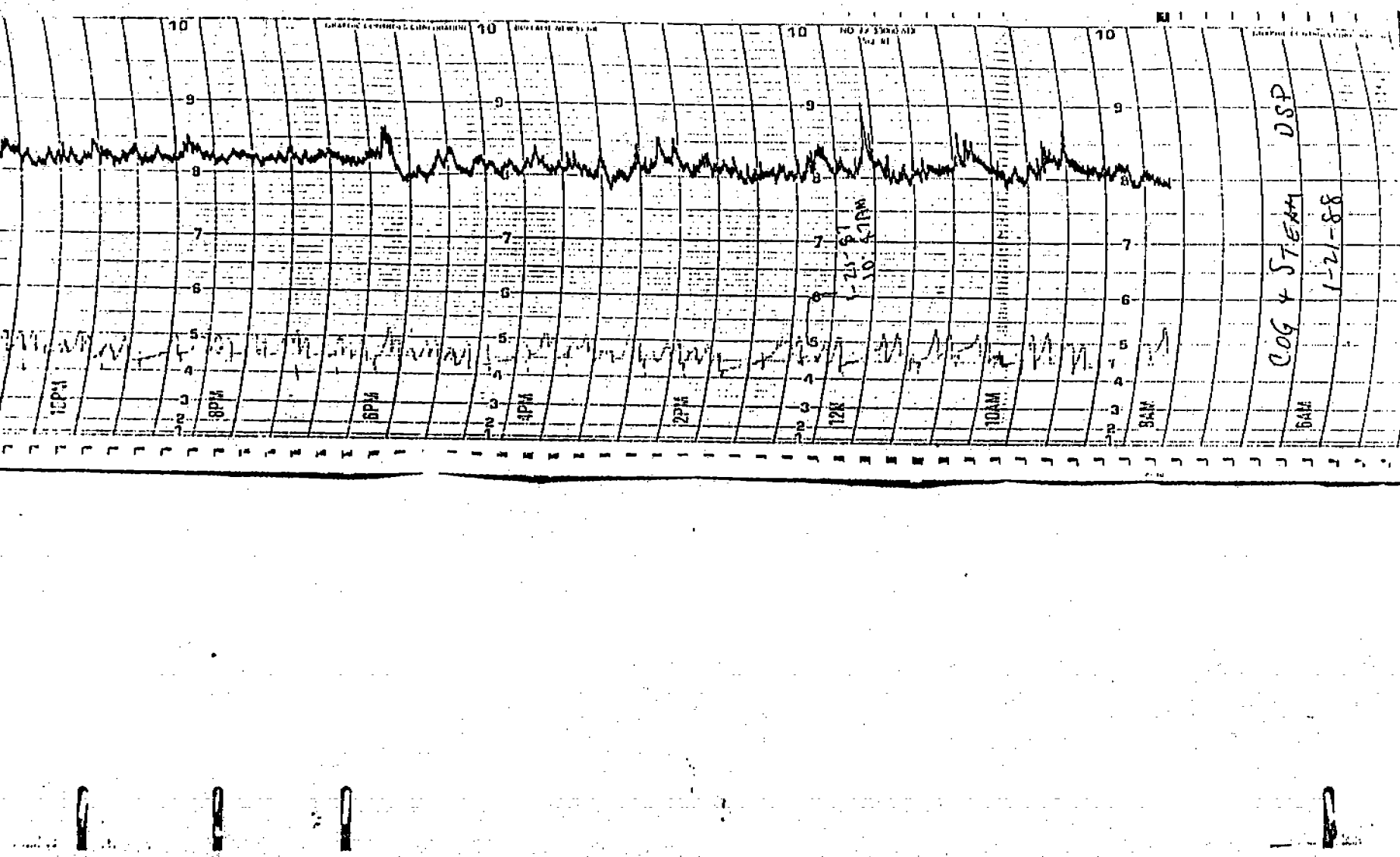
2PM
12N
10AM
8AM
6AM
4AM
2AM
12M
10PM
COG + STEAM DSP
1-19-88


10PM
8PM
6PM
4PM
2PM
12N
10AM
8AM
6AM

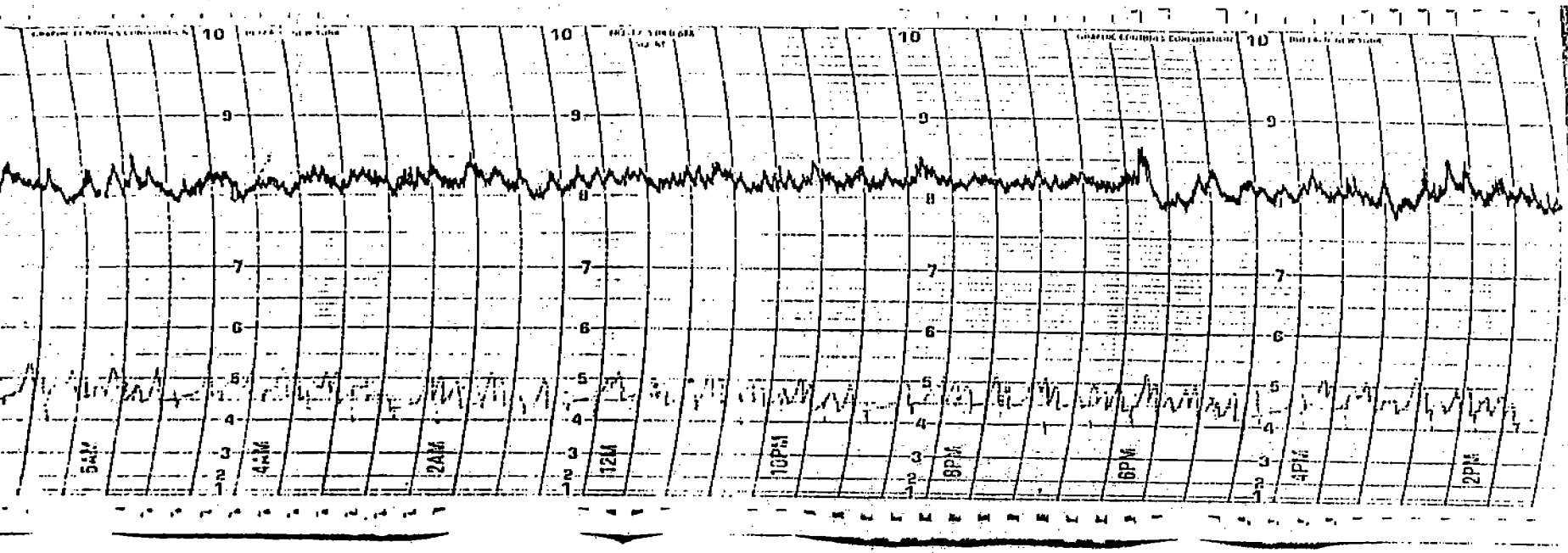
12:15PM
12-24-81
10AM
12N
2PM
4PM
6PM
8PM
10PM
12M
2AM

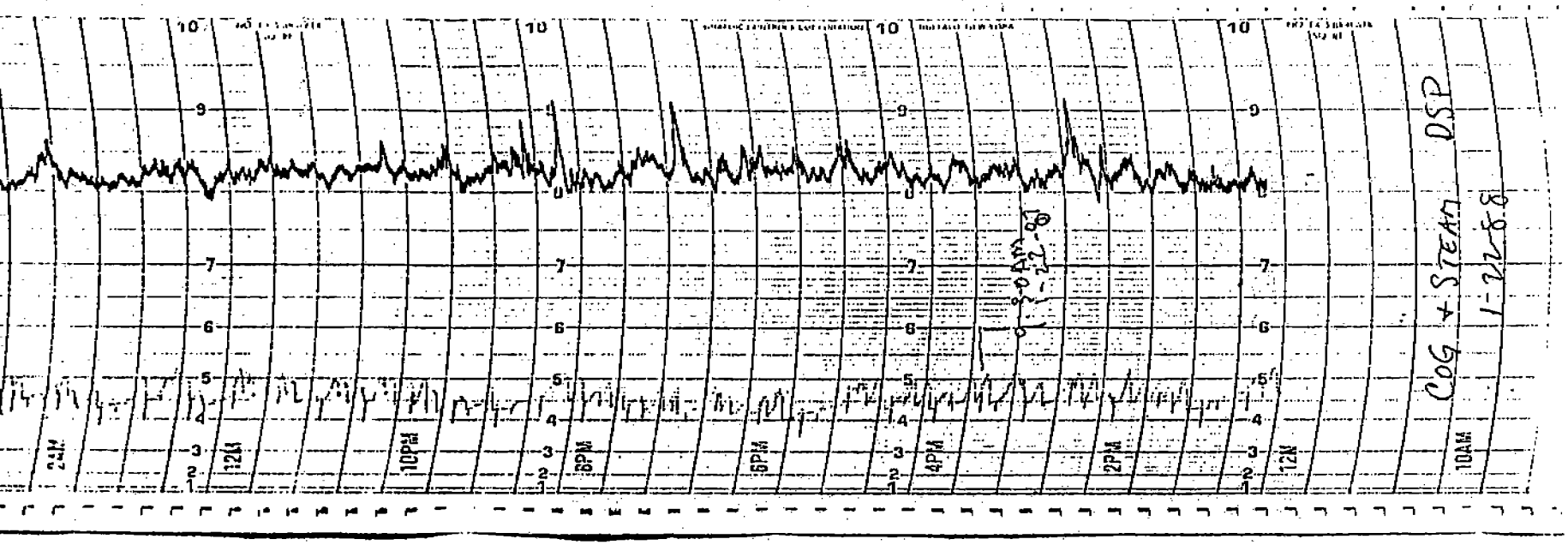

5PM
4PM
2PM
12N
10AM
12:15PM
12-20-87
8AM
6AM
4AM
2AM
COG + STEAM DSP
1-20-88


10
9
7
6
5
4
3
2
1
2AM
12M
10PM
8PM
6PM
4PM
2PM
12M
10AM

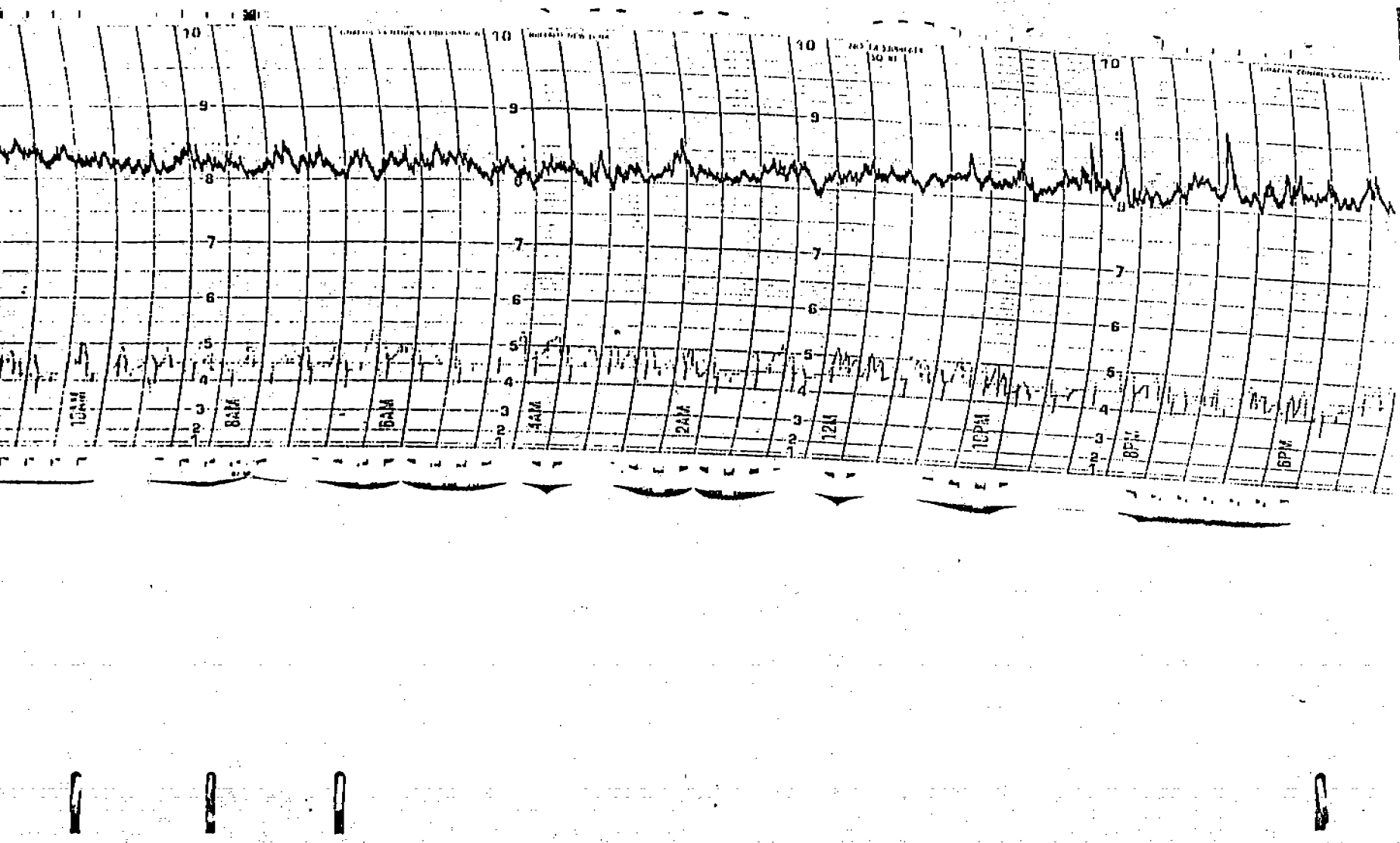


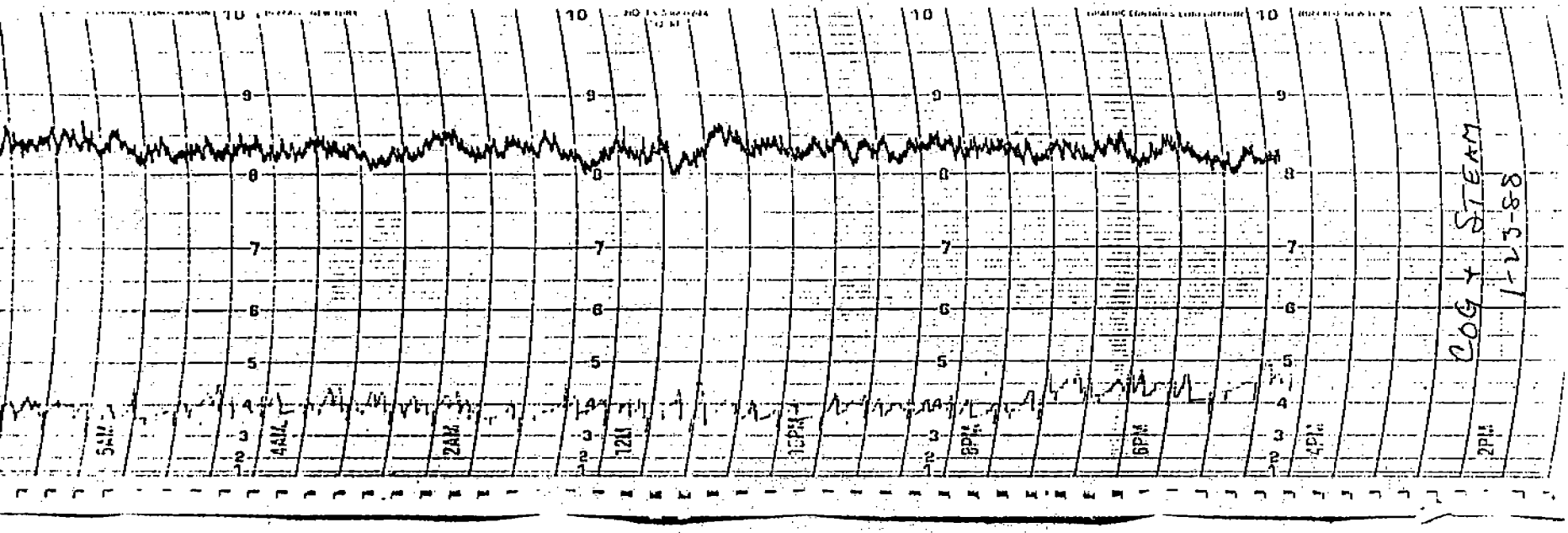
10
9
8
7
6
5
4
3
2
1
10PM
8PM
6PM
4PM
2PM
12M
10AM
8AM
6AM
1-21-87
10:47AM
COG + STEAM DSP
1-21-88

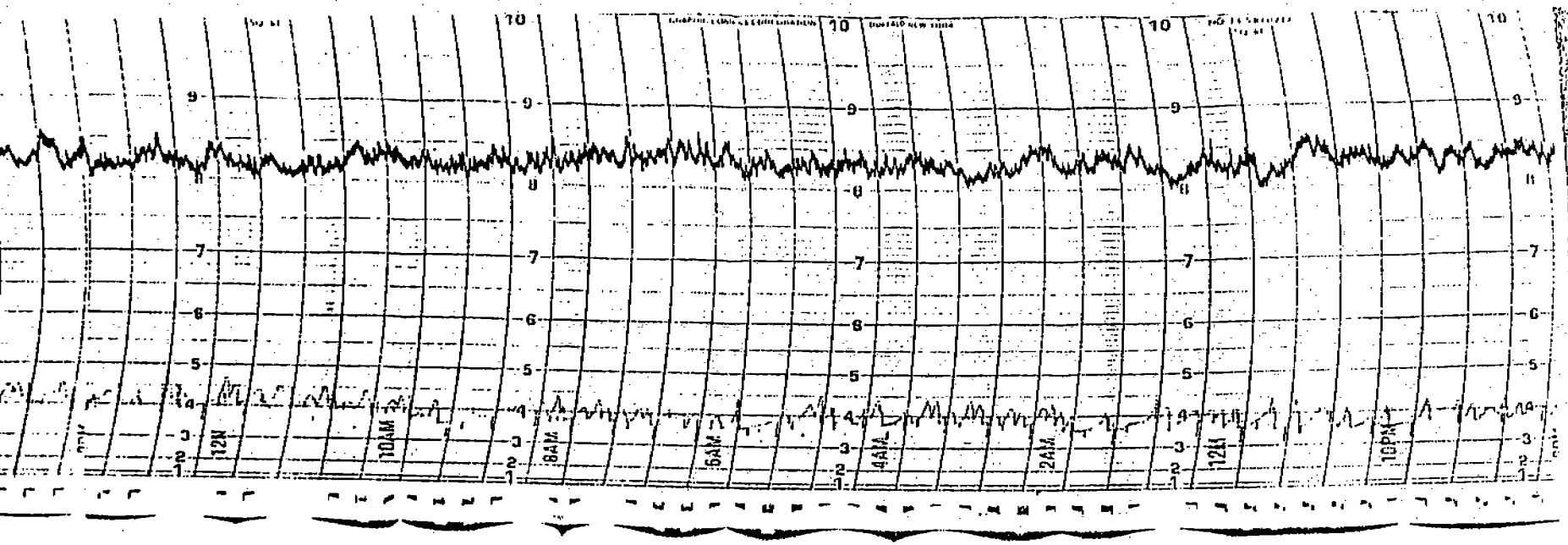

10
9
8
7
6
5
4
3
2
1
4AM
2AM
12M
10PM
8PM
6PM
4PM
2PM



10
9
8
7
6
5
4
3
2
1
24M
12M
10PM
8PM
6PM
4PM
2PM
12M
10AM
COG + STEAM DSP
1-22-88


10
9
8
7
6
5
4
3
2
1
10AM
8AM
6AM
4AM
2AM
12M
10PM
8PM
6PM


10
9
8
7
6
5
4
3
2
1
5AM
4AM
2AM
12M
10PM
8PM
6PM
4PM
2PM
COG + STEAM
1-23-88


12N
10AM
8AM
6AM
4AM
2AM
12N
10PM