

Computer inventoried

CORE ANALYSIS REPORT

FOR

GULF OIL EXPLORATION & PRODUCTION CO.  
ARCHIE HUGHES NO. 1-22 WELL  
SHERIDAN COUNTY, KANSAS

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
DALLAS, TEXAS 75207

March 30, 1978

REPLY TO  
SUITE 133  
400 SOUTH VERMONT  
OKLAHOMA CITY, OKLA.  
73108

Gulf Oil Exploration and Production Company  
P. O. Box 12116  
Oklahoma City, Oklahoma 73112

Attn: Mr. Earl Hale

Subject: Core Analysis Data  
Archie Hughes No. 1-22 Well  
Sheridan County, Kansas  
CLI File 3402-9253

Gentlemen:

Cores taken in the subject well in the Lansing-Kansas City formation were received at the Oklahoma City laboratory for special analytical testing described on the procedure page.

The accompanying Coregraph presents the Surface Core-Gamma Log and binomially averaged core analysis data in graphical form to aid correlation with downhole electrical surveys.

Tabular presentation of the measured physical properties may be found on pages one and two of this report. Data averages reflecting zone changes are presented on page three.

Core analysis data in the cored interval between 3962 and 4225 feet indicate the majority of the formation to have low matrix permeability and poor porosity development. Samples with sufficient permeability and porosity to be oil productive occur in scattered, very thin zones. The zones that may be oil productive would have very low productive capacity due to the limited matrix permeability.

It is a pleasure to have this opportunity of serving you.

Very truly yours,

CORE LABORATORIES, INC.

*Dale E. Boyle (VJP)*  
Dale E. Boyle  
District Manager

DEB:VJP:sb  
6 cc - Addressee

Gulf Oil Exploration and Production Company  
Archie Hughes No. 1-22 Well  
CLI File 3402-9253

Procedure Page

#### Handling and Analytical Procedures

Diamond coring equipment and water base mud were used to obtain 4.0 inch diameter cores from selected intervals between 3962 and 4225 feet.

Cores were preserved at well site with saran and aluminum foil by CLI personnel.

The cores were transported to Oklahoma City by CLI personnel.

A Core-Gamma Log was recorded for downhole E-Log correlation.

Core analysis was made in the intervals requested on right cylinder full diameter samples.

Fluid removal was accomplished using vacuum retorts.

Porosity was determined by density balance method.

Air permeability in two horizontal directions--measured without Klinkenberg correction.

Selected intervals were slabbed for future geological study.

Slab segments have been picked up by a representative of Gulf Oil Exploration and Production Company.

Temporary storage of cores in Oklahoma City laboratory awaiting additional instructions.

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

GULF OIL EXP. & PROD. COMPANY  
 ARCHIE HUGHES NO. 1-22 WELL  
 SHERIDAN COUNTY, KANSAS

DATE: 3/10/78  
 FORMATION: LANSING-KANSAS CITY  
 DRLG. FLUID: WATER BASE MUD  
 LOCATION: C SW SW SEC. 22-9S-29W

FILE NO: 3402-9253  
 ENGINEER: PUGH  
 ELEVATION:

\* INDICATES PLUG PERM.

SMP. NO.	DEPTH	PERM. TO AIR MD. MAXIMUM	90 DEG	POROSITY PERCENT	FLUID SATS. OIL	WTR.	GR. DEN.	DESCRIPTION
WHOLE CORE ANALYSIS								
	3962.0-68.0							SH
1	3968.0-69.0	<0.1	<0.1	2.9	3.0	85.0	2.73	LM, FOSS
2	3969.0-70.0	1.3	0.8	5.7	9.9	78.0	2.72	LM, PP VGS, PYR, STY
3	3970.0-71.0	22.0	13.0	13.7	16.5	57.9	2.72	LM, PP VGS, VF
4	3971.0-72.0	*	<0.1	7.6	5.0	86.1	2.73	LM, SH STKS, FOSS
5	3972.0-73.0	*	<0.1	6.8	5.0	80.5	2.73	LM, SH STKS
6	3973.0-74.0	*	<0.1	4.3	6.7	77.5	2.73	LM, SH STKS, VF
7	3974.0-75.0	*	<0.1	4.5	1.5	83.5	2.74	LM, SH STKS, FOSS, VF
8	3975.0-76.0	*	<0.1	3.6	1.0	86.1	2.72	LM, SH STKS, FOSS
9	3976.0-77.0	<0.1	<0.1	3.1	10.0	79.9	2.72	LM, FOSS
10	3977.0-78.0	1.1	0.6	4.7	3.6	87.2	2.73	LM, SL/SHY, FOSS
	3978.0-84.5							SH
	3984.5-99.0							LM
	3999.0-4108.0	DRILLED						
	4108.0-09.0							LM
11	4109.0-10.0	844.0	<0.1	4.6	0.0	79.0	2.72	LM, SH STKS, FOSS, VF
12	4110.0-11.0	63.0	0.5	6.0	12.7	70.4	2.70	LM, SH STKS, VF
13	4111.0-12.0	16.0	10.0	3.8	9.0	77.0	2.72	LM, SH STKS, FOSS, VF
14	4112.0-13.0	16.0	0.2	3.3	8.9	79.4	2.72	LM, VGY, FOSS, VF
	4113.0-18.0							SH
15	4118.0-19.0	3.3	0.5	12.1	0.0	88.8	2.72	LM, SL/SHY, FOSS
+ 16	4119.0-20.0	2149.0	0.1	3.6	0.0	82.6	2.75	LM, FOSS
17	4120.0-21.0	0.9	0.9	7.8	1.8	77.5	2.74	LM, PP VGS, FOSS
18	4121.0-22.0	0.1	<0.1	5.0	1.0	90.6	2.71	LM, PP VGS, FOSS

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

GULF OIL EXP. & PROD. COMPANY  
 ARCHIE HUGHES NO. 1-22 WELL

DATE: 3/10/78  
 FORMATION: LANSING-KANSAS CITY

FILE NO: 3402-9253  
 ENGINEER: PUGH

SMP. NO.	DEPTH	PERM. TO AIR MD. MAXIMUM	90 DEG	POROSITY PERCENT	FLUID SATS. OIL	WTR.	GR. DEN.	DESCRIPTION
	4122.0-32.0							SH
	4132.0-42.0							LM
	4142.0-48.0							SH
19	4148.0-49.0	11.0	4.0	4.3	15.4	69.0	2.71	LM, SH STKS, PP VGS
20	4149.0-50.0	17.0	14.0	7.8	37.5	49.5	2.70	LM, CHT, PP VGS, FISS
21	4150.0-51.0	0.3	0.2	6.7	25.4	57.1	2.70	LM, PP VGS
22	4151.0-51.5	*	0.1	7.5	20.4	49.0	2.71	LM, PP VGS
	4151.5-4166.0	DRILLED						
+ 23	4166.0-67.0	2.4	1.6	18.4	1.1	88.3	2.82	LM, DOL, PP VGS, FISS
24	4167.0-68.0	0.4	0.4	11.0	1.7	88.4	2.76	LM, PP VGS, FISS, CHT
25	4168.0-69.0	4.3	2.6	14.9	2.1	90.5	2.77	LM, FOSS, VF
26	4169.0-70.0	1.0	0.4	7.4	8.6	69.1	2.75	LM, VGY, FOSS, PYR, VF
27	4170.0-71.0	1.8	<0.1	3.9	8.1	73.1	2.72	LM, VGY, FOSS, STY, PYR
28	4171.0-72.0	0.2	0.1	3.0	16.9	70.2	2.72	LM, PP VGS, STY
29	4172.0-73.0	0.2	0.1	3.6	18.4	69.1	2.71	LM, PP VGS, STY, PYR
30	4173.0-74.0	0.3	0.2	2.0	20.5	65.6	2.72	LM, PP VGS, STY
	4174.0-87.0							SH
31	4187.0-88.0	76.0	44.0	15.1	20.9	49.6	2.70	LM, PP VGS, VF
32	4188.0-89.0	201.0	189.0	15.2	16.3	54.4	2.72	LM, PP VGS, VF
33	4189.0-90.0	0.3	0.2	10.1	3.8	86.6	2.79	DOL, SL, SHY
34	4190.0-91.0	0.1	<0.1	5.8	3.6	83.2	2.75	LM, SL, DOL, FOSS
35	4191.0-92.0	0.8	0.6	11.0	6.4	78.0	2.77	LM, SL, DOL, PP VGS, VF
36	4192.0-93.0	<0.1	<0.1	4.3	8.9	72.3	2.72	LM, STY
37	4193.0-94.0	<0.1	<0.1	5.3	0.0	76.7	2.74	LM, PP VGS
38	4194.0-95.0	5.7	4.9	7.8	0.0	79.9	2.75	LM, FOSS, VF
39	4195.0-96.0	0.1	0.1	7.7	0.0	78.4	2.73	LM, FOSS, VF
	4196.0-05.0							LM, SHY
	4205.0-22.0							SH
40	4222.0-23.0	*	<0.1	5.4	12.5	72.3	2.82	DOL, LMY, VF
41	4223.0-24.0	*	<0.1	4.8	14.3	71.6	2.81	DOL, LMY, VF
	4224.0-25.0							SH, LMY

+ DENOTES HORIZONTAL CRACKS

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CORE LABORATORIES, INC.  
 Petroleum Reservoir Engineering  
 DALLAS, TEXAS

CORE SUMMARY

Company GULF OIL EXPLORATION AND PRODUCTION CO.  
 Well ARCHIE HUGHES NO. 1-22  
 Page 3 of 3 File 3402-9253

DEPTH FEET	HORIZONTAL PERMEABILITY, Md.		POROSITY PER CENT	SATURATION		GRAIN DENSITY
	MAXIMUM	90 DEGREES		OIL	WATER	
3968.0-70.0	0.7	0.4	4.3	6.5	81.5	2.73
3970.0-71.0	22	13	13.7	16.5	57.9	2.72
3971.0-78.0	0.6	0.1	4.9	4.7	83.0	2.73
4109.0-13.0	235	2.7	4.4	7.7	76.5	2.72
4118.0-19.0	3.3	0.5	12.1	0.0	88.8	2.72
4119.0-22.0	717	0.3	5.5	0.9	83.6	2.73
4148.0-51.5	9.4	4.6	6.6	24.7	56.2	2.71
4166.0-69.0	2.4	1.5	14.8	1.6	89.1	2.78
4169.0-74.0	0.7	0.2	4.0	14.5	69.4	2.72
4187.0-89.0	139	117	15.2	18.6	52.0	2.71
4189.0-92.0	0.4	0.3	9.0	4.6	82.6	2.77
4192.0-96.0	1.5	1.3	6.3	2.2	76.8	2.74
4222.0-24.0	*	<0.1	5.1	13.4	72.0	2.82

\* Denotes plug permeability.

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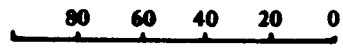
COMPANY GULF OIL EXPLORATION & PRODUCTION CO. FIELD \_\_\_\_\_ FILE 3402-9253  
 WELL ARCHIE HUGHES NO. 1-22 COUNTY SHERIDAN DATE 3-10-78  
 LOCATION C SW SW SEC. 22-9S-29W STATE KANSAS ELEV. \_\_\_\_\_

# CORE-GAMMA CORRELATION

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

VERTICAL SCALE: 5" = 100'

TOTAL WATER 0000  
PERCENT PORE SPACE



GAMMA RAY  
RADIATION INCREASE  
→

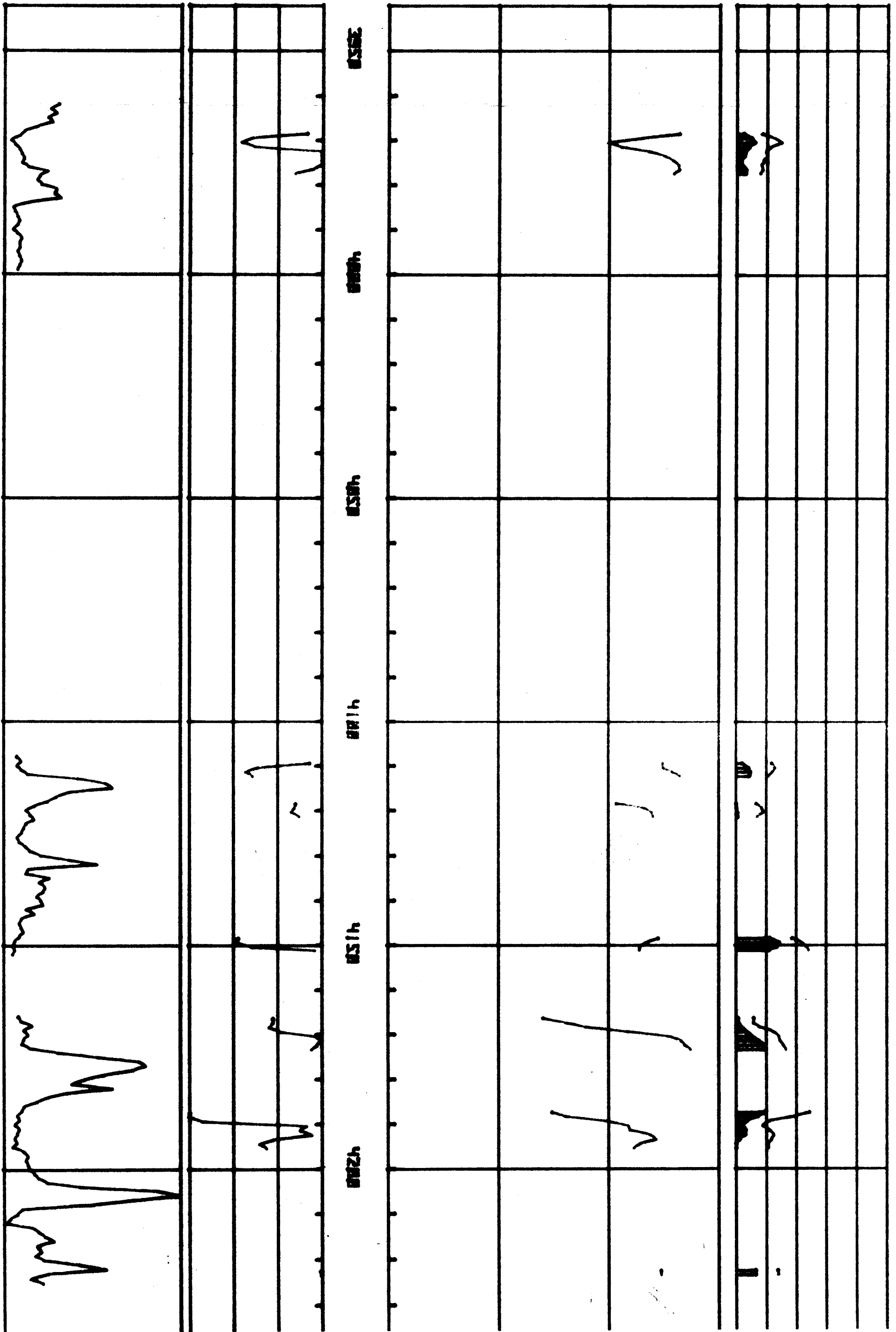
PERMEABILITY  
MILLIDARCYS

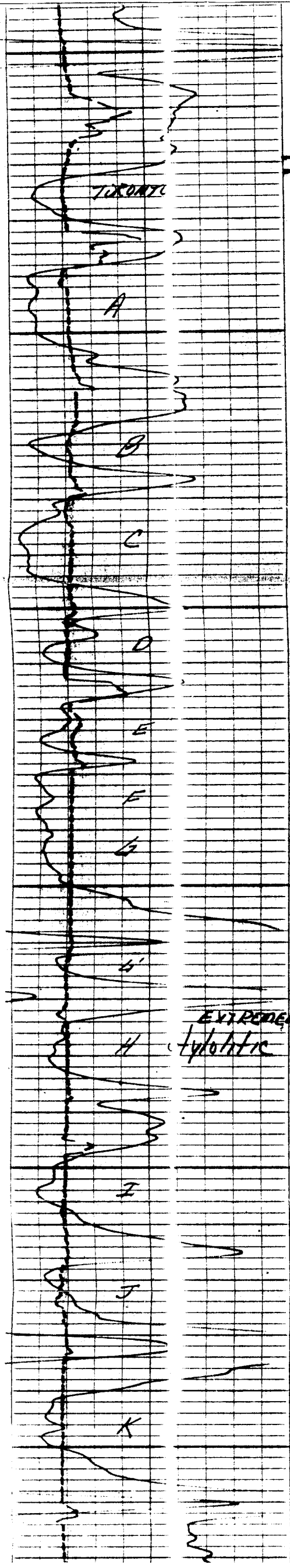


POROSITY  
PERCENT



OIL SATURATION XXXX  
PERCENT PORE SPACE





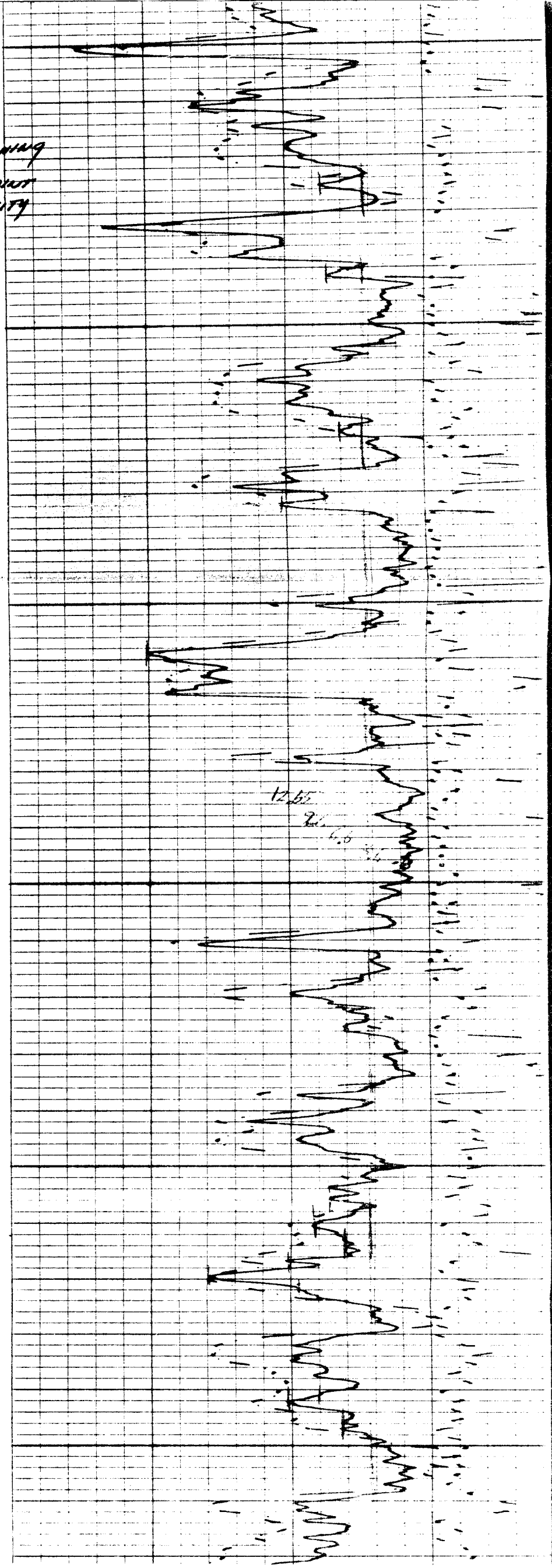
staining  
 Pw point  
 Porosity

4000

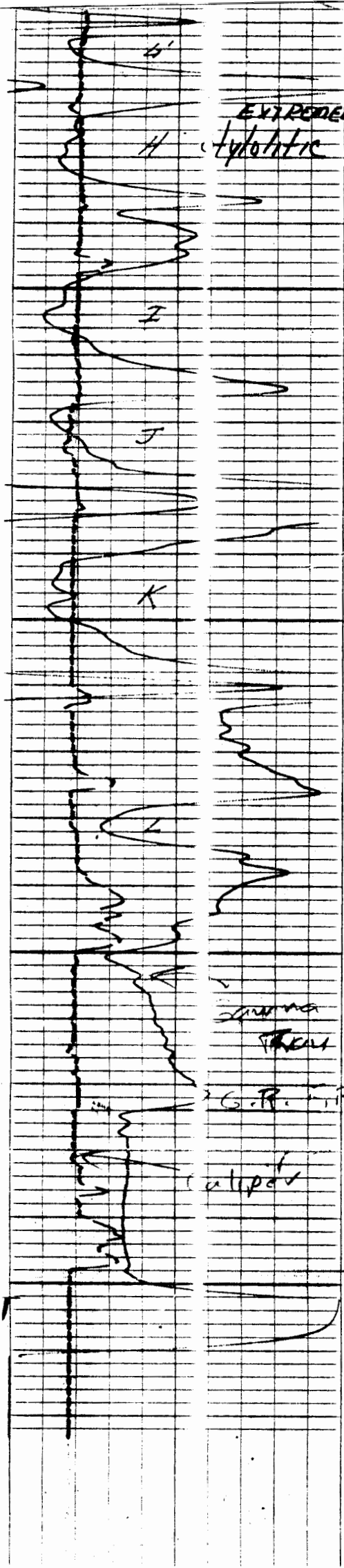
4100

EXTREMELY  
 hydrolytic

4200



12.65  
 2.1  
 6.5

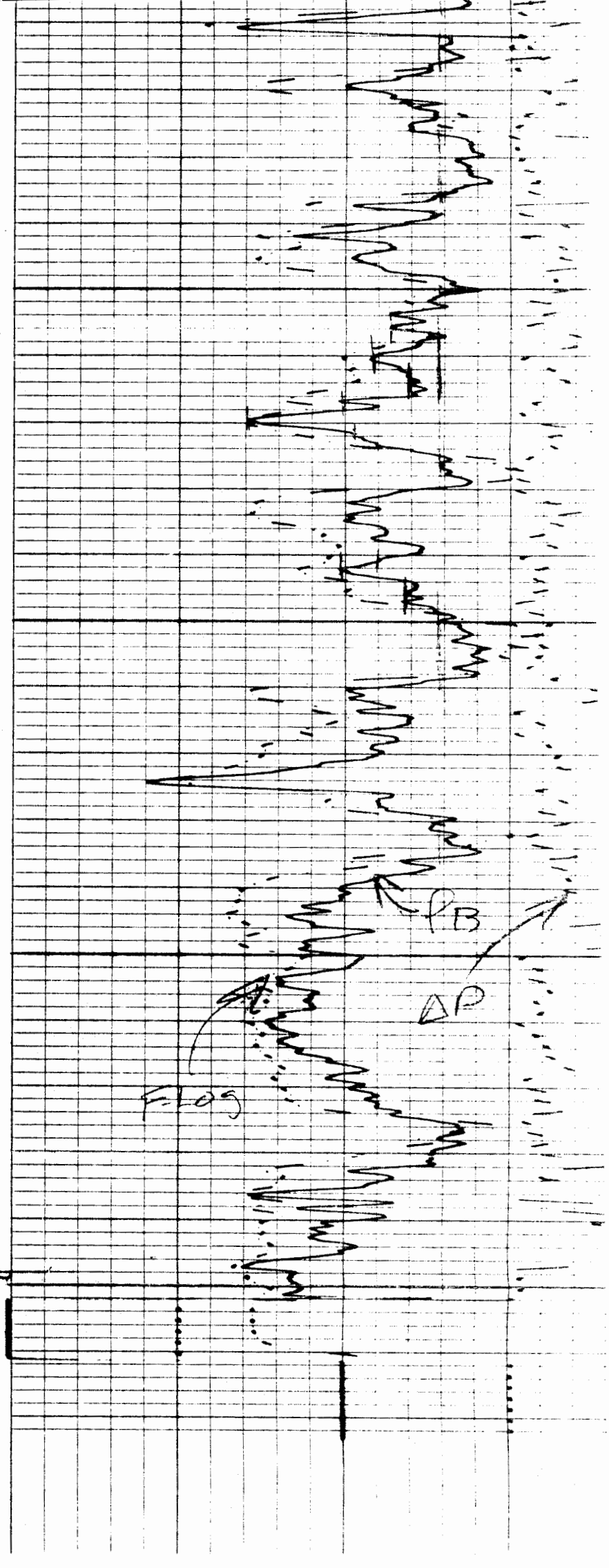
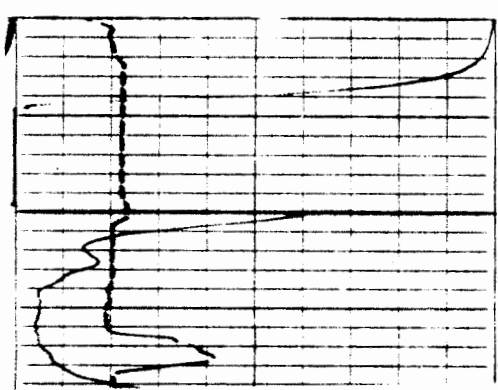


EXTREMELY  
hydrolytic

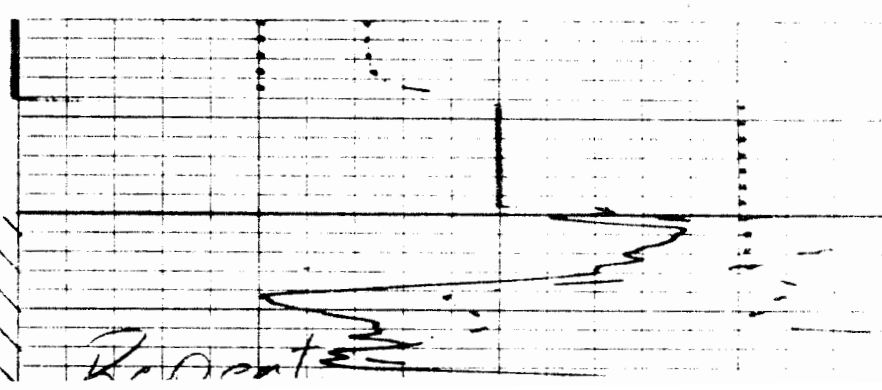
4200

strong  
broad  
G.P. IR  
aliphatic

F.R.  
700

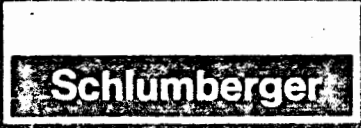


F.O.G  
B  
D



R. A. ...

MARKED



# DUAL INDUCTION-SELF WITH LINEAR CORRELATION LOG

COUNTY  
FIELD  
LOCATION  
WELL  
COMPANY

COMPANY Gulf Oil Corporation

WELL Hughes #1

FIELD WCC

COUNTY Sheridan STATE Kansas

LOCATION	<u>C SW SW</u>		
API SERIAL NO	SEC	TWP	RANGE
	<u>22</u>	<u>9S</u>	<u>29W</u>

Other Services:  
FOC-CUL-GR  
OCL-GR

Permanent Datum: Ground Level; Elev.: 2864  
Log Measured From: K.B., 6 Ft. Above Perm. Datum  
Drilling Measured From: K.B.

Elev.: K.B. 2870  
D.F. -  
G.L. 2864

Date	<u>3-4-5-78</u>					
Run No.	<u>One</u>					
Depth-Driller	<u>4300</u>					
Depth-Logger	<u>4300</u>					
Btm. Log Interval	<u>4294</u>					
Top Log Interval	<u>502</u>					
Casing-Driller	<u>8 5/8 @ 502</u>	@		@		@
Casing-Logger	<u>502</u>					
Bit Size	<u>7 7/8</u>					
Type Fluid in Hole	<u>CUC</u>					
Dens.	Visc.	<u>9.6</u>	<u>38</u>			
pH	Fluid Loss	<u>8.5</u>	<u>10</u> ml	ml	ml	ml
Source of Sample	<u>Flowline</u>					
Rm @ Meas. Temp.	<u>2.18 @ 55</u>	F	@	°F	@	°F
Rmf @ Meas. Temp.	<u>1.69 @ 52</u>	F	@	°F	@	°F
Rmc @ Meas. Temp.	<u>- @ -</u>	F	@	°F	@	°F
Source: Rmf   Rmc	<u>4.25</u>					
Rm @ BHT	<u>1.59 @ 114</u>	F	@	°F	@	°F
TIME	Circulation Stopped	<u>20:00</u>	<u>3-7</u>			
	Logger on Bottom	<u>22:30</u>	<u>3-7</u>			
Max. Rec. Temp.	<u>114</u>	F		F	F	F
Equip. Location	<u>7122</u>	<u>50-504</u>				
Recorded By	<u>[Signature]</u>					
Witnessed By	<u>[Signature]</u>					


The well name, location and borehole reference data were furnished by the customer.

FIELD HERE

Run No.	010				SCALE CHANGES			
Service Order No.	23232				Type Log	Depth	Scale Up Hole	Scale Down Hole
Fluid Level	Full							
Salinity ppm. cl	1500							
Speed F.P.M.	60							
<b>EQUIPMENT DATA</b>					REMARKS			
Panel No.	D-401							
Cart No.	DA-92							
Sonde No.	EA-86							
Mem. Panel No.	A-20							
G.R. Panel No.	AB-674							
G.R. Cart No.	556							
Tape Recorder - (TTR)	—							
Depth Encoder - (DRE)	—							
Pressure Wheel - (CPW)	—							
Type Centralizers	Fin-4							
Stand Off - Inches	1.5							
<b>CALIBRATION DATA</b>								
SBR	1.0							
Sonde Error - ILM								
Sonde Error - ILD								
G.R. BKG. - CPS.	126							
G.R. Source - CPS.	240							
S.E. Set In Hole - Depth	—							
S.E. Corr. - Hole Size	—							
<b>LOGGING DATA</b>								
SBR	1.0							
S.E. Log - ILM								
S.E. Log - ILD								
G.R. Scale per 100 Div.	150							
G.R. - T.C.	1							
G.R. Sens.	0-150							

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.

**SPONTANEOUS-POTENTIAL**

15  

 MILLIVOLTS

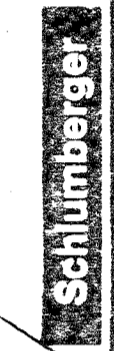
**CONDUCTIVITY**

MILLIMHOS, M  
 1000  
 OHMS M<sup>2</sup> M

DEEP INDUCTION

1000 500

**RESISTIVITY** OHMS M<sup>2</sup>/M  
 DEEP INDUCTION



# DUAL INDUCTION-SELF WITH LINEAR CORRELATION LOG

COMPANY Gulf Oil

WELL Hughes #1-22

FIELD W. W.

COUNTY Meriden STATE Mississippi

Other Services:  
FOC-242-GR  
CC-GR

Permanent Datum: Ground Level; Elev.: 2864

Log Measured From: K.B.; 5 Ft. Above Perm. Datum

Drilling Measured From: K.B.

Elev.: K.B. 2870  
D.F. -  
G.I. 2864

API SERIAL NO.	SEC	TWP	RANGE
	<u>22</u>	<u>9S</u>	<u>29W</u>

DATE 3-25-18

Run No. 04C

Depth-Driller 4300

Depth-Logger 4300

Btm. Log Interval 4294

Top Log Interval 501

Casing-Driller 858 @ 502

Casing-Logger 502

Bit Size 7 7/8

Type Fluid in Hole CMC

Dens. 9.6 Visc. 38

pH 8.5 Fluid Loss 10 ml

Source of Sample Flowpac

Rm @ Meas. Temp. 2.18 @ 53 F

Rmf @ Meas. Temp. 1.29 @ 52 F

Rmc @ Meas. Temp. - @ -

Source: Rmf Rmc Area

Rm @ BHT 1.09 @ 114 F

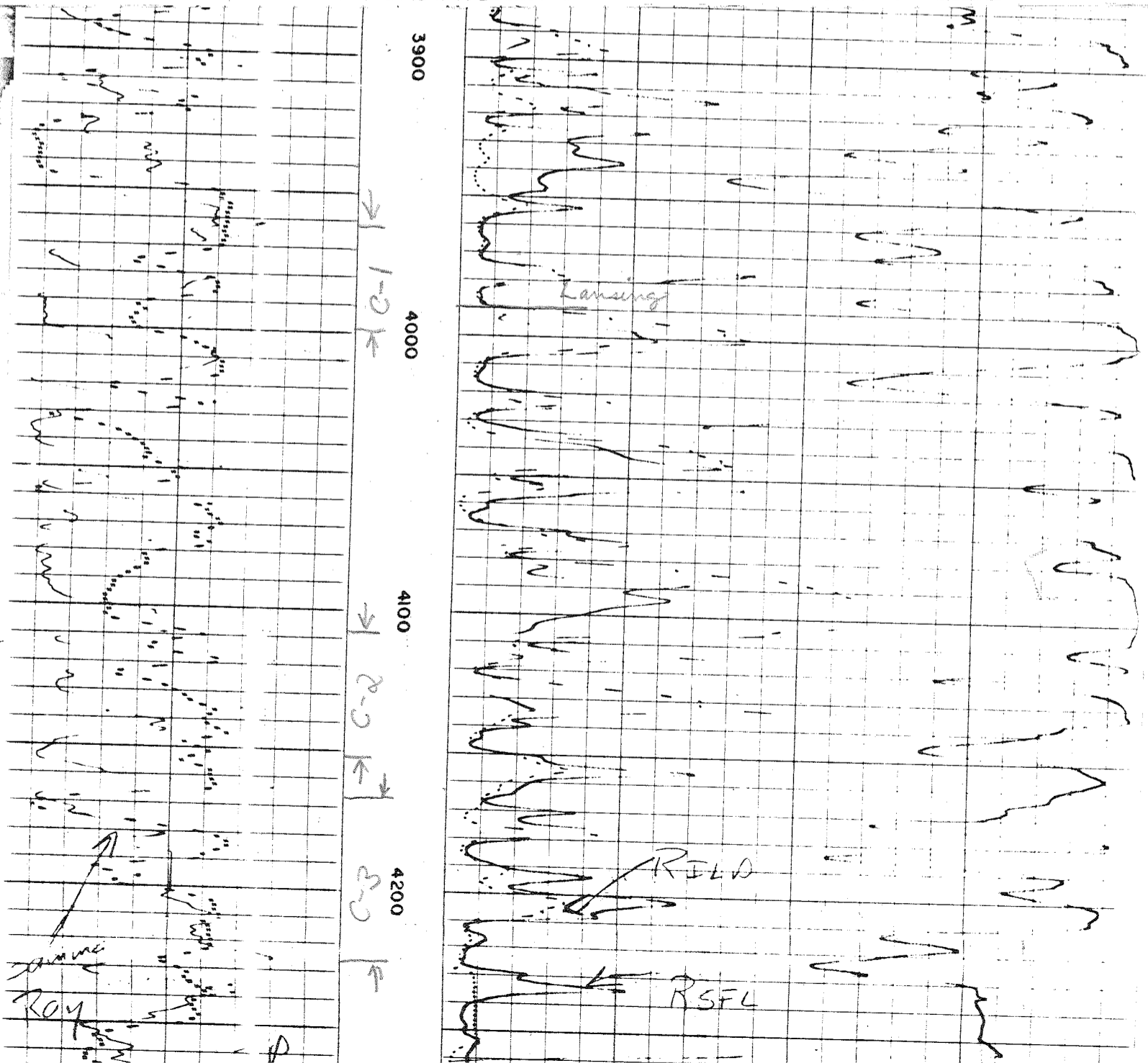
Calculation Stopped 2010 3-7

Per on Bottom 2200 3-7

Temp. 114

Location 7128 Sub-200

County Meriden



COMPANY

WELL *H01*

FIELD *64*

COUNTY *2*

LOCATION

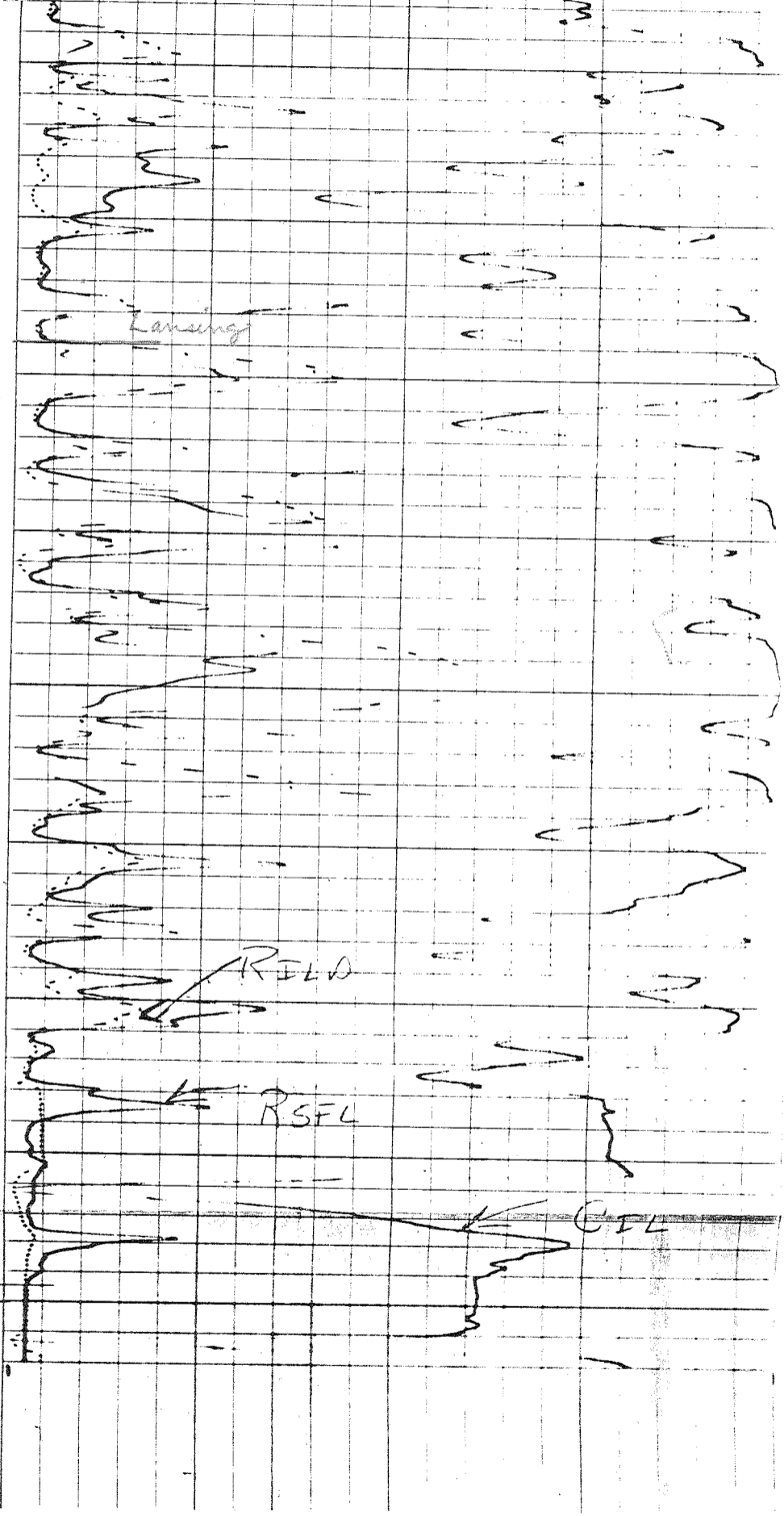
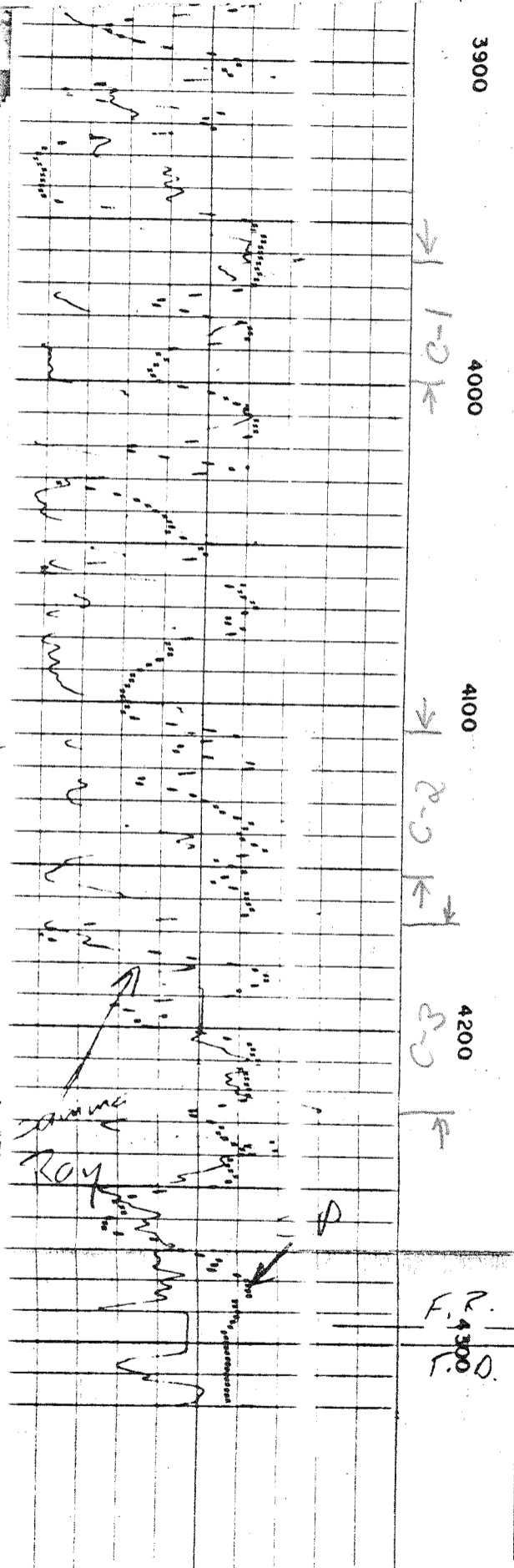
API SERIAL NO. SEC

Permanent Datum: *Sealed*  
 Log Measured From: *K.B.*  
 Drilling Measured From: *K.B.*

Date: *3-25-18*  
 Run No.: *01C*  
 Depth-Driller: *4300*  
 Depth-Logger: *4300*  
 Btm. Log Interval: *4194*  
 Top Log Interval: *502*  
 Casing-Driller: *85/8 @ 502*  
 Casing-Logger: *502*  
 Bit Size: *7 7/8*

Type Fluid in Hole: *CAC*  
 Dens.: *9.6 @ 38*  
 pH: *8.5 @ 10 ml*  
 Source of Sample: *Flowline*  
 Rm @ Meas. Temp.: *2.18 @ 53 F*  
 Rmf @ Meas. Temp.: *1.28 @ 52 F*  
 Rmc @ Meas. Temp.: *@ F*

Source: Rmf Rmc  
 Rm @ BHT: *1.09 @ 114 F*  
 Circulation Stopped: *3010 3.1*  
 Meter on Bottom: *4280 3.5*  
 Temp.: *114*  
 Location: *7126 455-60*  
 Date: *1/17/18*



MARKED

Schlumberger

# SIMULTANEOUS COMPENSATED NEUTRON- FORMATION DENSITY

Field  
Print

COMPANY Gulf Oil Corporation

WELL Hughes #1-22

FIELD WCC

COUNTY Sherridan STATE Kansas

LOCATION C SW SW

Other Services:

DTL-GR  
CCL-GR

API SERIAL NO	SEC	TWP	RANGE
	<u>22</u>	<u>9S</u>	<u>29W</u>

Permanent Datum: Ground level; Elev.: 2864  
 Log Measured From K.B., 6 Ft. Above Perm. Datum  
 Drilling Measured From K.B.

Elev.: K.B. 2870  
 D.F. ---  
 G.L. 2864

Date	<u>3-4, 5 78</u>				
Run No.	<u>One</u>				
Depth-Driller	<u>4300</u>				
Depth-Logger	<u>4299</u>				
Btm. Log Interval	<u>4298</u>				
Top Log Interval	<u>502</u>				
Casing-Driller	<u>8 5/8 @ 502</u>	<u>@</u>	<u>@</u>	<u>@</u>	<u>@</u>
Casing-Logger	<u>502</u>				
Bit Size	<u>7 7/8</u>				
Type Fluid in Hole	<u>CMC</u>				
Dens.	<u>9.6</u>	<u>3.8</u>			
Visc.					
pH	<u>8.5</u>	<u>10</u> ml		ml	ml
Fluid Loss					
Source of Sample	<u>Flowline</u>				
Rm @ Meas. Temp.	<u>2.18 @ 53</u> F	<u>@</u>	<u>@</u>	<u>@</u>	<u>@</u>
Rmf @ Meas. Temp.	<u>1.64 @ 52</u> F	<u>@</u>	<u>@</u>	<u>@</u>	<u>@</u>
Rmc @ Meas. Temp.	<u>@</u> F	<u>@</u>	<u>@</u>	<u>@</u>	<u>@</u>
Source: Rmf   Rmc	<u>4.00</u>   <u>---</u>				
Rm @ BHT	<u>1.09 @ 117</u> F	<u>@</u>	<u>@</u>	<u>@</u>	<u>@</u>
Circulation Stopped	<u>2000</u> 3-7				
Logger on Bottom	<u>0930</u> 3-2				
Max. Rec Temp.	<u>115</u> F		F	F	F
Equip.   Location	<u>2127</u>   <u>WCC</u>				
Recorded By	<u>---</u>				
Witnessed By Mr.	<u>---</u>				

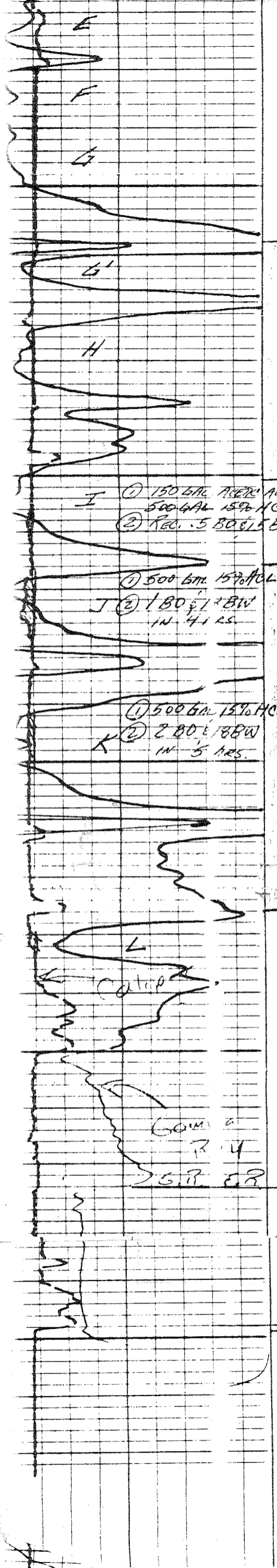
The well name, location and borehole reference data were furnished by the customer.

FOLD HERE









CORE No. 2

CORE No. 3

