

Computer Inventoried

CORE ANALYSIS REPORT

FOR

PENDLETON LAND & EXPLORATION
MILLER NO. 2 WELL
GRAY COUNTY, KANSAS

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
OKLAHOMA CITY, OKLAHOMA

October 30, 1981

REPLY TO
SUITE 133
400 SOUTH VERMONT
OKLAHOMA CITY, OK
73108

PENDLETON LAND & EXPLORATION
23 INVERNESS WAY EAST
ENGLEWOOD, COLORADO 80112

ATTN: MR. FOREST WOODSIDE

SUBJECT: CORE ANALYSIS DATA
MILLER NO. 2 WELL
GRAY COUNTY, KANSAS
CLI FILE 3402-10994

GENTLEMEN:

CORES TAKEN IN THE SUBJECT WELL IN THE MISSISSIPPIAN 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 PAGE ONE OF THIS REPORT.

DATA AVERAGES REFLECTING ZONE CHANGES ARE PRESENTED ON PAGE
TWO.

IT IS A PLEASURE TO HAVE THIS OPPORTUNITY OF SERVING YOU.

VERY TRULY YOURS,

CORE LABORATORIES, INC.


J. MICHAEL EDWARDS
DISTRICT MANAGER

PENDLETON LAND & EXPLORATION
MILLER NO. 2 WELL
FILE NO: 3402-10994

PROCEDURE PAGE

HANDLING AND ANALYTICAL PROCEDURES

DIAMOND CORING EQUIPMENT AND WATER BASE MUD WERE USED TO OBTAIN 3 1/2 INCH DIAMETER CORES BETWEEN 5050-5075 FEET.

THE CORES WERE PRESERVED AT THE WELL SITE IN A CO2 ATMOSPHERE 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.

CORES WERE SLABBED FOR FUTURE GEOLOGICAL STUDY.

SLAB SEGMENTS HAVE BEEN DELIVERED TO GULF OIL COMPANY, OKLAHOMA CITY, OKLAHOMA; ATTN: ANITA CRISTIL.

TEMPORARY STORAGE OF CORES IN OKLAHOMA CITY LABORATORY FOR A PERIOD OF THIRTY DAYS WITHOUT ADDITIONAL CHARGE.

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

1

PENDLETON LAND & EXPLORATION
MILLER NO. 2 WELL
GRAY COUNTY, KANSAS

DATE: 10/30/81
FORMATION: MISSISSIPPIAN LIME
DRLG. FLUID: WATER BASE MUD
LOCATION: SEC. 12-27S-29W

FILE NO: 3402-10994
ENGINEER: EDWARDS
ELEVATION:

* INDICATES PLUG PERM

SMP. NO.	DEPTH	PERM. MAXIMUM	TO AIR MD. 90 DEG	POROSITY PERCENT	FLUID SATS.		GR. DEN.	DESCRIPTION
					OIL	WTR.		
1	5050.0-51.0	0.4	0.1	4.6	0.0	69.4	2.71	LM, OOL, PP VGS, VF
2	5051.0-52.0	0.2	<0.1	4.6	0.0	62.9	2.71	LM, OOL, PP VGS
3	5052.0-53.0	0.1	<0.1	4.2	0.0	64.3	2.71	LM, OOL, PP VGS
4	5053.0-54.0	*	<0.1	2.4	0.0	63.2	2.71	LM, OOL, PP VGS, VF
5	5054.0-55.0	0.1	<0.1	1.6	0.0	53.6	2.71	LM, PP VGS, VF
6	5055.0-56.0	<0.1	<0.1	1.8	0.0	51.1	2.71	LM, PP VGS, VF
7	5056.0-57.0	<0.1	<0.1	1.8	0.0	50.6	2.71	LM, CHT, VF
8	5057.0-58.0	5.8	0.3	2.7	0.0	74.9	2.71	LM, CHT, SHY, VF
9	5058.0-59.0	3140.0	<0.1	1.5	0.0	60.2	2.72	LM, VF
10	5059.0-60.0	<0.1	<0.1	2.4	11.9	64.8	2.72	LM, PP VGS
11	5060.0-61.0	25.0	22.0	8.4	9.3	37.4	2.69	LM, OOL, VGY
12	5061.0-62.0	5.2	4.7	5.6	11.0	54.4	2.70	LM, OOL, VGY
13	5062.0-63.0	28.0	25.0	7.8	15.3	44.9	2.70	LM, OOL, VGY
14	5063.0-64.0	7.3	6.3	6.2	17.9	51.8	2.71	LM, OOL, VGY, STY, VF
15	5064.0-65.0	57.0	57.0	10.8	13.5	42.0	2.69	LM, OOL, VGY, VF
16	5065.0-66.0	42.0	38.0	10.3	10.7	48.2	2.69	LM, OOL, VGY
17	5066.0-67.0	14.0	11.0	4.8	10.6	60.3	2.70	LM, OOL, VGY, VF
18	5067.0-68.0	*	3.8	5.3	10.7	63.9	2.71	LM, OOL, SL/VGY, VF
19	5068.0-69.0	23.0	12.0	8.4	9.6	59.3	2.70	LM, OOL, SL/VGY, VF
20	5069.0-70.0	43.0	15.0	11.4	7.5	52.4	2.69	LM, OOL, VGY
21	5070.0-71.0	27.0	19.0	10.5	5.7	52.6	2.69	LM, OOL, VGY
22	5071.0-72.0	0.1	0.1	5.8	0.0	76.5	2.70	LM, OOL, SL/VGY, VF
23	5072.0-73.0	<0.1	<0.1	4.5	0.0	76.7	2.72	LM, PP VGS, VF
24	5073.0-74.0	*	<0.1	3.6	0.0	56.0	2.71	LM, SHY, VF
25	5074.0-75.0	<0.1	<0.1	3.3	0.0	61.2	2.71	LM, SHY, VF

WHOLE CORE ANALYSIS

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

CORE SUMMARY

Company PENDLETON LAND & EXPLORATION
Well MILLER NO. 2
CLI File 3402-10994 Page 2

<u>Depth Feet</u>	<u>Permeability</u>		<u>Porosity Percent</u>	<u>Saturation</u>		<u>Grain Density</u>
	<u>Maximum</u>	<u>90 Deg</u>		<u>Oil</u>	<u>Water</u>	
5050-59	393	0.1	2.8	0.0	61.1	2.71
5059-71	25	19	7.7	11.1	52.7	2.70
5071-75	<0.1	<0.1	4.3	0.0	67.6	2.71

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DISTRIBUTION OF FINAL REPORT -

PENDLETON LAND & EXPLORATION
Miller No. 2 Well
Gray County, Kansas
CLI File 3402-10994

- 5 cc - PENDLETON LAND & EXPLORATION
Attn: Mr. Forest Woodside
23 Inverness Way East
Englewood, Colorado 80112
- 4 cc - GULF OIL EXPL. & PROD. COMPANY
P. O. Box 24100
Oklahoma City, Oklahoma 73124

CORE LABORATORIES, INC.

LAB

Petroleum Reservoir Engineering

COMPANY PENDLETON LAND & EXPLORATION FILE NO. 3402-10994
 WELL MILLER NO. 2 DATE 10/30/81
 FIELD _____ FORMATION MISSISSIPPIAN ELEV. _____
 COUNTY GRAY STATE KANSAS DRLG. FLD WATER BASE MUD CORES _____
 LOCATION SEC. 12-27S-29W

CORRELATION COREGRAPH

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VERTICAL SCALE: 5" 100'

Gamma Ray

RADIATION INCREASE →

Permeability

MILLIDARCIES

Porosity

PERCENT

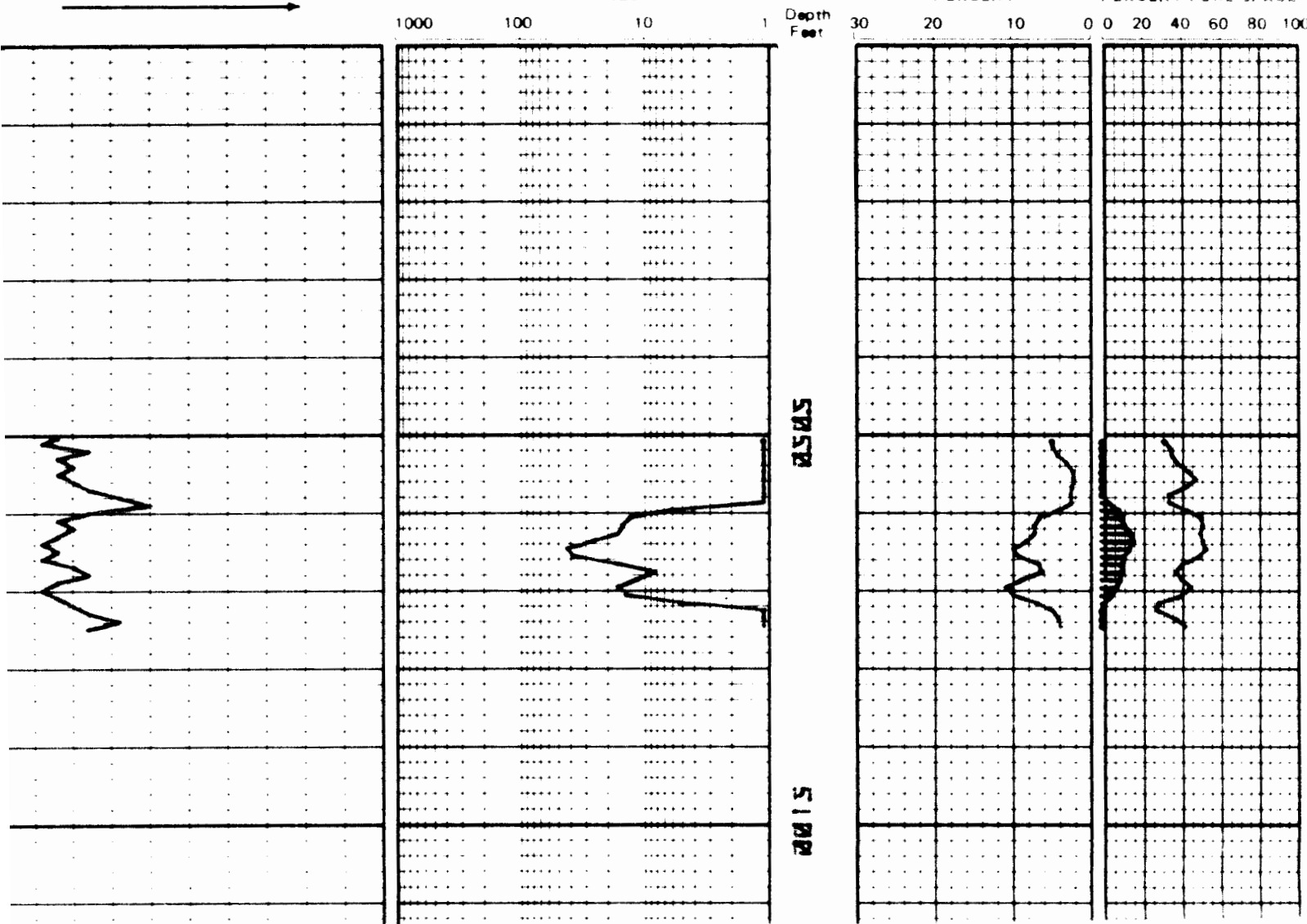
Total Water

PERCENT PORE SPACE

100 80 60 40 20 0

Oil Saturation

PERCENT PORE SPACE



Log Analysis

Schlumberger

COMPANY PEUDETTON LAND & EXPLORATION		WELL MILLER #2
FIELD WILDCAT	COUNTY GRAY	STATE KANSAS

DEPTH	R _w	R _{1/2}	φ _{FDC}	φ _{CAL}	% POROSITY X-ROT	% WATER	REMARKS
4700-02	.06	8	12	15	13.5	64	POSSIBLE
02-04	"	10	16	20	18.0	43	SHOW
04-06	"	16	10	10	10.0	61	"
4952-54	.055	16	8	8	8.0	73	WATER
54-56	"	10	12	16	14	53	TIGHT
56-58	"	13	7	8	7.5	87	WET
5062-64	.05	25	6	6	6	75	37.4 54.4 WATER
64-66	"	22	8	8	8	60	44.9 51.8 TIGHT?
66-68	"	21	9	9	9	54	42.0 43.2 SHOW
68-70	"	20	6	6	6	83	60.3 63.9 WET
70-72	"	18	11	11	11	48	59.3 52.1 TIGHT? SHOW
72-74	"	20	6	6	6	83	52.6 76.5 WET

R_w FROM WATER CATALOG

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 our General Terms and Conditions as set out in our current Price Schedule.

[illegible]

5020 : (-2276) STLS
Log Depth Sub Sea Horizon
13 /
Net Gross
T.D. : 5130 (-2386) STLS '79
I.P. : P 53BO & 3BW STLSA
Fm.

- | | | | |
|---|----------|------------|--------------|
| ○ | LOCATION | Log. Depth | Sub Sea |
| ○ | DRILLING | 13 | / |
| ● | OIL WELL | Net | Gross |
| ☼ | GAS WELL | T.D.: | 5130 (-2386) |
| ♂ | DRY HOLE | I.P.: | P 5380 & 3BW |
-
- | | | |
|-----|---------------------------------|-------------|
| ● | STLS | Penetration |
| | Show of Oil (grn.) or Gas (red) | |
| ● | STLS | Completion |
| | Oil (grn.), Gas (red) | |
| --- | Approx. Proven Limits of Prod. | |



Field Name: PENDLETON		Well Name: PENDLETON #2 MILLER	
County: GRAY		State: KANSAS	
Type Map: ISOPACH		Horizon: ST. LOUIS "A" OOLITIC ZONE	
Contour Interval: 5'		Spacing - No.: GENERAL RULES	
Scale: 1" = 2000'	Date: 10/80	Interpreted By: N.R. SHAFFER	

SEC. 12-275-29W

SW NE SW

#1 MILLER

#1 Wendel
B#1 Schmidt
A

#1 Wendel

#2 MILLER

KB 2741

KB 2742

KB 2751

KB 2743

KB 2742

est. sample log

Heebner	-1422 ²⁵	-1439 ¹⁶	-1461 ¹⁶	-1442 ²²	-1440	-1481
Toronto	-1447 ⁸⁰	-1455 ⁸²	-1477 ⁸²	-1462 ⁷⁵	-1461	-1488
Lansing	-1527 ⁴⁴⁰	-1538 ⁴⁶⁵	-1559 ⁴⁶²	-1537 ⁴⁵⁴	-1540	-1527 ^{??}
BKC	-1957 ¹⁸	-2003 ¹⁶	-2021 ¹⁶	-1991 ²⁰	-2000	-2003
Marmaton	-2005 ⁷⁶	-2019 ⁷⁷	-2037 ⁷⁶	-2011 ⁷⁴	-2018	-2012
Pawnee	-2081 ²⁸	-2096 ²⁴	-2113 ²⁹	-2085 ²⁶	-2093	-2012
Ft. Scott	-2109 ¹⁵	-2120 ¹⁶	-2142 ¹⁷	-2111 ¹⁶	-2120	-2112
Cherokee	-2124 ¹⁴⁵	-2136 ¹⁵²	-2159 ¹⁶²	-2127 ¹⁵⁰	-2136	-2136
MSSP (ste. Gen.)	-2272 ³⁶	-2288 ⁴²	-2321 ²⁰	-2277 ³⁴	~2300	-2290 ¹⁸
St. Louis	-2308	-2330	-2341	-2311	~2330	
Spergen	TD. St Lu	TD. St Lu	TD St Lu	TD St Lu	?	

will they match it?

~180' Ft Scott to MSSP

~30' Ste. Gen

GULF ENERGY & MINERALS COMPANY

WEST COAST DISTRICT

CORE REPORT

WELL NAME: MILLER #2 CORE NO.: _____ DATE: 10-6 GEOL. D.L. Pulte
 CUT: 10'-5" FROM: 5050 TO: 5075 REC: 24' TOT. TIME: 18.8 hrs AVG/FT: 47.2
 TYPE CORE HEAD: _____ SERIAL NO: _____ CORE HEAD OP: VINSON Diamond CORE DIA: 3 3/8
 MUD TYPE HEAD: _____ CORING WT: _____ RPM: _____ PUMP PRESS: _____
 FORMATION: Mls St. Louis REMARKS: _____

DEPTH	FROM	TO	MIN. FEET	STOWS	SPECIFIC LITHOLOGIC DESCRIPTION
Core 1	5050	5051		OIL STAINED	LIMESTONE, OOLITIC, TRACKS OF GLAUCONITE INTEROOOLITIC POROSITY, CARBONATE CEMENT, CALC ARENITE, F-M GRAINED, OIL STAINED ALONG FRACTURES, GOOD FLUORESCENCE
	5051	5052		OIL STAINED	LIMESTONE, OOLITIC, CALC-ARENACIOUS, TRACKS OF GLAUCONITE INTEROOOLITIC POROSITY, CARBONATE CEMENT, F-M GRAINED, FRAC OF OIL STAIN AND FLUORESCENCE.
	5052	5053		TRAIL OF OIL STAIN	LIMESTONE, OOLITIC WITH CALCAREOUS CEMENT, F-M GRAINED OOLIDS, TRACKS OF GLAUCONITE, TRAIL OF FOSSILS (CRINOID & FUS.)
	5053	5054			LIMESTONE, OOLITIC, FINE CALCAREOUS MICRITIC MATRIX, SLIGHTLY FOSSILIFEROUS, TRAIL OF GLAUCONITE.
	5054	5055			LIMESTONE, CRYSTALLINE, TRAIL OF OOLITES, TRAIL OF GLAUCONITE, FOSSILIFEROUS.
Core 2	5056	5057			LIMESTONE, VERY FINE CRYSTALLINE, GRAY, MICRITIC.
	5057	5058			A. A.
	5058	5059			A. A.
	5059	5060			SH, DARK GRAY, CALCAREOUS, => CALCAREOUS ARENITE.
Core 3	5060	5061		OIL STAINED BLEED OIL	LIMESTONE, TAP, OOLITIC WITH F-M GRAINED OOLITES, GOOD INTER-OOLITIC POROSITY, WITH OIL STAINS, WAS BLEEDING LUBRICANT, GOOD FLUORESCENCE.
	5061	5062	SAMPLED TWICE	A.A.	A.A. WITH VERY GOOD OIL STAIN AND FLUORESCENCE, ALSO ORIGINALLY BLEED OIL
	5062	5063		A.A.	A.A.
	5063	5064		A.A.	LIMESTONE, OOLITIC, F-M GRAINED OOLITES, GOOD INTEROOOLITIC POROSITY, OIL STAINED, TRAILS OF PYRITE, WAS BLEEDING OIL ORIGINALLY.
	5064	5065		A.A.	LIMESTONE, OOLITIC, F-M GRAINED OOLITES, GOOD INTEROOOLITIC POROSITY, FOSSILIFEROUS (BRACHIOPODS, FUSULINIDS, CRINOID) TRAILS OF SPAN, ORIGINALLY BLEED OIL.
	5065	5066		A.A.	LIMESTONE, OOLITIC, F-M GRAINED, TRAIL OF SPAN, VERY GOOD INTEROOOLITIC POROSITY, OIL STAINED, ORIGINALLY BLEED OIL.
	5066	5067		A.A.	LIMESTONE, OOLITIC, F-M GRAINED, TRAIL OF SPAN, FAIR POROSITY, OIL STAINED, ORIGINALLY BLEED OIL.
	5067	5068		SLIGHTLY OIL STAINED	LIMESTONE, OOLITIC, F-M GRAINED, MICRITIC, SPAN FILLING MIST INTEROOOLITIC PORE SPACES. SLIGHTLY OIL STAINED

GULF ENERGY & MINERALS COMPANY

WEST COAST DISTRICT

CORE REPORT

WELL NAME: MILLER #2 CORE NO.: _____ DATE: 10-7 GEOL: D.L. POUTER
 CUT: 10/6-10/7 FROM: 5050 TO: 5075 REC: 24' TOT. TIME: 18.8 HRS AVG/FT: 47.2 MIN
 TYPE CORE HEAD: _____ SERIAL NO: _____ CORE HEAD OP: VINSON DIAMOND CORE DIA: 3 3/8
 MUD TYPE HEAD: _____ CORING WT: _____ RPM: _____ PUMP PRESS: _____
 FORMATION: ST. LOUIS REMARKS: _____

DEPTH		MIN. FEET	SHOWS	SPZITIC LITHOLOGIC DESCRIPTION
FROM	TO			
5068	5069		<i>OIL STAINED CALCAREOUS MATERIAL</i>	LIMESTONE, OOLITE, F-M GRAINED OOLITES, FOSS - FEROUS (BAYOZONUS), GOOD INTEROOLITE POROSITY, OIL STAINED, ORIGINALLY BLEED OIL.
5069	5070		A.A.	LIMESTONE, OOLITE, F GRAINED OOLITES, SLIGHTLY FOSSILIFEROUS (PALAEOPRODS) VERY GOOD INTEROOLITE POROSITY, OIL STAINED, ORIGINALLY BLEED OIL.
5070	5071		A.A.	LIMESTONE, OOLITE, VF-F GRAINED OOLITES, GOOD INTEROOLITE POROSITY, TRACES OF SPAN, HAD M. LATELY BETWEEN A PORTION OF THE OOLITES.
5071	5072		<i>SPOTS OF STAINS RELEASED GAS BUBBLES IN OIL</i>	LIMESTONE, OOLITE, VF-F GRAINED OOLITES, TRACES OF SPAN, SLIGHTLY MICRITIC IN MATRIX, OIL STAINED * <u>HAD GAS BUBBLES RELEASED IN OIL STAINS</u> .
5072	5073			LIMESTONE, XLIN, SLIGHTLY OOLITE, VUGGY, HAD TRACES OF SPAN, MICRITIC MATRIX.
5073	5074			LIMESTONE, XLN, TRACES OF OOLITES, MICRITIC. NO SHOWS
<i>For grain XLN</i> 5074	5075			LIMESTONE, GRAY, XLN, MICRITIC.

GULF ENERGY & MINERALS COMPANY

WEST COAST DISTRICT

CORE REPORT

WELL NAME: MILLER #2 CORE NO.: _____ DATE: 10-7 GEOL: D.L. POLITE
 CUT: 10/5-10/6-10/7 FROM: 5050 TO: 5070 REC: 24' TOT. TIME: 18.8 HRS. AVG/FT: 47.2
 TYPE CORE HEAD: _____ SERIAL NO: _____ CORE HEAD OP: _____ CORE DIA: 3 3/8
 MUD TYPE HEAD: _____ CORING WT: _____ RPM: _____ PUMP PRESS: _____
 FORMATION: MISS. ST. LAMS REMARKS: _____

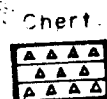
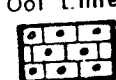
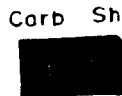
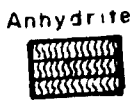
DEPTH		MIN. FEET			GENERAL LITHOLOGIC DESCRIPTION
FROM	TO				
5050	5053				LS, OOL, F-M OOL GR, TR OF GLAU, OIL STAINED ALONG FRACTURES (HORIZONTAL)
5053	5058				LS, XLN, SL OOL, LT GRAY, NS.
5058	5060				LS, XLN, MICRITIC, LT GRAY.
5060	5062				LS, TAN-LT GY, OOL, F-M GR OOL, GOOD INTER OOL. POR, BLEED OIL.
5062	5066				LS, TAN-LT GY, MICRITIC, OOL, F-M OOL GR, X-BDD w/ MICRITIC & OOL LAYERS, OOL LAYERS BLEED OIL.
5066	5071				A.A. w/ VERTICAL FRACTURES, w/ GOOD OOL ZONES WHICH BLEED OIL
5071	5077				LS, LT GY, TR, XLN, NS.

Well Name & No. FLICKER
Location S.W. 1/4 Sec 12-27S-29W
County & State GRAY Co., KS
KB 2742

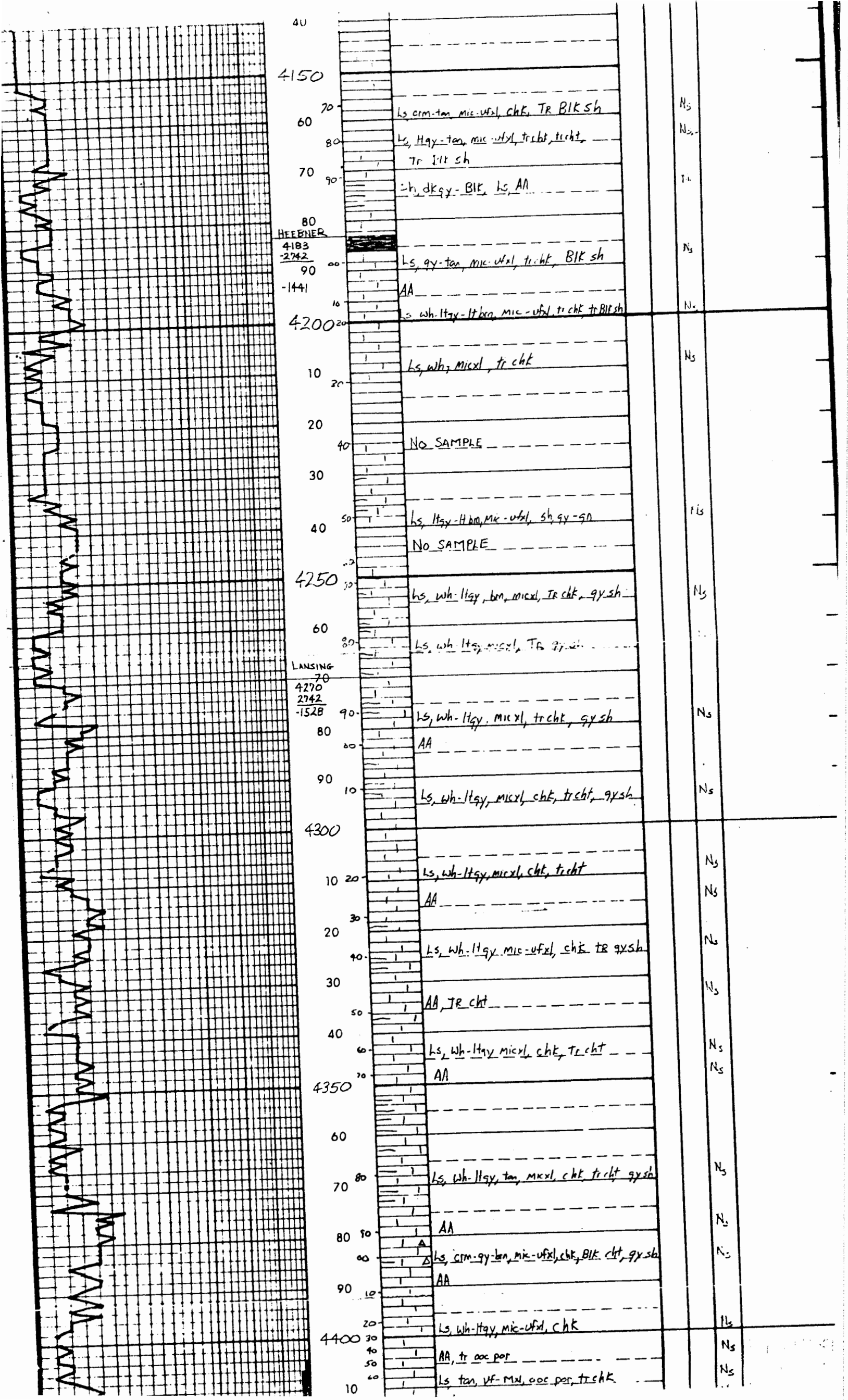
PENDLETON LAND & EXPLORATION
AL PENDLETON

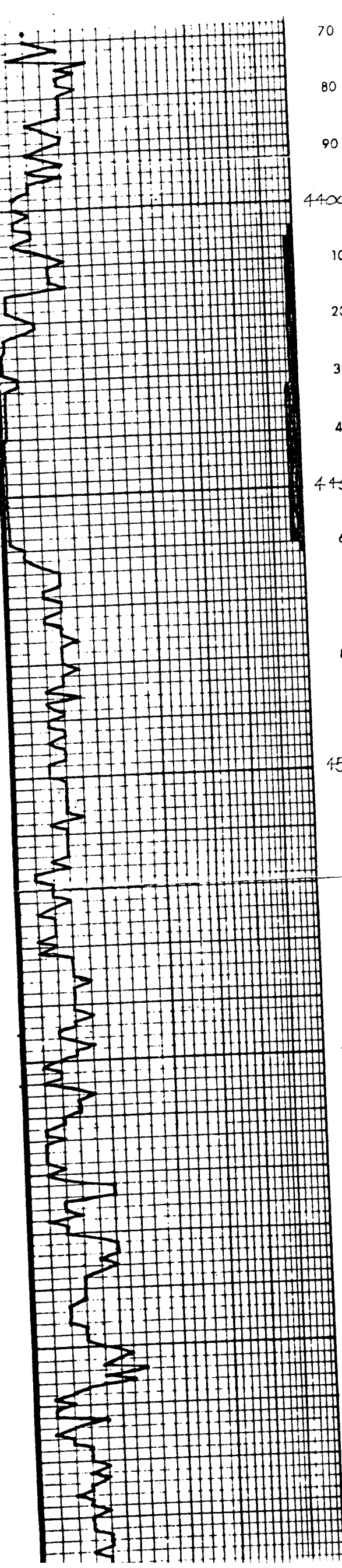
SAMPLE DESCRIPTION AND DRILLING TIME LOG

Samples examined, concurrent with drilling operation, from 4000' to RTD



DRILLING TIME in Minutes Per Foot Rate of Penetration Decreases	DEPTH	SAMPLE DESCRIPTIONS	FRAMEWORK	DIAGENESIS	OIL / GAS SHOWS	REMARKS
5.0 10.0 15.0 20.0 25.0	4000	20 Ls, wh-ltgy, vf-Mxl, chky, cht			N ₅	
	10	40 AA			N ₅	
	20	60 Ls, wh-ltgy, mic-ufxl, chky, tr cht			N ₅	
	30	80 AA			N ₅	
	40	100 AA			N ₅	
	50	120 AA			N ₅	
	60	140 AA			N ₅	
	70	160 Ls, ltgy-tan, mic-fxl, chky			N ₅	
	80	180 AA			N ₅	
	90	200 AA			N ₅	
	100	220 AA			N ₅	
	110	240 Ls, wh-crm-ltgy, mic-fxl, trcht			N ₅	
	120	260 AA, TR BIK Sh			N ₅	
	130	280 Ls, crm-ltgy, micxl, das, trcht			N ₅	
	140	300 AA			N ₅	
	150	320			N ₅	
	160	340			N ₅	
	170	360			N ₅	
	180	380			N ₅	
	190	400			N ₅	
	200	420			N ₅	
	210	440			N ₅	
	220	460			N ₅	
	230	480			N ₅	
	240	500			N ₅	
	250	520			N ₅	
	260	540			N ₅	
	270	560			N ₅	
	280	580			N ₅	
	290	600			N ₅	
	300	620			N ₅	
	310	640			N ₅	
	320	660			N ₅	
	330	680			N ₅	
	340	700			N ₅	
	350	720			N ₅	
	360	740			N ₅	
	370	760			N ₅	
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70	ls, tan, mic-ufxl, chkt, blk chkt, gy sh	Ns
80	AA	Ns
90	ls, tan-gy-bn, mic-ufxl, chkt, blk chkt, gy sh	
100	AA	
110		
120	ls, wh-ltgy, mic-ufxl, chkt	116
130	AA, tr ooc por	115
140	ls, tan, uf-Mxl, ooc por, tr chkt	Ns
150	AA	Ns
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