SOUTHWEST ROYALTIES, INC.
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SOUTHWEST ROYALTIES

November 19, 1998

Mr. David R. Catanach
Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

NOV 23 [illegible]

Re: Order No. R-11056

Dear Mr. Catanach:

The captioned order dated September 10, 1998, authorized Southwest Royalties to institute a waterflood project on its Eilliams and Wyatt Phillips Federal Leases on the N/2 Sec. 34, T17S, R33E, NMPM, Lea County, New Mexico, by the injection of water into the Grayburg/San Andres formations, Maljamar-Grayburg-San Andres pool through the perforated interval from approximately 4325' to 4833' in its Eilliams Federal Well No. 14. That order provided in part that

> (5) Prior to commencing injection operations into the Eilliams Federal Well No. 14, the applicant shall either: (1) demonstrate that the following described wells will not provide a conduit whereby injected fluid may migrate to other formations; or (2) conduct remedial cement operations on the following described wells and cement the production casing across and below the injection interval in a manner satisfactory to the Division.

The referenced wells were the Eilliams Federal No. 3 (Unit E), Eilliams Federal No. 7 (Unit F), and the Denius Federal #5 (Unit K). Phillips Petroleum Company is the operator of the two referenced Eilliams wells and Southwestern Energy Production Company (which in no way is associated with or related to Southwest Royalties, Inc.) is the operator of the Denius Federal #5 well.

This writer contacted Phillips Petroleum Company to determine if a bond log or a temperature log was ever run on its two wells. Their files indicated that there was a temperature log run on the Eilliams #3 on January 16, 1961, the day after the well was cemented. That log indicated the top of cement (TOC) to be 5862'. This height does not cover the Grayburg/San Andres interval but does isolate the Abo (8140') an oil bearing formation, the Tubb (6920') a non-oil bearing formation, the Clearfork (6439') a non-oil bearing formation, and the Glorieta (6158') a non-oil bearing formation. The well has an 8 5/8" intermediate string set at 4598' which isolates the Queen formation. The top of the Grayburg is 4190' and the top of the San Andres is 4480'. The well is also 2721'

from the Eilliams #14, which is 81' outside the ½ mile area of review. It was included in the area of review list due to its proximity to the circle.

The Phillips operated Eilliams #7 did not have a bond log or temperature log in its file, but the well did have a caliper log run on it. Using this caliper, the volume of the annulus was calculated and a TOC was estimated to be 5120'. The tabulated data is attached. The TOC calculation assume no cement losses and a cement yield of 1.32 cu ft/sack. Using this value, it appears that the Glorieta (6252') is cemented as well as the Clearfork (6412'), Tubb (7306'), Yeso (8027'), and Abo (8129'). The Queen is isolated by intermediate casing set @ 4614'. The top of the Grayburg is 4190' and the top of the San Andres is 4530'.

The third well is the Southwestern Energy operated Denius Fed #5. The writer has attempted to contact the operator, but those efforts have been unsuccessful. For purposes of calculation, it was assumed that the caliper would be the same as the Eilliams #7 above 7980' (A caliper log was run only on the bottom section of the Denius #5). Using this the TOC was estimated to be 4420'. The tabulated data is attached. Assumptions were as above. Using this value, it appears that the Glorieta (6454') is cemented as well as the Tubb (7409'), and Abo (8260'). The Queen is isolated by intermediate casing set @ 4215'. The top of the Grayburg is 4303' and the top of the San Andres is 4712'. The Queen producing interval is 3885-3935'. If an average hole size of 9¼" is used, the estimated TOC would be 4070' which would be up in the intermediate casing.

With this information, the applicant believes that it has demonstrated that the three referenced wells will not provide a conduit whereby injected fluid may migrate to other formations as set forth in the captioned order. Because the three referenced wells are not operated by Southwest Royalties, it would not be possible for the company to enter those premises and conduct remedial cement operations.

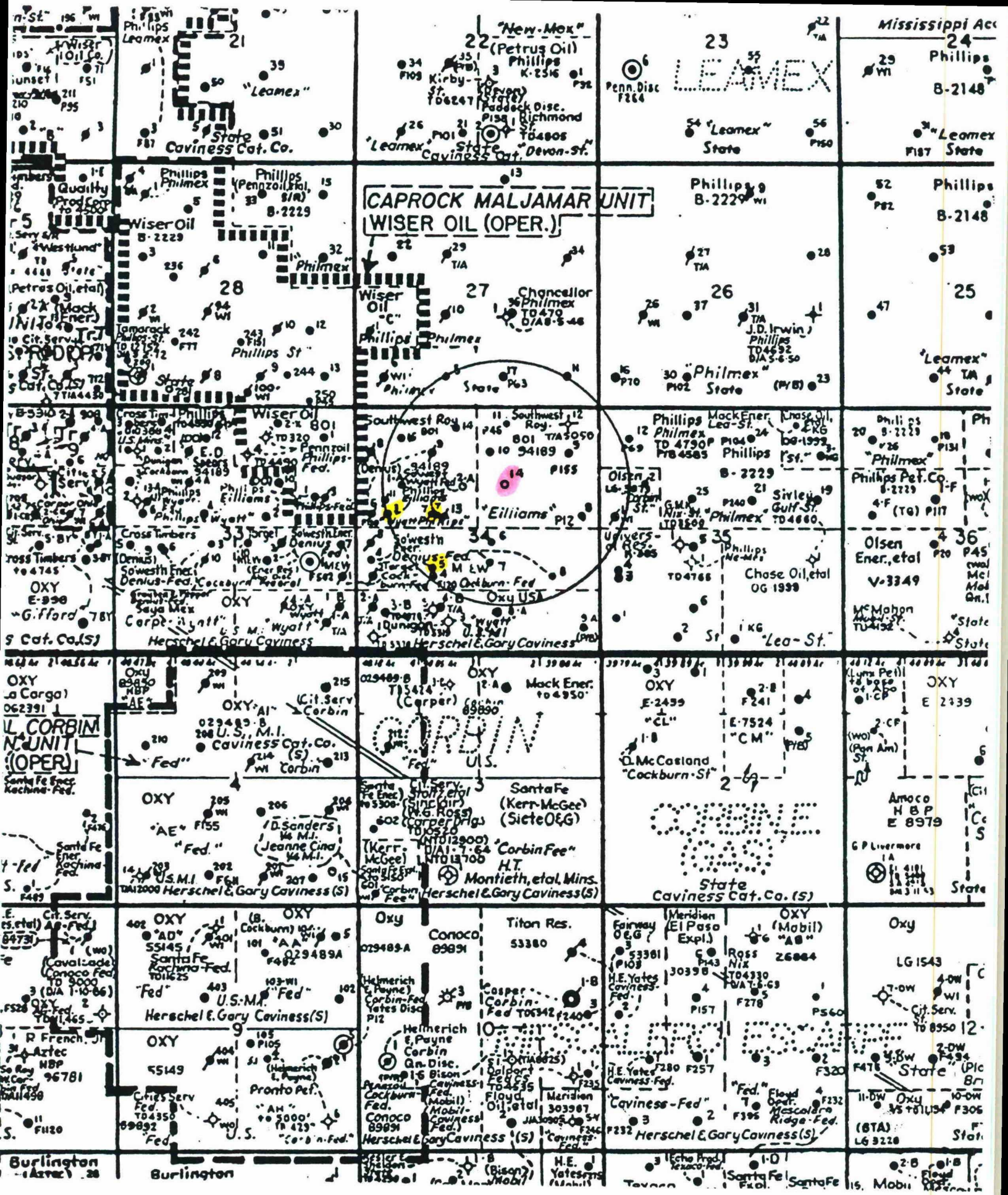
Should further information be desired, or if a supplemental hearing should be scheduled, please advise the writer at the applicant's Midland address.

Your courtesy to us in this matter is appreciated.

Very truly yours,

SOUTHWEST ROYALTIES, INC.

By _____
James Blount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Phillips B-2965
Phillips B-2966
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Phillips B-2989
Phillips B-2990
Phillips B-2991
Phillips B-2992
Phillips B-2993
Phillips B-2994
Phillips B-2995
Phillips B-2996
Phillips B-2997
Phillips B-2998
Phillips B-2999
Phillips B-3000

GENERAL PETROLEUM ENGINEERING SERVICE
"SPECIALIZING IN ACCURACY"

TEMPERATURE SURVEY

COMPANY Phillips Petroleum Company
P. O. Box 78, Buckeye, New Mexico
WELL Williams No. 3
FIELD Corbin Abo
COUNTY Lea STATE New Mexico

Type of Survey Mechanical Chart No. 15378
Log Measured From Rotary Bushing Elevation
Drilling Measured From Elevation
Permanent Datum Elevation

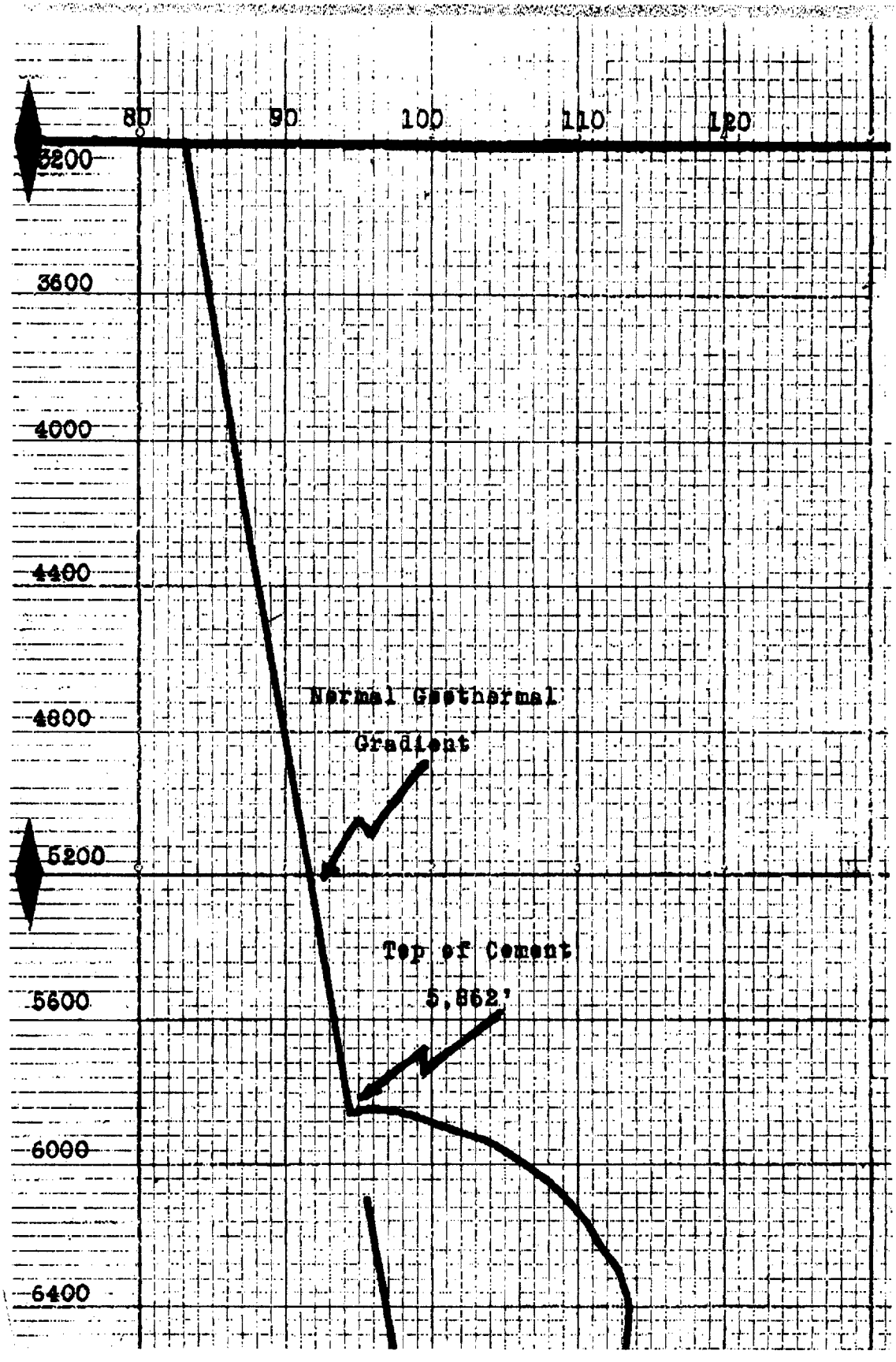
Date of Survey January 16, 1961 Time 10:15 A. M.
Date of Cementing January 15, 1961 Time 10:10 P. M.
Amount of Cement: 475 Cu. Ft. Cement w/ 20% Diacel followed by 165 sx. Trinity Inferno

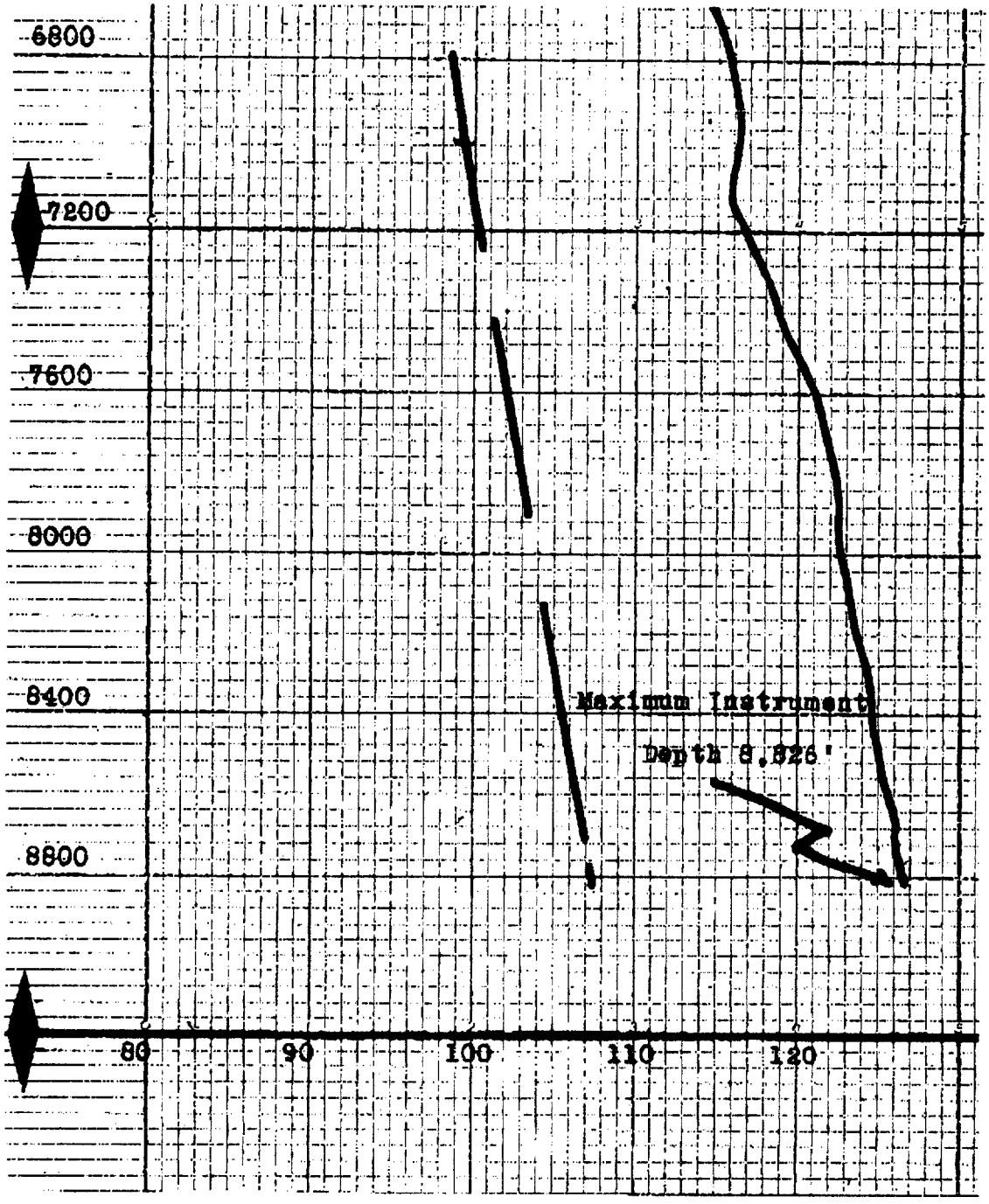
Casing Size	Casing Depth	Diam of Hole	Depth
5-1/2" from Sur.	to 8,830'	7-7/8" from Int.	to 8,832'
from	to	from	to

Survey Begins at Surface Ft. Ends at 8,826' Ft.
Run No. 1 Approx. Top Cement 5,862' Ft.
Recorded by Bright Witnessed by Mr. B. E. Allen

REMARKS OR OTHER DATA

TEMPERATURE IN DEGREES FAHRENHEIT


80
90
100
110
120
3200
3600
4000
4400
4800
5200
5600
6000
6400
Normal Geothermal
Gradient
Top of Cement
5,862'


6800
7200
7600
8000
8400
8800
80
90
100
110
120
Maximum Instrument
Depth 8,826'

TOTAL P.02

Eilliams Fed #7 2310' FNL & 1720' FWL, Sec 37, T17S, R33E

Range		Length	Diameter	cu ft/ft	Volume	Cum Vol	Sacks	Cum Sks		
8910	8670	240	8	0.1841	44.2	44.2	33.5	33.5		
8670	8100	570	9	0.2768	157.8	202.0	119.5	153.0	1.32	cu ft/sx
8100	8010	90	10	0.3804	34.2	236.2	25.9	178.9		
8010	7585	425	8.75	0.2526	107.4	343.6	81.3	260.3		
7585	7510	75	9.75	0.3535	26.5	370.1	20.1	280.4		
7510	7440	70	9	0.2768	19.4	389.4	14.7	295.0		
7440	7370	70	10.5	0.4363	30.5	420.0	23.1	318.2		
7370	6990	380	9	0.2768	105.2	525.2	79.7	397.9		
6990	6850	140	9.5	0.3272	45.8	571.0	34.7	432.6		
6850	6815	35	10.5	0.4363	15.3	586.2	11.6	444.1		
6815	6630	185	9.5	0.3272	60.5	646.8	45.9	490.0		
6630	5910	720	8.75	0.2526	181.9	828.6	137.8	627.8		
5910	5880	30	10.5	0.4363	13.1	841.7	9.9	637.7		
5880	5730	150	9	0.2768	41.5	883.3	31.5	669.1		
5730	5650	80	9.5	0.3272	26.2	909.4	19.8	689.0		
5650	5610	40	10.5	0.4363	17.5	926.9	13.2	702.2		
5610	5550	60	9.5	0.3272	19.6	946.5	14.9	717.1		
5550	5500	50	10	0.3804	19.0	965.5	14.4	731.5		
5500	5440	60	11	0.495	29.7	995.2	22.5	754.0		
5440	5180	260	10	0.3804	98.9	1094.1	74.9	828.9		
5180	4930	250	10.25	0.408	102.0	1196.1	77.3	906.2	TOC @	5124
4930	4770	160	11	0.495	79.2	1275.3	60.0	966.2		
4770	4610	160	10	0.3804	60.9	1336.2	46.1	1012.3		

Denius Fed #5 2310' FSL & 2310' FEL, Sec 34, T17S, R33E

Range		Length	Diameter	cu ft/ft	Volume	Cum Vol	Sacks	Cum Sks	
8877	8600	277	8	0.2386	66.1	66.1	50.1	50.1	
8600	8260	340	8.25	0.2608	88.7	154.8	67.2	117.2	1.32 cu ft/sx
8260	7980	280	8	0.2386	66.8	221.6	50.6	167.9	
7980	7585	395	8.75	0.3071	121.3	342.9	91.9	259.8 *	
7585	7510	75	9.75	0.408	30.6	373.5	23.2	282.9	
7510	7440	70	9	0.3313	23.2	396.7	17.6	300.5	
7440	7370	70	10.5	0.4909	34.4	431.0	26.0	326.5	
7370	6990	380	9	0.3313	125.9	556.9	95.4	421.9	
6990	6850	140	9.5	0.3818	53.5	610.4	40.5	462.4	
6850	6815	35	10.5	0.4909	17.2	627.6	13.0	475.4	
6815	6630	185	9.5	0.3818	70.6	698.2	53.5	528.9	
6630	5910	720	8.75	0.3071	221.1	919.3	167.5	696.4	
5910	5880	30	10.5	0.4909	14.7	934.0	11.2	707.6	
5880	5730	150	9	0.3313	49.7	983.7	37.6	745.2	
5730	5650	80	9.5	0.3818	30.5	1014.3	23.1	768.4	
5650	5610	40	10.5	0.4909	19.6	1033.9	14.9	783.3	
5610	5550	60	9.5	0.3818	22.9	1056.8	17.4	800.6	
5550	5500	50	10	0.435	21.8	1078.6	16.5	817.1	
5500	5440	60	11	0.5495	33.0	1111.5	25.0	842.1	
5440	5180	260	10	0.435	113.1	1224.6	85.7	927.8	
5180	4930	250	10.25	0.4626	115.7	1340.3	87.6	1015.4	
4930	4770	160	11	0.5495	87.9	1428.2	66.6	1082.0	
4770	4610	160	10	0.435	69.6	1497.8	52.7	1134.7	
4610	4420	190	10	0.435	82.7	1580.5	62.6	1197.3	TOC @ 4420'

* caliper assumed based on Eilliams #7 above 7980'

COMPENSATED NEUTRON
FORMATION DENSITY

COMPANY PHILLIPS PETROLEUM COMPANY
WELL WILLIAMS #7
FIELD CORBIN SSD
COUNTY LEA STATE NEW MEXICO
2312' FNL & 1720' FWL
Sec 35 Twp 17-S Rge 33-E
Elev.: K.B. 4139
D.F. 4138
G.L. 4126
Date 5-7-75
Run One
Depth-Driller 4665
Depth-Logger 4666
Bottom Logged Interval 4665
Top Logged Interval 3900
Type Fluid in Hole LIQ
Salinity, PPM Cl 1800
Density 9.0
Level FULL
Max. Rec. Temp. Logged 120°F
Operating Rig Time 3 HRS
Recorded by D. SMITH
Witnessed by MR. HOLLOWAY

DIL

Run No. One
Type Log | Depth | Date

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

REMARKS:

5-15-75

000160

EQUIPMENT DATA

Gamma Ray Sonde Type	GT-1125
Gamma Ray Sonde Serial No.	G-1429
Gamma Ray Cartridge Type	C-378
Gamma Ray Cartridge Serial No.	
Gamma Ray Detector	
Neutron Sonde Type	A-151
Neutron Sonde Serial No.	A-141
Neutron Cartridge Type	
Neutron Cartridge Serial No.	
Neutron Spacing	
Gamma Ray Source (GS)	
Neutron Source (NS)	NS-1361 AB-351
Caliper Arm (CAL)	
Caliper Shoe (CSH)	
Pressure Wheel (CPW)	
Centralizers Type	DOW SPRING
Centralizers No.	
Bowsprits No.	

CALIBRATION DATA

GR	P.U. CPS	60
	Response (GR)	590
	Scale Set	145
	T.C. Set	6
CN	Short Spacing Before Log	1040
	Long Spacing Before Log	1440
	Short Spacing After Log	
	Long Spacing After Log	
DC	P.U. Before Log	446
	P.U. Before Log	732
	P.U. After Log	446
	P.U. After Log	732

LOGGING DATA

Interval Top	Interval Bottom	Formation Density Porosity Scale	CDC Matrix	CDC Auto Curve or Hole Size Setting	FDC Porosity Scale	FDC Grain Density	Liquid Density	Hole Fluid	Scale Logged	GR Scale	GR Sensitivity	GR Tool Zero	GR Tool 100 API
4665	TD	30-10	LS/DOL	AUTO	30-10	2.71	1.00	LIQ	100	2	0	100	
0	4665								100	1	0	100	

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CALIPER (SCALE IN INCHES)
6 ... 16

GAMMA RAY API UNITS
0 ... 100
100 ... 200

CORRECTION GRAMS/CC
Use this scale when correction curve is presented in Track 3
.0 2

BULK DENSITY GRAMS/CC
2.0 ... 2.5 ... 3.0
1.0 ... 1.5 ... 2.0

OIL POROSITY — %

Schlumberger

COMPENSATED NEUTRON · FORMATION DENSITY

COMPANY PHILLIPS PETROLEUM COMPANY

WELL WILLIAMS #7

FIELD CORBIN ABO

COUNTY LEA STATE NEW MEXICO

2310' FNL & 1720' FWL

Other Services: DIL

Sec 33 Twp 17-S Rge 32-E

Permanent Datum: G.L. Elev. 3979 ft. Above Perm. Datum

Log Measured From: K.B. 10 ft. Above Perm. Datum

Drilling Measured From: K.B.

Elev.: K.B. 3989 D.F. 3988 G.L. 3979

Date 5-3-75

Run One

Depth-Driller 9900

Depth-Logger 9911

Bottom Logged Interval 9911

Top Logged Interval 0

Type Fluid in Hole SALT GEL

Salinity, PPM Cl 3400

Density LB/G 9.9

Viscosity 38

pH 7.5

Fluid Loss 9.2 ML

Source of Sample CIRC

Rm @ Meas. Temp. .36 @ 72°F

Rmf @ Meas. Temp. .29 @ 72°F

Rmc @ Meas. Temp. .71 @ 72°F

Source of Rmf & Rmc CALC

Rm @ BHT .19 @ 200°F

Time Since Circ. 36 HRS

Max. Rec. Temp. Deg. F 200°F

Equip. No. & Location 3115 HOBBS

Recorded By R. ROBERTS

Witnessed By MR. MOORE

Run No. ONE

Type Log: Depth-Driller

Depth-Logger

Bottom Logged Interval

Top Logged Interval

Casing-Driller 8 5/8 @ 1605

Casing-Logger

Bit Size 7 7/8

Type Fluid in Hole SALT GEL

Dens. Visc. 9.9 38

pH Fluid Loss 7.5 9.2 ML

Source of Sample CIRC

Rm @ Meas. Temp. .36 @ 72°F

Rmf @ Meas. Temp. .29 @ 72°F

Rmc @ Meas. Temp. .71 @ 72°F

Source of Rmf & Rmc CALC

Rm @ BHT .19 @ 200°F

Time Since Circ. 36 HRS

Max. Rec. Temp. Deg. F 200°F

Equip. No. & Location 3115 HOBBS

Recorded By R. ROBERTS

Witnessed By MR. MOORE

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

Type Log | Depth | Scale

REMARKS

5-15-75 | 0006 | 1650

LOG INFO

	Run ONE			
Recorded By	R. ROBERTS			
Witnessed By	MR. MOORE			

FOUR ARM DATA

	Run ONE			
Tool Serial No.	2-1125			
Tool Code	2-1125			
Tool Size	2-1125			
Tool Weight	2-1125			
Tool Type				
Tool Centralizer				
Tool Serial No.	A-141			
Tool Code				
Tool Weight				
Tool Eccentralizer				
Pad Sel.	KG-1241			
Manufacturer Pad	AB-392			
Caliper Recorder (1IN)				
Depth Encoder (DAC)				
Pressure Wheel (CPW)				
Centralizers Type	BOW SPRING			
Under Spring Standoffs No.				
Indicator Travel 5.0 Inches				

CALIBRATION DATA

		Run ONE			
CD	M.O. Cps	60			
	Source (Cs)	590			
	Bkgd. Cps	165			
	L.E. Cps	6			
	Short Spacing Before Log	3040			
	Long Spacing Before Log	1440			
	Short Spacing After Log				
	Long Spacing After Log				
P	Before Log	446			
	After Log	446			
P	Before Log	732			
	After Log	732			

LOGGING DATA

Interval Top	Interval Bottom	CNL Porosity Scale	CNL Matrix	CNL Auto Cure or Mud & Bit Setting	FDC Porosity Scale	FDC Grain Density	FDC Liquid Density	Hole Fluid	GR Semi Logged	GR I.C.	GR Tens. Dir. Left	GR Scale 100 Per
4565	TD 9905	30 -10	LS/DOL	AUTO	30 -10	2.71	1.00	LIQ	100	2	0	100
0	4565								100	1	0	100

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CALIPER DIAM IN INCHES 6 — 16

GAMMA RAY API UNITS 0 — 100 — 200

CORRECTION GRAMS/CC
Use this scale when correction curve is presented in Track 2
0 — 1.25

BULK DENSITY GRAMS/CC
2.0 — 2.5 — 3.0
1.0 — 1.5 — 2.0

CNL POROSITY — %

Scaling

8 3/4

9 1/2

10 1/2

9 1/2

9"

10 1/2

9 1/2

10 1/2

9"

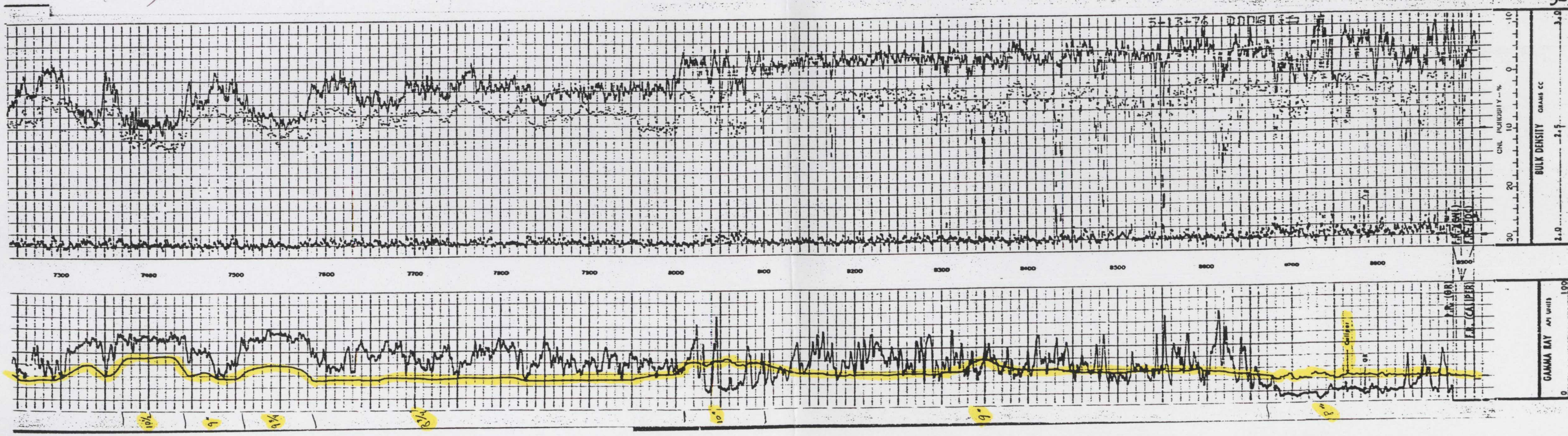
10"

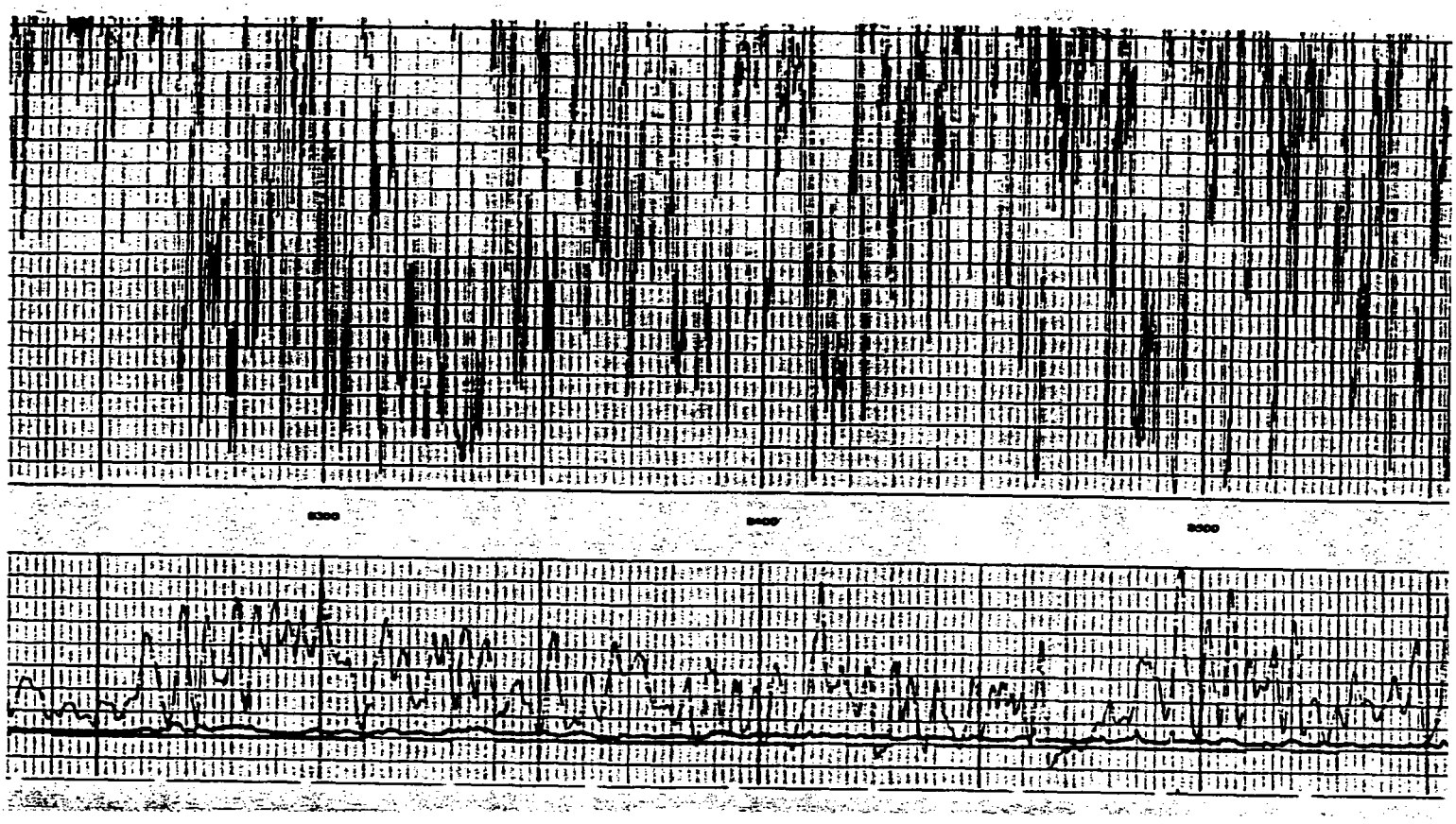
11"

ELLIAM #7 (CONT)

5-13-76

5-1





SCHLUMBERGER WELL SURVEYING CORPORATION

MICROLOGGING

COMPANY JAMES P. DUNIGAN

ARTESIA OFFICE COPY

WELL BENNUS FEDERAL # 5

FIELD CORBIN ABO REEF

LOCATION SEC. 34-17S-33E

COUNTY LEA

STATE NEW MEXICO

Other Surveys SGR, IES

Location of Well
1750' FROM S/L
1650' FROM W/L

Elevations D.F. 4077
K.B.
G.L.

Log Depths Measured From KB Ft. above

Run No.	ONE
Date	11-18-60
Depth-Driller	8877
Depth-Logger	8000
Bottom Logged Interval	877
Top Logged Interval	8878
Casing-Driller	8875
Casing-Logger	CHEM
Bit Size	7 7/8"
Type Fluid in Hole	PMS-A
Dens.	9
Visc.	37
pH	8.5
Fluid Loss	7.6 cc 30 min
Source of Sample	CIRC
Rm @ Meas. Temp.	1.30 @ 77 °F
Rmf @ Meas. Temp.	1.96 @ 177 °F
Rmc @ Meas. Temp.	1.47 @ 79 °F
Source of Rmf and Rmc	CALC
Rm @ BHT	1.30 @ 177 °F
Time Since Circ.	11 HOURS
Max. Rec. Temp.	177 °F
Equip. No.	2526-HOBBS
Recorded By	WILSON
Witnessed By	WARD

RECEIVED
DEC 29 1960
OIL CONSERVATION COMMISSION
ARTESIA, NEW MEXICO

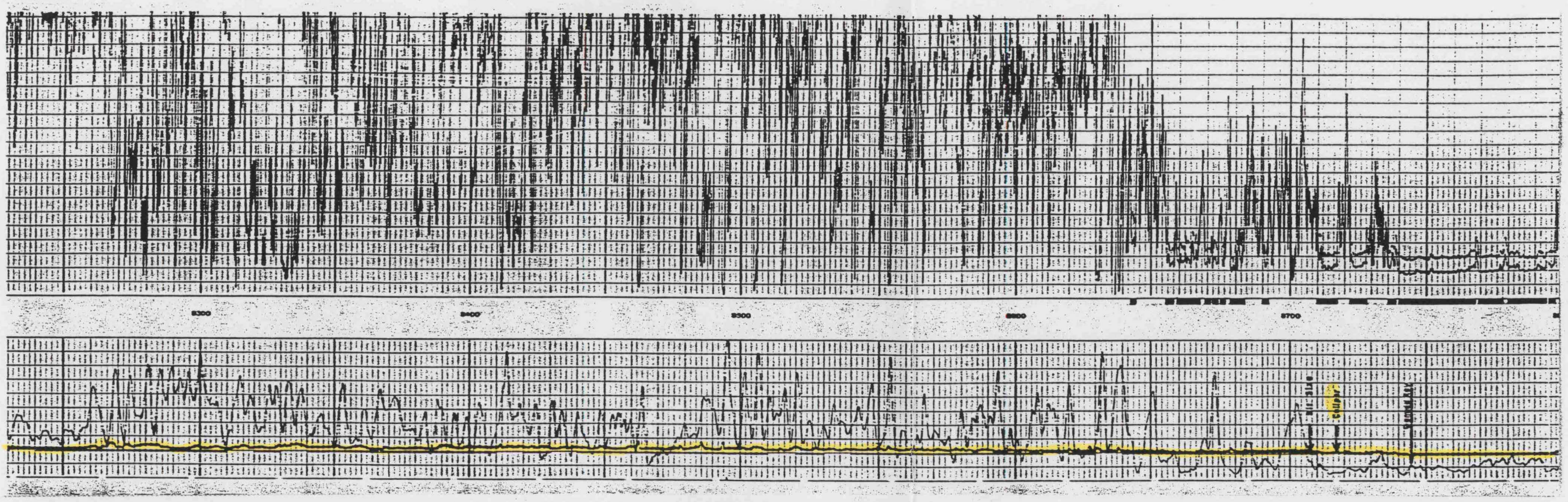
REMARKS

RESISTIVITY ohms. m²/m
Micro Inverse 1" x 1"
Micro Normal 2"
80 40 80

DEPTHS

MICROCALIPER
Hole Diameter in Inches
6 7 8 9 10 11 12 13 14 15 16

SPONTANEOUS-POTENTIAL millivolts
Micro



SCHLUMBERGER WELL SURVEYING CORP.
HOUSTON, TEXAS

34-17-33

MICRO LOGGING

COMPANY JAMES P. DUNIGAN
ARTESIA OFFICE COPY

WELL DENNIS FEDERAL # 5

FIELD CORBIN ABO REEF

LOCATION SEC. 34-17S-33E

COUNTY LEA

STATE NEW MEXICO

Other Surveys
SGR. IES

Location of Well
1750' FROM S/L
1650' FROM E/L

Elevations: D.F. 4073
K.B.
G.L.

Log Depths Measured From KB Ft. above

Run No.	ONE
Date	11-18-60
Log Reading	8377
Log Reading	8000
Csg. Measured	877
Csg. Reached	8878
Bottom Driller	8875
Fluid Type	CHEM
Fluid Level	FULL
Max. Rec. Temp.	137 °F
Resistivity	7 @ 52 °F
Res. BHT	5.6 @ 177 °F
pH	8.5 @ °F
Viscosity	39
Water Loss	7.6 CC 30
Resistivity	.75 @ 177 °F
Resistivity	1.47 @ 79 °F
Fluid Loss Rm	1.90
Depth	8685
Bit Size	7 7/8"
Service Type	PMS-A
Rig Type	H
Equip. Rig Time	7½ HOURS
Truck No.	2526-HOBBS
Recorded By	WILSON
Witnessed By	WARD

RECEIVED
DEC 29 1960
OIL CONSERVATION SURVEY
ARTESIA, NEW MEXICO

REMARKS

RESISTIVITY ohms. m²/m
Micro Inverse 1" x 1" 0 40
Micro Normal 2" 0 40

DEPTHS

MICROCALIPER
Hole Diameter, in Inches 6 7 8 9 10 11 12 13 14 15 16

SPONTANEOUS-POTENTIAL millivolts
Micro -80 +20