

OILFIELD RESEARCH LABORATORIES

536 NORTH HIGHLAND - CHANUTE, KANSAS 66720 - PHONE (316) 431-2650

August 24, 1981

Don McGinnis
Rural Route # 1, Box 99
Rantoul, Kansas 66079

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Powener Lease, Well No. 1, located in Miami County, Kansas and submitted to our laboratory on August 14, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Rantoul, Kansas

Oilfield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company Don McGinnis Lease Powener Well No. 1

Location _____

Section 26 Twp. 17S Rge. 22E County Miami State Kansas

Elevation, Feet
 Name of Sand..... Peru
 Top of Core 344.0
 Bottom of Core 353.0
 Top of Sand 344.0
 Bottom of Sand 353.0
 Total Feet of Permeable Sand 3.9
 Total Feet of Floodable Sand 2.0

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
35 - 45	2.2	2.2
60 - 65	0.7	2.9
140 & Above	1.0	3.9

Average Permeability Millidarcys 70.1
 Average Percent Porosity 15.0
 Average Percent Oil Saturation 24.4
 Average Percent Water Saturation..... 61.7
 Average Oil Content, Bbls./A. Ft. 313.
 Total Oil Content, Bbls./Acre..... 2,662.
 Average Percent Oil Recovery by Laboratory Flooding Tests..... 12.
 Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. 178.
 Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre 356.
 Total Calculated Oil Recovery, Bbls./Acre.....

See "Calculated Recovery"
Section

The core was sampled and the samples sealed in plastic bags by a representative of the client. Fresh water mud was used as a drilling fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
344.0 - 344.8	Gray and light brown slightly calcareous laminated shale and sandstone.
344.8 - 346.0	Brown slightly calcareous laminated sandstone and shale.
346.0 - 347.0	Gray and light brown laminated slightly calcareous shale and sandstone.
347.0 - 349.7	Dark brown slightly calcareous slightly carbonaceous sandstone.
349.7 - 350.4	Gray and brown laminated slightly calcareous shale and sandstone.
350.4 - 350.6	Brown slightly calcareous sandstone.
350.6 - 352.0	Gray and light brown laminated slightly calcareous shale and sandstone.
352.0 - 352.3	Brown slightly calcareous sandstone.
352.3 - 353.0	Gray and light brown laminated slightly calcareous shale and sandstone.

-3-

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 356 barrels of oil per acre was obtained from 2.0 feet of sand. The weighted average percent oil saturation was reduced from 43.0 to 31.0, or represents an average recovery of 12.0 percent. The weighted average effective permeability of the samples is 2.81 millidarcys, while the average initial fluid production pressure is 22.5 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 9 samples tested, 2 produced water and oil, and 2 produced water only. This indicates that approximately 22 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

It would appear from a study of the core data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 450 barrels of oil per acre. This is an average recovery of 223 barrels per acre foot from 2.0 feet of floodable sand analyzed in this core.

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-4-

These recovery values were calculated using the following data and assumptions:

Original formation volume factor, estimated	1.03
Reservoir water saturation, percent, estimated	40.0
Average porosity, percent	19.2
Oil saturation after flooding, percent	31.0
Performance factor, percent, estimated	55.0
Net floodable sand, feet	2.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Don McGinnis

Lease Powener

Well No. 1

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation		Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water			Ft.	Cum. Ft.		
1	344.5	14.7	14	82	160	Imp.	0.8	0.8	128	0.00
2	345.5	21.3	24	49	397	44.	1.2	2.0	476	52.80
3	346.3	14.8	20	76	230	Imp.	1.0	3.0	230	0.00
4	347.6	20.3	40	20	630	141.	1.0	4.0	630	141.00
5	348.5	18.3	46	44	653	36.	1.0	5.0	653	36.00
6	349.4	17.4	30	61	405	62.	0.7	5.7	284	43.40
7	350.3	4.6	4	90	14	Imp.	0.7	6.4	10	0.00
8	351.8	7.8	24	65	145	Imp.	1.4	7.8	203	0.00
9	352.4	14.9	6	90	69	Imp.	0.7	8.5	48	0.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Don McGinnis	Lease	Powener	Well No.	1
	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.	
	344.0 - 353.0	3.9	70.1	273.20	
	Depth Interval, Feet	Feet of Core Analyzed	Average Percent Oil Saturation	Average Percent Water Saturation	Total Oil Content Bbls./Acre
	344.0 - 353.0	8.5	24.4	61.7	2,662
				313	

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation		Volume of Water Recovered cc*	Effective Permeability Millidarcys**	Initial Fluid Production Pressure Lbs./Sq./In.	
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water				Bbls./A. Ft.
1	344.5	14.8	14	161	0	0	14	83	0	Imp.	-	
2	345.5	21.2	24	395	0	0	24	71	16	0.50	40	
3	346.3	14.9	20	231	0	0	20	77	0	Imp.	-	
4	347.6	20.2	40	627	11	172	29	68	42	0.75	25	
5	348.5	18.2	46	649	13	184	33	62	268	4.87	20	
6	349.4	17.3	30	403	0	0	30	66	18	0.45	50	
7	350.3	4.7	4	15	0	0	4	91	0	Imp.	-	
8	351.8	7.9	24	147	0	0	24	66	0	Imp.	-	
9	352.4	14.8	6	69	0	0	6	90	0	Imp.	-	

Company Don McGinnis
Lease Powener
Well No. 1

Notes: cc—cubic centimeter.

*—Volume of water recovered at the time of maximum oil recovery.

**—Determined by passing water through sample which still contains residual oil.

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SUMMARY OF LABORATORY FLOODING TESTS

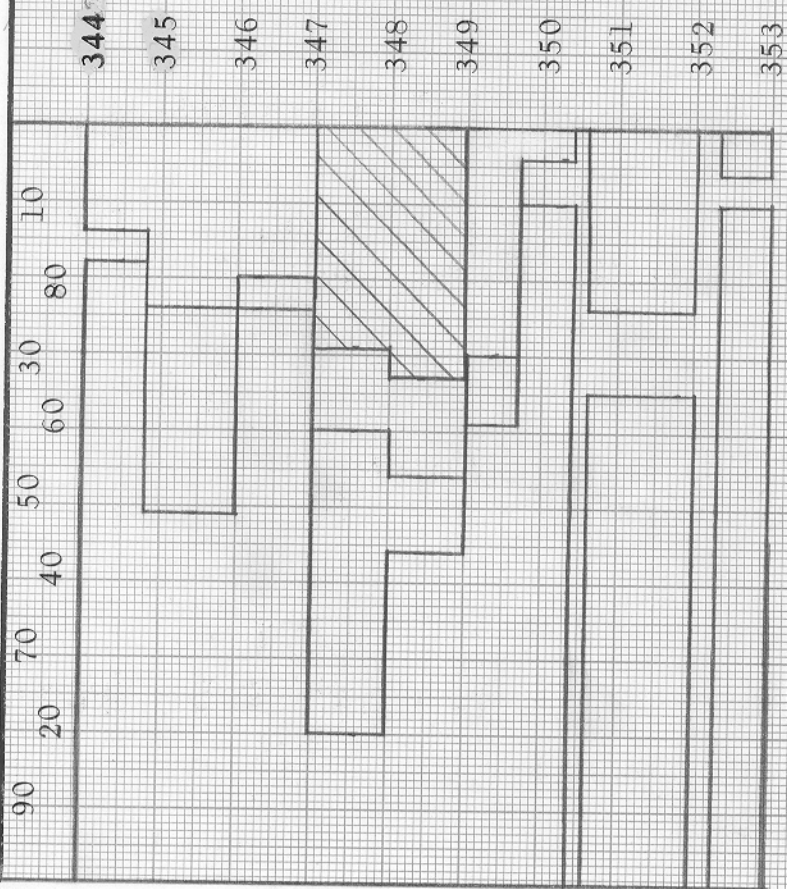
TABLE V

Company Don McGinnis Lease Powener Well No. 1

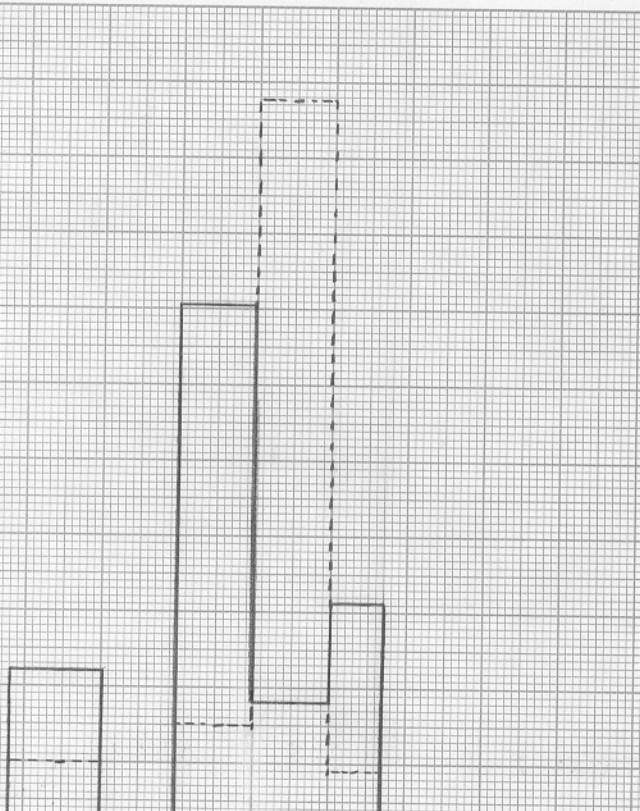
Depth Interval, Feet	344.0 - 353.0
Feet of Core Analyzed	2.0
Average Percent Porosity	19.2
Average Percent Original Oil Saturation	43.0
Average Percent Oil Recovery	12.0
Average Percent Residual Oil Saturation	31.0
Average Percent Residual Water Saturation	65.0
Average Percent Total Residual Fluid Saturation	96.0
Average Original Oil Content, Bbls./A. Ft.	638.
Average Oil Recovery, Bbls./A. Ft.	178.
Average Residual Oil Content, Bbls./A. Ft.	460.
Total Original Oil Content, Bbls./Acre	1,276.
Total Oil Recovery, Bbls./Acre	356.
Total Residual Oil Content, Bbls./Acre	920.
Average Effective Permeability, Millidarcys	2.81
Average Initial Fluid Production Pressure, p.s.i.	22.5

NOTE: Only those samples which recovered oil were used in calculating the above averages.

WATER SAT., PERCENT \rightarrow \leftarrow OIL SAT., PERCENT



PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS



KEY:

-  CALCAREOUS SANDSTONE
-  CARBONACEOUS CALCAREOUS SANDSTONE



LAMINATED CALCAREOUS SANDSTONE AND SHALE



FLOODPOT RESIDUAL OIL SATURATION



IMPERMEABLE TO WATER

DON MC GINNIS

POWENER LEASE

WELL NO. 1

MIAMI COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLs. / ACRE
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344.0 - 353.0

8.5

15.0

24.4

61.7

70.1

450

(PRIMARY AND
WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
AUGUST, 1981

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