

OILFIELD RESEARCH LABORATORIES

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

October 22, 1982

Sand Bar Oil Company
Box 143
Canton, Kansas 67428

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Decker Lease, Well No. 3, located in Crawford County, Kansas and submitted to our laboratory on October 15, 1982.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/rmc

5 c to Canton, Kansas
2 c to Box 45, McCune, Kansas

- REGISTERED ENGINEERS -

CORE ANALYSIS - WATER ANALYSIS - REPRESSURING ENGINEERING - SURVEYING & MAPPING - PROPERTY EVALUATION & OPERATION

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GENERAL INFORMATION & SUMMARY

Company Sand Bar Oil Company Lease Decker Well No. 3
 Location _____
 Section 31 Twp. 30S Rge. 22E County Crawford State Kansas

Elevation, Feet
 Name of Sand..... Bartlesville
 Top of Core 208.0
 Bottom of Core 214.0
 Top of Sand (Tested) 208.3
 Bottom of Sand 214.0
 Total Feet of Permeable Sand 3.4
 Total Feet of Floodable Sand 0.9

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 3	1.5	1.5
5 - 7	1.9	3.4

Average Permeability Millidarcys 4.0
 Average Percent Porosity 17.8
 Average Percent Oil Saturation 35.1
 Average Percent Water Saturation..... 46.3
 Average Oil Content, Bbls./A. Ft. 496.
 Total Oil Content, Bbls./Acre..... 2,034.
 Average Percent Oil Recovery by Laboratory Flooding Tests..... 3.0
 Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. 44.
 Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre 40.
 Total Calculated Oil Recovery, Bbls./Acre.....

See "Calculated Recovery"
Section

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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>
208.0 - 208.3	Grayish brown very shaly sandstone.
208.3 - 209.2	Brown slightly shaly sandstone.
209.2 - 211.0	Brown shaly sandstone with scattered micaceous partings.
211.0 - 212.6	Gray shale.
212.6 - 213.0	Brown very shaly sandstone.
213.0 - 214.0	Grayish brown very shaly sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 40 barrels of oil per acre was obtained from 0.9 feet of sand. The weighted average percent oil saturation was reduced from 39.0 to 36.0, or represents an average recovery of 3.0 percent. The weighted average effective permeability of the samples is 0.37 millidarcys, while the average initial fluid production pressure is 50.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 5 samples tested, 1 produced water and oil, and 1 produced water only.

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This indicates that approximately 20 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 230 barrels of oil per acre. This is an average recovery of 258 barrels per acre foot from 0.9 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.03
Reservoir water saturation, percent, estimated	30.0
Average porosity, percent	18.9
Oil saturation after flooding, percent	36.0
Performance factor, percent, estimated	55.0
Net floodable sand, feet	0.9

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Sand Bar Oil Company Lease Decker Well No. 3

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	Total			Ft.	Cum. Ft.		
1	208.5	18.8	39	56	95	569	6.0	0.9	0.9	512	5.40
2	209.5	18.3	38	40	78	540	2.8	0.8	1.7	432	2.24
3	210.4	18.6	45	32	77	649	5.2	1.0	2.7	649	5.20
4	212.7	14.9	16	65	81	185	Imp.	0.7	3.4	130	0.00
5	213.6	17.9	32	43	75	444	0.89	0.7	4.1	311	0.62

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company	Lease	Decker	Well No.				
Sand Bar Oil Company			3				
	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.			
	208.3 - 214.0	3.4	4.0	13.46			
	Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre	
	208.3 - 214.0	4.1	17.8	35.1	46.3	496	2,034

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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	208.5	18.9	39	572	3	44	36	60	528	12	0.37	50		
2	209.5	18.1	38	534	0	0	38	42	534	6	0.22	50		
3	210.4	18.5	45	646	0	0	45	33	646	0	Imp.	-		
4	212.7	14.4	17	190	0	0	17	64	190	0	Imp.	-		
5	213.6	17.9	32	444	0	0	32	44	444	0	Imp.	-		

Company Sand Bar Oil Company
Lease Decker
Well No. 3

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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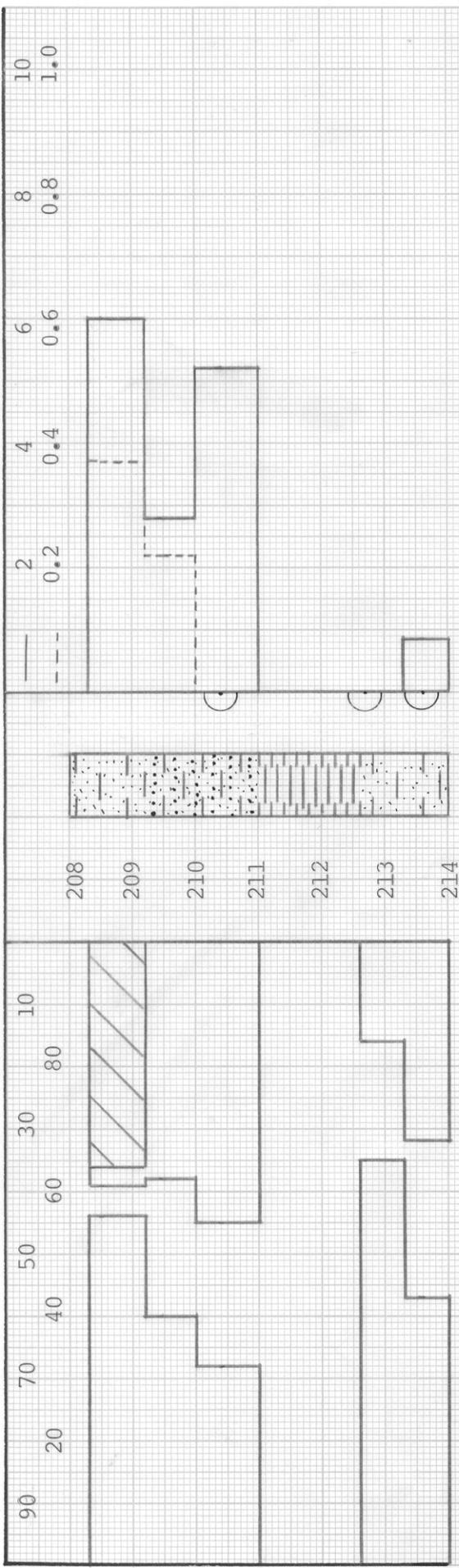
SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company	Sand Bar Oil Company	Lease	Decker	Well No.	3
Depth Interval, Feet	208.3 - 214.0				
Feet of Core Analyzed	0.9				
Average Percent Porosity	18.9				
Average Percent Original Oil Saturation	39.0				
Average Percent Oil Recovery	3.0				
Average Percent Residual Oil Saturation	36.0				
Average Percent Residual Water Saturation	60.0				
Average Percent Total Residual Fluid Saturation	96.0				
Average Original Oil Content, Bbbls./A. Ft.	572.				
Average Oil Recovery, Bbbls./A. Ft.	44.				
Average Residual Oil Content, Bbbls./A. Ft.	528.				
Total Original Oil Content, Bbbls./Acre	515.				
Total Oil Recovery, Bbbls./Acre	40.				
Total Residual Oil Content, Bbbls./Acre	475.				
Average Effective Permeability, Millidarcys	0.37				
Average Initial Fluid Production Pressure, p.s.i.	50.0				

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

WATER SAT., PERCENT → ← OIL SAT., PERCENT



KEY:

- SHALY SANDSTONE
- IMPERMEABLE TO WATER
- SHALE
- SHALY SANDSTONE WITH MICACEOUS PARTINGS
- FLOODPOT RESIDUAL OIL SATURATION

SAND BAR OIL COMPANY

DECKER LEASE CRAWFORD COUNTY, KANSAS WELL NO. 3

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
208.3 - 214.0	4.1	17.8	35.1	46.3	4.0	230 (PRIMARY AND WATERFLOODING)

SAND BAR OIL COMPANY

DECKER LEASE

WELL NO. 3

CRAWFORD 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
208.3 - 214.0	4.1	17.8	35.1	46.3	4.0	230 (PRIMARY AND WATERFLOODING)

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CHANUTE, KANSAS
OCTOBER, 1982 PDC