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

January 14, 1981

Davis Oil Company
212 East Locust
Independence, Kansas 67301

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary cores taken from the Barnhill Lease, Well No. B-2, located in Montgomery County, Kansas and submitted to our laboratory on November 21, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Indepdendence, Kansas

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GENERAL INFORMATION & SUMMARY

Company Davis Oil Company Lease Barnhill Well No. B-2

Location 150' WEL & 700' NSL - SW ¼

Section 19 Twp. 34S Rge. 17E County Montgomery State Kansas

Elevation, Feet - - - - - - - - - - - - - - - -

	Peru	Bartlesville
Name of Sand		
Top of Core	351.0	580.0
Bottom of Core	371.6	582.4
Top of Sand	351.0	580.0
Bottom of Sand	371.6	580.9
Total Feet of Permeable Sand	20.6	0.9
Total Feet of Floodable Sand	5.5	0.0

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
	PERU SAND	
0 - 10	4.1	4.1
10 - 20	9.2	13.3
20 - 35	1.0	14.3
35 & Above	6.3	20.6
	BARTLESVILLE SAND	
0 - 20	0.9	0.9

Average Permeability Millidarcys	21.1	19.0
Average Percent Porosity	17.5	20.3
Average Percent Oil Saturation	27.3	30.0
Average Percent Water Saturation	52.8	42.0
Average Oil Content, Bbls./A. Ft.	373.	473.
Total Oil Content, Bbls./Acre	7,692.	426.
Average Percent Oil Recovery by Laboratory Flooding Tests	2.7	0.
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	38.	0.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	211.	0.
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery" Section	0.

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. The core was reported to be from a non-virgin area.

Since only the Peru sand portion of the core responded to flooding susceptibility tests, a calculated recovery is given for the Peru sand only.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
	PERU SAND
351.0 - 355.0	Light brown slightly calcareous sandstone.
355.0 - 355.9	Light brown calcareous sandstone.
355.9 - 356.8	Grayish light brown very calcareous sandstone.
356.8 - 357.7	Light brown calcareous sandstone.
357.7 - 359.2	Brown slightly calcareous sandstone.
359.2 - 359.8	Brown calcareous sandstone.
359.8 - 365.1	Light brown slightly calcareous sandstone.
365.1 - 365.9	Grayish light brown calcareous shaly sandstone.
365.9 - 371.6	Light brown slightly calcareous sandstone.
	BARTLESVILLE SAND
580.0 - 580.9	Light brown sandstone.
580.9 - 582.4	Gray sandy shale.

LABORATORY FLOODING TESTS

PERU SAND

The Peru sand in this core responded to laboratory flooding tests, as a total recovery of 211 barrels of oil per acre was obtained from 5.5 feet of sand. The weighted average percent oil saturation was reduced from 33.2 to 30.5, or represents an average recovery of 2.7 percent. The weighted average effective permeability of the samples is 0.74 millidarcys, while the average initial fluid production presure is 40.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 20 samples tested, 5 produced water and oil, and 12 samples produced water only. This indicates that approximately 25 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

PERU SAND

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 1,240 barrels of oil per acre. This is an average recovery of 226 barrels per acre foot from 5.5 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, estiamted	35.0
Average porosity, percent	17.9
Oil saturation after flooding, percent	30.5
Performance factor, percent, estimated	50.0
Net floodable sand, feet	5.5

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Davis Oil Company Lease Barnhill Well No. B-2

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.		
						PERU SAND					
1	351.5	20.5	28	49	77	445	35.	1.0	1.0	445	35.00
2	352.5	21.3	32	46	78	529	46.	1.0	2.0	529	46.00
3	353.6	19.7	34	46	80	520	37.	1.0	3.0	520	37.00
4	354.5	17.5	35	47	82	475	35.	1.0	4.0	475	35.00
5	355.5	10.3	22	73	95	176	9.4	0.9	4.9	158	8.46
6	356.5	13.1	10	83	93	102	2.0	0.9	5.8	92	1.80
7	357.5	14.2	36	47	83	397	9.2	0.9	6.7	357	8.28
8	358.6	15.3	29	52	81	344	19.	1.5	8.2	516	28.50
9	359.5	19.0	57	40	97	840	8.9	0.6	8.8	504	5.34
10	360.5	16.6	20	56	76	258	35.	1.3	10.1	335	45.50
11	361.5	16.4	26	51	77	331	14.	1.0	11.1	331	14.00
12	362.4	18.9	20	50	70	293	44.	1.0	12.1	293	44.00
13	363.5	19.9	28	48	76	432	17.	1.0	13.1	432	17.00
14	364.6	18.0	37	38	75	517	26.	1.0	14.1	517	26.00
15	365.4	16.2	28	53	81	352	3.4	0.8	14.9	282	2.72
16	366.7	19.7	33	44	77	504	10.	1.0	15.9	504	10.00
17	367.5	21.9	19	53	72	323	14.	1.0	16.9	323	14.00
18	368.5	16.1	26	58	84	325	12.	1.0	17.9	325	12.00
19	369.5	16.4	24	60	84	305	19.	1.0	18.9	305	19.00
20	370.5	17.9	19	58	77	264	15.	1.7	20.6	449	25.50
						BARTLESVILLE SAND					
21	580.5	20.3	30	42	72	473	19.	0.9	0.9	426	17.10

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Davis Oil Company Lease Barnhill Well No. B-2

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
	PERU SAND		
351.0 - 359.8	8.8	23.3	205.38
359.8 - 371.6	11.8	19.5	229.72
351.0 - 371.6	20.6	21.1	435.10
	BARTLESVILLE SAND		
580.0 - 580.9	0.9	19.0	17.10

Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
			PERU SAND			
351.0 - 359.8	8.8	16.7	30.4	53.7	409	3,596
359.8 - 371.6	11.8	18.0	24.9	52.2	347	4,096
351.0 - 371.6	20.6	17.5	27.3	52.8	373	7,692
			BARTLESVILLE SAND			
580.0 - 580.9	0.9	20.3	30.0	42.0	473	426

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Davis Oil Company Lease Barnhill Well No. B-2

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.			
						PERU SAND						
1	351.5	20.4	28	443	0	0	28	65	443	10	0.30	50
2	352.5	21.8	31	524	0	0	31	65	524	114	2.55	30
3	353.6	19.8	34	522	3	46	31	66	476	71	1.65	35
4	354.5	17.6	35	478	2	27	33	58	451	8	0.30	50
5	355.5	10.0	23	178	0	0	23	72	178	0	Imp.	-
6	356.5	13.1	10	102	0	0	10	84	102	0	Imp.	-
7	357.5	14.6	35	396	0	0	35	50	396	0	Imp.	-
8	358.6	15.4	29	346	2	24	27	67	322	19	0.56	40
9	359.5	18.8	57	831	0	0	57	40	831	115	2.40	25
10	360.5	16.6	20	258	0	0	20	76	258	139	2.70	25
11	361.5	16.5	26	333	0	0	26	69	333	42	1.31	40
12	362.4	19.0	20	295	0	0	20	75	295	194	4.05	25
13	363.5	20.1	28	437	0	0	28	63	437	118	2.10	25
14	364.6	18.1	37	520	4	56	33	58	464	57	0.90	30
15	365.4	16.6	27	348	0	0	27	61	348	16	0.37	40
16	366.7	19.6	33	502	3	46	30	59	456	13	0.37	45
17	367.5	21.7	19	320	0	0	19	77	320	32	1.00	30
18	368.5	16.1	26	325	0	0	26	69	325	29	0.64	35
19	369.5	16.5	24	307	0	0	24	67	307	19	0.60	40
20	370.5	18.0	19	265	0	0	19	77	265	41	1.25	30
						BARTLESVILLE SAND						
21	580.5	19.8	31	476	0	0	31	63	476	10	0.30	50

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 Davis Oil Company Lease Barnhill Well No. B-2

PERU SAND

Depth Interval, Feet	351.0 - 359.8	359.8 - 371.6	351.0 - 371.6
Feet of Core Analyzed	3.5	2.0	5.5
Average Percent Porosity	17.3	18.9	17.9
Average Percent Original Oil Saturation	32.2	35.0	33.2
Average Percent Oil Recovery	2.3	3.5	2.7
Average Percent Residual Oil Saturation	29.9	31.5	30.5
Average Percent Residual Water Saturation	64.1	58.5	62.1
Average Percent Total Residual Fluid Saturation	94.0	90.0	92.6
Average Original Oil Content, Bbls./A. Ft.	434.	511.	462.
Average Oil Recovery, Bbls./A. Ft.	31.	51.	38.
Average Residual Oil Content, Bbls./A. Ft.	403.	460.	424.
Total Original Oil Content, Bbls./Acre	1,519.	1,022.	2,541.
Total Oil Recovery, Bbls./Acre	109.	102.	211.
Total Residual Oil Content, Bbls./Acre	1,410.	920.	2,330.
Average Effective Permeability, Millidarcys	0.80	0.64	0.74
Average Initial Fluid Production Pressure, p.s.i.	41.7	37.5	40.0

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