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RANTOUL ENERGY CORPORATION

CORE ANALYSIS REPORT

CARTER LEASE

WELSH NO. 28 D16C

MIAMI COUNTY, KANSAS

RECEIVED  
OCT 28 1957

CONSERVATION DIVISION  
Wichita, Kansas

25-17-21E

**OILFIELD RESEARCH LABORATORIES**

536 N. HIGHLAND

CHAMUTE, KANSAS



# OILFIELD RESEARCH LABORATORIES

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

December 19, 1979

Rantoul Energy Corporation  
P.O. Box 516  
Hutchinson, Kansas 67501

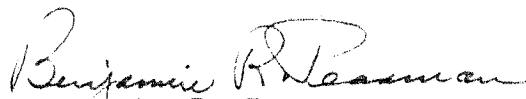
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary cores taken from the Carter Lease, Well No. 28, Miami County, Kansas, and submitted to our laboratory on November 26, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

  
Benjamin R. Pearman

SAM/tem  
5 c to Hutchinson, Kansas

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# Oilfield Research Laboratories

## GENERAL INFORMATION & SUMMARY

Company Rantoul Energy Corporation Lease Carter Well No. 28

Location 165' NSL & 1065' EWL NW SW

Section 25 Twp. 17S Rge. 21E County Miami State Kansas

Name of Sand	-		Peru
Top of Core	-		354.0
Bottom of Core	-		368.5
Top of Sand	-		354.0
Bottom of Sand	-		367.3
Total Feet of Permeable Sand	-		12.4
Total Feet of Floodable Sand	-		6.5
<b>Distribution of Permeable Sand:</b>			
Permeability Range Millidarcys	<b>Feet</b>	<b>Cum. Ft.</b>	
0 - 20	3.7	3.7	
20 - 100	4.2	7.9	
100 - 200	3.5	11.4	
300 - 400	1.0	12.4	
<b>Average Permeability Millidarcys</b>	-		91.4
<b>Average Percent Porosity</b>	-		18.6
<b>Average Percent Oil Saturation</b>	-		30.3
<b>Average Percent Water Saturation</b>	-		54.1
<b>Average Oil Content, Bbls./A. Ft.</b>	-		452.
<b>Total Oil Content, Bbls./Acre</b>	-		5599.
<b>Average Percent Oil Recovery by Laboratory Flooding Tests</b>	-		10.7
<b>Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.</b>	-		175.
<b>Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre</b>	-		1138.
<b>Total Calculated Oil Recovery, Bbls./Acre</b>	-		See "Calculated Recovery" Section.
<b>Packer Setting, Feet</b>	-		
<b>Viscosity, Centipoises @</b>	-		
<b>A. P. I. Gravity, degrees @ 60 °F</b>	-		
<b>Elevation, Feet</b>	-		

# Oilfield Research Laboratories

## GENERAL INFORMATION & SUMMARY

Company	Rantoul Energy Corporation	Lease	Carter	Well No.	28	
Location	165' NSL & 1065' EWL NW SW					
Section	25	Twp.	17S	Rge.	21E	
		County	Miami		State	Kansas
Name of Sand					Squirrel	
Top of Core					509.0	
Bottom of Core					520.0	
Top of Sand					510.2	
Bottom of Sand					517.9	
Total Feet of Permeable Sand					4.6	
Total Feet of Floodable Sand					0	
Distribution of Permeable Sand:						
Permeability Range Millidarcys	Feet	Cum. Ft.				
0 - 5	4.0	4.0				
5 - 10	0.6	4.6				
Average Permeability Millidarcys - - - - -						3.4
Average Percent Porosity - - - - -						16.2
Average Percent Oil Saturation - - - - -						43.2
Average Percent Water Saturation - - - - -						45.5
Average Oil Content, Bbls./A. Ft. - - - - -						537.
Total Oil Content, Bbls./Acre - - - - -						2687.
Average Percent Oil Recovery by Laboratory Flooding Tests - - - - -						0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - -						0
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - -						0
Total Calculated Oil Recovery, Bbls./Acre - - - - -						0
Packer Setting, Feet - - - - -						
Viscosity, Centipoises @ - - - - -						
A. P. I. Gravity, degrees @ 60 °F - - - - -						
Elevation, Feet - - - - -						

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The core was sampled by a representative of Oilfield Research Laboratories. Fresh water mud was used as a drilling fluid. The core was reported to be from a non-virgin area.

Since only the Peru portion of this core responded to floodpot testing, a calculated recovery is given for this portion of the core only.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
	<u>PERU SAND</u>
354.0 - 357.4	Dark sandstone containing thin shale streaks.
357.4 - 357.6	Gray shale.
357.6 - 360.1	Brown sandstone.
360.1 - 360.9	Alternate thin layers of sandstone and shale.
360.9 - 361.6	Gray limestone.
361.6 - 365.0	Alternate thin layers of sandstone and shale.
365.0 - 367.3	Light very shaly sandstone.
367.3 - 368.5	Gray calcareous shale.
	<u>SQUIRREL SAND</u>
509.0 - 510.2	Gray shale.
510.2 - 510.6	Light brown very shaly sandstone.
510.6 - 511.8	Hard calcareous sandstone.
511.8 - 513.6	Dark very shaly sandstone.
513.6 - 514.7	Gray calcareous shale.
514.7 - 515.4	Light brown very shaly sandstone.
515.4 - 517.0	Gray sandy shale.
517.0 - 517.9	Brown and gray shaly sandstone.
517.9 - 520.0	Gray sandy shale.

LABORATORY FLOODING TESTS

The Peru Sand in this core responded to laboratory flooding tests, as a total recovery of 1,138 barrels of oil per acre was obtained from 6.5 feet of sand. The weighted average percent oil saturation was reduced from 40.5 to 29.8, or represents an average recovery of 10.7 percent. The weighted average effective permeability of the samples is 3.93 millidarcys, while the average initial fluid production pressure is 27.9 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 13 samples tested, 7 produced water and oil, and 3 samples produced water only. This indicates that approximately 54 percent of the sand represented by these samples is floodable pay sand. The tests also show that the upper portion of the Peru Sand has a comparatively higher permeability profile than the lower portion.

CALCULATED RECOVERYPERU SAND

It would appear from a study of the data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 2,220 barrels of oil per acre. This is an average recovery of 342 barrels per acre foot from 6.5 feet of floodable sand analyzed in this core.

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

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Original formation volume factor, estimated	1.03
Reservoir water saturation, percent, estimated	25.0
Average porosity, percent	20.5
Oil saturation after flooding, percent	29.8
Performance factor, percent, estimated	50.0
Net floodable sand, feet	6.5



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**RESULTS OF SATURATION & PERMEABILITY TESTS**

**TABLE 1-B**

Company Rantoul Energy Corporation Lease Carter Well No. 28

Sample No.	Depth, Feet	Effective Porosity, Percent	Percent Saturation		Oil Content, Bbls. / A Ft.	Perm., MILL.	Feet of Sand		Total Oil Content	Pore Capacity, FT. X IN.
			Oil	Water			FT.	Comp. FT.		
					<u>PERU SAND</u>					
1	354.3	23.1	33	55	591	130.	1.0	1.0	591	130.00
2	355.5	15.8	51	46	625	335.	1.0	2.0	625	335.00
3	356.5	13.6	33	38	348	61.	1.4	3.4	487	85.40
4	357.8	22.0	46	26	785	110.	0.5	3.9	393	55.00
5	358.5	25.5	45	44	890	195.	1.0	4.9	890	195.00
6	359.5	22.0	43	31	734	188.	1.0	5.9	734	188.00
7	360.3	21.9	28	48	476	84.	0.8	6.7	381	67.20
8	361.7	18.3	29	60	412	7.1	0.4	7.1	165	2.84
9	362.6	17.4	32	57	432	15.	1.0	8.1	432	15.00
10	363.4	17.0	36	54	475	36.	1.0	9.1	475	36.00
11	364.7	19.6	10	72	152	22.	1.0	10.1	152	22.00
12	365.5	15.7	20	63	244	0.62	1.0	11.1	244	0.62
13	366.9	14.8	2	92	23	1.4	1.3	12.4	30	1.82
					<u>SQUIRREL SAND</u>					
1	510.4	16.9	41	48	538	Imp.	0.4	0.4	215	0.00
2	511.6	15.3	44	47	522	4.0	1.2	1.6	626	4.80
3	512.6	17.1	45	39	597	3.5	1.2	2.8	716	4.20
4	513.5	13.9	56	40	604	5.6	0.6	3.4	362	3.36
5	515.2	17.1	38	50	504	3.3	0.7	4.1	353	2.31
6	517.5	16.5	36	51	461	1.1	0.9	5.0	415	0.99

RESULTS OF LABORATORY FLUIDS

Company Antoul Energy Corporation Lease Carter Well No. 28

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation		Volume of Water Recovered cc <sup>e</sup>	Effective Permeability Millidarcys <sup>ss</sup>	Initial Fluid Production Pressure Lbs./Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water			
1	354.3	23.4	33	599	PERU SAND	7	127	26	70	8.75	20
2	355.5	16.3	51	645		13	164	38	59	10.71	20
3	356.5	13.1	33	335		0	0	33	63	0.15	50
4	357.8	22.5	46	803		17	297	29	72	2.62	25
5	358.5	25.2	45	880		15	293	30	63	1.80	25
6	359.5	22.5	43	751		14	244	29	64	2.40	25
7	360.3	21.4	28	465		0	0	28	65	0.22	40
8	361.7	18.3	29	412		0	0	29	62	Imp.	-
9	362.6	17.1	32	425		6	80	26	57	0.30	30
10	363.4	17.5	36	489		6	81	30	68	0.30	50
11	364.7	19.3	10	150		0	0	10	86	0.30	35
12	365.5	15.4	19	227		0	0	19	70	Imp.	-
13	366.9	14.9	2	23		0	0	2	92	Imp.	-
					SQUIRREL SAND						
1	510.4	17.0	41	541		0	0	41	50	Imp.	-
2	511.6	15.6	43	521		0	0	43	51	Imp.	-
3	512.6	16.9	45	590		0	0	45	41	Imp.	-
4	513.5	14.1	55	602		0	0	55	40	Imp.	-
5	515.2	16.8	39	508		0	0	39	51	Imp.	-
6	517.5	16.8	36	469		0	0	36	44	Imp.	-

Notes: cc—cubic centimeter.

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

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

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## SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company	Rantoul Energy Corporation	Lease	Carter	Well No.	28
Depth Interval, Feet	354.0 - 360.1	PERU SAND 360.1 - 367.3	360.1 - 367.3	354.0 - 367.3	
Feet of Core Analyzed	4.5	2.0		6.5	
Average Percent Porosity	21.9	17.3		20.5	
Average Percent Original Oil Saturation	43.4	34.0		40.5	
Average Percent Oil Recovery	12.8	6.0		10.7	
Average Percent Residual Oil Saturation	30.6	28.0		29.8	
Average Percent Residual Water Saturation	64.9	62.5		64.2	
Average Percent Total Residual Fluid Saturation	95.5	90.5		94.0	
Average Original Oil Content, Bbls./A. Ft.	728.	458.		645.	
Average Oil Recovery, Bbls./A. Ft.	217.	81.		175.	
Average Residual Oil Content, Bbls./A. Ft.	511.	377.		470.	
Total Original Oil Content, Bbls./Acre	3,277.	914.		4,191.	
Total Oil Recovery, Bbls./Acre	977.	161.		1,138.	
Total Residual Oil Content, Bbls./Acre	2,300.	753.		3,053.	
Average Effective Permeability, Millidarcys	5.55	0.30		3.93	
Average Initial Fluid Production Pressure, p.s.i.	23.0	40.0		27.9	

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