

OILFIELD RESEARCH LABORATORIES

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

October 30, 1979

Rantoul Energy Corporation
Box 516
Hutchinson, Kansas 67501

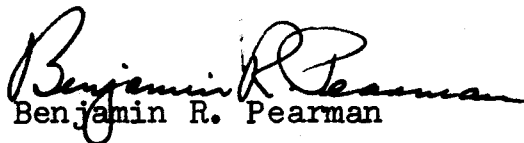
Gentlemen:

Enclosed herewith is the report of the analysis of the rotary cores taken from the Carter Lease, Well No. 25, Miami County, Kansas, and submitted to our laboratory on October 16 and October 17, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES


Benjamin R. Pearman

SAM:km
5 c to Hutchinson, Kansas

- REGISTERED ENGINEERS -

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

GENERAL INFORMATION & SUMMARY

Average Permeability Millidarcys	- - - - -	379.2
Average Percent Porosity	- - - - -	24.7
Average Percent Oil Saturation	- - - - -	36.9
Average Percent Water Saturation	- - - - -	44.0
Average Oil Content, Bbls./A. Ft.	- - - - -	706.
Total Oil Content, Bbls./Acre	- - - - -	9,533.
Average Percent Oil Recovery by Laboratory Flooding Tests	- - - - -	11.3
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	- - - - -	222.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	- - - - -	2,904.
Total Calculated Oil Recovery, Bbls./Acre	- - - - -	See "Calculated Recovery" Section
Packer Setting, Feet	- - - - -	
Viscosity, Centipoises @	- - - - -	
A. P. I. Gravity, degrees @ 60 °F	- - - - -	
Elevation, Feet	- - - - -	

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GENERAL INFORMATION & SUMMARY

Company	Rantoul Energy Corporation	Lease	Carter	Well No.	25
Location	SW				
Section	25	Twp.	17S	Rge.	21E
		County	Miami		State Kansas
Name of Sand	- - - - -				Squirrel
Top of Core	- - - - -				533.0
Bottom of Core	- - - - -				543.0
Top of Sand	- - - - -				533.0
Bottom of Sand	- - - - -				541.6
Total Feet of Permeable Sand	- - - - -				5.9
Total Feet of Floodable Sand	- - - - -				1.0
Distribution of Permeable Sand:					
Permeability Range Millidarcys	Feet		Cum. Ft.		
0 - 5	3.3		3.3		
5 - 10	2.6		5.9		
Average Permeability Millidarcys - - - - -					
					4.5
Average Percent Porosity - - - - -					
					16.6
Average Percent Oil Saturation - - - - -					
					29.7
Average Percent Water Saturation - - - - -					
					55.1
Average Oil Content, Bbls./A. Ft. - - - - -					
					391.
Total Oil Content, Bbls./Acre - - - - -					
					2,309.
Average Percent Oil Recovery by Laboratory Flooding Tests - - - - -					
					3.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - -					
					42.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - -					
					42.
Total Calculated Oil Recovery, Bbls./Acre - - - - -					
					See "Calculated Recovery" Section
Packer Setting, Feet - - - - -					
Viscosity, Centipoises @ - - - - -					
A. P. I. Gravity, degrees @ 60 °F - - - - -					
Elevation, Feet - - - - -					

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.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
<u>PERU SAND</u>	
378.0 - 380.0	Brown slightly calcareous sandstone.
380.0 - 380.4	Gray sandy shale.
380.4 - 388.5	Brown slightly calcareous sandstone.
388.5 - 389.4	Gray limestone.
389.4 - 389.8	Light brown calcareous sandstone.
389.8 - 392.9	Brown slightly calcareous sandstone.
392.9 - 396.0	Gray limestone.

SQUIRREL SAND

533.0 - 537.0	Light brown shaly sandstone.
537.0 - 539.7	Gray sandy shale.
539.7 - 541.6	Light brown shaly sandstone.
541.6 - 543.0	Gray sandy shale.

LABORATORY FLOODING TESTS

PERU SAND

The sand in this core responded to laboratory flooding tests, as a total recovery of 2,904 barrels of oil per acre was obtained from 13.1 feet of sand. The weighted average percent oil saturation was reduced from 36.7 to 25.4, or represents an average recovery of 11.3 percent. The weighted average effective permeability of the samples is 11.71 millidarcys, while

the average initial fluid production pressure is 11.4 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 15 samples tested, 14 produced water and oil. This indicates that approximately 93 percent of the sand represented by these samples is floodable pay sand.

SQUIRREL SAND

The sand in this core responded to laboratory flooding tests, as a total recovery of 42 barrels of oil per acre was obtained from 1.0 feet of sand. The weighted average percent oil saturation was reduced from 31.0 to 28.0, or represents an average recovery of 3.0 percent. The weighted average effective permeability of the samples is 0.47 millidarcys, while the average initial fluid production pressure is 40.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 7 samples tested, 1 produced water and oil, and 1 sample produced water only. This indicates that approximately 14 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

It would appear from a study of the data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 6,030 barrels of oil per acre for the Peru Sand, and 176 barrels of oil per acre for the Squirrel Sand. This is an average recovery of 460 barrels per acre foot from

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13.1 feet of floodable sand for the Peru Sand, and 176 barrels per acre foot from 1.0 feet of floodable sand for the Squirrel Sand.

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

	<u>PERU SAND</u>	<u>SQUIRREL SAND</u>
Original formation volume factor	1.03	1.04
Reservoir water saturation, percent	25.0	45.0
Average porosity, percent	25.0	18.2
Oil saturation after flooding, percent	25.4	28.0
Performance factor, percent	50.0	50.0
Net floodable pay sand, feet	13.1	1.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company	Rantoul Energy Corporation	Lease	Carter	Well No.	25
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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.		
<u>PERU SAND</u>										
1	378.5	21.3	29	60	89	188.	1.0	1.0	479	188.00
2	379.5	25.5	35	49	84	191.	1.0	2.0	692	191.00
3	380.5	27.9	37	38	75	340.	0.6	2.6	481	204.00
4	381.5	27.5	27	41	68	745.	1.0	3.6	576	745.00
5	382.5	27.4	35	42	77	470.	1.0	4.6	744	470.00
6	383.5	20.6	27	54	81	826.	1.0	5.6	432	826.00
7	384.6	27.7	40	29	69	745.	1.0	6.6	860	745.00
8	385.5	28.0	37	40	77	804.	1.0	7.6	804	804.00
9	386.5	27.3	38	38	76	288.	1.0	8.6	805	288.00
10	387.5	25.5	50	34	84	226.	1.0	9.6	989	226.00
11	388.3	14.2	37	51	88	38.	0.5	10.1	204	19.00
12	389.5	15.7	41	56	97	5.4	0.4	10.5	200	2.16
13	390.6	26.7	32	53	85	273.	1.2	11.7	796	327.60
14	391.5	20.3	49	41	90	8.1	1.0	12.7	772	8.10
15	392.5	25.6	44	39	83	94.	0.8	13.5	699	75.20
<u>SQUIRREL SAND</u>										
1	533.5	17.7	31	54	85	6.3	1.0	1.0	426	6.30
2	534.7	17.1	26	59	85	4.7	1.0	2.0	345	4.70
3	535.5	12.1	22	72	94	0.20	1.0	3.0	207	0.20
4	536.8	16.5	38	50	88	9.6	1.0	4.0	486	9.60
5	539.8	18.2	21	51	72	2.3	0.8	4.8	238	1.84
6	540.9	15.9	28	63	91	0.22	0.5	5.3	173	0.11
7	541.5	20.3	46	30	76	6.4	0.6	5.9	434	3.84

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SUMMARY OF PERMEABILITY & SATURATION TESTS

Company	Rantoul Energy Corporation		Lease	Carter		Well No.	25
	Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.			
			<u>PERU SAND</u>				
	378.0 - 392.9	13.5	379.2	5119.06			
			<u>SQUIRREL SAND</u>				
	533.0 - 541.6	5.9	4.5	26.59			
			<u>PERU SAND</u>				
	378.0 - 392.9	13.5	36.9	706			9,533
			<u>SQUIRREL SAND</u>				
	533.0 - 541.6	5.9	29.7	391			2,309

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company **Rantoul Energy Corporation** Lease **Carter** Well No. **25**

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			
1	378.5	21.8	29	450	PERU SAND		25	71	422	276	9.36
2	379.5	25.3	35	687	4	68	25	69	491	297	7.16
3	380.5	27.8	37	798	10	196	28	66	647	210	14.99
4	381.5	27.8	27	582	7	151	22	72	474	135	15.29
5	382.5	27.0	35	733	5	108	22	75	461	281	6.65
6	383.5	21.1	27	442	13	272	21	73	344	143	15.44
7	384.6	28.0	40	669	6	98	21	77	456	429	24.10
8	385.5	28.4	37	815	19	413	27	64	595	298	17.67
9	386.5	27.2	38	802	10	220	23	75	485	310	13.39
10	387.5	25.0	50	970	15	317	33	65	640	267	11.78
11	388.3	14.7	37	422	17	330	27	70	308	268	7.49
12	389.5	16.0	41	509	10	114	41	56	509	0	Imp.
13	390.6	26.5	32	658	0	0	22	73	452	282	7.33
14	391.5	20.0	49	760	10	206	34	58	527	25	0.52
15	392.5	25.6	44	874	15	233	28	61	556	183	13.12
					16	318					
					SQUIRREL SAND						
1	533.5	18.2	31	438	3	42	28	58	396	5	0.47
2	534.7	17.0	25	330	0	0	25	60	330	0	Imp.
3	535.5	12.4	21	202	0	0	21	73	202	0	Imp.
4	536.8	16.9	37	485	0	0	37	51	485	0	Imp.
5	539.8	17.7	21	288	0	0	21	71	288	10	0.17
6	540.9	16.0	28	348	0	0	28	63	348	0	Imp.
7	541.5	20.0	45	698	0	0	45	40	698	0	Imp.

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	Rantoul Energy Corporation	Lease	Carter	Well No.	25
Depth Interval, Feet	PERU SAND 378.0 - 392.9	SQUIRREL SAND 533.0 - 541.6			
Feet of Core Analyzed	13.1	1.0			
Average Percent Porosity	25.0	18.2			
Average Percent Original Oil Saturation	36.7	31.0			
Average Percent Oil Recovery	11.3	3.0			
Average Percent Residual Oil Saturation	25.4	28.0			
Average Percent Residual Water Saturation	69.5	58.0			
Average Percent Total Residual Fluid Saturation	94.9	86.0			
Average Original Oil Content, Bbls./A. Ft.	712.	438.			
Average Oil Recovery, Bbls./A. Ft.	222.	42.			
Average Residual Oil Content, Bbls./A. Ft.	490.	396.			
Total Original Oil Content, Bbls./Acre	9,329.	438.			
Total Oil Recovery, Bbls./Acre	2,904.	42.			
Total Residual Oil Content, Bbls./Acre	6,425.	396.			
Average Effective Permeability, Millidarcys	11.71	0.47			
Average Initial Fluid Production Pressure, p.s.i.	11.4	40.0			

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