



OILFIELD RESEARCH LABORATORIES

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January 11, 1980

Compton Industries
P.O. Box 437
Moran, Kansas 66755

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Shinkle Lease, Well No. 1-C, Linn County, Kansas, and submitted to our laboratory on December 12, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Benjamin R. Pearman
Benjamin R. Pearman

BRP/tem
5 c to Moran, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Compton Industries Lease Shinkle Well No. 1-C

Location 465' NSL & 465' EWL

Section 2 Twp. 20S Rge. 22E County Linn State Kansas

Name of Sand	- - - - -	Squirrel
Top of Core	- - - - -	593.0
Bottom of Core	- - - - -	607.0
Top of Sand	- - - - - (Analyzed) - -	594.9
Bottom of Sand	- - - - -	605.7
Total Feet of Permeable Sand	- - - - - (Analyzed) - -	5.0
Total Feet of Floodable Sand	- - - - - (Analyzed) - -	4.0

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

30 - 50

5.0

5.0

Average Permeability Millidarcys	- - - - -	40.2
Average Percent Porosity	- - - - -	18.5
Average Percent Oil Saturation	- - - - -	48.9
Average Percent Water Saturation	- - - - -	17.2
Average Oil Content, Bbls./A. Ft.	- - - - -	695.
Total Oil Content, Bbls./Acre	- - - - -	3,479.
Average Percent Oil Recovery by Laboratory Flooding Tests	- - - - -	12.5
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	- - - - -	179.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	- - - - -	715.

Total Calculated Oil Recovery, Bbls./Acre - - - - - See "Calculated Recovery" Section.

Packer Setting, Feet - - - - -

Viscosity, Centipoises @ - - - - -

A. P. I. Gravity, degrees @ 60 °F - - - - -

Elevation, Feet - - - - -

This core was sampled and the samples sealed in plastic bags by a representative of the client. The well was drilled in non-virgin territory using fresh water mud as the circulating fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
593.0 - 594.1	Gray sandy shale.
594.1 - 594.9	Light brown sandstone.
594.9 - 598.3	Brown sandstone.
598.3 - 598.8	Gray sandy shale.
598.8 - 605.7	Dark brown sandstone.
605.7 - 607.0	Gray laminated sandstone and shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 715 barrels of oil per acre was obtained from 4.0 feet of sand. The weighted average percent oil saturation was reduced from 55.0 to 42.5, or represents an average recovery of 12.5 percent. The weighted average effective permeability of the samples is 3.48 millidarcys, while the average initial fluid production pressure is 21.3 pounds per square inch (See Table V).

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CALCULATED RECOVERY

The results of the laboratory testing of this core indicate that efficient primary and waterflooding operations in the vicinity of this well should recover approximately 243 barrels of oil per acre foot.

This recovery value was calculated using the following data and assumptions:

Original formation volume factor, estimated	1.05
Reservoir water saturation, percent, estimated	20.0
Average porosity, percent	18.6
Oil saturation after flooding, percent	42.5
Performance factor, percent, estimated	50.0

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

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	595.5	19.4	24	29	53	361	36.	1.0	1.0	361	36.00
2	597.6	16.3	47	9	56	594	30.	1.0	2.0	594	30.00
3	601.2	20.2	56	16	72	878	39.	1.0	3.0	878	39.00
4	603.5	17.4	69	5	74	931	48.	1.0	4.0	931	48.00
5	605.5	19.2	48	27	75	715	48.	1.0	5.0	715	48.00

Company Compton Industries

Lease

Shinkle

Well No. 1-C

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Compton Industries	Lease	Shinkle	Well No.	1-C
Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.			
594.9 - 605.7	5.0	40.2	201.00			
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
594.9 - 605.7	5.0	18.5	48.9	17.2	695	3,479

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company		Lease				Shinkle			Well No.		1-C
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	595.5	19.9	23	355	0	0	23	64	277	8.09	15
2	597.6	16.7	47	609	9	117	38	56	390	4.59	15
3	601.2	19.9	56	865	13	201	43	57	90	1.17	30
4	603.5	17.8	69	953	21	290	48	46	245	2.67	20
5	605.5	19.7	48	734	7	107	41	57	296	5.48	20

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	Compton Industries	Lease	Shinkle	Well No.
		594.9 - 605.7		1-C
Depth Interval, Feet		4.0		
Feet of Core Analyzed		18.6		
Average Percent Porosity		55.0		
Average Percent Original Oil Saturation		12.5		
Average Percent Oil Recovery		42.5		
Average Percent Residual Oil Saturation		54.0		
Average Percent Residual Water Saturation		96.5		
Average Percent Total Residual Fluid Saturation		791.		
Average Original Oil Content, Bbls./A. Ft.		179.		
Average Oil Recovery, Bbls./A. Ft.		612.		
Average Residual Oil Content, Bbls./A. Ft.		3,161.		
Total Original Oil Content, Bbls./Acre		715.		
Total Oil Recovery, Bbls./Acre		2,446.		
Total Residual Oil Content, Bbls./Acre		3.48		
Average Effective Permeability, Millidarcys		21.3		
Average Initial Fluid Production Pressure, p.s.i.				

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

TABLE VI

Sample No.	Depth, Feet	Chloride Content of Brine in Sand ppm	Percent Connate Water Saturation	Drilling & Foreign	Total
1	595.5	12,221			
2	597.6	55,973			
3	601.2	30,032			
4	603.5	101,708			
5	605.5	22,248			

Note: ppm — parts per million