



OILFIELD RESEARCH LABORATORIES

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

May 19, 1977

Glenn Caldwell
Box 42
Garnett, Kansas 66032

Dear Mr. Caldwell:

Enclosed herewith is the report of the analysis of the Rotary core taken from the North Unit Lease, Well No. 25, Anderson County, Kansas and submitted to our laboratory on May 10, 1977.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

James E. Russell

James E. Russell

by Perry S. Brigham

Geologist

JER:ss
4 c to Garnett, Kansas

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GENERAL INFORMATION & SUMMARY

Company Glenn Caldwell Lease North Unit Well No. 25

Location SE^W NE SW NW NE

Section 4 Twp. 21S Rge. 21E County Anderson State Kansas

Name of Sand	-	Bartlesville
Top of Core	(Received)	727.0
Bottom of Core	(Received)	741.0
Top of Sand	Good	727.4
Bottom of Sand	Good	740.6
Total Feet of Permeable Sand		13.2
Total Feet of Floodable Sand		10.5

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 50	4.6	4.6
50 - 75	4.6	9.2
75 - 100	2.0	11.2
100 & above	2.0	13.2

Average Permeability Millidarcys	-	67.9
Average Percent Porosity	-	19.9
Average Percent Oil Saturation	-	33.1
Average Percent Water Saturation	-	47.5
Average Oil Content, Bbls./A. Ft.	-	509.
Total Oil Content, Bbls./Acre	-	6,718.
Average Percent Oil Recovery by Laboratory Flooding Tests	-	7.2
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	-	115.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	-	1,211.
Total Calculated Oil Recovery, Bbls./Acre	-	
Packer Setting, Feet	-	
Viscosity, Centipoises @	-	
A. P. I. Gravity, degrees @ 60 °F	-	
Elevation, Feet	-	

A salt water mud was used as a circulating fluid in the coring of the sand in this well. The sand reservoir from which the core was taken has been waterflooded. The core was sampled by the client.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
727.0 - 727.4	Grayish brown very shaly fine grained sandstone.
727.4 - 736.0	Brown slightly shaly fine grained sandstone.
736.0 - 736.7	Brown slightly laminated very shaly fine grained sandstone containing an angular fracture.
736.7 - 740.0	Brown slightly laminated slightly carbonaceous shaly fine grained sandstone.
740.0 - 740.6	Brown slightly shaly fine grained sandstone.
740.6 - 740.8	Gray sandy shale.
740.8 - 741.0	Light brown very shaly sandstone.

Coring was started at a depth of 727.0 feet in grayish brown very shaly fine grained sandstone and completed at 741.0 feet in light brown very shaly sandstone. This core shows a total of 13.2 feet of sandstone. For the most part, the pay is made up of brown, slightly shaly fine grained sandstone.

PERMEABILITY

The weighted average permeability of the cored section is 67.9 millidarcys. By observing the data given on the coregraph, it is noticeable that the sand has a very irregular permeability profile. The permeability of the sand varies from 3.2 to a maximum of 195 millidarcys.

PERCENT SATURATION & OIL CONTENT

The sand in this core shows a fairly good weighted average percent oil saturation, namely, 33.1. The weighted average percent water saturation of the cored section is 47.5. This gives an overall weighted average total fluid saturation of 80.6 percent. This fairly low total fluid saturation indicates some fluid was lost during coring which was probably oil.

The weighted average oil content of the sand section is 509 barrels per acre foot. The total oil content, as shown by this core, is 6,718 barrels per acre.

LABORATORY FLOODING TESTS

When taking into consideration the fairly low total fluid saturations, the sand in this core responded fairly well to laboratory flooding tests, as a total recovery of 1,211 barrels of oil per acre was obtained from 10.5 feet of sand. The weighted average percent oil saturation was reduced from 34.1 to 26.9, or represents an average recovery of 7.2 percent. The weighted average effective permeability of the samples is 7.40 millidarcys, while the average initial fluid production pressure is 15.1 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 14 samples tested, 11 produced water and oil. This indicates that approximately 79 percent of the sand represented by these samples is floodable pay sand. The tests also show that the sand has a wide variation in effective permeability to water.

CONCLUSION

This core shows a clean pay sand section having a fairly good oil saturation, a moderate water saturation, and good porosity and permeability.

No estimated oil recovery is given in the report because the sand reservoir has been waterflooded.

A handwritten signature in cursive script that reads "Perry S. Brigham".

Perry S. Brigham

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Glenn Caldwell Lease North Unit Well No. 25

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	727.5	19.9	27	39	66	417	25.	0.6	0.6	250	15.00
2	728.5	21.2	28	47	75	461	52.	1.0	1.6	461	52.00
3	729.5	20.3	31	43	74	488	84.	1.0	2.6	488	84.00
4	730.5	20.2	31	48	79	486	72.	1.0	3.6	486	72.00
5	731.5	19.6	36	46	82	548	29.	1.0	4.6	548	29.00
6	732.5	22.4	36	44	80	626	133.	1.0	5.6	626	133.00
7	733.5	21.3	32	42	74	529	88.	1.0	6.6	529	88.00
8	734.5	24.0	30	44	74	559	195.	1.0	7.6	559	195.00
9	735.5	19.4	34	49	83	512	31.	1.0	8.6	512	31.00
10	736.5	15.9	26	70	96	321	3.2	0.7	9.3	225	2.24
11	737.5	16.1	45	48	93	562	30.	1.3	10.6	731	39.00
12	738.5	18.1	36	50	86	506	57.	1.0	11.6	506	57.00
13	739.5	20.7	30	52	82	482	56.	1.0	12.6	482	56.00
14	740.5	19.9	34	45	79	525	72.	0.6	13.2	315	43.20

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Glenn Caldwell Lease North Unit 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	Bbls./A. Ft.			
1	727.5	21.0	31	505	6	98	25	72	407	23	0.68	20
2	728.5	21.9	31	527	7	119	24	69	408	57	1.80	15
3	729.5	22.9	30	533	4	71	26	71	462	136	6.50	15
4	730.5	21.6	35	587	5	84	30	67	503	59	2.50	15
5	731.5	20.6	36	575	9	143	27	69	432	260	7.60	15
6	732.5	21.8	34	575	9	152	25	72	423	196	14.99	15
7	733.5	20.2	33	517	7	110	26	71	407	97	3.20	15
8	734.5	24.5	35	665	6	114	29	69	551	188	16.42	10
9	735.5	20.6	34	544	8	128	26	71	416	262	12.00	15
10	736.5	15.9	26	321	0	0	26	70	321	0	Imp.	-
11	737.5	16.7	39	505	9	116	30	68	389	31	1.10	15
12	738.5	18.1	36	506	0	0	36	50	506	0	Imp.	-
13	739.5	20.7	30	482	0	0	30	52	482	0	Imp.	-
14	740.5	21.4	34	565	8	133	26	72	432	332	18.11	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

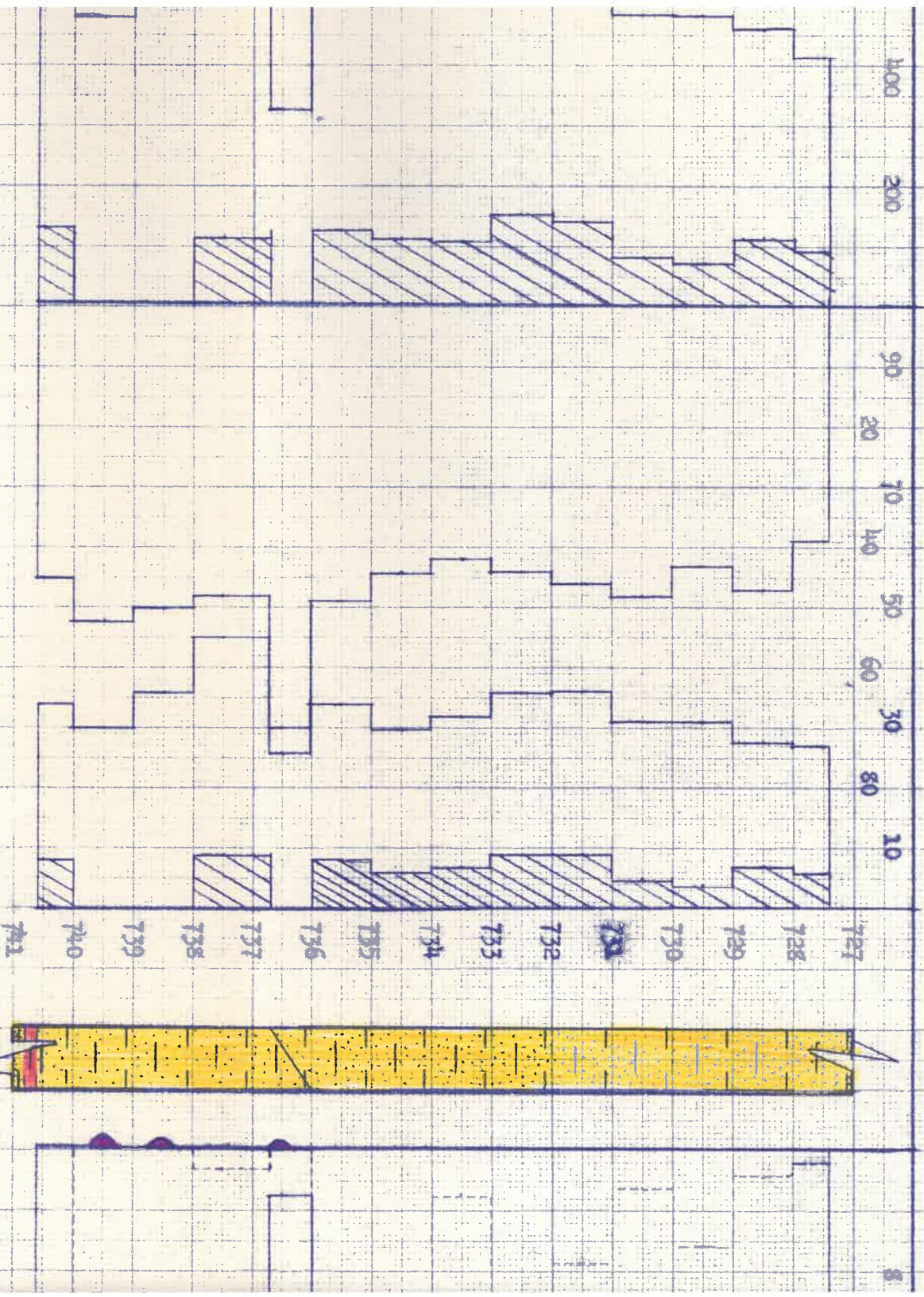
Company	Glenn Caldwell	Lease	North Unit	Well No.	25
Depth Interval, Feet	727.4 to 740.6				
Feet of Core Analyzed	10.5				
Average Percent Porosity	21.1				
Average Percent Original Oil Saturation	34.1				
Average Percent Oil Recovery	7.2				
Average Percent Residual Oil Saturation	26.9				
Average Percent Residual Water Saturation	69.9				
Average Percent Total Residual Fluid Saturation	96.8				
Average Original Oil Content, Bbls./A. Ft.	554.				
Average Oil Recovery, Bbls./A. Ft.	115.				
Average Residual Oil Content, Bbls./A. Ft.	439.				
Total Original Oil Content, Bbls./Acre	5,822.				
Total Oil Recovery, Bbls./Acre	1,211.				
Total Residual Oil Content, Bbls./Acre	4,611.				
Average Effective Permeability, Millidarcys	7.40				
Average Initial Fluid Production Pressure, p.s.i.	15.1				

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

OIL CONTENT,
LS./A. FT.,

WATER SAT.,
PERCENT

OIL SAT.,
PERCENT



FLOOD POT RECOVERY
IMPERMEABLE TO WATER

SEALY SANDSTONE

GLEN

NUMBER IN
AN

DEPTH INTERVAL, FEET	NO. OF CORES ANALYZED	AVERAGE POROSITY	AVG. OIL SATURATION PERCENT
727.4 - 740.6	13.2	29.9	33.1

