

JOE BAILEY

CORE ANALYSIS REPORT

COX LEASE

WELL NO. K-2

LINN COUNTY, KANSAS

OILFIELD RESEARCH LABORATORIES

536 N. HIGHLAND

CHANUTE, KANSAS



OILFIELD RESEARCH LABORATORIES

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

T, 20 RSC 226 SEC. 20

July 19, 1983

Joe Bailey
641 West First Street
Garnett, Kansas 66032

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Cox Lease, Well No. K-2, located in Linn County, Kansas and submitted to our laboratory on July 11, 1983.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/rmc

5 c to Garnett, Kansas

Oilfield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company Joe Bailey Lease COX Well No. K-2
 Location _____
 Section 20 Twp. 22S Rge. 22E County Linn State Kansas

Elevation, Feet
 Name of Sand..... Squirrel
 Top of Core 586.0
 Bottom of Core 606.0
 Top of Sand (Tested) 590.5
 Bottom of Sand 606.0
 Total Feet of Permeable Sand 12.7
 Total Feet of Floodable Sand 2.6

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
1 - 5	4.9	4.9
5 - 12	6.4	11.3
18 - 30	1.4	12.7

Average Permeability Millidarcys 7.5
 Average Percent Porosity 20.1
 Average Percent Oil Saturation 26.1
 Average Percent Water Saturation..... 46.1
 Average Oil Content, Bbls./ A. Ft. 405.
 Total Oil Content, Bbls./ Acre..... 5,424.
 Average Percent Oil Recovery by Laboratory Flooding Tests..... 3.7
 Average Oil Recovery by Laboratory Flooding Tests, Bbls./ A. Ft. 60.
 Total Oil Recovery by Laboratory Flooding Tests, Bbls./ Acre 155.

See "Calculated Recovery"
Section

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 semi-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
586.0 - 588.0	Gray and brown finely laminated shale and sandstone.
588.0 - 589.0	Gray shale.
589.0 - 590.0	Gray and brown finely laminated shale and sandstone.
590.0 - 590.5	Gray shale.
590.5 - 592.0	Brown sandstone with scattered gray shale partings.
592.0 - 593.0	Brown slightly shaly sandstone with scattered gray shale partings.
593.0 - 593.6	Gray and brown finely laminated shale and sandstone.
593.6 - 594.3	Gray shale.
594.3 - 597.0	Gray and brown finely laminated shale and sandstone.
597.0 - 597.6	Brown sandstone.
597.6 - 598.3	Gray and brown finely laminated shale and sandstone.
598.3 - 598.8	Brown slightly shaly sandstone with scattered gray shale partings.
598.8 - 599.3	Gray and brown laminated shale and sandstone.
599.3 - 599.6	Brown sandstone with gray shale partings.
599.6 - 599.8	Gray shale.
599.8 - 602.3	Gray and brown laminated shale and sandstone.

<u>Depth Interval, Feet</u>	<u>Description</u>
602.3 - 604.0	Brown slightly shaly sandstone with gray shale partings.
604.0 - 605.0	Light brown slightly calcareous sandstone.
605.0 - 606.0	Light brown shaly calcareous sandstone.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 155 barrels of oil per acre was obtained from 2.6 feet of sand. The weighted average percent oil saturation was reduced from 32.7 to 29.0, or represents an average recovery of 3.7 percent. The weighted average effective permeability of the samples is 0.31 millidarcys, while the average initial fluid production pressure is 45.0 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 16 samples tested, 4 produced water and oil, and 2 produced water only. This indicates that approximately 25 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

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 930 barrels of oil per acre. This is an average recovery of 356 barrels per acre foot from 2.6 feet of floodable sand analyzed in this core.

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

Original formation volume factor, estimated	1.05
Reservoir water saturation, percent, estimated	25.0
Average porosity, percent	21.6
Oil saturation after flooding, percent	29.0
Performance factor, percent, estimated	50.0
Net floodable sand, feet	2.6

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Joe Bailey Lease Cox Well No. K-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.		
1	590.7	23.4	29	34	63	526	18.	0.8	0.8	421	14.40
2	591.5	21.2	35	39	74	576	9.9	0.7	1.5	403	6.93
3	592.4	21.2	28	43	71	461	8.9	1.0	2.5	461	8.90
4	593.5	19.2	12	55	67	179	4.7	0.6	3.1	107	2.82
5	594.4	16.8	10	70	80	130	Imp.	0.7	3.8	91	0.00
6	595.4	16.7	37	54	91	479	1.3	1.0	4.8	479	1.30
7	596.3	19.0	31	53	84	457	1.7	1.0	5.8	457	1.70
8	597.4	20.7	37	25	62	594	29.	0.6	6.4	356	17.40
9	598.4	22.4	30	36	66	521	9.1	0.5	6.9	261	4.55
10	599.5	19.9	16	53	69	247	11.	0.3	7.2	74	3.30
11	600.4	20.0	24	53	77	372	5.7	1.2	8.4	446	6.84
12	601.4	20.2	22	54	76	345	3.1	1.3	9.7	449	4.03
13	602.4	22.7	10	49	59	176	6.4	0.8	10.5	141	5.12
14	603.4	22.7	27	41	68	476	7.4	0.9	11.4	428	6.66
15	604.6	21.0	25	40	65	407	7.7	1.0	12.4	407	7.70
16	605.5	16.3	35	32	67	443	3.1	1.0	13.4	443	3.10

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Joe Bailey Lease COX Well No. K-2

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
590.5 - 598.8	6.2	9.4	58.00
599.3 - 606.0	6.5	5.7	36.75
590.5 - 606.0	12.7	7.5	94.75

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
590.5 - 598.8	6.9	19.9	28.3	46.3	440	3,036
599.3 - 606.0	6.5	20.3	23.8	45.8	367	2,388
590.5 - 606.0	13.4	20.1	26.1	46.1	405	5,424

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Joe Bailey Lease Cox Well No. K-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.			
1	590.7	22.9	29	515	2	36	27	64	479	32	0.60	40
2	591.5	21.2	35	576	3	49	32	51	527	14	0.22	45
3	592.4	21.7	27	455	0	0	27	59	455	28	0.45	40
4	593.5	19.0	12	177	0	0	12	56	177	0	Imp.	-
5	594.4	17.3	10	134	0	0	10	70	134	0	Imp.	-
6	595.4	17.2	36	480	0	0	36	55	480	0	Imp.	-
7	596.3	19.5	30	454	0	0	30	54	454	0	Imp.	-
8	597.4	20.2	37	580	8	125	29	54	455	16	0.22	45
9	598.4	22.0	30	512	2	34	28	49	478	6	0.08	50
10	599.5	20.4	16	253	0	0	16	55	253	0	Imp.	-
11	600.4	20.5	24	382	0	0	24	53	382	0	Imp.	-
12	601.4	20.4	22	348	0	0	22	56	348	0	Imp.	-
13	602.4	22.3	10	173	0	0	10	51	173	0	Imp.	-
14	603.4	22.7	27	476	0	0	27	41	476	0	Imp.	-
15	604.6	20.5	26	414	0	0	26	39	414	0	Imp.	-
16	605.5	16.8	35	456	0	0	35	55	456	8	0.15	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.

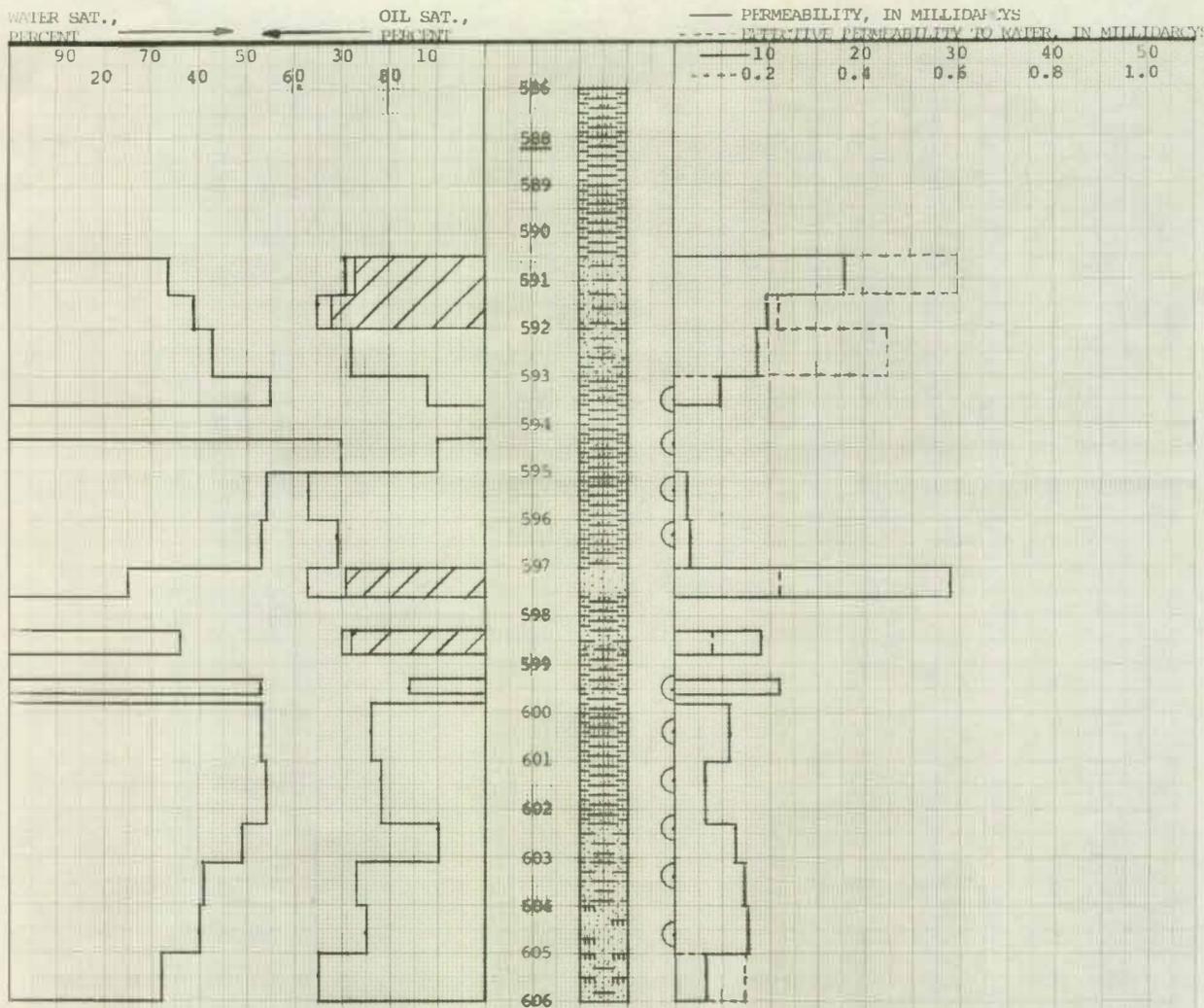
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SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

Company	Joe Bailey	Lease	Cox	Well No.	K-2
Depth Interval, Feet	590.5 - 598.8				
Feet of Core Analyzed	2.6				
Average Percent Porosity	21.6				
Average Percent Original Oil Saturation	32.7				
Average Percent Oil Recovery	3.7				
Average Percent Residual Oil Saturation	29.0				
Average Percent Residual Water Saturation	55.3				
Average Percent Total Residual Fluid Saturation	84.3				
Average Original Oil Content, Bbls./A. Ft.	546.				
Average Oil Recovery, Bbls./A. Ft.	60.				
Average Residual Oil Content, Bbls./A. Ft.	486.				
Total Original Oil Content, Bbls./Acre	1,419.				
Total Oil Recovery, Bbls./Acre	155.				
Total Residual Oil Content, Bbls./Acre	1,264.				
Average Effective Permeability, Millidarcys	0.31				
Average Initial Fluid Production Pressure, p.s.i.	45.0				

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



KEY:

- SANDSTONE
- SHALE
- CALCAREOUS SANDSTONE
- IMPERMEABLE TO WATER

- SHALY CALCAREOUS SANDSTONE
- SANDSTONE WITH SHALE PARTINGS
- SHALY SANDSTONE WITH SHALE PARTINGS
- LAMINATED SHALE AND SANDSTONE
- FLOODPOT RESIDUAL OIL SATURATION

JOE BAILEY

COX LEASE

LINN COUNTY, KANSAS

WELL NO. R-2

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCS	CALCULATED OIL RECOVERY BBLs. / ACRE
590.5 - 598.8	6.9	19.9	28.3	46.3	9.4	
599.3 - 606.0	6.5	20.3	23.8	45.8	5.7	
590.5 - 606.0	13.4	20.1	26.1	46.1	7.5	

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(PRIMARY AND WATER FLOODING)

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CHANUTE, KANSAS
JULY, 1983 RAL