REPORT

FOR

SOHIO PETROLEUM COMPANY
(LYNDE, WALTER & DARBY OPTION)

ON

M. KRUEGER WELL NO. CW-8

Copy Eleven Date 2-10-50

M. KRUEGER WELL NO. CW-8

PETROLOGISTS, INC. TULSA
PETROLEUM CONSULTANTS - CORE ANALYSES
624 EAST FOURTH STREET
TULSA 3, OKLAHOMA

EARLOUGHER ENGINEERING
PETROLEUM CONSULTANTS - CORE ANALYSES
319 EAST FOURTH STREET
TULSA 3, OKLAHOMA

February 10, 1950

Sohio Petroleum Company
(Lynde, Walter & Darby Option)
Independence, Kansas

Attention - Mr. C. R. Temple

Re - Core Analysis
M. Krueger Well No. CW-8
Sec. 19, T.27-S., R.19-E.
Neosho County, Kansas

Gentlemen:

Attached are results of analysis, together with profile and summary, covering core received from your above well.

There are 8.1 net feet of oil sand in a broken section from 738.0 to 752.3 feet. Laboratory water flooding tests indicated a total oil recovery of only 950 barrels per acre. The average residual oil saturation was 25 per cent and permeability to water was low.

Average oil saturation was 33 per cent, average water saturation 27 per cent and average permeability 19 millidarcys. The low total average core saturation may indicate that oil was lost from the core during coring. However, the sand did not respond satisfactorily to water flooding in the laboratory as indicated above.

Estimated oil recovery by water flooding is 850 barrels per acre from the area of which this core is representative.

Yours very truly

EARLOUGHER ENGINEERING

R. C. Earlougher

R. C. Earlougher, Engineer

JMR 1
Encl 1
6 cc to Foster M. Pyle
3 cc to Lynde, Walter & Darby

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CORE SUMMARY

Company Sohio Petroleum Company (Lynde, Walter & Darby Option) Lease M. Krueger Well No. CW-8

Location 330 feet North, 440 feet East of Southwest Corner, SW/4

Section 19 Twp. 27-S Rge. 19-E County Neosho State Kansas

Formation Cored Bartlesville Sand Type Core Rotary, 2-inch

Date Cored 2-6-50 Date Shot Date Completed

Depths:

Reported top of oil sand	738.0 feet
Started coring, oil sand	741.0 "
Bottom of oil sand	752.3 "
Net feet of oil sand cored	5.1 "
Estimated net feet of oil sand	8.1 "
Coal	773.6 - 774.5 "
Bottom of core, shale	781.0 "
Total cored	40.0 "
Feet analyzed	5.7 "

Recommended Shot Record: Set Packer Feet

Depth, Feet From	Depth, Feet To	Feet	Shell Diameter	Quarts Per Foot	Quarts Total
739	750	11	5"	3.9	42.9

Set packer with bottom of cement at 736.0 feet.
Plug back to 750.0 feet.

Hole plugged with mud and cement pending development.

Completion Data:

Hrs. well stood after coring ; Feet Fluid in Hole (Oil Water)

Clean-out time, hrs. ; Initial production, bbls. day . (Oil Water)

Remarks: A 2-inch rotary core was cut from 741.0 to 781.0 feet using water as coring fluid. The core was sampled at the well by Sohio Petroleum Company who retained a duplicate set of samples.

Coring was commenced in shaly oil sand but drill cuttings reportedly indicated 3.0 feet of saturated sand from 738.0 to 741.0 feet. The core indicates 0.6 net feet of shaly oil sand at the top of the cored section and 4.5 net feet of variable oil sand separated from the upper streak of sand by 5.3 feet of shale. Based on the

(Continued following page)

field report of 3.0 feet of sand drilled above the top of the core, there should be 3.6 feet of oil sand above the shale break and 4.5 feet below or a total of 8.1 net feet of oil sand in the section from 738.0 to 752.3 feet.

Results of analysis show a relatively low average oil saturation and low average water saturation. It is possible that some oil was lost from the core during coring; however, the sand did not respond very well to water flooding in the laboratory except for 2 flood samples in the middle of the section. Permeability to water was low for the most part and residual oil saturation somewhat high.

PERMEABILITY Weighted average permeability is 19 millidarcys and values range from 0.7 to 52 millidarcys. Permeability capacity is 154 foot-millidarcys.

POROSITY Average porosity is 18.2 per cent and values range from 14.3 to 20.4 per cent.

PER CENT SATURATION Average oil saturation is 33 per cent and values range from 24 to 43 per cent. Average water saturation is 27 per cent which is relatively low. The low average total core saturation of 60 per cent may indicate loss of oil from the core during coring and it was reported the core bled oil when taken from the core barrel. However, the erratic oil saturation shown by the samples analyzed is not characteristic of a core which has been excessively flushed.

OIL CONTENT Average oil content is 471 barrels per acre-foot and values range from 350 to 620 barrels per acre-foot.

LABORATORY FLOODING TESTS Laboratory water flooding tests indicated an average oil recovery of 117 barrels per acre-foot or a

total oil recovery of 950 barrels per acre based on 8.1 net feet of sand. The major part of this flood pot recovery was obtained from the 2.7 net feet of sand in the middle of the sand section. Average residual oil saturation was 25 per cent which is relatively high. Permeability to water was low.

CONCLUSIONS

1. Net feet of oil sand is 8.1 located between depths 738.0 and 752.3 feet. This includes 3.0 feet of oil sand reportedly drilled at the top of the section.

2. The sand is broken and micaceous and has a relatively low average oil saturation of 33 per cent and low average water saturation of 27 per cent.

3. Laboratory water flooding tests indicated a total oil recovery of 950 barrels per acre based on 8.1 feet of sand and the average residual oil saturation was 25 per cent.

4. It is possible that oil was lost from the core during coring; however, in general the sand did not respond satisfactorily to water flooding in the laboratory as indicated by the relatively high average residual oil saturation and low permeability to water.

5. Estimated oil recovery by water flooding is 850 barrels per acre from the area of which this core is representative.

Respectfully submitted

EARLOUGHER ENGINEERING

J. M. Robinson

J. M. Robinson, Engineer

JMR 1

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SUMMARY OF CORE ANALYSES DATA

COMPANY Sohio Petroleum Company (Lynde, Walter & Darby Option) LEASE M. Krueger WELL NO. CW-8

Sec.	Formation	Depth, Ft.		Net Ft. of Sand	Avg. Por.	Avg. Core Saturation		Core Oil Content		Permeability		Flood Pot Residuals				Oil Recovery Bbl./Acre	
												Saturation		Oil Content			
		From	To			Oil	Water	Avg. B/A. Ft.	Total B/Ac.	Avg. Md.	Capacity Ft. x Md.	Oil	Water	B/A. Ft.	B/Ac.	Diff.	Flood Pot
1	Bartlesville	741.0	741.6	0.6	19.1	32.	--	480.	290	9.3	5.6	25.	52.	370.	220.	70.	70.
2	Bartlesville	746.3	749.2	2.7	19.1	36.	27.	537.	1450	30.	82.	25.	70.	370.	1000.	450.	640.
3	Bartlesville	749.9	752.3	1.8	16.6	28.	26.	367.	660	4.2	7.5	25.	62.	322.	480.	80.	100.
1-3	Bartlesville	741.0	752.3	5.1	18.2	33.	27.	471.	2400	19.	95.	25.	65.	353.	1800.	600.	810.
1-3	Bartlesville	738.0	752.3	8.1**	18.2	33.	27.	471.	3810	19.	154.	25.	65.	353.	2860.	950.	1290.

** Includes 3.0 feet drilled, probably sand.

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RESULTS OF SATURATION TESTS

COMPANY Sohio Petroleum Company (Lynde, Walter & Darby Option) WELL M. Krueger CW-8

Sat. No.	Depth Feet	Porosity Per Cent	Per Cent Saturation			Avg. Oil Content Bbl./A. Ft.	Ft. of Sand		Total Oil Content Bbl./Acre
			Oil	Water	Total		Ft.	Cum.	
F-1	741.1	19.1	32.	--	--	480.	0.6	0.6	290.
2	745.8	17.4	17.	42.	59.	230.	0.6*		
F-3	746.6	18.5	43.	--	--	620.	0.9	1.5	560.
4	747.3	20.4	27.	22.	49.	430.	0.3	1.8	130.
F-5	748.1	19.7	39.	--	--	600.	0.7	2.5	420.
6	749.0	18.7	30.	32.	62.	430.	0.8	3.3	340.
F-7	750.0	14.3	34.	--	--	380.	0.7	4.0	270.
8	750.8	17.0	28.	26.	54.	370.	0.3	4.3	110.
F-9	751.7	18.5	24.	--	--	350.	0.8	5.1	280.

*Not included in cumulative feet of sand.

1

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RESULTS OF LABORATORY FLOODING TESTS

COMPANY Sohio Petroleum Company (Lynde, Walter & Darby Option) LEASE M. Krueger WELL NO. CW-8

Sample No.	Depth	Porosity	Perm. Approx.	Before Flooding 1/			Max. Press. Psi.	Water Through C.C.	Time Min.	Flood Pot Residual			Flood Pot Oil Recovery Bbl./A. Ft.	
				Oil Sat.	Water Sat.	Oil Content Bbl./A. Ft.				Oil Sat.	Water Sat.	Oil Content Bbl./A. Ft.		
F-1	741.1	19.1	10.	32.	--	480.	40.	48.	495.	25.	52.	370.	109.	
F-3	746.6	18.5	5.0	43.	--	620.	40.	279.	435.	23.	74.	340.	276.	
F-5	748.1	19.7	18.	39.	--	600.	40.	1,465.	495.	26.	65.	400.	201.	
F-7	750.0	14.3	2.0	34.	--	380.	40.	64.	555.	26.	69.	290.	93.	
F-9	751.7	18.5	1.0	24.	--	350.	40.	+	495.	23.	55.	330.	23.	

1

1/ Unless otherwise noted, oil content and saturation before flooding equals flood pot oil recovery plus flood pot residual.

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RESULTS OF PERMEABILITY TESTS

COMPANY Sohio Petroleum Company (Lynde, Walter & Darby Option) WELL M. Krueger No. CW-8

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Sand		Capacity Ft. X Md.	Sample No.	Depth Feet	Permeability Millidarcys	Feet of Sand		Capacity Ft. X Md.
			Ft.	Cum. Ft.					Ft.	Cum. Ft.	
1	741.1	10.	0.2	0.2	2.0	10	747.9	39.	0.3	2.5	12.
2	741.5	8.9	0.4	0.6	3.6	11	748.8	20.	0.4	2.9	8.0
3	745.8	1.8	0.6*			12	749.1	22.	0.4	3.3	8.8
4	746.3	2.7	0.2	0.8	0.5	13	750.0	0.7	0.1	3.4	0.1
5	746.5	4.6	0.2	1.0	0.9	14	750.6	4.9	0.6	4.0	2.9
6	746.8	25.	0.2	1.2	5.0	15	750.9	4.5	0.3	4.3	1.4
7	747.1	52.	0.3	1.5	16.	16	751.1	-0-	0.4*		
8	747.4	41.	0.3	1.8	12.	17	751.4	3.9	0.8	5.1	3.1
9	747.6	48.	0.4	2.2	19.	18	751.9	0.3	0.1*		

*Not included in cumulative feet of sand.

1

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