

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

December 6, 1956

REPLY TO
P. O. BOX 36
MIDLAND, TEXAS

Carper Drilling Company, Inc.
200 Carper Building
Artesia, New Mexico

Attention: Mr. Marshall Rowley

Subject: Core Analysis
Carper State 14 No. 2 Well
Ek Queen Field
Lea County, New Mexico
Location: Sec. 14-T18S-R33E

Gentlemen:

Diamond coring equipment and water base mud were used to core the Queen sand between 4275 and 4309 feet in the Carper State 14 No. 2. Engineers of Core Laboratories, Inc. selected and quick-froze samples of recovered formation as directed by representatives of Carper Drilling Company, Inc., and analyzed these samples in the Lovington laboratory. The results of the analysis are presented in this report.

Queen sand between 4284 and 4309 feet has permeability equal to or greater than 0.1 millidarcy at only six points, these points being confined to the interval, 4298 to 4304 feet.

In this six-foot interval the arithmetic average permeability is 2.5 millidarcys, and the total productive capacity is 15 millidarcy-feet. This natural productive capacity is inadequate to support satisfactory rates of fluid production, and a commercial completion in this interval between 4298 and 4304 feet will be entirely dependent on the response of the formation to treatment. The porosity in this zone ranges from 9.3 to 19.9 per cent and averages 15.3 per cent, and the empirically calculated connate water saturation is 45 per cent of pore space.

Carper Drilling Company, Inc.
Carper State 14 No. 2 Well

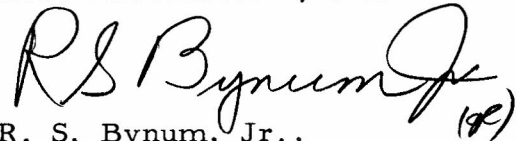
Page Two

Estimates of recoverable oil have been calculated for the Queen sand between 4298 and 4304 feet using the observed core analysis data from this zone in conjunction with estimated reservoir fluid characteristics considered applicable. These estimates by solution gas and by water drive production mechanisms are presented on page one of the report, and are subject to the conditions set forth in the body of and in the footnotes to the summary page.

We sincerely appreciate this opportunity to be of service to you, and trust that this report will prove useful in evaluating the Queen sand analyzed from this well.

Very truly yours,

Core Laboratories, Inc.

A handwritten signature in cursive script that reads "R. S. Bynum, Jr." with a small circled "19" at the end of the signature.

R. S. Bynum, Jr.,
District Manager

RSB:TLK:ds

7 cc. - Addressee

CORE LABORATORIES, INC.

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Page 1 of 1 File WP-3-664 FC
Well Carper State 14 No. 2

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Queen 4298.0-4304.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	6.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	46.7
FEET OF CORE INCLUDED IN AVERAGES	6.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	(c) 45
AVERAGE PERMEABILITY: MILLIDARCY	2.5	OIL GRAVITY: °API	(e) 36
PRODUCTIVE CAPACITY: MILLIDARCY-Feet	15	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	(e) 300
AVERAGE POROSITY: PER CENT	15.3	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	(e) 1.21
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	10.0	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	540

Calculated maximum solution gas drive recovery is 138 barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is 421 barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

FORMATION NAME AND DEPTH INTERVAL:

FEET OF CORE RECOVERED FROM ABOVE INTERVAL		AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	
FEET OF CORE INCLUDED IN AVERAGES		AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	
AVERAGE PERMEABILITY: MILLIDARCY		OIL GRAVITY: °API	
PRODUCTIVE CAPACITY: MILLIDARCY-Feet		ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	
AVERAGE POROSITY: PER CENT		ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE		CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	

Calculated maximum solution gas drive recovery is _____ barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is _____ barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

(c) Calculated (e) Estimated (m) Measured (*) Refer to attached letter.

These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc., and its officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.



CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

COMPANY CARPER DRILLING COMPANY, INC. DATE ON 12-3-56 FILE NO. WP-3-664 FC
 WELL CARPER STATE 14 NO. 2 DATE OFF 12-4-56 ENGRS. BOONE
 FIELD EK QUEEN FORMATION QUEEN ELEV. 3918' DF
 COUNTY LEA STATE NEW MEXICO DRLG. FLD. WATER BASE MUD CORES DIAMOND 3 1/2"
 LOCATION 660 FS & 1980 FEL SEC 14-T18S-R33E REMARKS SAMPLED AS DIRECTED BY CLIENT

SAND [Pattern] LIMESTONE [Pattern] CONGLOMERATE [Pattern] CHERT [Pattern]
 SHALE [Pattern] DOLOMITE [Pattern] ANHYDRITE [Pattern]

R-RED
 G-GRAY
 M-MOTTLED
 FG-FINE GRAIN
 MG-MEDIUM GRAIN

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TABULAR DATA and INTERPRETATION

SAMPLE NUMBER	DEPTH FEET	PERM. MD.	POROSITY %	RESIDUAL SATURATION % PORE SPACE		VISUAL DESCRIPTION	PROD.
				OIL	TOTAL WATER		
CONVENTIONAL ANALYSIS							
1	4284.5	<0.1	6.8	0.0	80.9	R, FG	
2	85.5	<0.1	9.0	0.0	55.6	R, FG	
3	86.5	<0.1	7.2	0.0	61.2	R, FG	
4	87.5	<0.1	8.1	2.5	55.6	R, FG	
5	88.5	<0.1	9.8	0.0	72.4	R, FG	
6	89.5	<0.1	10.6	0.0	65.2	R, FG	
7	90.5	<0.1	5.9	0.0	74.6	R, FG	
8	91.5	<0.1	9.9	0.0	68.7	R, FG	
9	92.5	<0.1	7.7	0.0	59.7	R, G, M, FG	
10	93.5	<0.1	6.8	0.0	54.5	R, FG	
11	94.5	<0.1	4.2	0.0	21.0	R, FG	
12	95.5	<0.1	4.3	0.0	21.3	R, FG	
13	96.5	<0.1	3.4	0.0	15.3	R, G, FG	
14	97.5	<0.1	3.4	0.0	15.3	R, G, FG	
15	98.5	5.0	14.2	10.5	35.2	R, G, MG	OIL
16	99.5	1.9	17.6	10.8	51.7	R, MG	OIL
17	4300.5	3.3	19.9	12.1	49.3	R, G, MG	OIL
18	01.5	4.3	15.3	12.4	40.5	G, MG	OIL
19	02.5	0.1	9.3	9.7	44.1	R, G, FG	OIL
20	03.5	0.1	15.7	4.5	59.6	R, MG	OIL
21	04.5	<0.1	6.7	0.0	46.3	R, FG	
22	05.5	<0.1	4.7	0.0	61.7	R, FG	
23	06.5	<0.1	4.7	0.0	57.5	R, FG	
24	07.5	<0.1	5.5	0.0	84.6	R, FG	
25	08.5	<0.1	7.8	0.0	84.7	R, FG	

COMPLETION COREGRAPH

