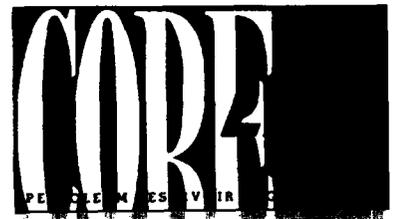


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**CORE ANALYSIS REPORT
FOR
CITIES SERVICE OIL COMPANY
STATE "AW" NO. 2 WELL
DEAN FIELD
LEA COUNTY, NEW MEXICO**



CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

April 16, 1956

REPLY TO
P. O. BOX 36
MIDLAND, TEXAS

Cities Service Oil Company
Box 97
Hobbs, New Mexico

Attention: Mr. John D. Albright

Subject: Core Analysis
State "AW" No. 2 Well
Dean Field
Lea County, New Mexico

Gentlemen:

Diamond coring equipment and water base mud were used to core the interval from 11,500 to 11,590 feet in the State "AW" No. 2. Poor core recovery was obtained, and representatives of Cities Service Oil Company selected samples of recovered formation on which analysis was desired. These samples were submitted to the Lovington laboratory, and the results of the analysis are presented in this report. The interval from 11,500 to 11,512 feet was analyzed by whole-core procedures using long segments of full diameter core, while formation analyzed in the interval from 11,515 to 11,579 feet was analyzed for permeability and porosity only by conventional procedures using plugs of the recovered formation.

The Strawn lime from 11,500 to 11,512 feet is characterized by residual oil and total water saturations indicating the formation to be oil productive. The permeability throughout this interval is relatively low, ranging from 0.3 to 8.5 millidarcys and averaging only 3.0 millidarcys. Since the total productive capacity of this 12-foot interval is only 36 millidarcy-feet, commercial rates of oil production over sustained periods of time are probably dependent upon the response of the formation to treatment. The average porosity is 7.6 per cent, and the calculated connate water saturation is 30.7 per cent of pore space.

Recoverable oil estimates by solution gas and by water drive production mechanisms have been computed for this 12-foot zone using the observed

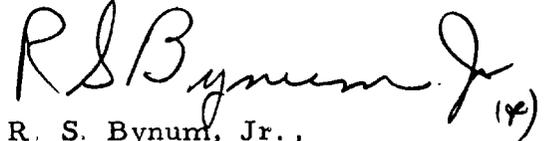
core analysis data in conjunction with estimated reservoir fluid characteristics considered applicable. These recovery estimates are presented on the core summary and calculated recoverable oil page of the report, and are subject to the conditions set forth in the body of and in the footnotes to the summary page.

Thirteen samples representing the depth interval from 11,515 to 11,579 feet were analyzed for permeability and porosity only. The permeability at all points analyzed was less than 0.1 millidarcy, and the porosity ranged from 0.5 to only 2.2 per cent. These data are presented in tabular and graphical form on the Completion Coregraph.

We sincerely appreciate this opportunity to be of service to you, and trust that this report will prove useful in making a preliminary evaluation of the Strawn lime analyzed from this well.

Very truly yours,

Core Laboratories, Inc.



R. S. Bynum, Jr.,
District Manager

RSB:TLK:jp

7cc. - Addressee

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

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Well State "AW" No. 2

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Strawn 11,500.0 - 11,512.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	12.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	30.7
FEET OF CORE INCLUDED IN AVERAGES	12.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	(c) 30.7
AVERAGE PERMEABILITY: MILLIDARCY	3.0	OIL GRAVITY: °API	(e) 45
Max.: 90°	1.5	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	(e) 1200
PRODUCTIVE CAPACITY: MILLIDARCY-Feet	36	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK TANK OIL	(e) 1.74
Max.: 90°	18	CALCULATED ORIGINAL STOCK TANK OIL-IN-PLACE: BARRELS PER ACRE FOOT	235
AVERAGE POROSITY: PER CENT	7.6		
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	5.5		

Calculated maximum solution gas drive recovery is 42 barrels per acre foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is 202 barrels per acre foot, assuming full maintenance of original reservoir pressure, 100% areal 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 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.