22   23   24

M. G. Peters
(Kelly)

M. G. Peters
(Gulf)

M. G. Peters
(Kelly)

• 1-B

◇ 1

State

27   J. W. Brown   M. G. Peters   M.G. Peters 26   Gulf   25
(Gulf)

• 5   • 4

• 1-A

DeKalb

◉ 3   ◉ 6   • 10   • 2   • 1

• 1

◎ 8   ◉   ◉ 2

Gulf

Steinberger
◇ 3 (Brown)

State

Proposed Pilot Flood

◎ Proposed Injection Well

• Producing Well

J. W. Brown
BROWN POOL

Section 26   T-10-S   R-26-E
Chaves Co. New Mexico

Scale 1" - 1000'

CORE ANALYSIS REPORT

J. W. Brown
Nickson Hotel
Roswell, New Mexico

> Subject: Core Analysis
> State E-92 No. 8 Well
> Brown Field
> Chaves County, New Mexico
> Location: Sec. 26-T10S-R26E

Gentlemen:

Penrose formation analyzed from 720 to 759 feet is interpreted to be oil productive. The natural productive capacity is 245 millidarcy-feet and an economic completion will be entirely dependent upon a successful formation treatment.

The theoretical maximum solution gas drive recovery is calculated to be 66 barrels per acre-foot, assuming production is started at original reservoir pressure and is continued until such pressure declines to zero psig. The theoretical maximum water drive recovery is calculated to be 228 barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100 per cent areal and vertical coverage and continuation of production to 100 per cent water cut. The actual recovery will be less than these theoretical maximums due to the various economic limiting factors affecting ultimate recovery.

We sincerely appreciate this opportunity to be of service.

Very truly yours,

Core Laboratories, Inc.

R. S. Bynum, Jr.,
District Manager

RSB:MH:jw
10 cc. - Addressee

Form F-11B

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Penrose 720.0-759.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	39.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE		41.2
FEET OF CORE INCLUDED IN AVERAGES	35.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	(c)	41
AVERAGE PERMEABILITY: MILLIDARCYS	7.0	OIL GRAVITY: °API	(e)	36
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	245	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	(e)	40
AVERAGE POROSITY: PER CENT	9.2	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	(e)	1.06
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	23.8	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT		397

Calculated maximum solution gas drive recovery is 66 barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is 228 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.*)
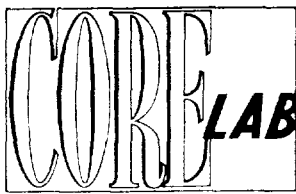
FORMATION NAME AND DEPTH INTERVAL:

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: MILLIDARCYS		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.
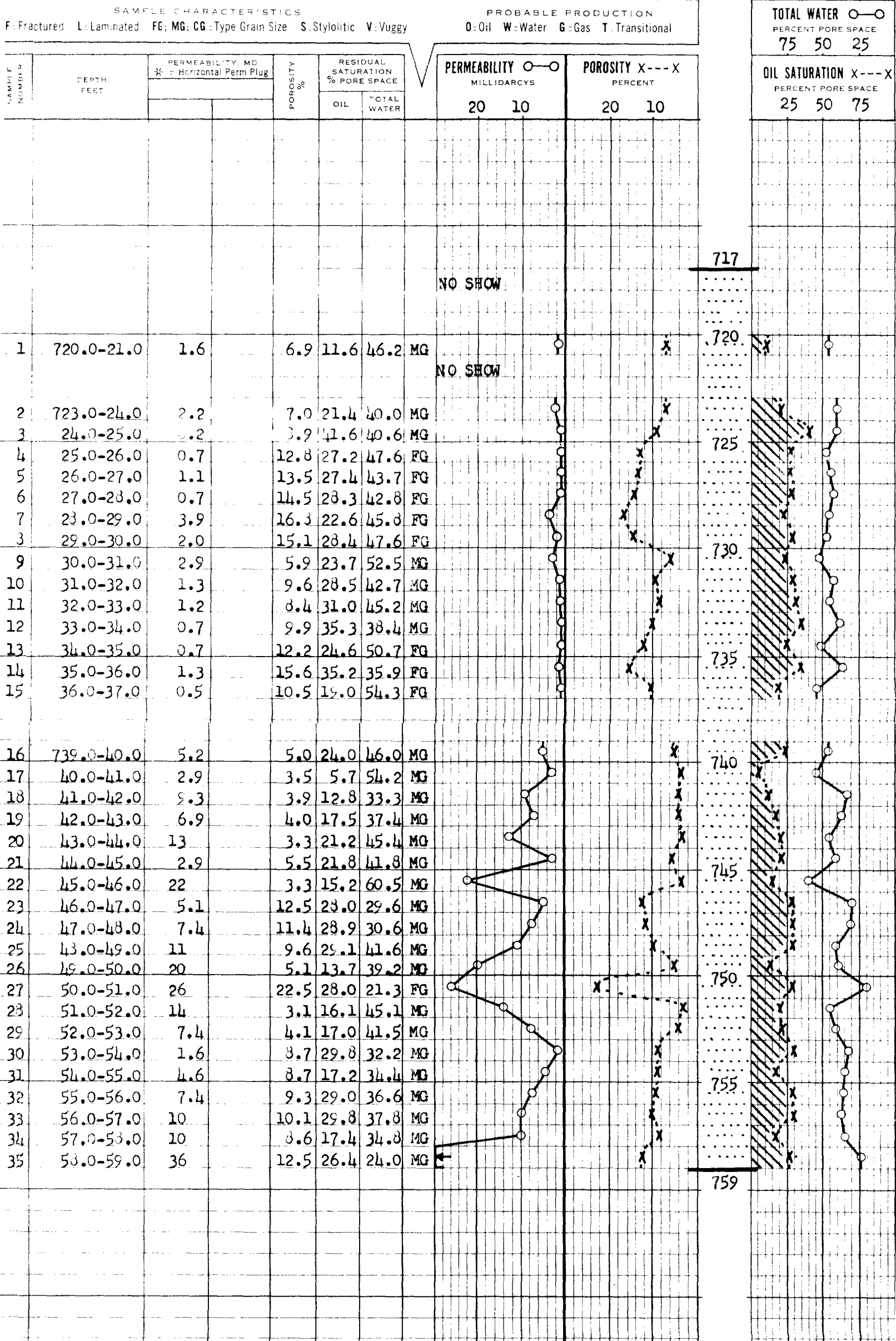
CORE LABORATORIES, INC.

CORE LAB

Petroleum Reservoir Engineering

OMPANY J. W. BROWN	FILE NO. WP-3-1267
'ELL STATE F-92 NO. 8	DATE 5-18-59 ENGRS. BOONE
IELD BROWN	FORMATION PENROSE ELEV.
OUNTY CHAVES STATE NEW MEXICO	DRLG. FLD. WATER BASE MUD CORES DIAMOND 2 1/8"
OCATION SW¼ SE¼ SEC 26-T10S-R26E	REMARKS SAMPLED AS DIRECTED BY CLIENT

COMPLETION COREGRAPH

These analyses, opinions or interpretations are based on observations and material 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 profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon

SAND   LIMESTONE   CONGLOMERATE   CHERT   ANHYDRITE

SHALE   DOLOMITE   OOLITES

SAMPLE CHARACTERISTICS
F=Fractured L=Laminated FG; MG; CG=Type Grain Size S=Stylolitic V=Vuggy

PROBABLE PRODUCTION
O=Oil W=Water G=Gas T=Transitional

TOTAL WATER — PERCENT PORE SPACE — 75 50 25

OIL SATURATION — PERCENT PORE SPACE — 25 50 75

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY, MD ※ = Horizontal Perm Plug	POROSITY %	RESIDUAL SATURATION % PORE SPACE OIL	RESIDUAL SATURATION % PORE SPACE TOTAL WATER	Type Grain Size
						717
				NO SHOW		
						720
1	720.0-21.0	1.6	6.9	11.6	46.2	MG
				NO SHOW		
2	723.0-24.0	2.2	7.0	21.4	40.0	MG
3	24.0-25.0	2.2	9.9	41.6	40.6	MG
						725
4	25.0-26.0	0.7	12.8	27.2	47.6	FG
5	26.0-27.0	1.1	13.5	27.4	43.7	FG
6	27.0-28.0	0.7	14.5	28.3	42.8	FG
7	28.0-29.0	3.9	16.3	22.6	45.8	FG
8	29.0-30.0	2.0	15.1	28.4	47.6	FG
						730
9	30.0-31.0	2.9	5.9	23.7	52.5	MG
10	31.0-32.0	1.3	9.6	28.5	42.7	MG
11	32.0-33.0	1.2	8.4	31.0	45.2	MG
12	33.0-34.0	0.7	9.9	35.3	38.4	MG
13	34.0-35.0	0.7	12.2	24.6	50.7	FG
						735
14	35.0-36.0	1.3	15.6	35.2	35.9	FG
15	36.0-37.0	0.5	10.5	19.0	54.3	FG
16	739.0-40.0	5.2	5.0	24.0	46.0	MG
						740
17	40.0-41.0	2.9	3.5	5.7	54.2	MG
18	41.0-42.0	9.3	3.9	12.8	33.3	MG
19	42.0-43.0	6.9	4.0	17.5	37.4	MG
20	43.0-44.0	13	3.3	21.2	45.4	MG
21	44.0-45.0	2.9	5.5	21.8	41.8	MG
						745
22	45.0-46.0	22	3.3	15.2	60.5	MG
23	46.0-47.0	5.1	12.5	28.0	29.6	MG
24	47.0-48.0	7.4	11.4	28.9	30.6	MG
25	48.0-49.0	11	9.6	29.1	41.6	MG
26	49.0-50.0	20	5.1	13.7	39.2	MG
						750
27	50.0-51.0	26	22.5	28.0	21.3	FG
28	51.0-52.0	14	3.1	16.1	45.1	MG
29	52.0-53.0	7.4	4.1	17.0	41.5	MG
30	53.0-54.0	1.6	8.7	29.8	32.2	MG
31	54.0-55.0	4.6	8.7	17.2	34.4	MG
						755
32	55.0-56.0	7.4	9.3	29.0	36.6	MG
33	56.0-57.0	10	10.1	29.8	37.8	MG
34	57.0-58.0	10	8.6	17.4	34.8	MG
35	58.0-59.0	36	12.5	26.4	24.0	MG
						759

CORE ANALYSIS REPORT

FOR

J. W. BROWN

BROWN STATE NO. 6 WELL

BROWN FIELD

CHAVES COUNTY, NEW MEXICO

CORE

J. W. Brown
Nickson Hotel
Roswell, New Mexico

<div style="text-align: right;">

Subject: Core Analysis
Brown State No. 6 Well
Brown Field
Chaves County, New Mexico

</div>

Gentlemen:

Diamond coring equipment and water base mud were used to core the interval, 728 to 792 feet, in the Brown State No. 6. An engineer of Core Laboratories, Inc. selected samples of recovered formation for analysis as directed by a representative of J. W. Brown. These samples were quick-frozen to preserve fluid content and were transported to the Hobbs laboratory. Complete analysis results are presented in this report.

Queen sand analyzed between the depths of 754 and 792 feet is characterized at most points by favorable residual fluid saturations and is interpreted to be capable of oil production. Those samples in this zone which exhibit zero residual oil saturation are considered of no productive significance and have been excluded from further consideration. The average permeability of the 28 productive feet considered in this interval is 13 millidarcys and the total observed natural productive capacity is 358 millidarcy-feet, indicating that formation treatment probably will be necessary in order to establish sustained satisfactory rates of flow. The average measured porosity is 13.5 per cent and the average empirically calculated connate water saturation is 35 per cent of pore space.

Recoverable oil estimates have been calculated for the Queen formation interval, 754 to 792 feet, using the observed core analysis data from the 28 productive feet in conjunction with estimated reservoir fluid characteristics considered applicable. These estimates are presented on page one

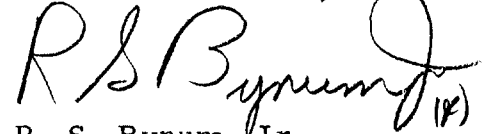of this report and are subject in all respects to the conditions set forth
in the body of and in the footnotes to the summary page.

We sincerely appreciate this opportunity to be of service and trust that
this report will assist the preliminary evaluation of the Queen formation
analyzed from the Brown State No. 6.

Very truly yours,

Core Laboratories, Inc.

R. S. Bynum, Jr.,
District Manager

RSB:JDJ:dw
6 cc. - Addressee

Form F-11B

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Queen 754.0-792.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	38.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	36.4
FEET OF CORE INCLUDED IN AVERAGES	28.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE (c)	35
AVERAGE PERMEABILITY: MILLIDARCYS	13	OIL GRAVITY: °API ( )	36
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	358	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL (e)	50
AVERAGE POROSITY: PER CENT	13.5	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL (e)	1.07
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	26.3	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	636

Calculated maximum solution gas drive recovery is 105 barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is 361 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.*)

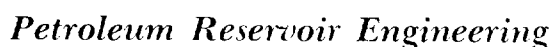**FORMATION NAME AND DEPTH INTERVAL:**

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: MILLIDARCYS		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.

CORE LAB

CORE LABORATORIES, INC. — Petroleum Reservoir Engineering

COMPANY J. W. BROWN	DATE ON 5-11-58	FILE NO. WP-3-1076 FC
WELL BROWN STATE NO. 6	DATE OFF 5-15-58	ENGRS. BOONE
FIELD BROWN	FORMATION QUEEN	ELEV. 3738' GL
COUNTY CHAVES	STATE NEW MEXICO DRLG. FLD. WATER BASE MUD	CORES DIAMOND 2 1/8"
LOCATION	REMARKS SAMPLED AS DIRECTED BY CLIENT	

Special Analysis

CORE REPORT

SAND — LIMESTONE — CONGLOMERATE — CHERT

SHALE — DOLOMITE

T-TAN
FG-FINE GRAINED

These analyses opinions or interpretations are based on observations and material 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 representations as to the productivity, proper operation, or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

PERMEABILITY, Maximum O—O   MILLIDARCYS 40 30 20 10 0

TOTAL WATER O—O PERCENT PORE SPACE 80 60 40 20 0

POROSITY X----X PERCENT 40 30 20 10 0

OIL SATURATION X----X PERCENT PORE SPACE 0 20 40 60 80

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS MAX	PERMEABILITY 90°	POROSITY	RESIDUAL SATURATION PORE SPACE OIL	RESIDUAL SATURATION TOTAL WATER	VISUAL DESCRIPTION
			CONVENTIONAL ANALYSIS				
	NO ANALYSIS BY REQUEST						
1	754.0-55.0	1.0		7.5	14.7	42.7	T,FG
2	55.0-56.0	0.7		7.2	33.4	40.2	T,FG
3	56.0-57.0	20		16.1	32.3	36.6	T,FG
4	57.0-58.0	16		20.4	29.4	34.3	T,FG
5	58.0-59.0	0.7		16.3	16.0	57.6	T,FG
6	59.0-60.0	7.4		18.1	28.2	45.3	T,FG
7	60.0-61.0	1.2		13.2	21.2	30.3	T,FG
8	61.0-62.0	7.9		17.2	37.8	47.7	T,FG
9	62.0-63.0	4.2		14.4	30.5	32.6	T,FG
10	63.0-64.0	0.1		13.6	30.9	35.3	T,FG
11	64.0-65.0	19		17.0	22.9	27.1	T,FG
12	65.0-66.0	4.2		16.0	36.3	22.5	T,FG
13	66.0-67.0	17		16.4	32.9	21.9	T,FG
14	67.0-68.0	12		20.7	17.4	49.8	T,FG
	NO ANALYSIS BY REQUEST						
15	776.0-77.0	0.7		9.7	14.5	44.3	T,FG
16	77.0-78.0	3.3		11.4	11.4	46.6	T,FG
17	78.0-79.0	15		15.0	20.0	42.0	T,FG
18	79.0-80.0	19		18.3	19.1	32.8	T,FG
19	80.0-81.0	5.1		4.0	0.0	57.5	T,FG
20	81.0-82.0	2.9		21.2	23.1	59.8	T,FG
21	82.0-83.0	14		4.0	0.0	47.5	T,FG
22	83.0-84.0	19		3.6	13.9	55.7	T,FG
23	84.0-85.0	14		3.0	16.2	28.7	T,FG
24	85.0-86.0	12		9.5	27.4	27.4	T,FG
25	86.0-87.0	12		10.0	35.0	36.0	T,FG
26	87.0-88.0	51		8.9	18.0	32.6	T,FG
27	88.0-89.0	13		13.4	39.5	19.4	T,FG
28	89.0-90.0	51		16.4	17.0	22.0	T,FG
29	90.0-91.0	22		11.6	44.8	20.7	T,FG
30	91.0-92.0	1.2		6.6	51.5	25.7	T,FG

Depth markers: 728, 730, 735, 740, 745, 750, 755, 760, 765, 770, 775, 780, 785, 790, 792