CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

November 20, 1959

REPLY TO
728 PATTERSON BLDG.
DENVER, COLORADO

El Paso Natural Gas Company
Box 997
Farmington, New Mexico

Attention: Mr. Roy Pritchard

Subject: Core Analysis
San Juan 29 - 5 No. 45 - 22 Well
Wildcat (Blanco Mesa Verde Dakota)
Rio Arriba County, New Mexico
Location: Sec. 22-T29N-R5W

Gentlemen:

Dakota formation analyzed from 8108 to 8121 feet is essentially non-productive due to low permeability and porosity. A decrease in the total water saturations may be an indication of gas in the vertical fractures and further testing is recommended to evaluate the fracture system noted within this interval.

Formation analyzed from the intervals 8127 to 8135, 8144 to 8161, 8166 to 8171 and 8186 to 8188 feet, is considered capable of producing gas. The productive capacity in each of the intervals is quite low and a formation treatment will be required in order to establish and maintain satisfactory rates of production. The vertical fractures noted in the intervals, 8127 to 8135, 8144 to 8166 and 8166 to 8171 feet, should increase the effective permeability. Average core analysis values for the four gas productive zones are given on pages one and two of this report.

The remaining analyzed intervals are considered to be of no commercial value due to low permeability and porosity and high total water saturations.

We sincerely appreciate this opportunity to be of service.

Very truly yours,

Core Laboratories, Inc.

J. D. Harris, (R)
District Manager

JDH:HC:11

Form F-11B

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

 File RP-3-1109
Well San Juan 29-5 No. 45-22

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Dakota 8127.0 - 8135.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	8.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE		31.5
FEET OF CORE INCLUDED IN AVERAGES	7.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	(c)	31
AVERAGE PERMEABILITY: MILLIDARCYS	0.03	OIL GRAVITY: °API		
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	0.21	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL		
AVERAGE POROSITY: PER CENT	3.5	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL		
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	0.0	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.*)

FORMATION NAME AND DEPTH INTERVAL: Dakota 8144.0 - 8161.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	17.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE		9.1
FEET OF CORE INCLUDED IN AVERAGES	15.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	(c)	9
AVERAGE PERMEABILITY: MILLIDARCYS	0.29	OIL GRAVITY: °API		
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	4.4	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL		
AVERAGE POROSITY: PER CENT	6.9	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL		
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	0.7	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.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE # 3 7799-7736

CORE ANALYSIS RESULTS

Company EL PASO NATURAL GAS COMPANY Formation DAKOTA File RP-3-1045
Well SAN JUAN 29-5 No. 32-29 Core Type DIAMOND CONV. Date Report 8/3/59
Field BLANCO MESA VERDE DAKOTA WILDCAT Drilling Fluid OIL EMULSION MUD Analysts ENGLISH
County RIO ARRIBA State N.MEXICO Elev. 6531 DF Location Sec29 29N 5W

Lithological Abbreviations

SAND-SD, SHALE-SH, LIME-LM, DOLOMITE-DOL, CHERT-CH, GYPSUM-GYP, ANHYDRITE-ANHY, CONGLOMERATE-CONG, FOSSILIFEROUS-FOSS, SANDY-SDY, SHALY-SHY, LIMY-LMY, FINE-FN, MEDIUM-MED, COARSE-CSE, CRYSTALLINE-XLN, GRAIN-GRN, GRANULAR-GRNL, BROWN-BRN, GRAY-GY, VUGGY-VGY, FRACTURED-FRAC, LAMINATION-LAM, STYLOLITIC-STY, SLIGHTLY-SL/, VERY-V/, WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE OIL	RESIDUAL SATURATION PER CENT PORE TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
20	7799-7800	0.01	2.9	0.0	30.3	Vertical Fracture
21	7800-01	<0.01	4.8	0.0	25.0	Vertical Fracture
22	01-02	0.06	3.9	0.0	25.6	Vertical Fracture
23	02-03	<0.01	4.6	0.0	47.8	Vertical Fracture
24	03-04	<0.01	1.9	0.0	52.6	Vertical Fracture
25	04-05	0.03	4.3	4.7	55.8	Vertical Fracture
26	05-06	<0.01	1.7	0.0	82.3	Vertical Fracture
27	06-07	<0.01	1.4	0.0	92.7	Vertical Fracture
28	07-08	0.01	5.5	0.0	40.0	Vertical Fracture
29	08-09	0.02	2.8	0.0	78.6	Vertical Fracture
30	09-10	<0.01	2.3	0.0	69.5	Vertical Fracture
31	10-11	0.02	3.4	0.0	79.3	
32	11-12	<0.01	3.3	0.2	81.7	Vertical Fracture
33	12-13	<0.01	5.9	8.5	81.3	Vertical Fracture
34	13-14	<0.01	4.3	4.7	86.0	Vertical Fracture
35	14-15	<0.01	3.9	0.0	84.6	Vertical Fracture
36	15-16	<0.01	3.1	6.5	83.8	Vertical Fracture
37	16-17	0.02	5.8	3.4	86.2	Vertical Fracture
38	17-18	<0.01	2.1	9.5	71.4	Vertical Fracture
39	18-19	<0.01	4.1	0.0	80.5	Vertical Fracture
40	19-20	<0.01	2.1	0.0	90.5	Vertical Fracture
41	20-21	<0.01	3.7	0.0	83.7	Vertical Fracture
42	21-22	0.04	5.7	3.5	87.7	Vertical Fracture
43						
43	7835-36	<0.01	1.1	18.2	36.4	Vertical Fracture

7799-7802 This interval has low porosity (3.8% average) and low permeability (0.02 md. / ft. average) . The saturations (residual oil 0.0% average and total water 26.9% average) are within the range associated with gas production . The vertical fractures should increase the effective permeability .

8002-8022 This interval has low porosity (3.6% average) and low permeability (0.01 md./ft. average) .. The saturations (residual oil 1.8% average and total water 75.6% average) show the interval to be of no commercial value . There is evidence of a good fracture system and further testing should be done to evaluate the fluid within these fractures .

7835-7836 Low porosity (1.1%) shows this one-foot interval to have no commercial value . There is evidence of a fracture system and further testing should be done to evaluate the amount and type of fluid within these fractures .

CA-20

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company EL PASO NATURAL GAS COMPANY | Formation DAKOTA | File RP-3-1045
Well SAN JUAN 29-5 No. 32-29 | Core Type DIAMOND CONV. | Date Report 8/5/59
Field BLANCO MESA VERDE DAKOTA WILDCAT | Drilling Fluid OIL EMULSION MUD | Analysts ENGLISH
County RIO ARRIBA | State N.MEXICO | Elev. 6531 DF | Location SEC 29 29N 5W

Lithological Abbreviations

SAND-SD, SHALE-SH, LIME-LM | DOLOMITE-DOL, CHERT-CH, GYPSUM-GYP | ANHYDRITE-ANHY, CONGLOMERATE-CONG, FOSSILIFEROUS-FOSS | SANDY-SDY, SHALY-SHY, LIMY-LMY | FINE-FN, MEDIUM-MED, COARSE-CSE | CRYSTALLINE-XLN, GRAIN-GRN, GRANULAR-GRNL | BROWN-BRN, GRAY-GY, VUGGY-VGY | FRACTURED-FRAC, LAMINATION-LAM, STYLOLITIC-STY | SLIGHTLY-, VERY-V/, WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE: OIL	RESIDUAL SATURATION PER CENT PORE: TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
44	8740-41	0.01	1.4	0.0	42.8	
45	41-42	0.02	2.6	0.0	88.2	
46	42-43	0.02	2.7	0.0	81.4	Vertical Fracture
47	43-44	0.67	3.0	0.0	90.0	
48	44-45	0.01	3.2	0.0	90.7	
49	8752-53	5.7	1.0	0.0	80.0	
50	53-54	0.01	0.9	0.0	45.0	

8740-8745 Low porosity (2.5% average) and low permeability (0.14 md./ft. average) associated with high total water saturations (78.6% average) show this interval to have no commercial value . The saturation of residual oil is 0.0% average .

8752-8754 Low porosity (0.9% average) and high total water saturations (62.5% average) show this interval to have no commercial value . Other properties are : permeability 2.9 md./ft. average ; and saturation of residual oil 0.0% average .

Form F-11B

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

Well San Juan 29-5 No. 45-22

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Dakota 8166.0 - 8171.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	5.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE		34.5
FEET OF CORE INCLUDED IN AVERAGES	5.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	(c)	34
AVERAGE PERMEABILITY: MILLIDARCYS	0.06	OIL GRAVITY: °API		
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	0.30	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL		
AVERAGE POROSITY: PER CENT	4.2	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL		
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	0.0	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.)*

FORMATION NAME AND DEPTH INTERVAL: Dakota 8186.0 - 8188.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	2.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE		29.4
FEET OF CORE INCLUDED IN AVERAGES	2.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	(c)	29
AVERAGE PERMEABILITY: MILLIDARCYS	0.02	OIL GRAVITY: °API		
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	0.04	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL		
AVERAGE POROSITY: PER CENT	3.4	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL		
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	0.0	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.

Distribution of Final Reports

9 Copies	El Paso Natural Gas Company Box 997 Farmington, New Mexico Attention: Mr. Roy Pritchard
1 Copy	El Paso Natural Gas Company Box 1492 El Paso, Texas Attention: Mr. A. M. Derrick